Exploring the Influential Factors of Continuous Online Shopping Intention

Cheng-Mei Tung, Feng Chia University, Taiwan*

ABSTRACT

This study explores consumers’ continuous intention regarding online shopping in Taiwan. The technology acceptance model and expectation confirmation model are integrated to explore the influential factors in the continuous online shopping intention. A total number of 236 samples were collected from an online survey and analyzed using structural equation modeling with the partial least squares approach. The integrated model has good explanatory power (73.8%) to predict the continuous intention of online shopping. The results indicate that satisfaction, attitude, and perceived usefulness have a significant influence on continuous intention. Attitude has large effect size and is found to be the most significant continuous intention predictor. Confirmation and perceived ease of use indirectly influenced continuous intention through satisfaction and attitude, respectively. Perceived usefulness affects consumers’ attitudes more than making online shopping easy to operate. The implications of this research are also discussed.

KEYWORDS

Attitude, Continuous Intention, Expectation Confirmation Model, Online Shopping, Perceived Ease of Use, Perceived Usefulness, Technology Acceptance Model

1. INTRODUCTION

With the rapid growth of the Internet, companies have invested large amounts of money to develop online platforms for users. Although traditional sales channels have not disappeared, e-commerce has become an alternative. The company provides more online services, including more product information, customized services, competitive prices, and fast delivery. Therefore, the market for online shopping has also increased annually. In 2022, the Asian e-commerce market will exceed USD$ 2 trillion, and user penetration will be 57.1% (Statista, 2021). According to MOEA statistics, Taiwan’s e-commerce market is approximately USD$ 27.9 billion in 2020 (Department of Statistics, 2022). The number of young shoppers has increased, and they prefer to shop online.

Online shopping refers to the process of purchasing products or services on the Internet and eliminating the need for customers to satisfy their needs through face-to-face services (Li & Zhang, 2002). Research exploring online shopping has continued to grow due to the boom in online sales. The success of online platforms means that consumers are willing to adopt new ways of shopping and continue to use them (Bhattacherjee 2001a). In the past two years, the world has been affected by the pandemic, and consumers are less willing to shop via physical channels, and such shopping has been restricted (Alhaimer, 2021; Grashuis et al., 2020). Research on online shopping adoption often uses the technology acceptance model (TAM) to discuss the determinants of users’ decisions (Agag & El-Masry, 2016). The TAM is mainly about technology adoption in the workplace rather
than personal use (Shang & Wu, 2017). The model has been shown to have significant explanatory power in some studies (Shang & Wu, 2017) and provides information of initially adoption by the users (Gefen et al., 2003). Attitude is an antecedent that affects intention. Therefore, researchers have suggested adding other models to understand users’ intention (Shah et al., 2021).

Previous studies have combined the TAM and the expectation confirmation model (ECM) in online shopping studies (Hong et al., 2006; Shang & Wu, 2017). ECM is used to analyze users’ continued use intention by individual factors (Oliver, 1980), combined with other models for better explanatory power. Consumers’ expectations and satisfaction affect their willingness and likelihood of continuing to use or repurchase (Bhattacherjee, 2001a, 2001b). ECM refers to users having fixed expectations about a product or service before using it, and then having a new understanding of the performance of the product or service after the experience (Shah et al., 2021). The users compared the experience performance and inherent expectations, and the results will affect their satisfaction and, in turn, their willingness to reuse or purchase. This feature complements our understanding of continuous intention (CI). Both Perceived usefulness (PU) and satisfaction with the ECM may be affected by external factors (Venkatesh & Bala, 2008). PU stands for cognitive belief after acceptance (Bhattacherjee 2001b). Satisfaction is an important factor that affects CI (Bhattacherjee 2001a, 2001b). Furthermore, the user’s continued use represents loyalty, which is critical for business success. CI has a significant effect on continued use behavior (Armitage & Conner, 2001). TAM can understand the initial motivation of users, while ECM can explain CI, which is also an influential factor of loyalty.

Shang and Wu (2017) mentioned that information on acceptance and adoption of online shopping is still limited and worth exploring, and an integrative framework has better explanatory power. There is a difference between the initial adoption and continued use by users (Liao et al., 2009). Therefore, this study combines the TAM and ECM to explore the factors influencing consumers’ continuous online shopping intentions in Taiwan.

This research has both theoretical and practical contributions.

§ This research investigates the factors that influence consumers’ online shopping use and their willingness to continue using it.
§ Based on the ECM and TAM as the theoretical framework, the combined model can help marketers understand consumers’ reactions to online shopping and CI.

The remainder of this paper is organized as follows. The next section introduces the theory of this research, and the third section explains the research hypothesis and framework. The fourth section describes the research method. The fifth presents the survey results. Finally, to provide the research discussions and conclusions.

2. LITERATURE REVIEW

2.1 Expectation Confirmation Model (ECM)

The ECM is widely used in marketing research to understand the CI of information and communication products or services (Bhattacherjee, 2001a, 2001b; Lee, 2010; Rahi et al., 2021; Shiau et al., 2020; Tam et al., 2020). The variables in the ECM include confirmation, PU, and satisfaction. Confirmation represents the gap between the user’s expectations and perceived performance. When the user confirms, it means they think the experience of the information system or service meets their expectations (Bhattacherjee, 2001a, 2001b; Bhattacherjee & Premkumar, 2004). PU is a cognitive belief for the use of information systems (IS) (Davis, 1989), and represents the perception of performance after acceptance (Shah et al., 2021). Satisfaction indicates users’ psychological feelings after purchase and use (Bhattacherjee, 2001a, 2001b; Bhattacherjee & Premkumar, 2004) that affects their CI (Park, 2020).
Related research on ECM mainly discusses the post-acceptance behavior of IS (Aslam et al., 2019). Some scholars have added other variables to explore their impact on CI. For example, added resource quality in the ECM to discuss college students’ intention to continue using the online library (Joo & Choi, 2016). Scholars have also combined TAM and ECM as the research framework to more effectively explain the CI of a particular IS or service (Hong et al., 2006; Shang & Wu, 2017). As the ECM considers personal cognition factors, combined with other theoretical frameworks, it can explain consumers’ CI of online shopping more effectively.

2.2 Technology Acceptance Model (TAM)

The TAM is the most widely used innovation adoption model (Benamati et al., 2010; Gefen et al., 2003). Perceived ease of use (PEOU) and PU are the two cognitive factors that determine individuals’ technology acceptance (Agag & El-Masry, 2016). PEOU refers to the fact that individuals use the system smoothly, and they do not feel it takes time or effort (Davis, 1989). PU refers to when using a system or website, it can improve work efficiency or performance and make the user think that the system or website is useful (Davis, 1989). Attitude is a positive or negative view of the interface and system quality of a certain technology or website, and affects the user’s behavior (Davis, 1986, 1989). Research indicates that attitude has an important influence on online purchase intention (Chi, 2018). The TAM model comprehensively explains the use of online behaviors; however, it ignores the psychological motivation of users’ CIs after acceptance (Bhattacherjee, 2001a). The extended model achieves a higher explanatory power on the use intention and behavior (Singh et al., 2020). Therefore, this study added the ECM to the research model.

3. RESEARCH HYPOTHESES DEVELOPMENT

3.1. Hypotheses for ECM

The ECM model highlights that confirmation positively affects satisfaction, which in turn affects CI (Bhattacherjee, 2001a, 2001b). Confirmation indicated that consumers form initial expectations for a specific product or service based on existing knowledge and previous experience before purchasing (Oliver, 1980). The willingness to make repeat purchases is also determined by the degree of satisfaction of the initial expectations (Bhattacherjee, 2001a, 2001b; Bölen & Özen, 2020). Providing positive experience of information products or services for consumers will make them willing to make repeat purchases (Sarkar & Khare, 2019).

Confirmation has a positive effect on PU and satisfaction (Bhattacherjee, 2001a, 2001b; Bölen & Özen, 2020; Kim et al., 2019; Rahi & Ghani, 2019). Thong et al. (2006) and Kim et al. (2019) explored the use of internet services, revealing a positive relationship between confirmation and PU and service satisfaction. Satisfaction is an important predictor of users’ acceptance of IS (Bölen & Özen, 2020). However, Hong et al. (2006) and Liao et al. (2007) found that the relationship between PU and satisfaction is not significant. Consumer satisfaction increases repurchase intentions and enhances loyalty toward the brand (Chiu et al., 2009). High satisfaction will result in consumers having high willingness to continue use. Bölen and Özen (2020) suggested that PU was a determinant of CI, but Hsiao et al. (2016) found that the relationship is not significant.

Thus, the research proposed the following hypotheses:

H1: Users’ satisfaction positively affects their CI for online shopping.
H2: Confirmation positively affects users’ satisfaction with online shopping.
H3: Confirmation positively affects PU of online shopping.
H4: PU positively affects users’ satisfaction with online shopping.
H5: PU positively affects users’ CI for online shopping.
3.2. Hypotheses for TAM and CI

According to TAM, PEOU and PU theoretically affect adoption attitude and CI (Venkatesh, 2006). If consumers cannot feel the benefits of shopping online, they may not want to adopt it and switch from offline to online (Lu et al., 2011). PU is an important factor in predicting repeated online purchase intention (Chiu et al., 2009). Laukkanen et al. (2008) demonstrated that PEOU is an important factor affecting consumers’ use and adoption of new technologies. Related research has also highlighted the relationship between PEOU and PU (Chiu et al., 2009; Davis, 1989).

Attitudes affect behavioral intentions (Ho, 2010). In addition, previous research supports a significant relationship between PU and consumer attitudes (Agag & El-Masry, 2016; Gefen et al., 2003). Consumers’ PU directly influences online purchase intentions (Alhaimer, 2021; Chiu et al., 2009; Davis, 1989; Hong et al., 2006) and PEOU indirectly affects behavioral intentions through PU (Davis, 1989). Based on the literature review, the following hypotheses were developed:

H6: Attitude positively affects users’ CI for online shopping.
H7: PEOU positively affects PU of online shopping.
H8: PEOU positively affects users’ attitude toward online shopping.
H9: PU positively affects users’ attitude toward online shopping.

The theoretical framework of the factors identified in the literature review is illustrated in Figure 1.

4. METHODOLOGY

4.1. Measurement and Instruments

This study integrates two models to determine consumers’ CI for online shopping. An online survey was used to collect data and exclude those without internet access. The questionnaire consisting of two parts was developed and verified in the relevant literature. The first included questions for measuring constructs in the research framework, and the second part was comprised of demographic questions. The questionnaire is presented in Appendix 1. In addition, a seven-point Likert scale was adopted to measure the participants’ agreement ranging from 7 “Strongly agree” to 1 “Strongly disagree.” After
designing the questionnaire, two management and marketing professors were invited to review the content and appropriateness of the question items. Subsequently, the pre-test was conducted by 35 master’s students. The expert validity and pre-test results indicated that the measurement tool was appropriate.

4.2. Data Collection

This study used online questionnaires to collect data in May and June 2021 and adopted a convenience sampling approach. Rowley (2014) suggests that convenience sampling is sufficient to test the authenticity of theoretical knowledge. A total of 238 responses were collected for this study. After removing incomplete responses, 236 valid responses were used for further data analysis.

The response questionnaires were analyzed using SPSS 23.0 for descriptive statistics. Of the respondents, 39.4% were male and 60.6% were female. The majority of the participants were aged 41–50 (41.1%). A total of 94.5% of respondents’ education level was above university level. Of the respondents, 57.2% had used online shopping for more than five years. The demographic information of the respondents is reported in Table 1.

| Characteristic                              | Category                  | Frequency | Percentage |
|---------------------------------------------|----------------------------|-----------|------------|
| Gender                                      | Male                       | 93        | 39.4%      |
|                                             | Female                     | 143       | 60.6%      |
| Age                                         | 18-25                      | 11        | 4.7%       |
|                                             | 26-30                      | 9         | 3.8%       |
|                                             | 31-40                      | 59        | 25.0%      |
|                                             | 41-50                      | 97        | 41.1%      |
|                                             | 51-60                      | 52        | 22.0%      |
|                                             | 61-70                      | 7         | 3.0%       |
|                                             | 71 and above               | 1         | 0.4%       |
| Education                                   | High school or below       | 13        | 5.5%       |
|                                             | Bachelor degree            | 111       | 47.0%      |
|                                             | Master degree or higher    | 112       | 47.5%      |
| How long have you been using online shopping| less than 1 year           | 33        | 14%        |
|                                             | 1-2 years                  | 13        | 5.5%       |
|                                             | 3-5 years                  | 55        | 12.3%      |
|                                             | 5-10 years                 | 61        | 25.8%      |
|                                             | More than 10 years         | 74        | 31.4%      |
| Frequency of online shopping use            | Once daily                 | 7         | 2.9%       |
|                                             | Multiple times weekly      | 35        | 14.8%      |
|                                             | Once a week                | 33        | 14.0%      |
|                                             | At least once a month      | 103       | 43.6%      |
|                                             | Rarely                     | 58        | 24.6%      |
| Average spending on online shopping         | Less than USD 18           | 7         | 3.0%       |
|                                             | USD 19.35                  | 62        | 26.3%      |
|                                             | USD 36-107                 | 112       | 47.5%      |
|                                             | USD 108-178                | 34        | 14.4%      |
|                                             | USD 179-357                | 15        | 6.4%       |
|                                             | More than USD 358          | 6         | 2.5%       |
4.3. Common Method Variance (CMV)
As the research uses single-source data, there may be potential issues with common method variance (CMV) (Podsakoff et al., 2003). Therefore, Harman’s single factor test was used to check for CMV. According to Podsakoff et al. (2003), CMV is problematic if the single factor explained the variance over 50%. The computed first factor explained 43.35% of the variance. The results indicate that no significant common method bias is found in this study.

5. DATA ANALYSIS AND RESULTS
SEM was used to evaluate the research hypothesis, and a two-stage procedure was adopted to analyze the data (Anderson & Gerbing, 1988). First, the measurement model was tested, and the structural model was examined. To test the significance of the model and hypothesis, a bootstrapping method was used (Hair et al., 2019) using the Smart-PLS software. The benefit of PLS-SEM is that it is used for small samples and non-normal data (Hair et al., 2019).

5.1 Measurement Model
The measurement model is to understand the reliability, convergent validity, and discriminant validity. The reliability indicator was evaluated based on a factor loading higher than 0.7 (Hair et al., 2019). The Average Variance Extracted (AVE) was use to evaluate the convergent validity and the value must exceeded 0.5 (Fornell & Larcker, 1981; Hair et al., 2006, 2019). Construct validity uses two indicators to evaluate composite reliability (CR) and Cronbach’s alpha. The criteria of Cronbach’s alpha and CR were greater than 0.7 (Henseler et al., 2009). The results showed that the factor loading was 0.81–0.94 that is higher than the required value. The construct reliability showed a Cronbach’s alpha value between 0.88–0.94, which was higher than the threshold value. The composite reliability (CR) value was between 0.90–0.93, and the AVE value was between 0.73–0.81. Both values were greater than the required value. The square root of the AVE of each factor was used to check the discriminant validity, and value was greater than its corresponding correlation coefficients with other factors. The result was satisfying criteria for discriminant validity (Fornell & Larcker, 1981). As a result, the measurement model had good fit, including reliability, convergent validity (Table 2), discriminant validity (Table 3), and could be used to test the structural model.

5.2 Structure Model and Hypothesis Testing
After analyzing reliability and validity, the research hypotheses were tested. The value of the variance inflation factor (VIF) score varied between 1.9 and 4.3, which is lower than 5, indicating that there is no collinearity in the results of the structural analysis model (Hair et al., 2019). The structural model was estimated using bootstrapping with 5000 re-sampling. The estimation of the model fit criterion, SRMR, is 0.055, which is less than 0.8, as suggested by Henseler et al. (2014).

Structure coefficient estimates for reach model are shown in Table 4. The hypothesis tests indicated that all structural relationships were significant (p<0.05). CI was jointly predicted by satisfaction (β=0.347, T=6.428), attitude (β=0.484, T=8.497) and PU (β=0.105, T=2.194), therefore, H1, H5 and H6 were supported. Confirmation significantly affected satisfaction (β=0.810, T=26.912) and PU (β=0.440, T=7.347), and the results supported H2 and H3. PU significantly affected satisfaction (β=0.139, T=3.479) and attitude (β=0.435, T=7.386) thus confirming H4 and H9. In addition, PEOU significantly affected PU (β=0.314, T=4.371) and attitude (β=0.394, T=6.544), supporting H7 and H8.

The adjusted R² values were 0.538 for attitude and 0.738 for CI, 0.452 for PU, and 0.815 for satisfaction, indicating good explanatory power of the model (Brieman & Friedman, 1985). The findings indicated that PU and PEOU explained 53.8% of the variance in attitudes. Confirmation and PU accounted for 81.5% of the variance in satisfaction. Satisfaction, PU, and attitude explained 73.8% of the variance in CI. Furthermore, the study also assessed the effect sizes and predictive
Table 2. Results of construct reliability and convergent validity

| Construct items | Mean  | Std. Deviation | Factor loading | Cronbach’s alpha | CR   | AVE  |
|-----------------|-------|----------------|----------------|------------------|------|------|
| PU1             | 4.92  | 1.336          | 0.826          | 0.887            | 0.922| 0.748|
| PU2             | 5.07  | 1.374          | 0.847          |                  |      |      |
| PU3             | 5.49  | 1.233          | 0.899          |                  |      |      |
| PU4             | 5.69  | 1.139          | 0.885          |                  |      |      |
| PEOU1           | 5.56  | 1.235          | 0.865          | 0.894            | 0.906| 0.763|
| PEOU2           | 5.53  | 1.243          | 0.901          |                  |      |      |
| PEOU3           | 5.55  | 1.189          | 0.854          |                  |      |      |
| ATT1            | 5.61  | 1.122          | 0.857          | 0.884            | 0.929| 0.814|
| ATT2            | 5.07  | 1.321          | 0.943          |                  |      |      |
| ATT3            | 4.92  | 1.372          | 0.905          |                  |      |      |
| CONF1           | 4.88  | 1.197          | 0.817          | 0.907            | 0.931| 0.730|
| CONF2           | 4.75  | 1.266          | 0.832          |                  |      |      |
| CONF3           | 4.47  | 1.232          | 0.890          |                  |      |      |
| CONF4           | 4.49  | 1.253          | 0.830          |                  |      |      |
| CONF5           | 4.96  | 1.161          | 0.900          |                  |      |      |
| SAT1            | 4.92  | 1.151          | 0.851          | 0.944            | 0.923| 0.749|
| SAT2            | 4.93  | 1.147          | 0.849          |                  |      |      |
| SAT3            | 4.95  | 1.127          | 0.890          |                  |      |      |
| SAT4            | 5.09  | 1.113          | 0.872          |                  |      |      |
| CI1             | 5.53  | 1.081          | 0.885          | 0.904            | 0.939| 0.793|
| CI2             | 5.46  | 1.120          | 0.908          |                  |      |      |
| CI3             | 4.64  | 1.514          | 0.872          |                  |      |      |
| CI4             | 4.90  | 1.406          | 0.896          |                  |      |      |

Notes: CONF=confirmation, CI=continuous intention, SAT=satisfaction, ATT=attitude, PEOU=perceived ease of use, PU=perceived usefulness.

Table 3. Correlation matrices and discriminant validity

|       | ATT  | CI   | CONF  | PEOU  | PU   | SAT  |
|-------|------|------|-------|-------|------|------|
| ATT   |     |      |       |       |      |      |
| CI    | 0.902|      |       |       |      |      |
| CONF  | 0.823| 0.890|       |       |      |      |
| PEOU  | 0.745| 0.741| 0.854 |       |      |      |
| PU    | 0.645| 0.594| 0.596 | 0.873 |      |      |
| SAT   | 0.662| 0.650| 0.627 | 0.576 | 0.865|      |

Note: Diagonal elements (in bold italics) are the square roots of the average variance extracted.
relevance. Hair et al. (2019) mention that the $R^2$ value shows that the effect exists but does not disclose the size of the effect. The acceptable values of effect sizes ($f^2$) of 0.02, 0.15 and 0.35 are considered small, medium, and substantial effect sizes, respectively (Cohen, 1988). The blindfolding procedure was used to assess the predictive relevance $Q^2$. The value of $Q^2$ should be greater than zero, indicating that the model has predictive relevance for a certain endogenous construct (Cohen, 1988). In terms of effect size, attitude ($f^2=0.319$) was the most significant CI predictor with a large effect size. Satisfaction ($f^2=0.170$) was also an important CI predictor with a medium effect size. All predictive relevance values $Q^2$ exceed zero, which indicates that the proposed model has significant predictive relevance. Table 5 presents the $R^2$, $f^2$ and $Q^2$.

### Table 4. Summary of hypothesis tests

| Hypothesis | Relationship | $\beta$ | Standard Deviation | T Statistics | Remarks |
|------------|--------------|---------|--------------------|--------------|---------|
| H1         | SAT $\rightarrow$ CI | 0.347   | 0.054              | 6.428**      | supported |
| H2         | CONF $\rightarrow$ SAT | 0.810   | 0.030              | 26.912**     | supported |
| H3         | CONF $\rightarrow$ PU | 0.440   | 0.060              | 7.347**      | supported |
| H4         | PU $\rightarrow$ SAT | 0.139   | 0.040              | 3.479**      | supported |
| H5         | PU $\rightarrow$ CI | 0.105   | 0.048              | 2.194*       | supported |
| H6         | ATT $\rightarrow$ CI | 0.484   | 0.057              | 8.497**      | supported |
| H7         | PEOU $\rightarrow$ PU | 0.314   | 0.072              | 4.371**      | supported |
| H8         | PEOU $\rightarrow$ ATT | 0.394   | 0.060              | 6.544**      | supported |
| H9         | PU $\rightarrow$ ATT | 0.435   | 0.059              | 7.386**      | supported |

Note: *$P<0.05$; **$P<0.01$

### Table 5. The results of $R^2$, $Q^2$ and $f^2$

| Constructs | Relationship | $R^2$  | Adjusted $R^2$ | $Q^2$  | $f^2$  |
|------------|--------------|--------|----------------|--------|--------|
| PU         | PEOU $\rightarrow$ PU | 0.457  | 0.452          | 0.446  | 0.117  |
|            | CONF $\rightarrow$ PU |        |                |        | 0.230  |
| SAT        | CONF $\rightarrow$ SAT | 0.817  | 0.815          | 0.812  | 0.171  |
|            | PU $\rightarrow$ SAT |        |                |        | 0.064  |
| ATT        | PEOU $\rightarrow$ ATT | 0.542  | 0.538          | 0.523  | 0.226  |
|            | PU $\rightarrow$ ATT |        |                |        | 0.276  |
| CI         | SAT $\rightarrow$ CI | 0.741  | 0.738          | 0.564  | 0.170  |
|            | ATT $\rightarrow$ CI |        |                |        | 0.319  |
|            | PU $\rightarrow$ CI |        |                |        | 0.022  |

Notes: $f^2$: 0.02, small; 0.15, medium; 0.35, substantial

### 6. DISCUSSION

The results of this study validate the conceptual model to explain consumers’ online shopping CI in Taiwan. The research framework demonstrated a good fit, and all relationships were supported. The research model explained 73.8% of the variance in CI for online shopping. Satisfaction, attitude,
and PU significantly affect consumers’ CI. Related research has yielded similar findings (Rahi et al., 2021; Shang & Wu, 2017). The results also indicate that consumers’ online shopping attitudes and satisfaction were the strongest CI predictors. Therefore, it is very important for consumers to have a positive attitude toward online shopping and satisfy their online shopping experience.

In the integrated model, confirmation significantly affected user satisfaction and PU, which was consistent with previous research by Hong et al. (2006) and Thong et al. (2006). The effect of confirmation and PU on satisfaction is significant, and the relationship between confirmation and satisfaction is strong. The results indicated that providing consumers with expected confirmation services would increase their satisfaction more than PU. This means the user’s pre-expectation behavior is much stronger predictor of satisfaction than post-expectation behavior. Consumer satisfaction significantly affected their willingness in terms of CI. Related research has presented similar findings (Bhattacherjee, 2001; Rahi & Ghani, 2019). If users are satisfied with the online shopping service experience, they will perceive a high level of motivation to continue to shop online.

Accordingly, PEOU and PU had a significant impact on attitudes toward online shopping, and PU had a greater impact on attitude than PEOU. This may be because most of the respondents in this research were experienced users of online shopping, and most were well educated. They had required knowledge of buying and browsing the internet (Alhaimer, 2021). The result reflects the importance for users to perceive values and performance of online shopping. Furthermore, this research found that PEOU had a significant effect on PU, consistent with related studies (Davis, 1989; Hsiao et al., 2016; Venkatesh & Davis, 2000). It is important for consumers to feel that the system is easy to use and perceive online shopping performance.

The findings also indicate that PU is significant but weak effect on CI. CI is a cognitive assessment of how the use of technology helps users achieve valuable goals as well as their emotional feelings about using technology (Hsiao et al., 2016). The performance of online shopping to assist users in completing the shopping task was weak to generate CI. Perhaps for consumers, the CI does not necessarily have to be linked to functionality. The influence of creating and maintaining emotions in the online world is more important.

Online shopping consumers have kept growing due to the epidemic in the past two years. It is necessary to explore the factors that affect consumers’ willingness to continue to use online shopping. In addition to the consumers’ factors, integrating external factors can help understand CI and behavior. Given that online shopping behavior entails searching first and then purchasing, the integrated model of TAM and ECM helps to understand user acceptance and post-adoption intention better. The results indicate that the integrated model provides better understanding of the impact of behavior on CI. The results also show that users can understand online shopping performance from the actual online user experience. The integrated model considers the user’s cognition while explaining the CI. There also helps in better understanding the actual behavior.

6.1. Practical Implications

The advantage of online shopping is that users can purchase goods and do not need to go out. The results revealed that major significant factors affecting users’ CI were user satisfaction, attitude, and PU. This is also an important clue for online platform managers to understand the factors that influence user CI. Hence, practitioners are required to ensure positive attitudes and satisfaction with services for online users.

Consumer satisfaction significantly affected the CI. Clearly, it is important to provide consumers with a satisfactory shopping experience. When consumers’ expectations are confirmed, they will be satisfied with the service, which will affect their CI. This means that consumers have positive expectations to confirm that the online shopping system can complete their shopping tasks, and their satisfaction with the system will also affect their continued use intentions. This is also why companies must pay attention to customers’ internal perceptions when providing online shopping services. Enterprises or platforms that provide consumers with positive emotional experiences would enhance their CI.
Furthermore, Consumers’ attitudes are higher impact to the CI. PU toward online shopping affects their attitudes more than PEOU. PU is an important factor for technology adoption (Laukkanen et al. 2008). Therefore, the usefulness of online shopping increases when the user’s expectations are confirmed. Online system design should provide users with the experience of being easy to use and effectively solving their problems. These results suggest that users will continue to use online shopping if they continue to provide a good solution, and then they will have a positive attitude towards online shopping. Companies could refer to the findings to develop business solutions to improve customers’ online shopping experience.

6.2. Limitations and Future Research

This study has increased the understanding of consumers’ CI of online shopping in Taiwan. However, there are several limitations:

- This study only investigates a single country, which limits the generalization of the results. Future research should compare with other countries and regions.
- The survey period of the study is short. Future research should observe consumer behavior changes over a longer period.
- This study integrates the ECT and TAM models to explore the influential factors on CI. Future research should explore factors from different aspects.
- There are no real data to verify consumers’ actual online use behavior in this study. The intention may still be inconsistent with the actual behavior (Venkatesh, 2006). If future research can incorporate actual data, there will be interesting findings.

7. CONCLUSION

Consumer CI in online shopping is critical for online stores. This study used TAM and ECM to explore consumers’ CI for online shopping in Taiwan, and found that attitude, satisfaction, and PU had a significant impact on CI. The user’s experience and opinion on the use and operation of online shopping affects their willingness to adopt and continue to use intention. Consumer satisfaction and attitudes are important and worthy of managerial attention. This study suggests that businesses provide useful platforms and meet consumer expectations, which helps increase consumers’ willingness to continue using them. The research adds to the understanding of related studies on the CI of online shopping.

FUNDING AGENCY

The Open Access Processing fee for this article has been waived by the publisher.
REFERENCES

Agag, G., & El-Masry, A. A. (2016). Understanding consumer intention to participate in online travel community and effects on consumer intention to purchase travel online and WOM: An integration of innovation diffusion theory and TAM with trust. *Computers in Human Behavior, 60*, 97–111. doi:10.1016/j.chb.2016.02.038

Al-Rahmi, W. M., Yahaya, N., Alamri, M. M., Alyoussef, I. Y., Al-Rahmi, A. M., & Kamin, Y. B. (2019). Integrating innovation diffusion theory with technology acceptance model: Supporting students’ attitude towards using a massive open online courses (MOOCs) systems. *Interactive Learning Environments, 1–13*. doi:10.1080/10494820.2019.1629599

Alhaimer, R. (2021). Fluctuating attitudes and behaviors of customers toward online shopping in times of emergency: The case of Kuwait during the COVID-19 pandemic. *Journal of Internet Commerce*, 1–26. doi:10.1080/15332861.2021.1882758

Anderson, J., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin, 103*(3), 411–423. doi:10.1037/0033-2909.103.3.411

Armitage, C. J., & Conner, M. (2001). Efficacy of the Theory of Planned Behaviour: A meta-analytic review. *British Journal of Social Psychology, 40*(4), 471–499. doi:10.1348/014466601164939 PMID:11795063

Aslam, W., Ham, M., & Farhat, K. (2019). Building brand loyalty: An application of expectation confirmation model in mobile social commerce. *Pakistan Journal of Commerce and Social Sciences, 13*(4), 806–825.

Benamati, J., Fuller, M. A., Serva, M. A., & Baroudi, J. (2010). Clarifying the integration of trust and TAM in e-commerce environments: Implications for systems design and management. *IEEE Transactions on Engineering Management, 57*(3), 380–393. doi:10.1109/TEM.2009.2023111

Bhattacherjee, A. (2001a). Understanding information systems continuance: An Expectation-Confirmation Model. *Management Information Systems Quarterly, 25*(3), 351–370. doi:10.2307/3250921

Bhattacherjee, A. (2001b). An empirical analysis of the antecedents of electronic commerce service continuance. *Decision Support Systems, 32*(2), 201–214. doi:10.1016/S0168-9236(01)00111-7

Bhattacherjee, A., & Premkumar, G. (2004). Understanding changes in belief and attitude toward information technology usage: A theoretical model and longitudinal Test. *Management Information Systems Quarterly, 28*(2), 229–254. doi:10.2307/25148634

Bölen, M. C., & Özen, Ü. (2020). Understanding the factors affecting consumers’ continuance intention in mobile shopping: The case of private shopping clubs. *International Journal of Mobile Communications, 18*(1), 101–129. doi:10.1504/IJMC.2020.104423

Brieman, L., & Friedman, J. H. (1985). Estimation optimal transformations for multiple regression and correlation. *Journal of the American Statistical Association, 80*(391), 580–598. doi:10.1080/01621459.1985.10478157

Chi, T. (2018). Understanding Chinese consumer adoption of apparel mobile commerce: An extended TAM approach. *Journal of Retailing and Consumer Services, 44*, 274–284. doi:10.1016/j.jretconser.2018.07.019

Chiu, C., Chang, C., Cheng, H., & Fang, Y. (2009). Determinants of customer repurchase intention in online shopping. *Online Information Review, 33*(4), 761–784. doi:10.1108/14684520910985710

Chiu, C.-M., Lin, H.-Y., Sun, S.-Y., & Hsu, M.-H. (2009). Understanding customers’ loyalty intentions towards online shopping: An integration of technology acceptance model and fairness theory. *Behaviour & Information Technology, 28*(4), 347–360. doi:10.1080/01449290801892492

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). L. Erlbaum Associates.

Davis, F. D. (1986). *Technology acceptance model for empirically testing new end-user information systems theory and results* [Doctoral Dissertation]. Sloan School of Management Massachusetts Institute of Technology.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319–340. 10.2307/249008
Department of Statistics. (2022, February 15). *Industrial Economic Statistics in Brief*. Department of Statistics, MOEA. https://www.moea.gov.tw/Mns/dos/bulletin/Bulletin.aspx?kind=9&html=1&menu_id=18808&bull_id=9673

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research, 18*(1), 39–50. 10.2307/3151312

Gefen, D., Karahanna, E., & Straub, D. W. (2003). Trust and TAM in online shopping: An integrated model. *MIS Quarterly, 27*(1), 51–90. 10.2307/30036519

Goldsmith, R., & Bridges, E. (2000). E-tailing vs. retailing: Using attitudes to predict online buying behavior. *Quarterly Journal of Electronic Commerce, 1*, 245–253.

Grashuis, J., Skevas, T., & Segovia, M. S. (2020). Grocery shopping preferences during the COVID-19 pandemic. *Sustainability, 12*(13), 5369. doi:10.3390/su12135369

Ha, S., & Stoel, L. (2009). Consumer e-shopping acceptance: Antecedents in a technology acceptance model. *Journal of Business Research, 62*(5), 565–571. doi:10.1016/j.jbusres.2008.06.016

Hair, J. F., Black, W. C., Anderson, R. L., R. E., & Tatham, R. L. (2006). *Multivariate data analysis* (6th ed.). Pearson Prentice Hall.

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. (2019). When to use and how to report the results of PLS-SEM. *European Business Review, 31*(1), 2–24. doi:10.1108/EBR-11-2018-0203

Henseler, J., Ringle, C. M., & Sinkovics, R. R. (2009). The use of partial least squares path modeling in international marketing. In R. R. Sinkovics & P. N. Ghauri (Eds.), *New Challenges to International Marketing* (Vol. 20, pp. 277–319). Emerald Group Publishing Limited. doi:10.1108/S1474-7979(2009)0000020014

Ho, C.-H. (2010). Continuance intention of e-Learning platform: Toward an integrated model. *International Journal of Electronic Business Management, 8*(3), 206–215.

Hong, S., Thong, J. Y. L., & Tam, K. Y. (2006). Understanding continued information technology usage behavior: A comparison of three models in the context of mobile internet. *Decision Support Systems, 42*(3), 1819–1834. doi:10.1016/j.dss.2006.03.009

Hsiao, C.-H., Chang, J.-J., & Tang, K.-Y. (2016). Exploring the influential factors in continuance usage of mobile social Apps: Satisfaction, habit, and customer value perspectives. *Telematics and Informatics, 33*(2), 342–355. doi:10.1016/j.tele.2015.08.014

Joo, S., & Choi, N. (2016). Understanding users’ continuance intention to use online library resources based on an extended expectation-confirmation model. *The Electronic Library, 34*(4), 554–571. doi:10.1108/EL-02-2015-0033

Kim, S. H., Bae, J. H., & Jeon, H. M. (2019). Continuous intention on accommodation Apps: Integrated value-based adoption and expectation–confirmation model analysis. *Sustainability, 11*(6), 1578. doi:10.3390/su11061578

Laukkanen, P., Sinkkonen, S., & Laukkanen, T. (2008). Consumer resistance to internet banking: Postponers, opponents and rejecters. *International Journal of Bank Marketing, 26*(6), 440–455. doi:10.1108/02652320810902451

Law, M., Kwok, R. C.-W., & Ng, M. (2016). An extended online purchase intention model for middle-aged online users. *Electronic Commerce Research and Applications, 20*, 132–146. doi:10.1016/j.elerap.2016.10.005

Lee, M.-C. (2010). Explaining and predicting users’ continuance intention toward e-learning: An extension of the expectation–confirmation model. *Computers & Education, 54*(2), 506–516. doi:10.1016/j.compedu.2009.09.002

Li, N., & Zhang, P. (2002). Consumer online shopping attitudes and behavior: An assessment of research. *AMCIS 2002 Proceedings, 74*, 508–517. https://aisel.aisnet.org/amcis2002/74

Liao, C., Chen, J.-L., & Yen, D. C. (2007). Theory of planning behavior (TPB) and customer satisfaction in the continued use of e-service: An integrated model. *Computers in Human Behavior, 23*(6), 2804–2822. doi:10.1016/j.chb.2006.05.006
Liao, C., Palvia, P., & Chen, J.-L. (2009). Information technology adoption behavior life cycle: Toward a Technology Continuance Theory (TCT). *International Journal of Information Management, 29*(4), 309–320. doi:10.1016/j.ijinfomgt.2009.03.004

Lu, Y., Yang, S., Chau, P. Y. K., & Cao, Y. (2011). Dynamics between the trust transfer process and intention to use mobile payment services: A cross-environment perspective. *Information & Management, 48*(8), 393–403. doi:10.1016/j.im.2011.09.006

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. doi:10.1080/23311975.2019.1644715

Oliver, R. L. (1980). A cognitive model of the antecedents and consequences of satisfaction decisions. *JMR, Journal of Marketing Research, 17*(4), 460–469. doi:10.1177/002224378001700405

Park, E. (2020). User acceptance of smart wearable devices: An expectation-confirmation model approach. *Telematics and Informatics, 47*, 101318. doi:10.1016/j.tele.2019.101318

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *The Journal of Applied Psychology, 88*(5), 879–903. doi:10.1037/0022-9100.88.5.879 PMID:14516251

Rahi, S., & Ghani, M. A. (2019). Integration of expectation confirmation theory and self-determination theory in internet banking continuance intention. *Journal of Science and Technology Policy Management, 10*(3), 533–550. doi:10.1108/JSTPM-06-2018-0057

Rahi, S., Othman, M. M. M., Alharafsheh, M., & Alghizzawi, M. (2021). The post-adoption behavior of internet banking users through the eyes of self-determination theory and expectation confirmation model. *Journal of Enterprise Information Management*. 10.1108/JEIM-04-2020-0156

Rowley, J. (2014). Designing and using research questionnaires. *Management Research Review, 37*(3), 308–330. doi:10.1108/MRR-02-2013-0027

Sarkar, S., & Khare, A. (2019). Influence of expectation confirmation, network externalities, and flow on use of mobile shopping apps. *International Journal of Human-Computer Interaction, 35*(16), 1449–1460. doi:10.1080/10447318.2018.1540383

Shah, S. K., Zhongjun, T., Sattar, A., & XinHao, Z. (2021). Consumer’s intention to purchase 5G: Do environmental awareness, environmental knowledge and health consciousness attitude matter? *Technology in Society, 65*, 101563. doi:10.1016/j.techsoc.2021.101563

Shang, D., & Wu, W. (2017). Understanding mobile shopping consumers’ continuance intention. *Industrial Management & Data Systems, 117*(1), 213–227. doi:10.1108/IMDS-02-2016-0052

Shiau, W.-L., Yuan, Y., Pu, X., Ray, S., & Chen, C. C. (2020). Understanding fintech continuance: Perspectives from self-efficacy and ECT-IS theories. *Industrial Management & Data Systems, 120*(9), 1659–1689. doi:10.1108/IMDS-02-2020-0069

Singh, N., Sinha, N., & Liébana-Cabanillas, F. J. (2020). Determining factors in the adoption and recommendation of mobile wallet services in India: Analysis of the effect of innovativeness, stress to use and social influence. *International Journal of Information Management, 50*, 191–205. doi:10.1016/j.ijinfomgt.2019.05.022

Statista. (2021, December). *ECommerce Asia*. Statista. https://www.statista.com/outlook/dmo/eCommerce/asia

Tam, C., Santos, D., & Oliveaira, T. (2020). Exploring the influential factors of continuance intention to use mobile Apps: Extending the expectation confirmation model. *Information Systems Frontiers, 22*(1), 243–257. doi:10.1007/s10796-018-9864-5

Thong, J. Y. L., Hong, S.-J., & Tam, K. Y. (2006). The effects of post-adoption beliefs on the expectation-confirmation model for information technology continuance. *International Journal of Human-Computer Studies, 64*(9), 799–810. doi:10.1016/j.ijhcs.2006.05.001

Venkatesh, V. (2000). Determinants of perceived ease of use: Integrating control, intrinsic motivation, and emotion into the technology acceptance model. *Information Systems Research, 11*(4), 342–365. doi:10.1287/ isre.11.4.342.11872
Venkatesh, V. (2006). Where to go from here? Thoughts on future directions for research on individual-level technology adoption with a focus on decision making. *Decision Sciences, 37*(4), 497–518. doi:10.1111/j.1540-5414.2006.00136.x

Venkatesh, V., & Bala, H. (2008). Technology acceptance model 3 and a research agenda on interventions. *Decision Sciences, 39*(2), 273–315. doi:10.1111/j.1540-5915.2008.00192.x

Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management Science, 46*(2), 186–204. doi:10.1287/mnsc.46.2.186.11926
### APPENDIX A – SCALE ITEMS OF CONSTRUCTS

Table 6. Scale items of constructs

| Constructs                  | Items | Questions                                                                 | Adapted from                                      |
|-----------------------------|-------|---------------------------------------------------------------------------|---------------------------------------------------|
| PU (Perceived Usefulness)   | PU1   | Using online shopping helps me accomplish things quickly.                  | Davis (1989)                                      |
|                             | PU2   | Using online shopping can enhance my effectiveness                       | Rahi & Ghani (2018)                               |
|                             | PU3   | I find online shopping useful for me.                                     |                                                   |
|                             | PU4   | Overall, online shopping is a convenience shopping channel.               |                                                   |
| Perceived Ease of Use (PEOU)| PEOU1 | Learning to use online shopping is easy for me.                           | Davis (1989)                                      |
|                             | PEOU2 | It is easy for me to become skillful at using the online shopping.        |                                                   |
|                             | PEOU3 | Overall, online shopping is easy to use.                                  |                                                   |
| Attitude (ATT)              | ATT1  | Using online shopping is a good idea.                                     | Davis (1989)                                      |
|                             | ATT2  | I like using online shopping.                                             |                                                   |
|                             | ATT3  | It is a desirable to use online shopping.                                 |                                                   |
| Confirmation (CONF)         | CONF1 | My experience with using online shopping was better than I expected.      | Bhattachacherjee, (2001,a,b)                      |
|                             | CONF2 | The online shopping system can meet demands excess of what I required for the service. | Rahi & Ghani (2018)                               |
|                             | CONF3 | The service level provided by online shops was better than I expected.    |                                                   |
|                             | CONF4 | The product information provided by online shops was better than I expected. |                                                   |
|                             | CONF5 | Overall, most of my expectations from using online shopping were confirmed. |                                                   |
| Satisfaction (SAT)          | SAT1  | I am pleased with the experience of using online shopping.                | Bhattachacherjee, (2001,a,b)                      |
|                             | SAT2  | I am satisfied with the performance of online shopping.                   | Rahi & Ghani (2018)                               |
|                             | SAT3  | I think I made the correct decision in using online shopping              |                                                   |
|                             | SAT4  | Overall, I am satisfied with the experience of using online shopping.     |                                                   |
| Continuous Intention (CI)   | CI1   | I intend to continue using online shopping in the future.                 | Bhattachacherjee, (2001,a,b)                      |
|                             | CI2   | I will always try to use online shopping in my daily life.                |                                                   |
|                             | CI3   | I intend to increase my use of online shopping in the future.             |                                                   |
|                             | CI4   | I will keep using online shopping as regularly as I do now.               |                                                   |
Cheng-Mei Tung is an associate professor of Department of International Business at Feng Chia University in Taiwan. Her research and teaching focus on industry competition, innovation and entrepreneurship, and marketing management.