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A study of online grocery shopping behaviour in Malaysia

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Abstract

The Malaysian e-commerce industry has been growing; however, online grocery shopping is still underpenetrated in Malaysia. This study investigated the factors affecting online grocery shopping behaviour in Malaysia. This study integrated the Technology Acceptance Model (TAM) and Theory of Planned Behaviour (TPB) variables with price as an additional factor. Data were collected through a survey involving 344 Malaysians who were at least 18 years old and had an online grocery shopping experience. SPSS statistical software was used to analyse the data. It was found that attitude, subjective norm, and perceived behavioural control have significant positive relationships with online grocery shopping intention, which further positively influences online grocery shopping behaviour. Perceived usefulness, perceived ease of use, and price have insignificant associations with online grocery shopping intention. The study provides useful information and implications for academics and grocers regarding the factors affecting online grocery shopping behaviour in Malaysia.

Keywords:
Technology acceptance;
Theory of planned behaviour;
Price;
Online grocery shopping;
Malaysia

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1. Introduction

Nowadays, online platforms play a four times larger role than offline channels in Malaysia (Ganesan, 2021). According to Kepios (2022), 66.6% of internet users in Malaysia buy products or services online weekly, including groceries. Groceries are food and beverages and other things, including, but not limited to, household products, beauty and health, baby care, and pet care, which are bought regularly for the home (MyGroser, 2022; Jaya Grocer, 2020). In the past, consumers mainly bought groceries physically. As e-commerce grows, 34.7% of Malaysian internet users order groceries online each week (Kepios, 2022). This reflects a significant opportunity for online grocery growth in Malaysia in the future.

While grocery retailers gain benefits during the pandemic, multiple factors can lead to a deteriorating grocery industry. One of the primary examples is the soaring prices of groceries, which result from climate conditions, labour shortages, low production, the rising cost of raw materials, and supply chain volatility due to the recent Russia-Ukraine conflict (Effendy, 2022;

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Nair, 2022). This will affect grocery shopping intention and behaviour and hit the grocery industry in Malaysia.

As e-commerce grows, consumers can now purchase groceries via online platforms. Although many Malaysians have adopted online shopping during the COVID-19 pandemic, over 75% still prefer physical shopping (Bernama, 2022). This is evidenced in the grocery category. In Southeast Asia, including Malaysia, online grocery is still underpenetrated compared to offline grocery, contributing only around 2% of total grocery spending due to lower purchase frequency and transaction value (Business Today, 2022; Google et al., 2021). In Malaysia, online grocery sales only account for 4% of total grocery sales (Muthusamy & Krishnan, 2022). This shows that online grocery shopping is still in its infancy in Malaysia. However, Ipsos (2022) indicates that the percentage of Malaysians who demand online groceries rose by 11% to 39% in 2022. These figures reflect a significant opportunity for online grocery growth in Malaysia. Therefore, it is crucial to identify the determinants of online grocery shopping behaviour in Malaysia.

There are only a few studies that examine online grocery shopping behaviour, especially in Malaysia. Many previous studies studied online grocery shopping intentions (Athapaththu & Kulathunga, 2018; Irawan et al., 2020; Baeshen, 2021) and do not delve further into online shopping behaviour. Besides, the use of limited theoretical foundations further limits past studies (Kamis et al., 2021; Redda, 2019). Hence, this study aimed to examine the determinants of online grocery shopping intention and behaviour in Malaysia by integrating variables from Technology Acceptance Model and Theory of Planned Behaviour. The price factor is also included to better understand the issue.

2. Underlying theories

Behaviour is an individual's observable act (Fishbein & Ajzen, 1975). Researchers have studied different online behaviours, such as online safety behaviour (Burns & Roberts, 2013) and engagement with social media advertisements (Sanne & Wiese, 2018). Two theories have been identified as relevant to this study, namely Technology Acceptance Model and Theory of Planned Behaviour.

2.1 Technology Acceptance Model

The Technology Acceptance Model (TAM), introduced by Davis (1986), is about how system characteristics affect the acceptance of information systems. Figure 1 shows the original construct of TAM, which includes external variables, perceived usefulness, perceived ease of use, attitude toward using, and actual system use.

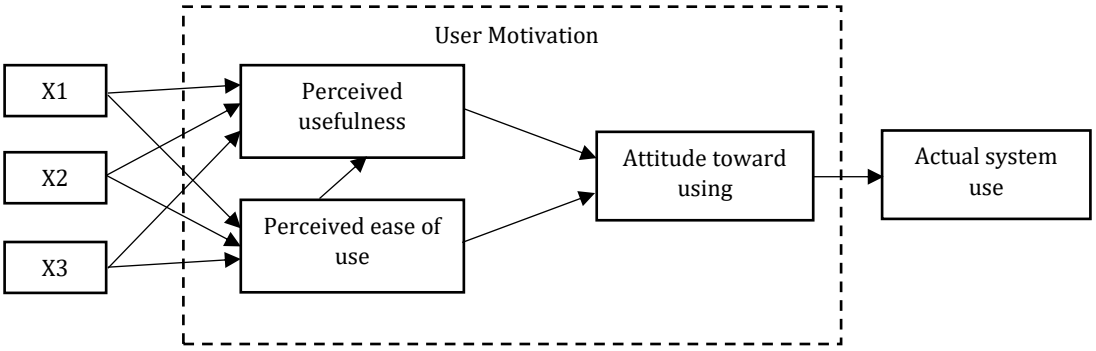

Figure 1: Original TAM
Source: Davis (1986, pp 109)

Throughout the years, TAM has been modified several times. Davis et al. (1989) added the "behavioural intention" variable, and Venkatesh and Davis (1996) later eliminated the "attitude" variable (Figure 2) as both perceived usefulness and perceived ease of use were found to directly impact behavioural intention. Accordingly, the 1996 version of TAM was considered in this study, with the exclusion of external variables and the attitude factor to develop a simpler model (Fu et al., 2006). Under this model, perceived ease of use predicts perceived usefulness, and both perceived usefulness and perceived ease of use determine behavioural intention, which further affects actual system use. Researchers have used TAM to study online shopping (Lee et al., 2021; Leong & Chaichi, 2021; Ofori & Appiah-Nimo, 2019) and is therefore considered relevant to explain online grocery shopping.

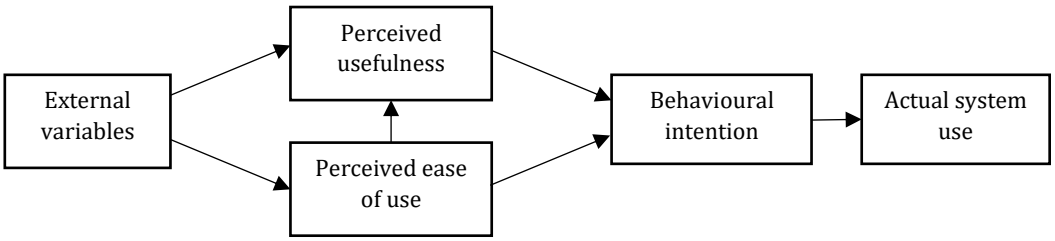

Figure 2: The 1996 Version of TAM
Source: Venkatesh and Davis (1996, pp 453)

2.2 Theory of Planned Behaviour

The Theory of Planned Behaviour (TPB) studies and predicts various human behaviours (Ajzen, 1991). Figure 3 is the original construct of TPB, including attitude toward the behaviour, subjective norm, perceived behavioural control, intention, and behaviour. Attitude, subjective norm, and perceived behavioural control are the drivers of intention, which further influence behaviour (Ajzen, 1991). The relevance of TPB in explaining online grocery shopping is supported by its application in other online shopping studies (Lee et al., 2021; Pena-García et al., 2020; Ramli et al., 2021).

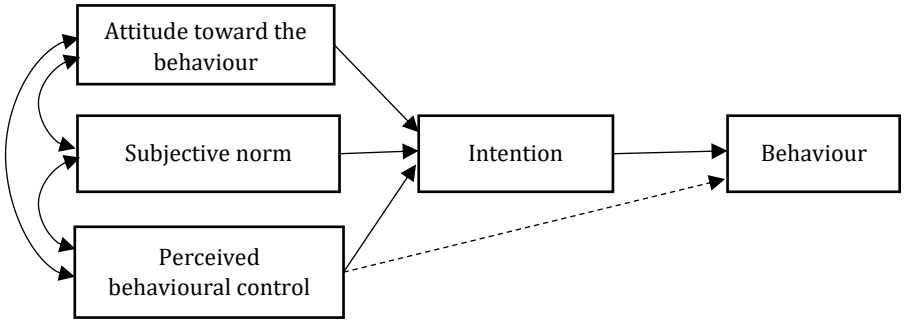

Figure 3: Original TPB
Source: Ajzen (1991, pp 182)

3. Research framework and hypotheses

Seven independent variables were identified as significant determinants of grocery shopping behaviour based on the underlying theories. The variables are perceived usefulness, perceived ease of use, attitude, subjective norm, perceived behavioural control, price and online shopping

intention. Figure 4 shows the research framework of this study, in which TAM and TPB were applied. Price was integrated as an additional variable into the research framework to help extend the theories. In this study, perceived usefulness, perceived ease of use, attitude, subjective norm, perceived behavioural control, and price are the independent variables. Online grocery shopping intention acts as a mediating variable, while online grocery shopping behaviour is the dependent variable. The following subsections deliberate on the hypothesised relationship between the variables.

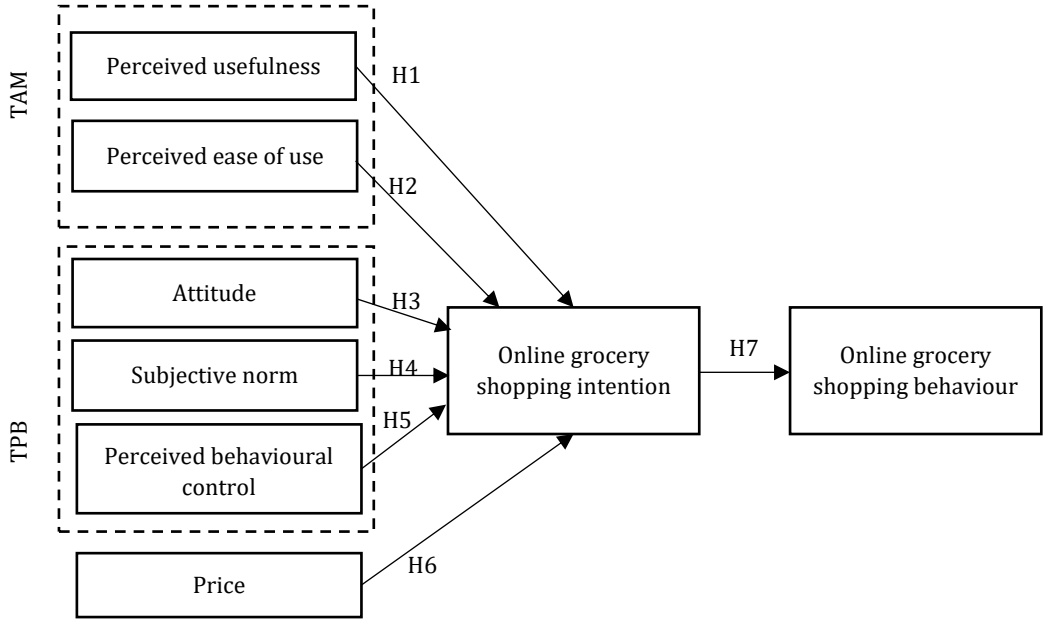

Figure 4: Research framework

3.1 Perceived usefulness

Perceived usefulness indicates how much a person believes that using a particular system would enhance his or her job performance (Davis, 1989). Perceived usefulness shows how much a person believes that purchasing performance can be improved using an internet system (Cheng & Yee, 2014). In this study, perceived usefulness refers to consumer beliefs about the usefulness of online grocery shopping. If consumers perceive online grocery shopping as useful and beneficial, they will have the intention to purchase groceries online. Past studies confirmed that online grocery shopping intention is positively influenced by perceived usefulness (Gruntkowski & Martinez, 2022; Rout et al., 2022; Warganegara & Hendijani, 2022). Thus, a hypothesis was set as follows:

H1: There is a positive relationship between perceived usefulness and online grocery shopping intention in Malaysia.

3.2 Perceived ease of use

Perceived ease of use indicates how much a person believes that using a particular system would be easy (Davis, 1989). According to TAM, users tend to accept the application that is perceived to be easier to use. Thus, if consumers perceive purchasing groceries online as easy, they intend to do online grocery shopping. A positive relationship between perceived ease of use and online grocery shopping intention has been confirmed in various studies (Warganegara & Hendijani, 2022; Gruntkowski & Martinez, 2022; Rout et al., 2022). However, Kesharwani et al. (2017) and Tan et al. (2018) found that perceived ease of use has an insignificant relationship with consumer intention to purchase groceries online. Based on the findings above, the following hypothesis was developed:

H2: There is a positive relationship between perceived ease of use and online grocery shopping intention in Malaysia.

3.3 Attitude

Attitude indicates a person's favourable or unfavourable appraisal of the behaviour (Ajzen, 1991). In this study, attitude refers to the consumer's assessment of online grocery shopping. If consumers have a favourable attitude toward online grocery shopping, their intention to shop online will increase. Past studies proved the positive relationship between attitude and online grocery shopping intention (Badenhop & Frasquet, 2021; Khan & Khan, 2020; Warganegara & Hendijani, 2022). Thus, a hypothesis was suggested as below:
H3: There is a positive relationship between attitude and online grocery shopping intention in Malaysia.

3.4 Subjective norm

The subjective norm is the perceived social pressure regarding whether to perform the behaviour (Ajzen, 1991). In this study, the subjective norm is the perceived influence or pressure from the referent individuals or groups on online grocery shopping. When consumers perceive that online grocery shopping is encouraged by people around them, they will have an online grocery shopping intention. Ruangkanjanases et al. (2021); Tan et al. (2018); and Kesharwani et al. (2017) found that subjective norm significantly and positively influences online grocery shopping intention. Thereby, a hypothesis was set as follows:
H4: There is a positive relationship between subjective norm and online grocery shopping intention in Malaysia.

3.5 Perceived behavioural control

Perceived behavioural control is the perception of ease or difficulty in performing the behaviour (Ajzen, 1991). When a person believes that he or she has the resources and opportunities, and anticipates fewer obstacles, then the person shall be confident to perform the behaviour and, thus, show greater perceived behavioural control and stronger behavioural intention (Ajzen, 1991). Accordingly, consumers who believe they have control over online grocery shopping will exhibit greater perceived behavioural control, resulting in a stronger online grocery shopping intention. Prior studies showed that perceived behavioural control significantly and positively influences online purchase intention (Kumar & Permatasari, 2021; Noor et al., 2020; Ramli et al., 2021). Therefore, a hypothesis was developed as below:
H5: There is a positive relationship between perceived behavioural control and online grocery shopping intention in Malaysia.

3.6 Price

Price is a medium of exchange and monetary sacrifice needed to obtain a product or service and benefit from it (Erickson & Johansson, 1985; Irawan et al., 2020). Consumers with high price sensitivity care about getting the best deal. Zhang et al. (2018) found a negative relationship between price and vegetable purchase intention. Li and Ohlsson (2017) also found that discounts or coupons attract consumers to purchase groceries online. Nonetheless, Warganegara and Hendijani (2022) found an insignificant correlation between price and online grocery purchase intention, while Irawan et al. (2020) found that price positively affects purchase intention. Based on the findings above, the following hypothesis was developed:
H6: There is a negative relationship between price and online grocery shopping intention in Malaysia.

3.7 Online grocery shopping intention

Intention indicates people's willingness to try and the effort they intend to put into performing the behaviour (Ajzen, 1991). A stronger intention leads to a higher likelihood of performing the behaviour. Accordingly, a strong online grocery shopping intention can lead to actual online grocery shopping behaviour. Warganegara and Hendijani (2022) found a significant positive association between purchase intention and online grocery shopping behaviour. Kumar and Permatasari (2021); and Zarei et al. (2019) also found a significant positive relationship between behavioural intention and the actual behaviour of online shopping. Therefore, a hypothesis was suggested as below:

H7: There is a positive relationship between online grocery shopping intention and online grocery shopping behaviour in Malaysia.

4. Research methodology

This quantitative study tests the relationship between TAM and TPB variables, price, online grocery shopping intention, and online grocery shopping behaviour. A cross-sectional study was performed by collecting data at a single point in time. Multiple researchers used the cross-sectional study, one of the most recognised research designs (Olsen & St. George, 2004). This study used a questionnaire survey to collect primary data as it is less expensive, more convenient, time-saving and can eliminate researcher bias resulting from interviews (Kumar, 2018).

4.1 The research instrument

The questionnaire had 41 items, which had been validated from prior studies and were adjusted to fit the context of this study. A five-point Likert scale was used to measure all the items. The items for perceived usefulness were adapted from Davis (1987), Davis (1989), and Davis et al. (1989). Perceived ease of use was measured using items adapted from Davis (1987) and Davis (1989). The items related to attitude and subjective norms were adapted from Ajzen and Fishbein (1980), Ajzen (1991), and Ajzen (1985). For perceived behavioural control, the items used were adapted from Dilotsotlhe (2021). To measure price, the items were adapted from Tran et al. (2019); Sinha and Batra (1999); Grewal et al. (1998); and Richardson et al. (1996). The items related to online grocery shopping intention were adapted from Davis (1989); Davis et al. (1989); and Yadav and Pathak (2016). The items used to measure online grocery shopping behaviour were adapted from Lee (2009); Wan et al. (2012); Aref and Okasha (2019); and Chai et al. (2018).

The questionnaire was constructed using Google Forms and English. The respondents must meet the criteria to fill out the questionnaire, including being Malaysian, 18 years old and above, and having online grocery shopping experiences. Filter questions were included to ensure the respondents met the stated criteria. The questionnaire consisted of four sections. Section A contained demographic profile questions, while Sections B, C, and D included questions regarding independent variables, the mediating variable, and the dependent variable, respectively.

The research questionnaire was subjected to a pilot test, a mini version of a full-scale study that can test the adequacy of the research instrument and uncover potential problems (Teijlingen & Hundley, 2002). According to Hazzi and Maldaon (2015), a reasonable range for a pilot test is between 10% and 20% of the sample size. A pilot test was conducted on 40 respondents. Data from the pilot test was examined for their internal consistency. The Cronbach's alpha reliability test statistics, as displayed in Table 1, show acceptable levels of internal consistency, with values of above 0.7 for all variables (Cronbach, 1951).

Table 1: Reliability of the pilot data

Variables	Cronbach's Alpha	Number of Items
Perceived Usefulness	0.719	5
Perceived Ease of Use	0.802	4
Attitude	0.869	4
Subjective Norm	0.872	5
Perceived Behavioural Control	0.733	6
Price	0.727	5
Online Grocery Shopping Intention	0.904	6
Online Grocery Shopping Behaviour	0.838	6

4.2 Population and sample

The population in this study was Malaysians who are 18 years old and above since they are legally considered adults and have much more responsibility and independence. Besides, Malaysian online shoppers mostly fall into this age range, with those aged between 18 and 34 contributing 66 % of online shopping, those aged between 35 and 49 contributing 19%, and those 50 years old and above accounting for 15 % (Ipsos, 2022). In this study, the sampling frame was unavailable as obtaining information on every Malaysian with a minimum age of 18 is impossible. As for sampling location, all 13 Malaysian States and 3 Federal Territories in Malaysia were covered. Since this study focused on online grocery shopping behaviour, Malaysians with online shopping experience were chosen as the samples.

Given that the sampling frame was unavailable, purposive sampling was adopted in this study to focus on respondents who have online grocery shopping experiences. This sampling method is popular among researchers studying online purchases, including online grocery shopping, used purposive sampling in their studies (Kumar & Permatasari, 2021; Noor et al., 2020; Rout et al., 2022; Warganegara & Hendijani, 2022). The research questionnaires were distributed through online platforms, including Microsoft Teams, Messenger, Instagram, and WhatsApp.

According to Hinkin (1998), the ideal sample size should be between 4 and 10 times the number of questionnaire items. There were 41 questionnaire items in this study; therefore, a sample size between 164 and 410 is considered sufficient for data analysis. A total of 352 responses were collected. After removing the invalid responses, 344 usable responses were retained for analysis.

This study involved 245 female (71.2%) and 99 male (28.8%) respondents. There were 191 respondents aged between 18 and 25 (55.5%), 40 aged between 26 and 33 (11.6%), 28 aged between 34 and 41 (8.1%), 35 aged between 42 and 49 (10.2%), and 50 aged 50 or above (14.5%). Among the respondents, 215 were Chinese (62.5%), followed by 115 Malays (33.4%), 10 Indians (2.9%) and 4 Dusuns (1.2%).

Besides, there were 130 respondents from Kuala Lumpur (37.8%), 79 from Selangor (23%), 26 from Perak (7.6%), 18 from Johor (5.2%), 16 from Penang (4.7%), 11 from Sabah (3.2%), 10 from Sarawak (2.9%), 8 from Putrajaya, Negeri Sembilan, Malacca, and Pahang each (2.3% for four states each), 6 from Kedah (1.7%), and 4 from Perlis, Kelantan, Terengganu and Labuan (1.2% for four States each). As for occupation, 165 respondents were students (48%), 162 were employed (47.1%), 7 were housewives (2%), 6 were self-employed (1.7%). and 4 were retired (1.2%).

4.3 Results

This study used descriptive analysis, reliability test, normality test, Pearson's correlation coefficient analysis, and inferential analysis to analyse the data. SPSS Statistical Software was used to complete the data analysis.

4.3.1 Data reliability and normality

Table 2 shows the reliability test of the final data. All variables had a Cronbach's alpha above 0.7. Hence, all the questions in the research instrument were consistent and reliable.

Table 2: Reliability test

Variables	Cronbach's Alpha	Number of Items
Perceived Usefulness (PU)	0.798	5
Perceived Ease of Use (PEOU)	0.875	4
Attitude (ATT)	0.880	4
Subjective Norm (SN)	0.873	5
Perceived Behavioural Control (PCB)	0.819	6
Price (P)	0.743	5
Online Grocery Shopping Intention (OGSI)	0.923	6
Online Grocery Shopping Behaviour (OGSB)	0.913	6

This study used skewness and kurtosis values to analyse the normal distribution. According to Kline (2015), the items are normally distributed when the skewness values lie between the range of -3 and +3 and the kurtosis values lie between the range of -10 and +10. In this study, all skewness and kurtosis values fell within the acceptable range, indicating data normality.

4.3.2 Multicollinearity test

Pearson's correlation coefficient measures the linear relationship between variables. There is no multicollinearity problem when the correlation between the variables is less than 0.9 (Hair et al., 2010). Table 3 shows the result of Pearson's correlation coefficient analysis, in which the highest correlation coefficient was 0.754. Given that the correlation among the variables was all below 0.9, multicollinearity is not an issue with the data.

Table 3: Pearson's correlation coefficients

	PU	PEOU	ATT	SN	PBC	P	OGSI
PU	1						
PEOU	0.516**	1					
ATT	0.731**	0.578**	1				
SN	0.580**	0.365**	0.666**	1			
PBC	0.618**	0.647**	0.685**	0.590**	1		
P	0.473**	0.530**	0.496**	0.416**	0.524**	1	
OGSI	0.642**	0.554**	0.754**	0.640**	0.731**	0.469**	1
OGSB	0.601**	0.445**	0.719**	0.677**	0.653**	0.428**	0.741**

n = 344,
*correlation is significant at the 0.01 level (2-tailed);
**correlation is significant at the 0.05 level (2-tailed)

4.3.3 Inferential analysis

In this study, the inferential analysis is broken into two parts. The first part is a multiple linear regression, which investigates the relationship between the independent variables and the

mediating variable. The second part is a simple linear regression that examines the relationship between intention and behaviour.

Table 4 summarises the results of the multiple regression analysis. The R^2 value was 0.672, indicating that 67.2% of the variation in online grocery shopping intention is explicable by the independent variables, and the remaining 32.8% is explainable by other factors not included in this study. The *F*-value was 115.173, which is significant. The *p*-value was 0.00, which is less than 0.05. Hence, the model fits this study, and at least one of the six independent variables has a significant relationship with online grocery shopping intention.

Table 4 also shows that attitude, subjective norm, and perceived behavioural control had a *p*-value of 0.00, which is below 0.05, and the standardised beta coefficients were 0.344, 0.160, and 0.325, respectively. The results indicate that attitude, subjective norm, and perceived behavioural control significantly and positively impact online grocery shopping intention. Three variables were found not significant in determining online grocery shopping intention, namely perceived usefulness (p=0.140), perceived ease of use (p=0.270), and price (p=0.941). These results support H3, H4 and H5. H1, H2, and H6 were not supported. The multiple linear regression equation is formed as below:
OGSI = -0.480 + 0.084(PU) + 0.062(PEOU) + 0.366(ATT) + 0.163(SN) + 0.436(PBC) + 0.004(P)

Table 4: Results of multiple linear regression

	β	Std. Error	*β*	*t*	*p*-value
(Constant)	-0.480	0.216		-2.217	0.027
PU	0.084	0.057	0.071	1.478	0.140
PEOU	0.062	0.057	0.048	1.083	0.279
ATT	0.366	0.059	0.344	6.240	0.000
SN	0.163	0.045	0.160	3.599	0.000
PBC	0.436	0.067	0.325	6.480	0.000
P	0.004	0.056	0.003	0.074	0.941

R= 0.820; R^2 = 0.672; Adj R^2 = 0.666; Std error of the estimate: 0.48132
F= 115.173; *p*-value = 0.000
a. Dependent Variable: OGSI

Table 5 demonstrates that 54.9% of the variation in online grocery shopping behaviour can be explained by online grocery shopping intention (R^2 =0.549, *F*-value= 415.477, p=0.00). The remaining 45.1% of the variation in online grocery shopping behaviour is explicable by other factors not included in this study. The results show significant association between online grocery shopping intention and shopping behaviour (β=0.741, p=0.00), and support H7. The simple linear regression equation is formed as below:
OGSB = 0.165 + 0.849(OGSI)

Table 5: Results of simple linear regression

	β	Std. Error	*β*	*t*	*p*-value
(Constant)	0.165	0.168		0.980	0.328
OGSI	0.849	0.042	0.741	20.383	0.000

R= 0.741; R^2 = 0.549; Adj R^2 = 0.547; Std error of the estimate: 0.64246
F= 415.477; *p-value* = 0.000
a. Dependent Variable: OGSB

5. Discussion

Table 6 summarises the results of the hypotheses testing. It shows that H3, H4, H5, and H7 were supported, whereas H1, H2 and H6 were not supported. Based on the hypothesis testing, this study has determined three significant determinants of online shopping intention in Malaysia: attitude, subjective norm, and perceived behavioural control. The positive influence of attitude on online grocery shopping intention in Malaysia is aligned with the studies by Warganegara and Hendijani (2022), Badenhop and Frasquet (2021), and Khan and Khan (2020). Thereby, there is a higher chance of Malaysian consumers intending to purchase groceries online when they favour online grocery shopping. The positive relationship between subjective norms and online grocery shopping intention corresponds with the studies by Ruangkanjanases et al. (2021), Tan et al. (2018), and Kesharwani et al. (2017). Thus, there is a higher tendency for Malaysian consumers to shop for groceries online when people around them encourage it. This study also proves a positive relationship between perceived behavioural control and online grocery shopping intention in Malaysia. The finding is supported by Ramli et al. (2021), Kumar and Permatasari (2021) and Noor et al. (2020). Hence, Malaysian consumers who regard themselves as capable of purchasing groceries online will intend to perform online grocery shopping.

Table 6: Summary of hypotheses testing

Hypothesis	*p*-value	Result
H1. There is a positive relationship between perceived usefulness and online grocery shopping intention in Malaysia.	0.140	Not supported
H2: There is a positive relationship between perceived ease of use and online grocery shopping intention in Malaysia.	0.279	Not supported
H3: There is a positive relationship between attitude and online grocery shopping intention in Malaysia.	0.000	Supported
H4: There is a positive relationship between subjective norms and online grocery shopping intention in Malaysia.	0.000	Supported
H5: There is a positive relationship between perceived behavioural control and online grocery shopping intention in Malaysia.	0.000	Supported
H6: There is a negative relationship between price and online grocery shopping intention in Malaysia.	0.941	Not supported
H7: There is a positive relationship between online grocery shopping intention and online grocery shopping behaviour in Malaysia.	0.000	Supported

The influence of perceived usefulness, perceived ease of use, and price were found to be not significant. This result is consistent with those of Cheema et al. (2013) and Ramayah and Ignatius (2005). One possible explanation is that Malaysians' online grocery shopping intention is not solely because of perceived usefulness but also for other more crucial reasons. The respondents could be more affected by fear of public places, initiated by the COVID-19 pandemic, causing them to prefer staying at home (Gruntkowski & Martinez, 2022; Rout et al., 2022). The convenience of online shopping could also influence online grocery shopping intention.

The result also coincides with Tan et al. (2018) and Kesharwani et al. (2017), showing that perceived ease of use has an insignificant association with online grocery shopping intention. Lee et al. (2021) also proved the insignificant correlation between perceived ease of use and online purchase intention. Similarly, one possible reason is the COVID-19 pandemic mentioned before. Moreover, the majority of respondents in this study were Millennials and Generation Z, who are less likely to be making online grocery shopping. They could be buying groceries because they were asked to do so by their parents or guardians. Therefore, perceived usefulness does not play a significant role in their decision to perform online grocery shopping. Moreover, this population

segment also represents apt users of online technologies. Hence, even if they feel the ease of online grocery shopping, they do not necessarily intend to purchase groceries online.

The lack of significance of price could be attributed to the competitive grocery industry, where the price difference cannot be too great (Warganegara & Hendijani, 2022). When the prices of different products or services are almost the same, consumers are less price-sensitive (Akbar & James, 2014). The price factor becomes less important in determining online grocery shopping intentions. Moreover, groceries are low-cost items in general. The finding is supported by Warganegara and Hendijani (2022); and Juliana et al. (2020). Possible reasons include

This study documents that online shopping behaviour in Malaysia is significantly determined by online grocery shopping intention. A similar finding is found in Warganegara and Hendijani (2022) and Driediger and Bhatiasevi (2019). Besides, Kumar and Permatasari (2021) and Zarei et al. (2019) found a positive correlation between online shopping intention and actual behaviour. Thus, Malaysian consumers who intend to purchase groceries online are likely to perform online grocery shopping.

5.1 Implications

This study contributes to academics as it comprehensively explains the factors affecting online grocery shopping behaviour in Malaysia. This study examined the factors affecting online grocery shopping behaviour in Malaysia by integrating two theories (i.e., TAM and TPB) and an additional factor (i.e., price). This study is one of the few conducted to investigate online grocery shopping behaviour in Malaysia and one of the few to merge the two theories for a deeper understanding. This study provides grocers with an insight into the factors affecting online grocery shopping behaviour in Malaysia. Grocers can focus on the factors that were proven to be effective in stimulating the online grocery shopping intention, so that it can ultimately prompt consumers to purchase groceries online.

5.2 Limitations and recommendations

Firstly, this study adopted a cross-sectional approach. Data were collected at a single point in time without follow-up (Saunders et al., 2009). Thus, it might fail to reflect the respondents' opinions, which may emerge over time. Secondly, this study used a questionnaire survey to collect data. The result might be inaccurate as respondents might not have answered the questions carefully, or some might try to predict the answers they think the researchers are looking for (Chai et al., 2018). Thirdly, the imbalance of the number of respondents concerning ethnicity and location in this study can lead to differences in opinions about online grocery shopping intention and behaviour.

Given these limitations, three recommendations for future studies are presented. Firstly, longitudinal studies can detect the pattern of change in online grocery shopping behaviour. Therefore, the effects of environmental and economic changes on online grocery shopping can be observed better. Secondly, studies that utilise face-to-face interviews can avoid random answers provided by respondents (Chai et al., 2018). Thirdly, researchers can consider including various demographic factors as the independent variables, providing a better understanding of the behaviour.

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REFERENCES

Ajzen, I. (1985). Action control: From cognition to behaviour. In J. Kuhl & J. Beckmann (Eds.), *From intentions to actions: A Theory of Planned Behaviour* (pp. 11–39). Springer Verlag.

Ajzen, I. (1991). The Theory of Planned Behaviour. *Organizational Behaviour and Human Decision Processes*, *50*(2), 179–211. https://doi.org/10.1016/0749-5978(91)90020-T

Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behaviour*. Prentice-Hall.

Akbar, S., & James, P. T. J. (2014). Consumers' attitude towards online shopping: Factors influencing employees of crazy domains to shop online. *Journal of Management and Marketing Research*, *14*(1), 1–11. https://www.aabri.com/manuscripts/131640.pdf

Aref, M. M., & Okasha, A. E. (2019). Evaluating the online shopping behaviour among Egyptian college-educated community. *Review of Economics and Political Science*, *5*(1), 21–37. https://doi.org/10.1108/REPS-10-2018-0013

Athapaththu, J. C., & Kulathunga, D. (2018). Factors affecting online purchase intention: Effects of technology and social commerce. *International Business Research*, *11*(10), 111–128. https://doi.org/10.5539/ibr.v11n10p111

Badenhop, A., & Frasquet, M. (2021). Online grocery shopping at multichannel supermarkets: The impact of retailer brand equity. *Journal of Food Products Marketing*, *27*(2), 89–104. https://doi.org/10.1080/10454446.2021.1894296

Baeshen, Y. A. (2021). Factors influencing consumer purchase intention while buying online. *International Journal of Research - GRANTHAALAYAH*, *9*(2), 99–107. https://doi.org/10.29121/granthaalayah.v9.i2.2021.3293

Bernama. (2022, May 6). *Physical stores relevant despite e-commerce rise*. Daily Express. https://www.dailyexpress.com.my/news/191927/physical-stores-relevant-despite-e-commerce-rise-/

Burns, S., & Roberts, L. D. (2013). Applying the Theory of Planned Behaviour to predicting online safety behaviour. *Crime Prevention and Community Safety*, *15*(1), 48–64. https://doi.org/10.1057/cpcs.2012.13

Business Today. (2022, February 2). *GrabMart and Jaya Grocer are about to hyper-scale grocery shopping*. https://www.businesstoday.com.my/2022/02/02/grabpay-and-jaya-grocer-are-about-to-hyper-scale-grocery-shopping/

Chai, K. Y., Lee, Y. W., Peh, J. T., & Yap, H. Y. (2018). *Factors influencing the online shopping behaviour of students in Universiti Tunku Abdul Rahman (UTAR), Kampar campus* [Bachelor thesis]. Universiti Tunku Abdul Rahman.

Cheema, U., Rizwan, M., Jalal, R., Durrani, F., & Sohail, N. (2013). The trend of online shopping in 21st century: Impact of enjoyment in TAM model. *Asian Journal of Empirical Research*, *3*(2), 131–141. https://archive.aessweb.com/index.php/5004/article/view/2948

Cheng, B. L., & Yee, S. W. (2014). Factors influencing consumers' online purchase intention: A study among university students in Malaysia. *International Journal of Liberal Arts and Social Science*, *2*(8), 121–133. http://eprints.sunway.edu.my/id/eprint/1803

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, *16*(3), 297–334. https://doi.org/10.1007/BF02310555

Davis, F. (1986). *A technology acceptance model for empirically testing new end-user information systems: Theory and results* [Doctoral dissertation]. Massachusetts Institute of Technology.

Davis, F. (1987, August). *User acceptance of information systems: The technology acceptance model (TAM)*. (Working Paper No. 529). https://deepblue.lib.umich.edu/bitstream/handle/2027.42/35547/b1409190.0001.001.pdf?sequence=2&isAllowed=y

Davis, F. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, *13*(3), 319–340. https://doi.org/10.2307/249008

Davis, F., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management Science*, *35*(8), 982–1003. http://doi.org/10.1287/mnsc.35.8.982

Dilotsotlhe, N. (2021). Factors influencing the green purchase behaviour of Millennials: An emerging country perspective. *Cogent Business & Management*, *8*(1), 1908745. https://doi.org/10.1080/23311975.2021.1908745

Driediger, F., & Bhatiasevi, V. (2019). Online grocery shopping in Thailand: Consumer acceptance and usage behaviour. *Journal of Retailing and Consumer Services*, *48*(3), 224–237. https://doi.org/10.1016/j.jretconser.2019.02.005

Effendy, N. (2022). *Is the grocery store industry ripe for digital innovation?* Pandan Social. https://pandansocial.com/is-the-grocery-store-industry-ripe-for-digital-innovation/

Erickson, G. M., & Johansson, J. K. (1985). The role of price in multi-attribute product evaluations. *Journal of Consumer Research*, *12*(2), 195–199. https://doi.org/10.1086/208508

Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention, and behaviour: An introduction to theory and research*. Addison-Wesley.

Fu, J. R., Farn, C. K., & Chao, W. P. (2006). Acceptance of electronic tax filing: A study of taxpayer intentions. *Information & Management*, *43*(1), 109–126. https://doi.org/10.1016/j.im.2005.04.001

Ganesan, V. (2021, October 20). *Malaysia e-shopping king of the region, 9 out of 10 online by end-2021*. The Edge Markets. https://www.theedgemarkets.com/article/malaysia-eshopping-king-region-9-out-10-online-end2021

Google, Temasek, & Bain (2021). *e-Conomy SEA 2021: Roaring 20s - The SEA Digital Decade*. Bain & Company. https://www.bain.com/globalassets/noindex/2021/e_conomy_sea_2021_report.pdf

Grewal, D., Krishnan, R., Baker, J., & Borin, N. (1998). The effect of store name, brand name and price discounts on consumers' evaluations and purchase intentions. *Journal of Retailing*, *74*(3), 331–352. https://doi.org/10.1016/S0022-4359(99)80099-2

Gruntkowski, L. M., & Martinez, L. F. (2022). Online grocery shopping in Germany: Assessing the impact of Covid-19. *Journal of Theoretical and Applied Electronic Commerce Research*, *17*(3), 984–1002. https://doi.org/10.3390/jtaer17030050

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis: A global perspective* (7th ed.). Pearson Education.

Hazzi, O., & Maldaon, I. (2015). A pilot study: Vital methodological issues. *Business: Theory and Practice*, *16*(1), 53–62. https://doi.org/10.3846/btp.2015.437

Hinkin, T. R. (1998). A brief tutorial on the development of measures for use in survey questionnaires. *Organizational Research Methods*, *1*(1), 104–121. https://doi.org/10.1177/109442819800100106

Ipsos. (2022, June 13). *E-commerce landscape in a reopened economy* [Press release]. https://www.ipsos.com/en-my/press-release-e-commerce-landscape-reopened-economy-june-2022

Irawan, R., Selfi, S., Octaviani, R. D., & Suminar, R. (2020). The effect of e-service quality and price on online purchase intention during Covid 19. *Advances in Transportation and Logistics Research*, 127–134. GROSLOG 2020 Conference Proceeding.

Jaya Grocer. (2020). *Jaya Grocer online*. https://klec.jayagrocer.com/

Juliana, Djakasaputra, A., Pramono, R., & Hulu, E. (2020). Brand image, perceived quality, ease of use, trust, price, service quality on customer satisfaction and purchase intention of Blibli website with digital technology as dummy variable in the use of Eviews. *Journal of Critical Reviews*, *7*(11), 3987–4000. https://ssrn.com/abstract=3870524

Kamis, F. F., Ramlee, S. I. F., & Zulkiffli, W. F. W. (2021). Does the Theory of Planned Behaviour and perceived enjoyment give a big impact on online purchase intention among Gen-Y in east coast Malaysia? In *Proceedings of 8th International Conference on Advanced Materials Engineering & Technology* (Vol. 2347). AIP Publishing. https://doi.org/10.1063/5.0055763

Kepios. (2022). *Digital 2022: Malaysia*. DataReportal. https://datareportal.com/reports/digital-2022-malaysia

Kesharwani, A., Sreeram, A., & Desai, S. (2017). Factors affecting satisfaction and loyalty in online grocery shopping: An integrated model. *Journal of Indian Business Research*, *9*(2), 107–132. https://doi.org/10.1108/JIBR-01-2016-0001

Khan, A., & Khan, S. (2020). Purchasing grocery online in a nonmetro city: Investigating the role of convenience, security, and variety. *Journal of Public Affairs*, *22*(2), e2497. https://doi.org/10.1002/pa.2497

Kline, R. B. (2015). *Principles and practice of structural equation modelling* (4th ed.). Guilford Press.Kumar, R. (2018). *Research methodology: A step-by-step guide for beginners* (5th ed.). SAGE Publications.

Kumar, R. (2018). *Research methodology: A step-by-step guide for beginners* (5th ed.). SAGE Publications.

Kumar, S., & Permatasari, D. (2021). Factor influencing online shopping behaviour through e-commerce: An extension of TPB with perceived enjoyment and trust. In *Proceeding of the International Conference on Family Business and Entrepreneurship (ICFBE)* (Vol. 2). President University. https://doi.org/10.33021/icfbe.v2i1.3566

Lee, J. R., Tan, O. K., Choi, S. L., Fong, S. F., & Goh, C. F. (2021). Factors influencing online purchase intention of Shopee's consumers in Malaysia. *International Journal of Academic Research in Business and Social Sciences*, *11*(1), 761–776. https://doi.org/10.6007/IJARBSS/v11-i1/8577

Lee, K. (2009). Gender differences in Hong Kong adolescent consumers' green purchasing behaviour. *Journal of Consumer Marketing*, *26*(2), 87–96. https://doi.org/10.1108/07363760910940456

Leong, M. K., & Chaichi, K. (2021). The adoption of Technology Acceptance Model (TAM) and trust in influencing online purchase intention during the Covid-19 pandemic: Empirical evidence from Malaysia. *International Journal of Academic Research in Business and Social Sciences*, *11*(8), 468–478. https://doi.org/10.6007/IJARBSS/v11-i8/10422

Li, J. R., & Ohlsson, H. (2017). *Online grocery shopping: The key factors influencing consumers' purchase intention - A study based on consumers in Sweden* [Bachelor thesis]. Jönköping University.

Muthusamy, G., & Krishnan, R. (2022, February 3). *Don't get carried away by online shopping*. New Straits Times. https://www.nst.com.my/opinion/letters/2022/02/768268/dont-get-carried-away-online-shopping

MyGroser. (2022). *Browse products*. https://mygroser.com/en/index

Nair, T. (2022, July 1). *Explained: Rising food prices*. Free Malaysia Today. https://www.freemalaysiatoday.com/category/nation/2022/07/01/rising-food-prices-explained/

Noor, N. M., Noranee, S., Zakaria, M. F., Unin, N., & Suaee, M. A. H. M. (2020). Online shopping: The influence of attitude, subjective norm and perceived behavioural control on purchase intention. In *ICEBA 2020: Proceedings of the 2020 The 6th International Conference on E-Business and Applications*. Association for Computing Machinery. https://doi.org/10.1145/3387263.3387266

Ofori, D., & Appiah-Nimo, C. (2019). Determinants of online shopping among tertiary students in Ghana: An extended Technology Acceptance Model. *Cogent Business & Management*, *6*(1), 1644715. https://doi.org/10.1080/23311975.2019.1644715

Olsen, C., & St. George, D. M. M. (2004). *Cross-sectional study design and data analysis*. College Entrance Examination Board. http://yes-competition.org/media.collegeboard.com/digitalServices/pdf/yes/4297_MODULE_05.pdf

Pena-García, N., Gil-Saura, I., Rodríguez-Orejuela, A., & Siqueira-Junior, J. R. (2020). Purchase intention and purchase behaviour online: A cross-cultural approach. *Heliyon*, *6*(6), 1–11. https://doi.org/10.1016/j.heliyon.2020.e04284

Ramayah, T., & Ignatius, J. (2005). Impact of perceived usefulness, perceived ease of use and perceived enjoyment on intention to shop online. *ICFAI Journal of Systems Management*, *3*(3), 36–51. https://www.ramayah.com/journalarticlespdf/impactpeu.pdf

Ramli, M., Rashid, U. K., Nasuredin, J., & Kepal, N. (2021). Factors influencing consumer intention to purchase online: A study among female consumer in Johor, Malaysia. *Research in Management of Technology and Business*, *2*(2), 935–951. https://publisher.uthm.edu.my/periodicals/index.php/rmtb/article/view/4963

Redda, E. H. (2019). Attitudes towards online shopping: Application of the Theory of Planned Behaviour. *Acta Universitatis Danubius. Œconomica*, *15*(2), 148–159. https://journals.univ-danubius.ro/index.php/oeconomica/article/view/5290/5219

Richardson, P. S., Jain, A. K., & Dick, A. (1996). Household store brand proneness: A framework. *Journal of Retailing*, *72*(2), 159–185. https://doi.org/10.1016/S0022-4359(96)90012-3

Rout, K., Sahoo, P. R., Bhuyan, A., Tripathy, A., & Smrutirekha. (2022). Online grocery shopping behaviour during Covid-19 pandemic: An interdisciplinary explanation. *Cogent Business & Management*, *9*(1), 2084969. https://doi.org/10.1080/23311975.2022.2084969

Ruangkanjanases, A., Sirisrisakulchai, P., Natalia, & Simamora, B. H. (2021). Predicting consumer intention to adopt online grocery shopping: A comparative study between Millennials in Thailand and Indonesia. *International Journal of Electronic Commerce Studies*, *12*(2), 193–208. https://doi.org/10.7903/ijecs.1894

Sanne, P. N. C., & Wiese, M. (2018). The Theory of Planned Behaviour and user engagement applied to Facebook advertising. *South Africa Journal of Information Management*, *20*(1), 1–10. https://doi.org/10.4102/sajim.v20i1.915

Saunders, M., Lewis, P., & Thornhill, A. (2009). *Research methods for business students* (5th ed.). Pearson.

Sinha, I., & Batra, R. (1999). The effect of consumer price consciousness on private label purchase. *International Journal of Research in Marketing*, *16*(3), 237–251. https://doi.org/10.1016/S0167-8116(99)00013-0

Tan, P. K., Chin, A. W. L., & Wee, S. L. F. (2018). Customer purchase intention on online grocery shopping. *International Journal of Academic Research in Business and Social Sciences*, *8*(12), 1579–1595. https://doi.org/10.6007/IJARBSS/v8-i12/5260

Teijlingen, E. R. V., & Hundley, V. (2002, June). *The importance of pilot studies*. Nursing Standard: Official Newspaper of the Royal College of Nursing. https://www.researchgate.net/publication/11173521_The_Importance_of_Pilot_Studies

Tran, L. H., Freytag-Leyer, B., Ploeger, A., & Krikser, T. (2019). Driving and deterrent factors affecting organic food consumption in Vietnam. *Journal of Economics, Business and Management*, *7*(4), 137–142. https://doi.org/10.18178/joebm.2019.7.4.596

Venkatesh, V., & Davis, F. (1996). A model of the antecedents of perceived ease of use: Development and test. *Decision Sciences*, *27*(3), 451–481. https://doi.org/10.1111/j.1540-5915.1996.tb00860.x

Wan, C., Cheung, R., & Shen, G. Q. (2012). Recycling attitude and behaviour in university campus: A case study in Hong Kong. *Facilities*, *30*(13/14), 630–646. https://doi.org/10.1108/02632771211270595

Warganegara, D. L., & Hendijani, R. B. (2022). Factors that drive actual purchasing of groceries through e-commerce platforms during Covid-19 in Indonesia. *Sustainability*, *14*(6), 3235. https://doi.org/10.3390/su14063235

Yadav, R., & Pathak, G. S. (2016). Intention to purchase organic food among young consumers: Evidences from a developing nation. *Appetite*, *96*, 122–128. https://doi.org/10.1016/j.appet.2015.09.017

Zarei, G., Nuri, B. A., & Noroozi, N. (2019). The effect of internet service quality on consumers' purchase behaviour: The role of satisfaction, attitude, and purchase intention. *Journal of Internet Commerce*, *18*(2), 197–220. https://doi.org/10.1080/15332861.2019.1585724

Zhang, B., Fu, Z. T., Huang, J., Wang, J. Q., Xu, S. Y., & Zhang, L. X. (2018). Consumers' perceptions, purchase intention, and willingness to pay a premium price for safe vegetables: A case study of Beijing, China. *Journal of Cleaner Production*, *197*, 1498–1507. https://doi.org/10.1016/j.jclepro.2018.06.273