

Stimulus-Organism-Response Model: Antecedent and Consequent Customer Engagement

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ABSTRACT

This study investigates the impact of customer engagement on the characteristics of Online Brand Community (information quality and system quality) on brand loyalty. The respondents of this study were the general public in the Solo Raya area who had interacted with the Smartfren Community. 196 respondents met the research criteria. Data processing was conducted by employing the PLS-SEM analysis tool to test the model developed using the application of the stimulus-organism-response model. Each Online Brand Community (OBC) characteristic shows a significant positive effect on customer engagement. Customer engagement has a significant positive effect on brand loyalty. Customer engagement effectively mediates the relationship between information quality and system quality on brand loyalty. The hypothesized model of the stimulus-organism-response framework was validated among a sample of emerging markets, with a focus on customer engagement on OBC characteristics of brand loyalty.

Keywords: *Information Quality, System Quality, Customer Engagement, Brand Loyalty, Online Brand Community, SOR Model*

1. INTRODUCTION

Over the last decade, the internet has grown rapidly. According to the Secretary-General of APJII and survey data from Statistics Indonesia (BPS), there were 196.7 million internet users in 2019 [1]. This is in response to [2], proving that Indonesia is a potential target market.

The provider company is a service company in the telecommunications sector. The appealing services offered by the company are worth the number of complaints of disappointment and dissatisfaction with the provider network. Complaints, criticisms, and suggestions will have an impact on the company, both positively and negatively. This will affect the survival of the company in the future. The solution to these problems is to form a community. This community will strengthen not only products and brands but also interpersonal relationships, both among members and with the company. Companies are attempting to increase the existence of the Online Brand Community (OBC), ranging from start-up companies to companies that have been in business for a long time.

Customer loyalty is critical to the brand. Brand loyalty has the potential to instill brand ethics in consumer psychology [3]. Customers who are brand

loyal will remain loyal to a particular brand even though there are service changes and complaints from other customers. It does not reduce their loyalty and continue to support the brand. The activities in OBC will increase customers' interest and encourage them to engage with the brand. Loyalty does not appear in an instant process [4]. Customer loyalty can be developed by establishing a relationship between customers and products through consumer interaction and participation. This interaction can be referred to as customer engagement [5]. During the product engagement process, customers will intentionally develop knowledge and interact with brands or other customers to obtain information about the brand [6].

Previous studies have discussed OBC characteristics and their impact on customer engagement (for example [7] and [8]). Furthermore, research by [9] and [10] showed that there are commitment, satisfaction, and brand trust as a result of OBC characteristics. There are still limited studies that discuss the characteristics of OBC with customer engagement [11].

The difference between this study and previous research lies in the presence of OBC as the object of research. Researchers chose the Smartfren Community as the object of this present research. Smartfren

Community social media platforms such as Twitter, Facebook, and Instagram have evolved into a medium for customers to express satisfaction, complaints, and disappointments. According to [12] and [13], the OBC can be used to build customer engagement. Customers are engaged, empowered, and connected through the communities.

In this study, the researcher adopted information quality and system quality as OBC characteristics. As with the research conducted by [14], [15], and [16].

Empirically, this study also replicates research by [17] by applying the Stimulus-Organism-Response (SOR) paradigm, wherein this study model will explain the relationship between the stimulus, namely the quality of information and the quality of the system. User responses in the form of actions, namely the user becoming loyal to the brand. The SOR model can illustrate that communication is an action-reaction process [18]. The SOR model supports the background of this research and will facilitate the development of a marketing strategy on brand loyalty. This study aims to analyze customer engagement as a mediating variable on the effect of information quality and system quality on brand loyalty.

2. THEORETICAL BACKGROUND AND HYPOTHESES

2.1. Stimulus - Organism - Response Model

The Stimulus-Organism-Response Model is a model used to explain how the physical environment influences an individual's internal state and behavior [19]. This study used the basic theory of SOR proposed by [20], which was later modified by [21] and then implemented in the research by [17].

Stimuli can be perceived by the human senses, and the stimulus can also be described as an influence on the individual's internal state. This study also used the characteristics (information quality and system quality) of OBC as a form of stimulation.

Organisms are represented by cognitive and affective aspects which are implemented by intermediary processes that mediated the relationship between individual stimuli and responses. Cognitive and affective aspects are the key dimensions of customer engagement. Therefore, this study concludes that the engagement of the customer (state of the organism) with the brand community is influenced by the environmental

cues (characteristics of the brand community) on intermediary customers, cognitive and affective states.

The last SOR framework is the responses. The response is the result of the consumer behavior approach [22]. In this study, the form of response investigated is loyalty from customer engagement in OBC. The expected response is customers' loyalty to the brand. This means that customers will remain loyal to the brand regardless of the circumstances and conditions.

2.2. Influence of Information Quality on Customer Engagement

According to [23], the quality of information is the expectations of customers for information that can meet the needs of completing tasks or customer activities. While the quality of information is the perception that stems from the quality of information on the website [24].

Poor information quality will have an impact on customer processing and raise search costs [25]. Information on OBC provides an opportunity for its customers to get the best experience that will impact the brand and long-term relationship as well as customer loyalty to the brand.

Customers in the digital sphere will assess the quality of information based on the suitability of their expectations for the information provided [23]. [17] shows that the quality of information will affect community commitment [10]. Quality information on OBC will provide users with an extraordinary experience, which will have a positive influence on the brand and long-term relationships [12]. Therefore, providing high-quality information to customers is critical because it increases customer loyalty to the brand and will affect customer decisions and consistency [26]. According to [23], indicators of information quality are relevant information, data richness, access to information, interaction, and adaptability.

The results of research by [17] and [16] showed that the quality of information mentioned as an OBC characteristic has a positive effect on customer engagement. Therefore, the high quality of the information provided by the OBC (Smartfren Community) will encourage customer engagement. So in this study, the following hypothesis was formulated:

H1: Information quality in Smartfren Community has a positive impact on customer engagement.

2.3. Influence of System Quality on Customer Engagement

System quality is an exploration activity that is carried out quickly and conveniently on the information obtained by customers [10]. Internet technology has an important role in website transactions [27]. System quality refers to the fast and convenient retrieval of information [10]. Indicators of system quality according to [9] include ease of use, navigation, user-friendliness, and system friendliness.

According to [28], if users believe that the quality of a given system is high, they will become involved in the system, recognize the brand, and spread the good news through word of mouth. This is supported by the results of research conducted by [17] that the quality of the system, which is mentioned as an OBC characteristic, has a positive effect on customer engagement. Therefore, this study suspects that there is a relationship between system quality and customer engagement:

H2: System quality in Smartfren Community has a positive impact on customer engagement.

2.4. Influence of Customer Engagement on Brand Loyalty

According to [29], customer engagement is defined as a customer action that shows an interaction with a brand, community, or organizational activity that leads to good or bad outcomes depending on the nature of the customer interaction.

When a customer is in the process of being involved in the product, he or she will intentionally develop knowledge and interact with the brand or other customers to learn more about the brand [6]. All activities in the brand community are a form of customer engagement. This is in line with the opinion of [12] and [13] that customer engagement can be built with OBC. According to [30], customer engagement includes both cognitive processes and affection, and activation. This study adopts the concept of customer engagement proposed by [31], that is:

"A consumer's positively valenced brand-related cognitive, emotional and behavioral activity during or related to focal consumer/brand interactions"

A brand is a name, symbol, or identity of a product that is used to distinguish one product from other products [32]. Brands can reflect customer perceptions and habits [33]. There is a term in the brand called

brand equity, which can be defined as a set of assets and liabilities associated with the brand. The assets and liabilities are divided into five categories. Those are brand loyalty, brand awareness, prevailed quality, brand associations, and other brand assets. This study will focus more on customer loyalty to the brand.

According to [34], brand loyalty is the exposure of consumer attitudes and behavior preferences to a brand. Brand loyalty can be explained by an attitude approach (attitudinal loyalty) and a behavioral approach (behavior loyalty) [34]. Indicators of brand loyalty are positive feedback, the recommendation to others or friends, and repeat purchases [35].

Previous studies have shown that customer engagement has a positive effect on brand loyalty, and the results of this study are supported by [25] and [17]. Research by [36] states that customer engagement does not affect brand loyalty. This means that the absence of customer engagement does not affect brand loyalty. Thus the formulated hypothesis is:

H3: Customer engagement in Smartfren Community has a positive impact on brand loyalty.

2.5. Customer Engagement as Mediating Variable

Previous research has shown that information quality and service quality has a positive effect on customer satisfaction, but system quality does not have a positive effect on customer satisfaction, meanwhile, customer satisfaction has a positive effect on customer loyalty [37]. Research by [17] found that OBC characteristics (information quality, system quality, virtual interactive, and rewards) have a positive influence on customer engagement, and customer engagement has a positive influence on brand loyalty. These findings support the idea that information quality and system quality, such as OBC characteristics in this study, can be mediated by customer engagement, which leads to the following two hypotheses:

H4: The effect of information quality on brand loyalty is mediated by customer engagement.

H5: The effect of system quality on brand loyalty is mediated by customer engagement.

3. RESEARCH METHODOLOGY

3.1. Sample

This study used a non-probability sampling technique. The criteria of the respondents include; (1) the general public in the Solo Raya area, (2) individuals who conduct repeat purchases of the Smartfren cards, and (3) individuals who have interacted three times with Smartfren through digital platforms such as Facebook, Twitter, Instagram, and websites of Smartfren Community. The sample size in this study was determined using the multivariate analysis proposed by [38].

3.2. Measure

This research was divided into two parts of questions. The first part asked respondents about demographic information, frequency of repeat purchases of Smartfren cards, and interactive experiences with the Smartfren Community. In the second part, respondents answered questions related to the four research indicators. Questionnaires were distributed through social media (Facebook, Twitter, and Instagram) and chat applications (Whatsapp Group and WhatsApp

Table 1 Data Distribution

		Frequency	Percent
Gender	Male	66	28,8
	Female	163	71,2
Age	< 17	4	1,7
	18 - 25	196	85,6
	25 - 35	22	9,6
	35 - 45	5	2,2
	45 or above	4	1,7
Occupation	Student	175	76,4
	Entrepreneur	22	9,6
	Civil Servant	7	3,1
	Other	25	10,9
Income Level	< 2 million	173	75,5
	2 - 5 million	35	15,3
	5 - 10 million	9	3,9
	10 - 15 million	9	3,9
	> 15 million	3	1,4
Address	Boyolali	128	55,9
	Surakarta	33	14,4
	Wonogiri	4	1,7
	Sukoharjo	23	10
	Klaten	11	4,8
	Karanganyar	20	8,7
	Sragen	10	4,5

Source: processed by researchers

Status). Respondents completed the online questionnaire using Google Forms. The questionnaire was in the form

of a Likert Scale, with 1 indicating "strongly disagree" and 5 indicating "strongly agree".

4. ANALYSIS AND RESULTS

4.1. Descriptive Analysis

The questionnaires were distributed to 229 respondents, and 196 respondents met the inclusion criteria, as shown in table 1.

4.2. Analysis

This study used the SEM-PLS analysis tool, along with the SmartPLS software version 3.3.3. The evaluation of the PLS model was carried out by evaluating the measurement model (outer model), and structural model (inner model).4.2.1. Measurement Model

This study used a validity and reliability testing measurement model. Convergent validity is measured based on the standardized loading factor, which measures the construct with an outer loading value > 0.7 [39]. Meanwhile, discriminant validity with AVE

Table 2 Validity and Reliability of the Constructs.

Variable	Items	Factor Loading	CA	AVE	CR
SQ	1	0.764	0.839	0.609	0.886
	2	0.800			
	3	0.744			
	4	0.764			
	5	0.821			
IQ	1	0.773	0.822	0.652	0.882
	2	0.826			
	3	0.791			
	4	0.839			
CE	1	0.797	0.852	0.693	0.900
	2	0.847			
	3	0.811			
	4	0.873			
BL	1	0.907	0.899	0.768	0.930
	2	0.870			
	3	0.895			
	4	0.832			

Source: Smart PLS Output, processed by researchers

Notes: SQ: System Quality
IQ: Information Quality
CE: Customer Engagement
BL: Brand Loyalty

criteria > 0.5 [40]. Table 2 shows the results of the validity test with the measurement of convergent validity, demonstrating that all the variables used in this study have a value loading factor > 0.7, then it can be concluded that each variable fulfills the question to be

Table 3 The Multicollinearity Testing

Variable	CE	IQ	SQ	BL
CE				1.000
IQ	2.432			
SQ	2.432			
BL				

Source: Smart PLS Output, processed by researchers

studied. The measurement of discriminant validity in this test is that the AVE value of the variable SQ = 0.609, IQ = 0.652, CE = 0.693, BL = 0.768, each variable used is greater than 0.5, so it fulfills the standard requirements for the validity test.

Reliability test is measured based on Cronbach's Alpha for each variable > 0.7, Composite Reliability is considered reliable if it has a value of 0.60 - 0.90 [38]. Table 4 shows the results of each variable SQ α = 0.839, IQ α = 0.822, CE α = 0.852, BL α = 0.899. While the value of CR Variable SQ = 0.886, IQ = 0.882, CE = 0.900, BL = 0.930. So that each variable can be declared reliable.

The multicollinearity test uses a VIF value of < 5 criteria, and it does not violate the multicollinearity test [39]. Table 3 shows that the variable quality of customer engagement information is 2,432, system quality on customer engagement is 2,432, and customer engagement on brand loyalty is 1,000. From these results, it is assumed that there are no symptoms.

4.2.2. Structural Model

The inner model is a structural model that predicts causality between latent variables. This test was performed using the Goodness of Fit Test and Hypothesis Testing.

Table 4 R Square

Variable	R Square
Customer Engagement	0.646
Brand Loyalty	0.587

Source: output Smart PLS, processed by researchers

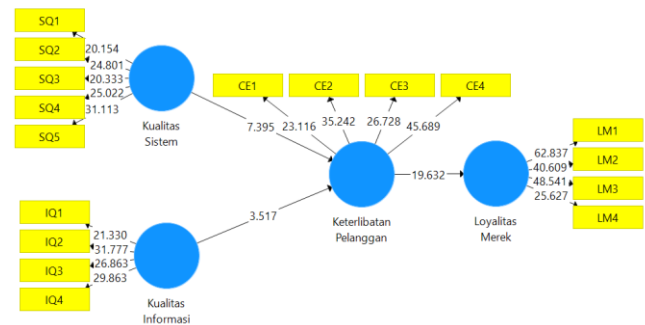


Figure 1 Theoretical Framework

*Path significant at $p < 0.05$ level

Figure 2 Structural PLS Model

4.2.2.1. Goodness of Fit Test

Structural models or inner models in PLS are measured using the Goodness of Fit Test through the Coefficient Determinant (R^2) and Stone-Geisser (Q^2)

Table 5 Hypotheses Testing Result of Direct Effect

Variable	Direct effect	t-statistic	P value	Test result
H1 SQ \rightarrow CE	0.558	7.395	0.000	Supported
H2 IQ \rightarrow CE	0.292	3.517	0.000	Supported
H3 CE \rightarrow BL	0.766	19.632	0.000	Supported

Source: output Smart PLS, processed by researchers

tests. An R^2 value of 0.75 indicates a strong model, an R^2 value of 0.5 indicates a moderate model, and an R^2 value of 0.35 indicates a weak model [38]. The higher the R^2 value, the better the prediction model of the proposed research model. While in the Q^2 test, the closer to 1 the value of Q^2 , the better the model to be getting fits with the data. Q^2 can be calculated using the formula $Q^2 = 1 - [(1 - R^2_{CE}) \times (1 - R^2_{LM})]$. Normal Fit Index (NFI) is a tool to measure the relative fit value to the baseline model which assumes there is no covariance between the observed variables. A model is said to be accepted if the model has an NFI value > 0.1. Meanwhile, it is said to be fit if it is close to the value of 1 or 0.9.

Table 4 shows that the value of R Square on customer engagement is 0.642 or customer engagement has an influence on information quality and system quality by 64.6%, and brand loyalty is 0.587, which means brand loyalty influences customer engagement by 58.7%. Meanwhile, in the Q^2 assessment, the value is 0.853, and the NFI value = 0.853. Thus, from these

results, it is concluded that this research has good goodness of fit.

4.2.2.2. Hypothesis Testing

Hypothesis testing in this study was carried out by looking at t-statistics and s using bootstrapping analysis techniques. The hypothesis is accepted if P-Value < 0.05 or t statistics > t table (at a significance level of 5%) [41].

1. Direct Effect

According to Table 5, the biggest influence of customer engagement on brand loyalty is 0.766, the effect of system quality on customer engagement is 0.558, and the influence of information quality on customer engagement is 0.292. All variables have positive path coefficient values. As a result, the greater the value of the path coefficient, the stronger the influence of the independent variable and the dependent variable, with the greatest influence coming from customer engagement on brand loyalty.

Significance value is seen from P value < 0.05 and t statistics > t table, where t table = 1.972 (two tail test). Table 7 displays the results of the system quality (t statistic value 7395 > 1.972, P value = 0.000 < 0.05). Information quality (t statistic value = 3517 > 1.972 and P value = 0.000 < 0.05) shows a significant positive effect on customer engagement. Customer engagement (t statistic = 19.632 > 1.972 and P value = 0.000 < 0.05) has a significant positive effect on brand loyalty. Therefore, H1, H2, and H3 are accepted.

2. Indirect Effect

Table 6 above shows the results of the t statistic is 3.414 and P-value is 0.001, with a coefficient of 0.427 on the effect of system quality on brand loyalty mediated by customer engagement. The value of t-statistic = 3.414 > t-table 1.972, P-value 0.001 < 0.05 and positive coefficient 0.427. This shows that H4 is and accepted, customer engagement as a mediating variable has a positive and significant effect. While H5, namely the influence of information quality on brand loyalty mediated by customer engagement, shows the results of t-statistic = 6.957 > t table 1.972, P-value = 0.000 < 0.05, and a positive coefficient of 0.223 which means that H5 is accepted and has a positive and significant effect.

4.3. Discussion

Sophisticated technology makes communication

Table 6 Hypotheses Testing Result of Indirect Effect

Variable	Indirect effect	t statistic	P-value	Test Result
H4 SQ → CE → BL	0.427	3.414	0.001	Supported
H5 IQ → CE → BL	0.223	6.947	0.000	Supported

Source: Smart PLS Output, processed by researchers

easier. Customers use social media platforms to communicate with the company openly. Customer communication in discussing a brand is a form of customer engagement with the brand. This engagement will encourage potential customers to become loyal to the brand. Therefore, the company began to design and develop a brand community on social media to strengthen the brand and keep customers connected with the company. This community is known as the online brand community (OBC). OBC can be found on various social media platforms, including Instagram, Twitter, Facebook, and so on. OBC's social media will be a medium for customers to interact with each other. This is consistent with the views of [12] and [13] that OBC can be used to build customer engagement. This study measures the impact of OBC characteristics on loyalty mediated by customer interaction, similar to previous studies by [7], [17], [42], and [16].

1. The Influence of Information Quality on Customer Engagement

The results of the study indicate that the quality of information presented on Smartfren Community social media has a significant positive effect on customer engagement, which is supported by the findings of [16], [6], and [25]. It means the increase in relevant, interactive, complete, and quality information provided by Smartfren Community will correspond to increased customer engagement in the community.

2. The Influence of System Quality on Customer Engagement

The results of research on the effect of system quality on customer engagement also show a positive and significant effect. Smartfren Community will increase customer engagement in the community by increasing the ease of navigation, user-friendliness, and system security on social media. The results of this study are also supported by [9] and [17].

3. The Influence of Customer Engagement on Brand Loyalty

The results of this study show that customer engagement has a significant positive impact on brand loyalty. These findings are in line with the research by [17] and [25], but they contradict the research by [36], which claimed that customer engagement does not affect brand loyalty.

4. The Influence of Customer Engagement as Mediating Variable

The results of testing the mediating effect of customer engagement on the effect of both information quality and system quality on brand loyalty are positive and significant. These results are in agreement with research conducted by [17].

5. CONCLUSION

This study concludes that increasing the quality of information and system quality will have an impact on increasing customer loyalty to the brand through customer engagement. Smartfren Community has been successful in sharing information with customers and in developing a reliable quality system. As a result, it encourages customers to interact with one another and will eventually become loyal to Smartfren.

LIMITATIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH

Limitations in this study include:

1. This study focuses solely on the online brand community. It is suggested that future researchers use not only online communities but also offline.
2. To reduce generalization, this study was limited to the brand community in the telecommunications sector in the Solo Raya area. Future researchers are expected to expand samplings, such as communities in the field of health, education, or other communities, as well as to expand the sample in different regions.

AUTHOR'S CONTRIBUTION

The researchers contributed equatoy in the completion of this research on customer engagement analysis as mediating variable on the effect of information quality and system quality on brand loyalty

by using the Stimulus-Organism-Response Model as a supporting research background.

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