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A new model to evaluate the success of electronic customer relationship management systems in industrial marketing: the mediating role of customer feedback management

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New technologies are making industries and firms alter their main processes into digital processes for realizing sustainable marketing objectives in the digitalization age. Therefore, Electronic Customer Relationship Management (E-CRM) has become very important as the newest term in the customer-oriented organization. This paper tries to propose a model to examine the effect of buyer behaviors, consumer-driven innovation, product lifecycle management, and customer feedback management on the success of E-CRM. Structural Equation Modeling (SEM) was utilized to analyze the paths of the proposed method, and research data are collected and evaluated using SMART PLS 3.2. The study sample includes 330 participants, with a useful 85% response rate. Current research meaningfully supplies learning and literature by focusing more on the performance of E-CRM systems, examining the related important aspects, and applying advanced statistical analysis techniques. The outcomes indicated that buyer behaviors and consumer-driven innovation positively affect the customer feedback management and success of E-CRM. Besides, the outcomes illustrated that the function of product lifecycle management on customer feedback management was significant. Organizations can obtain competitive advantages from the increased effectiveness of the E-CRM. By identifying the aspects of a successful E-CRM, managers can effectively improve appropriate strategies in addressing the organization's customers.

Keywords: Buyer behaviors; industrial marketing; consumer-driven innovation; product lifecycle; customer feedback management; E-CRM

1. Introduction

The concept of e-commerce is defined as the conduct of online commercial transactions which can realize the online sale, delivery and payment of goods and services. Thus, it includes various technologies, including mobile commerce, Internet marketing, supply chain management, electronic funds transfers and online transaction processing (Alamdari et al., 2022). Industrial marketing has been a foundation term in the progress of trade selling perception recently (Brychkov & Domegan, 2017; Garner, 2019). Trade selling contains a task set like creating novel client connections, preserving current relations, discovering novel trading and generating customer insights (Ebrahimian et al., 2018; Ritter & Geersbro, 2018). Today, many industries are competing for reinstating their relations with new and current clients to enhance lifetime customer loyalty (Chih-Hung et al., 2019). Some businesses are competing efficiently and winning this competition by means of a new human resource management tools (Vahdat, 2021) and employing technology-

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based Customer Relationship Management (CRM) (Chen & Popovich, 2003). Creating a robust relationship between the customers and the company in industrial marketing is serious for organizational success (Jalili & Ghadimi, 2016; Saeedi et al., 2019). Many papers suggested that a company adjust its CRM activities based on customer value (Thakur & Workman, 2016). CRM is ‘a comprehensive methodology and mechanism that helps a company recognize, attract, maintain and nurture productive clients by creating and sustaining long-term partnerships with them’ (Badwan et al., 2017). It has been considered only as a method that is originated from the requirement to build a novel trade setting that provides an efficient relationship with customers based on the principles of cooperation (Nyadzayo & Khajehzadeh, 2016; Rahimi & Kozak, 2017). CRM can use IT and the related trading possibility policies to build useful and semi-permanent relations with clients and other main mortgagers (Gollou & Ghadimi, 2017; Payne & Frow, 2005). It has been a tactical trade method that has been supported by a connection trading viewpoint (Dewnarain et al., 2019).

Based on the emergence of the technology relying on the Internet, E-CRM develops the customary CRM methods by mixing the business application technologies and the total enterprise CRM strategy (Galvão et al., 2018). Both CRM and E-CRM devices contain many common features that assist business-client interplays (Kim et al., 2002). Many businesses currently understand the position of CRM and its potential to sustain a competitive edge (La Rocca et al., 2019). These organizations have previously changed their business processes and offered technology solutions that enable them to obtain novel clients, preserve current customers and improve their lifespan worthiness (Heller Baird & Parasnis, 2011; Sanayei & Rajabion, 2012). A set of procedures and notions that let an establishment attain the highest amount from e-business assets can be done by E-CRM (Sue Scullin et al., 2004). From an industrial marketing perspective, E-CRM can be observed as marketing. It is a form of software application that can manage customer relationships on the Internet. The business can utilize the application of E-CRM as a method for being more aware of clients’ requirements and behaviors for strengthening relationships with them (Sophonthummapharn, 2009).

There is clearly a requirement to improve a better thought of E-CRM success. This study’s main goal is to improve a complete research structure for specifying key invoices on E-CRM success. It has been estimated that results may supply good conduction toward marketing policy-makers and personal organizations that intend to improve the E-CRM applications’ admission, particularly in the Tourism sector. Since many researchers have discussed the success of the E-CRM by focusing on trust, quality of service and customer satisfaction, there is limited research exploring the relationship between the success of the E-CRM and buyer behaviors, consumer-driven innovation and product lifecycle management. Therefore, this research aims to improve the success of E-CRM employing customer feedback management and find effective activities in this process. Briefly, the research question is ‘Which factors are significant in the success of the E-CRM using the customer feedback management?’. The main goals of this paper are:

- Presenting a structure and a model to define the important factors for the prosperous execution of the E-CRM;
- Examining the roles of buyer behaviors, consumer-driven innovation and product lifecycle management on customer feedback management.
- Evaluating the customer feedback management effect on E-CRM success.

The literature is reviewed and hypotheses are made in the next section. In Section 4, the research methodology is explained. After that, in Sections 5 and 6, the study findings, discussion and implications are explored. Eventually, we come to a conclusion and discuss the study's limitations.

2. Literature review

The fast development of technology causes companies to alter their infrastructures periodically (Kang & Shin, 2016) and attend to the risk awareness model and digital economic growth (Chen et al., 2021). Industrial companies can manage their relationship with clients in a more effective and operative technique (Sigala, 2018). With the arrival of the Internet and novel technologies, another CRM implication has been created and turned into Web-based CRM or E-CRM. It includes the whole processes required to become acquired, built and maintain client connections employing e-business operations (Azila & NoorNeeraj, 2011; Salojärvi et al., 2015). Industrial organizations and marketing businesses worldwide have understood the potential of the Internet as a tool for CRM (Sujitha & Johnson, 2017). Today, customer satisfaction is the primary objective of the marketing industry. Unless all of the customers' marketing needs are not taken care of adequately by the organization, they cannot be survived in the globalization era. The rest of this section offers a concise overview of the most important CRM and E-CRM studies in the area.

Mokha and Kumar (2022) looked into the influence of E-CRM on customer loyalty in the banking business, considering the mediating impacts of customer experience and satisfaction. The Stimulus-Organism-Response (S-O-R) model was used to investigate the variable connections in this investigation. After that, the data was evaluated using AMOS' structural equation modeling software (SEM). Customer experience and pleasure found to be a mediating factor in the link between E-CRM and customer loyalty, according to the findings.

Khanh et al. (2021) looked at the impact of organizational characteristics on the effectiveness of E-CRM adoption. The data for this study was gathered by a questionnaire survey. The causal links between organizational characteristics, customer orientation, data quality, knowledge management and CRM strategy were investigated using correlation analysis and SEM. The findings revealed that organizational characteristics have an impact on e-CRM performance.

In Saudi Arabia, Salameh et al. (2020) looked at the impact of customer satisfaction, commitment, trust and profitability on E-CRM. This study was based on a quantitative cross-sectional questionnaire survey with 319 participants, which was used to conduct the analysis. Customer satisfaction, trust, profitability and commitment all have a substantial impact on eCRM, according to the findings.

Sumartono and Handayani (2020) focused on the impact of performance and compliance development on the Product Life Cycle using CRM mediation (PLC). The study's participants are all Batik Madura SMEs on Madura Island. The findings demonstrated that both performance and conformance innovation have an impact on the product life cycle, and mediating the effect of CRM on the product life cycle. CRM, on the other hand, has no direct impact on the product life cycle of Madura batik items.

Al-Dmour et al. (2019) developed an integrated structure to search the effects of E-CRM success on customer satisfaction, trust and retention. Consequences illustrated that the procedure fitness, client data modality, and device backing influenced customers' consent, confidence, and preservation. Additionally, the results showed that client consent

and confidence affirmatively affected the preservation of the customer. Finally, outcomes showed that the mentioned factors positively influence financial performance.

Diffley et al. (2018) examined the important invoices originating from communal CRM procedures in the hotel domain. The results showed that hotels' communal CRM actions could improve hotel task alternation actions. It affirmatively influences the capability to extend a client-linking strength, leading to superior stages of client efficiency.

Also, Sigala (2018) debated the CRM alternation that is driven from technology into public CRM. The results showed that by taking a worth co-building method recognizing the client authorization developed by technology, the public CRM focuses on migrating through relation leadership to connection superintendence. The execution of social CRM has to backup and raise conversation simplification and client candidacy in co-building client skills through the current manner.

Jamali et al. (2017) assessed the impact of E-CRM execution on consent and fidelity. Inferential and descriptive statistic methods like Spearman and Pearson correlation coefficient, correlation analysis and linear regression were employed through SPSS to examine information. The results showed that E-CRM execution has an affirmative and vital influence on customers' consent and fidelity.

Furthermore, Sunny and Abolaji (2016) described how e-shopping could influence the marketing efficiency of companies in telecommunication manufacturing. The results showed that an affirmative connection exists among prognosticator variables and the efficiency of marketing. It also showed that e-service quality, mobile CRM and Internet-based CRM impact the market performance of Internet Services Provider (ISP) firms.

Besides, Chen et al. (2011) analyzed and examined the associations among E-CRM, consumer value and innovation power in the electrical and electronics market in Taiwan. The study results found a direct and indirect positive effect on workforce service, E-CRM, product image value, value and potential for creativity.

Finally, Harrigan et al. (2009) developed experimental proof on the duty of Internet technologies in CRM operations of Irish Small-And Medium-Sized Enterprise (SMEs). They showed the fact that SMEs are executing vital E-CRM functions. The results showed that firms that serve universal shopping want to substitute higher importance on E-CRM. They are obtaining better influences. These pros vary from improved service for clients, elevated sales, enhanced profitability and reduced business cost.

Based on the provided comprehensive review of the state-of-the-art, Table 1 shows the used variables in the proposed and related models.

3. Research hypotheses and model

Successful E-CRM is a part of the main reasonable benefits that any business is able to misuse to prohibit consumers from tending toward another business (Chiang, 2019; Kımlıoğlu & Zaralı, 2009). E-CRM helps organizations minister to their customers through a better method by guiding and categorizing their information (Al-Dmour et al., 2019; Yang et al., 2020). Providing a novel plan to identify impressive invoices for E-CRM success is the objective of this part. Figure 1 illustrates the conceptual model. Six hypotheses have been indicated to test the connections between framework parts in the current part. To recognize the effective determining invoices for the prosperity of E-CRM, a summary of the significant modern study is supplied in the remaining research. Based on the previous investigations, four variables, including buyer behaviors, consumer-driven innovation, product lifecycle management and customer feedback management, are discussed.

Table 1. Identification of the important variables.

Reference	Variables				
	Buyer behaviors	Consumer-driven innovation	Product lifecycle management	Customer feedback management	Success the E-CRM
Mokha and Kumar (2022)	*				*
Khanh et al. (2021)		*	*		*
Salameh et al. (2020)		*		*	*
Sumartono and Handayani (2020)		*	*		*
Al-Dmour et al. (2019)	*	*			*
Diffley et al. (2018)				*	*
Sigala (2018)		*		*	*
Jamali et al. (2017)	*				*
Sunny and Abolaji (2016)	*				*
Chen et al. (2011)		*			*
Harrigan et al. (2009)	*			*	*
The Proposed Model	*	*	*	*	*

(*) shows the used variables in the proposed model and related works.

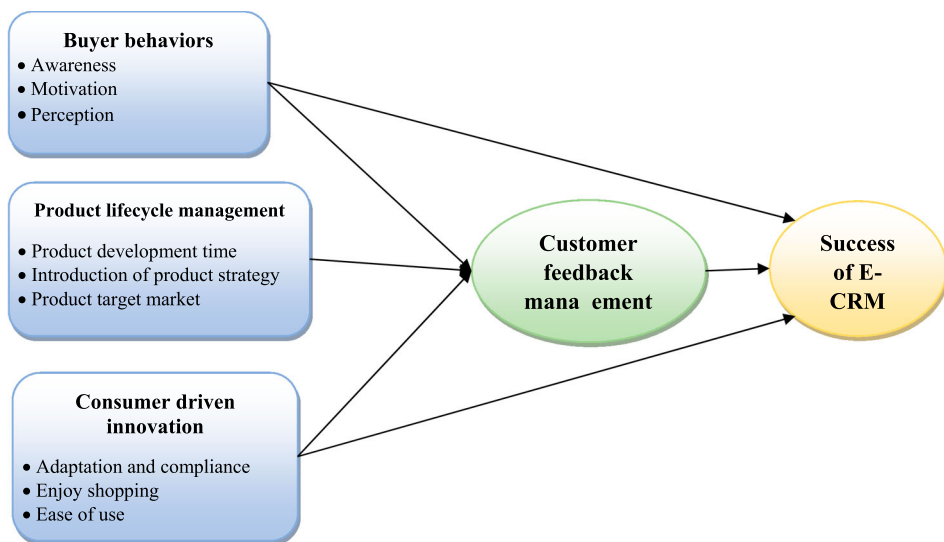


Figure 1. Research model.

3.1. *Buyer behavior*

Buyer behavior of customers is the concept of several studies, mainly in the area of marketing (Huang et al., 2015; Veronika, 2013). Buyer behavior theories contribute to our understanding of buying behavior (Huang et al., 2015; Kokkinaki, 2015). The related issues are already considered directly or indirectly by some guidelines in the historical development of management (Dang et al., 2019; Etco et al., 2017). Buyer behaviors can include awareness, motivation and perception. *H1* and *H2* try to test the effect of buyer behaviors on customer feedback management and the success of E-CRM.

H1. Buyer behaviors have a positive influence on the success of E-CRM.

H2. Buyer behaviors have a positive influence on customer feedback management.

3.2. *Product lifecycle management*

Usually, lifecycle management includes three levels: Beginning Of Life (BOL) which comprises scheme and construction, Middle Of Life (MOL) that contains utilization, functions, and preservation, and End Of Life (EOL) that contains disassembling, reconstruction, re-using and arranging the product (Zhang et al., 2017). Product lifecycle management can control supplies from the start of their durability to the life terminal, comprising progress by formation and puberty (Zheng et al., 2018). Product lifecycle management aims to raise outcome efficiency, decrease the costs related to the product, increase the product status worth, and enhance the worth of contemporary and subsequent outcomes for shareholders and clients (Stark, 2020). Product lifecycle management includes product development time, the introduction of product strategy and product target market. *H3* tries to test the effect of product lifecycle management on customer feedback management.

H3. Product lifecycle management has a positive influence on customer feedback management.

3.3. *Consumer-driven innovation*

The client-oriented merchandizing implication motivates an increasing number of businesses to make advanced services and yields according to consumers' and customers' perceived values (Zhang & Hou, 2017). Some researchers have received a consumer-centric view on consumers' perceptions of new products (Busalim & Ghabban, 2021; Wang & Kim, 2017). Innovation in the product has received the researcher's attention toward consumer perception (Sinha, 2017). Consumer-driven innovation includes adaptation and compliance, enjoy shopping and ease of use. *H4* and *H5* try to test consumer-driven innovation's effect on customer feedback management and E-CRM success.

H4. Consumer-driven innovation has a positive influence on customer feedback management.

H5. Consumer-driven innovation has a positive influence on the success of E-CRM.

3.4. *Customer feedback management*

Customer feedback can recognize problem areas and generate ideas for service enhancements (van Heerde et al., 2019; Wirtz et al., 2010). *H6* tries to test the effect of customer feedback management on the success of E-CRM.

H6. Customer feedback management has a positive influence on the success of E-CRM.

H7. Customer feedback management mediates the effects of buyer behaviors, product lifecycle management and consumer-driven innovation on the success of E-CRM.

In [Figure 1](#), the conceptual model has illustrated describing the elements of the accomplishment of E-CRM.

4. Research methodology

Gefen et al. (2000) suggested that investigators utilize route examination to simultaneously analyze numerous sample routes because normal statistical examination processes like linear regression, ANOVA, factorial investigation and multiple regression analysis only examine the single routes (Hewitt, 2010). In order to analyze assessment information, PLS analysis has been utilized in information systems investigation (Chin et al., 2003). This paper uses SEM to analyze all paths among latent variables. This research uses SMART PLS version 3.2. The following paragraphs describe the data collection and analysis instrument methods in depth.

4.1. Research instrument

To realize current research objectives, a quantitative method has been employed. A questionnaire has been developed according to the proposed model, extensive literature review and comparison with recent validated surveys (see [Table 2](#)). A 5-point Likert scale was employed to enhance the distinction between different levels. Besides, specialists were invited to comment on the general organization and design of the tool. The replies indicated only improvements of minor formatting. More reviews were rendered following small improvements by two other specialist academics. In addition, the PLS was used as a data analysis technique to determine causality among variables in the analysis. PLS was utilized to forecast and establish hypotheses (Andihka et al., 2016; Vățămănescu et al., 2020).

4.2. Sampling and data collection

The data gathering was performed with the workers of the traveler agencies of China. This selection is because this organization has high concentrations of E-CRM systems' users. Traveler agencies are considered as a developed region in China with up-to-date infrastructure based on Internet connectivity. It is rational to assume that the majority of them are technology-based and active E-CRM systems users. The G*Power tool was utilized to assess the sample size's appropriateness. It's a standalone power analysis application for several common statistical tests in the behavioral, social and biological sciences (Faul et al., 2009). Using suggested minimum values (α value of 0.05, a power of 0.95 and effect size of 0.3), the a priori G* Power calculation indicated that a sample size of 220 would be required. From the 384 sets of returned questionnaires, only 330 sets are useable. So the sample size is good. A non-probability purposive sampling method was conducted to select representative respondents.

5. Research results

Smart PLS 3 is a common PLS approach for analyzing structural and measurement models (Gardas & Navimipour, 2021). PLS requires a modest sample size that does not constrain the distributions of the variable. Smart PLS 3 is regarded as an acceptable instrument in this investigation. The entire procedure is carried out in two steps, as shown in [Table 3](#) (Boubker & Douayri, 2020). The first is to analyze the measurement models' validity and reliability, and the second is to assess their fit. The next two sections show examples of the models' results.

Table 2. Scale items.

Constructs	Items	Questions	Scale
Buyer behaviors	BB1	Customers have enough awareness to use E-CRM systems.	1 (strongly disagree)
	BB2	The buy motivation of customers is based on their experiences in receiving a good product or service.	2 (disagree) 3 (no idea) 4 (agree)
	BB3	Having perception can make the best use of E-CRM systems.	5 (strongly agree)
	BB4	Customer buying behavior analysis is a management strategy for success.	
Product lifecycle management	PLM1	Product life cycle management affects customer feedback management and the success of E-CRM.	1 (strongly disagree) 2 (disagree)
	PLM2	My company's strategy is to develop a product or service tailor-made to customers' needs.	3 (no idea) 4 (agree)
	PLM3	How to introduce a product or service is a success of the E-CRM strategy.	5 (strongly agree)
	PLM4	Using technology will help identify the target market.	
Consumer-driven innovation	CDI1	Consumer-based innovation has an impact on customer feedback management and the success of E-CRM.	1 (strongly disagree) 2 (disagree)
	CDI2	My company's strategy is to adapt and compliance products and services to customers' needs.	3 (no idea) 4 (agree) 5 (strongly agree)
	CDI3	Customers re-use E-CRM systems if they are enjoyed shopping.	
	CDI4	Client-centric services have an impact on the success of E-CRM.	
Customer feedback management	CFM1	To achieve success, the company has long-term strategic planning.	1 (strongly disagree)
	CFM2	Communications in our company are reciprocal.	2 (disagree)
	CFM3	All people in the organization have fully understood the strategies.	3 (no idea) 4 (agree)
	CFM4	Customer feedback management affects the success of electronic customer relationship management.	5 (strongly agree)
Success of the E-CRM	ECRM1	E-CRM systems services are always available.	1 (strongly disagree)
	ECRM2	The training programs reduce the cost of implementing E-CRM systems.	2 (disagree)
	ECRM3	By using new technologies in the organization, employees have more control over their work.	3 (no idea) 4 (agree)
	ECRM4	Users of E-CRM systems in this organization tend to use new electronic services.	5 (strongly agree)
	ECRM5	The structure of E-CRM systems is appropriate in terms of innovation.	
	ECRM6	Creating infrastructural capabilities to gain a competitive advantage is essential.	

5.1. Measurement model

To evaluate the features of the calculation measures, we have improved Confirmatory Factor Analysis (CFA) to measure discriminant validity, reliability and convergent validity. 0.5 is an acceptable amount for AVE, i.e. a hidden variable can define an amount

higher than 50% of the variance of its observed variables (Mosleh & Nosratabadi, 2015; Rajabion et al., 2019). The composite reliabilities have been higher than 0.7, and all constructs' AVEs are again more than 0.5 (Ramayah et al., 2017). Also, for the whole used structures, Cronbach's alpha has been observed more than 0.7, proposing a great internal reliability level (Pal et al., 2018; Tenenhaus et al., 2005) (See Table 4).

Discriminant validity is calculated using the AVE numbers square root of the parallel instructions. It has to contain an amount more than the correlation between all latent variables (Fornell & Larcker, 1981). Every AVE value is made up of construct and expected root of correlations for each pair, illustrated in Table 5.

Heterotic-Monotrait Criteria Analysis (HTMT) must meet the requirement that the HTMT value should be greater than HTMT 0.85 (Kamis et al., 2020). Based on Table 6, it is found that the HTMT values of the constructs tested met the analysis criteria by obtaining less than one value. This showed that the relationship between constructs was vehemently weak, verifying discriminant validity for each construct tested.

Table 3. PLS Path modeling procedure.

Steps	Criteria	Accepted value
<i>Step 1. Evaluation of the measurement models (outer model)</i>		
Convergent validity	Individual item reliability	Cronbach's $\alpha > 0.7$
	Composite reliability	CR > 0.7
	Factor loadings	Loadings > 0.7
	VIF	VIF ≤ 3
	Average variance extracted	AVE > 0.5
Discriminant validity	Variable correlation (root square of AVE)	The AVE of each latent construct should be higher than the construct's highest squared correlation with any other latent construct.
	Cross loadings	The loading of an indicator on its assigned latent variable should be higher than its loadings on all other latent variables
	heterotrait-monotrait ratio of correlations (HTMT)	HTMT < 0.85
Measurement model fit	Standardized root mean square residual (SRMR)	SRMR < 0.08
<i>Step 2. Evaluation of the structural model (inner model)</i>		
Coefficient of determination of endogenous constructs (R-square)	$R^2 < 0.19$	Unacceptable
	$0.19 \leq R^2 < 0.33$	Weak
	$0.33 \leq R^2 < 0.67$	Moderate
	$R^2 \geq 0.67$	Substantial
Predictive relevance (Q^2)	$Q^2 > 0$	Acceptable validity
	$Q^2 < 0$	No validity
Hypotheses Testing (Path Coefficient & t -value)	t -value = 1.96. Sig. at p -value < .05*; t = 2.58. Sig. at p -value < .01**; t = 3.29. Sign. at p -value < .001***	
Goodness of Fit of the Model (GoF) $GOF = \sqrt{AVE * R^2}$	GoF < 0.10	No fit
	$0.1 \leq GoF < 0.25$	Small
	$0.25 \leq GoF < 0.36$	Medium
	GoF ≥ 0.36	Large

5.1.1. *Common method bias*

Standard method biases can arise from a variety of factors, including social desirability and the consistency theme (Liang et al., 2007). The measuring technique utilized in a SEM investigation, not the network of causes and effects in the model being examined, causes common method bias in the PLS-SEM. A VIF of larger than 3.3 is suggested as a sign of pathological collinearity, as well as a sign that a model might be polluted by common technique bias. As a consequence, if all VIFs obtained from a comprehensive collinearity test are equal to or less than 3.3, the model is free of standard method bias (Kock, 2015) (See Table 7).

5.2. *Structural model*

PLS has been utilized to test the hypotheses and structural model (the R^2 values, the T -value and the GoF index). Results of the testing model might be provided as follow:

5.2.1. R^2 and path coefficients

Structural model testing is done to forecast the causal relationship between variables or hypothesis testing. The structural model in the PLS is evaluated employing R Square for the dependent construct, the path coefficient value (β) or t -values of each path significance test in the structural model. The value of R Square is employed to assess the level of variation of the independent variable changes to the dependent variable. The higher the value of R Square means, the better the prediction model of the proposed research model. The value of the path coefficient (β) or inner model indicates the

Table 4. Convergent validity and scale reliability.

	Items	Factorial load	T -value	AVE	Composite reliability	Cronbach's alpha
Buyer behaviors	BB1	0.63	13.77	0.65	0.88	0.82
	BB2	0.76	31.73			
	BB3	0.90	86.96			
	BB4	0.90	122.44			
Product lifecycle management	PLM1	0.78	29.93	0.71	0.90	0.86
	PLM2	0.84	57.08			
	PLM3	0.87	70.21			
	PLM4	0.86	46.85			
Consumer-driven innovation	CDI1	0.76	23.40	0.59	0.85	0.77
	CDI2	0.71	19.62			
	CDI3	0.86	84.97			
	CDI4	0.73	23.48			
Customer feedback management	CFM1	0.73	23.20	0.53	0.82	0.71
	CFM2	0.72	25.75			
	CFM3	0.70	23.59			
	CFM4	0.77	39.64			
E-CRM	ECRM1	0.75	20.16	0.54	0.87	0.83
	ECRM2	0.74	21.36			
	ECRM3	0.70	25.13			
	ECRM4	0.83	28.26			
	ECRM5	0.86	30.25			
	ECRM6	0.84	35.12			

Table 5. Discriminant and correlation matrix assessment.

	Buyer behaviors	Product lifecycle management	Consumer-driven innovation	Customer feedback management	Success of E-CRM
Buyer behaviors	0.80^a				
Product lifecycle management	0.70	0.84^b			
Consumer driven innovation	0.55	0.66	0.77^c		
Customer feedback management	0.71	0.73	0.61	0.73^d	
Success of E-CRM	0.66	0.64	0.65	0.69	0.73^e

Note: $a = \sqrt{0.65}$, $b = \sqrt{0.71}$, $c = \sqrt{0.59}$, $d = \sqrt{0.53}$, $e = \sqrt{0.54}$.

significance level in testing the hypothesis. The score coefficient path (β) or inner model is shown by T -statistic value or p -Value. The p -Value is less than 0.05 (Mulyono & Situmorang, 2018). The R^2 criterion amounts have been calculated for instructions based on the assessment model (Sarstedt et al., 2019). With regards to the efficacy values described for R^2 by Cohen (1977), those influences can be ranked as small, medium and large (R^2_{small} is 0.02; R^2_{medium} is 0.13; R^2_{large} is 0.26) (Wetzels et al., 2009). As demonstrated in Figure 2, the R^2 (customer feedback management) = 0.64 and the R^2 (success of E-CRM) = 0.63; therefore, these values are considered moderate and acceptable.

5.2.2. Goodness of Fit

In PLS, no global standard is optimized, and the evaluation of the whole model is not feasible (Rajabion et al., 2019). Trying to solve this problem, Tenenhaus et al. (2004) have

Table 6. Discriminant and correlation matrix assessment.

	Buyer behaviors	Product lifecycle management	Consumer-driven innovation	Customer feedback management	Success of E-CRM
Buyer behaviors					
Product lifecycle management	0.659				
Consumer driven innovation	0.719	0.749			
Customer feedback management	0.689	0.738	0.669		
Success of E-CRM	0.639	0.709	0.680	0.649	

Note: The numbers below shaded cells must be less than 1.0000.

Table 7. Common method bias.

	Buyer behaviors	Product lifecycle management	Consumer-driven innovation	Customer feedback management	Success of E-CRM
Product lifecycle management	3.001				
Consumer-driven innovation	2.802				
Customer feedback management	2.413				
Success of E-CRM	2.402				
Buyer behaviors		2.002			
Consumer-driven innovation		2.486			
Customer feedback management		2.247			
Success of E-CRM		2.786			
Buyer behaviors			1.985		
Product lifecycle management			2.790		
Customer feedback management			2.345		
Success of E-CRM			2.720		
Buyer behaviors				2.007	
Product lifecycle management				2.840	
Consumer-driven innovation				2.634	
Success of E-CRM				2.677	
Buyer behaviors					1.712
Product lifecycle management					2.854
Consumer-driven innovation					1.986
Customer feedback management					2.302

Note: The numbers of shaded cells must be equal to or less than 3.3.

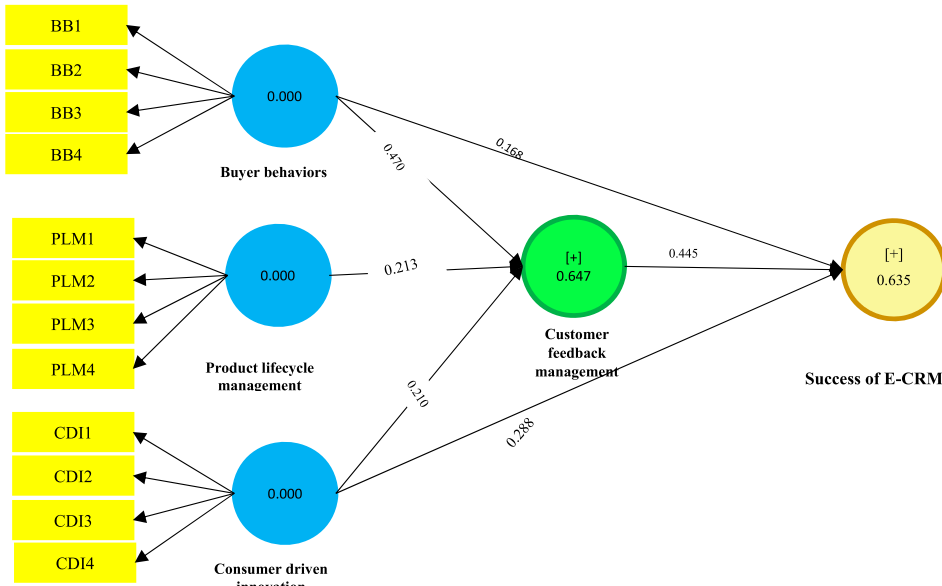


Figure 2. R^2 and path coefficients.

proposed a universal index of goodness-of-fit (GoF) that denotes a way of solving the current issue and can be used for validating the PLS model. According to this fact, GoF is gotten as the average correlation index’s numeral mean and the mean R^2 amount (Vinzi et al., 2010):

$$GOF = \sqrt{AVE \times \overline{R^2}} \tag{1}$$

$$GoF = 0.80$$

As Wetzels et al. (2009) reported, 0.36, 0.25 and 0.1 are amounts of baseline for GoF that mean high, medium and small, respectively. The model GoF index defined in Figure 2 is 0.61, which clearly speaks in favor of the model.

Also, the prediction model accuracy can be confirmed with Q^2 value. Q^2 value must be higher than zero (less than 0.25: small, 0.25–0.49: a medium, and 0.50 and above: high) (Abdul-Mohsin et al., 2020). Here, the Q^2 value is 0.515, and it is concluded that the prediction accuracy is high.

5.2.3. Bootstrap and T-value

Examination of the hypothesis is depended on PLS path coefficients that show the power of relation among variable pairs (Rajabion et al., 2019). The statistical emphasis of construction coefficients has been investigated in an analysis of bootstrapping to assess the measurement model’s indicator weights (Gerpott & Paukert, 2013). PLS evaluates the structural component by estimating the standardized regression coefficients for the structural paths in the model (Kalaitzi et al., 2019). In Figure 3, the statistical emphasis of these path coefficients has been examined utilizing bootstrapping (Hesterberg et al., 2005). A

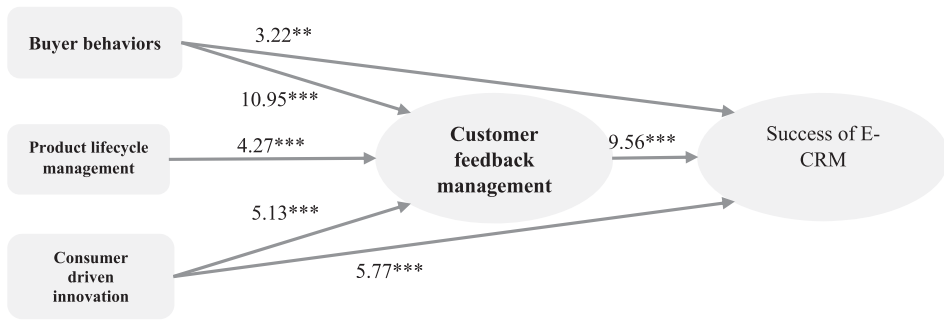


Figure 3. PLS results of the research model.
 Note: ** $p < .01$, *** $p < .001$.

rate of T -statistic > 1.96 indicates the significance of the hypothesis and path coefficients (Sosik et al., 2009).

To specify the intensity of the independent variable indirect impact on the dependent one, Variance Accounted For (VAF) index is used:

$$VAF = \frac{a \times b}{(a \times b) + c} \tag{2}$$

$$VAF = \frac{0.47 \times 0.44}{(0.47 \times 0.44) + 0.16} = 0.55$$

$$VAF = \frac{0.21 \times 0.44}{(0.21 \times 0.44) + 0.28} = 0.24$$

a : path coefficient between the independent variable and the mediator; b : path coefficient between the dependent variable and mediator; c : path coefficient between the independent variable and dependent one.

The results showed that the mediator variable and customer feedback management mediates the relationship among buyer behaviors, consumer-driven innovation and E-CRM success ($H7$ is confirmed).

5.2.4. Importance-Performance Map Analysis (IPMA)

An Importance-Performance Map Analytical (IPMA) was also used to try to enhance the current study’s analysis outcomes. In a PLS-SEM study, IPMA analyzes the

Table 8. Latent variable index values and performance of the target construct the success of E-CRM.

	Buyer behaviors	Consumer-driven innovation	Product lifecycle management	Customer feedback management
LV index values	3.996	4.056	3.971	4.026
LV performance	75.066	76.400	74.275	75.651

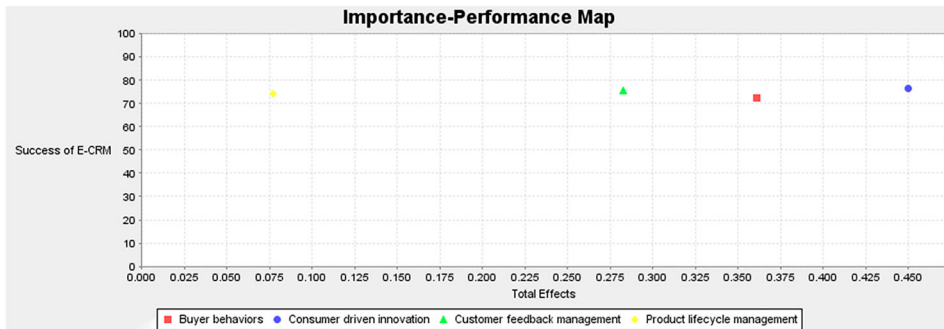


Figure 4. IPMA chart for the variables.

performance level of latent and manifest variables, as Ringle and Sarstedt (2016) do (Nawanir et al., 2018). Thus, rather than only presenting the importance of latent and manifest variables (i.e. path coefficient), IPMA additionally provides insight into the variables' significance to the target construct (Wei & Cheah, 2020). As a result, IPMA enables the prioritization of variables in order to enhance the targeted variable. Furthermore, examining the indicator level aids investigators in identifying the most important behaviors for improving the dependent variable. In short, IPMA is advantageous and especially important when it comes to prioritizing managerial tasks. Table 8 shows the latent variable (LV) values and performance of the constructs' importance-performance according to Ringle and Sarstedt (2016) standards. Product lifecycle management is less important and performs slower than the other elements, according to this research.

The standardized total effects (importance) are shown in Figure 4. In terms of importance, consumer-driven innovation (0.450) scored the highest, followed by buyer behaviors (0.361), customer feedback management (0.283) and product lifecycle management (0.077). In terms of performance, consumer-driven innovation (76.400) scored the highest, followed by customer feedback management (75.651), buyer behaviors (75.066) and lastly, product lifecycle management (74.275). It indicated that organizations should concentrate on product lifecycle management because it performed poorly compared to other factors.

6. Discussion and implications

A study model is presented to evaluate the impact of buyer behaviors, consumer-driven innovation, product lifecycle management and customer feedback management on the success of E-CRM. The model was assessed using a survey administered to 384 workers of the traveler agencies of China. The hypothesized model was examined utilizing PLS-SEM. The emphasis of path coefficients (β_1 – β_6) is assessed by investigating the *T*-value importance for the whole path coefficients. Each hypothesis is discussed in the rest of this section, and its implications are stated.

6.1. Buyer behaviors → customer feedback management → success of E-CRM

The following sub-indicators are used in the client behavior variable: awareness, motivation and perception. As the three sub-indicators are explained for buyer behaviors,

issues BB1-BB4 were presented to assess its association with the customer feedback management and success of E-CRM. The association among buyer behaviors with the success of E-CRM has a significant T -value (3.22) and β -value (0.16). Also, the relationship between buyer behaviors with customer feedback management has a considerable T -value (10.95) and β -value (0.47). The results have demonstrated that the hypothesis was verified at a significant level of 99%. These results are consistent with Al-Dmour et al. (2019), Jamali et al. (2017) and Sunny and Abolaji (2016). Long cycle periods, collective decision-making, players from various functional areas and levels, often contradictory aims, and changing responsibilities of the participants over the purchasing cycle are all characteristics of buying behavior in a corporate market. The result indicates that companies should have a particular program to focus on buyers' behavior by receiving feedback, as this can affect the success of the company's E-CRM. If customers are more motivated and aware, they will provide more positive feedback, significantly affecting its performance among competitors. Also, the recommendations to motivate the consumers' buying behavior include positive reinforcement of unique value proposition and online reviews boost buying behavior. The following recommendations were given in some studies;

1. The organization should develop its E-CRM platforms to focus on attracting and retaining existing buyers instead of dissipating resources to acquire new customers.
2. The firm should solidify the electronic platform to protect customers' data and resources.
3. The electronic customer relationship policies should show a significant level of commitment to improve customer patronage.
4. All E-CRM efforts should be channeled towards satisfying and delighting the buyers.

6.2. Product lifecycle management → customer feedback management

Product lifecycle management includes the following sub-indicators: product development time, the introduction of product strategy, and product target market. Questions PLM1-PLM4 assess the influence of product lifecycle management on customer feedback management. Product lifecycle management and customer feedback management are significant (T -value is 4.27 and β -value is 0.21). The findings showed that the conclusion was confirmed at a substantial 99.9% stage. These results are in line with Khanh et al. (2021) and Sumartono and Handayani (2020). At every administrative and technical level, and essential suppliers and customers, the product lifecycle management concept holds the potential of combining all information created during all phases of an organizational product's life cycle. They must provide the information mentioned above as well and assure the consistency and traceability of product data. The obtained result showed that predicting product development time, introducing product strategy and determining the product's target market are essential factors that managers should pay particular attention to them. The findings of this article demonstrate that there is a dearth of research on product lifecycle management, and it concludes by recommending promising future research directions: more exploratory and case studies on organizations trying to implement a product lifecycle management strategy; investigating product lifecycle management approaches to solve the difficulties of sustainability, raceability and transparency in the industry and inter-industry collaborations; studying the knowledge management.

6.3. Consumer-driven innovation → customer feedback management → success of E-CRM

The consumer-driven innovation value includes core variables like adaptation and compliance, enjoyable shopping, and ease of use. Besides, according to three sub-indicators of consumer-driven innovation, questions CDI1-CDI4 were built to assess their association with customer feedback management and the success of E-CRM. The relationship between consumer-driven innovation with customer feedback management experienced a significant T -value (5.13) and β -value (0.21). The relationship between consumer-driven innovation with the success of E-CRM found a significant T -value (5.77) and β -value (0.28). The findings suggested that the hypothesis was verified at a substantial 99.9% stage. These results are consistent with Khanh et al. (2021), Salameh et al. (2020) and Chen et al. (2011). With the emergence of social media, consumer-driven innovation has reached a new level of connection, with networking sites, video distribution, recommendation blogs, and wikis altering how customers engage with one another, resulting in changes in customer–company interactions. The obtained result showed that companies must have a specific program for customer-based innovation in all dimensions, such as research and development, production, marketing and sales. This is especially important concerning new products, which increases the need to identify and move towards innovative customers versus accepting customers. Furthermore, service providers, particularly travel providers, must focus not only on providing high value to customers by prioritizing their preferences, but also on treating them as individual partners, because customer information is a critical source of customized services and process development.

6.4. Customer feedback management → success of E-CRM

Questions CFM1-CFM4 try to assess the influence of customer feedback management on the success of E-CRM. The relationship between customer feedback management and E-CRM's success was significant (T -value is 9.56 and β -value is 0.44). The findings indicate that the hypothesis was verified at a substantial 99.9% stage. These results are consistent with Salameh et al. (2020) and Diffley et al. (2018). Customer feedback is described as communication from a customer about a product or service. Feedback from customers might be sought or uninvited. The organization encourages clients to provide unsolicited input by utilizing methods such as surveys and focus groups. The uninvited one is based on the customer's desires and experiences. According to the findings, paying attention to customer input can help speed up the process of enhancing the performance of E-CRM systems. To put it another way, it is critical not only to develop short-term customer interactions and values, but also to utilize E-CRM to improve long-term mutual relationships with consumers and the success of the travel sector. This research is very valuable since it shows the link between E-CRM deployment and customer experience and happiness, allowing present agencies and other agencies and institutions to give insight and inference.

7. Conclusion and limitations

Businesses that develop and deploy an E-CRM system may efficiently organize their activities around technology in order to provide a consistent, high-quality customer experience across all channels. Customers can help themselves by using online tailored services that are available on demand. According to the preceding argument, the consumer is a key reason to deploy e-CRM. As a result, customers should be well-treated and provided in

order to achieve customer happiness, even after they have made a purchase. It is because delighted customers are more likely to become loyal customers, and customer retention is one of CRM's key goals. Logistic assistance, technological qualities, information characteristics, home page layout and product characteristics are all elements that influence customer happiness. Customers are the foundation of organizations, and their value comes from customer equity. This investigation aims to check out the influence of buyer behaviors, product lifecycle, consumer-driven innovation and customer feedback management on the prosperity of E-CRM. The discoveries showed that the buyer behaviors variable (awareness, motivation and perception) is considered the main factor in the E-CRM accomplishment. Consumer behavior is a crucial factor determining consumers' behavior and intention to accept or reject new information about a product. In addition, the findings revealed that the effect of the customer behaviors variable on customer feedback management is positive and significant. Also, the results illustrated a significant and positive association between product lifecycle management and customer feedback management. Lifecycle management indicators included the product development time, introduction of product strategy and product target market. Additionally, product life management is also closely related to E-CRM. This is revealed from several studies that applying customer relationship management in institutions can build customer loyalty towards the realization of a product life cycle that benefits business entities. Furthermore, if innovation is combined with customer relationship management, it will increase customer satisfaction leading to loyalty, which is certainly very closely related to the product life cycle. The results also showed that consumer-driven innovation (adaptation and compliance, enjoy shopping, and ease of use) is considered the key factor in customer feedback management. Besides, they indicated that the influence of the consumer-driven innovation variable on the success of E-CRM is positive and significant. Ultimately, the results illustrate a positive association between customer feedback management and the success of E-CRM.

Present research meaningfully leads to the literature and knowledge by concentrating more on the performance of E-CRM systems. In addition, current research's outcomes suggest experimental notions for marketing practitioners and managers who implement tools and provide tactical methods to boost the performance or productivity of the E-CRM systems. From an empirical viewpoint, the statistical outcomes support the significant action of the factors below: buyer behaviors, product lifecycle, consumer-driven innovation and customer feedback management on the success of E-CRM. Finally, considering other factors such as the Internet of Things (IoTs) (Yi, 2021) and Business-government relations (Wu et al., 2022) can be done in future research.

In this research, some confines must be considered in upcoming investigations. The present study was restricted to traveler agencies. An extension of the research to cover the other areas can improve the results' generalizability. Future research must check the impact of moderating factors like quality of service and culture on the adoption process. Also, this study pursued a quantitative procedure and depended on an individual data collection technique, so it can be considered in future works. Therefore, the answers might not reliably and accurately measure the variables. It is interesting if subsequent research mix qualitative and quantitative procedures to perform a profound study on the efficiency and the use of cloud-based marketing systems.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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