

## INVESTIGATING THE IMPACT OF TECHNOLOGY-BASED CRM, KNOWLEDGE MANAGEMENT, AND LONG-TERM RELATIONSHIP ON MARKETING INNOVATION

Nguyen Thi Khanh Chi  
Foreign Trade University

ARTICLE INFO		ABSTRACT
Received:	15/3/2022	The e-CRM application has currently offered benefits for companies in different business sectors, especially in service industry. The objective of this paper is to investigate the impact of e-CRM components (i.e. technology-based CRM and knowledge management) on marketing innovation. Data was collected through a structured questionnaire survey conducted in Vietnam. The dataset consists of 203 valid responses by managers (first-line, middle and top managing position). Correlation analysis and structural equation modeling (SEM) were employed to examine the causal relationships among technology-based CRM, knowledge management, long-term relationships and marketing innovation. The results show that knowledge management and technology-based CRM have positive influence on long-term relationships and marketing innovation. From these findings, this study confirmed the important role of knowledge management and technology-based CRM in innovating marketing activities in emerging countries. This paper also contributes several implications to practice.
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E-CRM		
Technology-based CRM		
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## NGHIÊN CỨU TÁC ĐỘNG CỦA QUẢN TRỊ QUAN HỆ KHÁCH HÀNG ĐIỆN TỬ ĐẾN ĐỔI MỚI TRONG HOẠT ĐỘNG MARKETING

Nguyễn Thị Khánh Chi  
Trường Đại học Ngoại thương

THÔNG TIN BÀI BÁO		TÓM TẮT
Ngày nhận bài:	15/3/2022	Ứng dụng e-CRM hiện đã mang lại lợi ích cho các công ty trong các lĩnh vực kinh doanh khác nhau, đặc biệt là trong ngành dịch vụ. Mục tiêu của bài báo này là điều tra tác động của các thành phần e-CRM (tức là CRM dựa trên công nghệ và quản lý tri thức) đối với sự đổi mới tiếp thị. Dữ liệu được thu thập thông qua một cuộc khảo sát bảng câu hỏi có cấu trúc được thực hiện tại Việt Nam. Tập dữ liệu bao gồm 203 câu trả lời hợp lệ của các nhà quản lý (vị trí quản lý cấp một, cấp trung và cấp cao nhất). Phân tích tương quan và lập mô hình phương trình cấu trúc (SEM) đã được sử dụng để kiểm tra các mối quan hệ nhân quả giữa CRM dựa trên công nghệ, quản lý tri thức, các mối quan hệ dài hạn và đổi mới tiếp thị. Kết quả cho thấy quản lý tri thức và CRM dựa trên công nghệ có ảnh hưởng tích cực đến các mối quan hệ lâu dài và đổi mới tiếp thị. Từ những phát hiện này, nghiên cứu này đã khẳng định vai trò quan trọng của quản lý tri thức và CRM dựa trên công nghệ trong việc đổi mới hoạt động tiếp thị ở các nước mới nổi. Bài báo này cũng đóng góp một số ý nghĩa cho thực tiễn.
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<b>TỪ KHÓA</b>		
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Email: [chintk@ftu.edu.vn](mailto:chintk@ftu.edu.vn)

<http://jst.tnu.edu.vn>

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Email: [jst@tnu.edu.vn](mailto:jst@tnu.edu.vn)

## 1. Introduction

Recently, firms have implemented electronic customer relationship management (e-CRM) efforts because they revealed that e-CRM plays a critical role in their business operation [1] based on technology and knowledge management [2]. E-CRM focuses on relationship marketing with the goal of improvement long-term relationships [3]. One of the results of e-CRM adoption is to innovate firms' products, services and marketing activities which are seen as marketing innovation [4]. Consequently, understanding how e-CRM can affect marketing innovation is necessary for firms in the fluctuated business market.

Since e-CRM is about technology-based CRM and managing customer knowledge [5], technology and knowledge management can be considered as the main components of e-CRM. Several research found that while previous CRM focused on technological aspects, the key role of knowledge management is starting to be found in marketing literature [6]. While technology is a root of implementing e-CRM, managing knowledge helps firms to increase revenue, enhance customer service and innovate marketing activities [7]. Some research recently have studied two such constructs in the e-CRM framework [2] which investigated the impact of technology and knowledge management on firm performance. For example, Chi et al. (2021) [8] proposed the new framework to investigate critical factors (i.e. organization, technology, CRM strategy, knowledge management) on e-CRM success. Otherwise, Migdadi (2020) [4] examined the impact of knowledge management on firm performance which measured by marketing innovation, process innovation and product innovation. The existing research on e-CRM is mostly conceptual and empirical study confirming the impact of technology and knowledge management on CRM innovation [8]. Unfortunately, there is little attention about the impact of technology-based CRM and knowledge management on long-term relationships and marketing innovation.

In regarding to marketing innovation, the role of long-term relationships is not clear in previous research even though the important of marketing innovation is important for any business. Firms having higher product and service innovation can obtain higher profits of those firms without marketing innovation [2]. E-CRM not only creates long-term relationship but also encourages customers to give their feedback and suggestions for promoting products and service. However, prior e-CRM research primarily addressed on using structure's and culture's organization to enhance firm performance [7]-[9]. The interrelationship among technology-based CRM, knowledge management, long-term relationship and marketing innovation has not been clearly examined.

To bridge this gap, this study focuses on investigating the impact of two e-CRM components, namely technology-based CRM and knowledge management, on marketing innovation and the interrelationship among technology-based CRM, knowledge management, long-term relationship and marketing innovation. To test such relationships, an empirical study is employed. Data were collected from the managers of the Vietnamese service firms, namely banking and hotel. These service firms were chosen because they are emerging in developing countries like Vietnam. Banking and hotel in Vietnam context generally follow higher standards by evaluating international best practices. Consequently, E-CRM becomes an important strategy for service sector in enhancing customer relationship. The contribution from the current paper is to explore the linkage between e-CRM and marketing innovation because it is important to expand and explain the impact of e-CRM on innovation of marketing.

## 2. Methodology

### 2.1. The proposed framework

This study examines the impact of technology-based CRM, long-term relationships, and knowledge management on marketing innovation. The proposed framework is follows:

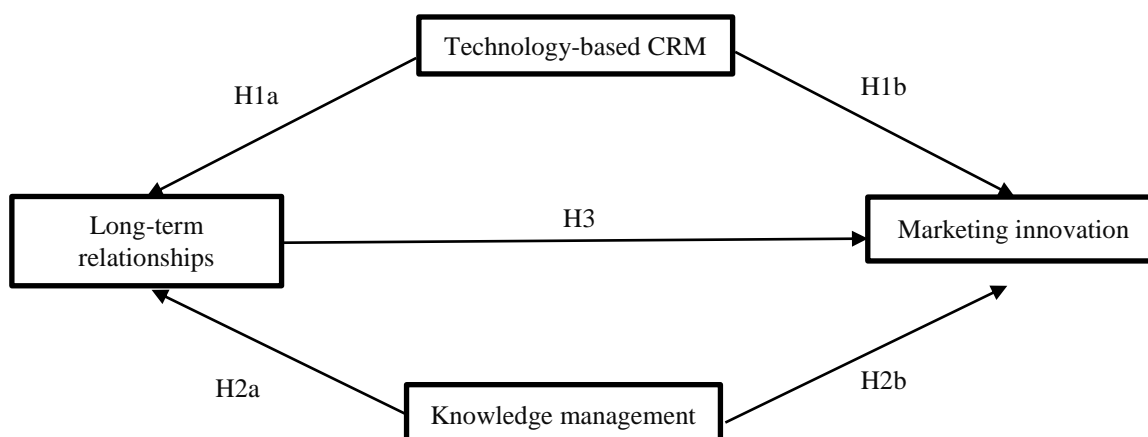
H1a: Technology-based CRM positively impacts long-term relationships

H1b: Technology-based CRM positively impacts marketing innovation

H2a: Knowledge management positively impacts on long-term relationships

H2b: Knowledge management positively impacts marketing innovation

H3: Long-term relationships positively impact marketing innovation



**Fig.1.** The proposed framework

Figure 1 proposes the role of electronic customer relationship on marketing innovation.

## 2.2. Measurement scale

The current paper employed SEM (a structured equation model) to examine the proposed hypotheses. A five-point Likert scale was used to assess the degree of KM-knowledge management, IT-technology-based CRM, RE-long-term relationships and MAR-marketing innovation. Knowledge management has four items and adapted and modified from Mahawrah et al. (2016) [10]. Technology-based CRM scales have four items and were developed based on Chi et al. (2021). Long-term relationship has four items and was adapted from Chi (2021) [2]. MAR-Marketing innovation has four items and was validated from Migdadi (2020) [4]. Table 1 shows the measurement scale of each variable.

**Table 1.** Measurement scale items for variables

Item code	Item description	Source
<b>Knowledge management-KM</b>		
KM1	We provide channels that enable continuous two-way communication with key customers	Mahawrah et al. (2016) [10]
KM2	We have established processes to gather customer knowledge	
KM3	We are able to make quick decisions with the knowledge of our customers	
KM4	We can provide real customer information that allows for quick and accurate interaction with them	
<b>Technology-IT</b>		
IT1	We have a dedicated engineering team to provide technical support for using e-CRM technology in building customer relationships.	T. K. C. Nguyen (2021) [2]
IT2	We have right hardware to serve our customers	
IT3	We have right software to serve our customers	
IT4	Our information systems are integrated in different functional areas	
<b>Long-term relationships</b>		
RE1	Our relationship with customers will be beneficial	T. K. C. Nguyen (2021) [2]
RE2	Maintaining long-term customer relationships is important to us	
RE3	We focus on long-term goals in our customer relationships	
RE4	We care about the long-term success of our customer relationships	
<b>Marketing innovation</b>		
MAR1	Frequently introducing new services	Migdadi (2020) [4]
MAR2	Being first in new services introductions in the market	
MAR3	Having service with superior quality	
MAR4	Using new service to penetrate markets	

### **2.3. Population and sampling**

The data is collected from Vietnamese managers in service firms including banking and hotel. SRS - "Proportionate stratified random sampling" is conducted as a sampling technique in the current paper. SRS "involves a process of stratification or segregation, followed by a random selection of subjects from each stratum". SRS was drawn from the firms (population) that implement e-CRM (376 companies in Vietnam), followed by a random selection of subjects from each stratum.

Initially, each general manager was personally contacted and provided with an information sheet about the study, which explained the need and significance of the research. Since the managers had agreed to participate, they each provided a list of the heads of each department for data collection purposes. The questionnaires were distributed to managers, for each one of which four managers were approached. Five assistants were recruited to launch the questionnaires. The trained assistants visited each hotel to explain the significance of the study and the survey procedures to the participants. The managers knew that the collected data would be kept confidential and would be processed in aggregate form. The completed questionnaires were returned directly to the researcher by post or in person. On receipt of the completed questionnaires, those that had incomplete or disengaged responses were discarded, while only complete questionnaires were used for data analysis. Having collected the data, the completed questionnaires were inputted, cleansed, and assessed to ensure good quality. Proper ethical procedure was followed: all the participants' answers were kept confidential, while complete anonymity was ensured.

The large-scale survey was launched from 22 September to 16 December 2020. Respondents of banking accounted for 61%, while respondents of the hotel accounted for 39%. Emails and calls are sent to individual companies with the aim of increasing response rates. Managers know that the collected data will be kept confidential and will be processed in aggregate form. The valid responses were 203 which gave a response rate of 53.9%. Regarding the information of respondents, the survey was completed exclusively by first-line managers (83.6%), middle managers (12.1%) and top managers (4.3%). Specifically, the current paper observed the positions of participants in the banking and hospitality sectors as positions with a higher frequency of exposure in the customer relations department (46.4%), followed by technology department (38%).

### **2.4. Data analysis**

Factor analysis using AMOS was performed to verify unidirectional and convergence validity and differentiation of measurement items. Furthermore, after collecting data, the researcher used descriptive statistical methods and SEM to analyze the data from the respondents and examine the relationships between the research structures.

## **3. Results**

Correlations between items on the total and exploratory factor analysis are analyzed to evaluate the scales. To check the validity of the structures, a confirmation factor analysis (CFA) was conducted to evaluate the scale. The analysis result revealed that the model achieved overall fit with the actual data (Chi-square/df = 3.255; GFI= 0.922, CFI = 0.931; TLI = 0.921; RMSEA = 0.042). The load factor of each item in the structure (> 0.5) shows that the components in the first order structure have achieved convergence values. Cronbach's Alpha and the coefficient of synthesis (> 0.7) and the mean variance drawn (> 0.3) two that the work achieves reliability (showed in Table 2).

**Table 2.** *The reliability and convergent validity*

Construct	Factor Loading	Standard Error	Standardized factor loading	t-value	Cronbach's Alpha	CR	AVE
Knowledge management (KM)					.823	.863	.730
KM1	1.000		.866				
KM2	.913	.051	.892	18.563***			
KM3	.865	.054	.814	15.916***			
KM4	1.026	.058	.867	17.618***			
Technology-based CRM (IT)					.796	.762	.510
IT1	1.000		.662				
IT2	.937	.104	.673	8.822***			
IT3	.976	.117	.821	9.929***			
IT4	.951	.112	.664	8.525***			
Long-term relationships (RE)					.842	.779	.590
RE1	1.000		.705				
RE2	1.153	.105	.785	11.092***			
RE3	1.254	.117	.788	10.757***			
RE4	1.224	.112	.789	11.015***			
Marketing innovation (MAR)					.857	.759	.570
MAR1	1.000		.771				
MAR2	.713	.071	.645	10.242***			
MAR3	1.000	.076	.845	13.361***			
MAR4	1.082	.084	.844	13.263***			

Note: KM-knowledge management, IT- technology-based CRM, RE-long-term relationship, MAR-marketing innovation

### Structural model hypothesis testing

Table 3 shows the analysis results using SEM on the whole sample. As can be seen from Table 3, the measurement model has a good fit and the hypothesized relationships are all statically significant. Therefore, hypothesis H1a, H1b, H2a, H2b and H3 are supported.

**Table 3.** *The results of hypothesis testing*

	Hypothesis	Path Coefficient	P
<b>H1a:</b>	IT → Long-term relationships	0.326	***
<b>H1b:</b>	IT → Marketing innovation	0.231	***
<b>H2a:</b>	KM → Long-term relationships	0.452	***
<b>H2b:</b>	KM → Marketing innovation	0.324	***
<b>H3:</b>	RE → Marketing innovation	0.686	***

Note: \*\*\*< 0.01, Chi-square/df = 3.054; CFI= 0.916; TLI= 0.932; GFI= 0.916; RMSEA= 0.048. KM-knowledge management, IT- technology-based CRM, RE-long-term relationship.

The impact of knowledge management on long-term relationships has the highest level (0.452) while the technology-based CRM has lower impact (0.326). Knowledge management also have higher positive influence on marketing innovation (0.452) than technology-based CRM (0.324). Furthermore, long-term relationships showed its highest impact on marketing innovation (0.686). Generally, this study proposed framework to investigate the impact of e-CRM adoption on marketing innovation. From the findings, although both technology-based CRM and knowledge management have positive and significant effect on long-term relationships and marketing innovation, knowledge management is seen as a higher effect.

### 4. Implication

This study results can help to recommend some contributions to marketing literature. Firstly, this paper finds the significantly positive impact of e-CRM adoption on marketing innovation in emerging countries where the development of technology is underground. The results provide the

enhanced understanding of how knowledge management, technology-based CRM and long-term relationships influence marketing innovation. It has been used to plan key components of the e-CRM application and highlight which implementation issues and processes need the most attention in the banking and hospitality industries. Therefore, this study offers a new perspective that the adoption of e-CRM helps companies gain an edge in marketing innovation. Furthermore, this current article emphasizes the importance of knowledge management and links it to marketing innovation. Marketing innovation involves the creation, adoption, and implementation of new ideas, processes, products and services.

This study also provides some implications for practice. First, the current study recommends that hotel and banking service providers and marketing managers, especially those in Vietnam, focus more on knowledge and technology management activities (i.e. provides a customer service center and knowledge management tools, and supports customer service initiatives and corporate restructuring). For example, managers manage both internal and external knowledge to enhance marketing innovation. Second, each business needs to invest in software and hardware that is suitable for them in applying e-CRM. However, the e-CRM migration allows companies to consider the degree of complexity in terms of technology. This transformation is only possible if it overcomes key barriers including customer orientation, effective management in knowledge and appropriate IT.

## 5. Conclusion

This paper also has some limitations. At first, this paper has not yet compared the efficacy of two different measures which are service and process items in marketing innovation construct. Therefore, it is necessary to improve in future research. Secondly, this research does not discuss about the interrelationships among other factors influencing marketing innovation. Consequently, future studies should improve this gap. Thirdly, the demographic characteristics in this study did not explore because the different sectors may be perceived differently in analyzing advertising. Thus, the effect of different service should be study in the future to examine the result in different results. Lastly, the other limitation is in data analysis since this paper also investigate the interrelationship model. Future research might consider investigating the moderating role of these constructs and use other analyzing method instead of SEM [11]. Next, the scale of marketing innovation construct is also a limitation as this research use structured questionnaire. Future research might consider adding open-ended questions, reconsider the Likert scale rating and also employ both quantitative and qualitative methods. Finally, this study was conducted in Vietnam, not in different countries. Future research also needs to improve this limitation.

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