
THEORY CONTINUANCE TECHNOLOGY (TCT): EXPLORING THE EFFECT OF SELF EFFICACY AS ANTECEDENT AND SATISFACTION ON CONTINUANCE INTENTION OF GAS STATION SELF-SERVICE TECHNOLOGY

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ABSTRACT

This research aims to assess the intention to use SST by customers at Jabodetabek gas stations. To investigate the influence of customer self-efficacy on SST continuance intention at gas stations. To determine the effect of satisfaction on SST continuance intention at gas stations. Moreover, to assess customer satisfaction and continuance intention after using SST at gas stations. The method used in this research is quantitative; data analysis techniques are used to conduct statistical tests consisting of convergent validity tests, discriminant validity tests and reliability tests. So, the results of this research show that providing more accurate and precise information in the post-COVID pandemic period, especially in the self-efficacy section. In this study, we expand the Continuance Technology Theory (TCT) by adding self-efficacy as an antecedent. This research has implications for companies that should listen to customer input, increase interaction, and strengthen self-efficacy. This research provides an important basis for implementing kiosks in the gas station industry.

Keywords: self-efficacy, continuance intention, gas station.

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INTRODUCTION

The COVID-19 pandemic that has passed has changed various aspects of daily life, including the way we interact, one of which is the use of technology (Pandey & Pal, 2020). When the pandemic made technological progress faster (Renu, 2021), one of the technologies developed to overcome the problem of social distancing was self-service technology. SST is a vital tool for improving operational efficiency and increasing profits (Chan & Petrikat, 2022). Several current literature reviews show that SST has helped companies increase customer satisfaction (Djajanto et al., nd), (Purba et al., 2022), (Sedighimanesh et al., 2017). The positive benefits provided by SST have made several businesses apply this model, such as banking, e-commerce, restaurant food delivery, and, most recently, services at gas stations (public fuel filling stations). To use SST, a user-centred system is needed. However, several external factors influence user perceptions of a system (Considine & Cormican, 2016).

Many consumers have noticed the application of SST in several industries. However, it is common for them to have doubts and need help understanding how to use SST. This is due to the low average technological literacy possessed by Indonesian citizens; this is evidenced by the intermediate frequency of information-seeking activities for Indonesian citizens, which is smaller than communicating or using social media (Kominfo, 2020). One example of a problem when using SST is its use at gas stations. Based on media publications, Antara News (Arfani, 2022) and

(Marshanda, 2022) state that the SST policy can train customers to be more independent in obtaining gas station services, but the lack of consumer knowledge results in long queues and wasted fuel due to misuse. The media (Bob, 2020) also shows that people still cannot use SST for payments and petrol filling and need help to operate it (Bob, 2020). Some still choose not to use SST gas stations and choose to look for other gas stations Kompas, 2023. Another phenomenon is the uncertainty the public feels when filling fuel because they do not know the limits. They are not aware of the operation of the filling lever so that fuel drips or overflows (None, 2020); both of these things will be dangerous for the public.

SST gas stations have only been adopted in Indonesia, where from the above phenomenon, it is possible that consumers who have tried it do not want to use self-service technology when filling their vehicles with petrol, especially now that it is in the post-pandemic period. Research on the use of SST at gas stations has been carried out using Theory Acceptance Model 3. However, there needs to be research examining the continuity of consumer usage regarding SST adoption. To find out the components that influence the intention to use SST at gas stations, you can use the TCT variable, where this theory is a synthesis of three models (Technology Acceptance Model, Expectation Confirmation Model and Cognitive Model) to detect user behaviour in accepting the sustainability of Information Systems (Liao et al., 2009). The variables used are perceived usefulness, perceived ease of use, confirmation, attitude, and continuity of use. From previous research (J. Lee et al., 2019) using self-efficacy as an antecedent in TAM3, it was found that self-efficacy has a positive relationship with perceived ease of use. However, there is still not much research that combines self-efficacy as an antecedent in TCT. One of the predecessor studies that used self-efficacy as an antecedent in TCT was Daragmeh, 2021 where the research was conducted during the Covid pandemic and in the context of e-wallet; the results of the research showed that self-efficacy had a positive relationship with perceived ease of use of e-wallet. Research (EM et al., 2022) and (Kumar, 2007), which examine self-efficacy, suggest that this SST research can be carried out in business fields other than QSR and banking and can be carried out in other countries besides Singapore and Korea. Previous research (Cheng et al., 2019) using TCT found that attitude, perceived usefulness and satisfaction had a significant effect on continuance intention. The research aims to determine the influence of self-efficacy, perceived usefulness, ease of use, confirmation, and attitude on the continuance intention of self-service technology that already exists at gas stations.

When viewed from a business perspective, Self-Service gas stations promise high profitability due to savings in labour costs. However, if seen from the perspective of customers who are used to being served by officers, there is a risk of causing service failure because consumers want to avoid using the self-service service. Another factor that causes consumers not to want to use Self-Service is the need for Self-Efficacy from customers so that it is difficult or they do not want to use the machine. Finally, with this adoption, satisfaction, attitude, and continuance may have an influence where customers may prefer to look for another gas station that can serve them rather than using the self-service kiosk.

Based on the background above, this research aims to assess the intention to use SST by customers at Jabodetabek gas stations. To investigate the influence of customer self-efficacy on the continuance intention of SST at gas stations. To assess the influence of satisfaction on SST

continuance intention at gas stations. Moreover, to assess customer satisfaction and continuance intention after using SST at gas stations.

METHOD

Indonesian people, especially at gas stations, need help using this self-service technology. Some gas station customers are still unable to operate the petrol filling SST and need help to use the machine. Apart from that, the adoption of SST at gas stations is also faced with the problem of long queues due to some customers who still choose not to use self-service and look for other gas stations that still provide traditional services.

This research uses quantitative methods, namely surveys, to collect data from gas station customers in Indonesia. Questionnaires will be distributed via the Google Forms (form) platform to assess the influence of customer self-efficacy on continuance intention in SST. The survey has questions based on the TCT theoretical framework model and a Likert scale to measure self-efficacy, confirmation of expectations and satisfaction.

In this research, some variables influence (repeat relate to new variables). The data collection technique from the questionnaire is then measured using a Likert scale where the indicators for each variable in the questionnaire have answers in the form of a value scale. This research uses the PLS-SEM (Partial et al. Equation Modeling) data analysis technique, with SmartPLS (v4.0) software as a data analysis tool, which is used to carry out statistical tests consisting of convergent validity tests, discriminant validity tests and reliability to test the validity and reliability of the questionnaire, then to test data analysis using tests such as Coefficient of Determination (R²), Predictive Relevance (Q²), and Hypothesis Testing (Ghozali & Latan, 2015). After carrying out in-depth analysis through several calculations, the final data results obtained will be interpreted by comparing the findings with relevant literature references and in accordance with the research objectives.

RESULTS AND DISCUSSION

Analysis of validity reliability

The analysis was carried out using PLS-SEM version 4 software. The variables for analysis were self-efficacy, perceived usefulness, perceived ease of use, expectation confirmation theory, attitude toward technology, and continuance intention. Invalidity and reliability analysis, they generally used an outer loading greater than 0.5 with an average variance extracted (AVE) greater than 0.5. There are several data, such as SE3 and CIN5, which have values less than 0.5 (0.368, 0.282), so inappropriate data items are cleaned to increase the AVE and Construct Reliability (CR) values. The requirements for Construct Reliability or Cronbach Alpha can be seen in Table 2 below.

Table 2. Cronbach's alpha reliability range (Arof, 2018)

Coefficient of Cronbach's Alpha	Reliability Level
More than 0.9	Excellent
0.8-0.9	Good
0.7-0.79	Acceptable
0.6-0.69	Questionable
0.5-0.59	Poor
Less than 0.59	Unacceptable

Table 3. Outer Loadings, Cronbach Alpha and AVE of the variables studied

Construct	Items	Outer Loading	CR	AVE
Self Efficacy	SE1. I have confidence in using self-service at gas stations	0.634	0.633	0.477
	SE2. I can use self-service technology without learning about it first	0.647		
	SE4. I can fulfil my needs using self-service technology at gas stations independently, without help from people around me	0.798		
	SE5. I can effectively meet my needs by using self-service technology at gas stations	0.671		
Perceived Usefulness	USE1. Gas station self-service technology is very useful in meeting my needs	0.743	0.690	0.520
	USE3. Using gas station self-service technology will increase the effectiveness of filling my vehicle with oil.	0.715		
	USE4. Using gas station self-service technology will make it easier to fill my vehicle with oil.	0.634		
	USE5. I prefer to use self-service gas stations, considering my time and energy.	0.784		
Perceived Ease of Use	EOU4. Learning to use gas station self-service technology is easy	0.808	0.608	0.716
	EOU5. Using gas station self-service technology is very simple	0.883		
	C1. My experience in using gas station self-service technology was better than I expected	0.736		
	C2. The service provided by the gas station's self-service technology was better than I expected	0.676		
Expectation Confirmation Theory	C3. The gas station's self-service technology suits my needs	0.722	0.763	0.514
	C4. This gas station's self-service technology meets my expectations	0.744		
	C5. Gas station self-service technology meets my needs	0.705		
	S1. I am satisfied with the way the gas station's self-service technology works	0.722		
Satisfaction	\$2. I am satisfied with the service provided by self-service technology at gas stations.	0.684	0.750	0.500
	\$5. I am satisfied with the use of self-service technology at gas stations.	0.718		
	S6. I feel happy with the use of self-service technology at gas stations	0.702		
	\$7. My overall experience using self-service technology has been truly enjoyable.	0.709		
Attitude toward technology	ATT1. I am satisfied with my decision to use gas station self-service technology	0.745	0.708	0.533
	ATT2. I am interested in the services provided by gas station self-service technology.	0.707		
	ATT6. I like the idea of using self-service technology for gas filling.	0.743		
	ATTZ. Using gas station self-service technology will be a pleasant experience	0.727		
Continuance	CIN1. I intend to continue using gas station self-service technology rather than discontinuing it.	0.749		

Construct	Items	Outer Loading	CR	AVE
	CIN2. I intend to continue using gas station self-service technology rather than other alternative methods.	0.761		
	CIN3. I would like to continue using gas station self-service technology as much as possible.	0.744		
	CIN4. I will advise my friends to use self-service technology for refuelling vehicles.	0.705	0.725	0.548

(*) reversed statement

Table 3 is a data item that has been cleaned, where the AVE values are close to 0.5, so it is accepted because it has a Cronbach Alpha > 0.7, which shows the data is reliable. For self-efficacy data with an AVE value of less than 0.5, but because it has a Cronbach Alpha > 0.6, even though the data is questionable, it is still acceptable, so the self-efficacy item is not discarded.

Discriminant Validity Fornell Larcker

	Attitude	Confirmation	Continuance Intention	Perceived Ease of Use	Perceived Usefulness	Satisfaction	Self Efficacy
Attitude	0.730						
Confirmation	0.750	0.717					
Continuance Intention	0.730	0.736	0.740				
Perceived Ease of Use	0.505	0.542	0.522	0.846			
Perceived Usefulness	0.658	0.737	0.735	0.452	0.721		
Satisfaction	0.745	0.827	0.722	0.570	0.705	0.707	
Self Efficacy	0.582	0.679	0.660	0.638	0.619	0.642	0.691

Discriminant Validity describes how different a latent variable is from other variables; if the AVE value is higher than the squared correlation value, the validity of the construct is confirmed. All correlations between factors and AVE in this study show higher values than the squared correlation coefficients of other factors, so reliability is confirmed.

Fit Models

Model fit is carried out first before proceeding to the hypothesis theory verification stage. In the model fit item, SRMR (standardized root mean square residual) determines whether the model can be said to be a good fit. Saturated model is a model that measures the correlation between each construct. Meanwhile, the estimated model is a model that is based on the total effect scheme and considers the model structure.

SRMR must be less than 1 to be considered a fit model. The SRMR in the saturated model is 0.068 and is smaller than 1, so it meets the model fit requirements. The estimated model is 0.089, so it is a fit model. Then, the model fit requirement for NFI must be greater than 0.9. Meanwhile, the NFI saturated model is $0.697 < 0.9$ and the NFI estimated model is $0.674 < 0.9$. So, the fit model is based on SRMR, which meets the requirements for a fit model for both the estimated model and the saturated model.

Table 4. Model Fit Results

	Saturated Model	Estimated Model
SUMMER	0.068	0.089
d_ULS	1,853	3,216
d_G	0.677	0.778
Chi-square	1010.061	1089.17
NFI	0.697	0.674

Hypothesis Verification

Hypothesis verification using path analysis in bootstrap in the PLS-SEM 4 application, results can be seen in Table 5 and Figure 2. Standard deviation (STdev) shows the stability and accuracy of the parameters studied. To adopt a hypothesis, it can be seen from the t statistics, where the t statistics must have a value above 1.96 with a p-value of less than 0.05.

Regarding the relationship between attitude and continuance intention, the standard deviation is 0.055, and the mean is 0.32. This shows that there is no data deviation. In research with a significance level of 0.05, the t table is 1.96. The t statistic is 5.893, which is bigger than the t table. The P value is 0, smaller than 0.05, so it is significant. Thus, the hypothesis can be accepted. Attitude has a significant positive relationship with continuance intention.

In the relationship between confirmation and perceived usefulness, the standard deviation is 0.072, and the mean is 0.688. This shows that there is no data deviation. In research with a significance level of 0.05, the t table is 1.96. The t statistic is 9.706, which is bigger than the t table. The P value is 0, smaller than 0.05, so it is significant. Thus, the hypothesis can be accepted. Confirmation has a significant positive relationship with perceived usefulness.

In the relationship between confirmation and satisfaction, the standard deviation is 0.059, and the mean is 0.665. This shows that there is no data deviation. In research with a significance level of 0.05, the t table is 1.96. The t statistic is 11.321, which is bigger than the t table. The P value is 0, smaller than 0.05, so it is significant. Thus, the hypothesis can be accepted. Confirmation has a significant positive relationship with satisfaction.

Then, in the relationship between perceived ease of use and attitude, the standard deviation is 0.045, and the mean is 0.262. This shows that there is no data deviation. In research with a significance level of 0.05, the t table is 1.96. The t statistic is 5.77, which is bigger than the t table. The P value is 0, greater than 0.05, so it is significant. Thus, the hypothesis can be accepted. Perceived ease of use has a significant positive relationship with attitude.

Then, in the relationship between perceived ease of use and perceived usefulness, the standard deviation is 0.068, and the mean is 0.08. This shows that there is no data deviation. In research with a significance level of 0.05, the t table is 1.96. The t statistic is 1.091, which is smaller than the t table. The P value is 0.138, greater than 0.05, so it is insignificant. Thus, the hypothesis cannot be accepted. Perceived ease of use has an insignificant relationship with perceived usefulness.

Then, regarding the relationship between perceived usefulness and attitude, the standard deviation is 0.061, and the mean is 0.537. This shows that there is no data deviation. In research with a significance level of 0.05, the t table is 1.96. The t statistic is 8.891, which is bigger than the t table.

The P value is 0, greater than 0.05, so it is significant. Thus, the hypothesis can be accepted. Perceived usefulness has a significant positive relationship with attitude.

In the relationship between perceived usefulness and continuance intention, the standard deviation is 0.062, and the mean is 0.367. This shows that there is no data deviation. In research with a significance level of 0.05, the t table is 1.96. The t statistic is 5.87, which is bigger than the t table. The P value is 0, smaller than 0.05, so it is significant. Thus, the hypothesis can be accepted. Perceived usefulness has a significant positive relationship with continuance intention.

In the relationship between perceived usefulness and satisfaction, the standard deviation is 0.054, and the mean is 0.212. This shows that there is no data deviation. In research with a significance level of 0.05, the t table is 1.96. The t statistic is 3.871, which is bigger than the t table. The P value is 0, smaller than 0.05, so it is significant. Thus, the hypothesis can be accepted. Perceived usefulness has a significant positive relationship with satisfaction.

Then, regarding the relationship between satisfaction and continuance intention, the standard deviation is 0.063, and the mean is 0.222. This shows that there is no data deviation. In research with a significance level of 0.05, the t table is 1.96. The t statistic is 3.541, which is bigger than the t table. The P value is 0, smaller than 0.05, so it is significant. Thus, the hypothesis can be accepted. Satisfaction has a significant relationship with continuance intention.

Then, regarding the relationship between self-efficacy and perceived ease of use, the standard deviation is 0.047, and the mean is 0.641. This shows that there is no data deviation. In research with a significance level of 0.05, the t table is 1.96. The t statistic is 13.488, which is bigger than the t table. The P value is 0, smaller than 0.05, so it is significant. Thus, the hypothesis can be accepted.

Self-efficacy has a significant relationship with perceived ease of use. This illustrates that if customers who have a positive evaluation of gas station self-service technology view that gas station technology can increase effectiveness in filling oil and feel satisfied after using it, they will form a positive intention to continue using self-service gas stations.

Table 5. Path analysis

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
Attitude -> Continuance Intention	0.323	0.32	0.055	5.893	0
Confirmation -> Perceived Usefulness	0.697	0.688	0.072	9.706	0
Confirmation -> Satisfaction	0.673	0.665	0.059	11.321	0
Perceived Ease of Use -> Attitude	0.262	0.262	0.045	5.77	0
Perceived Ease of Use -> Perceived Usefulness	0.074	0,08	0.068	1.091	0.138
Perceived usefulness -> Attitude	0.54	0.537	0.061	8.891	0
Perceived usefulness -> Continuance Intention	0.366	0.367	0.062	5.87	0
Perceived usefulness -> Satisfaction	0.21	0.212	0.054	3.871	0
Satisfaction -> Continuance Intention	0.223	0.222	0.063	3.541	0

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
Self Efficacy -> Perceived Ease of Use	0.638	0.641	0.047	13.488	0

P value <0.05 Sig , P value > 0.05 not Sig

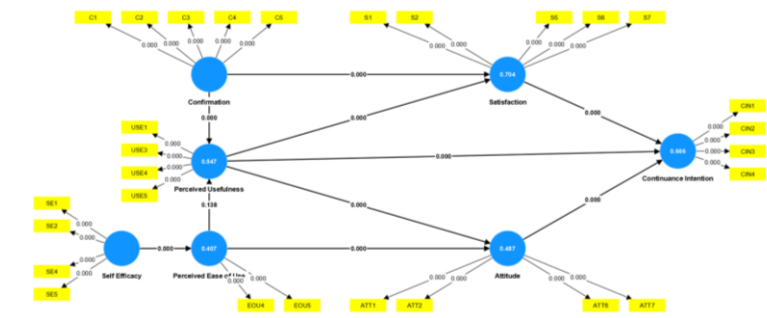


Figure 2. Hypothesis Test Results

P value <0.05 Sig , P value > 0.05 not Sig

CONCLUSION

The conclusions from this research are as follows: 1) Enhancing Customer Trust: The findings indicate that customers exhibit a positive inclination toward using supermarket fuel stations (SPBU swalayan). The implication is the importance of reinforcing and maintaining customer trust by delivering consistent and high-quality services. 2) Appropriate Marketing Strategies: This data can be utilized to steer more effective marketing strategies. Focusing on the strengths and benefits of supermarket fuel stations in marketing campaigns can help alleviate customer concerns and drive increased service usage. 3) Expansion and Service Improvement: Considering the high interest from customers, expanding the network of supermarket fuel stations or enhancing services at existing stations can be a strategic choice. This could enhance the options and comfort for customers using supermarket fuel stations. 4) Customer Referral Program Development: The presence of customers willing to recommend supermarket fuel stations to their friends signifies high satisfaction. Building incentive programs or rewards for customers who recommend the service can strengthen customer loyalty and expand business reach. 5) Innovation and Service Enhancement: This data can also serve as a basis for innovating products or refining services at supermarket fuel stations. Understanding customer preferences and needs can assist in refining the offered services. 6) Boosting Competitiveness: With this research, supermarket fuel stations can use it as a competitive advantage in the industry. This could help enhance the competitiveness of these stations in an increasingly competitive market. 7) Partnership and Collaboration Development: Considering the enthusiasm of customers towards supermarket fuel stations, initiatives to collaborate with other brands or entities to enhance services or create joint promotional packages can be a strategic choice..

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