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ENHANCING AUDIENCE ENGAGEMENT AND LOYALTY THROUGH CRM IN DIGITAL MULTIMEDIA BROADCASTING: AN EMPIRICAL ANALYSIS

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ABSTRACT

This study examines the strategic role of Customer Relationship Management (CRM) in digital multimedia broadcasting by analyzing the relationships among CRM capabilities, technological enablers, customer experience, customer satisfaction, engagement, and loyalty. Using survey data from 412 OTT, IPTV, and mobile streaming users, Structural Equation Modeling (SEM) was employed to test the proposed framework. Results indicate that technological enablers significantly strengthen CRM capabilities, which enhance customer experience, satisfaction, engagement, and loyalty. Customer experience and satisfaction mediate the relationship between CRM and loyalty, while personalization and omnichannel integration improve engagement. Data privacy significantly moderates CRM effectiveness. The findings demonstrate that technology-enabled CRM is a key source of sustainable competitive advantage in digital broadcasting.

KEYWORDS: *Artificial Intelligence, Audience Engagement, Big Data Analytics, Customer Loyalty, Omnichannel Integration.*

1. INTRODUCTION

The digital transformation of media and communication technologies has fundamentally altered the broadcasting industry, shifting it from traditional one-way content dissemination toward interactive, customer-centric ecosystems. The proliferation of over-the-top (OTT) platforms, Internet Protocol Television (IPTV), mobile streaming services, and hybrid broadcast systems has expanded audience choice and intensified competition among content providers. Consequently, broadcasters increasingly depend on Customer Relationship Management (CRM) strategies to understand audience preferences, personalize services, and strengthen long-term customer relationships (Verhoef et al., 2021).

CRM has evolved from a transactional information-management system into a strategic capability that integrates marketing, technology, and customer experience management to create sustainable customer value (Payne & Frow, 2005; Buttle & Maklan, 2019). In digital multimedia broadcasting, CRM enables organizations to collect and analyze extensive user data generated through content consumption, browsing behavior, engagement patterns, and subscription activities. Such data-driven insights support personalized content recommendations, targeted advertising, and proactive customer engagement initiatives (Wedel & Kannan, 2016).

Technological advancements, particularly artificial intelligence (AI), machine learning, cloud computing, and big data analytics, have significantly enhanced CRM capabilities. AI-powered systems facilitate audience segmentation, predictive modeling, recommendation engines, and automated customer interactions, thereby improving operational efficiency and customer satisfaction (Davenport et al., 2020). Moreover, omnichannel integration enables broadcasters to provide seamless experiences across multiple platforms and devices, ensuring consistency in customer interactions and service delivery (Verhoef et al., 2015).

Customer experience has emerged as a critical determinant of competitive advantage in digital environments. Research suggests that customer perceptions are shaped by interactions across the entire customer journey rather than by isolated service encounters (Lemon & Verhoef, 2016). In digital multimedia broadcasting, personalized services, platform usability, responsiveness, and content relevance contribute significantly to customer satisfaction and loyalty. Given the low switching costs associated with digital platforms, maintaining positive customer experiences is essential for audience retention and long-term profitability (Oliver, 1999; Reichheld & Schefter, 2000).

Despite the benefits of CRM, broadcasters face challenges related to data privacy, cybersecurity, system integration, and regulatory compliance. The increasing reliance on customer data requires organizations to balance personalization with responsible data management practices to maintain consumer trust (Martin & Murphy, 2017). Therefore, understanding how CRM capabilities, technological enablers, and customer experience interact to influence customer outcomes remains an important research priority. This study seeks to address this issue by examining the relationships among CRM capabilities, technological enablers, customer experience, customer satisfaction, engagement, and loyalty within digital multimedia broadcasting.

1.1 Literature Review

Customer Relationship Management has undergone significant transformation over the past two decades. Early CRM systems primarily focused on customer databases and transactional activities designed to improve operational efficiency and customer service. However, contemporary CRM is increasingly viewed as a strategic process that integrates organizational resources, customer information, and technology to create superior customer value and long-term relationships (Payne & Frow, 2005; Buttle & Maklan, 2019). This shift has been accelerated by digital transformation, which has enabled firms to gather, analyze, and utilize customer data on an unprecedented scale.

Within digital multimedia broadcasting, CRM plays a central role in facilitating personalized customer interactions. Digital platforms generate extensive behavioral data that can be leveraged to understand customer preferences, predict future behavior, and deliver customized content recommendations. Recommendation engines, personalized notifications, and targeted advertising represent practical applications of CRM designed to improve user engagement and platform performance (Wedel & Kannan, 2016). Research indicates that data-driven personalization enhances customer perceptions of value and contributes positively to customer satisfaction and retention (Kannan & Li, 2017).

Technological advancements have further expanded CRM capabilities. Artificial intelligence, machine learning, and predictive analytics enable organizations to process large volumes of customer data in real time and generate actionable insights for decision-making (Davenport et al., 2020). AI-powered CRM systems support customer segmentation, sentiment analysis, recommendation algorithms, and automated communication, thereby improving both operational efficiency and customer experience. Trainor et al. (2014) argue that technology-enabled CRM significantly enhances relationship performance by improving organizational responsiveness and customer engagement.

Customer experience has become one of the most important outcomes associated with CRM implementation. According to Lemon and Verhoef (2016), customer experience encompasses the cognitive, emotional, and behavioral responses generated throughout the customer journey. Effective CRM systems contribute to positive experiences by enabling personalized interactions, timely responses, and consistent service delivery across channels. Verhoef et al. (2009) further emphasize that customer experience serves as a critical mechanism through which organizations create customer value and differentiation.

Customer satisfaction and loyalty are closely linked to customer experience. Satisfaction reflects customers' evaluations of their overall interactions with an organization, while loyalty represents a commitment to maintain an ongoing relationship despite competitive alternatives (Oliver, 1999). Previous studies have consistently found that satisfied customers are more likely to continue using services, recommend them to others, and contribute to long-term organizational profitability (Fornell et al., 1996; Reichheld & Schefter, 2000). In digital broadcasting environments, where switching barriers are relatively low, customer satisfaction becomes particularly important for retaining audiences.

The concept of customer engagement has also gained prominence in CRM research. Customer engagement refers to customers' cognitive, emotional, and behavioral investment in interactions with a brand or platform (Brodie et al., 2011). Engaged customers tend to participate more actively in platform activities, contribute user-generated content, and exhibit stronger loyalty. Kumar and Pansari (2016) argue that customer engagement constitutes a significant source of competitive advantage because it strengthens customer relationships and enhances business performance.

Another important development in CRM research is the emergence of omnichannel customer management. Customers increasingly interact with organizations through multiple touchpoints, including websites, mobile applications, social media platforms, and smart devices. Verhoef et al. (2015) emphasize that successful omnichannel strategies require seamless integration across channels to ensure consistent customer experiences. In digital multimedia broadcasting, omnichannel CRM enables audiences to access content and services conveniently across different devices, thereby improving engagement and perceived service quality.

While technological innovations have improved CRM effectiveness, they have also raised concerns regarding data privacy and ethical data usage. Martin and Murphy (2017) argue that consumer trust is increasingly dependent on organizations' ability to manage personal information responsibly. Excessive personalization or inappropriate use of customer data may create privacy concerns that negatively affect customer relationships (Zulfikar, 2026). Consequently, organizations must balance personalization benefits with privacy protection and regulatory compliance.

Although previous studies have examined CRM, customer experience, engagement, loyalty, and technology adoption independently, limited research has integrated these constructs within a comprehensive framework specifically tailored to digital multimedia broadcasting. This study addresses this gap by developing and empirically testing a model that links CRM capabilities,

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technological enablers, customer experience, customer satisfaction, engagement, and loyalty while considering the moderating role of data privacy.

1.2 Conceptual Framework

The conceptual framework is grounded in CRM theory, customer experience theory, and technology adoption literature (Payne & Frow, 2005; Venkatesh et al., 2003). The framework proposes that technological enablers act as foundational resources that enhance the effectiveness of CRM capabilities. Technologies such as AI, big data analytics, cloud computing, and machine learning facilitate the collection, processing, and interpretation of customer information, enabling broadcasters to deliver personalized services and targeted communications (Davenport et al., 2020; Wedel & Kannan, 2016).

CRM capabilities encompass customer data management, audience segmentation, personalized communication, and lifecycle management. These capabilities support meaningful customer interactions and enable organizations to develop a comprehensive understanding of audience behavior (Buttle & Maklan, 2019). Consistent with relationship marketing theory, effective CRM practices are expected to improve customer experience by enhancing personalization, responsiveness, and service quality (Payne & Frow, 2005).

Customer experience serves as a mediating construct linking CRM capabilities to customer outcomes. According to Lemon and Verhoef (2016), customer experience reflects customers' cognitive, emotional, and behavioral responses to interactions throughout the customer journey. Positive experiences increase customer satisfaction, which subsequently strengthens customer loyalty and retention (Oliver, 1999; Fornell et al., 1996).

The framework also incorporates customer engagement as an important outcome of CRM implementation. Customer engagement reflects customers' active participation, emotional attachment, and behavioral involvement with a platform (Brodie et al., 2011). Personalized content delivery, analytics-driven recommendations, and omnichannel interactions are expected to increase engagement levels and strengthen customer relationships (Kumar & Pansari, 2016).

Furthermore, data privacy is incorporated as a moderating variable. Although CRM relies heavily on customer information, concerns regarding privacy and data protection can influence customer trust and willingness to engage with digital platforms (Martin & Murphy, 2017). Consequently, the effectiveness of CRM strategies may depend on how organizations manage privacy-related concerns and regulatory compliance.

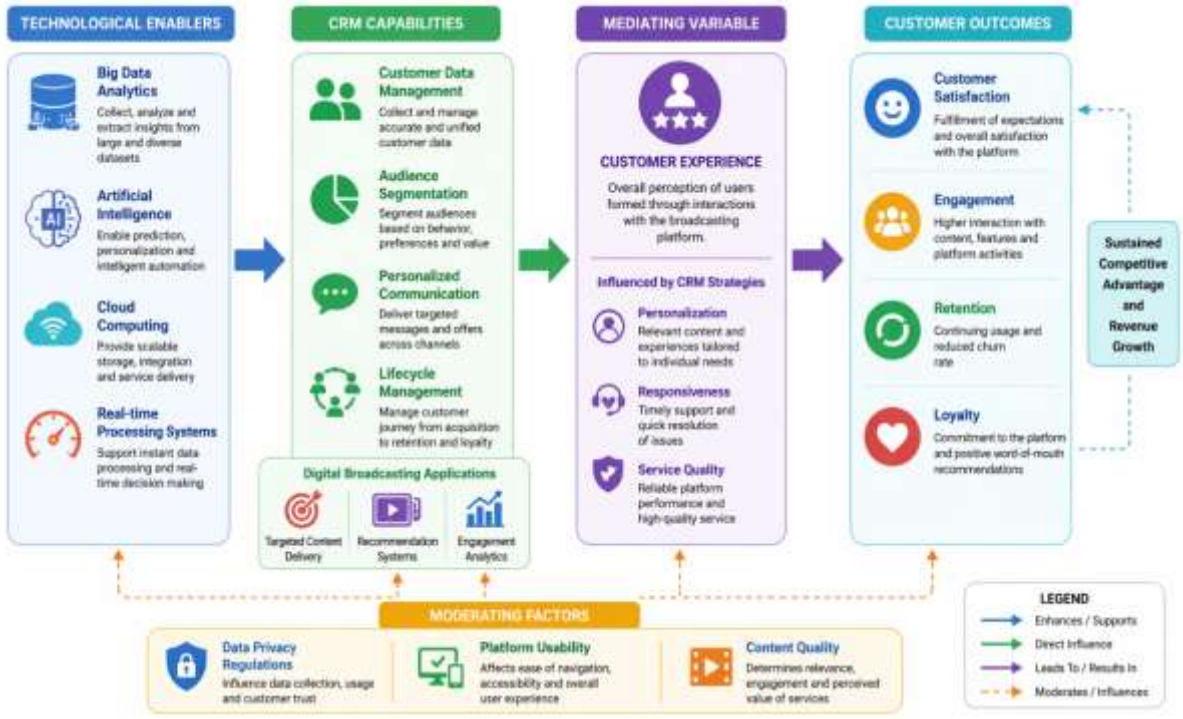

Figure 1. Conceptual framework: CRM in digital multimedia broadcasting

The framework in Figure 1 suggests that technological enablers empower CRM capabilities, which are applied in digital broadcasting to manage relationships and deliver personalized experiences. These experiences drive satisfaction, engagement, retention and loyalty, key customer outcomes that lead to sustained competitive advantage and revenue growth. However, the strength of these relationships is influenced by moderating factors such as data privacy, platform usability and content quality.

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1.3 Hypotheses

H1: CRM capabilities positively influence customer experience.
H2: Technological enablers positively influence CRM capabilities.
H3: Customer experience positively influences customer satisfaction.
H4: Customer satisfaction positively influences customer loyalty.
H5: CRM capabilities indirectly influence loyalty through customer experience and satisfaction.
H6: Analytics and personalization positively influence audience engagement.
H7: Data privacy moderates the CRM–customer experience relationship.
H8: Omnichannel CRM positively influences engagement and perceived service quality.

2. METHODOLOGY

2.1 Research Design

This study adopts a quantitative, explanatory research design to examine the relationships among CRM capabilities, technological enablers, customer experience, customer satisfaction, engagement, and loyalty. The research follows a cross-sectional approach, which is appropriate for testing theoretical relationships and evaluating causal pathways within a structured conceptual framework (Hair et al., 2022).

2.2 Data Collection

Primary data were collected through a structured online questionnaire administered to users of OTT platforms, IPTV services, and mobile streaming applications. A stratified random sampling approach was employed to ensure representation across demographic categories and usage patterns. A total of 412 valid responses were obtained and included in the analysis. Secondary data from academic literature, industry reports, and professional publications were used to support theoretical development and interpretation of findings.

2.3 Measurement Instrument

The survey instrument consisted of multiple constructs measured using a five-point Likert scale ranging from strongly disagree (1) to strongly agree (5). CRM capability measures were adapted from established CRM research (Payne & Frow, 2005; Trainor et al., 2014), while customer experience and satisfaction measures were based on customer experience literature (Lemon & Verhoef, 2016). Customer loyalty indicators were adapted from loyalty research (Oliver, 1999), and engagement measures were informed by customer engagement frameworks (Brodie et al., 2011). Table 1 presents the key constructs used in the study along with their corresponding measurement indicators and source basis.

Table 1. Constructs and measurement variables

Construct	Indicators (Sample Items)	Source Basis
CRM Capabilities	Data personalization, targeted communication, user profiling	Adapted from CRM literature
Technological Enablers	AI usage, analytics capability, system integration	Technology adoption studies
Customer Experience	Ease of use, responsiveness, personalization satisfaction	CX frameworks
Customer Satisfaction	Overall satisfaction, expectation fulfillment	Marketing studies
Customer Retention/Loyalty	Continued usage, recommendation intention	Loyalty models

2.4 Data Analysis

Data analysis was conducted using a multistage statistical approach. Descriptive statistics were first employed to summarize respondent characteristics and construct distributions. Reliability and validity assessments were then performed using Cronbach's Alpha, Composite Reliability (CR), and Average Variance Extracted (AVE) (Hair et al., 2022).

2.5 Factor Analysis

Exploratory Factor Analysis (EFA) was conducted to identify underlying dimensions among the measurement items, followed by Confirmatory Factor Analysis (CFA) to validate the measurement model and assess construct validity.

2.6 Structural Equation Modeling (SEM)

Structural Equation Modeling (SEM) was employed to evaluate the hypothesized relationships among constructs. SEM is particularly suitable for examining direct and indirect effects simultaneously while accounting for measurement error (Hair et al., 2022). The model assessed the effects of technological enablers on CRM capabilities, CRM capabilities on customer experience, and the subsequent effects on satisfaction, engagement, and loyalty.

$$CE = \beta_1 CRM + \beta_2 TE + \epsilon_1$$
$$CS = \beta_3 CE + \epsilon_2$$
$$CL = \beta_4 CS + \epsilon_3$$

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In this model, Customer Experience (CE) is influenced by CRM capabilities (CRM) and technological enablers (TE). Customer Satisfaction (CS) is subsequently determined by customer experience, while Customer Loyalty (CL) is influenced by customer satisfaction. The error terms account for unexplained variance in each equation. This structured approach enables a comprehensive assessment of how CRM and technology-driven factors indirectly contribute to customer loyalty through experience and satisfaction.

2.7 Hypothesis Testing

The proposed hypotheses were tested through standardized path coefficients, t-statistics, and p-values. Statistical significance was evaluated at the 0.05 and 0.01 levels. Model adequacy was assessed using commonly accepted fit indices, including RMSEA, CFI, and GFI (Hair et al., 2022).

2.8 Reliability and Validity

Reliability was evaluated using Cronbach's Alpha and Composite Reliability values exceeding the recommended threshold of 0.70. Convergent validity was assessed through AVE values greater than 0.50. These procedures ensured the consistency and validity of the measurement model (Hair et al., 2022). Table 2 presents the evaluation criteria and corresponding threshold values used in this study to ensure the adequacy of the measurement and structural models.

Table 2. Evaluation criteria

Measure	Threshold Value
Cronbach's Alpha	≥ 0.70
Composite Reliability	≥ 0.70
Average Variance Extracted	≥ 0.50
RMSEA	≤ 0.08

3. RESULTS

3.1 Descriptive Statistics

As presented in Table 3, the sample comprised 412 respondents. Users aged 31–45 represented the largest group (39.3%), followed by ages 18–30 (35.9%). Daily users accounted for 67% of the sample.

Table 3. Respondent profile

Category	Frequency	Percentage (%)
Age (18–30)	148	35.9
Age (31–45)	162	39.3
Age (46+)	102	24.8
Male	238	57.8
Female	174	42.2
Daily Users	276	67.0
Weekly Users	136	33.0

3.2 Descriptive Statistics of Constructs

Table 4 reveals that Customer Experience recorded the highest mean (4.02), followed by Customer Satisfaction (3.98), Technological Enablers (3.95), Customer Loyalty (3.89), and CRM Capabilities (3.87). These results indicate favorable perceptions of CRM and technology-driven practices.

Table 4. Descriptive statistics of constructs

Construct	Mean	Std. Deviation
CRM Capabilities	3.87	0.68
Technological Enablers	3.95	0.72
Customer Experience	4.02	0.64
Customer Satisfaction	3.98	0.66
Customer Loyalty	3.89	0.70

The findings reflect a positive evaluation of CRM and technology-driven practices, supporting their role in enhancing customer experience and satisfaction in digital multimedia broadcasting.

3.3 Reliability and Validity Analysis

Table 5 divulges the results of the reliability and convergent validity assessment for the study constructs. Cronbach's Alpha values ranged from 0.86 to 0.90, Composite Reliability from 0.89 to 0.92, and AVE from 0.61 to 0.67, confirming strong reliability and validity.

Table 5. Reliability and convergent validity

Construct	Cronbach's Alpha	Composite Reliability	AVE
CRM Capabilities	0.88	0.91	0.63
Technological Enablers	0.86	0.89	0.61
Customer Experience	0.90	0.92	0.67
Customer Satisfaction	0.89	0.91	0.65

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Customer Loyalty	0.87	0.90	0.62

Since all constructs exceed the recommended thresholds (α > 0.70, CR > 0.70, AVE > 0.50), the results confirm strong internal consistency and adequate convergent validity. This suggests that the measurement model is reliable and suitable for further structural analysis.

3.4 Measurement Model Evaluation

The measurement model demonstrated good fit ($\chi^2/df = 2.31$, RMSEA = 0.056, CFI = 0.94, GFI = 0.92), validating the proposed constructs. The results, as presented in Table 6, indicate that all model fit indices fall within the recommended threshold levels, confirming a satisfactory model fit.

Table 6. Model fit indices

Fit Index	Value	Recommended Threshold
χ^2/df	2.31	< 3.0
RMSEA	0.056	< 0.08
CFI	0.94	> 0.90
GFI	0.92	> 0.90

These results demonstrate that the measurement model is well-structured and adequately represents the data. The satisfactory fit indices confirm that the constructs and their observed variables are appropriately specified, thereby validating the measurement model and supporting its suitability for further structural equation modeling analysis.

3.5 Structural Model Results

Technological Enablers significantly influenced CRM Capabilities (β = 0.52). CRM Capabilities positively affected Customer Experience (β = 0.61), which influenced Customer Satisfaction (β = 0.68). Satisfaction strongly predicted Loyalty (β = 0.72). CRM Capabilities also positively influenced Engagement (β = 0.47). The hypothesized relationships among the constructs were examined using Structural Equation Modeling (SEM). The standardized path coefficients are illustrated in Figure 2.

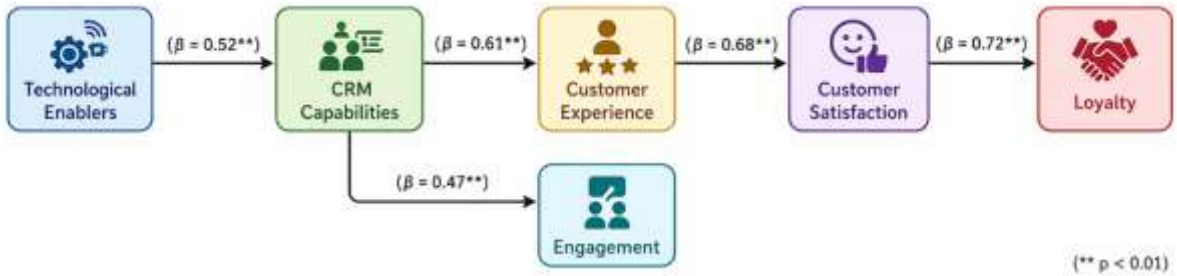

Figure 2. Structural model with path coefficients

3.6 Hypothesis Testing

All eight hypotheses were supported. CRM capabilities, technological enablers, analytics, personalization, omnichannel integration, and privacy considerations significantly influenced customer outcomes. The results of hypothesis testing were presented in Table 7.

Table 7. Hypothesis results

Hypothesis	Relationship Tested	β Value	Result
H1	CRM → Customer Experience	0.61	Supported
H2	Technological Enablers → CRM	0.52	Supported
H3	Customer Experience → Satisfaction	0.68	Supported
H4	Satisfaction → Loyalty	0.72	Supported
H5	CRM → Loyalty (Indirect via CE & CS)	—	Supported
H6	Analytics → Engagement	0.47	Supported
H7	Privacy Moderation Effect	Significant	Supported
H8	Omnichannel CRM → Engagement	0.55	Supported

3.7 Mediation Analysis

CRM Capabilities indirectly influenced Loyalty through Customer Experience and Satisfaction (indirect effect = 0.29), confirming the mediating role of these variables. As shown in Table 8, the indirect path from CRM Capabilities to Customer Loyalty through Customer Experience and Customer Satisfaction is found to be positive and statistically significant, with an indirect effect value of 0.29.

Table 8. Mediation effects

Path	Indirect Effect	Significance
CRM → CE → CS → Loyalty	0.29	Significant

3.8 Key Findings

CRM capabilities significantly improve customer experience and engagement. Technological enablers strengthen CRM effectiveness. Customer satisfaction is the strongest predictor of loyalty. Personalization and omnichannel integration enhance engagement, while data privacy significantly influences CRM success.

4. DISCUSSION

The findings provide strong evidence for the strategic importance of CRM in digital multimedia broadcasting. Consistent with CRM theory, CRM capabilities significantly enhance customer experience, demonstrating that customer-centric practices such as personalization, audience segmentation, and targeted communication play a vital role in shaping audience perceptions (Payne & Frow, 2005; Buttle & Maklan, 2019). The strong relationship between CRM capabilities and customer experience supports the growing emphasis on relationship-based broadcasting models rather than traditional content-centric approaches.

The results highlight the critical contribution of technological enablers to CRM effectiveness. Artificial intelligence, analytics, and system integration significantly strengthen CRM capabilities by enabling organizations to process customer information more effectively and deliver personalized experiences. These findings align with previous studies emphasizing the transformative role of AI and analytics in customer relationship management and marketing decision-making (Davenport et al., 2020; Wedel & Kannan, 2016).

Customer experience emerged as a significant determinant of customer satisfaction, which subsequently exerted the strongest influence on loyalty. This finding supports customer experience theory and confirms that positive interactions throughout the customer journey contribute directly to favorable customer outcomes (Lemon & Verhoef, 2016). The strong relationship between satisfaction and loyalty is consistent with established loyalty literature suggesting that satisfied customers are more likely to continue using services and recommend them to others (Oliver, 1999; Reichheld & Schefter, 2000).

The mediation analysis further demonstrates that CRM capabilities influence loyalty indirectly through customer experience and satisfaction. This finding extends previous research by clarifying the mechanisms through which CRM creates value in digital broadcasting environments. Rather than affecting loyalty directly, CRM contributes to loyalty by enhancing customer interactions and meeting customer expectations (Fornell et al., 1996).

The positive effects of personalization, analytics, and omnichannel integration on customer engagement further reinforce the importance of technology-enabled CRM strategies. Consistent with customer engagement theory, personalized and seamless interactions encourage deeper customer involvement and stronger emotional connections with digital platforms (Brodie et al., 2011; Kumar & Pansari, 2016). As consumers increasingly interact with content across multiple channels, integrated CRM systems become essential for maintaining engagement and service consistency (Verhoef et al., 2015).

The moderating effect of data privacy underscores the growing importance of trust in digital ecosystems. While personalization enhances customer value, excessive or inappropriate use of customer information may generate privacy concerns and reduce customer confidence (Martin & Murphy, 2017; Zulfikar, 2026). Therefore, organizations must balance personalization objectives with ethical data practices and regulatory compliance to sustain long-term customer relationships.

The findings support a comprehensive view of CRM as a strategic, technology-enabled capability that enhances customer experience, satisfaction, engagement, and loyalty. The study contributes to the growing literature on digital transformation by demonstrating how CRM serves as a critical mechanism for creating competitive advantage in digital multimedia broadcasting environments.

5. CONCLUSION

CRM has become a strategic asset in digital multimedia broadcasting. The study demonstrates that technological enablers strengthen CRM capabilities, which improve customer experience, satisfaction, engagement, and loyalty. Customer satisfaction is the strongest determinant of loyalty, while privacy and trust significantly influence CRM effectiveness. By combining technology-enabled personalization with responsible data practices, broadcasters can achieve sustainable audience engagement and competitive advantage.

5.1 Theoretical Implications

This study extends CRM theory to digital multimedia broadcasting by integrating CRM capabilities, technological enablers, customer experience, and customer outcomes into a unified framework. It highlights CRM as a strategic, technology-enabled capability and identifies customer experience as a key mechanism linking CRM to loyalty. The inclusion of data privacy enriches CRM theory by incorporating ethical and regulatory dimensions.

5.2 Managerial Implications

Broadcasters should invest in AI, analytics, and personalization technologies to strengthen CRM effectiveness. Organizations should focus on enhancing customer experience through intuitive interfaces, personalized content, and seamless omnichannel engagement. Strong privacy and cybersecurity practices are essential for maintaining customer trust.

5.3 Policy Implications

Policymakers should strengthen data protection regulations while supporting innovation. Industry standards for responsible AI use, transparency, and data governance can improve accountability and consumer confidence.

5.4 Scope for Future Research

Future studies may adopt longitudinal designs, compare different broadcasting platforms, integrate behavioral analytics, and examine emerging technologies such as blockchain, AR, and VR. Further research can also explore cultural differences and ethical aspects of personalization and algorithmic transparency.

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