Article

Exploring technology acceptance model to investigate consumers' online purchasing behavior of bakery: The case of the Taiwan

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Abstract: This study aims at analyzing the consumers' perception towards online purchasing bakery goods on subjective norm (SN), computer self-efficacy (CSE), and technology acceptance model (TAM). Convenience sampling was used and the final sample of respondents was made of 344 participants, with an effective recovery rate of 96%, who bought bakery goods on the LINE social platform in Nantou County. Descriptive statistics, confirmatory factor analysis, and SEM structural equation model were used to test the research hypothesis. The results show that after adding external variables to the technology acceptance model (TAM), the application of purchasing bakery goods online is significant; the consumers' behavior of purchasing bakery goods online, subjective norm (SN), computer self-efficacy (CSE), and technology acceptance model (TAM) have cause-and-effect relationships. This research concludes that it is easy, helpful, and worthy to use the Internet to buy bakery goods.

Keywords: subjective norm (SN); technological acceptance model (TAM); computer self-efficacy (CSE); online purchasing behavior

1. Introduction

1.1. Background and motivation

Taiwan Network Information Center, TWNIC, pointed out that the number of people over the age of 12 who get online is estimated to be 18.98 million in Taiwan, and the number of people get online in Taiwan is estimated to have reached 20.2 million, with the overall Internet rate reaching 85.6% (TWNIC, 2019). From the data, people use the Internet has become widespread and popular.

Since Wu Pao-Chun won the title of Master Baker in the bred category of the 2010, it has driven the development of Taiwan's baking industry and promote internationally (Lin et al., 2019). This sensation has also made Taiwan's baking industry flourish and develop rapidly. Traditionally, baked goods are mainly sold in brick-and-mortar stores. With the advancement of technology and network information, the pattern of online shopping has changed. With the epidemic attacks, people can buy bakery products online more efficiently that shows the convenience and importance of Internet software, such as Facebook, LINE, and Instagram.

Theory of Acceptance Model (TAM) proposed by Davis predicts the user's behavioral intention and accept or reject information technologies (Davis, 1989). The technology acceptance model is applied to various situations, control variables, research objects, and various technology systems. Therefore, in the information

systems research, the technology acceptance model (TAM) is considered to be a simple and powerful theory (Lucas and Spitler, 1999; Venkateshand Davis, 2008). Therefore, the technology acceptance model is used to explore consumer behavior in purchasing bakery goods on the LINE social platform. The research results as reference provide to traditional bakery shop owners to transform into online shops.

In recent years, Internet development has changed the traditional consumption in the past. The number of consumers participating in consumption through Internet platforms and social media continually increase, forming a new consumption trend. In the past, relevant research rarely explored the purchasing bakery goods on social media. In view of this, this study explores consumers' online purchasing behavior of bakery goods through the technology acceptance model (TAM).

1.2. Research purposes

Nowadays, with the development of Internet information, purchasing goods through smartphone software has become a trend. Therefore, the relevant literature on research variables, such as technology acceptance model (TAM), subjective norm (SN), and computer self-efficacy (CSE) are used in this study to understand consumers' online purchasing of bakery goods. The purposes of this study are as follows:

1) Discuss the current situation of consumer behavior in purchasing bakery goods online.

This research aims to provide a comprehensive understanding of how consumers currently purchase bakery goods online. This involves identifying the factors that influence their decision-making processes and behaviors. By understanding these behaviors, bakery businesses can tailor their strategies to better meet consumer needs and preferences.

2) Verify the appropriateness of adding external variables to the technology acceptance model (TAM) in consumers' online purchase of bakery goods.

This study seeks to verify the appropriateness of incorporating external variables, such as subjective norm (SN) and computer self-efficacy (CSE), into the Technology Acceptance Model (TAM) in the context of online bakery purchases. This validation is crucial for enhancing the model's predictive power and providing a more nuanced understanding of consumer behavior in this specific context.

3) Providing research results as reference for relevant units in the industry.

The research results aim to offer practical and strategic insights for bakery industry stakeholders, including traditional bakery shop owners considering the transition to online shops. By understanding the factors that drive online purchases, businesses can develop more effective marketing strategies, improve customer engagement, and ultimately increase sales.

1.3. Scope of research and subjects

This study takes consumers who purchased bakery goods on the LINE social platform in Nantou County as the research objects. A questionnaire was distributed to the groups that group buying in Line social platform.

In this study, the technology acceptance model (TAM) proposed by Davis (Davis, 1989), which includes five variables: perceived usefulness (PU), perceived ease of use

(PEU), attitude toward using (ATT), behavioral intention (BI) and actual system use (ASU), and two external variables, subjective norm (SN) and computer self-efficacy (CSE) to explain and verify users' use behavior and acceptance of an emerging technology.

2. Materials and methods

This study explores the relationship between subjective norm (SN), computer self-efficacy (CSE), and technology acceptance models (TAM) from the perspective of consumers. Online questionnaire survey method was used to explore consumers' online purchasing behavior of bakery goods.

This study intends to explore consumers' online purchasing behavior of bakery goods. Based on the research motivation, purposes, and literature review, the research framework of this study is proposed. Based on the technology acceptance model (TAM) proposed by Davis et al. (1989) as the basis of the research structure, and adding external variables, subjective norm (SN) and computer self-efficacy (CSE), the framework of this study as shown in **Figure 1**.
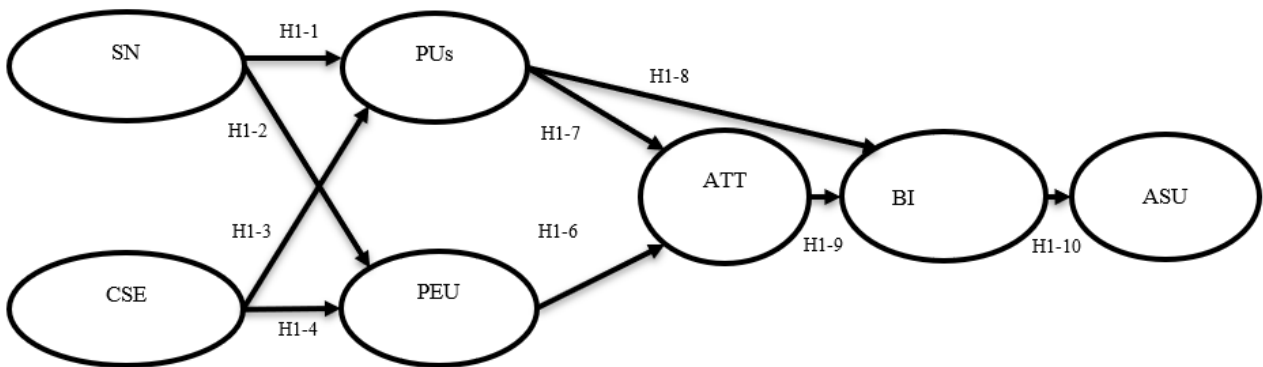

Figure 1. Technology acceptance model (TAM).
Notes: PEU: Perceived Ease of Use; PU: Perceived Usefulness; ATT: Attitude Toward Using; BI: Behavioral Intention; ASU: Actual System Use; SN: Subjective Norm; CSE: Computer Self-Efficacy.

2.1. Research hypothesis

According to Chang (2018) study on "A study on the behavior of watching the broadcast of the judo competition of judo players", as a basis for adding external variables to technology acceptance model (TAM). The results show that the subjective norm (SN) of judo players watching judo competition broadcasts have significant impacts on perceived ease of use (PEU), computer self-efficacy (CSE), attitude toward using (ATT), attitude toward using (ATT) on behavioral intention (BI), and behavioral intention (BI) on actual system use (ASU). In this study, consumers use the LINE social platform to purchase bakery goods through the online system; when consumers think that using the Internet is substantially helpful in purchasing bakery goods and is easy to use, it is worth continuing to use it. Based on the above, we hypothesize that:

H1: External variables of consumers' behavior of purchasing bakery goods using the LINE social platform have a significant impact on the technology acceptance model (TAM).

H1-1: Adding external variables to the subjective norm (SN) of technology acceptance model (TAM) has a significant impact on perceived usefulness (PU).

H1-2: Adding external variables to the subjective norm (SN) of technology acceptance model (TAM) has a significant impact on perceived ease of use (PEU).

H1-3: Adding external variables to the computer self-efficacy (CSE) of technology acceptance model (TAM) has a significant impact on perceived usefulness (PU).

H1-4: Adding external variables to the computer self-efficacy (CSE) of technology acceptance model (TAM) has a significant impact on perceived ease of use (PEU).

H1-5: Adding external variables to the perceived ease of use (PEU) of technology acceptance model (TAM) has a significant impact on perceived usefulness (PU).

H1-6: Adding external variables to the attitude toward using (ATT) of technology acceptance model (TAM) has a significant impact on p perceived ease of use (PEU).

H1-7: Adding external variables to the perceived usefulness (PU) of technology acceptance model (TAM) has a significant impact on attitude toward using (ATT).

H1-8: Adding external variables to the perceived usefulness (PU) of technology acceptance model (TAM) has a significant impact on behavioral intention (BI).

H1-9: Adding external variables to the attitude toward using (ATT) of technology acceptance model (TAM) has a significant impact on behavioral intention (BI).

H1-10: Adding external variables to the behavioral intention (BI) of technology acceptance model (TAM) has a significant impact on actual system use (ASU).

2.2. Scope, participants, and sampling method

The study focused on people who have used computers, smartphones, tablets, etc. to purchase bakery goods on the LINE social platform, and conducted online questionnaires based on different gender, age, marital status, education level, and employment.

Convenience sampling is used in this research. The samples who are from Nantou County have purchased bakery goods on the LINE social platform. Generally, when the number of samples is less than 100, the analysis of the structural equation model is less stable; therefore, scholars suggest that if to pursue stable SEM analysis results, the number of samples must be at least greater than 200 (Chiou, 2006). Therefore, a total of 360 questionnaires were issued in this study, and 16 invalid questionnaires were eliminated, resulting in a total of 344 valid questionnaires, with an effective response rate was 96%.

2.3. Research instruments

The research tool is based on the Theory of Acceptance Model, TAM proposed by Davis (1989) and refers to the dimension items from Venkatesh and Bala (2008) and Davis et al. (1989) to adapt the questionnaire items. The questionnaire was divided into eight parts. The questionnaire of this study is divided into eight parts, Perceived Ease of Use (PEU), Perceived Usefulness, (PU), Attitude Toward Using (ATT), Behavioral Intention (BI), Actual System Use (ASU), Subjective Norm (SN), Computer Self-Efficacy (CSE), and demographic variables of gender, age, marital status, education level, and employment. Each scale in this study adopts a seven-point

Likert scale, ranging from 1 to 7, (ranging from 1 = strongly disagree, to 7 = strongly agree).

2.3.1. Perceived ease of use (PEU)

According to the definition from Davis (1989), perceived ease of use (PEU) refers to the degree to which users believe that using an information technology system can reduce effort. The items refer to the scales developed by Hsu et al. (2019) and Kao and Huang (2019), and modified the questions based on the purposes of this study. The questionnaire items include, "The various functions of purchasing bakery goods on the LINE social platform are clear and easy to understand."; "I can use the LINE social platform to purchase bakery goods without spending too much effort.", with total of 4 questions. In the study of Kao and Huang (2019), the Cronbach's alpha value of this scale was verified to be 0.85, and the standardized loading ranged from 0.67~0.78.

2.3.2. Perceived usefulness (PU)

According to the definition from Davis (1989), perceived usefulness (PU) refers to the extent to which users believe that using a certain information technology system will help improve personal work performance. For questions, refer to Hsu et al. (2019) and Kao and Huang (2019), modified based on the purposes of this study. Questionnaire items include, "Using the LINE social platform to purchase bakery goods can increase the efficiency of purchasing bakery goods", "Buying bakery goods through the LINE social platform helps me buy bakery goods.", with a total of 4 questions. In the study of Kao and Huang (2019), the Cronbach's alpha value of this scale was verified to be 0.88, and the Standardized Loading ranged from 0.79~0.79

2.3.3. Attitude toward using (ATU)

Davis (1989) and Taylor and Todd (1995) define attitude toward using (ATU) as a user's personal positive or negative feelings about using the information technology. The items refer to the scales developed by Hsu et al. (2019) and Kao and Huang (2019), modified based on the purposes of this study. The items include, "I have good view about using the LINE social platform to purchase baked goods", "I like to use Line social platform to purchase bakery goods", with a total of five questions. In the study of Kao and Huang (2019), it was verified that the Cronbach's alpha value of this scale is 0.86, and the standardized loading ranges from 0.75~0.81.

2.3.4. Behavioral intention (BI)

Taylor and Todd (1995) pointed out that behavioral intention (BI) is an individual's willingness to use a certain information technology, that is, an individual's possibility of adopting a certain information technology. The items refer to the scales developed by Hsu et al. (2019) and Kao and Huang (2019), modified based on the purposes of this study. Questionnaire items include, "In the future, I plan to increase the use of the LINE social platform to purchase bakery goods." "I think the LINE social platform is worth using to purchase bakery products.", with a total of five questions. In the study of Kao and Huang (2019), the Cronbach's alpha value of this scale was verified to be 0.86, and the standardized loading ranged from 0.81~0.82.

2.3.5. Actual system use (ASU)

Fishbein and Ajzen (1975) believe that actual system use (ASU) is the action of an individual engaging in a specific behavior. Davis (1989) proposed two key variables perceived usefulness (PU) and perceived ease of use (PEU) to analyze users' willingness to use information technology. After receiving external variables, users form attitude toward using and behavioral intentions through the two factors of perceived usefulness and perceived ease of use, and then generate actual usage behaviors. The items refer to the scales developed by Hsu et al. (2019), modified based on the purposes of this study. The questionnaire items include, "I use the LINE social platform to purchase bakery goods frequently.", "I spent a lot of time using the LINE social platform to buy bakery goods.", with a total of three questions. In the study of Hsu et al. (2019), the Cronbach's alpha value of this scale was verified to be 0.88, and the factor loadings ranged from 0.89~0.91.

2.3.6. Subjective norm (SN)

Subjective norm (SN) proposed by Fisbein and Ajzen (1975), refer to the pressure individuals feel from society when engaging in a specific behavior (Ajzen, 1991; Fishbein and Ajzen, 1975). The items refer to the scale developed by Hsu et al. (2019), modified based on the purposes of this study. The questionnaire items include, "People who have influence on me (maybe family members, good friends) think that I should use the LINE social platform to purchase baked goods", "Consumers who have used the LINE social platform to purchase baked goods (e.g., family members, good friends) will help me use the LINE social platform to purchase baked goods.", with a total of five questions. In the study of Hsu et al. (2019), the Cronbach's alpha value of this scale was verified to be 0.77, and the factor loadings ranged from 0.68~0.81.

2.3.7. Computer self-efficacy (CSE)

Self-efficacy was first proposed by Bandura (1977) based on social cognitive theory. He believed that self-efficacy refers to people's beliefs about their ability to engage in a specific behavior. This belief is formed based on an individual's subjective assessment of one's ability to complete a specific task or behavior. Compeau and Higgins (1995) believe that computer self-efficacy (CSE) is an individual's judgment of computer capabilities, and emphasize that computer self-efficacy will reflect an individual's perceived ability to use a computer to complete a specific behavior, rather than actual computer operation skills. The items refer to the scale developed by Hsu et al. (2019), modified based on the purpose of this study. The questionnaire items include, "I think it is easy to learn to buy bakery goods on the LINE social platform.", "It is not difficult to skillfully operate the LINE social platform to purchase bakery goods.", with a total of nine questions. In the study of Hsu et al. (2019), the Cronbach's alpha value of this scale was verified to be 0.85, and the factor loadings ranged from 0.56~0.90.

2.4. Data analysis

Item analysis and reliability analysis of the questionnaire pre-test, and descriptive statistics of formal questionnaire using SPSS for Windows 20.0. Smart PLS 2.0 software was used to analyze the results of the formal questionnaire, including confirmatory factor analysis and SEM structural equation model.

Partial least squares SEM (PLS-SEM) was used to assess the Goodness of Fit (GOF). The purpose of GOF is to justify the reliance the study model and the actual observed data are at the conceptual and empirical level. Determining GOF 0.1 is small, 0.25 is medium, and 0.36 is large (Akter et al., 2011).

2.5. Questionnaire pre-test and survey

Convenience sampling was used in this study. A total of 50 pre-test questionnaires were distributed via the Internet. Consumers in Nantou County who have purchased bakery goods through the LINE social platform were selected as the pre-test objects, from 21 January to 21 January 2021. The formal questionnaire survey was conducted from 1 March to 25 March 2021. A total of 360 respondents were answered the survey, and 16 invalid ones were eliminated, with an effective recovery rate of 96%.

3. Results and discussion

3.1. Data analysis and results

Table 1. Estimated parameters of measurement model.

Dimensions	Items	Original Sample	S.E.	T Statistics	CR	AVE
PEU	PEU1	0.830	0.027	31.106	0.943	0.805
	PEU2	0.913	0.013	68.158		
	PEU3	0.916	0.014	67.060		
	PEU4	0.927	0.010	97.873		
PU	PU1	0.917	0.015	62.541	0.962	0.864
	PU2	0.938	0.011	87.789		
	PU3	0.921	0.012	75.505		
	PU4	0.942	0.009	101.557		
ATT	ATT1	0.901	0.014	66.207	0.954	0.807
	ATT2	0.922	0.009	107.830		
	ATT3	0.934	0.008	113.247		
	ATT4	0.826	0.024	34.849		
	ATT5	0.907	0.013	71.011		
BI	BI1	0.891	0.016	54.844	0.956	0.813
	BI2	0.923	0.011	86.086		
	BI3	0.891	0.019	47.674		
	BI4	0.913	0.013	72.854		
	BI5	0.888	0.018	50.634		
ASU	ASU1	0.960	0.006	159.180	0.969	0.911
	ASU2	0.958	0.006	149.216		
	ASU3	0.945	0.008	116.372		
SN	SN1	0.857	0.018	47.746	0.935	0.740
	SN2	0.876	0.016	53.528		
	SN3	0.870	0.018	49.726		
	SN4	0.895	0.012	74.124		
	SN5	0.803	0.023	34.368		

Table 1. (*Continued*).

Dimensions	Items	Original Sample	S.E.	T Statistics	CR	AVE
	CSE1	0.815	0.021	38.435		
	CSE2	0.779	0.030	25.646		
	CSE3	0.894	0.019	46.581		
	CSE4	0.916	0.012	75.390		
CSE	CSE5	0.881	0.020	44.231	0.956	0.752
	CSE6	0.903	0.016	55.090		
	CSE7	0.877	0.020	43.038		
	CSE8	0.867	0.020	44.245		
	CSE9	0.862	0.023	37.700		

Notes: PEU: Perceived Ease of Use; PU: Perceived Usefulness; ATT: Attitude Toward Using; BI: Behavioral Intention; ASU: Actual System Use; SN: Subjective Norm; CSE: Computer Self-Efficacy.

Before conducting model path analysis, confirmatory factor analysis was used to test the reliability and validity of each dimension. The methods of measurement included the evaluation of the measurement model and the test of discriminant validity, the detail results show in **Tables 1** and **2**. The factor loadings of each dimension ranged from 0.76 to 0.95, indicating good convergent validity. The CR value of each dimension ranges from 0.92 to 0.97, indicating that each dimension has good internal consistency (Hair et al., 2021). Average Variance Extracted (AVE) measures the convergent validity and discriminant validity of each dimension. Each variable ranges from 0.72 to 0.87, all greater than 0.5, indicating that each variable has convergent effect degree (Fornell and Larcker, 1981; Hair et al., 2021). The AVE value of each dimension after taking the root is greater than the correlation coefficient with other dimensions, indicating that each scale has discriminant validity (Hair et al., 2021), shows as **Table 1**.

SmartPLS software was used to conduct a research model, the technology acceptance model (TAM) was added to subjective norm (SN), computer self-efficacy (CSE) model, and verify the model has a GOF, shows as **Table 2**.

Table 2. Assessment of the path coefficients of various variables.

Paths	Standardization coefficient	SE	*t* value	*p* value
PEU → PU	0.541	0.057	9.546	0.000
PU → ATT	0.713	0.051	14.113	0.000
PEU → ATT	0.612	0.054	11.283	0.000
PU → BI	0.694	0.044	15.937	0.000
ATT → BI	0.821	0.060	13.741	0.000
BI → ASU	0.753	0.021	35.920	0.000
SN → PU	0.372	0.071	5.239	0.000
SN → PEU	0.353	0.068	5.181	0.000
CSE → PU	0.457	0.073	6.255	0.000
CSE → PEU	0.465	0.073	6.382	0.000

Notes: PEU: Perceived Ease of Use; PU: Perceived Usefulness; ATT: Attitude Toward Using; BI: Behavioral Intention; ASU: Actual System Use; SN: Subjective Norm; CSE: Computer Self-Efficacy.

Figure 2 shows the results of the hypotheses testing and subjective norm (SN) directly and positively affect perceived ease of use (PEU) 0.353; computer self-efficacy (CSE) directly and positively affects perceived ease of use (PEU) 0.465; computer self-efficacy (CSE) directly and positively affects perceived usefulness (PU) 0.457; perceived ease of use (PEU) directly and positively affects attitude toward using (ATT) 0.612; perceived usefulness (PU) directly and positively affects usage attitude (ATT) 0.713; attitude toward using (ATT) directly and positively affects behavioral intention (BI) 0.821; behavioral intention (BI) directly and positively affects actual system use (ASU) 0.753.

Memon and Rahman (2013) pointed out that the purpose of model adaptation is to measure whether the structure is sufficient to explain the data obtained from actual exploration. The Smart PLS statistical software measures the model adaptation index with GOF (Goodness of Fit), and reported as GOFsmall = 0.1, GOFmedium = 0.25, GOFlarge = 0.36 (Akter et al., 2011). However, the software cannot calculate the value and must be calculated by the researchers. The formula is = $\sqrt{}$ (average AVE × average R^2). If GOF of the model has high substantive value and the estimated value is more representative. The GOF score is 0.63, which indicates the model is fit with data, shows as **Table 3**.

Table 3. Direct and indirect effects of variables.

	PEU	PU	ATT		BI		ASU	
	Direct	**Direct**	**Direct**	**Indirect**	**Direct**	**Indirect**	**Direct**	**Indirect**
SN	0.353	0.372		0.345		0.324		0.244
ATT					0.821			0.618
PEU		0.541	0.612			0.561		0.423
PU			0.713		0.694			0.523
CSE	0.465	0.457		0.431		0.404		0.304
BI							0.753	
R^2	0.609	0.739	0.826		0.847		0.567	
GOF			0.646					

Notes: PEU: Perceived Ease of Use; PU: Perceived Usefulness; ATT: Attitude Toward Using; BI: Behavioral Intention; ASU: Actual System Use; SN: Subjective Norm; CSE: Computer Self-Efficacy.
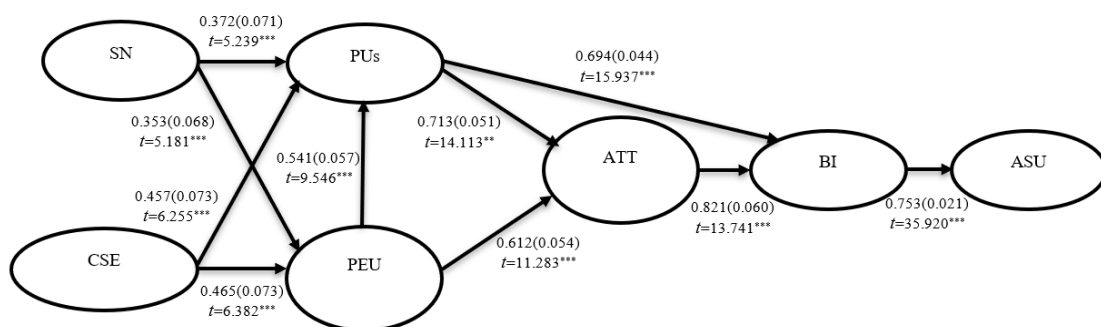

Figure 2. Hypotheses testing results.

Notes: PEU: Perceived Ease of Use; PU: Perceived Usefulness; ATT: Attitude Toward Using; BI: Behavioral Intention; ASU: Actual System Use; SN: Subjective Norm; CSE: Computer Self-Efficacy.

3.2. Verification results and discussion

H1: External variables of consumers' online purchase of bakery goods have a significant impact on technology acceptance patterns.

H1-1: Consumers' subjective norm (SN) has a significant impact on perceived usefulness (PU)

As **Table 2** shows, the standardized coefficient of subjective norm (SN) on perceived usefulness (PU) is 0.372. The *t*-value of subjective norm (SN) on perceived usefulness (PU) is 5.239, which is greater than the significant level of 1.96. Therefore, H1-1 established, which is consistent with the research results of Chen (2010) and Liao (2016).

H1-2: Consumers' subjective norm (SN) has a significant impact on perceived ease of use (PEU)

As **Table 2** shows, the standardized coefficient of subjective norm (SN) on perceived ease of use (PEU) is 0.372. The *t*-value is 5.181, which is greater than the significant level of 1.96. Therefore, H1-2 established.

H1-3: Consumers' computer self-efficacy (CSE) has a significant impact on perceived usefulness (PU)

As **Table 2** shows, the standardized coefficient of computer self-efficacy (CSE) on perceived usefulness (PU) is 0.457; the *t*-value is 6.255, which is greater than the significant level of 1.96. Therefore, H1-3 established, which is consistent with the research results of Chang (2018), Tsui (2011), and Chen (2013).

H1-4: Consumers' computer self-efficacy (CSE) has a significant impact on perceived ease of use (PEU)

As **Table 2** shows, the standardized coefficient of computer self-efficacy (CSE) on perceived ease of use (PEU) is 0.465; the *t*-value is 6.382, which is greater than the significant level of 1.96. Therefore, H1-4 established, which is consistent with the research results of Chang (2018), Liao (2016), and Chen (2013).

H1-5: Adding external variables to the perceived ease of use (PEU) of technology acceptance model (TAM) has a significant impact on perceived usefulness (PU)

As **Table 2** shows, the standardized coefficient of perceived ease of use (PEU) on perceived usefulness (PU) is 0.541; the *t*-value is 9.546, which is greater than the significant level of 1.96. Therefore, H1-3 established, which is consistent with the research results of Liao (2016). It is easy for consumers to use the Internet to purchase bakery goods. Clear and easy to understand how to use Internet to purchase bakery goods can improve efficiency and increase purchase rates. Therefore, perceived ease of use (PEU) has a significant impact on perceived usefulness (PU).

H1-6: Adding external variables to the perceived ease of use (PEU) of technology acceptance model (TAM) has a significant impact on attitude toward using (ATT)

As **Table 2** shows, the standardized coefficient of perceived ease of use (PEU) on attitude toward using (ATT) is 0.612; the *t*-value is 11.283, which is greater than the significant level of 1.96. Therefore, H1-6 established, which is consistent with the research results of Chang (2018). It is helpful and easy for consumers to use the Internet to purchase bakery goods, and their attitudes will be more positive. Therefore, perceived ease of use (PEU) has a significant impact on attitude toward using (ATT).

H1-7: Adding external variables to the perceived usefulness (PU) of technology acceptance model (TAM) has a significant impact on attitude toward using (ATT)

As **Table 2** shows, the standardized coefficient of perceived usefulness (PU) on attitude toward using (ATT) is 0.713; the *t*-value is 14.113, which is greater than the significant level of 1.96. Therefore, H1-7 established.

H1-8: Adding external variables to the perceived usefulness (PU) of technology acceptance model (TAM) has a significant impact on behavioral intention (BI).

As **Table 2** shows, the standardized coefficient of perceived usefulness (PU) on behavioral intention (BI) is 0.694; the *t*-value is 15.937, which is greater than the significant level of 1.96. Therefore, H1-8 established, which is consistent with the research results of Liao (2016). For online purchase bakery goods consumers think is worth using and are willing to continue to online purchase bakery goods. Therefore, perceived usefulness has a significant impact on behavioral intention (BI).

H1-9: Adding external variables to the attitude toward using (ATT) of technology acceptance model (TAM) has a significant impact on behavioral intention (BI)

Table 2 shows, the standardized coefficient of attitude toward using (ATT) on behavioral intention (BI) is 0.821; the *t*-value is 13.741, which is greater than the significant level of 1.96. Therefore, H1-9 established, which is consistent with the research results of Chang (2018) and Liao (2016). Consumers think that using the Internet to purchase bakery goods does not require much effort and is easy, and are willingness to use. Therefore, attitude toward using (ATT) has a significant impact on behavioral intention (BI).

H1-10: Adding external variables to the behavioral intention (BI) of technology acceptance model (TAM) has a significant impact actual system use (ASU)

Table 2 shows, the standardized coefficient of behavioral intention (BI) on actual system use (ASU) is 0.753; the *t*-value is 35.920, which is greater than the significant level of 1.96. Therefore, H1-10 established, which is consistent with the research results of Chang (2018) and Liao (2016). Consumers believe that buying bakery goods online is worth using and are willing to continue and frequent using them, so behavioral intention (BI) has a significant impact on actual system use (ASU).

The results of the research hypothesis are shown in **Table 4**.

Table 4. The results of research hypotheses.

Research hypotheses	Results
H1: External variables of consumer online purchasing behavior of bakery goods have a significant impact on technology acceptance model.	
H1-1: Adding external variables to the subjective norm (SN) of technology acceptance model (TAM) has a significant impact on perceived usefulness (PU).	Established
H1-2: Adding external variables to the subjective norm (SN) of technology acceptance model (TAM) has a significant impact on perceived ease of use (PEU).	Established
H1-3: Adding external variables to the computer self-efficacy (CSE) of technology acceptance model (TAM) has a significant impact on perceived usefulness (PU).	Established
H1-4: Adding external variables to the computer self-efficacy (CSE) of technology acceptance model (TAM) has a significant impact on perceived ease of use (PEU).	Established
H1-5: Adding external variables to the perceived ease of use (PEU) of technology acceptance model (TAM) has a significant impact on perceived usefulness (PU).	Established

Table 4. (*Continued*).

Research hypotheses	Results
H1-6: Adding external variables to the attitude toward using (ATT) of technology acceptance model (TAM) has a significant impact on p perceived ease of use (PEU).	Established
H1-7: Adding external variables to the perceived usefulness (PU) of technology acceptance model (TAM) has a significant impact on attitude toward using (ATT).	Established
H1-8: Adding external variables to the perceived usefulness (PU) of technology acceptance model (TAM) has a significant impact on behavioral intention (BI).	Established
H1-9: Adding external variables to the attitude toward using (ATT) of technology acceptance model (TAM) has a significant impact on behavioral intention (BI).	Established
H1-10: Adding external variables to the behavioral intention (BI)of technology acceptance model (TAM) has a significant impact on actual system use (ASU).	Established

4. Conclusion

4.1. Conclusions

Based on the research results, the following research conclusions are summarized as follows.

4.1.1. The status of each variable

The distribution of consumer demographic variables (gender, age, marital status, education level, and employment) indicates that the primary demographic for online bakery goods purchases consists of women aged 51 or above with a university education. This demographic insight is crucial for targeting marketing strategies.

In terms of the Technology Acceptance Model (TAM):

Perceived Usefulness (PU): Consumers prioritize understanding the system's functions when purchasing bakery goods online.

Perceived Ease of Use (PEU): Consumers find the online purchase system user-friendly.

Attitude Toward Using (ATT): Positive attitudes toward the system facilitate online purchases of bakery goods.

Behavioral Intention (BI): Participants find the online system beneficial, worth using, and intend to continue using it for future purchases.

Actual System Use (ASU): Frequent online purchases of bakery goods indicate high system utilization.

External variables include:

Subjective Norm (SN): There is a prevailing belief among consumers that purchasing bakery goods online will become a future trend.

Computer Self-Efficacy (CSE): Consumers find the system easy to use, indicating high self-efficacy in online transactions.

4.1.2. Validation of technology acceptance model (TAM)

The study confirms that within the TAM framework, the variables perceived usefulness (PU), perceived ease of use (PEU), attitude toward using (ATT), behavioral intention (BI), and actual system use (ASU) all have positive impacts on the acceptance and usage of online bakery goods purchasing systems.

4.1.3. Adding external variable to technology acceptance model (TAM)

Incorporating external variables such as subjective norm (SN) and computer self-efficacy (CSE) into the TAM reveals significant impacts:

Subjective Norm (SN): The influence and positive perception of others enhance the perceived ease of use and efficiency of the system.

Computer Self-Efficacy (CSE): High self-efficacy in using information products leads to a more efficient and easier-to-use system.

This addition establishes a causal relationship between subjective norm (SN), computer self-efficacy (CSE), and the technology acceptance model, highlighting the importance of social influence and individual capability in adopting online bakery goods purchasing systems.

4.1.4. Practical implications

Targeted Marketing: Marketers should focus on older, educated women, tailoring advertisements and promotions to this demographic.

System Design: Enhancing the system's usability and ensuring clear communication of its functions can improve consumer satisfaction and usage rates.

Social Influence: Leveraging social proof and endorsements can strengthen the subjective norm, encouraging more consumers to adopt online purchasing.

Training and Support: Providing resources to improve computer self-efficacy can facilitate easier adoption and sustained use of the online system.

By addressing these practical implications, businesses can enhance user experience, drive higher engagement, and increase the overall success of online bakery goods sales.

4.2. Suggestions

4.2.1. Practical suggestions

a) The research results indicate that the majority of users are women over the age of 51 that speculates that the reason may be the group that issued the questionnaire is mostly women and the majority are mothers. The purchase rate is high as long as the products sold in the stores genuine and the prices are reasonable. The stores will definitely increase the stores' sales if the mothers give good reputation for them. It is recommended that the stores conduct research and development from time to time. After the new product information is released, the operators can invite more government agencies, companies, and office workers to try the products, and maintain a good interactive relationship with consumers. Online shopping is a powerful group-gathering power, and it will drive a new purchasing trend.

b) The research results also found that consumers believe that online bakery goods purchasing is a trend, and they are willing to continue to use the Internet to purchase bakery goods. This study suggests that using agricultural ingredients that grow locally in baking goods to develop local specialty products that has become a well-known tourist souvenir can help stimulate consumers' willingness to buy, thereby increasing consumption and increasing store turnover.

4.2.2. Suggestions for follow-up researches

a) Expand the scope of research and increase the number of samples: This study only conducts research on the classification of bakery products. It is recommended that in the future, the products can be further divided into breads, cakes, handmade

biscuits, and the number of samples can be increased for research to understand the differences in consumer preferences for various bakery goods.

b) The analysis of occupational samples in personal background information: Other in the occupational sample analysis of this study accounted for 41.6%. It is impossible to understand what occupations consumers engage in. It is recommended that subsequent researchers can increase occupational categories in further to learn more about what occupations consumers are engaged in.

c) It suggests traditional baking shops and those who are just starting to set up baking studios can use social network platforms, such as LINE, Facebook, and Instagram to share more information about in-store activities, special products, and discounts to consumers. Maintaining a good interactive relationship and establishing a good reputation for high-quality products can help online store marketing and greatly increase turnover.

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