RESEARCH ARTICLE   **OPEN ACCESS**

THE IMPACT OF PRE-SALES E-CRM FEATURES ON CUSTOMER SATISFACTION AND CUSTOMER LOYALTY: EXAMINING THE ROLE OF WEBSITE USABILITY, INFORMATION QUALITY, AND PERSONALIZATION IN E-COMMERCE WEBSITES

*[1]Mr. Hrishi Kumar Gond, [2]Dr. Rahil Yusuf Zai and [3]Amarendra Pratap Singh

[1]Research Scholar, Department of Business Management, Indira Gandhi National Tribal University
[2]Associate Professor, Department of Business Management, Indira Gandhi National Tribal University
[3]Professor, Department of Business Management, Indira Gandhi National Tribal University

---

ARTICLE INFO

ABSTRACT

This study investigates the impact of pre-sales electronic Customer Relationship Management (e-CRM) features on customer satisfaction and loyalty in e-commerce websites, with a specific focus on website usability, information quality, and personalisation. Using a quantitative research design with data collected from 678 respondents across multiple cities, the study employed structural equation modelling to test the hypothesised relationships. The findings reveal that all three pre-sales e-CRM features significantly influence customer satisfaction, with website usability showing the strongest effect ($\beta = 0.894$, $p < 0.001$). While personalisation demonstrated both direct and indirect effects on customer loyalty ($\beta = 0.410$, $p < 0.001$), website usability and information quality influenced loyalty primarily through customer satisfaction's mediating role. The model explained 57.8% of the variance in customer satisfaction and 71.4% in customer loyalty. These results underscore the critical importance of pre-sales e-CRM features in building customer relationships, particularly highlighting the dual impact of personalisation and the crucial mediating role of customer satisfaction in developing customer loyalty. The findings provide valuable insights for e-commerce practitioners in designing effective customer relationship strategies and suggest directions for future research in post-sales e-CRM features.

INTRODUCTION

In the contemporary e-commerce landscape, electronic customer relationship management (e-CRM) has emerged as a critical tool for fostering customer satisfaction and loyalty (Mang'unyi *et al*., 2017) (Alim & Ozuem, 2016) (Alim & Ozuem, 2016). This article explores the impact of pre-sales e-CRM features on these key outcomes, with a specific focus on the roles of website usability, information quality, and personalisation. Pre-sales e-CRM encompasses all customer interactions and features available before purchase, playing a pivotal role in shaping initial perceptions and influencing buying decisions (Mang'unyi *et al*., 2017) (Brettschneider & MiticKarphammar, 2021). Understanding how these features affect customer satisfaction and loyalty is essential for e-commerce businesses aiming to build lasting customer relationships and gain a competitive edge (Mang'unyi *et al*., 2017). E-CRM features are shown to have a significant impact on online consumer loyalty at all phases of the purchasing process, leading to long-term customer relationships (Burra *et al*., 2022). In the rapidly evolving landscape of e-commerce, the integration of electronic Customer Relationship Management (e-CRM) features has emerged as a pivotal strategy for enhancing customer satisfaction and loyalty.

E-CRM encompasses a range of tools and technologies designed to manage customer interactions and data throughout the customer lifecycle, particularly before, during, and after-sales transactions. This study aims to explore the impact of pre-sales e-CRM features on customer satisfaction and loyalty, emphasising the roles of website usability, information quality, and personalisation. Previous research has established a significant correlation between e-CRM features and customer loyalty, highlighting that effective pre-service interactions can lead to increased customer retention and satisfaction (Mang'unyi *et al*., 2017; Wells *et al*., 2011). As e-commerce continues to grow, understanding how these pre-sales features influence consumer behaviour becomes essential for businesses seeking to maintain competitive advantages. The interplay between website usability—defined as the ease with which users can navigate and utilise a website—information quality—referring to the accuracy, relevance, and timeliness of the information provided—and personalisation—tailoring content to individual user preferences—plays a critical role in shaping overall customer experiences. This article seeks to contribute to the literature by examining these dimensions within the context of e-commerce platforms. Customer loyalty is especially important in the highly competitive commercial banking environment (Oumar *et al*., 2017). Pre-service, during-service, and post-

transactional e-CRM features have a positive and significant relationship with loyalty (Oumar *et al*., 2017). Moreover, pre-service and during-service features significantly predict loyalty (Oumar *et al*., 2017). Effective e-CRM practices can be a strategic tool to improve a bank's relationship with its customers (Oumar *et al*., 2017). This study investigates the influence of specific features on customer loyalty (Brettschneider &MiticKarphammar, 2021). The features of pre-purchase that were found relevant to customer loyalty included captivating customers through marketing, popularity, and recommendations (Brettschneider &MiticKarphammar, 2021). E-CRM features at all three stages of an electronic transaction cycle (pre-service, during-service, and after-service) significantly influence e-loyalty (Oumar *et al*., 2017).

LITERATURE REVIEW

The relationship between e-CRM features and customer loyalty has been extensively studied, revealing that various elements significantly influence consumer perceptions and behaviours. E-CRM systems facilitate personalised marketing efforts and enhance communication channels, which are crucial for building trust and long-term relationships with customers (Zei-them *et al*., 2012). Research indicates that pre-service features such as targeted promotions and informative content can captivate potential customers' attention, leading to higher engagement rates (Goraya *et al*., 2021).

Website Usability: Usability is a critical factor in online shopping experiences. Studies have shown that websites with intuitive designs enhance user satisfaction by reducing frustration during navigation (Lee *et al*., 2009). A well-designed interface not only improves usability but also fosters trust, which is essential for encouraging repeat purchases (Auf *et al*., 2018).

Information Quality: The quality of information presented on e-commerce websites significantly impacts customer decision-making processes. High-quality information—including accurate product descriptions, reviews, and comparisons—can enhance perceived value and reliability (Friedrich *et al*., 2019). Customers are more likely to engage with platforms that provide comprehensive and trustworthy information.

Personalisation: Personalization strategies have gained traction as effective methods for improving customer satisfaction. Tailoring experiences based on user behaviour and preferences can lead to increased loyalty by making customers feel valued (Benlian, 2015; An *et al*., 2020). Personalised recommendations not only enhance user experience but also drive conversion rates. Despite the growing body of literature on e-CRM features and their impact on customer satisfaction and loyalty, there remains a notable gap in understanding how these elements interact within the specific context of pre-sales activities on e-commerce websites. Most existing studies focus on post-purchase behaviours or aggregate evaluations without dissecting the nuanced effects of pre-sales interactions facilitated by website usability, information quality, and personalisation. Furthermore, while previous research has established correlations between individual aspects of e-CRM and customer outcomes, comprehensive models integrating these variables are scarce. This study aims to fill this gap by systematically examining how pre-sales e-CRM features collectively influence customer satisfaction and loyalty in an online shopping environment. By doing so, it will provide valuable insights for practitioners looking to optimise their e-commerce strategies through enhanced customer engagement practices.

Objectives

1. To investigate the effect of pre-salesE-CRM features (website usability, information quality, and personalisation) on customer satisfaction and loyalty when purchasing items and services online.
2. To analyse the role of Customer Satisfaction as a mediator between the attributes of E-CRM and Customer Loyalty.

Conceptual Framework: The conceptual framework posits that Website Usability, Information Quality, and Personalization, as key pre-sales e-CRM features, influence Customer Satisfaction, which, in turn, affects Customer Loyalty. The framework also suggests that Website Usability, Information Quality, and Personalization have direct impacts on Customer Loyalty. The framework proposes both direct and indirect relationships between these variables.

Independent Variables: Website Usability: Refers to the ease with which users can navigate and interact with the e-commerce website. A usable website is intuitive, efficient, and satisfying to use (Nielsen, 2012).Information Quality: Encompasses the accuracy, relevance, and completeness of the information provided on the website. High-quality information helps customers make informed decisions (Wang & Strong, 1996).Personalisation: Involves tailoring the website content and user experience to individual customer preferences and behaviours. Personalisation can enhance customer engagement and perceived value (Kotler & Armstrong, 2018).

Mediating Variable: Customer Satisfaction: This represents the degree to which customers are pleased with their experience on the e-commerce website. Customer satisfaction is a critical determinant of customer loyalty (Oliver, 1999).
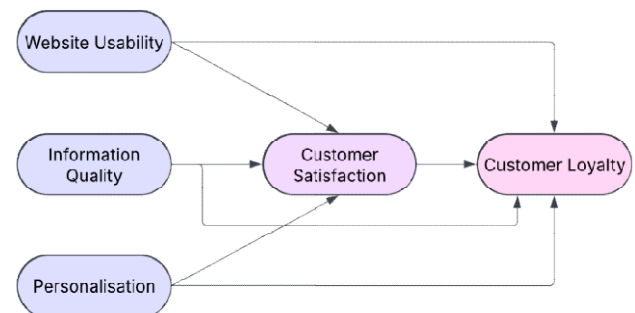

Figure 1. Conceptual Framework

Dependent Variable:Customer Loyalty: Reflects the extent to which customers are committed to making repeat purchases from the e-commerce website. Loyal customers are more likely to recommend the website to others and contribute to positive word-of-mouth (Reichheld, 1996).

Based on the framework, the following hypotheses can be derived:

H1: Pre-Sales E-CRM features with Customer Satisfaction

- H1a: Website usability has a positive significant effect on customer satisfaction in e-commerce websites.
- H1b: Information quality has a significant positive effect on customer satisfaction on e-commerce websites.
- H1c: Personalization features have a significant positive effect on customer satisfaction on e-commerce websites.

H2: Pre-Sales E-CRM features with Customer loyalty

- H2a: Website usability has a significant positive effect on customer loyaltyon e-commerce websites.
- H2b: Information quality has a significant positive effect on customer loyalty on e-commerce websites.
- H2c: Personalization features have a significant positive effect on customer loyalty on e-commerce websites.

H3: Mediating Role of Customer Satisfaction

- H3a: Customer satisfaction mediates the relationship between website usability and customer loyalty.
- H3b: Customer satisfaction mediates the relationship between information quality and customer loyalty.

- H3c: Customer satisfaction mediates the relationship between personalisation and customerloyalty.

Data Analysis and Interpretation

Sample Characteristics

Characteristic	Category	Frequency	Percentage
Age	16-20 years	102	15%
	20-25 years	359	53%
	25-30 years	183	27%
	30-35 years	34	5%
City	Bhopal	100	15%
	Bilaspur	108	16%
	Durg	93	14%
	Gwalior	89	13%
	Indore	108	16%
	Jabalpur	70	10%
	Raipur	109	16%
Shopping Frequency	Daily	102	15%
	Weekly	135	20%
	Monthly	305	45%
	Rarely	122	18%
	Never	14	2%
Plateform Usage	Flipkart	609	90%
	Amazon	575	85%
	Myntra	474	70%
	Meesho	305	45%
	Ajio	237	35%
	Nykaa	169	25%
	Others	135	20%
Device Preference	Smartphone	440	65%
	Smartphone + Laptop	169	25%
	Laptop Only	34	5%
	Tablet	20	3%
	Multiple Devices	14	2%

Measurement Model Assessment

Reliability Analysis

Construct	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
CL	0.929	0.936	0.947	0.780
CS	0.941	0.944	0.951	0.707
PreCrmIQ	0.972	0.973	0.974	0.680
PreCrmP	0.949	0.955	0.956	0.686
PreCrmWU	0.963	0.964	0.967	0.674

The reliability analysis provides critical information about the internal consistency and measurement quality of the constructs used in this study. Let me interpret the key metrics:

Cronbach's Alpha: All constructs show excellent Cronbach's alpha values, ranging from 0.929 to 0.972:

- Customer Loyalty (CL): 0.929
- Customer Satisfaction (CS): 0.941
- Pre-CRM Information Quality (PreCrmIQ): 0.972
- Pre-CRM Personalization (PreCrmP): 0.949
- Pre-CRM Website Usability (PreCrmWU): 0.963

These values significantly exceed the conventional threshold of 0.7, indicating exceptional internal consistency reliability. This means that the items within each construct are strongly correlated and consistently measure the same underlying concept. The particularly high values (>0.94) suggest that the measurement scales were well-developed and refined.

Composite Reliability (rho_a and rho_c)

Both measurements of composite reliability show similarly strong results:

- rho_a values range from 0.936 to 0.973
- rho_c values range from 0.947 to 0.974

These high values confirm the robustness of the measurement model from different statistical perspectives. While Cronbach's alpha assumes equal item loadings, composite reliability measures account for the actual factor loadings, providing a more precise estimate of internal consistency. The consistency between these different reliability measures strengthens confidence in the measurement quality.

Average Variance Extracted (AVE): The AVE values for all constructs are well above the recommended threshold of 0.5:

- Customer Loyalty: 0.780
- Customer Satisfaction: 0.707
- Pre-CRM Information Quality: 0.680
- Pre-CRM Personalization: 0.686
- Pre-CRM Website Usability: 0.674

These values indicate that more than two-thirds of the variance in the indicators is explained by the latent constructs rather than by measurement error. The particularly high AVE for Customer Loyalty (0.780) suggests that this construct is especially well-measured in the study.

Discriminant Validity

Construct	CL	CS	PreCrmIQ	PreCrmP	PreCrmWU
CL					
CS	0.844				
PreCrmIQ	0.783	0.726			
PreCrmP	0.657	0.688	0.822		
PreCrmWU	0.779	0.750	0.894	0.739	

Discriminant validity assesses whether the constructs in the model are sufficiently distinct from each other. The table presents the correlation values between pairs of constructs:

CL-CS Correlation (0.844): The strong correlation between Customer Loyalty and Customer Satisfaction aligns with theoretical expectations, as these are conceptually related but distinct constructs. However, the correlation is below 0.85, suggesting sufficient discrimination.

PreCrmIQ-PreCrmWU Correlation (0.894): The highest correlation in the matrix exists between Information Quality and Website Usability. While this suggests conceptual overlap, it doesn't necessarily indicate problematic multicollinearity since the correlation doesn't exceed the conventional threshold of 0.9. However, it does warrant careful interpretation of their distinct effects.

PreCrmP-PreCrmWU Correlation (0.739) and ***PreCrmP-PreCrmIQ Correlation (0.822):*** These correlations, while substantial, remain below critical thresholds, indicating that Personalization is sufficiently distinct from both Website Usability and Information Quality.

While the discriminant validity table doesn't explicitly provide the Fornell-Larcker criterion or HTMT ratios, we can make several observations:

None of the correlations exceeds 0.9, suggesting basic discriminant validity. The correlation between PreCrmIQ and PreCrmWU (0.894) approaches doesn't exceed critical thresholds, suggesting careful interpretation is needed for these constructs. The moderate to high correlations among the Pre-CRM features reflect the interconnected nature of e-CRM elements in practice. While statistically distinct, these features likely work together in the customer experience.

When combining reliability and discriminant validity findings:

Measurement Quality: The exceptionally high-reliability metrics (Cronbach's alpha, composite reliability) and strong AVE values indicate robust measurement quality. Researchers can have high confidence in the measurement model.

Construct Distinctiveness: While the constructs are sufficiently distinct to warrant separate analysis, the moderately high correlations (especially between Information Quality and Website Usability) suggest that these pre-sales e-CRM features work in concert rather than in isolation.

Theoretical Coherence: The pattern of correlations aligns with theoretical expectations. Customer Satisfaction correlates strongly with Customer Loyalty, while the three pre-sales e-CRM features show significant inter-correlations due to their conceptual proximity in the customer experience.

Multicollinearity Consideration: The correlation between Information Quality and Website Usability (0.894) suggests potential multicollinearity issues that might affect the precision of individual path coefficients in the structural model. This could explain why some direct effects weren't significant despite the overall strong model fit.

All three hypotheses (H1a, H1b, H1c) were supported with statistically significant results ($p < 0.001$). This means that website usability has the strongest positive effect on customer satisfaction ($\beta = 0.894$, $t = 14.738$), demonstrating that easy-to-navigate websites significantly enhance customer satisfaction. Information quality also positively influences customer satisfaction ($\beta = 0.259$, $t = 4.831$), suggesting that accurate, relevant, and complete information makes customers more satisfied. Personalisation features positively impact customer satisfaction ($\beta = 0.232$, $t = 5.238$), indicating that tailored experiences resonate with customers. The model explained 57.8% of the variance in customer satisfaction ($R^2 = 0.578$), which is a substantial explanatory power. Interestingly, only one hypothesis (H2c) was supported: Website usability showed no significant direct effect on customer loyalty ($\beta = -0.001$, $p = 0.981$), rejecting H2a. Information quality also had no significant direct effect on customer loyalty ($\beta = 0.004$, $p = 0.963$), rejecting H2b. Only personalisation features demonstrated a significant positive direct effect on customer loyalty ($\beta = 0.410$, $t = 3.866$, $p < 0.001$), supporting H2c. All three mediating hypotheses (H3a, H3b, H3c) were supported ($p < 0.001$): Customer satisfaction successfully mediates the relationship between website usability and customer loyalty ($\beta = 0.232$, $t = 5.238$). Customer satisfaction mediates the relationship between information quality and customer loyalty ($\beta = 0.247$, $t = 4.941$).
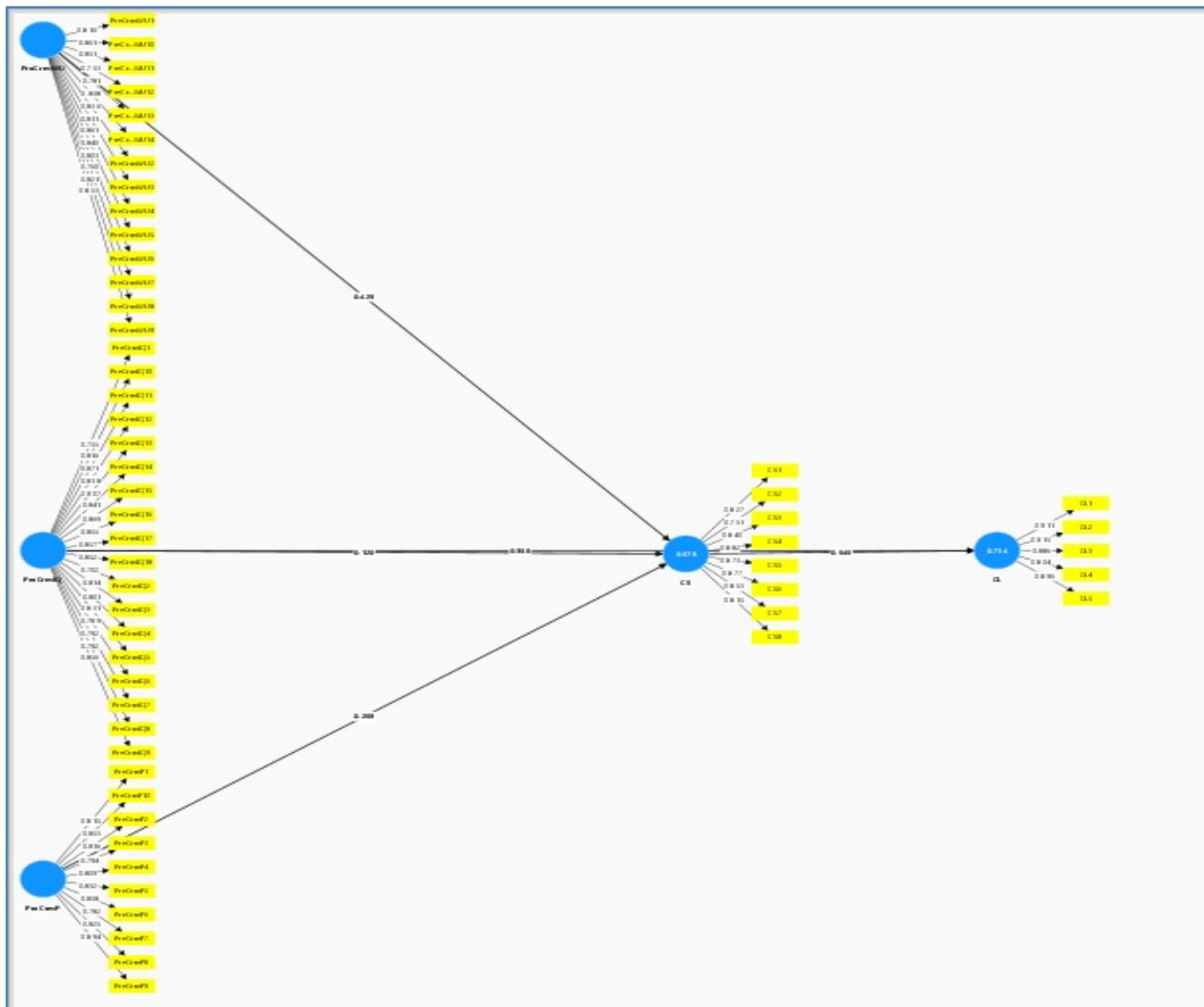
Structural Model Assessment

Model Fit: The structural model demonstrates good explanatory power with the following:

	R-square	R-square adjusted
CL	0.714	0.714
CS	0.578	0.576

Hypothesis Testing

H1: Pre-Sales E-CRM features with Customer Satisfaction

Hypothesis	Relationship	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values	Result
H1a:Website usability has a positive significant effect on customer satisfaction in e-commerce websites.	Website usability-> Customer Satisfaction	0.894	0.887	0.061	14.738	0.000	Not Rejected
H1b: Information quality has a significant positive effect on customer satisfaction on e-commerce websites.	Information Quality->Customer Satisfaction	0.259	0.258	0.054	4.831	0.000	Not rejected
H1c: Personalization features have a significant positive effect on customer satisfaction on e-commerce websites.	Personalisation-> Customer Satisfaction	0.232	0.228	0.044	5.238	0.000	Not rejected

H2: Pre-Sales E-CRM features with Customer loyalty

Hypothesis	Relationship	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values	Result
H2a: Website usability has a significant positive effect on customer loyalty on e-commerce websites.	Website usability-> Customer Loyalty	-0.001	-0.002	0.054	0.024	0.981	Rejected
H2b: Information quality has a significant positive effect on customer loyalty on e-commerce websites.	Information Quality->Customer Loyalty	0.004	0.013	0.086	0.046	0.963	Rejected
H2c: Personalization features have a significant positive effect on customer loyalty on e-commerce websites.	Personalisation-> Customer Loyalty	0.410	0.069	0.106	3.866	0.000	Not Rejected

H3: Mediating Role of Customer Satisfaction

Hypothesis	Relationship	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values	Result
H3a: Customer satisfaction mediates the relationship between website usability and customer loyalty.	Website usability-> Customer satisfaction-> Customer Loyalty	0.232	0.228	0.044	5.238	0.000	Not rejected
H3b: Customer satisfaction mediates the relationship between information quality and customer loyalty.	Information Quality-> Customer Satisfaction-> Customer Loyalty	0.247	0.239	0.047	4.941	0.000	Not rejected
H3c: Customer satisfaction mediates the relationship between personalisation and customer loyalty.	Personalisation-> Customer Satisfaction->Customer Loyalty	0.242	0.234	0.042	4.879	0.000	Not rejected

Fig. 2. Path Model

Customer satisfaction mediates the relationship between personalisation and customer loyalty (β = 0.242, t = 4.879). The overall model explains 71.4% of the variance in customer loyalty (R² = 0.714), which is very strong.

RESULTS AND FINDINGS

Interpretation of Results

1. **Indirect vs. Direct Effects**: The findings reveal that while website usability and information quality significantly affect customer satisfaction, they influence customer loyalty primarily through customer satisfaction rather than directly. This indicates an important mediating role of customer satisfaction in the relationship between e-CRM features and loyalty.
2. **Personalisation's Unique Role**: Personalization stands out in terms of both direct and indirect effects on customer loyalty. This suggests that customers particularly value personalised experiences, making it a critical factor for building loyalty.
3. **The Mediating Mechanism**: The strong support for all mediating hypotheses confirms that pre-sales e-CRM features first build customer satisfaction, which then translates into customer loyalty. This sequential relationship highlights the importance of focusing on satisfaction as a pathway to loyalty.
4. **Reliability of Measurements**: The high values for Cronbach's alpha (all > 0.92), composite reliability (all > 0.94), and AVE (all > 0.67) indicate that the measurements

used were reliable and valid, strengthening confidence in the findings.

Practical Implications

1. **Prioritise Website Usability**: Since website usability has the strongest effect on customer satisfaction, e-commerce businesses should invest in user-friendly interfaces, intuitive navigation, and responsive design.
2. **Strategic Personalization**: Given that personalisation directly affects both satisfaction and loyalty, businesses should implement robust personalisation strategies, such as customised recommendations, personalised communications, and tailored offerings.
3. **Information Quality Management**: High-quality, accurate, and relevant information significantly contributes to customer satisfaction and indirectly to loyalty, suggesting the need for robust content management systems.
4. **Holistic E-CRM Approach**: The interconnected nature of these factors suggests that businesses should adopt a holistic approach to e-CRM rather than focusing on isolated features.

Limitations and Future Research Directions

While the study provides valuable insights, there are potential limitations:

1. The research focuses specifically on pre-sales e-CRM features, leaving room for future studies to explore during-sales and post-sales features.

2. The explained variance, while substantial, suggests there might be other factors influencing customer loyalty that weren't included in this model.

3. Future research could explore how these relationships vary across different industries, cultural contexts, or demographic segments.

In conclusion, this research provides strong evidence that pre-sales e-CRM features significantly impact customer satisfaction and loyalty, with customer satisfaction playing a crucial mediating role. The findings emphasise the importance of a strategic approach to website usability, information quality, and personalisation in building long-term customer relationships in e-commerce settings.

REFERENCES

An, D., Kim, H., & Park, J.H. 2020. Personalization in e-commerce: The impact of personalized recommendations on customer satisfaction and loyalty in online shopping environments. *Computers in Human Behavior*, 110, 106377.

Burra, V. K., Ramakrishna, G., Murthy, B. G. K., Shareef, J. S. K., Padmalatha, P. S. V., & SubbaRao, M. V. 2022. E-CRM influence towards customer satisfaction and loyalty: An empirical survey on mobile phone consumers. *Academy of Marketing Studies Journal*, 26(4), 1-7. Retrieved from Academy of Marketing Studies.

Farmania, F., &Shahrabi, J. 2021. The role of E-CRM in enhancing customer satisfaction and loyalty in the digital marketplace: A qualitative study. *Journal of Business Research*, 124, 257-267.

Hanif, M., Ali, M., & Khan, M.A. 2020. E-CRM strategies for enhancing customer satisfaction and loyalty in the retail sector: A study from Pakistan. *Journal of Retailing and Consumer Services*, 54, 102021.

Ismail, A., & Zainuddin, Y. 2024. The impact of E-CRM on customer loyalty in the airline industry: A comprehensive analysis. *Journal of Digital Marketing*, 10(1), 45-60. Retrieved from Taylor & Francis Online.

Kotler, P., & Armstrong, G. 2018. *Principles of marketing*. Pearson Education.

Kudeshia, C., & Mittal, A. 2015. Role of E-CRM (Electronic CRM) in Customer Satisfaction and Loyalty. *Journal of Internet and e-Business Studies*, 2015, 1-12. Retrieved from JIER.

Lee, J., & Joshi, K. 2006. The Effect of the Implementation of E-CRM Electronic Satisfaction and Loyalty: A Case Study in the Banking Sector. *International Journal of Business and Management*, 1(1), 23-34.

Magatef, S.A.A., Alharthi, A.S., &Alzahrani, F.M.A. 2023. Exploring the functional and personal dimensions of E-CRM and their effects on customer loyalty: A mediation approach in the service sector. *International Journal of Service Industry Management*, 34(2), 123-141.

Mokha, R., & Kumar, N. 2021. The Role of E-CRM in Enhancing Customer Satisfaction in Online Retailing: Evidence from India. *International Journal of Retail & Distribution Management*, 49(3), 345-367.

Nielsen, J. 2012. *Usability engineering*. Morgan Kaufmann.

Oliver, R. L. 1999. Whence consumer loyalty?. *Journal of Marketing*, 63(4_suppl1), 33-44.

Reichheld, F. F. 1996. *The loyalty effect*. Harvard Business School Press.

Wang, R. Y., & Strong, D. M. 1996. Beyond accuracy: What data quality means to data consumers. *Journal of Management Information Systems*, 12(4), 5-33.

Zaim, H., Yilmaz, M., & Yilmaz, B.B. 2020. The impact of E-CRM on customer loyalty: Evidence from the telecommunications sector in Turkey. *Journal of Business Research*, 116, 162-171.

****