

# Uncertain Supply Chain Management

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## Factors affecting customer retention of e-marketplace industries through Stimulus-Organism-Response (SOR) model and mediating effect

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### ABSTRACT

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This research aims to study the factors influencing customer retention of E-Marketplace businesses by applying the SOR theory and the mediating effect by examining the relationship between value perception, customer engagement, brand loyalty, and customer retention variables by creating a model based on the SOR theory to study the influence of environmental factors that will lead to customer retention mechanisms. The study focused on a sample group of 426 people who have used E-Marketplace services using an online questionnaire as a research tool. The model was analyzed using the CFA and the hypothesis was tested using the SEM analysis. The results showed that stimuli (S), such as customer value perception, had a strong positive influence and a crucial role in the development and creation of a mechanism for assessing individuals' internal feelings (O) on two variables, customer engagement, brand loyalty, and directly influence customer retention. Furthermore, significant evidence also showed that brand loyalty has an important role as a mediator between customer value perception and customer retention, which is the outcome factor (R) of this study. This structural model can explain customer engagement and retention up to 86.50 percent. Therefore, this research has value as a theory and guideline in formulating an operational strategy for E-Marketplace businesses.

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## 1. Introduction

Currently, conducting business through online channels encompasses various platforms available for customers to choose from, extending beyond domestic transactions alone (Pathak & Mandloi, 2017). One of the most used online shopping platforms is E-Marketplace which allows customers to easily compare prices and quality of products. In addition, companies within the e-commerce industry, including electronic retailers who facilitate customer transactions through central E-Marketplaces have nearly doubled their value growth compared to the previous year (Das et al., 2018). The attractiveness of E-Marketplaces caused more and more service providers to enter the market, including foreign service providers, leading to intense competition, resulting in each electronic marketplace emphasizing offering attractive promotions. Consequently, each E-Marketplace needs to constantly improve its strategy to maintain market share, such as creating new features that provide more benefits and functionality to create customer perceived value and provide superior and cost-effective shopping experiences to increase customer engagement (Djohan et al., 2022). Additionally, relevant studies on marketing found that many researchers emphasized their studies on the application of the S-O-R Model (Aljuhmani et al., 2023; Tak & Gupta, 2021). The theory focuses on explaining consumer behaviors that were influenced by the environment and their reaction. The S-O-R theory was also applied to other industries or contexts, such as the tourism industry (Hsu et al., 2021; Luqman et al., 2017; Alam & Noor, 2020), restaurants (Lee et al., 2021; Sari et al., 2022), hotels (Ilijevski, 2016; Choi & Kandampully,

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2019; Chen et al., 2023). However, the application of this theory is still limited in the E-Marketplace industry, specifically the examination of the correlation of perceived value as a stimulus factor (S), as well as brand loyalty and customer engagement as a mediator and a mechanical variable in assessing individuals' internal feelings (O) that plays an important role in leading to the outcome factor (R) of the S-O-R theory, which is customer retention.

Customer retention is a key component of customer relationships, reflecting the long-term preservation of commercial relationships with customers (Magatef & Tomalieh, 2015; Putra, 2023). The rapid proliferation of competition across diverse organizational landscapes presents manifold challenges in preserving customer loyalty and attaining business objectives. In response to business competition, finding the driving force in customer retention, which is the outcome factor (R) of the S-O-R theory is essential. Previous studies have examined several factors in creating different types of customer retention (Hanaysha, 2018), such as customer experience (Cambra-Fierro et al., 2021; Chang & Zhang, 2016) customer satisfaction (Aityassine, 2022; Al-Tit, 2015; Danesh et al., 2012), and service quality (Abdullah & Kumar, 2023; Al-, 2015). Nevertheless, despite the agreement that the study on the factors driving customer retention has always attracted academic attention and consideration, this study focused on customer perceived value factors, which require empirical evidence to confirm its ultimate role as a stimulus factor (S) according to the S-O-R theory that will eventually lead to customer retention.

Customer perceived value has been acknowledged as a crucial factor in retaining customers in long-term relationships with organizations (Saewanee & Khamwon, 2022; Hanaysha, 2018; Eid, 2015) within the current business landscape, there is intense competition. and constantly changes. Marketers should understand, and evidently predict consumer behaviors in purchasing products and services to meet their needs. (Roy et al., 2017). Simultaneously, customer perceived value remains a crucial factor in driving brand loyalty. (Kaewkhav et al., 2023; Celyn & Hasan, 2023) and contributes to customer engagement (Qin et al., 2023; Xie et al., 2021). In this study, both the factors of brand loyalty and customer engagement are designated as mediating variables and psychological evaluative variables (O) that play a crucial role in propelling the movement towards customer retention. These factors serve as outcome variables (R) in the S-O-R theory under investigation.

The previous findings led to the research question of how customer perceived value, brand loyalty and customer engagement, influence customer retention. The researcher emphasized the study within the context of E-Marketplace to propose efficient strategies that align with the target group's behaviors. The research results not only fulfill marketing research but also lead to the introduction of ideas for developing the E-Marketplace industry to be at a more competitive level.

## 2. Literature Reviews and Research Hypothesis

### 2.1 S-O-R Theory

The supporting theoretical model in this study is the S-O-R Model, which describes consumer behavior resulting from environmental influence and their reactions to the environment. The research by Mehrabian and Russell (1974) helped pioneer research on the topic of emotional response. Later on, Bitner (1992) studied the concepts of perception and understanding and applied them to the theory. Jacoby (2002) further integrated both cognitive and emotional concepts to extend the application of the S-O-R theory to studies in various industries, including the marketing industry (Jang & Namkung, 2009; Lee et al., 2021; Ali et al. 2021). From this model, consumers may react differently depending on their internal core emotional reactions. The components of the model are described as follows: 1) Stimulus refers to how the external environment that affects consumers' perception of a product or service leads to certain behaviors. Stimuli are impetus within the environment that affect consumers' cognitive processes, consciousness, and emotions, such as the environmental factors and the design (Mehrabian & Russell, 1974) 2) Organisms are individuals' internal state, both cognitive and emotional assessments, which is considered a mechanism with potentials that strengthen the relationship between the stimuli and the response (Alam & Noor, 2020) and 3) Response, refers to consumers' affected by stimuli or the result of consumption experiences, including the post-purchase usage of the products and evaluating the purchase (Baker et al., 2002). Many academics have tested and supported this theory, such as Cachero-Martínez and Vázquez-Casielles (2017) have applied the S-O-R model in a retail context to observe how a positive environment can stimulate satisfaction. In addition, For the context of retail shopping in brick-and-mortar stores, the findings of Baker, Grewal, and Parasuraman (1994), using the SOR theory, confirm that a favorable in-store environment serves as a stimulus and drives consumers into retail stores. However, in current studies on the E-Marketplace business context, the S-O-R theory is used to describe customer responses to stimuli, where customer perceived value is a stimulus factor (S) that helps predict the role of customer engagement and brand loyalty is a mechanical factor that assesses individuals' internal feelings (O), leading to customer retention as an outcome factor (R).

### 2.2 Customer perceived value: PV

The word value indicates the difference between price and utility that consumers can perceive through both quality and input cost (Nguyen & LeBlanc, 1998). Generally, customers' value focuses on the perception or assessment of what customers receive from the purchase of certain products or services (Chang et al., 2009), which is the PV involves the comprehensive assessment by consumers of the utility derived from a product, considering both perceived gains and losses (Kesari & Atulkar, 2016). The overall assessment of the benefit may be assessed by price savings, excellent service, time-saving, etc. (Lien et

al., 2015). In other words, PV is like consumers weighing between the benefits they receive, including performance, durability, and economy, and the costs that occur, such as time and money, which is something consumers sacrifice or the cost that must occur as an exchange (Day, 2002). In terms of customer buying behavior, the value that customers perceive is not influencing only the pre-purchase process but extends to post-purchase activities, which includes satisfaction, reference, and refund (Parasuraman & Grewal, 2000). Therefore, companies need to create and deliver valuable propositions to their customers. (Itani et al., 2019). Obtaining information about the value customers seek is crucial and can be considered a cornerstone of efficient marketing management. Therefore, organizations need to gather comprehensive data about their target market customers to enhance their understanding of customer value perception, ultimately leading to CR (Hanaysha, 2018). PV is determined as a stimulus factor or consumer stimulus factor, or S in the S-O-R theory.

Reports indicate that in competitive environments, creating customer value is a key consideration for organizations aiming to maintain and foster customer satisfaction. (Dube, Renaghan, 2000). One fundamental strategy is delivering superior value to customers, considered a primary marketing strategy for many brands (Hansen et al., 2008). Additionally, numerous scholars affirm that PV has a significantly positive influence on CR. (Al-Gharaibah, 2020; Hanaysha, 2018; Edward & Sahadev, 2011). Previous empirical studies have also reported their findings that PV also indirectly influences CR (Itani et al., 2019). Additionally, according to the engagement theory, customers will engage with the organizations if they receive a lower price and the highest benefit although the organizations are not aware of the possible profit (Pansari & Kumar, 2017). In other words, customers can only have a certain level of engagement with the organization if they perceive a certain level of value regarding the organization's proposition (Itani et al., 2019). Brodie et al. (2011) suggested that PV can drive CE with the organization. Furthermore, in other studies, it has been elaborated that customers are more inclined to establish loyalty towards service providers who can offer services of greater value. Additionally, customers' relationship with the service provider is due to psychological reasons, or another way of looking for future value (Brodie et al., 2013). This finding aligns with several other empirical studies that identified PV as a driving factor for CE with the organization (Khoa et al., 2020; Itani et al., 2019). Moreover, previous studies also reported findings on the direct relationship between PV and BL that PV has a direct influence on BL (Lin et al., 2017; Chen, 2013), which helped form the following hypothesis.

**H<sub>1</sub>:** *PV positively influences CR.*

**H<sub>2</sub>:** *PV positively influences CE.*

**H<sub>3</sub>:** *PV positively influences BL.*

### 2.3 Customer engagement: CE

From the foundation of relationship marketing, which refers to the creation of customers' bonds (Fournier, 1998), consumer engagement causes the enhancement of knowledge about CE and brands to add value, support, respond, and increase CE with a positive experience (Vivek et al., 2012). CE reflects broad customer mobility activities in value creation (Appelbaum, 2001), which is a key topic that gained attention in marketing education in 2010 (Żymkowska et al., 2019). Van Doorn et al. (2010) explained the concept of customer engagement behavior as a behavioral expression towards a brand or company apart from purchasing, which is the result of the impetus. On the other hand, Hollebeek (2011) described the term as the level of the brand's motivational mind and depending on the customer's context, consisting of the level of activities regarding specific thoughts, emotions, and behaviors in brand interactions. This description is in line with So et al. (2014) explained that customer engagement is a personal attachment of customers to a brand, manifested in responses beyond purchasing, such as knowledge, understanding, emotions, and behavior. Additionally, Tripathi (2009) pointed out the importance of CE as a success factor for brands that can only happen when brands are well received by consumers, and this only happens when consumers are truly engaged. However, previous research has attempted to study and still maintain arguments about the concept of CE's dependent on the context. CE measurement consists of one-dimensional (Verleye et al., 2014; Pansari & Kumar, 2017) and multi-dimensional (Harmeling et al., 2017; Vivek et al., 2012; Brodie et al., 2011). This research applied the most accepted dimensions, consisting of 1) cognitive response dimension, 2) emotional dimension, and 3) behavioral dimension as the foundations of the study. CE was designated as customers' mechanical factor, or O in the S-O-R theory.

Furthermore, past studies have shown that CE produces different results, such as contributing to BL (Aljuhmani et al., 2023; Abror et al., 2020), customer satisfaction (Islam & Rahman, 2016), trust, brand loyalty, and commitment (Hollebeek, 2011). CE is a crucial element that contributes to overall business performance improvement (Kumar & Pansari, 2016). At the same time, CE is also a crucial factor in driving CR. The results of empirical studies showed that CE has a significant direct influence on CR (Elgarhy, 2022; Torkzadeh et al., 2022). Moreover, CE plays the role of a mediator influencing CR (Petzer & Van Tonder, 2019), which helped form hypothesis 4 as follows.

**H<sub>4</sub>:** *CE positively influences CR.*

**H<sub>4a</sub>:** *CE plays the role of a mediator between CV and CR.*

### 2.4 Brand Loyalty: BL

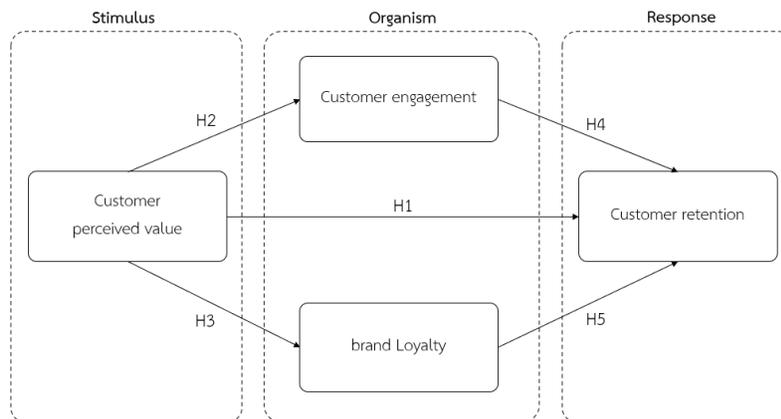
In the past, before the 1990s, a brand was perceived merely as a component used to identify the product or as a tool to help organizations sell more products (Oh et al., 2020). Subsequently, brands have evolved and elevated their perspective to be

considered as intangible assets of significant value for organizations (Veloutsou & Guzman, 2017) and a core component of branding (Aaker, 1996). The concept researchers used on current BL was developed before or at the beginning of the age of the Internet (Zyphur & Pierides, 2020). In addition, customer loyalty is generally considered a prerequisite for vendors' success. In other words, a strong sense of loyalty increases the likelihood of customers continuing to transact with the same vendor. Simultaneously, if businesses can maintain a strong and continuous relationship with customers, where customers exhibit consistent and enduring BL, sellers will be able to generate higher profits for the organization (Tsai et al., 2010). The definition of BL cited by most is that of Oliver (1999), who stated that BL is when a customer makes a repeat purchase or patronage of a particular brand. However, technological advancements expanded the definition of BL to cover brand stakeholders other than customers and go beyond just purchasing to brand relationships (Coelho et al., 2019). For example, the relationship of stakeholders with a brand can be manifested through social transactions, such as social media tags, video content on social platforms, spoken words, and images. These interactions may or may not involve financial transactions (Luciano et al., 2018). Brand loyalty is a multidimensional structure that is interconnected with various structures, brand attitude (Liu et al., 2012) and brand engagement (Pedeliento et al., 2016). As the current context changes, academics have proposed a more comprehensive definition of BL as the developed relationship between stakeholders and a particular brand, expressed by repeat purchases, engagement, promotion, sponsorship, collaboration, or co-ownership of the brand (Parris & Guzmán, 2023). The BL factor was designated as the mechanical factor of consumers, or O in the S-O-R theory of this research.

More importantly, the ability to build customer loyalty and CR affects a company's ability to create profit and is extremely important to the organization (Larsson & Broström, 2020). Customer loyalty can be determined as causing CR within the organization's engagement (Russo & Confente, 2017). Previous studies found significant evidence that if an organization succeeds in creating loyal customers, it will help them to stay in a relationship with the organization for a longer time. In other words, loyalty has a positive influence on CR (Eid, 2015; Zineldin, 2006). In addition, most previous studies often portray the role of BL as an outcome factor (Soleimani et al., 2023; Aljuhmani et al., 2023; Adhikari & Panda, 2019). However, some studies have found that BL also plays a role as a mediator (Tiep et al., 2023), which helped form hypothesis 5 as follows.

**H<sub>5</sub>:** *BL positively influences CR.*

**H<sub>5a</sub>:** *BL has the role of a mediator between PV and CR.*



**Fig. 1.** the conceptual model

## 2.5 Customer retention: CR

Customer retention is generally considered a primary factor for businesses that emphasize relationship marketing strategies (Coviello et al., 2001), with the CR factor determined as consumer response, or R in the S-O-R theory of this study even though the variation in definitions and measurements of customer retention across industries and organizations (Aspinall et al., 2001). Customer retention is largely concerned with consumer repurchase behavior, with a focus on obtaining repeated customer support (Buttle, 2004). In essence, the commitment to sustaining long-term relationships between customers and brands is the objective of customer retention, stemming from positive perceptions and past experiences (Mohamed & Borhan, 2014). In addition, Anderson and Sullivan (1990) have also demonstrated that retaining existing customers tends to incur lower costs compared to acquiring new ones because there will also be the costs of advertising and promotions to influence customers' buying behavior. Furthermore, it is said that CR can provide organizations with a variety of benefits, such as the retained customers' willingness to pay for the purchase of a company's products or services at a higher price than new customers. (Ang and Buttle, 2006). In addition, loyal customers who maintain a relationship with a particular brand will purchase its product more often and help recommend their products to others, allowing service providers to spend less time closing deals and are less susceptible to price changes compared to new customers (Sim et al., 2006). If the organization has a high CR rate, that means customers who are satisfied staying in the relationship will be more likely to shop for corporate products, the less it costs organizations to acquire new customers (Putra, 2023). CR statistics are expressed as the percentage

of retention within the relationship between a customer and the brand or organization. If the organization has a high CR rate, that means customers are satisfied to stay in the relationship, as well as the tendency to purchase the organization's products, and there will be less cost for the organization in seeking out new customers (Putra, 2023). However, although e-commerce businesses such as E-marketplace platforms have gained popularity as a new form of purchasing in recent years, a company's success often depends on its online ordering facilities and competitive pricing strategies (Nandankar et al., 2023). Therefore, CR is one of the essential factors that play an important role in businesses.

### 3. Research Methodology

#### 3.1 Sample and data collection

The sample group used in this study comprises 426 individuals who have previously utilized E-Marketplace services. who had used E-Marketplace. Aged between 18-22 years old. The participants in this survey underwent preliminary screening criteria. They were required to have utilized E-Marketplace services within the last six months. After the initial screening process, a complete set of responses was obtained from 426 participants who engaged in this study. A comprehensive analysis reveals that the majority of respondents were female (52.80%). Moreover, a large proportion were single (89.70%), aged between 18-22 years old (33.10%), held undergraduate degrees (64.32%), and were predominantly students (38.73%). Their average monthly income ranged between 15,000 to 25,000 Baht (53.76%). All respondents had experience using E-Marketplace services, with Shopee being the most frequently utilized platform (72.50%). On average, participants used these services 1-2 times per month (34.30%), and the most favored category of purchased products was women's fashion (23%).

#### 3.2 Measurements

In conducting quantitative method research, the researcher employed tools for data collection through online questionnaires. The measurement items were developed based on prior studies and were refined to ensure their appropriateness within the context of the E-Marketplace business. These tools comprised six components: 1) Screening data 2) General Information 3) Customer Perceived Value - consisting of 4 measurement items (Vera, 2015; Chakraborty, 2019) 4) Customer Engagement - consisting of 14 measurement items (Hollebeek et al., 2014; So et al., 2014; Dessart et al., 2015) 5) Brand Loyalty - consisting of 5 measurement items (Yoo and Donthu, 2001) Customer Retention - consisting of 7 measurement items (Edward and Sahadev, 2011; Mahmoud, 2019) These measurement tools utilized a Likert scale of 7 levels

#### 3.3 Verifying the completeness of the data before running the statistical analysis

Preliminary data checking before statistical analysis revealing that the completeness of the data was examined. The minimum value for skewness was found to be -0.554, while the maximum was -0.270. Additionally, the kurtosis ranged from a minimum of 0.161 to a maximum of 0.754. It can be observed that the data exhibits a normal distribution, as indicated by the values of skewness and kurtosis falling between -2 and 2 (Tabachnick & Fidell, 2007). Furthermore, an examination of the coefficients of correlation between the observed variables in the structural equation model influencing customer retention was performed. Considering the correlation coefficients among all six variables, it was discovered that all correlation coefficients were positive, signifying unidirectional relationships. These coefficients ranged 0.493 - 0.798, demonstrating statistically significant relationships at the .05 level. Moreover, an analysis of VIF and tolerance values, indicating multicollinearity among the independent variables, was undertaken. The VIF values ranged between 2.293 and 4.355, all below the threshold of 10 (Stevens, 2009), indicating no severe multicollinearity issues among the independent variables. The tolerance values, ranging 0.230 - 0.436, were also below the threshold of 5 (Stevens, 2009), further confirming the absence of substantial multicollinearity concerns among the observed independent variables.

#### 3.4 Data analysis

This research involved data collection using a questionnaire tool, data recording in SPSS, and presentation of general respondent questionnaire data through descriptive statistics such as percentages, means, and standard deviations. Subsequently, CFA was conducted to assess the reliability and validity of the data, followed by SEM analysis to test the research hypotheses.

## 4. Results

#### 4.1 Measurement assessment

Considering the weights of the components to assess the shared variance of indicators is conducted through analyzing the measurement model using Confirmatory Factor Analysis (CFA). It was found that the  $\chi^2/df$  was found to be 1.842, the GFI was 0.910, the CFI was 0.975, the RMSEA was 0.045, and the SRMR was 0.0459. These results indicate a high to very high level of model fit, signifying a strong level of congruence in the confirmatory factor analysis. Furthermore, this study undertook an analysis of construct validity to ascertain the factor loadings of each item, which were found to be above 0.50. The research revealed factor loading values ranging from 0.684 to 0.918, indicating structural congruence within the questionnaire (Hair et al., 2010). Additionally, an evaluation of the overall reliability of latent variables was conducted using

CR and AVE, which represent the average variance explained by the observed variables. The Composite Reliability (CR) values were high, ranging from a minimum of 0.835 to a maximum of 0.909, exceeding the threshold of 0.60, while the AVE values ranged from 0.559 - 0.773, surpassing the threshold of 0.50. This provides clear evidence that all latent variable operationalizations are accurate and reliable. Moreover, when calculating the Cronbach's alpha coefficients to analyze the reliability, it was found that all values ranged from 0.852 to 0.935. Each of these values exceeded 0.70 (Zikmund et al., 2010), indicating high reliability of the analyzed data, as depicted in Table 1.

**Table 1**  
Examination of Data Reliability and Validity

Constructs	Items	Loading	$\alpha$	CR	AVE
Customer perceived value	PV1	0.687	0.852	0.835	0.559
	PV2	0.720			
	PV3	0.761			
	PV4	0.817			
Cognitive	CE1	0.839	0.889	0.867	0.685
	CE2	0.840			
	CE4	0.803			
Affective	CE5	0.901	0.930	0.929	0.724
	CE6	0.831			
	CE7	0.862			
	CE8	0.814			
	CE9	0.843			
Interaction	CE11	0.883	0.935	0.882	0.773
	CE12	0.918			
	CE13	0.867			
	CE14	0.848			
Brand Loyalty	BL1	0.851	0.907	0.887	0.611
	BL2	0.803			
	BL3	0.777			
	BL4	0.711			
	BL5	0.760			
Customer Retention	CR1	0.801	0.926	0.909	0.588
	CR2	0.818			
	CR3	0.817			
	CR4	0.719			
	CR5	0.684			
	CR6	0.685			
	CR7	0.828			

To ascertain the distinctiveness of the structural elements for each variable and to establish discriminant validity, a comparison was executed between the square root of the AVE and the correlations between constructs. The examination revealed that the AVE for each construct, denoted in both the diagonal and off-diagonal elements, surpassed the inter-construct correlations both vertically and horizontally. Consequently, it can be inferred that the model possesses discriminant validity, signifying that the measurement model effectively and accurately captures the associations among variables—specifically, PV, CE, BL, and CR. This affirmation underscores the model's validity and reliability (Fornell & Larcker, 1981), as elucidated in Table 2.

**Table 2**  
Discriminant Validity Examination

	PV	COG	AFF	INT	CR	BL
PV	<b>0.750</b>					
COG	0.732	<b>0.830</b>				
AFF	0.633	0.798	<b>0.850</b>			
INT	0.493	0.654	0.746	<b>0.880</b>		
CR	0.644	0.735	0.688	0.653	<b>0.780</b>	
BL	0.522	0.627	0.609	0.707	0.709	<b>0.770</b>

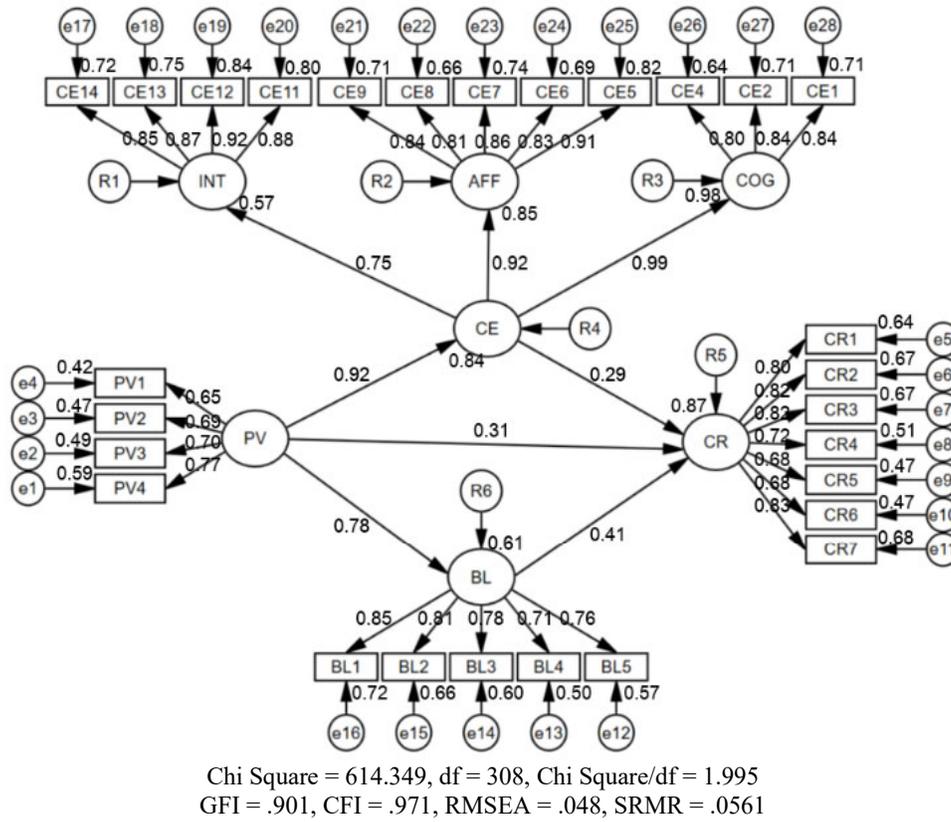
#### 4.2 Structural model assessment

The SEM analysis investigating the relationships among PV, CE, BL, and CR revealed that the structural equation model significantly fits the empirical data. The model demonstrated good fit indices, meeting acceptance criteria, as depicted in Fig. 2.

**Table 3**  
Structural equation modeling results.

Hypothesis	Relationships	$\beta$	t-value	p-Value	Test results
H1:	PV $\rightarrow$ CR	0.312	2.162	*	supported
H2:	PV $\rightarrow$ CE	0.915	14.608	***	supported
H3:	PV $\rightarrow$ BL	0.780	12.973	***	supported
H4:	CE $\rightarrow$ CR	0.283	2.261	*	supported
H5:	BL $\rightarrow$ CR	0.405	6.651	***	supported

Note:  $R^2_{CE} = 0.838$ ,  $R^2_{BL} = 0.609$ ,  $R^2_{CR} = 0.865$  \* =  $p < 0.05$ , \*\*\*  $p < 0.001$



**Fig. 2.** Structural Equation Model depicting the relationships between PV, CE, BL, and CR.

And based on the research hypothesis, the structural model assessed the influence of PV, CE, and BL on CR. It was found that PV significantly directly influenced CE ( $\beta=0.915, t=14.608$ ), BL ( $\beta=0.780, t=12.973$ ), and CR ( $\beta=0.312, t=2.162$ ). Additionally, both CE ( $\beta=0.283, t=2.261$ ) and BL ( $\beta=0.405, t=6.651$ ) had a significant direct impact on CR, as illustrated in Table 3.

**4.3 Testing of mediation**

To examine the mediating effects of the intermediate variables between CE and BL towards the relationship between PV and CR, bootstrapping analysis was conducted. The results are presented in Table 4. The analysis revealed that Hypothesis 4a, suggesting that CE does not play a mediating role between PV and CR, was unsupported. Conversely, Hypothesis 5a, proposing that BL acts as a mediating variable between PV and CR, was statistically significant ( $p<0.05$ ), indicating a partially mediating effect.

**Table 4**  
 Mediation analyses

Hypothesis	Relationships	Estimates	Lower bound	Upper bound	p-Values	Test results
H4a:	PV → CE → CR	0.289	-0.271	0.657	0.179	Not supported
H5a:	PV → BL → CR	0.353	0.212	0.545	*	supported

**5. Conclusion and discussion**

In past studies, the application of S-O-R theory was widely used in the tourism industry (Hsu et al., 2021; Luqman et al., 2017; Alam & Noor, 2020), restaurants (Lee et al., 2021; Sari et al., 2022), hotels (Ilijevski, 2016; Choi & Kandampully, 2019; Chen et al., 2023), and amusement parks (Wu et al., 2018). However, the application of this theory is found to be limited in the E-Marketplace industry, especially in examining the correlation of PV, which are stimuli (S), as well as CE and BL, which are the mediators and the mechanical variables in assessing individuals’ internal feelings (O) and have the crucial role in leading to the outcome factor (R) of S-O-R theory, that is CR. Previous studies often indicate that the PV variables are considered the mediator, and the BL variable is usually the outcome factor.

As for the key findings of this study, the first finding showed that PV, which is a stimulus factor for customers, equal to an S in the S-O-R theory of this study, has had a positive influence on CR, which aligns with the research by Al-Gharaibah (2020) and Hanaysha (2018). In other words, creating added value or delivering superior value to customers will provide satisfaction to customers and help maintain a long-lasting relationship with the brand. At the same time, it was found that PV also positively influences CE. The theory of engagement shows that customers will have an engagement with the organization if they receive the products at a lower price while getting the most benefit (Pansari & Kumar, 2017). This finding aligns with Brodie et al. (2011), Khoa et al. (2020), and Itani et al. (2019), who stated that PV is a factor that can lead to CE in the organization. Moreover, the findings also affirmed that PV positively influences BL, which is in line with previous studies with similar findings (Lin et al., 2017; Chen, 2013). Therefore, the PV factor can be considered a direct trigger factor that is an essential force in creating the outcome factor as well. Moreover, the findings of this study showed an empirical outcome that CE was designated as the mechanical factor of the customers, or O in the S-O-R theory, and has a direct influence on CR. This finding is in line with Elgarhy (2022) and Torkzadeh et al. (2022) in which CE is rooted in relationship marketing through the bonds created between customers and organizations (Fournier, 1998). Therefore, if the organization can build CE, it will be able to create a direct trigger in the customers that can lead to repeated purchasing, patronage, and long-term relationships with the organization. However, although CE has a positive direct influence on CR, this study found that CE does not have a role as a mediator between PV and CR but might have the role of a mediator between other factors. For instance, Petzer and Van Tonder (2019) found that CE plays a role as the mediator between customer satisfaction, trust, customer satisfaction, and trust, and between customer value and loyalty. Furthermore, the study also found that BL, which is designated as a consumer mechanical factor, or O in the S-O-R theory, had a positive influence on CR. This finding aligns with previous studies that showed significant evidence that if an organization can build customer loyalty, customers will maintain a longer relationship with the organization. In other words, loyalty has a positive influence on CR (Eid, 2015; Zineldin, 2006). However, many previous studies also identified the role of BL as an outcome factor (Soleimani et al., 2023; Aljuhmani et al., 2023; Adhikari & Panda, 2019). Nonetheless, the crucial finding of this study was that BL has the role of a mediator between PV and CR. The finding aligns with Tiep et al. (2023) who found that BL has the role of a good mediator between corporate social responsibility and the potential of businesses. Lastly, this study also found an empirical piece of evidence that the PV factor has an indirect influence through BL and will lead to the creation of CR, as opposed to the direct influence.

## 6. Theoretical implications

This study applied the S-O-R theory to study the creation of CR by identifying the stimulus factor (S), which includes PV through customer mechanism (O), which includes CE and BL, leading to the outcome factor (R), which includes CR. The findings were that PV is a crucial trigger factor that will lead to CR, CE, and BL. At the same time, CE and BL factors have the role of mechanical factors. In addition, it was also found that only BL has an influence as a mediator that drives the correlation between PV and CR. The finding is considered as a new finding that can enhance the theoretical knowledge of marketing since past studies generally found that the BL factor has the potential of the outcome factor.

## 7. Managerial implication

To emphasize building customer retention that indicates the long-term continuation of the relationship that business organizations or brands have with their customers (Putra, 2023; Magatef & Tomalieh, 2015) and strong and sustainable business organizations for E-Marketplace, a popular marketplace for buyers who can conveniently compare prices and quality of products, as well as encouraging their growth, the focus should be placed on creating customer perceived value to allow customers to evaluate the difference, utility, and the quality of what was given in terms of price and time spent (Kesari & Atulkar, 2016; Day, 2002; Nguyen & LeBlanc, 1998). In addition, the effort should also include creating customer engagement, time for money, superior experience (Djohan et al., 2022), and customer brand loyalty.

The study results are the data that shows the perspective of connecting consumers' minds to E-Marketplace business organizations, which acts as a guide in implementing ideas to develop the industry and determine operational strategies to be more competitive and stronger.

1) Businesses organizations and brands should consider emphasizing the building of communication with consumers, helping consumers to know about E-Marketplace services and how to receive the products and services they want at good prices and promotions when engaging in online E-marketplace shopping. For instance, the concept of tracking and merging consumer data to create a pop-up of products that consumers may be interested in, listing products with the best prices at that time, as well as having features that can be used while shopping and even price comparison. Organizations should make customers feel that choosing to use services on E-Marketplace helps them get products at a good price or the best promotion, getting great value for money, and as a result, leading to customers buying those products.

2) Business organizations should also consider adopting strategic concepts through creating experiential relationships with consumers to enhance the relationship between businesses, brands, and customers and maintain customer retention. This effort can be accomplished by using the concept of interactive features to create a happy, fun, and exciting experience while shopping

or using services on the E-Marketplace until customers can spend time without any worry. The concept can also create a sense of participation or exchange of information with one another. For example, the concept of interactive features may be introduced to facilitate the search for products more conveniently and respond to customers' needs more rapidly, increase data interaction between brands and customers, and a customer referral review menu to help create a sense of engagement with other people on the E-Marketplace. These ideas encourage customers to feel the need to express their feelings and pleasantly interact with E-Marketplace, which can help create engagement.

3) Business organizations should consider strengthening brand loyalty with customers, making E-Marketplace a channel that customers regularly use, as well as being the first choice consumers decide to use. Apart from selecting good products and services to regularly deliver and impress customers, additional strategies may be applied by providing promotions to attract repeat customers, such as discount coupons, collecting shopping points to get discounts, using the discount attached on the receipt for future services, and customer participation rewards to attract additional customers.

4) Business organizations should consider strengthening customer retention by organizing activities on E-Marketplace, such as a Top Spender Campaign for customers with the highest number of purchases or services to win prizes, an E-Marketplace fandom quizzes that can help reflect consumers' engagement where they can win various prizes or coupons to use for shopping on E-Marketplace, activities for customers to share their experiences and impressions of the organization's services to create a sense of engagement, customers participation with E-Marketplace, as well as customers' information that can be used as a base for businesses to attract other consumers to help generate income and enhance competitiveness in the future.

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