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Article

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Article

Transformation of CRM Activities into e-CRM: The Generating e-Loyalty and Open Innovation

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Abstract: Technological developments have digitized consumer behavior all over Indonesia. This has become the basis for the emergence of e-commerce, a digital business system that is widely used by the public in making purchases through apps or websites. For this reason, an e-commerce platform should create e-loyalty, to make it the best option among many stores. This is the first study investigating ten factors that contribute to e-Customer Relationship Management (e-CRM) value on e-loyalty in Indonesia. The study involved 767 active users of the number one e-commerce company in Indonesia. An empirical investigation was carried out, to validate the instrument items regarding the e-CRM factors and e-loyalty indicators, using Explanatory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA). The analysis utilizes Structural Equation Modeling (SEM) to test the hypotheses. The finding suggested that the variables of customization, care, cultivation, choice, online community, convenience, site security, personalization values, rewards, and interactivity positively contribute to e-CRM value on e-loyalty.



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Keywords: e-Customer Relationship Management; e-commerce; e-loyalty

1. Introduction

The use of electronic gadgets in Indonesia is rapidly growing. Based on a survey by IDN Times [1], the Indonesian millennial generation is categorized as heavy users of information and communication technology with an average usage of 4–6 h per day. According to data from Digital Around the World 2020 (www.datareportal.com, accessed on 19 October 2020), there are 4.57 billion internet users and 3.81 billion of them are active social media users, and 132.7 million of them are in Indonesia. The number is estimated to continue to rapidly increase. The internet has inherent to human's lives then impose them to successfully adapt to changes [2,3]. Gradually, the internet has replaced traditional mass media in communication [4] and also created another way to improve psychological well-being and the quality of life [5] by fulfilling human's needs. Internet usage has evolved from mainly being used for seeking information [3], to also include activities such as product purchases, management of finances, social networking, and other activities [6].

Companies must be able to adapt to the changes in digitized consumer behavior. This requires industries to enter the digital era for the development of business operational systems. In Indonesia, digital start-ups are continuously being developed. Based on data from the Ministry of Communication and Information of the Republic of Indonesia [7], there are about 7.4 million people doing online shopping, and this number is increasing every year. This is due to the increasing use of gadgets and the internet in Indonesia. The high number of smartphone users has also caused the retail value of e-commerce to increase significantly. Therefore, digital businesses in Indonesia should continuously

improve their business operational systems to ease consumers in shopping and to increase their confidence and loyalty in digital businesses such as electronic commerce [8].

Electronic commerce, commonly known as e-commerce, is a type of business that emerged due to technological advances in regard to carrying out the buying and selling of products, services, or even information through the internet [9,10]. Indonesia is a country with rapid e-commerce growth. This is proven by data from the Ministry of Communication and Information of the Republic of the Indonesia [7] that Indonesia has the fastest-growing e-commerce industry, with a growth rate of 78%, followed by Mexico and the Philippines, with rates of 59% and 51%, respectively. Based on data by Merchant Machine (2019) (www.merchantmachine.co.uk/, accessed on 1 October 2020, Indonesians spend an average of 3.19 million Rupiah per person annually for online-shopping transactions. This supports the idea that e-commerce is in high demand, especially by Indonesians, with the largest e-commerce market share in Southeast Asia.

The accelerated business growth of e-commerce in the marketplace is a result of the significant benefits experienced by both consumers and suppliers. For sellers, e-commerce can be a tool to expand the marketplace quickly and easily, save costs, improve supply chain processes, and facilitate the access of product information to customers [11]. For consumers, the benefits of e-commerce transactions include a wider range of options for products and services, increased convenience in conducting transactions anytime and anywhere, availability of detailed product information and reviews, and the possibility to obtain a greater number of products at a lower price [11].

With these various benefits, e-commerce is a highly prominent business for online sellers. In Indonesia, various e-commerce companies are available to consumers. However, despite the many benefits and conveniences offered by e-commerce businesses, they also have some drawbacks. One of many obstacles is to maintain consumer trust and loyalty [12]. As they mainly use technology systems, like the internet and websites, there is no direct interaction with the shop's staff. This physical connection and the lack of social interactions results in difficulties to build good relationships with consumers, especially in building loyalty [13]. Therefore, extra effort is needed [14–16]. In the e-commerce business, consumers' loyalty is called e-loyalty [14,17]. It is defined as a strong psychological desire from a customer to use e-commerce or an online store [18]. A loyal customer visits the website continuously and this leads to company profitability [19,20]. Therefore, customer relationship management in digital businesses need to build a website's service to attract and strengthen the relationships with their consumers both directly and indirectly [8]. Customer Relationship Management (CRM) has been discussed in various industries as a critical strategy to increase the revenue, customer satisfaction, and intangible assets [14,15,21–25]. CRM by e-commerce companies is digitally regulated through the website's services, to provide the best shopping experience and fulfill customer satisfaction and customer retention [16].

The quality of a company's CRM was previously determined by the ability of employees to identify and fulfill customer needs and to communicate, negotiate, and establish good relationships directly with customers [8,18]. However, the operational system of e-commerce businesses needs a more comprehensive CRM approach to improve the relationship with customers through the appearance of the website's services [8]. Changing the quality of a CRM into an online system is also known as e-CRM. Overall, e-CRM is digitally regulated through the website, to provide the best shopping experience; it is important in building a long-term relationship with consumers by fulfilling customer satisfaction and customer retention [8,16,24]. Moreover, e-CRM has an advantage as a strategy to increase intangible assets of a company with a lot of cost savings involved [26,27], because mainly this strategy operated virtually by website or apps development. Therefore, it is important for companies to evaluate the application of the technology from the consumers' perspective [28–30]. This means that companies should develop their digital operational appearance by putting attention on consumer behavior and interests, to build a good e-CRM. According to the study by Social Research & Monitoring soclab.co in 2015, around

77% of Indonesian consumers research product information before making a transaction or purchase. Indonesian consumers do not hesitate to spend their time on product reviews with several online stores, before they decide to make a purchase. Additionally, consumers also consider the digital operational processes, such as the application features and the website appearance [16,23,30]. The quality of the digital operational display does not only attract the customers, but it also eases them to purchase products [16,31,32].

According to Bodla and Ningyu [33], high-tech companies such as e-commerce platforms are the best object research in terms of digital working business processes, seeking new opportunities, and practice the latest knowledge in the era of IoT (*Internet of Things*). Understanding consumer behavior in the Indonesian market is the first step for e-commerce to develop e-CRM practices so that consumer loyalty can be created. Considering that Indonesia is the largest e-commerce market in Southeast Asia, this study investigated the number one Indonesian e-commerce site according to the online store ranking data by iPrice Insights (www.iprice.co.id/insights/, accessed on 17 February 2021). In the fourth quarter of 2020, this company had the largest share of Indonesia's e-commerce market based on their average quarterly traffic (129 million monthly website's visitors), mobile application ranking, and social media followers (the total followers from Facebook, Instagram, and Twitter is 27.5 million); thus, it is considered to represent the behavior of e-commerce users in Indonesia. According to the company's Head of Brands Management, in the second quarter of 2019, its revenue reached USD 3.5 billion (approximately 51 trillion Rupiahs). In this paper, we limit our study to the number one e-commerce site in Indonesia from the wide range of e-commerce company, to conduct the consumer's objectivity, rational, and precisely assess about its e-CRM values to achieve its e-loyalty. The study of e-CRM in e-commerce website is still very limited despite Indonesia's e-commerce growth. Indeed, research on how e-CRM values affect e-loyalty has not been conducted. This paper is the first to observe how the 10 factors (customization, care, cultivation, choice, online community, convenience, site security, personalization values, rewards, and interactivity) contribute to e-CRM values that affect e-loyalty in the number-one e-commerce company in Indonesia.

2. Literature Review

2.1. CRM

Customer Relationship Management (CRM) emerged in the 1990s, as an extension of relationship marketing [34,35]. However, it has been noted that CRM exceeds the boundaries of marketing to include human resource management, sales, customer service, and other functions dealing directly with the customer [36–38]. In spite of that, CRM depends on the convergence of strategy and technology. From a strategic perspective, CRM is about creating and maintaining profitable customer relationships in the long-term [37] and attempts to understand the needs and desires of consumers through the integration of strategy, people, technology, and business processes [38]. The main concept of CRM involves the differentiation of individual customers, in order to provide personalized treatment and deliver customized value based on their specific needs [35]. Advantages of CRM for both companies and customers include higher profits, customer satisfaction improvement and loyalty, and maximized customers' lifetime and costs efficiency [35,36]. Furthermore, from a technical perspective, CRM involves the collection and storage of customer data, the analysis of consumers' profit sustainability, and a lifetime value approach to managing customers [39].

The CRM initiatives are high risk [40] and frequently fail to deliver the desired results [34,35,37]. However, a successful of CRM initiatives should depends on support from top management, IT systems integrations, employee training, and substantial customer data [35]. It also requires the adequate allocation of human, organizational, and technological resources for CRM projects [34]. Ideally, customer data should be collected from every transaction, to improve the customer relationship [41]. Reference [42] argued that CRM systems enable two-way communication with the customer that can be used to further enhance the relationship. Moreover, the proliferation of the internet has greatly enabled

the evolution of CRM and the utilization of big data and artificial intelligence as promising avenues for the future development of CRM [39,43,44].

2.2. e-CRM

Ultimately, e-CRM has the same general meaning and concept as CRM. According to Reference [45], CRM is a part of company's strategy to strengthen the relationships between consumers and companies through interaction that benefits both parties and increases their in-value or value-added. Additionally, according to References [46,47], CRM is the entire process of building and maintaining profitable customer relationships that can deliver value and satisfaction for customers. References [23,48] state that CRM is a business approach in understanding and influencing consumer behavior through meaningful communication to increase customer acquisition, retention, loyalty, and profitability. The urgency of CRM is based on the needs of employees or internal companies to communicate or make direct contact with consumers in meeting consumer needs and desires [6].

Along with technological developments, digital business continues to grow rapidly resulting in changes in a company's business operational management, including in the process of building relationships with consumers. The change in relationship management refers to the transformation of CRM to e-CRM to adapt to digital consumer behavior in the current era. Moreover, e-CRM is a company strategy to build relationships with customers online [8,11]. According to Reference [45], e-CRM is a comprehensive business and marketing strategy that relies on the use of the internet. Furthermore, e-CRM emerged as a customer management process due to changes in consumer behavior in making online purchases. A more detailed definition of e-CRM is made by Reference [28], stating that e-CRM is a combination of corporate management commitments to consumer-related software, hardware, processes, and applications. From these definitions, briefly, it can be said that e-CRM is a strategy similar to CRM but controlled by the internet [28].

The ease of use the features and purchasing on the internet and websites can increase consumer expectations from the online-based services, which, according to Reference [25], is influenced by perceived ease of use. Following Reference [49], the ease of consumers' views on the technologies induce an e-CRM to pay attention to designing the features on a website. An e-commerce platform must be able to manage the website design and its features to build an e-CRM experience for its consumers. The change in company activities from CRM to e-CRM brings advantages for both companies and consumers [11]. This advantage generates value for e-CRM activity, which is called e-CRM value.

2.3. e-CRM Value

Several studies stated that there is a lot of value obtained by companies and consumers from the quality improvement of e-CRM. They refer to e-CRM values. The shift from CRM to e-CRM is led by the need for a company's strategies to win the e-CRM value. For companies, e-CRM can eliminate the cost burden needed for direct interaction with consumers. Besides that, it can save time and effort, and reduce administrative and operational costs that directly impact sales performance, by offering a lower price and improving the quality of consumers' interaction, which is not limited to time and space, since the interaction can be carried out 24 h a day without the need for direct company involvement [6,8,50]. Moreover, e-CRM value refers to the satisfaction of consumers for the service provided by a company.

2.4. e-Loyalty

Many studies in the field of marketing attempt to discuss the factors and causes of the formation of consumer loyalty to the company. Customer loyalty can be indicated by repeated product purchases [8]. In another definition [51], a business or a company obtains customer loyalty by building a good communication between vendors and consumers through direct contact. However, along with the development of online businesses such as e-commerce, creating customer loyalty is more difficult and complex since all the interactions

and relationships between consumers and companies are mediated by technology [49,52]. In online-based transactions, loyalty is called electronic loyalty or e-loyalty, which refers to the desire of virtual consumers to intensely or continuously visit certain online shopping websites due to several beneficial factors [14,53]. According to Reference [12], e-loyalty is the consumer's commitment to using a website, e-commerce, or a particular brand when there are many alternative options available. Moreover, e-loyalty is shown by the consistency of consumers using the website features [8] and is also defined as the customer behavior to repeatedly buy products or services at the same store [54–56]. According to Reference [29], e-loyalty refers to the desire of consumers to buy something on a certain website without wanting to turn to another website. Moreover, e-loyalty can be an indicator of achieving e-CRM value for the company and consumers.

2.5. Open Innovation

Innovation is the process of generating new solutions based on the new knowledge that taking the form of product or process innovation [57,58]. The open innovation surpasses the internal boundaries of a company to include all the collaborations with people and external organizations to the company [59]. This includes the involvement of governments, universities, clients, suppliers, and society [60]. The open innovation is conducive to the creation of higher-value products and services and increases the competitiveness for a company [61]. Additionally, open innovation generates the organizations to be more agile, efficient, and responsive [62]. Furthermore, it has been prompted that the advantages of open innovation are not only for the companies but also for the economy, environment, society [63], and sustainability [64].

In practice, open innovation is difficult, and the processes should be specific to each company [65]. Therefore, open innovation should be engrained in a company's core culture [66], where it should be based on the collaboration, openness to the external know-how, constantly embracing the change management, transparency, and readiness for re-engineering [67,68]. Reference [69] established, in a study, that companies would be greatly beneficial from the open innovation by pursuing strategies that increase the legitimacy with the stakeholders [69]. Moreover, the service-sectors companies are also able to innovate in information and communication technology through frequent collaboration with customers and suppliers [63]. Some scholars, such as References [59,70], concluded that large- and medium-sized companies have been shown to be better at open innovation and to be promoted as the successful key factors in business start-ups, as well. Another study from Reference [60] pointed out that e-commerce businesses depend on the utilization of open innovation, in order to stay abreast of changes in consumer demand and technology [60]. In particular, for emerging economies, such as Indonesia's, which tend to have limited internal knowledge bases, the study of Kim et al. (2021) addressed open innovation as a source of competitive advantage by leveraging external sources of greater knowledge.

3. Research Model and Hypothesis

3.1. Research of e-CRM Value

Many previous studies discuss factors related to increasing e-CRM value, including the ones by References [28,71], which examine the security, and Reference [51], which examines the consistency. Reference [8] discusses e-CRM value from nine factors consisting of customization, interactivity, cultivation, care, community, choice, convenience, security, and market response. A study by Reference [45] investigated six factors of e-CRM, including site/mobile customization, alternative offers, local search engines, membership, chat, and mailing lists. Moreover, in research by Reference [16], there are several factors of e-CRM including information quality, customer service quality, fulfillment, online community, integrated marketing channels, ease of navigation, rewards, personalization value, perceived trust, site security, value-added services, and price attractiveness. In another study by Reference [31], regarding the factors of e-CRM on a hotel website, the authors used the 12 previously mentioned factors by Reference [16] and added two additional

factors of reservation tracking and the use of social media features. This study seeks to improve research on the factors of e-CRM value in the number one e-commerce website in Indonesia by analyzing 10 factors: customization, cultivation, rewards, care, online community, choice, convenience, site security, payment options, and personalization values. The research framework used on this study can be seen on Figure 1 below:

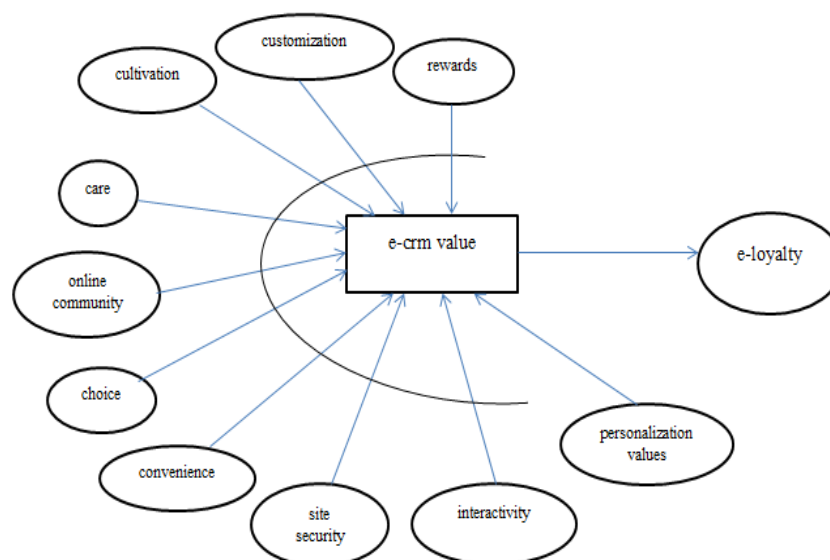


Figure 1. Research framework.

The 10 factors of e-CRM value investigated in this study are defined as follows: The first factor, customization, is related to the design and layout of the features available on the website and the ease to access the website [23]. Interactivity, as the second factor, is related to the active response of website service providers to consumers' inquiries causing easy access to communication [23]. Cultivation refers to the company's efforts in building cross-selling with customers through campaigns or notification so that consumers can stay updated with the information provided by the website [23]. Care is the fourth factor of e-CRM and focuses on researching the needs of customers and providing relevant information in meeting their needs and desires, to reduce any potential disruption in providing services [23]. The online community is a discussion forum that facilitates consumers to interact and to share their experiences of online shopping [23]. Choice refers to the number and variants of products and services available on the website, so that consumers can be more precise in selecting goods or services according to their needs [23]. Convenience refers to the easy and fast access to the website, supported by well-designed features. Rewards can be in the form of promotions, points, coupons, or other programs that can attract consumer interest to return to the website [31]. Security deals with the privacy of data inputted by consumers, in their accounts, on the website, for doing online shopping. Finally, the last factor is personalization values, which relate to the strategy the website implements to invite consumers back to the website that can be monitored from the consumer account as a sign of membership in the e-commerce platform [10,31]. Personalization values allow consumers to choose and design their account on the e-commerce site and determine the most needed and desired products [16]. This study analyzed those factors of e-CRM value with the following hypothesis:

Hypothesis 1 (H1). *The 10 factors positively contribute to e-CRM value.*

3.2. Research of e-CRM and e-Loyalty

Companies need to boost e-loyalty because it is an indicator of profitability and sales performance [8]. Research by Reference [72] states that e-CRM can increase consumer

loyalty to the company. Moreover, e-CRM has become increasingly adopted in many companies as a strategy to create a relationship through platform [15]. Therefore, companies need to maximize their e-CRM strategy by understanding that e-loyalty can be achieved by the increasing of e-CRM value. Research by Reference [23] found a relationship between e-CRM and e-loyalty which was studied from eight dimensions of e-loyalty and found a positive relationship between the two variables. Many studies found the relationship between e-CRM and e-loyalty in various sectors including banking [11,15], hotel [31], and transportation [73]. Meanwhile, according to Reference [7], the e-commerce business in Indonesia has always been increasing and getting more in demand by the public; however, research on e-loyalty is still limited. Therefore, e-commerce companies should analyze and measure the e-CRM value from the 10 factors (customization, cultivation, rewards, care, online community, choice, convenience, site security, payment options, and personalization values) to achieve the e-loyalty. This study analyzed the relationship between e-CRM value and e-loyalty with the following hypothesis:

Hypothesis 2 (H2). *The e-CRM value of the number one e-commerce company in Indonesia has a positive effect on e-loyalty.*

4. Research Method and Result

4.1. Method of Analysis

The analysis of this study is divided into several stages. The first step was to test the reliability of the instrument. Following that, Confirmatory Factor Analysis (CFA) analysis was carried out, using AMOS Software, to determine the validity of each item. The hypothesis was tested, using the Structural Equation Modeling Model (SEM-Model). This is a quantitative study collecting data by distributing online questionnaires, using a Likert scale. The questions were developed based on instrument items applied in previous research regarding the factors of e-CRM value and e-loyalty. All items used the five-point Likert scale ranging from 1 = strongly disagree to 5 = totally disagree. Lastly, this study applied 11 validated scales (see Table 1 for details) adapted from References [12,16,23], and each e-CRM scale has 3 questions, while e-loyalty has 4 questions; thus, the questionnaire consisted of 34 questions.

Table 1. Measurement items.

Scale	Alpha	Reference	Example of Item
Customization	0.679	[23]	<i>The placement of advertisement and promotion on website and application is appropriate.</i>
Cultivation	0.709	[23]	<i>Website and application. frequently send information or notifications that save my time and effort to search particular information.</i>
Rewards	0.761	[16]	<i>The website and application give points that can be exchanged with gifts in an online transaction made through the website and application.</i>
Care	0.610	[23]	<i>The website and application are very welcoming and friendly to each visitor.</i>
Online Community	0.710	[23]	<i>The website and application support me to express my personal opinion and comments.</i>
Choice	0.659	[23]	<i>I am satisfied with the choices of products and services provided on the website and application.</i>
Convenience	0.795	[23]	<i>It is easy for me to complete the payment after logging in to my account on the e-commerce website and application.</i>
Site Security	0.828	[23]	<i>I feel comfortable providing my personal information on the website and app.</i>
Interactivity	0.752	[23]	<i>The search features of the website and application enable me to find the product that I want.</i>
Personalization Values	0.653	[16]	<i>I can make my profile account on the e-commerce website and application.</i>
e-Loyalty	0.905	[12]	<i>Despite much available e-commerce, I prefer to use this website and application for online purchases.</i>

The content in italics is the statements from respondents about the scale of factors or variables.

4.2. Results

4.2.1. Respondent Profile

In total, 780 respondents answered the questionnaire, and after evaluating the data, 767 responses were taken for the next analysis. Table 2 shows the data sample characteristics profile used in this study from 780 respondents. The table shows respondents' profile about gender, region, and frequency of using the e-commerce website. Of the respondents who used the e-commerce site, 37.55% were females and 62.45% were male. A total of 65.58% of the respondents use the e-commerce site 0–10 times per month, which is the highest among the frequencies.

Table 2. Sample characteristics.

Demographic Data	Numbers of Users	Percentages
Gender		
Males	479 persons	62.45%
Females	288 persons	37.55%
Regionals		
Bekasi	90 persons	11.7%
West Jakarta	198 persons	25.8%
Central Jakarta	24 persons	3.13%
South Jakarta	191 persons	24.9%
East Jakarta	78 persons	10.17%
North Jakarta	36 persons	4.7%
Tangerang	150 persons	19.55%
Frequencies using the e-commerce site (per month)		
>30 times	48 persons	6.26%
0–10 times	503 persons	65.58%
11–20 times	168 persons	21.90%
21–30 times	48 persons	6.26%

4.2.2. Sampling Adequacy Test and Factor Analysis

The analysis process was started by performing the reliability test on the instrument. The instrument is regarded as being reliable if the Cronbach alpha value is >0.6 . Based on the reliability test, all variables have a Cronbach alpha value >0.6 ; thus, all items in this study are reliable. To avoid the sample bias and other problems, we employ the Harman's single factor test from the respondents' answers of 34 question listed in questionnaire. The result that is shown in Appendix A Table A3 is 29.43% ($<50\%$) and means that the sample is not biased and can be used for further analysis. The next step was to perform the Explanatory Factor Analysis (EFA) test, to determine the eligibility of the items based on the Kaiser–Meyer–Olkin (KMO) and Bartlett's Test and rotated component matrix. The results can be seen in Table 3. The table shows that the KMO and Bartlett's Test value is 0.849, which indicates a significant factor loading analysis.

Table 3. Kaiser–Meyer–Olkin (KMO) and Bartlett's Test.

Kaiser–Meyer–Olkin Measure of Sampling Adequacy		0.849
Bartlett's Test of Sphericity	Approximate Chi-Square	3711.008
	df	55
	Significance	0.000

Appendix A Table A1 shows that there are 11 components with loading factors >0.5 , while Appendix A Table A2 informs that the eigenvalue for each component >1 indicating that all instrument items used in this study has good scores. Further, the CFA analysis was carried out to determine the validity and feasibility of each item using the

value of standardized factor loadings, t -value, coefficient of determination (R^2), composite reliability, and average variance extracted (AVE). The results of CFA analysis can be seen in Appendix A Table A4. All items have a p -value < 0.05 , with a t -value of > 1.96 for each item, and a factor loading > 0.3 , which indicates that the instrument is valid. In addition, based on the composite reliability, all items have a value of > 0.7 and AVE > 0.5 , which indicates that all items are valid.

4.2.3. SEM-Model Test

Based on the goodness-of-fit model in Appendix A Table A5, this research model is fit based on the chi-square, AGFI (Adjusted Goodness Fit of Index), TLI (Tucker Lewis Index), RMSEA (Root Mean Square Error of Approximation), NFI (Normed Fit Index), CFI (Comparative Fit Index), and GFI (Goodness of Fit Index). Each value indicates that this model can be used to test hypotheses. The next step is using the SEM-Model test to test the hypothesis. t -value > 1.96 and p -value < 0.05 indicate that there is a relationship or influence between the variables [74]. Based on the results of the SEM-Model test, each instrument in this study explains the factors of e-CRM value is acceptable, or, in other words, the rewards, customization, cultivation, care, online community, choice, convenience, site security, interactivity, and personalization values of the number-one e-commerce website in Indonesia positively affect the e-CRM value in using its website and application. It can be seen in Figure 2. Research model results and Table 4 show that rewards have a t -value of 12.793 and direct effects of 0.55 on e-CRM; customization has a t -value (12.954) and direct effect of 0.87 on e-CRM value; cultivation has a t -value (10.561) and direct effect of 0.63 on e-CRM value; care has a t -value (7.886) and has a direct effect of 0.72 on e-CRM value; online community has a t -value (12.716) and direct effect of 0.71 on e-CRM value; choice has t -value (12.366) and direct effect of 0.81 on e-CRM value; convenience has a t -value (18.364) and direct effect of 0.91 to e-CRM value; site security has a t -value (12.363) and direct effect of 0.56 on e-CRM value; interactivity has a t -value (10.726) and direct effect of 0.94 on e-CRM value; and personalization value has a t -value (13.796) and direct effect of 0.75 on e-CRM value. The results of the SEM-Model test are shown in Tables 4 and 5.

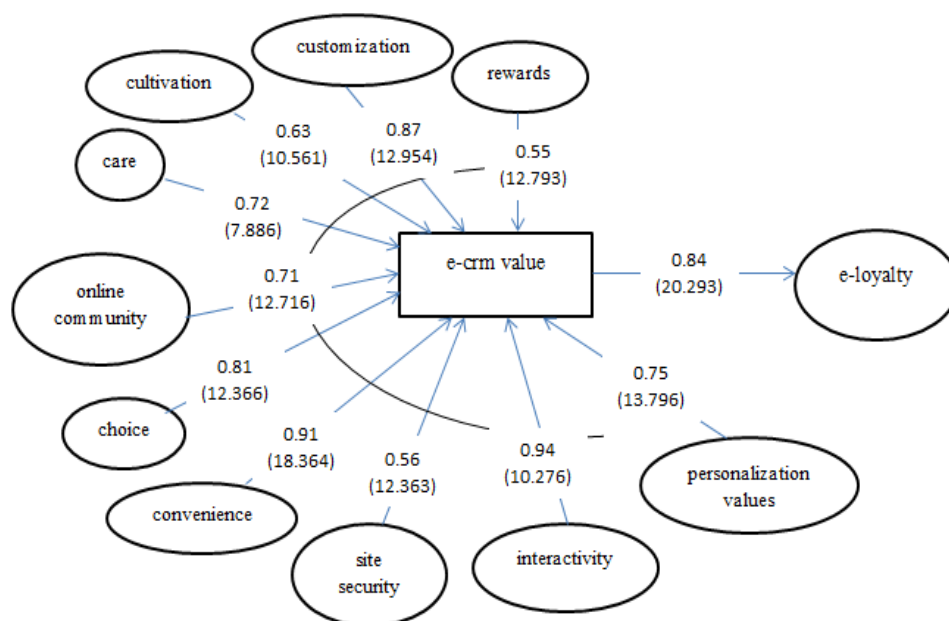


Figure 2. Research model results.

Table 4. Structural Equation Modeling Model (SEM-Model) results.

			Estimate	SE	CR	P	Result	Conclusion
e-Loyalty	<—	CRM	1.017	0.050	20.293	***	<0.05	Positive effect
Cultivation	<—	CRM	0.437	0.041	10.561	***	<0.05	Positive effect
Interactivity	<—	CRM	2.230	0.208	10.276	***	<0.05	Positive effect
Customization	<—	CRM	0.525	0.041	12.954	***	<0.05	Positive effect
Care	<—	CRM	0.335	0.042	7.886	***	<0.05	Positive effect
Community	<—	CRM	0.548	0.043	12.716	***	<0.05	Positive effect
Choice	<—	CRM	0.376	0.030	12.366	***	<0.05	Positive effect
Convenience	<—	CRM	0.584	0.031	18.764	***	<0.05	Positive effect
Security	<—	CRM	0.433	0.035	12.363	***	<0.05	Positive effect
Personalization	<—	CRM	0.476	0.035	13.796	***	<0.05	Positive effect
Reward	<—	CRM	0.696	0.054	12.793	***	<0.05	Positive effect

*** means 0.000, CR means Critical Ratio.

Table 5. Standardized total effects.

	CRM
e-Loyalty	0.842
Reward	0.552
Personalization	0.748
Security	0.560
Convenience	0.907
Choice	0.812
Community	0.708
Care	0.722
Cultivation	0.628
Interactivity	0.943
Customization	0.873

Table 5 shows each factor has a direct effect on e-CRM of >0.5, which means that the 10 factors have a strong contribution toward e-CRM value for the use of the e-commerce website and application. This result also shows that the path coefficient or direct effect values of each factor is positive; the higher the value of the above factors, the more they positively contributed to e-CRM value. The data explain that the strongest influences on e-CRM values were shown by factors of interactivity (0.94), convenience (0.91), customization (0.87), and choice (0.81), which means that it is important to integrate them into the website and application to manage the relationship between the company and the consumers. In conclusion, Hypothesis 1, which stated that the 10 factors (customization, cultivation, care, community, choice, interactivity, rewards, convenience, site security, and personalization) positively contribute to e-CRM value, is accepted.

Moreover, the SEM-Model test in this study found that e-CRM value positively affects e-loyalty in using the e-commerce website and application. The test exhibits the e-CRM value has a *t*-value of 20.293, which means that e-CRM value has a positive direct effect of 0.84 on e-loyalty or, in particular, the e-CRM value can affect e-loyalty by 0.84 or 84%. Thus, Hypothesis 2, which stated that e-CRM value positively affects e-loyalty, is accepted. The final data analysis from this study can be seen in Figure 2, below.

5. Discussion: e-CRM, e-Loyalty, and Open Innovation

Overall, e-commerce business is classified as a new type of the technology-based business model. This type of business model was initially emerged from the transformation of the customer behavior, including the speed of user's experience and the ease of the customers go through the products or services from the company's website and applications. In order to address the need for better user friendliness, the e-Commerce companies are urgently required to develop and implement openness of innovation for feature's website and applications continuously. From the perspective of References [67,68],

open innovation is defined as an internal and external collaboration between the company, users (customers and sellers), and partners that can surpasses the company's capability. Moreover, taking a case study in Germany SMEs (Small Medium Enterprises) [75] and also from European SMEs [76], it is concluded that the openness of an integrated managerial system is considered as a guideline and a provenance of potential strategy to establish the open innovation. Further, the open innovation has a strong relationship with business models and firm strategies [77], a value network in commercialization of new products [78], and interconnecting with several factors, such as family and non-family partners [79], venture management, and market entry barriers [80]; and it has been conducted in different regions and enterprises, such as the Korea SMEs [81], UK SMEs [82], and Belgium SMEs [83].

The theory of open innovation dynamics [84] is started as follows: first, by the firm's culture leadership, as in how the leadership style can influence the company's risk-taking behavior, including bolster new ideas, admit and overcome business failures to create a business sustainability through serial entrepreneurship [85]. Second is the firm's intrapreneurship, as in how the company can be proactive in the renewal of the system, which refers to goods and services innovativeness; customer market information, where the company build a good communication for all stakeholders [86]; and utilizing a large amount of data that can be managed to build new businesses through information and market society [87]. The last one is corporate entrepreneurship, as in how new businesses entry the market by introducing new methods between goods and services in the opportunity of monopoly or bringing the company to be a market leader.

Based on the results section shown above, it can be concluded that the condition of the e-commerce in Indonesia is strongly influenced by the performance of e-CRM value [88]. Customers are differentiated into three levels, as follows: the bottom level (transactional customers), the medium level (greater potential for company's growth and a golden opportunity for competitors, too), and the top level (premium customers as it is the highest contribution of company's profit stream). A study from Reference [89] points out a CRM strategy needs to be able identify the bottom level of customers (transactional) to assist in firm's decision making precisely and to execute the CRM strategy completely and effectively for medium level customers. By the rapidly increasing numbers of e-commerce, the e-commerce companies in Indonesia require the application of the strategy of e-CRM value that contains of 10 factors to retain and upscale the medium level to the top level. This study is not only established the evidence of e-CRM value concern to all factors of the website features development but also illustrates comprehensively how the e-commerce company can obtain loyalty from their customers. On top of that, this study is exhibit e-CRM value is positively affects to the costumer e-loyalty. The website features' development included the *customization*, where the ads and promotions appropriately placed on the website and applications; the *cultivation*, where the website gives notifications about product information; *rewards* for active users; *care*, where the major concern of switching from human customer service to automation; *online community*, where the website provides support for the costumers to express their opinions and suggestion; *choice* of the products availability on the website; *the convenience*, where the successful design that simplifies the process for customers to complete payments; *site security*, where the website provides user security guarantees to the customers so they feel comfortable to give their personal information; the *interactivity* that enables customers to find the products that they are looking for; and *personalization value*, where the website or applications provides recommendations based on the understanding of the user to assist customers in creating their own profile account. When the company applies all of the ten factors of e-CRM value precisely, it leads the customers to use the website or applications consistently over the other e-commerce sites, or, in other words, the e-CRM value generates higher e-loyalty.

In addition, the e-CRM value that builds from the 10 factors are reflections from the innovation of the digital-based enterprise, including the largest e-commerce company in Indonesia, which it adapts from their customer behavior and customer's interest. Furthermore, the higher e-CRM value is the higher e-loyalty indicates the customer loyalty

deriving from how the company creates the e-CRM value through their website development innovations. The concept of open innovation can be described as the process of building a value for customers as a specific task by the company, which includes collaboration [90,91] between companies and consumers. Moreover, most of the e-commerce sites in Indonesia are digital start-up business that can be identified as part of the open innovation in an industry that operates based on awareness of the changing consumer behavior, which is currently digitalized by the technology of the internet of things [92,93]. Therefore, to build a successful e-CRM value, especially in the e-Commerce sector, companies should focus not only on the 10 factors of e-CRM value but also on the open innovation in the website development to achieve a greater e-loyalty.

6. Conclusion and Contributions

This is the first study comprehensively analyzing e-CRM values from 10 factors (customization, interactivity, rewards, care, choice, online community, convenience, personalization, site security, and cultivation) that positively affect the e-loyalty in the number one e-commerce website in Indonesia, a country with the largest market share in South-east Asia region (Global e-Commerce Market Ranking 2019). This study also empirically concluded that increasing the e-CRM value has a positive impact on e-loyalty. Among the ten factors used to measure the e-CRM values, the four strongest factors were interactivity, convenience, customization, and choice.

This research contributes knowledge to consumer relationship management in e-commerce, which is currently urgently needed by modern society in selling and purchasing products or services. For this reason, this study sought to provide a discussion of the e-CRM value of e-commerce in Indonesia with millions of customers and a high interest in the website or application features to attain e-loyalty. The findings of the study should be followed up, to develop a better e-CRM strategy through the improvement of the quality of customization, rewards, interactivity, care, community, choice, cultivation, convenience, personalization values, and site security of websites and e-commerce applications, to increase consumer loyalty.

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Appendix A

Table A1. Rotated component matrix ^a.

	Items	Component										
		C	I	CU	CA	CO	CH	CN	SE	PER	RE	LO
Customization (C)	C1	0.814	0.057	0.046	0.216	0.110	−0.034	0.142	0.033	0.142	0.063	−0.135
	C2	0.520	0.431	0.245	−0.174	0.023	0.169	0.350	0.145	−0.002	−0.074	0.309
	C3	0.631	0.074	0.001	0.144	0.135	0.421	0.216	−0.055	0.084	−0.017	0.049
Interactivity (I)	I1	0.418	0.584	0.164	0.053	0.252	0.305	0.302	0.113	0.215	0.135	0.044
	I2	0.136	0.701	0.079	0.047	0.037	0.384	0.358	0.125	0.013	−0.018	0.094
	I3	0.098	0.618	0.195	0.290	0.290	0.091	0.103	0.089	0.165	0.004	−0.204
Cultivation (CU)	CU1	0.146	0.046	0.783	0.200	0.145	0.137	0.080	0.144	−0.013	0.016	0.040
	CU2	0.034	−0.014	0.531	−0.044	−0.074	0.057	−0.076	−0.106	0.075	0.838	−0.022
	CU3	−0.031	0.287	0.679	0.154	0.291	0.073	0.189	0.038	0.214	0.207	0.001
Care (CA)	CA1	−0.011	0.065	−0.027	0.667	0.129	0.038	0.035	0.065	0.041	0.564	0.091
	CA2	0.171	0.126	0.170	0.739	0.114	0.052	0.233	0.156	0.178	−0.177	−0.108
	CA3	0.184	0.052	0.274	0.597	0.065	0.350	0.204	0.082	0.047	−0.201	0.076
Community (CO)	CO1	−0.148	0.131	−0.085	−0.057	0.669	0.290	0.121	0.186	0.093	0.089	0.251
	CO2	0.165	−0.123	−0.064	0.116	0.603	0.119	0.159	−0.043	0.304	−0.134	0.311
	CO3	0.181	0.130	0.134	0.115	0.654	0.072	0.152	0.137	0.102	0.183	0.320
Choice (CH)	CH1	0.171	−0.055	0.148	0.195	0.124	0.556	0.122	−0.067	0.153	0.094	0.344
	CH2	−0.043	0.150	0.053	0.001	0.017	0.647	0.408	0.109	0.058	−0.075	−0.089
	CH3	0.132	0.275	0.034	0.126	0.069	0.793	0.103	0.109	0.100	0.049	−0.028
Convenience (CN)	CN1	0.189	0.021	0.196	0.107	0.078	0.510	0.592	0.147	0.142	0.098	−0.062
	CN2	0.286	0.130	−0.064	0.070	0.118	0.355	0.602	0.050	0.173	0.038	−0.402
	CN3	0.186	0.109	−0.016	−0.138	0.114	0.442	0.593	0.090	0.215	0.099	−0.316
Security (SE)	SE1	−0.056	0.054	0.051	0.163	0.141	0.061	0.021	0.818	0.091	−0.019	0.043
	SE2	−0.004	−0.030	0.166	0.000	0.094	0.167	0.161	0.847	0.109	−0.005	−0.078
	SE3	0.173	0.202	−0.059	0.065	0.207	−0.024	0.235	0.769	0.228	−0.050	0.031
Personalization (PER)	PER1	0.081	0.092	−0.016	0.121	0.062	0.016	0.206	0.129	0.758	0.028	0.054
	PER2	0.040	−0.007	−0.019	0.042	0.123	0.223	0.047	0.155	0.721	0.123	−0.014
	PER3	0.139	0.151	0.421	0.050	0.161	0.100	0.193	0.146	0.586	−0.084	−0.050

Table A1. Cont.

	Items	Component										
		C	I	CU	CA	CO	CH	CN	SE	PER	RE	LO
Reward (RE)	RE1	0.051	0.165	0.247	0.109	−0.001	−0.108	0.110	0.127	0.007	0.762	−0.151
	RE2	−0.036	0.088	0.020	0.191	−0.049	−0.018	−0.055	0.088	−0.087	0.798	−0.233
	RE3	0.249	−0.033	0.195	−0.129	−0.059	0.132	0.107	0.107	0.236	0.687	−0.081
e-Loyalty (LO)	LO1	0.295	0.284	0.266	0.248	0.481	0.377	0.357	0.298	0.306	0.128	0.821
	LO2	0.212	0.012	0.071	0.054	0.083	0.081	0.010	0.132	−0.001	0.025	0.745
	LO3	0.060	0.163	0.194	0.291	0.190	0.066	−0.076	0.131	0.036	0.023	0.801
	LO4	0.055	0.198	0.037	0.149	0.162	0.210	−0.010	0.092	0.202	0.077	0.855

^a Determinant = 0.008, the bold face shows the loading factor of measurement items on the constructs.

Table A2. Total variance explained.

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	16.504	35.879	35.879	16.504	35.879	35.879	6.288	13.669	13.669
2	4.230	9.197	45.075	4.230	9.197	45.075	5.387	11.712	25.381
3	2.839	6.173	51.248	2.839	6.173	51.248	4.271	9.284	34.666
4	2.504	5.444	56.692	2.504	5.444	56.692	3.484	7.575	42.241
5	2.038	4.430	61.123	2.038	4.430	61.123	3.180	6.912	49.153
6	1.806	3.926	65.048	1.806	3.926	65.048	3.107	6.755	55.908
7	1.765	3.838	68.886	1.765	3.838	68.886	2.914	6.334	62.242
8	1.672	3.634	72.520	1.672	3.634	72.520	2.627	5.710	67.952
9	1.285	2.792	75.312	1.285	2.792	75.312	2.600	5.651	73.604
10	1.122	2.438	77.751	1.122	2.438	77.751	1.671	3.633	77.236
11	1.052	2.288	80.038	1.052	2.288	80.038	1.289	2.802	80.038

Extraction Method: Principal Component Analysis.

Table A3. Total variance explained (Harman's Single Factor Test).

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	10.646	31.311	31.311	10.007	29.432	29.432
2	2.929	8.614	39.925			
3	1.944	5.717	45.642			
4	1.700	4.999	50.641			
5	1.511	4.444	55.085			
6	1.376	4.047	59.132			
7	1.262	3.711	62.843			
8	1.204	3.541	66.384			
9	1.049	3.084	69.468			
10	0.984	2.894	72.362			
11	0.855	2.515	74.877			
12	0.819	2.410	77.287			
13	0.764	2.248	79.535			
14	0.701	2.063	81.597			
15	0.645	1.898	83.495			
16	0.599	1.763	85.258			
17	0.576	1.695	86.953			
18	0.498	1.465	88.418			
19	0.483	1.421	89.839			
20	0.454	1.334	91.173			
21	0.390	1.147	92.321			
22	0.342	1.007	93.328			
23	0.299	0.881	94.208			
24	0.288	0.849	95.057			
25	0.253	0.746	95.802			
26	0.237	0.697	96.499			
27	0.226	0.666	97.165			
28	0.185	0.546	97.710			
29	0.165	0.485	98.195			
30	0.153	0.449	98.644			
31	0.146	0.430	99.073			
32	0.128	0.375	99.449			
33	0.108	0.319	99.767			
34	0.079	0.233	100.000			

Extraction Method: Principal Axis Factoring.

Table A4. Confirmatory Factor Analysis (CFA) results.

Latent Construct	Standardized Loadings	t-Values	R ²	Cronbach's Alpha	Composite Reliability	AVE
Customization				0.679	0.712	0.53
X1.1	0.647	13.809	0.400			
X1.2	0.722	13.809	0.522			
X1.3	0.647	12.989	0.419			
Interactivity				0.752	0.763	0.635
X2.1	0.848	23.382	0.720			
X2.2	0.735	23.382	0.541			
X2.3	0.562	16.494	0.316			
Cultivation				0.709	0.725	0.579
X3.1	0.593	5.273	0.352			
X3.2	0.403	5.273	0.441			
X3.3	0.941	13.933	0.886			
Care				0.610	0.789	0.629
X4.1	0.380	9.347	0.447			
X4.2	0.775	9.347	0.353			
X4.3	0.719	9.247	0.575			
Community				0.710	0.715	0.54
X5.1	0.669	14.302	0.345			
X5.2	0.594	14.302	0.601			
X5.3	0.758	17.443	0.516			
Choice				0.659	0.716	0.539
X6.1	0.620	12.402	0.604			
X6.2	0.637	12.402	0.790			
X6.3	0.766	13.584	0.847			
Convenience				0.795	0.811	0.721
X7.1	0.626	18.355	0.522			
X7.2	0.824	18.355	0.429			
X7.3	0.841	18.593	0.592			
Security				0.828	0.826	0.617
X8.1	0.658	18.172	0.458			
X8.2	0.776	18.172	0.568			
X8.3	0.903	18.982	0.638			
Personalization Value				0.653	0.711	0.529
X9.1	0.648	10.566	0.603			
X9.2	0.608	10.566	0.815			
X9.3	0.753	13.067	0.300			

Table A4. Cont.

Latent Construct	Standardized Loadings	t-Values	R ²	Cronbach's Alpha	Composite Reliability	AVE
Reward						
X10.1	0.799	19.615	0.680	0.761	0.770	0.641
X10.2	0.722	19.615	0.707			
X10.3	0.655	17.685	0.433			
E-Loyalty				0.905		
X11.1	0.770	23.107	0.470		0.76	0.692
X11.2	0.777	23.107	0.406			
X11.3	0.889	27.244	0.587			
X11.4	0.920	28.370	0.392			

AVE, average variance extracted.

Table A5. Model fit.

	χ^2	df	χ^2/df	GFI	AGFI	CFI	TLI	NFI	RMSEA
Model Fit			<3.00	0–1	>0.8	>0.9	>0.8	>0.9	<0.08
CFA Model	1020.6	359	2.843	0.809	0.836	0.952	0.809	0.9	0.079
SEM Model Fit	945.06	305	2.810	0.849	0.834	0.904	0.862	0.921	0.074

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