

## Article

# The Study on the Effectiveness of Sustainable Customer Relationship Management: Evidence from the Online Shopping Industry

Jiling Li <sup>1</sup>, Zekai Lin <sup>2,\*</sup> and Xiaoheng Zhang <sup>1</sup><sup>1</sup> Business School, Northwest University of Political Science and Law, Xi'an 710122, China<sup>2</sup> School of Geography and Tourism, Hanshan Normal University, Chaozhou 521041, China

\* Correspondence: lzk@hstc.edu.cn

**Abstract:** Sustainable development integrates business, environmental, and social objectives into a unified effort to achieve a common goal. Sustainable customer relationship management (CRM) combines company strategy, customer-focused business processes, and computer technologies. From the consumer's perspective, it lowers psychological, energy, time, and other costs; from the company's perspective, it offers a means of engaging with customers to build lasting and reliable relationships. The sustainable CRM program provides advantages to businesses in various industries, particularly online commerce. It alludes to a comprehensive strategy that promotes solid interactions between buyers and sellers of goods and services. Since current customer retention is less costly than new customer attraction in competitive markets, especially online shopping, identifying the factors affecting relationship management with stable customers is essential. This investigation intends to evaluate the effect of the use of management information systems (MIS), as well as insights on employee behavior and knowledge, and customer behavior (satisfaction and loyalty), on the effectiveness of sustainable CRM in online shopping. The model is validated using the PLS-SEM technique, and study sample of 293 employees and managers from private organizations. According to the results, the MIS, employee behavior and knowledge, customer satisfaction, and customer loyalty influence the effectiveness of sustainable CRM in online shopping. Furthermore, employee behavior and knowledge positively moderate the relationship between customer loyalty and the effectiveness of sustainable CRM. However, the moderating role of employee behavior and knowledge on customer satisfaction and the effectiveness of sustainable CRM is not confirmed. Overall, taking these characteristics into account might help organizations to take significant steps toward increasing the efficacy of sustainable CRM.

**Keywords:** Customer Relationship Management (CRM); sustainable; MIS; knowledge sharing; customer



**Citation:** Li, J.; Lin, Z.; Zhang, X. The Study on the Effectiveness of Sustainable Customer Relationship Management: Evidence from the Online Shopping Industry. *Sustainability* **2023**, *15*, 5911. <https://doi.org/10.3390/su15075911>

Academic Editors: Patricia Martínez García de Leaniz and Ricardo Chalmeta Rosaleñ

Received: 22 February 2023

Revised: 15 March 2023

Accepted: 23 March 2023

Published: 29 March 2023



**Copyright:** © 2023 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

## 1. Introduction

In the age of big data, the Internet has integrated into people's lives, and improved their productivity and quality of life [1]. With economic globalization and innovation in Information Technology (IT), the electronic commerce business model has increasingly affected people's lives [2]. The emergence of e-commerce had transformed the prior business paradigm, increasing businesses' marketing channels and lowering operational costs. e-commerce also strengthens upstream and downstream coordination and cooperation between enterprises [3]. As the external environment becomes more complex and unpredictable, recent studies have switched focus to how we can effectively assist companies in developing innovations in sustainability. Start-ups are forced to look beyond their industry of operation to find external information to suit their needs due to their limited resources and insufficient capacity for independent invention. Therefore, using proper knowledge discovery methodologies and gaining access to outside information sources will be essential

to influencing innovations in sustainability [4]. Sustainability is also becoming an increasingly important consideration in various aspects of business operations [5]. Sustainable customer relationship management (CRM) combines business strategy, customer-oriented processes, and computer systems that seek to integrate sustainability into CRM [6]. Sustainable CRM is described as “technology-centered” relationship marketing and its associated benefits, including standard CRM strategies and e-business marketplace tools utilized by corporations to preserve client interactions in a sustainable way. Enterprises worldwide are being pushed to be more socially responsive and environmentally sustainable, while also increasing company value and continuing to be customer-oriented. This process has forced an evolution in CRM towards sustainable CRM. It is possible to define sustainable CRM as considering social, economic, and environmental effects when developing long-lasting, fruitful client relationships. Sustainable CRM also engages with customers concerned about sustainability, and raises consumer knowledge of corporate sustainability issues [6]. Integrating economic, environmental, and social sustainability issues in CRM’s core functional areas—marketing, sales, and services—is the fundamental tenet of sustainability-oriented CRM [7].

Recent technological advancements have led to significant alterations in consumer-to-consumer interactions. Consumers are increasingly turning to internet communities for pre-purchase information [8]. Modifications in customer demand and aspirations frequently change consumer purchasing decisions; thus, all firms must have plans in place to ensure strong long-term market competitiveness [9]. Sustainable CRM assists businesses in attracting and retaining consumers and using customer information. It is a key tool in building client connections and assisting businesses in creating lucrative partnerships [10]. There should be no difference between pleasing good customers and bad customers for sustainable CRM because sustainable CRM emphasizes inclusive growth. It believes that all stakeholders and consumers are assets for the company, and that every effort should be made to turn unfavorable customer feedback into favorable customer feedback. Consumer profitability always results from how customer relations are set up, and many methods exist that propose to change how customers behave. If businesses combine traditional and social CRM strategies for managing great customer experiences, CRM can be viable in this new era of socially connected consumers. If implemented separately, traditional and social CRM are ineffective [11]. The aim of the present investigation is to provide a comprehensive model for examining the influence of management information system (MIS) on sustainable CRM effectiveness in online shopping. Since electronic retail markets offer e-commerce to individuals and businesses, online shopping malls differ from offline shopping malls. Online shopping is also called virtual shopping or electronic shopping. Online shopping malls can split into four categories: online retail shops, virtual shops, storefronts, and shopping malls [5]. This study uses the term “online shopping malls” to define the e-commerce environment. Therefore, the sub-objectives are:

- Examining the influence of the MIS on the effectiveness of sustainable CRM in online shopping;
- Examining the influence of the MIS on customer satisfaction and customer loyalty;
- Investigating the effect of customer satisfaction on the effectiveness of sustainable CRM in online shopping;
- Examining the impact of customer loyalty on the effectiveness of sustainable CRM in online shopping;
- Investigating the influence of employee behavior and knowledge on the effectiveness of sustainable CRM in online shopping;
- Examining the mediation role of employee behavior and knowledge between customer behavior (satisfaction and loyalty) and the effectiveness of sustainable CRM in online shopping.

The remainder of the article follows: the study’s research background is described in the upcoming section. Variable definitions and hypotheses are described in Section 3. Section 4 describes the applied approach containing the statistical sample, sample size,

sampling method, validity, and reliability. Data analysis is presented in Section 5, employing some tests like T-value, path coefficients, Goodness of Fit (GoF), IPMA, etc. In Section 6, discussions are described. Eventually, the conclusion, implications, and future work with research limitations are stated in Section 7.

## 2. Research Background

The term “sustainable development” was introduced at the 1972 United Nations Conference on the Human Environment. Since then, it has gained new connotations, such as environmental concerns and bio/green innovation connected to ecological factors [12,13]. Thus, for many companies, sustainable development became a goal in itself, integrated into their strategic mission and vision [14]. CRM is the approach to identifying, acquiring, and retaining customers to maximize an organization’s profitability. Sustainable CRM is the holistic approach that trusts relationships between customers and value providers. Sustainable CRM is a comprehensive strategy fostering solid customer relationships and value-adding businesses. It engages with clients in a way that promotes a long-lasting and reliable relationship. In other words, sustainable CRM is the mechanism that enables and extends win-win collaboration between customers, value providers, and businesses [15]. Sustainable CRM encompasses all CRM objectives that use internet settings, such as extranet, intranet, and the Internet, for sustainability goals. CRM can assist this process by using IT to manage client interactions [16]. CRM is frequently employed as a managing technique in today’s corporate environment. It pertains to Internet-based marketing efforts, tools, and tactics that use technology, such as email, the World Wide Web, chat rooms, social media, forums, etc., to identify, create, and improve long-term client connections [17]. The idea is to implement a customer-centric strategy that touches every goal and dramatically affects everyone inside the business [18]. In this section, some related works are reviewed.

Using resource-based view theory and contingency theory, Al-Gasawneh and Al-Zubi [19] investigated the mediating role of service quality between CRM performance dimensions and the marketing performance of Jordanian hotels. A self-administered survey of 162 hotel managers in Jordan was conducted. Partial least squares structural equation modeling was used to analyze the data. The results showed that service quality mediated the relationship between the CRM performance dimensions (key customer focus, CRM knowledge management, CRM organization, and CRM-based technology) and the marketing performance of Jordanian hotels.

Das and Hassan [20] investigated how competitive advantage (CA), CRM, and sustainable supply chain management (SSCM) affected organizational performance (OP). The present study used a self-administered questionnaire with 20 items as a research method. SMART PLS 3.0 was used to analyze the research’s findings. The findings demonstrated a strong correlation between SSCM and CRM, and OP. The findings revealed a somewhat significant and favorable correlation between CA and OP. Businesses were more likely to use SSCM and CA in underdeveloped nations in order to improve OP. However, the connection between CRM and OP has received relatively less attention.

Al-Bashayreh et al. [4] assessed the connections between the various success factors for electronic CRM. They also looked at the impact of customer pressure, trust, level of service quality, COVID-19, privacy, technological readiness, and customer satisfaction. They employed a purposeful sampling strategy. A total of 390 completed questionnaires from employees of Jordanian companies who participated in CRM technology activities were used to collect the data. AMOS software was used to analyze the data. According to the findings, the success of the e-CRM system was influenced favorably by technological readiness, COVID-19, customer pressure, and customer satisfaction. Additionally, the study demonstrated that customer satisfaction was positively impacted by technological readiness, privacy, and service quality. It was shown that customer satisfaction acted as a mediator in the relationships between service quality and e-CRM system success, as well as between trust and e-CRM system success.

Kumar and Mokha [21] looked at the effect of E-CRM on client loyalty in the banking business, and the moderating impact of customer pleasure. The data were analyzed using AMOS and SEM. According to the findings, customer satisfaction and E-CRM strongly influenced customer loyalty, and customer satisfaction partly affected the link between E-CRM and customer loyalty.

Chi [22] investigated the effect of organizational variables on the effective adoption of E-CRM. A systematic survey was done in Vietnam to obtain data. The dataset contained 241 valid replies from people who work for Vietnamese airlines. SEM and correlation analysis were used to investigate the causal relationships between organizational characteristics, data quality, knowledge management, customer orientation, and CRM strategy. The results showed that organizational variables impact the effectiveness of E-CRM.

Gil-Gomez and Guerola-Navarro [23] developed a research model to empirically validate the effects of the three CRM components (sales, marketing, and services) on customer knowledge management and innovation, as well as the companies' efforts toward digital transformation and sustainable business model innovation. Their research model was built around each possible combination of the three CRM modules and the three sustainability dimensions (economic, environmental, and social). According to the findings, CRM can be considered a type of Green IT, oriented toward digital transformation and long-term business model innovation.

In their study [11], Shukla and Pattnaik established the value of sustainability in CRM, and attempted to propose a conceptual framework for modern businesses through its integration with various social networking sites that produce volumes of real-time data. The article also discussed the value of customer experience management (CEM). They also provided an interactive framework based on an ecosystem for building a long-lasting CRM system. The findings demonstrated that the suggested sustainable CRM framework blends online and offline interaction between contemporary businesses and agile customers. It also combines style with substance in relationship management and, in the end, complements machine-to-machine connectively with human-to-human touch to strengthen customer's involvement.

Yunis and Tarhini [24] looked at information and communication technologies (ICT) and creativity's impact on improving organizational performance. The SMART PLS program analyzed data and evaluated the proposed model. The findings indicated that ICT utilization was closely related to the organization's performance and associated with innovation. The study's outcomes also demonstrated that ICT acceptance is directly related to organizational efficiency. The adoption and use of ICT is also related to entrepreneurship.

Naser and Al Shobaki [25] investigated the link between MIS resources and performance development in an electrical distribution firm. The statistical sample of the study was 360 people. SPSS software and ANOVA, linear regression, Cronbach's alpha, and step-wise regression were utilized to analyze data and check hypotheses. The results showed an essential connection between MIS resources and performance development in a power distribution company.

Also, Oh and Ryu [26] examined ICT as a vital invoice in developing organizational efficiency. The presented model was tested by regression analysis of field data. The outcomes indicated that the ICT characteristics effectively and positively influence the firms' market performance and connection between supply chain capabilities. However, the only weak moderating impact was the connection between companies' financial performance and supply chain capabilities.

The details and features of prior related studies are shown in Table 1.

**Table 1.** Comparative features of the previous related works.

Paper	Variables Examined in the Paper	Method	Sample
Al-Gasawneh, AlZubi [19]	<ul style="list-style-type: none"> <li>• CRM knowledge management</li> <li>• CRM organization</li> <li>• CRM-based technology</li> <li>• Service quality</li> <li>• Marketing performance</li> </ul>	<ul style="list-style-type: none"> <li>• Questionnaire</li> <li>• SMART PLS software</li> </ul>	162 general managers of hotels in Jordan
Das and Hassan [20]	<ul style="list-style-type: none"> <li>• Sustainable</li> <li>• SCM</li> <li>• CRM</li> <li>• Organizational performance</li> </ul>	<ul style="list-style-type: none"> <li>• Questionnaire</li> <li>• SMART PLS software</li> </ul>	Executives employed in the SCM division of the multiple organizations in Chattogram
Al-Bashayreh, Almajali [4]	<ul style="list-style-type: none"> <li>• Trust</li> <li>• Service quality</li> <li>• Customer satisfaction</li> <li>• E-CRM;</li> </ul>	<ul style="list-style-type: none"> <li>• Questionnaires</li> <li>• AMOS software version 22</li> <li>• SEM</li> </ul>	390 employees from Jordanian firms
Kumar and Mokha [21]	<ul style="list-style-type: none"> <li>• E-CRM</li> <li>• Customer satisfaction</li> <li>• Customer loyalty</li> <li>• Organizational characteristics</li> </ul>	<ul style="list-style-type: none"> <li>• Questionnaires</li> <li>• SEM through AMOS</li> </ul>	Customers of banks in Delhi, India
Chi [22]	<ul style="list-style-type: none"> <li>• Data quality</li> <li>• Knowledge management</li> <li>• Customer orientation</li> <li>• CRM strategy</li> </ul>	<ul style="list-style-type: none"> <li>• Systematic survey</li> <li>• SEM</li> </ul>	Employees of the Vietnamese airlines
Gil-Gomez, Guerola-Navarro [23]	<ul style="list-style-type: none"> <li>• CRM</li> <li>• sustainability</li> <li>• green IT</li> <li>• Customer knowledge management</li> <li>• Innovation</li> </ul>	<ul style="list-style-type: none"> <li>• Proposing a research model</li> </ul>	literature review
Shukla and Pattnaik [11]	<ul style="list-style-type: none"> <li>• CRM</li> <li>• Customer experience management</li> <li>• Social CRM</li> <li>• Sustainable CRM</li> </ul>	<ul style="list-style-type: none"> <li>• Proposing a conceptual framework</li> </ul>	Investigating CRM models from 1990 to 2016 through a survey of the literature explaining
Yunis, Tarhini [24]	<ul style="list-style-type: none"> <li>• ICT</li> <li>• Innovation</li> <li>• Corporate entrepreneurship</li> <li>• Dynamic capabilities</li> </ul>	<ul style="list-style-type: none"> <li>• Survey instrument</li> <li>• SMART PLS</li> </ul>	Employees and managers of organizations in the Lebanese market
Naser and Al Shobaki [25]	<ul style="list-style-type: none"> <li>• MIS resources</li> <li>• Performance development</li> </ul>	<ul style="list-style-type: none"> <li>• SPSS software</li> <li>• ANOVA</li> <li>• linear regression</li> </ul>	Employees of the electricity distribution company in Gaza
Oh, Ryu [26]	<ul style="list-style-type: none"> <li>• ICT</li> <li>• Supply chain capabilities</li> <li>• Firms' financial performance</li> </ul>	<ul style="list-style-type: none"> <li>• Questionnaires</li> <li>• SPSS</li> <li>• Exploratory Factor Analysis (EFA)</li> <li>• Harman's single-factor test</li> </ul>	Procurement managers of the firms



Consumer behavior and the value of retail space are changing as a result of the growth of e-commerce [27]. In today's highly competitive business environment, enterprises strive to achieve sustainable advantages [28]. Only when the business implements a value-creating strategy, at the same time that no current or potential competitors do so, and when other businesses are unable to duplicate the advantages of this strategy, can it achieve this sustainable advantage [29]. Despite the significance of these factors, Table 1 shows that little research has been done on how MIS, employee behavior and knowledge, customer satisfaction, and customer loyalty affect the effectiveness of sustainable CRM in online shopping. These variables have never been combined into a single framework to study the correlation and validity between them. Therefore, the present paper examines the relationship between MIS, employee behavior and knowledge, customer satisfaction, customer loyalty, and the effectiveness of sustainable CRM in online shopping.

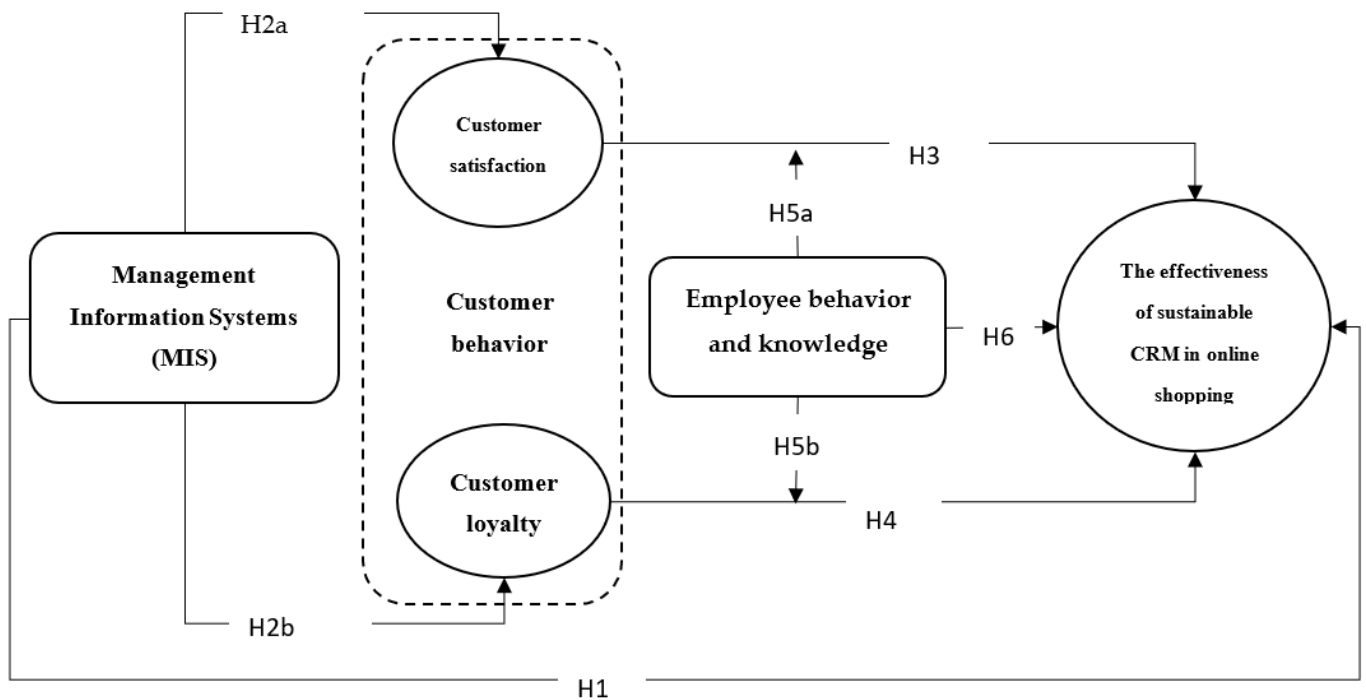
### 3. Conceptual Model and Hypotheses

An organization must redesign its CRM business processes to focus on sustainability to implement sustainable CRM [30]. Unfortunately, there is still little research on the development of sustainable CRM, and there are few real-world examples of sustainable CRM applications. As a result, CRM practitioners struggle to incorporate sustainability [23]. A system that can be seen as sustainable CRM if it meets the following criteria: it endures, performs, and evolves over time; the business ecosystem and customer ecosystem can continue to communicate, share, and transfer information, and; it can independently direct future generations of CRM [11]. There is little research that offers a combined perspective on how sustainability affects CRM, and the sustainable CRM literature that does exist typically considers sustainability to be synonymous with a long-term business activity, or analyzes only one of the sustainability dimensions (economic, environmental, or social) [31]. As a result, sustainability in CRM is portrayed as a fragmented idea without a comprehensive perspective. Moreover, sustainable CRM frequently considers only marketing and ignores other CRM components, such as sales or post-sales [6]. Consequently, more research is needed in this field. Table 1 presents some of the variables that influence CRM, which are discussed in detail. The impact of these variables was investigated individually on CRM. To understand the importance of sustainable CRM, it is necessary to examine these variables in a comprehensive model. In the following paragraphs, using some of the most prominent variables, a comprehensive model for effectiveness of the sustainable CRM is presented. This section also explains the study's research variables and hypotheses, while Figure 1 illustrates the study's conceptual model.

- MIS

The MIS research focuses on the interaction of industries, people, and technology [32]. MIS examines how people, groups, and companies assess, create, execute, administer, and employ information-generating systems. Cognitive science, management theory, organizational theory, computer science, and management science all benefit from utilizing MIS. Using MIS, a company's decision making procedures may be made more efficient and successful. MIS is a people-oriented discipline that focuses on technology-assisted service. MIS examines the entire company, including its people, work systems, and growth and placement, to determine how a goal may be achieved with little effort [33]. The procedure of gathering, analyzing, preserving, and transferring important information to support management activities in any business requires utilization of MISs [34]. A managing MIS is a tool that managers use to make better decisions and more effectively implement the organization's business activities [35]. The overall purpose of MIS is to supply managers with data to help them in decision making. A computer system provides relevant users with information [36]; users are usually part of an official organization. The information shows an organization with a view of what occurred previously, what is currently taking place, and what will occur in the future [37]. The information has been provided in the form of special reports, mathematical simulation results, and periodic reports [38]. The

results of reports are utilized by managers and non-managers when solving organizational issues. Information availability is commonly connected with “better decision-making”, particularly under evidence-based decision making [39]. The ease of learning, ease of use, user satisfaction, usefulness, and quality are all connected to availability; therefore, the extent to which one believes learning how to utilize and run an MIS needs minimal effort is referred to as ease of use [40]. Three hypotheses are presented to evaluate the suggested model in light of the above-reviewed theoretical considerations:



**Figure 1.** The study’s conceptual model.

**Hypothesis 1 (H1).** *The MIS positively influences the effectiveness of sustainable CRM in online shopping.*

**Hypothesis 2a (H2a).** *The MIS positively influences customer satisfaction.*

**Hypothesis 2b (H2b).** *The MIS positively influences customer loyalty.*

- Customer behavior

Researchers have worked independently in many countries to relate sustainability to customer behavior. Customers are becoming more informed and attracted to sustainable behaviors and principles, while some studies show that they tend to negatively evaluate firms that lack sustainability [41]. Customers may be “loyal” to a brand, loyalty program, channel middlemen, or personnel that they deemed to be sustainable [42]. Customer satisfaction is a psychological state that develops when the customer’s past feelings about their purchasing experience are joined with the emotion brought on by unmet expectations. Customers frequently decide whether or not to purchase/repurchase after assessing whether or not their previous experience with the product/service was satisfactory/pleasant. According to the customer satisfaction model, customers are happy (relying on the expectation disconfirmation theory) when actual business performance affirms or beats historical expectations [43]. Client happiness is a key aspect of establishing customer loyalty. Customer happiness is the key to prospective purchasing behavior. Customers who are happy with a supplier’s service will boost their utilization of the service and plan to use it again in the future. Providing excellent service quality can increase customer satisfaction and repurchase

intentions [44]. Two hypotheses are presented to evaluate the proposed model based on the previously reviewed theoretical aspects:

**Hypothesis 3 (H3).** *Customer satisfaction positively affects the effectiveness of sustainable CRM in online shopping.*

**Hypothesis 4 (H4).** *Customer loyalty positively affects the effectiveness of sustainable CRM in online shopping.*

- Employee behavior and knowledge

Employee conduct may be described as how employees interact or react in a sustainable workplace under various conditions. An employee in today's workplace must deal with a vastly different, difficult, and unpredictable environment. Employees who want to thrive in such a dynamic market must have the knowledge, skills, and attitudes to detect shifts and respond appropriately, such as by obtaining new deals and competitive advantages for the organization [45]. Knowledge is the mental form of ideas, facts, concepts, data, and techniques recorded in human memory [46]. Knowledge originates from the human brain, and is based on information transformed and fertilized by experience, beliefs, personal values, and decisions and actions [47]. Each person's knowledge is different from that of another person receiving the same information [48]. To assess the suggested model based on the reviewed theoretical regards above, three hypotheses are presented:

**Hypothesis 5a (H5a).** *Employee behavior and knowledge play a mediation role between customer satisfaction and the effectiveness of sustainable CRM in online shopping.*

**Hypothesis 5b (H5b).** *Employee behavior and knowledge play a mediation role between customer loyalty and the effectiveness of sustainable CRM in online shopping.*

**Hypothesis 6 (H6).** *Employee behavior and knowledge positively influence the effectiveness of sustainable CRM in online shopping.*

In addition to the above hypotheses, there was one other hypothesis in this study that assesses the role of the gender of employees and managers, which will be tested through multi-group analysis (MGA):

**Hypothesis 7 (H7).** *The extent of effectiveness of sustainable CRM differs with the gender of employees and managers.*

#### 4. Research Method

The current investigation considered the nature of the problem and its purpose. This investigation was also a descriptive survey of correlation types regarding data gathering. We described how the findings were collected without any manipulation, and the relationships between the variables were investigated. The following section will cover the statistical community, methodologies, sampling procedures, research variables, data-collecting instruments, and the reliability and validity of the survey questions.

##### 4.1. Statistical Sample

A statistical sample is a collection of people who share one or more characteristics, which the investigator takes into account. This experiment's statistical sample consists of employees and managers working for private firms in Beijing. The procedure stated in Equation (1) was employed to produce a statistically representative sample of the population [49]:

$$n = \frac{m}{1 + \left(\frac{m-1}{N}\right)} \quad (1)$$



where the sample sizes for the unlimited, limited, and available populations are  $m$ ,  $n$ , and  $N$ , respectively. Equation (2) was used to get the  $m$ :

$$m = \frac{z^2 \times p \times (1 - p)}{e^2} \quad (2)$$

where  $z$  is the statistic value for the confidence level (i.e., 2.575, 1.96, and 1.645 for 99 percent, 95 percent, and 90 percent confidence levels, respectively),  $p$  is the value of the population proportion being evaluated, and  $e$  is the point estimate's sampling error. Since the value of  $p$  is uncertain, Alaghbari and Sultan [49] recommended using a cautious value of 0.50 to generate a sample size at least as big as necessary. Utilizing a 95% confidence level (i.e., a 5% significance threshold) of the population's limitless sample size,  $m$  was estimated as follows [50]:

$$m = \frac{(1.96)^2 \times 0.50 \times (1 - 0.50)}{(0.05)^2} \approx 385 \quad (3)$$

After distributing 384 questionnaires, collecting them, and reducing the number of incomplete and useless questionnaires, 293 questionnaires were prepared for analysis. The sampling procedure used was simple random sampling. Table 2 shows the demographics of individuals. A high proportion of the respondents (58%) were male, and the most represented age group consisted of individuals aged over 35 years. The frequency of postgraduates was also higher than any other education group.

**Table 2.** Demographics of research samples.

Measure	Item	Frequency	Percentage
Gender	Female	122	41.63%
	Male	171	58.37%
Age	Under 25	38	12.0%
	25–35	94	32.1%
	Over 35	161	54.0%
Education	Bachelor	49	17.29%
	Master	154	52.0%
	Ph.D	90	30.71%

#### 4.2. Data Analysis

Measuring and assessing tools are those that a researcher may employ to measure variables, and collect the data needed to analyze and examine a phenomenon. Here, library and field methods were used to gather data, and the questionnaire was used as the means of classifying data. All accessible library resources, such as books, scientific research journals, papers, and reliable Internet sites, have compiled data on theoretical underpinnings, research, and the literature. The questionnaire is also one of the most common and direct tools for obtaining research data (field research). The questionnaire is a set of questions, phrases, and items of questions to which the respondent presents necessary answers; these answers form the data used by the researcher. A questionnaire was used to gather the essential data to establish the association between research variables.

To determine the effect of MIS, employee behavior and knowledge, and customer behavior (satisfaction and loyalty) on the effectiveness of sustainable CRM, a questionnaire with 22 questions was used. The questions were arranged and regulated depending on the identified variables. The questionnaire also utilized a five-point Likert scale (Table 3).

Table 3. Research questionnaire.

Row	Constructs	Options				
		Completely Disagree	Disagree	Middle	Agree	Completely Agree
<i>MIS</i>						
MIS1	The use of MIS in the organization and its application have impacted the career development and position of the organization.					
MIS2	With the growth of MISs in the organization, access to information is becoming faster.					
MIS3	The security of MISs has improved the performance of the organization.					
MIS4	High-quality organizational managers' access to the Internet affects their awareness.					
<i>Customer satisfaction (SAT)</i>						
SAT1	The structure of the sustainable CRM system is appropriate in terms of innovation.					
SAT2	The structure of the sustainable CRM system is suitable in terms of functionality.					
SAT3	Confidence and lack of anxiety increase satisfaction.					
SAT4	I prefer the services and products of the organization to other organizations.					
SAT5	I am satisfied with the overall performance of the organization.					
<i>Customer loyalty (LOY)</i>						
LOY1	Next time, I will definitely return to the organization and use the same services.					
LOY2	Employees fulfill their obligations correctly and honestly.					
LOY3	Services are provided to me quickly.					
LOY4	Organizations have a lot of information about what I need.					
<i>Employee behavior and knowledge (EBK)</i>						
EBK1	The goal of the organization is to implement a new technology-based education system.					
EBK2	Using MISs helps us to share knowledge.					
EBK3	The organization has formal systems for sending knowledge about special topics to employees who are interested in them.					
EBK4	Employees have familiarity with using MISs hardware and software.					
<i>Effectiveness of sustainable CRM</i>						
SCRM1	You will be aware of ways to improve your performance from the authorities.					
SCRM2	The organization has more credit for information and technology processes than it did last year.					
SCRM3	The organization optimally utilizes resources and facilities. (Performance)					
SCRM4	This year, private organizations have achieved their goals and objectives. (Effectiveness)					
SCRM5	MISs have facilitated decision-making in the organization and resulted in improved performance.					

#### 4.3. Validity and Reliability

After regulating the questionnaire and receiving the approval of experienced professors, the surveys were executed and examined, with data from 55 managers and employees used to correct the defects, certify the questionnaire's right schematization, and enhance its reliability and validity. The average variance extracted (AVE), Cronbach's alpha (CA), and composite reliability (CR) of the survey were calculated utilizing SMART PLS and SPSS software (shown in Tables 4 and 5) to increase confidence in its reliability and validity rate.

**Table 4.** Validity and reliability figures for the measurement model.

Constructs	Indicators	VIF	Outer Loadings	T-Value	CA	rho_A	CR	AVE
MIS	MIS1	1.256	0.569	9.218	0.785	0.851	0.859	0.610
	MIS2	1.638	0.781	26.619				
	MIS3	2.096	0.883	76.462				
	MIS4	2.053	0.851	46.523				
Customer satisfaction	SAT1	1.867	0.837	54.212	0.838	0.875	0.883	0.602
	SAT2	1.920	0.760	20.321				
	SAT3	1.883	0.750	18.395				
	SAT4	1.759	0.810	41.181				
	SAT5	1.590	0.717	14.953				
Customer loyalty	LOY1	1.436	0.735	20.982	0.723	0.728	0.828	0.547
	LOY2	1.393	0.752	19.107				
	LOY3	1.511	0.796	40.295				
	LOY4	1.237	0.671	17.687				
Employee behavior and knowledge	EBK1	1.449	0.775	47.111	0.820	0.822	0.881	0.649
	EBK2	2.165	0.823	37.010				
	EBK3	2.298	0.835	33.180				
	EBK4	1.602	0.788	36.722				
Effectiveness of sustainable CRM	ECRM1	1.555	0.749	25.038	0.816	0.818	0.871	0.576
	ECRM2	1.750	0.779	27.394				
	ECRM3	1.625	0.750	21.018				
	ECRM4	1.655	0.750	20.018				
	ECRM5	1.575	0.764	29.566				

**Table 5.** Discriminant validity for the measurement model.

	MIS	SAT	LOY	EBK	Moderating Effect 1 SAT × EBK	Moderating Effect 2 LOY × EBK	Effectiveness of Sustainable CRM
MIS	0.781						
SAT	0.500	0.776					
LOY	0.632	0.636	0.740				
EBK	0.633	0.654	0.553	0.806			
Moderating effect 1 (SAT × EBK)	−0.042	−0.218	−0.224	−0.081	1.0000		
Moderating effect 2 (LOY × EBK)	−0.218	−0.212	−0.414	−0.221	0.611	1.0000	
Effectiveness of sustainable CRM	0.667	0.652	0.697	0.691	−0.112	−0.173	0.759

In this case, the CA method and composite reliability were used to measure reliability. CA is a commonly used reliability metric; values greater than 0.7 imply satisfactory reliability [51]. As CA is a common criterion for specifying variables' reliability, the PLS procedure employs a new criterion, CR, to differentiate itself [52]. The superiority of this criterion over CA is that variable dependability is determined by the correlation of the variables together, rather than in absolute terms. Consequently, these criteria provided a better reliability assessment. If the CR amount for variables is above 0.7, it illustrated good model internal consistency; an amount less than 0.6 demonstrated no reliability [53].

The subsequent criterion to fit the measurement model is AVE. The AVE criterion demonstrates the variance average, divided among variables with their indices. Its critical amount is 0.5, i.e., the AVE amount of more than 0.5 illustrates acceptable convergent validity [54]. CA for independent variables, such as the MIS, customer satisfaction, customer loyalty, and employee behavior and knowledge, was 0.785, 0.838, 0.723, and 0.820, respectively. The dependent variable, i.e., the effectiveness of sustainable CRM, was 0.816, also indicated excellent reliability, with an amount higher than 0.7. For all variables, the CR was more than 0.7. For total variables, convergent validity was above 0.5. The recommended approach has been approved at the standard level because of the given criteria (See Table 4).

Ultimately, discriminant validity, or the degree of association between a variable and its indices compared to the other variables, was a criterion. When the AVE amount for a variable was more than the variance between that variable and the other variables, discriminant validity was satisfactory (i.e., the square of the correlation coefficients among

variables) in the model [53]. As the matrix in Table 5 shows, since the numbers in the original diagonal were greater than their lower numbers, they represented acceptable divergent validity.

The heterotrait–monotrait (HTMT) correlation ratio was another discriminant validity metric. Henseler and Ringle [55] used Monte Carlo simulation to validate the improved efficacy of this technique, finding that HTMT had greater specificity and sensitivity rates (97–99%) than the cross-loadings criteria (0.00%) and Fornell–Lacker (20.82%). A lack of discriminant validity was shown by HTMT scores near 1. The HTMT was compared to a pre-defined threshold when employed as a criterion. Discriminant validity is not present if the HTMT value exceeds this threshold. A 0.85 criterion has been proposed by several writers [56]. In addition, Gold and Malhotra [57] discussed it and recommended a value of 0.90. Table 6 illustrates the value of HTMT.

**Table 6.** The heterotrait–monotrait ratio of correlations (HTMT).

	MIS	SAT	LOY	EBK	Moderating Effect 1 (SAT × EBK)	Moderating Effect 2 (LOY × EBK)	Effectiveness of Sustainable CRM
MIS							
SAT	0.536						
LOY	0.799	0.784					
EBK	0.742	0.762	0.709				
Moderating effect 1 (SAT × EBK)	0.105	0.230	0.270	0.094			
Moderating effect 2 (LOY × EBK)	0.218	0.199	0.484	0.244	0.611		
Effectiveness of sustainable CRM	0.790	0.748	0.898	0.830	0.159	0.196	

#### 4.4. Data Analysis Methods

In this paper, for all the tests, SMART-PLS was used. The least squares approach was frequently employed as a substitute for SEM; this analysis was performed on two levels. The first step involved convergent reliability, validity analysis, and model and questionnaire reliability. The second stage needed to approve the whole study’s assumptions by performing tests [58]. SMART PLS 3.0 analyzed data; therefore, the path, GOF index,  $R^2$  criterion,  $Q^2$ , and t-value, importance, and performance MAP Analysis (IPMA) was utilized to measure the model’s overall fitness and hypothesis examination.

## 5. Results

In this section, the findings are collected from the results of data analysis. Therefore, research data, which comprise only quantitative statistics, should be interpreted according to the research’s aims and hypotheses, and converted into the research findings. At the analysis stage, the data was encoded and then analyzed using PLS software. This section will assess the validity of the models and hypotheses.

- $R^2$  criterion and path coefficients

The determination coefficient is the primary criterion for assessing the path model’s hidden endogenous variables. This score implies that the exogenous variable affects a small percentage of the endogenous variable changes. Figure 2 illustrates the outcomes for path coefficients.

$R^2$  is a criterion used in SEM to link the structural and measurement components. Chin [59] establishes three criteria for weak, medium, and strong  $R^2$  values: 0.19, 0.33, and 0.67, respectively. The model’s competence was assessed using  $R^2$ . In this model, the  $R^2$  value for customer satisfaction is 0.250, customer loyalty is 0.399, and the effectiveness of sustainable CRM in the online shopping dependent variable is 0.669; these results indicate that the model presented is strong and moderately high. The path coefficients are the standardized beta in linear regression [60]. Amounts attained by analysis of path coefficients and  $R^2$  criterion may be significant, approve the assumptions, and accept the influence of independent variables on the dependent ones. Figure 3 illustrates the outcomes for path coefficients and  $R^2$ .

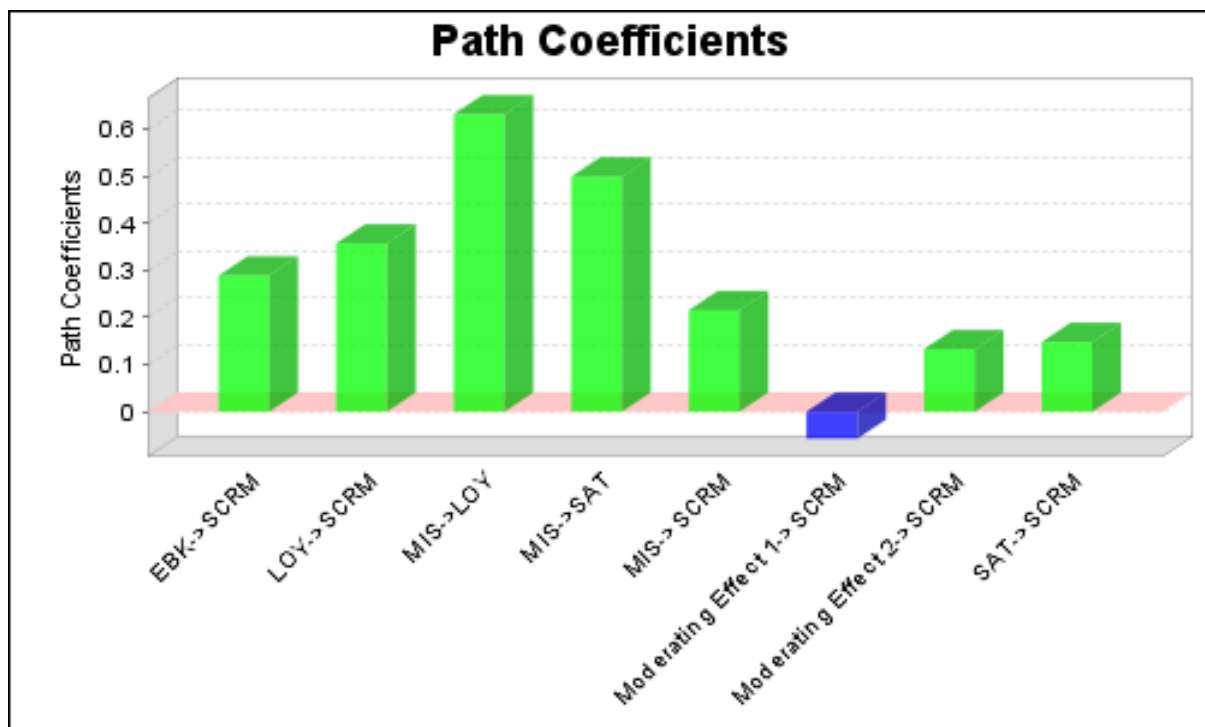


Figure 2. The path coefficients for the proposed model and hypothesis.

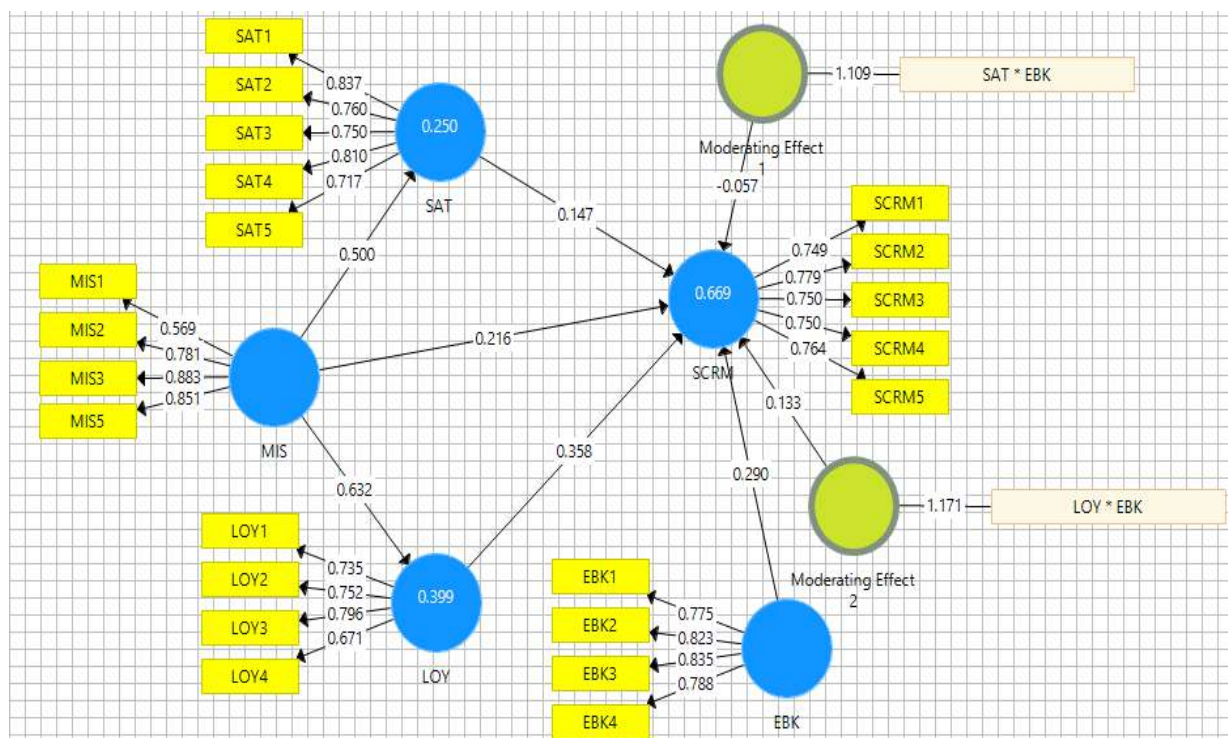


Figure 3. The R<sup>2</sup> value and coefficients.

- T-values

T-values are the most important criterion for assessing model structure relationships (structural section). If these amounts are above 1.96, the relationship among the structures is accurate. T-test was used to examine whether MISs affect the effectiveness of sustainable CRM in online shopping, and to test the hypotheses. The outcomes of the T-test

are illustrated in Table 7. The outcomes illustrate that all the assumptions are accepted and confirmed.

**Table 7.** Summarization of test results.

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ( O/STDEV )	p Values	Confirm or Reject the Hypothesis
MIS → sustainable CRM	0.216	0.213	0.055	3.947	0.000	Confirmed
MIS → SAT	0.500	0.505	0.046	10.798	0.000	Confirmed
MIS → LOY	0.632	0.635	0.032	19.460	0.000	Confirmed
SAT → sustainable CRM	0.147	0.149	0.054	2.710	0.007	Confirmed
LOY → sustainable CRM	0.358	0.358	0.051	7.041	0.000	Confirmed
EBK → sustainable CRM	0.290	0.290	0.053	5.494	0.000	Confirmed
Moderating effect 1 → sustainable CRM	−0.057	−0.056	0.034	1.676	0.094	Not Confirmed
Moderating effect 2 → sustainable CRM	0.133	0.131	0.032	4.198	0.000	Confirmed

- Partial least squares multi-group analysis

To address the last hypothesis of this study (H7)—manager and employees' gender as a categorical moderator variable—partial least squares multi-group analysis (PLS-MGA) is applied using the percentile bootstrapping method. In total, 122 female and 171 male candidates participated in this study. Therefore, two groups are considered for PLS-MGA. The significant group differences are shown in Table 8.

**Table 8.** PLS-MGA results for gender (H7).

	Path Coefficients-Diff ( Female—Male )	p-Value (Female vs. Male)
MIS → sustainable CRM	0.003	0.513
MIS → SAT	0.013	0.445
MIS → LOY	0.001	0.491
SAT → sustainable CRM	0.020	0.575
LOY → sustainable CRM	0.022	0.414
EBK → sustainable CRM	0.002	0.500
Moderating Effect 1 → sustainable CRM	0.023	0.381
Moderating Effect 2 → sustainable CRM	0.006	0.461

In PLS-MGA, based on the guidelines mentioned by Henseler and Ringle [61], a significant difference in a specific PLS path coefficient between groups is indicated by a percentage of less than 0.05 and greater than 0.95. Therefore, a result is significant at the 5% error level if the *p*-value is less than 0.05 or greater than 0.95 [62]. According to Henseler and Ringle [61], a percentile less than 0.05 indicates that Group 1's bootstrapping results are better than those of Group 2. Furthermore, percentiles greater than 0.95 indicate that Group 2's bootstrapping results are superior to those of Group 1. According to Table 8, the results suggest that the path coefficient of the relationships (MIS → sustainable CRM, MIS → SAT, MIS → LOY, SAT → sustainable CRM, LOY → sustainable CRM, EBK → sustainable CRM, Moderating Effect 1 → sustainable CRM, Moderating Effect 2 → sustainable CRM) do not vary significantly between female and male employees. Therefore, H7 is not supported, as extent of the effectiveness of sustainable CRM does not differ based on the gender of employees and managers.



- Fitness model

An appropriate universal measurement for overall model fitness with PLS usage has recently been proposed. The obtained amount for this criterion is a figure between zero and one. Wetzels et al. [63] reported three values of 0.1, 0.25, and 0.36 as weak, medium, and strong for GoF. If we estimate the quantity of 0.1 and its nearest as GoF in a model, we can conclude that the model's overall fitness is poor, and that we need to enhance the interactions among the model structures. This finding is also true for the other two GoF values (0.25: medium overall fitness, 0.36: strong overall fitness). According to the equation introduced by Henseler and Sarstedt [64], our research model for GoF obtained 0.512. Therefore, the model is valid and has strong fitness.

We employed blindfolding ( $Q^2$  statistic) to examine predictive relevance as an extra measure of model fit in PLS analysis, as recommended by Geisser [65]. The  $Q^2$  statistic is a jackknife variation of the  $R^2$  statistic, according to Chin [66]. It is used a metric to test how effectively the model and its parameter estimations are able to recreate observed values. Predictive relevance is defined as a model with a positive  $Q^2$ . The following values are used to calculate  $Q^2$ : 0.02 (low predictive relevance for an endogenous construct), 0.15 (mid predictive relevance for an endogenous construct), and 0.35 (high predictive relevance for an endogenous construct) [67]. Thus, this study's findings revealed that the  $Q^2$  statistic is 0.127 for customer satisfaction, 0.205 for customer loyalty, and 0.355 for the effectiveness of sustainable CRM in online shopping. The dependent variable is beyond zero for all measures, illustrating the model's predictive relevance.

- Importance-Performance Map Analysis (IPMA)

In this investigation, the importance and performance map analysis (IPMA) is employed to offer a visual analysis of the efficacy of sustainable CRM. In a PLS-SEM study, IPMA examines the performance level of latent and manifest variables. Therefore, it provides insight into the variables' significance to the goal constructed, and shows the importance of latent and manifest factors (i.e., path coefficient) [68]. As a result, IPMA makes it possible to prioritize variables to enhance the targeted variable [69]. Table 9 shows the latent variable (LV) values and performance of the constructs' based on the method introduced by Ringle and Sarstedt [70].

**Table 9.** Latent variable index amounts and performance of the target construct the effectiveness of sustainable CRM.

	LV Performances	LV Index Values
EBK	50.084	3.003
LOY	55.787	3.231
MIS	52.653	3.106
SAT	57.325	3.293

The standardized total effects (importance) are revealed in Figure 4. In terms of performance, customer satisfaction (57.325) scored the highest, followed by customer loyalty (55.787), the MIS (52.653), and employee behavior and knowledge (50.084). It indicated that organizations must concentrate on employee behavior and knowledge. since it performed relatively poorly compared to other factors.

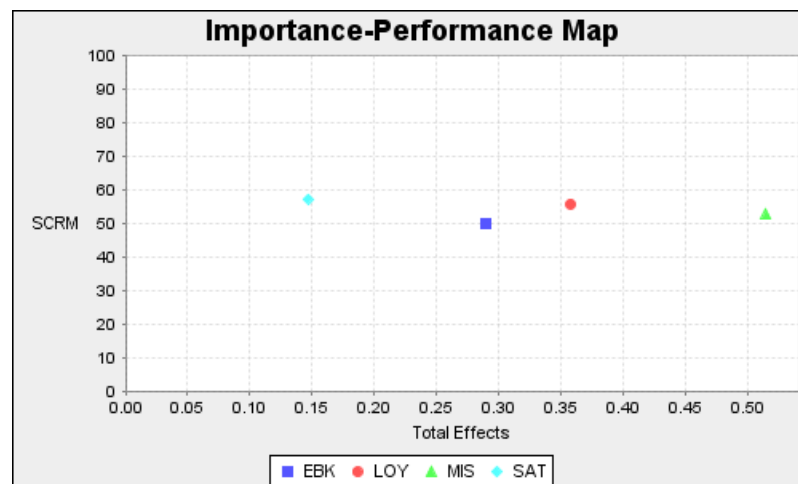


Figure 4. IPMA chart to show the importance of the variables.

## 6. Discussion

Enterprises strive to gain a lasting advantage in the highly competitive business environment of today [71]. This sustainable advantage can only be achieved when the business implements a value-creating strategy that is not being used by any existing or potential competitors, and when other businesses are unable to reap the same benefits. CRM refers to sustainable development that meets current demands without jeopardizing future generations' ability to meet their own demands. As discussed, the MIS, knowledge sharing, and customer behavior are key elements for improving the effectiveness of sustainable CRMs in the online shopping industry. We presented a research model and assessed its applicability to examining the use of sustainable CRM by the online shopping industry to exploit MIS technology. This study took a descriptive–correlational approach to data gathering and is applicable in terms of purpose. The statistical sample of the present investigation is the employees and managers of private organizations. After collecting and submitting questionnaires, 293 responses were prepared for analysis. In addition, the given model and data from surveys were examined using the SMART PLS 3.0. The reliability and validity of the investigation were evaluated using Cronbach's alpha, AVE, and composite reliability; all of our results were greater than the conventional values of 0.7 and 0.5 for the research variables. In addition, the hypotheses were measured by path coefficients, as well as  $R^2$ , T-Value,  $Q^2$ , IPMA, and GOF tests. The consequences of the hypothesis analysis illustrated that MIS, employee behavior and knowledge, customer satisfaction, and customer loyalty influence the effectiveness of sustainable CRM in online shopping.

The MIS considerably influences the efficacy of sustainable CRM in online shopping. The statistical analysis indicated that the path coefficient was 0.216, and the T value was 3.947, confirming the first hypothesis at the 99.9% level. The effect of MIS on customer satisfaction is also positive and significant. The obtained numbers showed a path coefficient of 0.500 and a T-value of 10.798, which confirmed this hypothesis at a 99.9% confidence level. The MIS also affects customer loyalty. As the results of the path coefficient and the T-value of were 0.632 and 19.460, respectively, this hypothesis is also confirmed at the 99.9% confidence level. These results are consistent with Naser and Al Shobaki [25]. These information systems are utilized in planning, leading, motivating, reporting, and controlling due to the numerous advantages of MIS, such as improved communication, more accurate control and data collecting, quicker data processing, and conversion-to-manager information. These systems perform managerial practices with the utmost accuracy and efficiency in a much shorter period and, positively impact the CRM system's performance. The research outcomes show that increasing the speed of MISs leads to greater efficiency, as well as increasing the speed of information transfer, ease of information transfer, and speed of saving information; these factors will accelerate the performance of any type of organization.

The results also show that modern systems implemented in private organizations have the necessary speed to respond to managers. The importance of ICT today is clearly linked to increasing the speed and accuracy of various organizations' activities, and linking different components to each other, thereby enhancing their productivity. The information system is also contains a network of communication channels, as well as components that collect and manipulate data and information. The on-time availability of information through these systems will enhance organizational performance. Adaptation of information systems to the needs and environment of the organization makes them more effective, improving the organization's performance. Therefore, according to research findings, implementing different aspects of the MIS process will facilitate decision making and subsequently increase the efficiency and performance of sustainable CRM.

The influence of customer satisfaction on the effectiveness of sustainable CRM is also significant, confirming the third hypothesis. The obtained numbers showed a path coefficient of 0.147 and a T-value of 2.710, which confirmed this hypothesis at the 99.9% confidence level. The next hypothesis was also confirmed through both obtained data [0.358, 7.041], and indicated customer loyalty's significant and positive influence on the effectiveness of sustainable CRM in online shopping. These results are consistent with Shukla and Pattnaik [11], Al-Bashayreh and Almajali [4], and Kumar and Mokha [21]. The results emphasize the significance of customer satisfaction and loyalty as a contributor to the effectiveness of CRM in online shopping, while also correlating with other academics' and researchers' theories. The importance of loyalty and customer satisfaction to the efficiency of sustainable CRM in online shopping has implications for management. To establish and attain competitive advantage in a market that is constantly competitive and decreasingly profitable, it is necessary to understand different aspects of customer satisfaction and loyalty, and their influence on sustainable CRM and customer loyalty; this is especially true when operating in new and/or emerging markets.

The confidence interval of the moderation effect on sustainable CRM is [−0.057, 1.676], indicating the effect is insignificant. The results of Table 7 show that employee behavior and knowledge do not moderate the effect between customer satisfaction and sustainable CRM; thus, H5a is not supported. Table 7 also shows the moderated mediation effect of employee behavior and knowledge; the confidence interval of the moderation effect on sustainable CRM is [0.133, 4.198] indicates the effect is significant (H5b). Finally, the sixth hypothesis was also confirmed by the obtained data (path coefficient of 0.290 and T-value of 5.494), which indicates the significant and positive influence of employee behavior and knowledge on the effectiveness of sustainable CRM in online shopping. The research outcomes show that knowledge that is not circulated in the organization will not grow, and eventually it will become obsolete and obstructed. In short, the circulation of knowledge via sharing, acquisition, and exchange will cause the creation of novel knowledge, which would be infeasible without the utilization of information technologies. This message is apparent from the upward movement of knowledge in improving CRM systems performance. The study's outcomes demonstrated that supporting knowledge creation and information sharing among their workers could better define effective processes and improve the performance of businesses' CRM systems.

H6 was also confirmed by the obtained data [0.290, 5.494], which indicates that employee behavior and knowledge had a significant and positive influence on the effectiveness of sustainable CRM in online shopping. These results are consistent with Chi [22], and Gil-Gomez and Guerola-Navarro [23]. The research outcomes illustrate that MIS, customer satisfaction, customer loyalty, and employee behavior and knowledge are useful tools for assessing the effectiveness of sustainable CRM; thus, investing in this area could deliver has economic benefits for organizations. MIS can be an effective factor in expanding the organization, and creating and improving the organization's competitive advantage. According to the values defined for  $R^2$ , the number attained for  $R^2$  in the analysis is 0.669 for the dependent variable of the effectiveness of sustainable CRM in online shopping, indicating the model's strong fitness. The use of a test to extend the model resulted in a value of 0.512,

demonstrating that the model is more appropriate than the baseline quantities established for GoF. The results of PLS-MGA also implied that the gender of employees and managers makes no significant difference to the effectiveness of sustainable CRM.

## 7. Conclusions, Implications, and Future Works

A relatively new concept, sustainable CRM ensures long-term customer retention, making any firm more lucrative and well-equipped to outperform rivals. Thus, the development of sustainable CRM is essential for any organization, especially those that provide online shopping services. Sustainable CRM extends customer relationships by removing discomfort issues and regenerating new customer needs, wants, and demands. CRM focuses on customer incentives, rewards, etc., as well as on the marginal utility that customers receive. Organizations need this information to survive in today's competitive environment. Thus, adapting information systems to suit their needs provides the basis for the success of organizations, besides efficiency and effectiveness. This research aimed to inspect the effect of MIS, employee behavior and knowledge, and customer behavior on the effectiveness of CRM.

As predicted in the first hypothesis, MIS significantly influences the effectiveness of sustainable CRM. Since MIS has a positive and significant impact on the effectiveness of sustainable CRM, it is suggested that organizations train their employees to use up-to-date information systems to improve performance. An overall review and redesign of the structure of organizations is also recommended. Therefore, providing appropriate information systems for storing, transferring, and exchanging data such as the Internet, Intranet, and software; providing the necessary conditions for easy access to appropriate hardware for information sharing, and; developing skills in using ISs such as the Internet, Intranet, etc., is recommended. Managers are also advised to prioritize the development of comprehensive and long-term planning to help private organizations utilize IT and information and communication systems. Studies have long recognized customer behavior as a powerful predictor of behavioral factors. Customer satisfaction is defined as a customer's beneficial and cognitive appraisal, depending on her/his own experiences throughout the relationship's service episodes. Customers want businesses to go above and beyond to meet their needs. Thus, customer happiness is the newest and most essential performance criterion that will firms will use to fight for profit in the future. Businesses may boost customer satisfaction, profitability, and loyalty by providing better service quality. Customer behavior also has a significant impact on CRM performance. Hence, if a variable impacts customer satisfaction, that variable will significantly impact CRM performance. As employee knowledge also influences the effectiveness of sustainable CRM, it is advisable to use employee training and knowledge sharing to enhance the effectiveness of CRM. It is also suggested that managers undertake training courses to introduce e-learning, to increase the day-to-day knowledge of managers and officials. In addition, it is advisable to train personnel before deploying them as hardware and software specialists. This study rejected the moderating role of employee behavior and knowledge between customer satisfaction and CRM; However, this subject can be reconsidered in future research.

In practice, this study can assist managers and practitioners in improving the effectiveness of sustainable CRM in online shopping. Furthermore, it can spur further empirical research into the relationships between customer satisfaction, customer loyalty, MIS, employee behavior, and knowledge. Only a few studies have previously considered the variables that influence the effectiveness of long-term CRM in online shopping and emerging industries in developing countries; these variables include customer satisfaction, loyalty, MIS, and employee behavior and knowledge. This study attempted to fill these gaps. As the current model is relatively constrained, it may be expanded in future studies. For example, cultural constructs could be incorporated into the model to ensure a more thorough and contextual analysis of this topic.

In future studies, it is recommended that researchers examine how security strategies affect sustainable CRM in private organizations' electronic spaces. Suggestions for future

research are presented depending on the study outcomes and the experience gained after this investigation. Based on these discussions, the applicability of sustainable CRM could be examined in several sectors of China. Future research may also adopt the concept of sustainable CRM to confirm that sustainable CRM encourages customer loyalty. Future work could also use the fsQCA method to find the configuration path.

**Author Contributions:** Conceptualization, J.L. and Z.L.; Data curation, Z.L.; Formal analysis, X.Z.; Funding acquisition, J.L.; Investigation, Z.L. and X.Z.; Methodology, J.L. and X.Z.; Project administration, Z.L.; Resources, Z.L. and X.Z.; Software, J.L. and X.Z.; Supervision, J.L. and Z.L.; Validation, Z.L.; Visualization, Z.L.; Writing—original draft, J.L. and X.Z.; Writing—review and editing, Z.L. and X.Z. All authors have read and agreed to the published version of the manuscript.

**Funding:** This work was supported by the National Social Science Fund’s “Research on the mechanism and path of cross-border e-commerce to promote the construction of China’s digital trade power” (22BJY014) project, and; the general project of the soft science plan of the Shaanxi Provincial Department of Science and Technology, known as the “Research on the promotion of transformation and upgrading of traditional manufacturing industry in Shaanxi Province by new cross-border e-commerce formats” (2023-CX-RKX-159) project.

**Informed Consent Statement:** Informed consent was obtained from all subjects involved in the study.

**Data Availability Statement:** All data are reported in the paper.

**Conflicts of Interest:** The authors declare no conflict of interest.

## References

1. Qin, X.; Liu, Z.; Liu, Y.; Liu, S.; Yang, B.; Yin, L.; Liu, M.; Zheng, W. User OCEAN personality model construction method using a BP neural network. *Electronics* **2022**, *11*, 3022. [\[CrossRef\]](#)
2. Wang, X.; Wang, H. A study on sustaining corporate innovation with E-commerce in China. *Sustainability* **2019**, *11*, 6604. [\[CrossRef\]](#)
3. Chen, Q.; Zhang, N. Does e-commerce provide a sustained competitive advantage? An investigation of survival and sustainability in growth-oriented enterprises. *Sustainability* **2015**, *7*, 1411–1428. [\[CrossRef\]](#)
4. Al-Bashayreh, M.; Almajali, D.; Al-Okaily, M.; Masa’deh, R.E.; Samed Al-Adwan, A. Evaluating Electronic Customer Relationship Management System Success: The Mediating Role of Customer Satisfaction. *Sustainability* **2022**, *14*, 12310. [\[CrossRef\]](#)
5. Choi, D.; Chung, C.Y.; Young, J. Sustainable online shopping logistics for customer satisfaction and repeat purchasing behavior: Evidence from China. *Sustainability* **2019**, *11*, 5626. [\[CrossRef\]](#)
6. Ferrer-Estévez, M.; Chalmeta, R. Sustainable customer relationship management. *Mark. Intell. Plan.* **2022**, *41*, 244–262. [\[CrossRef\]](#)
7. Müller, A.-L. Sustainability and customer relationship management: Current state of research and future research opportunities. *Manag. Rev. Q.* **2014**, *64*, 201–224. [\[CrossRef\]](#)
8. Zhuang, M.; Zhu, W.; Huang, L.; Pan, W.-T. Research of influence mechanism of corporate social responsibility for smart cities on consumers’ purchasing intention. *Library Hi Tech* **2021**, *40*, 1147–1158. [\[CrossRef\]](#)
9. Manurung, P.; Sembiring, S. E-crm Information System for Tapis Lampung SMEs. *J. Phys. Conf. Ser.* **2019**, *1338*, 012051.
10. Khanh, C.N.T.; Cao, K.D. The impact of organizational factors on E-CRM success implementation. *VINE J. Inf. Knowl. Manag. Syst.* **2021**, *52*, 612–629. [\[CrossRef\]](#)
11. Shukla, M.K.; Pattnaik, P.N. Managing customer relations in a modern business environment: Towards an ecosystem-based sustainable CRM model. *J. Relatsh. Mark.* **2019**, *18*, 17–33. [\[CrossRef\]](#)
12. Gao, H.; Hsu, P.-H.; Li, K.; Zhang, J. The real effect of smoking bans: Evidence from corporate innovation. *J. Financ. Quant. Anal.* **2020**, *55*, 387–427. [\[CrossRef\]](#)
13. Li, J.; Zhao, Y.; Zhang, A.; Song, B.; Hill, R.L. Effect of grazing exclusion on nitrous oxide emissions during freeze-thaw cycles in a typical steppe of Inner Mongolia. *Agric. Ecosyst. Environ.* **2021**, *307*, 107217. [\[CrossRef\]](#)
14. Burlea-Schiopoiu, A.; Mihai, L.S. An integrated framework on the sustainability of SMEs. *Sustainability* **2019**, *11*, 6026. [\[CrossRef\]](#)
15. Hasan, A.A.-T. Sustainable customer relationship management (susCRM) in customer loyalty perspective: An empirical study on restaurant industries in Bangladesh. *Glob. Media J.* **2021**, *19*, 1–4.
16. Ahmed, B.S.; Amroush, F.; Maati, M.B. The intelligence of E-CRM applications and approaches on online shopping industry. In *Advanced Methodologies and Technologies in Digital Marketing and Entrepreneurship*; IGI Global: Hershey, PA, USA, 2019; pp. 70–82.
17. Kampani, N.; Jhamb, D. Analyzing the role of E-CRM in managing customer relations: A critical review of the literature. *J. Crit. Rev.* **2020**, *7*, 221–226.
18. Moorthi, D.; Nallampalli, D. e-CRM an overview. *J. Interdiscip. Cycle Res.* **2020**, *12*, 795–801.



19. Al-Gasawneh, J.A.; AlZubi, K.N.; Anuar, M.M.; Padlee, S.F.; ul-Haque, A.; Saputra, J. Marketing performance sustainability in the Jordanian hospitality industry: The roles of customer relationship management and service quality. *Sustainability* **2022**, *14*, 803. [CrossRef]
20. Das, S.; Hassan, H.K. Impact of sustainable supply chain management and customer relationship management on organizational performance. *Int. J. Product. Perform. Manag.* **2022**, *71*, 2140–2160. [CrossRef]
21. Kumar, P.; Mokha, A.K. Electronic Customer Relationship Management (E-CRM) and Customer Loyalty: The Mediating Role of Customer Satisfaction in the Banking Industry. *Int. J. E-Bus. Res.* **2022**, *18*, 1–22. [CrossRef]
22. Chi, N.T.K. Innovation capability: The impact of e-CRM and COVID-19 risk perception. *Technol. Soc.* **2021**, *67*, 101725. [CrossRef]
23. Gil-Gomez, H.; Guerola-Navarro, V.; Oltra-Badenes, R.; Lozano-Quilis, J.A. Customer relationship management: Digital transformation and sustainable business model innovation. *Econ. Res.-Ekon. Istraživanja* **2020**, *33*, 2733–2750. [CrossRef]
24. Yunis, M.; Tarhini, A.; Kassar, A. The role of ICT and innovation in enhancing organizational performance: The catalysing effect of corporate entrepreneurship. *J. Bus. Res.* **2018**, *88*, 344–356. [CrossRef]
25. Naser, S.S.A.; Al Shobaki, M.J. Computerized Management Information Systems Resources and their Relationship to the Development of Performance in the Electricity Distribution Company in Gaza; 2016. Available online: <http://dstore.alazhar.edu.ps/xmlui/handle/123456789/119> (accessed on 21 February 2023).
26. Oh, S.; Ryu, Y.U.; Yang, H. Supply chain capabilities and information technology characteristics: Interaction effects on firm performance. In Proceedings of the 2016 49th Hawaii International Conference on System Sciences (HICSS), Washington, DC, USA, 5–8 January 2016; pp. 1417–1425.
27. Liu, X.; Tong, D.; Huang, J.; Zheng, W.; Kong, M.; Zhou, G. What matters in the e-commerce era? Modelling and mapping shop rents in Guangzhou, China. *Land Use Policy* **2022**, *123*, 106430. [CrossRef]
28. Liu, L.; Li, Z.; Fu, X.; Liu, X.; Li, Z.; Zheng, W. Impact of power on uneven development: Evaluating built-up area changes in Chengdu based on NPP-VIIRS images (2015–2019). *Land* **2022**, *11*, 489. [CrossRef]
29. Bhat, S.A.; Darzi, M.A. Service, people and customer orientation: A capability view to CRM and sustainable competitive advantage. *Vision* **2018**, *22*, 163–173. [CrossRef]
30. Chalmeta, R.; Barqueros-Muñoz, J.-E. Using big data for sustainability in supply chain management. *Sustainability* **2021**, *13*, 7004. [CrossRef]
31. Jang, H.-W.; Lee, S.-B. The relationship between contact-free services, social and personal norms, and customers' behavior for the sustainable management of the restaurant industry. *Sustainability* **2021**, *13*, 9870. [CrossRef]
32. Nowduri, S. Management information systems and business decision making: Review, analysis, and recommendations. *J. Manag. Mark. Res.* **2011**, *7*, 1.
33. Rahman, H.A.; Park, J.; Suh, J. Use of software agent technology in management information system: A literature review and classification. *Asia Pac. J. Inf. Syst.* **2019**, *29*, 65–82. [CrossRef]
34. Al-Mamary, Y.H.; Shamsuddin, A.; Aziati, N. Factors affecting successful adoption of management information systems in organizations towards enhancing organizational performance. *Am. J. Syst. Softw.* **2014**, *2*, 121–126.
35. Chang, M.; Ng, J.; Yu, K. The influence of analyst and management forecasts on investor decision making: An experimental approach. *Aust. J. Manag.* **2008**, *33*, 47–67. [CrossRef]
36. Benitez, J.; Luo, X.; Vastag, G. Information and Operational Decision Sciences: The Interplay of Information Technology and Operational Decision Sciences. *Decis. Sci.* **2019**, *51*, 458–463. [CrossRef]
37. Wu, P.F.; Vitak, J.; Zimmer, M.T. A contextual approach to information privacy research. *J. Assoc. Inf. Sci. Technol.* **2020**, *71*, 485–490. [CrossRef]
38. AlBar, A.M.; Hoque, M.R. Factors affecting the adoption of information and communication technology in small and medium enterprises: A perspective from rural Saudi Arabia. *Inf. Technol. Dev.* **2019**, *25*, 715–738. [CrossRef]
39. Islas, M.B.; Palermo, C.; Zapata, M.; Esteban, S. Information Systems, Statistical Information Availability and Decision Making in the Primary Health Care Level of the City of Buenos Aires. *Stud. Health Technol. Inform.* **2019**, *264*, 1829–1830.
40. Sanders, N.R.; Manrodt, K.B. Forecasting software in practice: Use, satisfaction, and performance. *Interfaces* **2003**, *33*, 90–93. [CrossRef]
41. Signori, P.; Gozzo, I.; Flint, D.J.; Milfeld, T.; Satinover Nichols, B. Sustainable customer experience: Bridging theory and practice. *Synerg. Bus. Theory Pract. Adv. Pract. Appl. Sch. Res.* **2019**, 131–174. [CrossRef]
42. Evanschitzky, H.; Ramaseshan, B.; Woisetschlager, D.M.; Richelsen, V.; Blut, M.; Backhaus, C. Consequences of customer loyalty to the loyalty program and to the company. *J. Acad. Mark. Sci.* **2012**, *40*, 625–638. [CrossRef]
43. Rather, R.A.; Tehseen, S.; Itoo, M.H.; Parrey, S.H. Customer brand identification, affective commitment, customer satisfaction, and brand trust as antecedents of customer behavioral intention of loyalty: An empirical study in the hospitality sector. *J. Glob. Sch. Mark. Sci.* **2019**, *29*, 196–217. [CrossRef]
44. Rita, P.; Oliveira, T.; Farisa, A. The impact of e-service quality and customer satisfaction on customer behavior in online shopping. *Heliyon* **2019**, *5*, e02690. [CrossRef]
45. Asadullah, A.; Juhdi, N.B.; Islam, M.N.; Ahmed, A.A.A.; Abdullah, A. The effect of reinforcement and punishment on employee performance. *ABC J. Adv. Res.* **2019**, *8*, 47–58. [CrossRef]
46. Zheng, W.; Cheng, J.; Wu, X.; Sun, R.; Wang, X.; Sun, X. Domain knowledge-based security bug reports prediction. *Knowl.-Based Syst.* **2022**, *241*, 108293. [CrossRef]



47. Chen, M.; Zhang, W. WeChat knowledge service system of university library based on SoLoMo: A holistic design framework. *J. Inf. Sci.* **2019**, *46*, 0165551519860045. [[CrossRef](#)]
48. Ma, Y.; Bennett, D. The relationship between higher education students' perceived employability, academic engagement and stress among students in China. *Educ. Train.* **2021**, *63*, 744–762. [[CrossRef](#)]
49. Alaghbari, W.; Sultan, B. The significant factors affecting labours productivity in construction projects in Yemen. *J. Eng. Sci.* **2015**, *4*, 41–57.
50. Alaghbari, W.; Al-Sakkaf, A.A.; Sultan, B. Factors affecting construction labour productivity in Yemen. *Int. J. Constr. Manag.* **2019**, *19*, 79–91. [[CrossRef](#)]
51. Cronbach, L.J. Coefficient alpha and the internal structure of tests. *Psychometrika* **1951**, *16*, 297–334. [[CrossRef](#)]
52. Dehgani, R.; Navimipour, N.J. The impact of information technology and communication systems on the agility of supply chain management systems. *Kybernetes* **2019**, *48*, 2217–2236. [[CrossRef](#)]
53. Nunnally, J. *Psychometric Methods*; McGraw-Hill: New York, NY, USA, 1978.
54. Navimipour, N.J.; Zareie, B. A model for assessing the impact of e-learning systems on employees' satisfaction. *Comput. Hum. Behav.* **2015**, *53*, 475–485. [[CrossRef](#)]
55. Henseler, J.; Ringle, C.M.; Sarstedt, M. A new criterion for assessing discriminant validity in variance-based structural equation modeling. *J. Acad. Mark. Sci.* **2015**, *43*, 115–135. [[CrossRef](#)]
56. Ab Hamid, M.; Sami, W.; Sidek, M.M. Discriminant validity assessment: Use of Fornell & Larcker criterion versus HTMT criterion. *J. Phys. Conf. Ser.* **2017**, *890*, 012163.
57. Gold, A.H.; Malhotra, A.; Segars, A.H. Knowledge management: An organizational capabilities perspective. *J. Manag. Inf. Syst.* **2001**, *18*, 185–214. [[CrossRef](#)]
58. Huang, Y.-M.; Huang, Y.-M.; Huang, S.-H.; Lin, Y.-T. A ubiquitous English vocabulary learning system: Evidence of active/passive attitudes vs. usefulness/ease-of-use. *Comput. Educ.* **2012**, *58*, 273–282. [[CrossRef](#)]
59. Chin, W.W. The partial least squares approach to structural equation modeling. *Mod. Methods Bus. Res.* **1998**, *295*, 295–336.
60. Hair, J.F.; Ringle, C.M.; Sarstedt, M. PLS-SEM: Indeed a silver bullet. *J. Mark. Theory Pract.* **2011**, *19*, 139–152. [[CrossRef](#)]
61. Henseler, J.; Ringle, C.M.; Sinkovics, R.R. The use of partial least squares path modeling in international marketing. In *New Challenges to International Marketing*; Emerald Group Publishing Limited: Bingley, UK, 2009.
62. Valaei, N.; Rezaei, S. Job satisfaction and organizational commitment: An empirical investigation among ICT-SMEs. *Manag. Res. Rev.* **2016**, *39*, 12. [[CrossRef](#)]
63. Wetzels, M.; Odekerken-Schröder, G.; Van Oppen, C. Using PLS path modeling for assessing hierarchical construct models: Guidelines and empirical illustration. *MIS Q.* **2009**, *33*, 177–195. [[CrossRef](#)]
64. Henseler, J.; Sarstedt, M. Goodness-of-fit indices for partial least squares path modeling. *Comput. Stat.* **2013**, *28*, 565–580. [[CrossRef](#)]
65. Geisser, S. The predictive sample reuse method with applications. *J. Am. Stat. Assoc.* **1975**, *70*, 320–328. [[CrossRef](#)]
66. Chin, W.W. *PLS-Graph User's Guide*; CT Bauer College of Business, University of Houston: Houston, TX, USA, 2001; Volume 15, pp. 1–16.
67. Ismail, A.; Razak, M.R.A. Effect of job satisfaction on organizational commitment. *Manag. Mark. J.* **2016**, *14*, 1.
68. Wei, G.; Cheah, W. Pay Satisfaction and Organizational Trust: An Importance-Performance Map Analysis. *J. Appl. Struct. Equ. Model.* **2020**, *4*, 1–16.
69. Liu, Y.; Chen, Z. A new model to evaluate the success of electronic customer relationship management systems in industrial marketing: The mediating role of customer feedback management. *Total Qual. Manag. Bus. Excell.* **2022**, *34*, 515–537. [[CrossRef](#)]
70. Ringle, C.M.; Sarstedt, M. Gain more insight from your PLS-SEM results: The importance-performance map analysis. *Ind. Manag. Data Syst.* **2016**, *116*, 1865–1886. [[CrossRef](#)]
71. Cheng, C.; Yang, X.; Jiang, F.; Yang, Z. How to Synergize Different Institutional Logics of Firms in Cross-border Acquisitions: A Matching Theory Perspective. *Manag. Int. Rev.* **2023**, *16*, 1–30. [[CrossRef](#)]

**Disclaimer/Publisher's Note:** The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.