Analysis of Variables Affecting Customer Satisfaction Using Online Food Purchase Services with Multiple Linear Regression

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Abstract

The surge in popularity of online food delivery services across Southeast Asia is undeniable. Remarkably, in the year 2020, Indonesia emerged as the frontrunner in Gross Merchandise Value (GMV) for such services in the region, amassing an impressive GMV of $3.7 billion, surpassing its regional counterparts. This burgeoning trend is underpinned by a multitude of factors motivating individuals to embrace online food purchases, including time efficiency, an array of enticing and pragmatic offers, and an abundance of choices. Building upon this backdrop, this research endeavors to delve into the intricate web of variables that wield influence over consumer satisfaction within the realm of online food procurement. Employing the multifaceted approach of multiple linear regression, the study aims to uncover the mechanisms that underlie this pivotal relationship. The findings gleaned from this investigation are noteworthy. They highlight the substantial joint impact of the independent variables on the dependent variable. This assertion is substantiated by the remarkably minute significance value of F, which registers at an impressive 0.000, comfortably falling below the conventional threshold of 0.05. This statistical affirmation underscores the collective potency of the five dimensions of service quality, cohesively exerting a significant influence on the variable of customer satisfaction. Moreover, a granular examination of the individual impacts of each independent variable warrants' attention, as gleaned from their respective 't' significance values. It is discernible that the variables of reliability and responsiveness, with significant values exceeding 0.005, exhibit limited individual impact on customer satisfaction. This discernment underscores that, when assessed in isolation, these two independent variables fail to manifest a statistically noteworthy effect on the overarching construct of customer contentment.

I.   INTRODUCTION

Online or online food delivery services are currently very popular[1]. In Southeast Asia itself, food delivery services are very popular. This can be seen from the value of GMV (Gross Merchandise Value) which has increased significantly for online food delivery services[2].
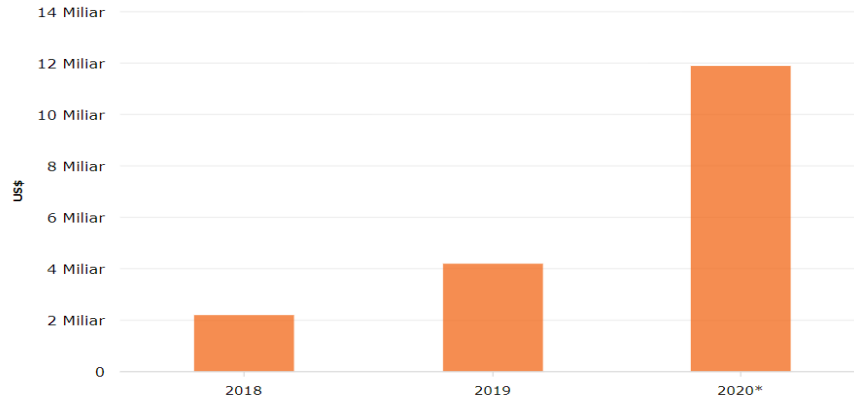

Figure 1. GMV Southeast Asian Food Delivery Service
(Source: Momentum Works, 2021).

The following is the GMV (Gross Merchandise Value) of food delivery in Southeast Asia in Figure 1. Seen in Figure 1. The GMV (Gross Merchandise Value) value in 2018 touched $2.2 billion and experienced a drastic increase to $11.9 billion in 2020. The increasing value of GMV creates good prospects in the future for Southeast Asia's online food delivery services[2].
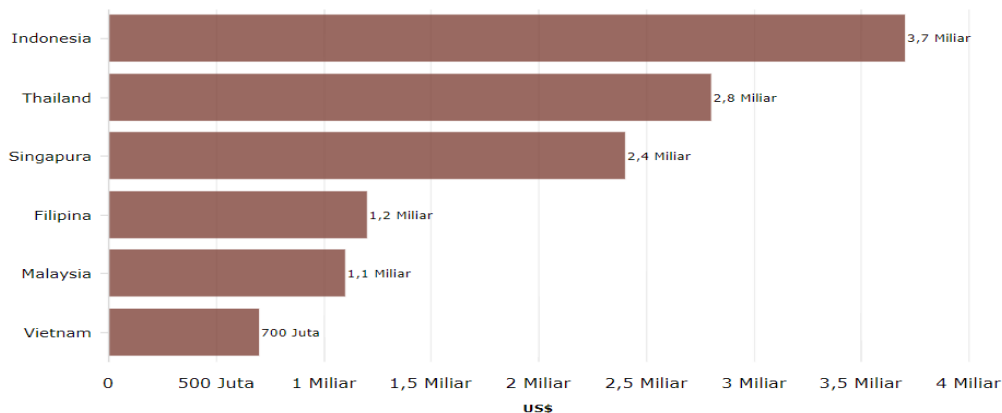

Figure 2. Gross Merchandise Value of Food Delivery Services in Southeast Asia in 2020
(Source: Momentum Works, 2021).

It can be seen in Figure 2 that in Southeast Asia, Indonesia has the largest GMV (Gross Merchandise Value) value for online food delivery services with a GMV value of $3.7 billion, following other countries such as Thailand, Singapore, the Philippines, Malaysia and Vietnam[3].

Online food ordering services are services that are widely used and are the most spent during this pandemic, following delivery service[4]. Consumption patterns that are influenced by socio-cultural factors today make people tend to consume food and drinks that are practical and easy to obtain. This has been going on since 2014, when consumption of processed food has continued to increase by 2.5% annually[5].

There are several reasons why people buy food online, including saving time, there are several attractive and practical offers and many choices[6]. The purpose of this study was to conduct an analysis to determine the variables that influence consumer satisfaction using online food purchasing services using multiple linear regression methods.

II.   RELATED WORKS

The purpose of this study was to conduct an analysis to determine the variables that influence consumer satisfaction using online food purchasing services using multiple linear regression methods.

A.   Definition of Services

Services are activities offered by one person to another. Services are basically intangible (not physically tangible). According to Kotler & Armstrong, services are basically intangible (not physically tangible) and are not marked by ownership of something, but services can be related to physical products which are called Service Production[7].

B.   Food Delivery Service

Food delivery services are services provided by restaurants by ordering by consumers via telephone or internet and then delivered to the home or where the consumer is. According to Henriette Bjerreskov Dinitzen, there are several factors that influence the success and failure of running inter-service[8].

C.   Delivery Time

The time of delivery or delivery from where the consumer orders the product until the product is received by the consumer. Estimated arrival is a reference for consumers to find out whether the services provided are good or not.

D.   Delivery Flexibility

Flexibility in delivery is a matter of influencing delivery services because consumers have product needs when and where, producers are able to provide according to irregular places and times such as morning, afternoon and evening, so the delivery service can be said to be flexible.

E.   Delivery Accuracy

Accuracy of delivery is a condition where a company or manufacturer can guarantee that the products ordered by consumers can be delivered on time and minimize product errors ordered.

F.   Stock Service

Assessment of the condition of a company that has orders received must be in accordance with the stock owned by the company.

G.   After Sales Service

The condition of the company has the ability to retain consumers after the product has been sold. One strategy in retaining consumers is to improve product or service quality and service quality so that consumers become loyal to the company.

H.   Order Management

The company's ability to receive information about incoming orders to companies made by customers or customers.

I.   Marketing and Communications

The company provides information to customers about the products sold so that buyers can understand it. E-Information Providing information through online media. From product info, how to order, product quality, order status and payment. Consumer personal information will be maintained by the company.

J.   Customer Satisfaction

Customer satisfaction is a condition where the emotions that surround expectations do not match the feelings that are formed from shopping and consuming experiences[9]. Satisfaction or dissatisfaction is a

response from product or service users where there is a feeling of pleasure or disappointment with the product or service that has been used. According to Kotler and Keller, the attribute variables used to measure service satisfaction are [10]: Physical evidence (tangibles); includes physical facilities, equipment, employees and communication facilities as well as operational vehicles. Reliability: is the ability to provide the promised service promptly and satisfactorily. Responsiveness: namely the responsiveness of employees in providing the services needed and can complete quickly. Guarantee (assurance): includes knowledge, ability, courtesy and trustworthiness of employees, free from danger, risk and doubt. Empathy: This includes the ease of making relationships, good communication and understanding customer needs.

K. Multiple Regression Linear Analysis

Multiple linear regression analysis is an analytical tool in statistics that is useful for measuring the relationship between more than two variables[11]. Regression analysis is often also referred to as predictive analysis. Because it is a prediction, the predicted value does not always match the real value, the smaller the level of deviation between the predicted value and the real value, the more precise the regression equation will be. The general form of the multiple linear regression equation can be written as follows: [12].

$$y_i = \beta_0 + \beta_1 x_{1i} + \beta_2 x_{2i} + ….. + \beta_k x_{ki} + \varepsilon_i \; ; \; i = 1,2, …, n \varepsilon iN \, (o,\sigma 2 \sim IID) \tag{1}$$

With:

y	: response variable
$\beta_0, \beta_1......\beta$	: regression parameters
$x_1, x_2....x_k$	: independent variables
ε	: error
k	: the number of parameters

L. Regression Parameter Testing

Testing the parameters in the regression model aims to determine whether these parameters have shown a real relationship between the independent variables and the response variables[5]. There are two stages of testing, namely simultaneous (simultaneous) test and partial (individual) test as follows[13]:

M. Simultaneous testing

The simultaneous test aims to test whether there is a linear relationship between the independent variables x and the dependent y.

N. Individual Test

The individual test is used if you want to know whether separately, a variable x still contributes significantly to the bond variable y.

III. METHODS

The methodology employed in this research comprises the subsequent stages:

A. Literature Study and Problem identification

The problem that will be studied in this study is to determine the effect of knowing the variables that influence consumer satisfaction using online food purchasing services using the multiple linear regression method.

While the literature study is intended to determine the quality attributes of food delivery services online and compile a questionnaire based on the service quality attributes based on what has been determined.

B. Distribution of Data Collection Questionnaires

Questionnaire is a data collection technique in which the researcher provides several written questions that need to be answered by the respondent. Questionnaires are usually used to find out the characteristics of each individual. Researchers distributed questionnaires online using the Google form platform and offline

(directly) to people who had used online food delivery applications. The questionnaire distributed to the respondents was a closed questionnaire. Determination of the number of respondents is determined by means of each question attribute that is asked or distributed has a minimum of 5 respondents (Hair, 2010). Therefore, the number of respondents needed in this study is 100 respondents. After knowing the number of respondents needed, 100 respondents distributed questionnaires to everyone who had used food delivery services using online transportation, namely GoFood and GrabFood. The scale used in this questionnaire is using a Likert scale from a weight value of 1 to 5. This scale is used for the categories of expectations, reality and satisfaction. The questionnaire was made based on 5 dimensions of service quality, namely tangible, reliability, responsiveness, assurance and empathy. The questionnaire used in this study was given to all respondents who had used online motorcycle taxi services. The questionnaire consists of 20 question attributes listed in Table 1.

Table 1. Questionnaire Question Attributes

No.	Question Attributes
1.	Attractive Food Delivery Service Features
2.	The Food Delivery Service feature has attractive promos
3.	Food or drinks delivered are sealed in plastic bags or paper bags
4.	Food or drink ordered according to the order
5.	Orders come on time
6.	Orders are delivered according to the user's address or the consumer's drop point
7.	The quality of the food or drink ordered is well maintained
8.	Food and beverages are still fresh when received by consumers
9.	Drivers are fast in responding to consumer desires
10.	Drivers are polite and friendly to consumers
11.	Willingness of the company to accept complaints
12.	The company provides prompt handling of consumer complaints
13.	Drivers protect consumer personal information
14.	Guaranteed cleanliness of food and beverages
15.	Convenience for consumers to cancel orders
16.	Cancellation of orders does not deduct balances/penalties
17.	The company provides an opportunity to provide suggestions
18.	Drivers try to meet consumer needs
19.	Drivers are patient in responding to consumer needs
20.	Drivers greet at the beginning of the service and the end of the service

C.   Model Evaluation and Data Processing

The data that has been collected will be analyzed and processed using multiple linear regression methods to determine the effect of knowing the variables that influence consumer satisfaction using online food purchasing services. The hypotheses in this study are as follows:

H1: There is an influence of tangibles variables on consumer satisfaction.

H2: There is an effect of the reliability variable on consumer satisfaction.

H3: There is an effect of the responsiveness variable on consumer satisfaction.

H4: There is an influence of the assurance variable on customer satisfaction.

H5: There is an influence of empathy on consumer satisfaction.

H6: There is a simultaneous/joint effect of the five service quality variables on customer satisfaction.

D.   Interpretation of Results and Conclusions

Within these stages, a meticulous analysis is undertaken, followed by astute deductions drawn from the conducted research endeavor. The primary objective is to elucidate the intricate network of variables that influence customer satisfaction within the domain of online food procurement services. Leveraging the robust analytical tool of Multiple Linear Regression, a multifaceted tapestry of relationships is meticulously unpicked and comprehensively expounded upon. This interpretation's purview extends beyond mere data elucidation; it is an avenue for informed recommendations. It aims to provide strategic insights that pave the way for the evolution of service offerings. By proffering cogent suggestions, this stages positions itself as a compass guiding further advancements in the realm of service development, thereby propelling the paradigm of online food purchase services towards unprecedented levels of refinement and customer-centric excellence.

IV.   RESULTS AND DISCUSSIONS

After testing the validity and reliability, states that all variable indicators are valid and reliable. In the classic assumption test, there are several tests that must be passed so that the data can be declared feasible to be processed. If the data cannot be tested, one or more solutions can be made to improve the data. These solutions include Ln transformations, adding data, eliminating problematic data and so on. The five dimensions of service quality represent the variable x and customer satisfaction represent the variable y.

A.   Classic Assumption Test

The classic assumption tests are as follows:

a. Multicollinearity Test

Table 2. Multicollinearity Test

		Coefficients[a]						
Model		Unstandardized Coeficients		Standardized Coefficients Beta	t	Sig.	Collinearity Statistics	
		B	Std. Error				Tolerance	VIF
1	(Constant)	0.078	0.038		2.022	0.046		
	Tangiables	0.063	0.021	0.202	3.006	0.003	0.216	4.621
	Reliability	-0.002	0.018	-0.007	-0.115	0.909	0.28	3.569
	Responsiveness	0.022	0.022	0.07	0.983	0.328	0.192	5.203
	Assurance	0.132	0.016	0.42	8.318	<.0.001	0.383	2.614
	Emphaty	0.112	0.018	0.379	6.138	<0.001	0.255	3.92
	a. Dependent Variable: Y_In							

Results From the results of the multicollinearity test in Table 2 above, all independent variables have a Tolerance value above 0.1 and a VIF value below 10. So that the data can be said to have no multicollinearity.

b. Heteroscedasticity Test

Table 3. Heteroscedasticity Test

Coefficients[a]

Model		Unstandardized Coeficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	0.113	0.027		4.148	<.001		
	Tangiables	-0.018	0.015	-0.262	-1.235	0.22	0.216	4.621
	Reliability	-0.001	0.013	-0.009	-0.047	0.962	0.28	3.569
	Responsiveness	0.027	0.016	0.387	1.716	0.089	0.192	5.203
	Assurance	-0.011	0.11	-0.157	-0.986	0.327	0.327	2.614
	Emphaty	-0.014	0.013	-0.205	-1.047	0.298	0.255	3.92
	a. Dependent Variable: AbsRes2							

Results From the results of the heteroscedasticity test in Table 3 above, the significance values of all independent variables are above 0.05. So that the data can be said that there is no heteroscedasticity.

    c.   Autocorrelation Test

Table 4. Autocorrelation Test

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0.953	0.908	0.904	0.8224	1.917
	a. Predictors: (Constant), Emphaty, Reliability, Assurance, Tangiables, Responsiveness				
	b. Dependent Variable: Y_In				

Results From the results of the autocorrelation test in Table 4. above, the following values are obtained:

       d = 1.917 dL = 1.5710 dU = 1.7804

       • dL < d < 4-dL = 1.5710 < d < 2.4290

       • dU < d < 4-dU = 1.7804 < d < 2.2196

From the results of the calculation of the Durbin Watson values above, it can be concluded that the data does not have autocorrelation.
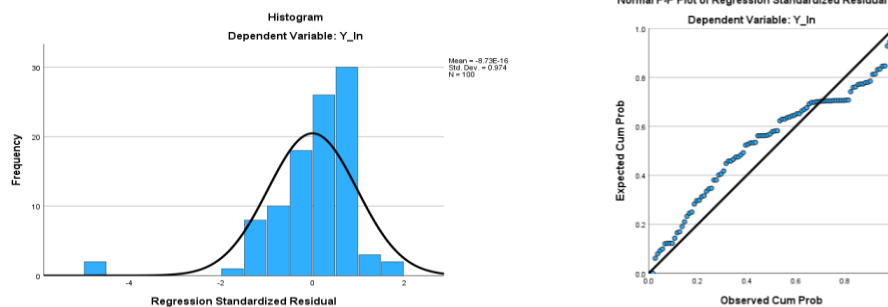
    d.   Normality Test

Figure 3. Normality Test

Results From the results of the normality test in Figure 3 above, it can be concluded that the data is normally distributed because most of the standardized data is close to the average value or standardized data that is normally distributed if depicted with a curve will form a bell-shaped curve which both sides expand to infinity.

B. Multiple Regression Analysis

After all variables fulfill the classical assumption test, multiple regression is performed to see the effect of variable x on variable y. The following is the result of data processing with SPSS to determine the effects of the independent variables on the dependent variable.

a. Correlation

Correlation values can be seen in the SPSS output below:

Table 5. Value of Coefficients

	Model	Unstandardized Coeficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	0.113	0.027		0.085	0.933					
	Tangiables	-0.018	0.015	-0.262	3.702	0.000	0.805	0.357	0.071	0.216	4.621
	Reliability	-0.001	0.013	-0.009	-670	0.504	0.741	-0.069	-0.013	0.280	3.569
	Responsiveness	0.027	0.016	0.387	1947	0.055	0.855	0.197	0.037	0.192	5.203
	Assurance	-0.011	0.11	-0.157	13.561	0.000	0.879	0.813	0.259	0.383	2.614
	Emphaty	-0.014	0.013	-0.205	12.056	0.000	0.920	0.779	0.231	0.255	3.920

a. Dependent Variable: Satisfaction

The correlation value of each independent variable to the dependent variable can be seen in the correlation's column in Table 5. The correlation value of X_1 to Y is 0.805, meaning a positive and strong correlation. The correlation value of X_2 to Y is 0.741, meaning that the correlation is positive and strong. The correlation value of X_3 to Y is 0.855, meaning that the correlation is positive and strong. The correlation value of X_4 to Y is 0.879, meaning that the correlation is positive and strong. The correlation value of X_5 to Y is 0.920, meaning that the correlation is positive and strong. Because the correlation values of all variables are positive and have values above 0.7, all independent variables have a strong relationship with the dependent variable.

b. The Contribution of the Independent Variables

The magnitude of the influence can be seen in the SPSS output below:

Table 6. Research Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	0.983	0.966	0.964	0.15062	0.966	528.118	5	94	0.000

a. Predictors: (Constant), Emphaty, Reliability, Assurance, Tangiables, Responsiveness

It can be seen in Table 6. that the influence of the independent variable on the dependent variable is 0.983. This means that the contribution of the independent variables in the research to the dependent variable is 98.3% and the remaining 1.7% is influenced by other variables outside the research. From these results it can be concluded that the influence of independent variables on customer satisfaction is very large, so that the five dimensions of service must be consideDred to improve the quality of customer service.

c. Simultaneous and Individual Influence
Simultaneous and individual influences can be seen in the SPSS output below:

Table 7. ANOVA

Coefficients [a]									
Model	Unstandardized Coeficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
	B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1 (Constant)	0.006	0.070		0.085	0.933					
Tangiables	0.141	0.038	0.152	3.702	0.000	0.805	0.357	0.071	0.216	4.621
Reliability	-0.023	0.034	-0.024	-670	0.504	0.741	-0.069	-0.013	0.280	3.569
Responsiveness	0.079	0.041	0.085	1947	0.055	0.855	0.197	0.037	0.192	5.203
Assurance	0.393	0.029	0.419	13.561	0.000	0.879	0.813	0.259	0.383	2.614
Emphaty	0.401	0.033	0.456	12.056	0.000	0.920	0.779	0.231	0.255	3.920
a. Dependent Variable: Satisfaction										

It can be seen in Table 7. that the significance value of F is 0.000 which is less than 0.05. This means that simultaneously or together the five dimensions of service quality have a significant effect on the variable of customer satisfaction.

Table 8. Table of Significance of Individual Test

Coefficients [a]					
Model	Unstandardized Coeficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	0.006	0.070		0.085	0.933
Tangiables	0.141	0.038	0.152	3.702	0.000
Reliability	-0.023	0.034	-0.024	-0.670	0.504
Responsiveness	0.079	0.041	0.085	1.947	0.055
Assurance	0.393	0.029	0.419	13.561	0.000
Emphaty	0.401	0.033	0.456	12.056	0.000
a. Dependent Variable: Satisfaction					

It can be seen in Table 8 that the significance value of t for the tangibles, assurance and empathy variables is 0.000 which is smaller than 0.05, this means that individually the three independent variables have a significant effect on customer satisfaction. Whereas the reliability and responsiveness variables have a significance value above 0.005, this means that individually the two independent variables have no significant effect on customer satisfaction.

C. *Analysis of Proof of Hypothesis*

From the significance value of t, the tangibles, assurance and empathy variables have a significant effect on customer satisfaction. Meanwhile, the reliability and responsiveness variables have no significant effect on customer satisfaction. While the significance value of F is 0.000, it means that simultaneously or together the five dimensions of service quality have a significant effect on the variable of customer satisfaction. Based on the explanation above, it can be concluded that H1, H4, H5, and H6 are accepted while H2 and H3 are rejected.

V.   CONCLUSIONS AND RECOMMENDATIONS

All independent variables exhibit a strong correlation with the dependent variable, as indicated by correlation values exceeding 0.7 ($r > 0.7$). This signifies a robust and significant relationship between the independent variables and the dependent variable. The collective impact of the independent variables on the dependent variable is quantified at 0.983. This implies that the cumulative contribution of the independent variables to the dependent variable amounts to 98.3%, leaving a residual 1.7% influenced by external factors not considered in this research. This outcome underscores the substantial influence of independent variables on customer satisfaction. Hence, the imperative of addressing all five dimensions of service to enhance customer service quality is evident. The combined effect of the independent variables on the dependent variable attains significance, evident from the remarkably low significance value of F, which stands at 0.000—a value below the conventional threshold of 0.05. This confirms that, in concert, the five dimensions of service quality exert a substantial impact on customer satisfaction. The individual effects of each independent variable are discernible through the 't' significance values. For the variables of tangibles, assurance, and empathy, these values register at 0.000, indicative of significance below the 0.05 threshold. Consequently, it can be inferred that these three independent variables wield a meaningful impact on customer satisfaction. In contrast, the reliability and responsiveness variables present significant values exceeding 0.005, suggesting an absence of statistically significant influence on customer satisfaction when considered individually.

Considering the results garnered from the analysis and ensuing discussion, the following recommendations in this research that online food delivery services are advised to pay keen attention to the attributes that significantly influence service quality, as this serves as a pathway to achieving heightened consumer satisfaction and for future research endeavors, careful consideration should be given to the selection of attributes and methodologies, ensuring they align effectively with the subject of investigation.

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