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CUSTOMERS' ACCEPTANCE INTENTION OF SELF-SERVICE TECHNOLOGY IN CASUAL DINING RESTAURANT: EXPANDING UTAUT WITH PERCEIVED RISK AND PERCEIVED VULNERABILITY

Shela Muktamarisa[1], Adi Zakaria Afiff [2]

[1]*Universitas Indonesia, shela.muktamarisa01@ui.ac.id*

[2]*Universtias Indonesia, adi.zakaria@ui.ac.id*

ABSTRACT

The COVID-19 pandemic has forced restaurants to adopt contactless self-service technology to address customers' level of vulnerability to COVID-19. This study examines important behavioral and user acceptance of self-service technology (SST) variables based on the Unified Theory of Use and Acceptance of Technology (UTAUT) model and enhanced to incorporate perceived risk and moderating effects of perceived vulnerability to COVID-19. The casual dining restaurants were chosen as the context of the study as this industry usually relies more on personal services than on SST, so the impact of environmental change can be seen more clearly. A questionnaire survey was created to gather empirical data about the usage of self-service technology through online data collection, and a quantitative method was adopted for data analysis. A structural analysis was conducted with the Partial Least Squares method to test the hypothetical relationship between the constructs proposed in the conceptual model. The contribution of this study is to analyze the use of technology in casual restaurant service settings in the context of the COVID-19 pandemic to provide an understanding of SST usage and practical implications for service development in the casual restaurants industry.

Keywords: *Self-service technology, UTAUT, Perceived risk, Perceived vulnerability, Casual-dining restaurant*

1. Introduction

The use of technology impacts changing business practices and traditional forms of marketing. One application that substantially impacts traditional business methods and strategies implemented by organizations is the presence of Self-Service Technology (SST), especially in the service industry. In recent years, restaurants have introduced SST, providing a table-top menu in service, contributing to increased customer engagement in the service process (Susskind & Curry, 2016). Previous studies have demonstrated that customers value the use of SST in fast food restaurants more than in luxury restaurants (Nilsson et al. 2021). However, research on consumer behavior towards SST in the context of casual restaurants is still lacking (Brustein, 2013; Garber, 2014)

While customers are beginning to embrace SST and a contactless dining experience, implementing these solutions in restaurants still faces challenges. The previous literature shows that SST in restaurants have both positive and negative impact regarding customer acceptance. Behind the benefits of its functionality to shorten order and payment times, SST is described as not being able to meet various individual customer demands (Chosun Biz, 2018). This emphasizes the need for further studies on customer behavior affiliated with SST acceptance before promoting SST to maximize cost-effectiveness of food service businesses.. For this reason, this research examines the empirical validity of the Unified Theory of Acceptance and Use of Technology (UTAUT) model by adding perceived risk as a variable that negatively affects customers' intentions to use SST.

In the context of the COVID-19 pandemic, this study explains how customers behave in restaurant dining activities. The COVID-19 pandemic has accelerated SST usage as a contactless service. Based on the Protection Motivation Theory, this study reveals how the risk of perceived vulnerability moderates customers' intention to accept SST as an evaluation of whether the service they receive accommodates and fulfills their needs amid the threat of being exposed to COVID-19. Furthermore, this study describes customer acceptance intentions on using SST in a casual dining restaurant.

By digitizing the restaurant industry sector, this paper will expand the field of consumer behavior research in casual dining settings. This attempt was made to analyze the factors influencing customers' intention to adopt SST in casual dining restaurants from COVID-19 context and differentiate this study from previous studies. This study explains the adoption behavior of casual restaurant customers in Indonesia to transition traditional restaurant services to SST. It provides practical information in determining sustainable food service management and marketing strategies.

2. Literature Review

2.1 Self-Service Technology

Self service technology (SST) refers to a technology or system that allows a consumer to perform services on their own without depending on employees, for example at ATM machines, banking services via the internet, e-commerce, and kiosk machines. In restaurants, self-service technology can help customers perform many different parts of the dining experience, from making a reservation, selecting a menu, ordering, to paying for their meal. During the COVID-19 pandemic, many restaurants, including those with a casual concept, have also implemented SST to reduce physical contact and convince customers to dine in at restaurants with health protocol safety standards.

2.2 The Unified Theory of Acceptance and Use of Technology (UTAUT)

The UTAUT model is an integrated model developed by Venkatesh et al. (2003). It has four fundamental constructs: performance expectancy, social influence, effort expectancy, and facilitating conditions that influence behavioral intention to use technology and, ultimately, behavior.By examining each of these constructs occurs in a real setting, researchers and practitioners will be able to determine a person's desire to use a particular system, making it feasible to pinpoint the key factor influencing acceptance in any given context.

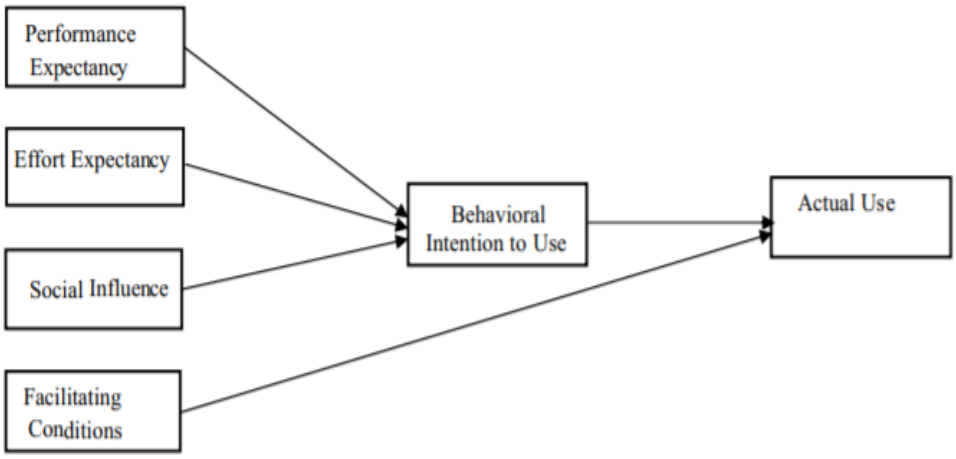

Figure 1. UTAUT Framework
(Source: Venkatesh et al., 2003)

Performance expectancy is similar to perceived usefulness in TAM, referring to how individuals feel that using information systems will help improve their task performance. The following construct is effort expectancy, which describes the degree of comfort and convenience involved with utilizing

information systems and is comparable to perceived ease of use TAM (Venkatesh et al., 2003). A user's perception of their significant other's opinion regarding whether they should adopt a new technology is known as social influence (Venkatesh et al., 2003). People tend to be influenced and persuaded by those close to them and perceive that using new technology is essential (Lee et al., 2019). When people think that there is a technological and organizational infrastructure in place to facilitate the deployment of new technologies, this is referred to as the "facilitating conditions" (Venkatesh et al., 2003). Thus facilitating conditions generally state the extent to which users can be sure that infrastructure is available and can practically support the use of technology, in this case, the use of SST in casual restaurants. Using the four main elements of the UTAUT model, we formulated the following hypotheses based on these past studies:

H1: Performance Expectancy has a positive and significant effect on intentions of using SST in casual restaurants.
H2: Effort expectancy has a positive and significant effect on intentions of using SST in casual restaurants.
H3: Social influence has a positive and significant effect on intentions of using SST in casual restaurants.
H4: Facilitating conditions has a positive and significant effect on intentions of using SST in casual restaurants.

2.3 Perceived Risk

As a construct of research on customer behavior, perceived risk has been identified as a factor that affects decision-making at an early stage. (Zeithaml et al., 2006). Numerous prior studies have examined perceived risk, mainly in the context of digital commerce, where consumers are conscious of the risks. These studies look at how customer reactions to a technology system are affected by perceived risk, especially as it relates to TAM and UTAUT. Perceived risk, according to Featherman and Pavlou (2003), may have a negative impact on a person's decision to use electronic services. This is deliberate due to the intricacy of the technology involved and the accepting of unfavorable feedback when adopting impractical systems. Therefore, we proposed the following hypotheses:

H5: Perceived risk has a negative and significant effect on intentions to use SST in casual restaurants.

2.4 The Moderating Role of Perceived Vulnerability

The intensity of protective behavior might emerge depending on the level of individual perceived vulnerability, which is explained as the perceived likelihood of a threat occurring. When a person believes they are more vulnerable to threats, they are more likely to engage in particular protective actions (Burns et al., 2017). The tendency of using SST as a self-protective reaction can be encouraged by customer protection motives. Customers at restaurants can assess whether the service meets their expectations under the influence of COVID-19, which makes them more secure from threats. Customer evaluation of restaurant offerings and protective behavior toward them are both influenced by their level of perceived vulnerability. SST's concept of a service usage tool enables waitresses to interact with dine-in guests in a way that minimizes physical contact and encourages physical distance through a contactless technology. As a result, the current study attempted to examine how customers' acceptance of SST at casual restaurants is affected by their perceived vulnerability of COVID-19. Therefore, the proposed hypotheses are:

H6: Customers' perceived vulnerability significantly strengthens the positive effect of performance expectancy toward the intention of using SST in casual restaurants.
H7: Customers' perceived vulnerability significantly strengthens the positive effect of effort expectancy toward the intention of using SST in casual restaurants.
H8: Customers' perceived vulnerability significantly strengthens the positive effect of social influence toward the intention of using SST in casual restaurants.
H9: Customers' perceived vulnerability significantly weakens the positive effect of facilitating conditions toward the intention of using SST in casual restaurants.
H10:Customers' perceived vulnerability significantly weakens or neutralizes the negative effect of perceived risk toward the intention of using SST in casual restaurants.

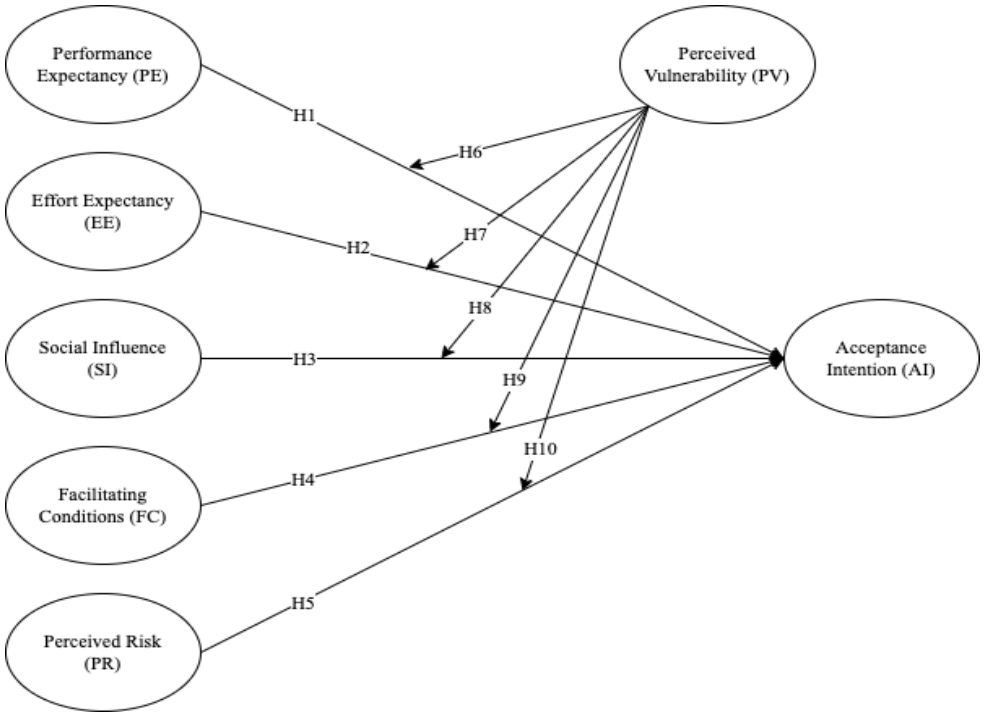

Figure 2. The Theoretical Framework
(Source: Developed by Researchers, 2022)

3. Research Method

3.1 Sampling and Data Collection

This study uses a quantitative research approach. The data was collected using the survey method. Respondents in this study were customers who used SST services at casual restaurants in the last three months, with an age profile above 18 years. Then purposive sampling became a non-probability sampling technique chosen as a technique that adjusts specific parameters determined by the author (Cooper & Schindler, 2014).

3.2 Research Instrument

The model approach in this study is adopted from Jeon et al. (2020), which identifies the main factors that influence users' intentions to adopt SST, using the UTAUT theoretical framework by Venkatesh et al. (2003), which was expanded to include perceived risk as a factor that negatively affects SST acceptance intentions and perceived vulnerability toward COVID-19 (Min et al. 2021).

The survey questionnaire used to test the study's components were created based on earlier studies (e.g., Venkatesh et al., 2003; Jeon et al., 2020; and Min et al., 2021) and adapt to research context. Items measuring performance expectancy, effort expectancy, social influence, facilitating conditions, and acceptance intention were adopted from Venkatesh et al. (2003). To investigate restaurant customers' perceptions of their COVID-19 vulnerability, three items from Zhao et al. (2016) and Zhao et al. (2003) were applied. The items for perceived risk were also adopted from Featherman (2003) and Lee (2009). To measure these variables, the researcher used a Likert scale of one to six (Strongly Disagree, Disagree, Moderately Disagree, Moderately Agree, Agree, Strongly Agree). Variable Operationalization is shown in Table 1.

Table 1. Operationalization of Variables

Variables	Definition	Indicator(s)	Measurement
Performance Expectancy	Refers to how individuals feel that using information systems will help improve their job or task performance (Venkatesh et al. 2012)	1. Perceived Usefulness. 2. Extrinsic Motivation 3. Job Fit 4. Advantage 5. Outcome Expectations	Likert 1-6
Effort Expectancy	Refers to the level of comfort and convenience associated with using information systems (Venkatesh et al. 2012)	1. Perceived Ease of Use 2. Complexity	Likert 1-6
Social Influence	How a user perceives that their significant other encourage them to use a system (Venkatesh et al. 2012)	1. Subjective Norm 2. Social Factor 3. Image	Likert 1-6
Facilitating Condition	How individuals require technical and others infrastructure to reinforce the use of new technologies (Venkatesh et al. 2012)	1. Perceived Behavioral Control 2. Facilitating Conditions 3. Compatibility	Likert 1-6
Perceived Risk	The possibility of loss when pursuing the desired outcome (Featherman and Pavlou, 2003)	1. Time Risk 2. Financial Risk 3. Physiological Risk	Likert 1-6
Acceptance Intention	Is the desire or intention to use the system continuously (Venkatesh et al. 2012)	1. Technology Usage 2. Use of Behavior	Likert 1-6
Perceived Vulnerability	Defined as a perception of the potential for threats, it can shape the intensity of protective behavior (Zhao et al. 2016)	1. Harmful effects of COVID-19 2. A victim of COVID-19 3. Negatively affected by COVID-19	Likert 1-6

Source: Created by the author (2022)

Each question on the questionnaire is examined for validity and reliability as part of the instrument testing process. Then a pretest is conducted on at least 30 people to determine the feasibility of the data collection tool, namely the questionnaire. The SPSS application requires a minimum of 30 respondents for processing this test. Variables and questions are declared valid if based on the KMO parameters, Anti-Image Matrix, and Factor Matrix have a value of 0.5, while to test the reliability, Cronbach Alpha is expected to have a value of 0.5. 0.6 (Malhotra et al., 2003).

3.3 Analytical Methods

The author uses descriptive analysis to present explanations related to respondent profiles, analyses related to behavioral questions, and describe data on each assessment variable carried out by compiling a frequency distribution table. The Partial Least Square (PLS) approach was then used to analyze the data using SmartPLS software, version 3.0. Partial Least Square is a structural equation analysis (SEM) version that can simultaneously assess the measurement and structural models.

The analysis stage in research using PLS is carried out in the following two stages: The first stage is to test the measurement model, which is to test the validity and construct reliability of each indicator using convergent validity and discriminant validity. The next step is to run a structural model analysis using the PLS t-test to see whether there is a correlation or influence between the constructs that are intended to be measured.

The results of the hypothesis test are then obtained from the estimated value of the path coefficient, namely the estimated value of the path relationship in the structural model with the bootstrap procedure. The value is considered significant if the t statistic is greater than 1.96 with a significant degree of 5%. As a result, when the t-statistic is greater than 1.96, the hypothesis is accepted as Ha and rejected as H0. To reject or accept the hypothesis using probability, then Ha is accepted if the p-value < 0.05

4. Results and Discussion

4.1 Respondents Profile

This respondent profile contains demographic data from individuals who were collected from 195 respondents in this study. The following table is a complete description of the profile of respondents in this study.

Table 2. Respondents' Profile

Category	Group Name	Total	%
Gender	Men	98	50%
	Women	97	50%
Age	18-27 years old	87	45%
	28-42 years old	107	55%
	43-57 years old	1	1%
Monthly Income	Rp 1.000.000,- to Rp 2.500.000,-	18	9%
	Rp 2.500.001,- to Rp 4.000.000,-	20	10%
	Rp 4.000.001,- to Rp 10.000.000,-	115	59%
	Rp 10.000.001,- to Rp 20.000.000,-	42	22%
Marital Status	Not married	154	79%
	Married	41	21%

Source: Researcher's Field Result (2022)

4.2 Descriptive Statistics

In this descriptive analysis, the researcher will present a description of the results of the questionnaire scoring that all 195 respondents have filled out. Six values will be used as benchmarks: the number of respondents, the smallest value, the largest value, and the total mean value. This is shown in the table below

Table 3. Descriptive Statistics Result

Variable	Code	Min	Max	Mean	Std. Deviation	N	Result
Performance Expectancy	X1	1	6	4.914	0.798	195	Agree
Effort Expectancy	X2	2	6	4.741	0.829	195	Agree
Social Influence	X3	1	6	4.124	1.287	195	Quite Agree
Facilitating Condition	X4	1	6	4.805	0.823	195	Agree
Perceived Risk	X5	1	6	4.198	1.398	195	Quite Agree
Acceptance Intention	Y	1	6	4.879	0.857	195	Agree
Perceived Vulnerability	Z	1	6	4.501	1.146	195	Agree

Source: Researcher's Field Result (2022)

4.3 Measurement Model

The measurement model's validity and reliability were ensured by convergent validity, composite reliability (CR), and average variance extracted (AVE). The value of the loading factor on the latent variable and its indicators shows convergent validity. When each extracted construct's mean-variance (AVE) is 0.50 or higher, a factor loading value greater than 0.7 is expected. According to Hair et al. (2014), AVE is the large mean value of the squared loading of a set of indicators and is the same as a construct's commonality. Examine the AVE root for each construct, which must be greater than the correlation value with other constructs in the model in order to be considered to have a good discriminant validity value, to assess the discriminant validity between factors that demonstrate convergent validity (Fornell and Larcker 1981).

Table 4 displays the findings of the discriminant validity test.

Table 4. Discriminant Validity

	PE	EE	SI	FC	PR	AI	PV
Performance Expectancy	0.823						
Effort Expectancy	0.447	0.848					
Social Influence	0.028	-0.11	0.926				
Facilitating Condition	0.504	0.417	-0.054	0.877			
Perceived Risk	-0.136	-0.28	0.209	-0.224	0.941		
Acceptance Intention	0.567	0.568	0.095	0.572	-0.373	0.897	
Perceived Vulnerability	0.13	0.085	0.295	0.119	0.06	0.276	0.934

Source: Test Output with SmartPLS, 2022

Based on the table above, all the roots of the AVE (Fornell-Larcker Criterion) for each construct are more significant than their correlations with other variables. The construct reliability test is conducted after the construct validity test, and it is based on two criteria: Composite Reliability (CR) and Cronbach's Alpha (CA), which are both measurements of the CR construct used to demonstrate good reliability. A construction is declared reliable if the value of composite reliability and Cronbach's Alpha > 0.7. The test results can be seen in table 5.

Table 5. Measurement Model Assessment

Variables and Items	Loadings	Cronbach's Alpha	Composite Reliability	Average Variance Extracted
Performance Expectancy (PE)				
PE(1)	0.853	0.92	0.936	0.823
PE(2)	0.751			
PE(3)	0.868			
PE(4)	0.803			
PE(5)	0.873			
PE(6)	0.828			
PE(7)	0.779			
Effort Expectancy (EE)				
EE(1)	0.81	0.87	0.911	0.848
EE(2)	0.849			
EE(3)	0.845			
EE(4)	0.886			
Social Influence (SI)				
SI(1)	0.896	0.946	0.96	0.926
SI(2)	0.949			
SI(3)	0.929			
SI(4)	0.93			
Facilitating Condition (FC)				
FC(1)	0.871	0.9	0.93	0.877
FC(2)	0.89			
FC(3)	0.859			
FC(4)	0.886			
Perceived Risk (PR)				
PR(1)	0.946	0.957	0.969	0.941
PR(2)	0.927			
PR(3)	0.935			
PR(4)	0.956			

Acceptance Intention (AI)				
AI(1)	0.868	0.918	0.942	0.897
AI(2)	0.917			
AI(3)	0.867			
AI(4)	0.932			
Perceived Vulnerability (PV)				
PV(1)	0.909	0.927	0.954	0.934
PV(2)	0.953			
PV(3)	0.94			

Source: Test Output with SmartPLS, 2022

Based on the results presented in the table information above, it is known that all indicator items have a loading factor value above 0.7. In addition, it is shown that the results of the composite reliability test and Cronbach's alpha show a value of > 0.7, which means that the value on each instrument is valid and reliable.

4.4 Structural Model

After evaluating the measurement model and meeting the requirements, the next step is to assess the structural model (inner model), which includes R^2, Q^2, f^2 (shown in Table 5), and then test the path coefficient (Shown in Table 6).

Table 6. Result of R^2, Q^2 and F^2

Constructs	R^2	Q^2	f^2	f^2 Decision
Acceptance Intention	0.699	0.539		
Performance Expectancy			0.072	Small
Effort Expectancy			0.276	Moderate
Social Influence			0.002	Small
Facilitating Condition			0.05	Small
Perceived Risk			0.097	Small

Source: Test Output with SmartPLS, 2022

Table 7 presents the results of the hypothesis testing, which illustrate the cause-and-effect linked between any pair of constructs. H1 is accepted as performance expectancy has a positive and significant effect acceptance intention. H2 is accepted as effort expectancy has positive and significant effect acceptance intention. H3 was rejected because social influence does not have a positive and significant effect on acceptance intention. H4 is accepted because facilitating conditions has a positive and significant effect on acceptance intention. H5 is accepted because perceived risk has a negative and significant effect on acceptance intention.

Table 7. Hypothesis Testing

Hypotheses	β	*t-value*	*p*-value	Decision
(H1) PE - AI	0.188	3.195	0.001	Accepted
(H2) EE - AI	0.389	5.294	0	Accepted
(H3) SI - AI	0.031	0.513	0.608	Rejected
(H4) FC - AI	0.156	2.465	0.014	Accepted
(H5) PR - AI	-0.194	3.228	0.001	Accepted
(H6) PE * PV - AI	-0.077	0.803	0.423	Rejected
(H7) EE * PV - AI	0.166	2.223	0.027	Accepted
(H8) SI * PV - AI	0.035	0.69	0.491	Rejected
(H9) FC * PV - AI	-0.061	0.578	0.563	Rejected
(H10) PR * PV - AI	0.21	2.791	0.005	Accepted

Source: Test Output with SmartPLS, 2022

Moreover, H7 and H10 are accepted because perceived vulnerability strengthens the positive relationship between effort expectancy and SST acceptance, and neutralizes the negative effect of perceived risk towards SST acceptance intention. It is obtained from the net effect of 0.016 based on the sum of the original sample values. It implies that as the user's perceived vulnerability level increases, effort expectancy and perceived risk influence the acceptance intention. H6, H8, and H9 are rejected, since perceived vulnerability does not significantly influence the relationship between constructs on the SST acceptance intention.

5. Conclusion and Implications

In general, this study again proves the results of the previous study conducted by Jeon et al. (2□2□) on the SST acceptance intention in fast-food restaurants and tested it in a different context; casual restaurants using the UTAUT framework model by Venkatesh (2□□3). The nature of a casual restaurant demands a higher level of service than fast-food restaurants, where table service activities are quite needed. This is supported by the study results, which showed that facilitating conditions significantly affected the acceptance intention of using SST. The role of waiters or restaurant staff and easy procedures and methods with supporting infrastructure are essential to consider in implementing SST in casual restaurants.

The findings show that perceived risk negatively affects acceptance intention. So that a high perceived risk will cause a decrease in the level of acceptance intention in SST in casual restaurants. Therefore, casual restaurant managers need to pay attention to the risk factors these customers perceive concerning using SST technology. The customer's perceived vulnerability by cause of their concern over coming into contact with the COVID-19 virus is a variable that can moderate the effect of effort expectancy and perceived risk toward customer acceptance intentions in using SST. The COVID-19 phenomenon has made restaurant customers more vulnerable to the threat of virus contamination, so the role of contactless services such as SST is expected to accommodate customer needs and replace the role of waiter staff.

From a practical perspective, this study provides helpful information about the variables influencing consumers' intention to use SST for developing marketing strategies that aim to encourage an increase in the intention to use SST in casual restaurants. In light of the findings of this study, managers of restaurants must ensure SST's usability in order to provide a contactless system that is quicker and more precise than conventional processes. In casual restaurants, facilitating conditions such as supporting infrastructure, including the presence of service or restaurant staff who assist when problems occur in the system are essential factors. The system must function properly to avoid system failures and reduce the customer's perceived risk of using SST that does not match their expectations. Thus, in the COVID-19 situation, the managerial role of casual restaurants is to ensure that the system infrastructure is made as good as possible to reduce the perceived risk of possible system failures. Restaurants may eventually accelerate the use of SST as a contactless service to reduce physical contact with customers.

For the theoretical implications, the modified UTAUT model framework, which incorporates perceived risk and perceived vulnerability to suit the research setting, is used in this study to assess the key factors influencing users' desire to adopt SST in casual restaurants in Indonesia. In order to better fit the context being examined, this study modifies the earlier research model.. In addition, this study confirms previous research by Jeon et al. (2□2□) related to the use of SST Kiosk in fast-food restaurants in Korea and the research of Min et al. (2□21) related to the role of moderating effect on restaurant customer behavior and then applying it on a casual dine-in restaurant during the pandemic. This study confirmed the use of UTAUT to explain customer acceptance of using SST during the COVID-19 Pandemic.

Apart from the findings and implications, this study has limitations, which can be recommendations for future research. This research was only conducted in Indonesia, especially in restaurants in the Greater Jakarta area, so the generalization may still be limited. Moreover, this research is only limited to restaurants with casual dining types, so the results may differ in other restaurants, such as fast-food and fine-dining restaurants. Other factors not included in the variables can affect the relationship between constructs, which have not been explained by the researchers because of their limitations. Moreover, respondent statistics do not proportionally represent each age group percentage. Therefore, it is possible that the study population is not big enough to portray all casual restaurant customers and SST users.

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