

整合顧客滿意度觀點和系統觀點探討台灣美食外送服務之採用意願

張永佶

南臺科技大學財務金融系

keyuse@stust.edu.tw

摘要

本研究整合顧客滿意度以及系統觀點建構出整合性架構，企圖探討食品品質（FQ）、電子服務品質（E-SQ）、電子服務滿意度（E-SAT）、網站/應用程式的有用性和易用性對美食外送服務（OFDS）採用意圖的影響。有 230 位台灣的 OFDS 樣本參與研究問題的回答。研究發現，E-SQ 和 FQ 會同時影響 OFDS 的顧客滿意度(CS)，惟，ESQ 的影響較果較大。另外，本研究也證實 E-SAT 會正向的影響 OFDS 有用性和易用性。通過系統和滿意度觀點的框架的探討，本研究有助於諸如 OFDS 之電子商務業者提高 E-SAT 並擴大對 OFDS 用戶行為的認識。

關鍵詞：電子服務品質、食品品質、COVID-19、採用意圖、線上外送服務

Integrating Customer Satisfaction and System Perspective to Explore the Adoption Intention of Online Food Delivery Service in Taiwan

Yung-Chi Chang

Department of Finance, Southern Taiwan University of Science and Technology

Abstract

This study proposed an integrated framework from the customer satisfaction (CS) and the system perspective of the technology acceptance model (TAM) to explore the adoption of online food delivery service (OFDS) in Taiwan. Variables from the CS perspective as food quality (FQ), e-service quality (E-SQ), and e-satisfaction (E-SAT), and the variables from TAM as usefulness and ease of use of website/app are integrated into the research framework to investigate the adoption intention of OFDS in Taiwan. 230 OFDS samples from Taiwan were joined to answer the research questionnaire during the COVID-19 pandemic. Findings indicate that E-SQ and FQ are significant factors for the customer satisfaction (CS) of OFDS, while E-SQ will have a more significant impact. Moreover, the E-SAT will positively affect OFDS usefulness and ease of use, showing the impact of CS on the system design in the e-service industry. With the application of the integrating framework of CS and system design perspective in the context of OFDS, this study found the relevant importance between FQ and E-SQ and their impacts on E-SAT and system design, which can contribute to the expansion of the knowledge about the management of e-commerce like the industry of OFDS.

Keywords: E-SQ, FQ, COVID-19, Adopt intention, Online food delivery service

I. Introduction

The advantage of OFDS services has been proven through time and especially during the pandemic when the rise of Covid-19 occurred in every country and its consequences to all businesses (Pan et al., 2020). With an app or a website, the OFDS suppliers, such as Uber Eats, Foodpanda, and other platforms ... help customers to buy food or products from different food suppliers. Moreover, since the spread of the COVID-19 after 2019, this service mode as OFDS of "internet + restaurant + delivery" supplied by the platform further simultaneously satisfied the requirement for convenience, efficiency, and personal safety for food suppliers and customers both (Zhao and Bacao, 2020) and became accepted by more and more people (Alalwan, 2020).

In Taiwan, the platform-to-customer delivery service as OFDS is a fast-growing industry. According to Statista (2022), the anticipated revenue of OFDSS in Taiwan is US\$285.50 million in 2022 and US\$399.60 million by 2027 with a CAGR (compound annual growth rate) of 6.96% from 2022 to 2027. Driven by the COVID-19, in 2020, the scale of Taiwan's OFDSS industry grew to USD\$ 70.50 million and USD\$110.47 million in the first and second quarters of 2020, respectively, with a growth rate of 326% and 276% over the same period (Mirai Business, 2020). With the increasing popularization of OFDSS in Taiwan,

While much research has explored the antecedents, moderators, mediators, and consequences of customer adoption of OFDS (Yeo, Goh, and Rezaei, 2017; Pigatto et al., 2017; Roh and Park, 2019; Ray et al., 2019; Cho et al., 2019; Zhao and Bacao, 2020; Kaur et al., 2020; Shankar et al., 2022), limited studies tried to integrate variables from the CS perspective as food quality (FQ), e-service quality (E-SQ), and e-satisfaction (E-SAT), and the variables from the system perspective of TAM as usefulness and ease of use of website/app to explore the factors influencing OFDS user behavior. This research applied an integrative framework of E-SQ, FQ, E-SAT, and TAM from the CS and system perspective to explore the adoption intention of OFDS in Taiwan. The research findings will be more comprehensive and beneficial for online food delivery companies to recognize the relevance and importance of the elements that lead customers to use OFDS services. From this understanding, OFDS developers may have a better strategy to improve their website/app to attract new customers.

II. Literature review

1. Variables from the CS perspective

(1) E-SQ and E-SAT

The E-SQ was first described as the effectiveness and efficiency of the site during the online purchasing process from ordering to delivery (Zeithaml et al., 2000). Based on this definition, the E-SQ can be understood as an assessment of the network service from the initial purchase to the repurchase process (Chang et al., 2009). Many researchers (Chang et al., 2009; Pee et al., 2019) claim that if a company strives to provide E-SQ, then it sees positive benefits in the long run. In OFDS services, the E-SQ is particularly important since the firms and their customers only interact through the only platform (Suhartanto et al., 2019). Therefore, it's critical to comprehend how customers appreciate internet services so that the company can offer the best services.

There are noticeable differences between online and offline retailing industries, such as efficiency, convenience, security and secrecy, the non-human interaction, and service quality co-production (Ladhari, 2010). E-SQ measurements have been an attractive topic and developed through different studies. Annaraud and Berezina (2020) created a summary table showing studies with different scales and their dimension to measure E-SQ. The key constructs provided in the instruments appear to be efficiency, reliability, fulfillment, and privacy.

CS could be defined in various ways. According to Carpenter (2008), the discrepancy between the expectations of the customers and the performance of a specific product or service is known as CS, with a rating of satisfactory or unsatisfactory. CS is referred to as E-SAT in the online services context. Ranjbarian et al. (2012)

defined E-SAT as the sum of customer perceptions of online convenience, trade techniques, website design, security, and online customer service. On the other hand, E-SAT is an attitude toward an object that includes information satisfaction, system satisfaction, and e-service satisfaction (Xu et al., 2013).

Much research has established the positive impact of service quality on CS in a variety of industries, including hospitality (Berezina et al., 2012), tourism (Baker and Crompton, 2000), e-commerce (Kaya et al., 2019), and the traditional restaurant sector (Ryu and Han, 2010). Annaraud and Berezina (2020) found that a high E-SQ of the OFDS app is the most important factor in achieving CS in the OFDS business. As a result, it is logical that E-SQ will have a positive impact on the E-SAT of the customers of OFDS.

H1: The E-SQ of OFDS has a positive effect on E-SAT.

(2) FQ and E-SAT

There are various ways to define the perceived FQ from objective to subjective (Konuk, 2019; Cho et al., 2019). Namkung and Jang (2007) define FQ as a broad notion of packaging, versatility, healthy choices, taste, freshness, and warmth. In the traditional restaurant environment, Clark and Wood (1999) dedicated that one of the things that influences a customer's decision to eat at a restaurant is the food quality. Other research (Namkung and Jang, 2007; Ryu et al., 2012; Konuk, 2019) suggest that CS is highly decided by the good FQ. Restaurants exist primarily to serve foods and provide customers pleasant dining experience (Annaraud and Berezina, 2020). In the OFDS setting, on the other hand, providing customers foods in thousands of restaurant options with conveniences, Suhartanto et al. (2019) discovered a positive impact of FQ on customer's satisfaction. For those differences, the function of FQ in the new online meal delivery services segment has to be investigated.

H2: FQ of OFDS has a positive impact on E-SAT.

2. The link between CS and system perspective of TAM

Several scholars have applied TAM and the extended TAM model to predict customer intention in the online world (Gefen and Straub, 2000). However, frameworks choosing E-SAT as the external variables are still in their infancy. Xu et al. (2013) demonstrated the importance of positive E-SAT elements (information satisfaction, system satisfaction, and e-service satisfaction) to customers' perceptions of the e-service's usefulness and ease of use. This outcome supports the theoretical integration of user pleasure and TAM (Wixom and Todd, 2005). Accordingly, user satisfaction with website information will be a favorable impact on their assessment of the system's usefulness. When customers are satisfied with the service given by the website/app, they likely to have more easy and beneficial experiences. In the same way, customers' satisfaction with the website system is a solid prediction of the website's ease of use. For this reason, we propose:

H3: Customers' E-SAT positively affects the usefulness of OFDS.

H4: User's E-SAT positively affects the ease of use of OFDS.

3. The system perspective of TAM

Davis et al. (1989) proposed that perceived usefulness and ease of use are two elements of technology that explain user technology acceptance. The importance of these two characteristics has been well acknowledged in a variety of circumstances (Karahanna, et al., 2006), including the new OFDS field (Roh and Park, 2019; Troise et al., 2021). In detail, previous research has found that ease of use has a direct positive effect on customer intention and an indirect effect on customer's perceived usefulness (Alalwan, Dwivedi, and Rana, 2017; Dwivedi, et al., 2017; Roh and Park, 2019), and usefulness has a positive relationship with customer intention (Koo et al., 2015; Talaei-Khoei and Daniel, 2018; Roh and Park, 2019; Troise et al., 2020). Roh and Park (2019) validated the explaining power of usefulness and ease of use toward OFDS user adoption intention in Korea. Based on the literature, it is assumed to be logical to propose that user intention is positively impacted by technology usefulness

and ease of use.

H5: OFDS ease of use has a positive effect on its' usefulness.

H6: OFDS usefulness has a positive effect on customers' adoption intention.

H7: OFDS ease of use has a positive effect on customers' adoption intention.

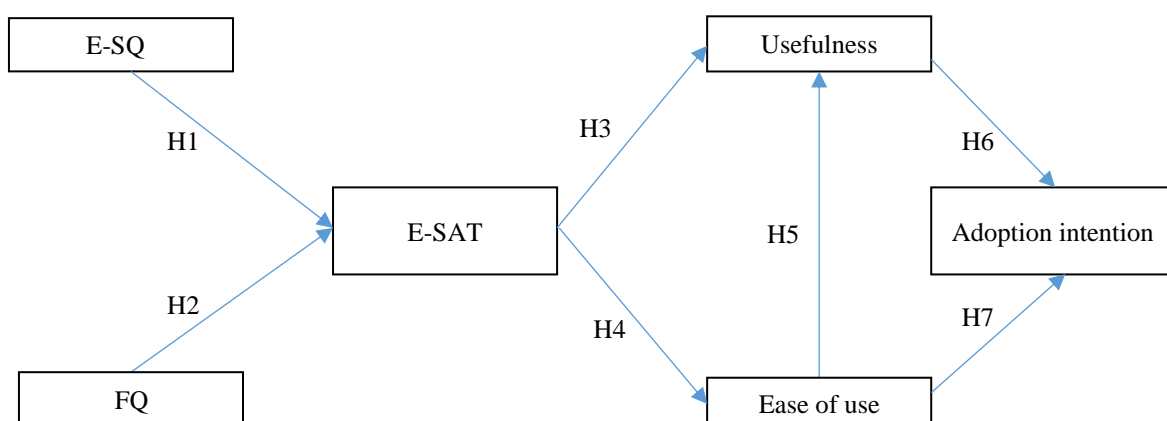
III. Methodology

1. Research framework and samples

This research applied an integrative framework (see Figure 1) of E-SQ, FQ, E-SAT, and TAM from the CS and system perspective to explore the adoption intention of OFDS in Taiwan.

Figure 1

Research Framework



The research is designed as quantitative research with SmartPLS 3.0 to conduct SEM analysis. The survey was designed using web-based questionnaires to collect data from respondents. The online survey can easily record data and helps respondents in completing the whole questionnaire without omitting any questions. Besides, the study examines the influence of electronic elements and using an online survey ensures the entire sample consists of Internet customers. The research survey is in English and Chinese. A convenient sampling process involves 230 respondents taking part in this study.

2. Demographic Questions

Demographic questions are applied to understand the respondents' profiles. Respondents' characteristics have impacts on the intended dependent variable in previous studies. In the setting of the new technology intention, respondents' age and gender are two crucial factors (Talwar et al., 2019). There are four dimensions to ask the respondents in this study: gender, age, usage frequency, and usage period.

3. Construct Measurement Questions

Besides the demographical variables, this study applied Likert 5-point scale to design the measurement questions and characterized those questions into ten parts focusing on getting the answers regarding the hypotheses. All the questions cited in this research are from former studies that were applied and qualified in former research. The constructs, measurement items, and sources of the indicators show in the latter part as Appendix 1.

4. Data Analysis

This section will examine the data to determine whether it answers the research questions. The analysis

purpose is to check seven hypotheses. For this data analysis, SPSS and PLS-SEM will be used. SPSS is utilized to calculate demographic analysis, whereas PLS-SEM is used to check reliability, validity, and the hypothesis.

IV. Results

1. Descriptive Analysis for Demographic Information

A total of 230 people answered the questionnaire. In this research, the demographic information included four parameters: gender, age, usage frequency, and usage period. 50.4% of the respondents to the questionnaire are female, and 49.6% are male, showing that both male and female respondents contribute equally to this research study.

Customers of online food delivery services are mostly aged 25-30 years, which comprises 34.2% of the total respondents. People aged 30 and above come second, with 32.2% of the total respondents. Then comes the respondents aged 19-24, comprising about 31.3% of the respondents; lastly, a total of 1.7 % of the respondents are under 18. Of the respondents who order food from online food providers, 5.2% of the respondents use OFDSs every day, 43.9% of the respondents use OFDSs a few times a week, 15.7% use it once a week, 13.5 uses it once or twice a month, and 21.7% use online food delivery services for not even once a month.

This research also considers whether the respondents are over one-year customers', or they started using these services recently because the experience and satisfaction of people can change over long usage. In this study, 20% of the respondents have used OFDSs for less than a month, 10.4% used OFDSs for less than three months, 16.1% of respondents used OFDSs for less than six months, 22.2% of the respondents used OFDSs for less than a year, and 31.3% of the respondents are using OFDSs for more than a year. The majority of those have been using food delivery apps for more than a year.

2. Analyzing the structural model

(1) Measurement validity

As the measuring items were adopted from earlier research, the dimensions and questions were approved appropriately and precisely for each construct. The reliability and validity tests have been conducted. Most of the item loadings of each construct are more than 0.6 in the PLS path coefficients, passing the validity test. The validation of reflective constructs was conducted with three tests: (1) the test of internal consistency reliability with Composite Reliability(CR) , (2) the test of convergent validity with the average variance extracted (AVE) value, and (3) the test of discriminant validity (Hair et a., 2014).

Reliability analysis is to make sure the consistency between several measurement variables of a construct. For reliability analysis, a composite reliability score from SmartPLS can be used to test internal consistency and to check if each question contributed to the construct. According to Table 1, the CR of each construct is above 0.7. The reliability of the measurement is satisfactory.

Table 1
Construct validation and Collinearity test

Items	Composite Reliability(CR)	AVE	VIF
E-SQ	0.949	0.752	2.071
FQ	0.856	0.624	2.071
E-SAT	0.937	0.789	2.407
Ease of Use	0.948	0.785	2.575
Usefulness	0.954	0.839	2.575
Intention	0.961	0.890	#

Convergent validity is to identify the proportion of variance for each element, as measured by the AVE value. According to Table 1, the convergent validity of each construct is greater than 0.5. The convergent validity of the measurement is satisfactory.

The discriminant validity is to see the measurement model's performance compared to the other measurement models. It can tell if the square root of all AVE values in each concealed idea is higher than their correlation with the other latent variables. The structural elements describe more variation than the elements of other constructs when the AVE of a specific construct is higher than its correlation with the other latent constructs. Finally, as Table 2 shows, discriminant validity also matches Fornell–Larcker's criterion (Hair et al., 2014) because each square root of AVE is greater than the correlations between the constructs with reflective indicators.

Table 2

Discriminant validity test

	E-SQ	FQ	E-SAT	Ease of use	Usefulness	Int
E-SQ	0.867					
FQ	0.719	0.79				
E-SAT	0.859	0.753	0.888			
Ease of use	0.78	0.652	0.765	0.886		
Usefulness	0.78	0.637	0.776	0.782	0.916	
Int	0.699	0.615	0.628	0.648	0.686	0.944

(2) SEM analysis

VIF is to check the structural model for issues related to collinearity. It is calculated by extracting the latent variable scores and using them as input for the assessment operated in SPSS. The VIF values of all the constructs (E-SQ, FQ, CS, ease of use, and usefulness) are under the value of 5 (See table 1), which means that collinearity is not an issue for this structural model.

A bootstrapping technique was applied to generate 5000 subsamples to test the hypotheses. T-test was used to test the significance of the relationship between each variable. The T-test determines whether the two groups' means are statistically different and have a relationship with each other. A T-value greater than 1.65 refers to a significance level of 0.1, 1.96 refers to 0.05, and 2.58 refers to 0.01 (2-tailed). Table 3 and Figure 2 show the results of the hypothesis test.

Figure 2

SEM results

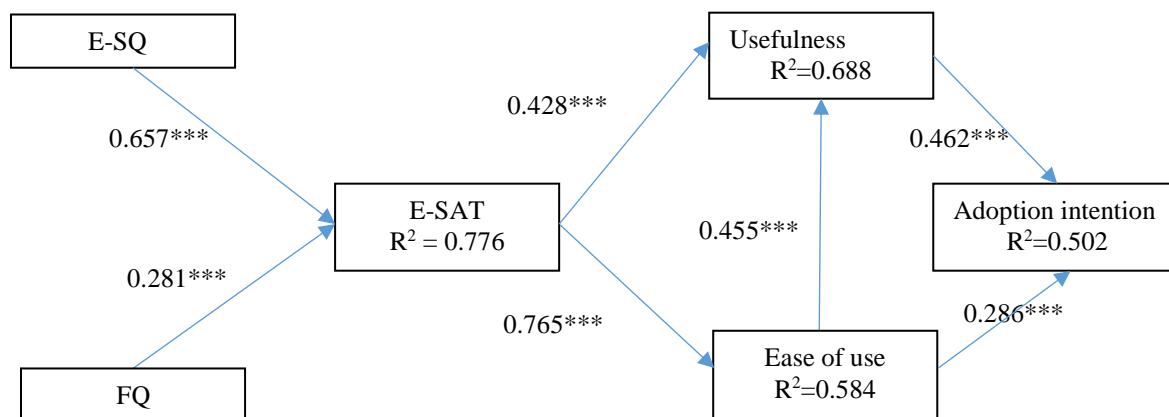


Table 3*Hypothesis results*

Hypothesis	Relationship	Path coefficient (β)	T-Statistics	Conclusion
H1	E-SQ \rightarrow E-SAT	0.657***	11.308	H1 is supported
H2	FQ \rightarrow E-SAT	0.281***	4.870	H2 is supported
H3	E-SAT \rightarrow Usefulness	0.428***	4.940	H3 is supported
H4	E-SAT \rightarrow Ease of use	0.765***	21.470	H4 is supported
H5	Esse of usse \rightarrow Usefulness	0.455***	5.034	H5 is supported
H6	Usefulness \rightarrow Intention	0.462***	3.634	H6 is supported
H7	Ease of use \rightarrow intention	0.286***	2.126	H7 is supported

Note: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

This research shows that the E-SQ of OFDS has a significant positive impact on customer E-SAT (H1: $\beta = 0.657$, t -value = 11.308, $p < 0.5$), and the FQ of OFDS has a substantial positive influence on E-SAT (H2: $\beta = 0.281$, t -value = 4.870, $p < 0.5$). Customer E-SAT has a positive impact on customer perceived usefulness (H3: $\beta = 0.428$, t -value = 4.940, $p < 0.5$) and perceived ease of use (H4: $\beta = 0.765$, t -value = 21.470, $p < 0.5$). Ease of use has a significant positive impact on usefulness (H5: $\beta = 0.455$, t -value = 5.034, $p < 0.5$) and on customer adopt intention (H7: $\beta = 0.286$, t -value = 2.126, $p < 0.5$). The usefulness of OFDS positively affects customers' adoption intention (H6: $\beta = 0.462$, t -value = 3.634, $p < 0.5$). The results support all the proposed hypothesis (H1, H2, H3, H4, H5, H6, H7) (Table 3). The model can explain 77.6% variance in customer E-SAT, 68.8% in customer perceived usefulness, 58.4% in customer perceived ease of use, and 50.2% in customer adoption intention.

V. Conclusion and Discussion

1. Conclusion

In the CS sector, FQ and E-SQ are the same critical factors affecting E-SAT. The findings of this study echoed prior studies (Namkung and Jang, 2007; Ryu and Han, 2010; Ha and Jang, 2010, Suhartanto et al., 2019; Annaraud and Berezina, 2020) to show a positive direct influence of FQ (H1) and E-SQ (H2) toward CS. Yet, the results suggest that E-SQ will impact CS more than FQ, which differs from the other research that shows FQ will impact more (ex. Suhartanto et al., 2019) and the research suggesting the most significant impact of FQ on the CS of a restaurant (ex. Zhong and Moon, 2020). This finding explores a transition in the importance of these two factors of the food industry in the different contexts of OFDS, which needs more attention from future research to confirm the new phenomenon.

Besides the CS sector, the findings also supported the effect of TAM factors on customer intention. In detail, the results support that perceived ease of use has a direct positive impact on customer intention (H7) and an indirect effect on perceived usefulness (H5) (Alalwan et al., 2017; Dwivedi et al., 2017; Roh and Park, 2019), and usefulness has a direct positive impact on customer OFDS adopt intention (H6) (Koo, Chung and Nam, 2015; Talaei-Khoei and Daniel, 2018; Roh and Park, 2019; Troise et al., 2020), thus showing the potential of the integration of the perspectives of CS and system perspective in the different context of OFDS.

The result also shows that E-SAT will positively affect perceived usefulness (H3) and ease of use (H4). This research result echoes the suggestion of Wixom and Todd (2005) and Xu et al. (2013). Yet, the results suggest that E-SAT will impact ease of use more than usefulness E-SAT of customers in the OFDS context can help customers to elevate the perceived usefulness of online food delivery services. E-SAT can reinforce the beliefs of customers that the service can improve their ability to make good decisions, do their job more quickly, and

increase their effects on the job. However, positive E-SAT can more reinforce customers' belief that the service is easy to use and that ordering food online can be finished easier. Those findings support the contribution to integrating the service quality–satisfaction–behavioral intentions approach and TAM model in explaining customer adoption intention toward OFDS services.

2. Implications and limitations

(1) Theoretical implications

This study explored the importance of E-SQ, FQ, and their new weights to the E-SAT of OFDS. The finding confirms a direct effect of E-SQ and FQ on the E-SAT of OFDS, in which E-SQ outweighs FQ in affecting CS. This result differs from the findings of Zhong and Moon (2020), which indicated that FQ would have the highest effect on the CS of a restaurant. The explanation for this difference could be that in a hybrid industry like online food, the industry has both features from the food industry and the online service industry. In this particular research, we observe customer behaviors follow the features of online service rather than traditional restaurants since this result echoes the consistent finding of previous scholars about the strong influence of E-SQ on CS in online settings (Ahmad et al., 2017; Che-Hui, Wen, and Chung-Cheng, 2011). Therefore, this finding added to our knowledge of the importance of E-SQ, FQ, and the change in their weight of effectiveness, especially in the different contexts of OFDS.

This study adopted CS and a system perspective to investigate the influence of E-SAT and web/app elements on Taiwanese intention toward OFDS. This study confirmed the effects of both perspectives on adoption intention and their interaction to enlarge the impact on customer adoption intention of OFDS. The study explains that E-SQ and FQ are keys to E-SAT. Through CS, the satisfaction perspective has supported the effect of the system perspective's elements (usefulness, ease of use) effect on user intention. Thus, the study has successfully integrated the system and satisfaction perspective in the context of OFDS. The study also lays the path for future research by (a) looking into other antecedents of user usage that may be related to the integrated system and satisfaction and (b) exploring the influence of integrated system perspective and satisfaction perspectives on other outcome variables such as user loyalty or recommendation intention.

(2) Managerial Implication

Because of the severe lockdowns and efforts to avoid the hurt of COVID-19, even traditional companies have moved to online operations to adapt to the changes. Many businesses and managers were changing their ways of supplying products and services. This research provides practical answers to the executives of the industries of food delivery and app-based services(e.g., online teaching and health advice).

For managers and OFDS designers, the study has four practical suggestions. First, E-SQ significantly affects OFDS user satisfaction. Following this result, the business should focus on improving its E-SQ. For example, the OFDS website/ app should be well-designed and readable. Managers should strive to ensure that the OFDS website/app is secure and reliable by providing a sufficient personal data use policy. Besides the technical parts, e- customer service should work on interacting with the customer, paying attention to customer problems to provide on-time solutions.

Second, FQ keeps remaining its role in E-SAT in OFDS. That explains the importance of the food, variety in menu items, availability of healthy food options, and availability of fresh food regarding CS as a traditional restaurant. This finding addresses a more challenging task for the multi-restaurant OFDS website/app since they need cooperation from different sides to ensure the food quality.

Third, the perceived usefulness and ease of use of OFDS are crucial in recruiting new customers. Moreover, perceived ease of use also significantly influences the perceived usefulness of OFDS. Thus, managers and app designers are encouraged to create a system for OFDS that is clear, clean, symmetrical, and functional. The system

application process, from installation to track, should be finished easily and fluently to make the system features easier to be accepted. The easier-to-use program is, the more customers it can attract.

In addition, E-SAT also plays an instrumental role in this area as it improves user perception toward OFDS usefulness and ease of use. If the customer is overall satisfied after the use of OFDS services, then they will believe that the online food delivery service is easy to understand and use. As making a customer satisfied has various works to do, according to this research, one of the important options is to increase the E-SQ and FQ of OFDS simultaneously with a little more attention on E-SQ.

(3) Limitations and suggestion

This study contains three limitations. First, this research is a cross-sectional study in a specific COVID-19 pandemic setting, focusing only on the midst of a public health and safety catastrophe. Future research could consider longitudinal or experimental approaches for better understanding consumers' perceptions in other contexts and verify the causality over time to explain why people choose to take OFDS. Secondly, this research is a self-reported study conducted in Taiwan, which may restrict the study's generalizability. By reproducing this study in multiple regions, future studies can account for the restriction. Third, this study utilizes the impact of the CS perspective and system perspective in evoking customer intention. Future research may study the impacts of other factors like discounts and coupons when customers utilize OFDS or other behaviors of OFDS customers to gain more insights into this area.

References

- Ahmad, W., Hussain, S., Sultan, M.U., & JianZhou, Y. (2017). Impact of E-SQ on purchase intention through mediator perceived value in online shopping. *Journal of Information Engineering and Applications*, 7(8), 24–28.
- Alalwan, A.A., Dwivedi, Y.K., & Rana, N.P. (2017). Factors influencing adoption of mobile banking by Jordanian bank customers: Extending UTAUT2 with trust. *International Journal of Information Management*, 37(3), 99–110.
- Alalwan, A. A. (2020). Mobile food ordering apps: An empirical study of the factors affecting customer e-satisfaction and continued intention to reuse. *International Journal of Information Management*, 50, 28–44.
- Annaud, K., & Berezina, K. (2020). Predicting satisfaction and intentions to use online food delivery: What really makes a difference? *Journal of Foodservice Business Research*, 1–19. <https://doi.org/10.1080/15378020.2020.1768039>
- Baker, D.A., & Crompton, J.L. (2000). Quality, satisfaction and behavioral intentions. *Annals of tourism research*, 27(3), 785–804.
- Berezina, K., Cobanoglu, C., Miller, B.L., & Kwansa, F.A. (2012). The impact of information security breach on hotel guest perception of service quality, satisfaction, revisit intentions and word-of-mouth. *International Journal of Contemporary Hospitality Management*, 24(7), 991–1010. <https://doi.org/10.1108/09596111211258883>
- Carpenter, J. (2008). Consumer shopping value, satisfaction and loyalty in discount retailing. *Journal of retailing and consumer services*, 15(5), 358–363.
- Chang, H.H., Wang, Y.H., & Yang, W.Y. (2009). The impact of e-service quality, customer satisfaction, and loyalty on e-marketing: Moderating effect of perceived value. *Total quality management*, 20(4), 423–443.
- Che-Hui, L., Wen, M.J., & Chung-Cheng, W. (2011). Investigating the relationships among E-SQ, perceived

- value, satisfaction, and behavioral intentions in Taiwanese online shopping. *Asia Pacific Management Review*, 16(3), 211–223.
- Cho, M., Bonn, M.A., & Li, J.J. (2019). Differences in perceptions about food delivery apps between single-person and multi-person households. *International Journal of Hospitality Management*, 77, 108–116.
- Clark, M.A., & Wood, R.C. (1998). Consumer loyalty in the restaurant industry - a preliminary exploration of the issues. *International Journal of Contemporary Hospitality Management*, 10(4), 139–144. <https://doi.org/10.1108/09596119810222104>
- Davis, F.D., Bagozzi, R.P., & Warshaw, P.R. (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management Science*, 35(8), 982–1003. <https://doi.org/10.1287/mnsc.35.8.982>
- Dwivedi, Y.K., Rana, N.P., Jeyaraj, A., Clement, M., & Williams, M.D. (2017). Re-examining the unified theory of acceptance and use of technology (UTAUT): Towards a revised theoretical model. *Information Systems Frontiers*, 21(3), 719–734.
- Gefen, D., & Straub, D. (2000). The relative importance of perceived ease of use in IS adoption: A study of e-commerce adoption. *Journal of the association for Information Systems*, 1(8), 1–30. [doi:10.17705/1jais.00008](https://doi.org/10.17705/1jais.00008)
- Ha, J., & Jang, S.S. (2012). Effects of service quality and food quality: The moderating role of atmospherics in an ethnic restaurant segment. *International Journal of Hospitality Management*, 29(3), 520–529.
- Hair, J., Hult, T., Ringle, C., & Sarstedt, M. (2014). *A Primer on partial least squares structural equation modeling (PLS-SEM)*. Sage Publications, Inc.
- Karahanna, E., Agarwal, R., & Angst, C.M. (2006). Reconceptualizing compatibility beliefs in technology acceptance research. *MIS Quarterly*, 781–804.
- Kaur, P., Dhir, A., Ray, A., Bala, P., & Khalil, A. (2020). Innovation resistance theory perspective on the use of food delivery applications. *Journal of Enterprise Information Management*, 34(6), 1746–1768. <https://doi.org/10.1108/JEIM-03-2020-0091>
- Kaya, B., Behraves, E., Abubakar, A.M., Kaya, O.S., & Orús, C. (2019). The moderating role of website familiarity in the relationships between e-service quality, e-satisfaction and e-loyalty. *Journal of Internet Commerce*, 18(4), 369–394.
- Konuk, F.A. (2019). The influence of perceived food quality, price fairness, perceived value and satisfaction on customers' revisit and word-of-mouth intentions towards organic food restaurants. *Journal of Retailing & Consumer Services*, 50, 103–110.
- Koo, C., Chung, N., & Nam, K. (2015). Assessing the impact of intrinsic and extrinsic motivators on smart green IT device use: Reference group perspectives. *International Journal of Information Management*, 35(1), 64–79.
- Kumar, S., & Shah, A. (2021). Revisiting food delivery apps during COVID-19 pandemic? Investigating the role of emotions. *Journal of Retailing and Consumer Services*, 62, 102595.
- Ladhari, R. (2007). The effect of consumption emotions on satisfaction and word-of-mouth communications. *Psychology & Marketing*, 24 (12), 1085–1108.
- Mirai Business. (2020). Illustrated Industry Map: A map to understand the industrial layout of the "food delivery platform" in Taiwan 2020 (in Chinese). <https://www.mirai.com.tw/2020-taiwan-food-delivery-industry-competition-map/>

- Namkung, Y., & Jang, S.C. (2007). Does food quality really matter in restaurants? Its impact on customer satisfaction and behavioral intentions. *Journal of Hospitality & Tourism Research*, *31*, 387–409.
- Pan, S.L., Cui, M., & Qian, J. (2020). Information resource orchestration during the COVID-19 pandemic: A study of community lockdowns in China. *International Journal of Information Management*, 102143.
- Pee, L.G., Jiang, J.J., & Klein, G. (2019). E-store loyalty: Longitudinal comparison of website usefulness and satisfaction. *International Journal of Market Research*, *61*(2), 178–194.
- Pigatto, G. Machado, J.G.d.C.F., Negreti, A.d.S., & Machado, L.M. (2017). Have you chosen your request? Analysis of online food delivery companies in Brazil. *British Food Journal*, *119* (3), 639–657. <https://doi.org/10.1108/BFJ-05-2016-0207>
- Ranjbarian, B., Sanayei, A., Kaboli, M.R., & Hadadian, A. (2012). An analysis of brand image, perceived quality, customer satisfaction and re-purchase intention in Iranian department stores. *International Journal of Business and Management*, *7*(6), 40–48.
- Ray, A., Dhir, A., Bala, P.K., & Kaur, P. (2019). Why do people use food delivery apps (FDA)? A uses and gratification theory perspective. *Journal of Retailing and Consumer Services*, *51*, 221–230. <https://doi.org/10.1016/j.jretconser.2019.05.025>
- Roh, M., & Park, K. (2019). Adoption of O2O food delivery services in South Korea: The moderating role of moral obligation in meal preparation. *International Journal of Information Management*, *47*, 262–273. <https://doi.org/10.1016/j.ijinfomgt.2018.09.017>
- Ryu, K., & Han, H. (2010). Influence of the Quality of Food, Service, and Physical Environment on Customer Satisfaction and Behavioral Intention in Quick-Casual Restaurants: Moderating Role of Perceived Price. . *Journal of Hospitality & Tourism Research*, *34*, 310–329. <https://doi.org/10.1177/1096348009350624>
- Ryu, K., Lee, H., & Gon Kim, W. (2012). The influence of the quality of the physical environment, food, and service on restaurant image, customer perceived value, customer satisfaction, and behavioral intentions. *International Journal of Contemporary Hospitality Management*, *24*(2), 200–223. <https://doi.org/10.1108/09596111211206141>
- Shankar, A., Jebarajakirthy, C., Nayal, P., Maseeh, H.I., Kumar, A., & Sivapalan, A. (2022). Online food delivery: A systematic synthesis of literature and a framework development. *International Journal of Hospitality Management*, *104*, 103240.
- Statistia. (2020). *Platform Delivery - Worldwide*. <https://www.statista.com/outlook/dmo/online-food-delivery/meal-delivery/platform-delivery/worldwide?currency=usd>
- Statistia. (2022). *Platform delivery - Taiwan*. <https://www.statista.com/outlook/dmo/online-food-delivery/meal-delivery/platform-delivery/taiwan?currency=usd>
- Suhartanto, D., Helmi Ali, M., Tan, K.H., Sjahroeddin, F., & Kusdiby, L. (2019). Loyalty toward online food delivery service: the role of e-service quality and food quality. *Journal of Foodservice Business Research*, *22* (1), 81–97. <https://doi.org/10.1080/15378020.2018.1546076>
- Talaei-Khoei, A., & Daniel, J. (2018). How younger elderly realize usefulness of cognitive training video games to maintain their independent living. *International Journal of Information Management*, *42*, 1–12.
- Talwar, S., Dhir, A., Kaur, P., Zafar, N., & Alrasheedy, M. (2019). Why do people share fake news? Associations between the dark side of social media use and fake news sharing behavior. *Journal of Retailing and Consumer Services*, *51*, 72–82.

- Tandon, A., Dhir, A., Kaur, P., Kushwah, S., & Salo, J. (2020). Why do people buy organic food? The moderating role of environmental concerns and trust. *Journal of Retailing and Consumer Services*, 57, 102247.
- The Mobile Economy*. (2020). <https://www.gsma.com/mobileeconomy/>.
- Troise, C., O'Driscoll, A., Tani, M., & Prisco, A. (2021). Online food delivery services and behavioural intention – a test of an integrated TAM and TPB framework. *British Food Journal*, 123 (2), 664–683. <https://doi.org/10.1108/BFJ-05-2020-0418>
- Venkatesh, A., & Edirappuli, S. (2020). Social distancing in covid-19: what are the mental health implications? *BMJ*, 369: m1379. <https://doi.org/10.1136/bmj.m1379>
- Wixom, B.H., & Todd, P.A. (2005). A theoretical integration of user satisfaction and technology acceptance. *Information Systems Research*, 16(1), 85–102.
- Wolfinger, M., & Gilly, M.C. (2003). eTailQ: dimensionalizing, measuring and predicting eTail quality. *Journal of Retailing*, 79(3), 183–198. [https://doi.org/10.1016/s0022-4359\(03\)00034-4](https://doi.org/10.1016/s0022-4359(03)00034-4)
- Xu, J.D., Benbasat, I., & Cenfetelli, R.T. (2013). Integrating service quality with system and information quality: An empirical test in the e-service context. *MISQ*, 37(3), 777–794. <https://doi.org/10.25300/MISQ/2013/37.3.05>
- Yeo, V.C.S., Goh, S.-K., & Rezaei, S. (2017). Consumer experiences, attitude and behavioral intention toward online food delivery (OFD) services. *Journal of Retailing and Consumer Services*, 35, 150–162. <https://doi.org/10.1016/j.jretconser.2016.12.013>
- Yilmaz, G., & Şahin, A. (2021). How does the COVID-19 outbreak affect the food and beverage industry in Turkey? Proposal of a holistic model. *Journal of Foodservice Business Research*, 24(6), 629–664.
- Zeithaml, V.A., Parasuraman, A., & Malhotra, A. (2000). *A conceptual framework for understanding E-SQ: implications for future research and managerial practice (Vol. 115)*. Marketing Science Institute.
- Zhao, Y., & Bacao, F. (2020). What factors determining customer continuingly using food delivery apps during 2019 novel coronavirus pandemic period? *International Journal of Hospitality Management*, 91, 102683. <https://doi.org/10.1016/j.ijhm.2020.102683>
- Zhong, Y., & Moon, H.C. (2020). What drives customer satisfaction, loyalty, and happiness in fast-food restaurants in China? Perceived price, service quality, FQ, physical environment quality, and the moderating role of gender. *Foods*, 9(4), 460.

Appendix 1*Questionnaire design*

Construct	Measurement Items	Related studies
E-Service quality	ESQ1: Overall, the service quality of online food delivery services is good. ESQ2: Overall, the service quality of online food delivery services is excellent ESQ3: Overall, the service quality of online food delivery services is high standard. ESQ4: Overall, the service quality of online food delivery services is superior.	Xu et al., (2013)
Food quality	FQ1: Online food delivery services present food attractively. FQ2: Online food delivery services offer a variety of menu items. FQ3: Online food delivery services offer tasty food. FQ4: Online food delivery services offer healthy food options. FQ5: Online food delivery services offer fresh food.	Young Namkung (2007) Suhartanto et al. (2018)
Customer satisfaction	CS1: Overall, the service provided by the online food delivery services app/website is very satisfying. CS2: I am pleased to use the online food delivery services app/website. CS3: I am very satisfied with the information I receive from the online food delivery services app/website. CS4: My interaction with the online food delivery services app/website is very satisfying.	Xu et al., (2013))
Ease of use	EU1: It is easy to get the app/website of online food delivery services to do what I want it to do. EU2: Overall, I found that the app/website for online food delivery services is easy to use. EU3: Online food delivery services app/website is easy to operate. EU4: Learning to use the app/website for online food delivery services to get food is easy. EU5: My interaction with the app/website of online food delivery services to get food is clear and understandable.	Xu et al., (2013)
Usefulness	USFL1: Using the app/website for online food delivery services increases my ability to get food. USFL2: I found that the app/website for online food delivery services is useful to get food. USFL3: Online food delivery services app/website allows me to get food effectively. USFL4: Using online food delivery services app/website enhances the performance of getting food.	Xu et al., (2013)
Adoption intention	IN1: I anticipate using online food delivery services in the near future. IN2: It is likely that I will use online food delivery services to get food in the near future. IN3: I expect to use online food delivery services in the near future.	Xu et al., (2013)