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Article

From Digital Content Marketing Mix to Customer Insight: The Mediating Role of Customer Engagement and the AI Personalization Perception — Evidence from Five-Star Luxury Hotels

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Abstract: This study aims to explore the impact of the digital content marketing mix (DCM) on customer insight (CI) within five-star luxury hotels in Baghdad, Iraq, incorporating customer engagement (CE) as a mediating variable and AI personalization perception (AIP) as a moderating variable. A descriptive-analytical approach was adopted, with 380 questionnaires distributed to a random sample of guests across six five-star hotels in Baghdad, of which 364 were valid for analysis. Data were analyses using SmartPLS4. Hypothesis testing confirmed a significant positive impact of DCM on CI. AIP exerted significant effects on both CE ($\beta = 0.554$, $f^2 = 0.388$) and CI ($\beta = 0.276$), with coefficients of determination of $R^2 = 0.509$ and $R^2 = 0.315$ respectively. CE did not demonstrate a statistically significant mediating role between DCM and CI ($p = 0.089$), while AI personalization perception demonstrated a significant negative moderating effect on the relationship between the digital content marketing mix and customer engagement ($\beta = -0.086$, $p < 0.001$), its moderating effect on the relationship between the digital content marketing mix and customer insight was not statistically significant ($p = 0.549$). The study provides valuable managerial insights for luxury hospitality marketers on optimizing digital content strategies alongside AI personalization features to capture deep customer insights.
Keywords: digital content marketing mix; customer insight; customer engagement; AI personalization perception; luxury hotels Baghdad

1. Introduction

The luxury tourism sector is experiencing rapid growth and demonstrating remarkable resilience; tourism and luxury hospitality services are regarded as the third most important sector in the global luxury industry (Christodoulides et al., 2025), offering guests high-quality accommodation alongside bespoke customer experiences. Given that the tourism sector relies heavily on information, the performance of any organisation operating within it depends on its capacity to collect and disseminate information effectively and efficiently to all relevant stakeholders (Abate et al., 2025). Accordingly, advances in information technology and communication tools have played a pivotal role in the effective management of hotels, with official hotel websites serving as critically important digital marketing touchpoints — playing a major role in introducing prospective guests to the hotel's identity and services through digital content, including images and videos, thereby influencing customer insight and behaviour through the quality of information conveyed about the hotels and their services (Halkiopoulos et al., 2023). Technological advancement has thus brought about a radical transformation in the relationship between supply and demand within the tourism sector, significantly affecting customer travel patterns (Gutierrez et al., 2025). This means that the digital transformation has

brought about changes in the way customers purchase products and services; they now have access to diverse online shopping options, in addition to an abundance of information reflecting the opinions of previous customers. Through the internet, customers share their personal experiences with specific products or services, and this sharing represents important information for other customers in their purchase decision-making (Sánchez & González, 2021).

Building on this premise, business organisations today have recognized the importance of getting closer to the customer, deepening their understanding of customer behaviour, and accurately identifying customer preferences — all of which enhance their capacity to expand market share, outperform competitors, and adopt a range of marketing practices that contribute to shaping customer insight. In order to build such insight and keep pace with digital transformation, organisations are required to employ tools that enable them to capture opportunities, face challenges, and adapt accordingly, while simultaneously building value and cultivating relationships with customers. Against this backdrop, digital content has emerged as one of the defining tools of the current era. (Sharma et al., 2024) describe it as an important branch of digital marketing that marketers use to highlight the distinguishing strengths of their products and services. (Bui et al., 2023) view digital content marketing as a form of relationship marketing that aims to build emotional bonds and relationships between customers and brands in a direct manner; digital content enhances bidirectional communication through digital platforms, creating value for users through information-seeking activities and social interactions via digital platforms. Digital platforms in Iraq are witnessing growing utilization. According to social media statistics for Iraq in October 2025 from the Stat Counter platform, Facebook accounts for 58.96% and Instagram for 23.38%, representing the largest share of social network usage in Iraq, while YouTube holds 11.4%, Twitter 4.71%, LinkedIn 0.29%, and Pinterest 1.15% (Stat Counter, 2025, Social Media Stats in Iraq - October 2025). Given the inherently responsive nature of the tourism sector to external variables and technological developments, it has become imperative for five-star luxury hotels in Baghdad to capitalize on these developments and reassess their various activities, by deploying digital content through their platforms that resonates with the desires and aspirations of customers seeking distinction and luxury in hotel services. As competitive intensity among organisations rises and customer awareness and culture expand, organisations have shifted towards implementing modern marketing tactics and strategies that leverage digital content and its educational-entertainment mix to promote their products and services, seeking to achieve sustained, interactive engagement with their customers (Khalayleh & Al-Hawary, 2022). Accordingly, the digital content marketing mix may be understood as the efforts organisations invest in designing, managing, and distributing diverse and interactive digital content across digital platforms, with the aim of building an ongoing relationship with customers, achieving their satisfaction, and cultivating their insight towards the brand.

However, achieving this does not occur directly; it necessitates an intermediary mechanism through which hotel managements can transform digital content from a marketing message into genuine and integrated understanding on the part of the customer. Customer engagement has thus emerged as that mechanism, playing the mediating role between content and customer insight, as (Chen et al., 2022) demonstrated that customer engagement in the hotel environment has a significant effect on customer behaviour and their perception of service quality through the building of brand trust. Consequently, if customer engagement represents the mediating role in the relationship, AI personalisation represents the moderating role that determines the extent to which digital content is effective in stimulating and enhancing this engagement. According to (Haleem et al., 2022), AI tools enable organisations to analyse data and build customer profiles, thereby facilitating the delivery of personalised digital content aligned with individual customer preferences. (Teepapal et al., 2025) demonstrated that customer perception of AI-supported personalisation plays an important role in the relationship between digital content and the level of customer engagement with the brand. In the same context, (Żyminkowska & Zachurzok-Srebrny, 2025) confirmed that AI personalisation plays a significant role in this dynamic.

Despite growing interest in digital content, Arabic and Iraqi literature still lacks studies linking the digital content marketing mix to organisational capacity for generating customer insight. (Khalayleh & Al-Hawary, 2022) linked the digital content marketing mix to marketing performance but did not connect it to customer insight — and therein lies the research gap that the researcher seeks to address through the present study.

Based on the foregoing, this study gains considerable significance, being the first to examine these two variables together in a single study. Its importance is further underscored by its aim to shed light on the role played by the digital content marketing mix in all its dimensions in shaping customer perceptions and enhancing their insight regarding hotel services, with positive implications for improving marketing performance and enhancing the competitive advantage of hotels.

The present study aims to explore the relationship between the digital content marketing mix and customer insight within five-star luxury hotels in Baghdad, particularly given the absence of studies that have examined these variables together. The study also presents a valuable scientific contribution by enriching marketing literature in this area, while offering a set of scientific recommendations that support luxury hotel managements in improving their digital marketing practices and enhancing their capacity to understand their customers.

2. Literature Review

2.1. Digital Content Marketing Mix

In 1960, the American Marketing Association (AMA) defined marketing, as cited in (Marín-Orantes et al., 2025), as "the performance of business activities that direct the flow of goods and services from producer to consumer". For business organisations to perform these activities efficiently and effectively, they require an integrated marketing mix. The marketing mix is therefore an inseparable component of marketing strategy, positioned at the intersection of the firm and the market, evolving alongside the market and its stakeholders. In the past decade, three fundamental forces converged: technological advancement, socioeconomic transformations, and environmental changes, which drove continuous and substantial developments in the market and its stakeholders, ultimately affecting the mechanisms through which markets operate (Wichmann et al., 2022). Every stakeholder participating in the marketing process seeks value; customers engage in the marketing process to obtain the best value for their money through the value offered to them, while marketers focus on the high-value customer in order to cover costs and achieve a profit margin (Londhe, 2014).

According to (Garg et al., 2024), the AMA described the marketing mix as a combination of controllable marketing variables employed by an organisation to achieve the desired level of sales within its target market. (Barrla, 2024) regards the marketing mix as foundational to any organisation, as it assists in defining its value proposition, alongside attracting and retaining customers, competing in the market, and generating revenue. (Afaishat et al., 2025) noted that constructing an integrated marketing mix differs from one organisation to another according to its activity, and is influenced by differences in market objectives, necessitating that organisations create a unique marketing mix capable of achieving their defined goals. Building on the foregoing, when the researcher sought to identify the elements of the digital content marketing mix, a review of marketing literature was conducted, revealing that the study of (Khalayleh & Al-Hawary, 2022) addressed this mix, comprising digital advertising, digital pricing, digital marketing database, and social media platforms. This framework was accordingly adopted in the present study on the basis that these elements directly support the content delivered by five-star luxury hotels in Baghdad, thereby influencing the construction of their customers' insight.

Five-star luxury hotel managements in Baghdad have therefore come to possess an integrated mix that relies on digital technology in creating and disseminating valuable and attractive digital content for their customers, contributing to the construction of their insight.

2.2. Customer Insight

The capacity of an organisation to collect data and subsequently analyse it allows it to gain insight into its customers, helping it to make optimal decisions and improve operations such as manufacturing, marketing, and human resource management, in addition to enabling the precise targeting of appropriate audiences and customers (Teye-Botchway, 2019).

(Król & Hadasik, 2021) argue that in order to properly understand customers, the holistic concept of customer insight is typically employed, which does not limit itself to classical customer information — such as who our customers are, what they do, and what they prefer to purchase — but extends to encompass psychological and behavioral concepts, including what customers think or feel, what their goals are, and how these behaviours influence their decisions, including the purchase decision. Customer insight is defined by (Kotler & Armstrong, 2021: 119) as "fresh marketing insights based on an understanding of customers and the marketplace, which become the basis for creating value for customers, engaging with them, and building loyalty relationships". Customer understanding is also considered a fundamental factor in new product innovation, allowing organisations to understand market requirements and customer aspirations with greater precision and clarity (Shahin et al., 2024). Beyond this, customer insight represents the link between creativity and marketing success; it helps organisations accurately understand customer needs and expectations, thereby directing innovation efforts towards developing products and delivering services aligned with market requirements (Stremersch et al., 2025). Building on the foregoing, (Bracewell, 2015) proposed a four-factor model, demonstrating that understanding customer insight requires the integration of customer behaviour, attitude, personality, and social culture, providing a comprehensive framework through which customer needs can be analysed and marketing strategies effectively directed.

2.3. Customer Engagement

In the context of accelerating digital developments, customers are now able to interact easily with other customers or business organisations via social media platforms. As a result, customer behaviours not directly tied to commercial transactions have attracted considerable attention from organisations, particularly positive recommendations for purchasing a product, experiencing a service, and online reviews — given their profound influence on customer behaviour (Chen et al., 2022). Engagement with digital content published by hotel managements improves attachment to the hotel's brand and creates booking intentions (Gomez-Suarez & Veloso, 2024). Customer engagement is defined by (Żyminkowska & Zachurzok-Srebrny, 2025) as the behaviours of customers towards the brand or organisation. (Abdelhamied et al., 2024) define it as the process through which customers interact with the hotel, with the interaction being deep enough to transcend superficial relationships and aiming to build strong long-term bonds, enabling hotel managements to deliver distinguished and personalised services aligned with customer desires and needs.

2.4. AI Personalization Perception

In recent years, artificial intelligence has emerged as a transformative force in marketing, enabling business organisations to deliver experiences designed specifically for their customers and to enhance satisfaction (Frimpong-Manso et al., 2025). Furthermore, the integration of artificial intelligence into digital marketing has brought about a significant shift in the way customers interact with brands and engage in shopping experiences; AI enables digital marketers to automate processes and create personalised advertisements, which is reflected in enhanced efficiency and effectiveness (Teepapal, 2025). Artificial intelligence is defined as the process by which machines — particularly computers — simulate human thought (Nira, 2025). In the luxury tourism and hospitality sector, a number of studies have shed light on AI personalisation in personalised services and efficiency enhancement through improved data analysis and guest interactions. (Makivić et al., 2024) affirmed that the increasing adoption of AI and robotics in luxury tourism and hospitality enables hotel managements to personalise services with greater precision and speed. AI-based systems can also handle routine customer interactions, enabling employees to focus on complex tasks, thereby increasing productivity and efficiency, reducing waiting times, and enhancing the overall customer experience (Acatrinei et al., 2025).

2.5. Conceptual Framework

To address the problem raised in the present study, it was necessary to develop an appropriate conceptual framework that accurately reflects the field in which the research was conducted. The conceptual framework in Figure 1 was developed in light of a review of established marketing literature, incorporating the theoretical assumptions.

This framework also illustrates the relationships among the study variables: the digital content marketing mix, customer engagement, customer insight, and AI personalisation perception.

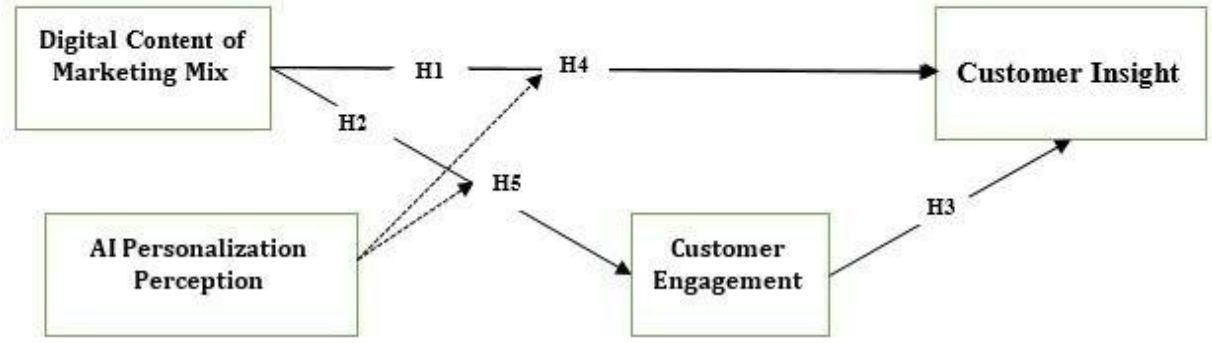


Figure 1: Conceptual framework

2.6. Hypotheses Development

To answer the primary research question — to what extent does the digital content marketing mix influence customer insight among five-star luxury hotels in Baghdad, Iraq, in light of the mediating role of customer engagement and the moderating role of AI personalization perception? — it is necessary to develop hypotheses that enable the researcher to provide an answer. This prompted the researcher to review a number of prior studies that addressed dimensions of the research variables, as the digital content marketing mix is considered an effective tool for influencing various aspects of customer engagement, which in turn is reflected in the construction of customer insight.

A number of recent marketing literature works have indicated that the digital content marketing mix, or more precisely certain of its dimensions, plays an important role in enhancing customer understanding and insight. Supporting this proposition is what (Nasrabadi et al., 2024: 6) found, that social media data analysis represents an effective tool for generating customer insight, enabling business organisations to correctly understand customer experiences and preferences through the content they share on digital platforms, and thereby revealing patterns and behaviours that may not be apparent using traditional methods. (Guoqiang & Bhaumik, 2024) demonstrated that social media has a positive influence on customer behaviour, as social media platforms such as Facebook and Instagram have become an integral part of human life, enhancing engagement with content, and the global interconnectedness of individuals through these platforms contributes to shaping converging behavioral patterns and orientations among customers. (Lütjens et al., 2022) indicated that customer attitudes towards digital advertising are influenced by four key factors: in formativeness, which strengthens the customer's attitude by providing sufficient and useful information; entertainment, which generates positive emotions in the customer; irritation, whereby some digital advertisements may cause annoyance in the customer, generating a negative attitude; and credibility, which increases trust in digital advertising and generates a positive attitude.

H1: There is a significant positive effect of the digital content marketing mix on customer insight.

As proposed by other researchers in the marketing context, the deployment of the digital content marketing mix by hotel managements contributes to enhancing customers' perception of AI personalisation practices through the delivery of digital content that aligns with customer needs and preferences. (Milovanović & Novaković, 2025) indicated that digital advertisements supported by tailored AI can elicit strong emotional responses from customers, enhancing brand interaction and loyalty, particularly among technology-proximate segments such as Generation Z — in the tourism sector, personalised AI-generated imagery enhances emotional and cognitive engagement through

narrative immersion. (Beyari & Hashem, 2025) demonstrated that AI personalisation represents an optimal option enabling organisations to deploy effective marketing tactics via social media, allowing marketers to create purposeful digital content at the right time to meet customer needs, and also enabling access to the products and services they need at the right time. (Żyminkowska & Zachurzok-Srebrny, 2025) noted that the vast volume of user-generated digital content can be managed through the deployment of personalised AI, providing capabilities for prediction, customer behaviour analysis, and engagement enhancement.

H2: There is a statistically significant effect of the digital content marketing mix on AI personalization perception.

Effect of AI Personalization Perception on Customer Engagement

When customers perceive that the content and services delivered to them have been designed according to their individual preferences and specific needs, their level of engagement with the brand rises markedly. (Teepapal, 2025) found that customer perception of digital personalisation has a significant effect on their level of engagement with digital content, with engagement being deeper and more sustained when the customer feels that the experience presented to them is genuine rather than random. In the hotel environment, (Jovanović et al., 2024) revealed that the application of digital personalisation in five-star hotels has a significant effect on guest attitudes, behaviours, and engagement with the hotel. (Acatrinei et al., 2025) confirmed that the perceived benefits of digital personalisation enhance customer engagement with digital platforms and elevate the level of behavioural engagement. Based on the foregoing:

H3: AI personalization perception exerts a significant positive effect on customer engagement in five-star luxury hotels in Baghdad.

Effect of Customer Engagement on Customer Insight

Customer engagement with a brand occurs as a result of the accumulation of knowledge, which transforms over time into deeper understanding and more mature awareness regarding the service and the value it embodies. (Chen et al., 2022) demonstrated that the engaged customer possesses clearer perceptions of service quality and develops more positive behavioral intentions towards it, embodying the direct reflection of engagement on insight. (So et al., 2024) found that customer engagement with digital marketing activities accumulates to form an affective and cognitive attachment to the brand. In the hospitality context, (Abdelhamied et al., 2024) confirmed that customer engagement significantly mediates the relationship between digital marketing and customer behavioral intentions and their perception of brand image. Based on the foregoing:

H4: Customer engagement exerts a significant positive effect on customer insight in five-star luxury hotels in Baghdad.

Effect of AI Personalization Perception on Customer Insight

AI personalization perception exerts a direct influence on customer insight. When customers perceive that the services and content delivered to them are personalised according to their needs, they develop deeper and clearer understanding of the brand and the unique value it offers. (Markou et al., 2025) demonstrated that trust in digital personalisation and its perception represents one of the most prominent determinants of customer acceptance of digital services and the formation of attitudes towards them. (Mufaddhal, 2025) confirmed in the hospitality context that customer perception of service personalisation directly influences their loyalty and understanding of service quality. This is further reinforced by what (Żyminkowska & Zachurzok-Srebrny, 2025) found, that digital personalisation deepens customer vision and insight towards the brand in the hospitality sector. Based on the foregoing:

H5: AI personalization perception exerts a significant positive effect on customer insight in five-star luxury hotels in Baghdad.

3. Materials and Methods

3.1. Research Methodology

This study adopted the descriptive-analytical approach to present, analyse, and interpret the research information, as this approach assists in collecting a large volume of research data and information pertaining to the phenomenon or research problem, evaluating hypotheses, and addressing the research questions arising from the research problem. The descriptive-analytical approach encompassed two dimensions: the descriptive dimension involved calculating the arithmetic mean and standard deviation for each of the research variables, while the analytical dimension was employed to complete the empirical component of the study, utilizing multiple regression to test the main hypothesis and its derived sub-hypotheses in order to achieve the research objectives.

3.2. Study Population and Sample

The study population comprised the six five-star luxury hotels in Baghdad: Baghdad International Hotel, Palestine International Hotel, Mansour Melia Hotel, Ishtar Sheraton Hotel, Babylon Rotana Hotel, and Qalb Al-Alam Hotel. A random sample of 380 customers from these hotels was targeted in two stages. In the first stage, the researcher reviewed the official hotel pages on digital platforms — particularly Facebook — through which customers who had engaged with hotel posts via comments or likes were identified, indicating that they had a genuine experience at the hotels. In the second stage, questionnaires were distributed in cooperation with hotel managements to their customers. A total of 364 valid questionnaires were retrieved for statistical analysis — a sufficient number for data analysis and interpretation. A set of statistical methods was employed to analyse and process the collected data using SPSS V.28 and SmartPLS4. The study reached a number of findings, most importantly that hypothesis testing results revealed a significant correlation and effect between the two variables — digital content marketing mix and customer insight — with a strong positive relationship between their respective dimensions.

3.3. Ethical Considerations

All applicable ethical principles required in scientific research were observed. The consent of all research participants was obtained, and respondents' participation in completing the questionnaire was entirely voluntary and of their own free will, contributing to the accuracy and validity of the research findings. The researcher informed participants of the purpose of the questionnaire and the importance of their responses to the success of the research, guaranteed the confidentiality and privacy of responses, and participants retained complete freedom to respond or decline.

3.4. Reliability Testing

3.5. Data Analysis Methods

3.5.1. Descriptive Statistical Analysis

4. Findings

4.1. Correlation Matrix Detail

Table 1. Correlation Matrix of the constructs

	AIP	CI	CM	DCM
AIP	1.000	0.508	0.688	0.588
CI	0.508	1.000	0.436	0.479
CM	0.688	0.436	1.000	0.512
DCM	0.588	0.479	0.512	1.000

Table 1 indicates a moderate positive correlation between the digital content marketing mix (DCM) and customer insight (CI), with a value of (r = 0.479), suggesting that improvements in digital content marketing practices

contribute to enhancing organisational capacity to better understand customer needs, behaviours, and preferences. This finding supports the premise that effective digital content represents an important source of information that helps generate deeper customer insights.

The results also revealed a moderate positive correlation between the digital content marketing mix (DCM) and customer engagement (CM) with a value of (r = 0.512), indicating that digital content is capable of stimulating customer interaction and participation with the brand across various digital channels, thereby enhancing their engagement levels and interactive behaviour.

With regard to AI personalization perception (AIP), the results showed a moderate positive correlation with the digital content marketing mix (DCM) of (r = 0.588), suggesting that customers who perceive the content delivered to them as highly personalised and aligned with their individual needs tend to be more responsive to digital content marketing efforts.

Additionally, the results revealed a moderate positive correlation between AI personalization perception (AIP) and customer insight (CI) with a value of (r = 0.508), reflecting the important role of intelligent technologies in providing more accurate information about customer needs and preferences, thereby supporting the formation of deeper marketing insights.

The results also revealed a moderate positive correlation between customer engagement (CM) and customer insight (CI) with a value of (r = 0.436), indicating that higher levels of customer engagement and participation with the organization's digital content and activities can contribute to providing data and indicators that help enhance the organization's understanding of its customers.

The relationship between AI personalization perception (AIP) and customer engagement (CM) recorded the highest correlation value among the study variables at (r = 0.688), indicating that customers' perception of personalised content and offers tailored to their individual needs and preferences substantially enhances their engagement and interaction levels with the brand.

Overall, the correlation matrix results indicate the existence of consistent positive relationships among all study variables, and the correlation coefficient values were all below (0.80), providing an initial indication of the absence of severely high inter-variable correlations, which supports the validity of proceeding to structural model tests and subsequent hypothesis analysis.

4.2. Measurement Model Assessment

Prior to testing the proposed hypotheses, it is first necessary to verify the reliability and validity of the measurement instruments. This step ensures construct measurement. In this section, the validity of the data for analysis is discussed and verified through various methods such as outer loadings, reliability, validity, and related criteria.

Table 2: Outer Loadings of the constructs

Items	Loadings	Items	Loadings
AIP1	0.850	CM1	0.821
AIP2	0.854	CM2	0.845
AIP3	0.846	CMR3	0.776
CI1	0.798	DCM1	0.877
CI2	0.869	DCM2	0.869
CI3	0.822	DCM3	0.843

The outer loadings results presented in Table 2 indicate that all measurement indicators demonstrated high levels of correlation with their latent constructs, as all loading values exceeded the minimum accepted threshold of

(0.70), confirming the availability of individual indicator reliability and their suitability for measuring the targeted variables.

For the AI personalization perception variable, outer loading values ranged between (0.846–0.854), indicating that the three items represent the variable with a high degree of consistency and precision. The customer engagement variable indicators yielded values ranging between (0.776–0.845), reflecting a good capacity to explain the dimensions of customer engagement among the sample members.

As for the customer insight variable, its indicators recorded values ranging between (0.798–0.869), suggesting that the items used provide a strong representation of the conceptual construct of this variable. The digital content marketing mix indicators demonstrated the highest loading levels, ranging between (0.843–0.877), reflecting the strength of the indicators used in measuring this variable and their capacity to explain the variance associated with it.

Overall, the outer loadings result confirm that all measurement indicators possess high levels of individual reliability and convergent validity, which supports the validity of the measurement model and justifies the transition to reliability and construct validity tests, and subsequently to structural model assessment and research hypothesis testing.

Table 3: Construct Reliability and Validity

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	AVE
AIP	0.808	0.808	0.886	0.722
CI	0.775	0.785	0.869	0.689
CM	0.748	0.759	0.855	0.663
DCM	0.829	0.831	0.898	0.745

The reliability and convergent validity results for the latent constructs in the measurement model, as shown in Table 3, indicate that all variables possess acceptable and high levels of internal consistency and construct validity. Cronbach's Alpha values ranged between (0.748) for the customer engagement variable (CM) and (0.829) for the digital content marketing mix variable (DCM), all of which are above the minimum accepted threshold of (0.70), confirming internal consistency among the measurement items for each construct.

The composite reliability (ρ_a) results showed values ranging between (0.759) and (0.831), while composite reliability (ρ_c) values ranged between (0.855) and (0.898), all above the recommended level of (0.70), indicating that the scales possess a high degree of reliability and stability in measuring the targeted variables.

With regard to convergent validity, the average variance extracted (AVE) values ranged between (0.663) for the customer engagement variable (CM) and (0.745) for the digital content marketing mix variable (DCM), all exceeding the minimum accepted threshold of (0.50), indicating that the indicators explain a large proportion of the variance in the latent constructs compared to measurement error.

Based on these results, it can be concluded that the study variables — DCM, CI, CM, and AIP — possess high levels of reliability and convergent validity, confirming the suitability of the measurement model and justifying the transition to structural model assessment and research hypothesis testing with statistical confidence.

Table 4: Discriminant Validity by Heterotrait-Monotrait Ratio (HTMT) — Matrix

	AIP	CI	CM	DCM
AIP	0.640			
CI	0.875	0.562		

CM	0.720	0.592	0.643	
DCM	0.640	0.286	0.452	0.363

Table 4 presents the results of the discriminant validity test using the heterotrait-monotrait ratio (HTMT) criterion, which is regarded as one of the most precise methods for verifying the distinctiveness of latent constructs from one another in PLS-SEM. The results indicate that all HTMT values between the study variables fell below the critical threshold of (0.90), ranging between (0.286) and (0.875), confirming the achievement of discriminant validity among all examined constructs.

The AI personalization perception variable (AIP) recorded the highest level of correlation with the customer insight variable (CI) at a value of (0.875), which is relatively high but still within statistically acceptable limits, indicating conceptual proximity between the two variables while each retains its theoretical and statistical distinctiveness. The results also showed a moderate correlation between AIP and CM at (0.720), and between CM and CI at (0.592).

On the other hand, the digital content marketing mix (DCM) recorded the lowest correlation value with customer insight (CI) at (0.286), indicating clear distinctiveness between these two dimensions from both a conceptual and measurement standpoint. Its relationships with the remaining variables ranged from weak to moderate, reaching (0.452) with CM and (0.640) with AIP.

Based on these results, it can be concluded that all study variables — DCM, CM, AIP, and CI — represent statistically and conceptually distinct concepts, confirming the soundness of the measurement model and its suitability for transitioning to the testing of structural relationships and research hypotheses with high scientific confidence.

Table 5: Discriminant Validity by Fornell-Larcker Criterion

	AIP	**CI**	**CM**	**DCM**
AIP	0.850			
CI	0.508	0.830		
CM	0.688	0.436	0.814	
DCM	0.588	0.479	0.512	0.863

Discriminant validity was assessed using the Fornell-Larcker criterion by comparing the square root of the average variance extracted (AVE) for each latent variable with the correlation coefficients between it and the other variables. The square root of AVE for each variable must be higher than all of its correlation coefficients with other variables.

The results in Table 5 indicate that this condition is satisfied for all study variables. The diagonal values for AIP (0.850), CI (0.830), CM (0.814), and DCM (0.863) are all higher than their corresponding correlation coefficients with other variables.

The highest correlation for AIP was with CM at (0.688), which is lower than its square root of AVE (0.850). DCM recorded its highest correlation with AIP at (0.588), which is lower than its diagonal value of (0.863). Similarly, all correlation coefficients for CI and CM were lower than their respective square roots of AVE.

Based on this, the results confirm that the four study variables represent concepts that are distinct from one another, and that the measurement model possesses an appropriate level of discriminant validity according to the Fornell-Larcker criterion, supporting the validity of using these variables in testing structural relationships and research hypotheses in subsequent stages of analysis.

Table 6: Collinearity Statistics (VIF)

Construct	VIF	Construct	VIF
AIP1	1.771	CM1	1.413
AIP2	1.811	CM2	1.636
AIP3	1.697	CMR3	1.504
CI1	1.519	DCM1	2.006
CI2	1.725	DCM2	1.924
CI3	1.591	DCM3	1.787

Table 6 presents the variance inflation factor (VIF) test results for the indicators used in the measurement model, in order to verify the absence of multicollinearity. VIF values ranged between (1.413) and (2.006), with indicator DCM1 recording the highest value of (2.006), while indicator CM1 recorded the lowest value of (1.413).

These results indicate that all VIF values fall within statistically acceptable limits, as they are clearly below the critical threshold of (5.0), and even below the more conservative criterion of (3.3), confirming the absence of multicollinearity among the study indicators. These values also reflect an appropriate level of relative independence among the indicators, ensuring that each indicator contributes to measuring the dimension it belongs to without excessive overlap or redundancy.

All indicators of the four study variables — DCM, CM, AIP, and CI — possess acceptable degrees of statistical distinctiveness, enhancing the reliability of the measurement model and confirming its suitability for conducting subsequent structural model analyses. The data are therefore free from bias resulting from multicollinearity, and the indicators used are suitable for testing the causal relationships and hypotheses proposed in the study.

Table 7: Goodness-of-Fit Measures for the Estimated Model

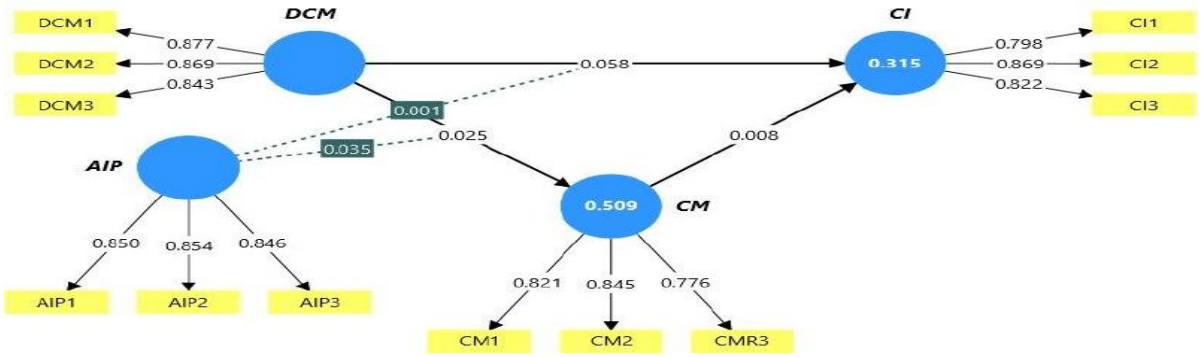
	Saturated model	Estimated model
SRMR	0.067	0.064
d_ULS	0.351	0.324
d_G	0.176	0.164
Chi-square	401.384	369.568
NFI	0.801	0.817

The model fit assessment results indicate that the proposed model possesses a good level of fit with the field data. The SRMR value for the saturated model was (0.067) and for the estimated model was (0.064), both below the accepted threshold of (0.08), indicating a good degree of consistency between the observed and model-estimated correlation matrices.

The d_ULS values were (0.351) for the saturated model and (0.324) for the estimated model, while d_G values were (0.176) and (0.164) respectively. These low values indicate a limited gap between the actual data and the data generated by the model, enhancing the model's capacity to represent relationships among latent variables appropriately.

The chi-square statistic reached (401.384) for the saturated model and (369.568) for the estimated model. Despite the influence of sample size on this indicator, the relative convergence between the two values reflects the stability of the model and the absence of fundamental deviations in the assumed relationship structure.

The NFI achieved values of (0.801) for the saturated model and (0.817) for the estimated model, approaching the recommended level in structural equation modelling studies, indicating a clear improvement in model fit compared to the null model and confirming its acceptable explanatory capacity.



Overall, the combined fit indicators suggest that the proposed structural model — which explains the relationship between DCM and CI through the role of CE and the effect of AIP — possesses a good level of statistical fit, providing a reliable scientific basis for transitioning to hypothesis testing and causal relationship analysis.

Figure 1: Measurement Model with Items Loadings

4.2. Structural Model Assessment

Following confirmation of the measurement model's adequacy, the study transitions to assessing the structural model to test the proposed theoretical relationships and hypotheses. In this section, the hypotheses are first tested using beta values and their probabilities. All proposed hypotheses are tested and a final conclusion is reached based on the results. The study also describes the indirect effects of selected relationships among variables. Furthermore, the figure below illustrates the structural model diagram.

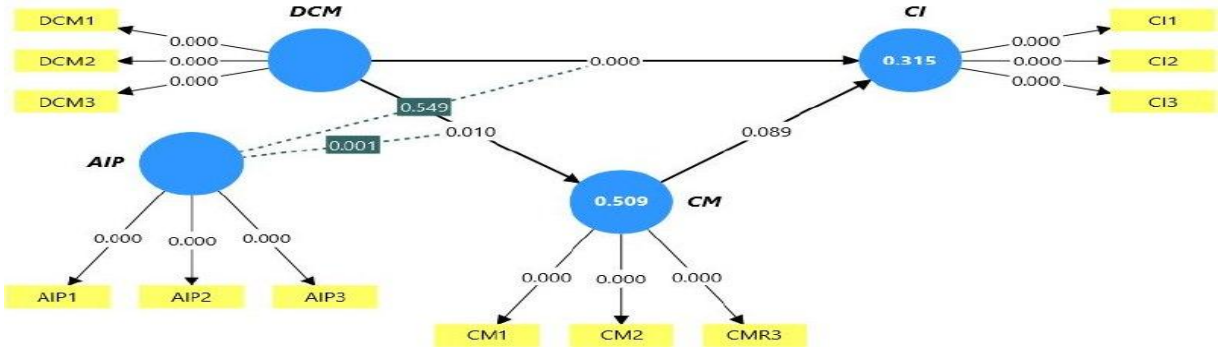


Figure 2: Structural Model with Path Coefficients

The figure presents the structural model results following the application of the PLS-SEM approach and hypothesis testing using the bootstrapping technique. The results indicate that the study model possesses acceptable explanatory power, as the coefficient of determination (R^2) for the customer engagement variable (CM) reached (0.509), meaning that the digital content marketing mix (DCM) explains approximately (50.9%) of the variance in customer engagement, a relatively high explanatory proportion according to PLS-SEM standards.

The coefficient of determination (R^2) for the customer insight variable (CI) reached (0.315), indicating that the explanatory variables in the model — DCM, CM, and AIP — explain (31.5%) of the variance in customer insight, which represents an acceptable explanatory capacity in behavioral and marketing studies.

The structural model results reveal a significant effect of the digital content marketing mix (DCM) on customer engagement (CM), where the p-value reached (0.010), below the adopted significance level of (0.05), confirming acceptance of the hypothesis. This result indicates that improving digital content elements in terms of informational value, appeal, and interactivity contributes to raising customer engagement levels with the brand.

The results also indicate a significant direct effect of DCM on customer insight (CI), where the p-value was (< 0.001), confirming the direct role of digital content in enhancing customers' capacity to understand the brand and form deeper knowledge and insights regarding its products and services.

The empirical results presented in Table 8 indicate that the digital content marketing mix (DCM) exerts a significant and positive direct effect on customer insight (CI) (\beta = 0.312, p < 0.001), supporting the primary hypothesis. Furthermore, DCM significantly influences customer engagement (CM). However, the analysis reveals the absence of a statistically significant direct relationship between customer engagement (CM) and customer insight (CI) (\beta = 0.105, p = 0.089). Consequently, customer engagement does not function as a significant mediator in this structural path, indicating that the impact of digital content marketing on generating customer insights is predominantly direct rather than transmitted through behavioral digital engagement.

Overall, the results confirm that the digital content marketing mix represents a fundamental factor in enhancing customer insight both directly and indirectly through customer engagement, and that AI personalisation technologies contribute to strengthening this relationship and maximizing its impact, underscoring the importance of integrating digital content strategies with AI applications to achieve deeper and more accurate understanding of customers.

Table 8: Hypothesis Testing Results

Hypothesis	β	t-Statistics	p-Value	R^2	f^2	2.50%	97.50%	Decision
AIP -> CI	0.276	2.566	p < 0.001	0.315	0.050	0.142	0.408	Supported
AIP -> CM	0.554	2.315	p < 0.001	0.509	0.388	0.450	0.652	Supported
AIP x DCM -> CI	-0.018	6.047	p = 0.549		0.001	-0.076	0.044	Unsupported
AIP x DCM -> CM	-0.086	8.558	p < 0.001		0.035	-0.135	-0.029	Supported
CM -> CI	0.105	1.699	p = 0.089		0.008	-0.018	0.222	Unsupported
DCM -> CI	0.253	2.312	p < 0.001		0.058	0.142	0.362	Supported
DCM -> CM	0.139	7.756	p = 0.010		0.025	0.033	0.244	Supported

The hypothesis testing results in Table 8 indicate that the structural model possesses acceptable explanatory power, as the R^2 for CI was (0.315), meaning that the model variables explain (31.5%) of the variance in customer insight among luxury hotel guests. The R^2 for CM was (0.509), a good proportion reflecting the model's capacity to explain interaction and participation behaviours among this category of customers.

The results also showed a significant positive effect of AIP on CI, indicating that guests who perceive the hotel as using intelligent technologies to personalise offers, services, and marketing content according to their personal preferences possess a deeper understanding of the services and hotel brand. In a luxury hotel environment, the customer expects a distinctive personal experience that aligns with their individual needs, making AI-supported personalisation an effective tool for enhancing customer knowledge and awareness.

The results also showed that AIP has a significant positive effect on CM. Luxury hotel guests tend to interact more with digital content when they feel that the messages, offers, and recommendations presented to them were specifically designed to match their interests and purchasing behaviour. The higher the degree of personalisation, the greater the customer's sense of the importance of their relationship with the hotel, reflected in higher levels of participation and interaction.

A significant positive effect of DCM on CI was also found. This reflects the importance of high-quality digital content in the luxury hospitality sector, as customers rely extensively on professional images, videos, digital stories, and interactive content to form their perceptions of service quality and the accommodation experience before booking. Improving digital content quality therefore contributes to building clearer insight among customers regarding the hotel's advantages and added value.

The digital content marketing mix also demonstrated a significant positive effect on CM. Attractive and relevant digital content contributes to capturing the attention of luxury hotel guests and motivating them to interact with the hotel's digital platforms, whether through following content, participating in it, or engaging with digital offers and services.

With regard to the relationship between CM and CI, the results did not show a significant direct effect. This may be due to the nature of luxury hotel guests, who typically make decisions based on the quality of information and its personal relevance more than on the level of digital engagement per se. Engagement with content does not necessarily entail acquiring a deeper understanding of services, unless that content possesses cognitive value.

As for the interaction effect of AIP on the relationship between DCM and CI, the result was non-significant. This indicates that good digital content remains capable of enhancing customer insight regardless of the level of awareness of intelligent personalisation, reflecting the intrinsic importance of content itself.

In contrast, the results showed a significant negative interaction effect of AIP on the relationship between DCM and CM. This can be explained by the concept of over-personalisation; high levels of personalisation may reduce customers' reliance on general or traditional marketing content, making them more interested in individual recommendations. The higher the guest's perception of the effectiveness of AI systems in delivering personal content, the lower the importance of general digital content in stimulating engagement.

Looking at effect sizes (f^2), AI personalization perception was the most influential factor in customer engagement ($f^2 = 0.388$), confirming that intelligent personalisation has become one of the fundamental pillars of managing relationships with luxury hotel customers, making AI technologies capable of delivering individual and specifically designed experiences a decisive factor in enhancing interaction and attachment to the hotel brand.

Overall, the results confirm that luxury hotels' success in enhancing customer insight and engagement requires not only high-quality digital content, but also the deployment of AI technologies to deliver personalised marketing experiences that align with guest expectations and individual preferences, granting hotels an important competitive advantage.

Table 9: Results of Direct — Indirect Effects Analysis and Mediation Path in the Structural Model

Path	β	t-Statistics	p-Value	2.50%	97.50%
Direct					
DCM -> CI AIP	0.235	3.702	0.000	0.110	0.360
DCM -> CM AIP	0.053	0.955	0.340	-0.055	0.161
DCM -> CI AIP	0.253	4.536	0.000	0.142	0.362
DCM -> CM AIP	0.139	2.574	0.010	0.033	0.244
Indirect					
DCM -> CM -> CI AIP	0.006	0.763	0.446	-0.007	0.023

DCM -> CM -> CI AIP	0.015	1.440	0.150	-0.003	0.036

To further unpack the conditional effects, a conditional direct and indirect path analysis was conducted as displayed in Table 9. The results indicate that the direct effect of the digital content marketing mix (DCM) on customer insight (CI) remains robust, positive, and statistically significant across varying levels of AI personalization perception (AIP), yielding path coefficients of b = 0.235 and b = 0.253 respectively ($p < 0.001$). Conversely, the indirect paths evaluating the mediating role of customer engagement (CM) consistently failed to achieve statistical significance under both conditional scenarios ($p = 0.446$ and $p = 0.150$). These findings definitively confirm that while AI personalization alters direct behavioral dynamics, the failure of customer engagement to act as a bridge toward customer insight remains constant.

4.3. Predictive Relevance

Following the assessment of the structural model and hypothesis testing, predictive relevance analysis is conducted to determine the model's predictive capacity outside the sample.

Table 10: Stone–Geisser's Q^2 Values for Endogenous Constructs

	Q^2predict	**RMSE**	**MAE**
CM	0.499	0.713	0.533
CI	0.331	0.824	0.627

Table 10 presents the predictive relevance test results (Stone–Geisser's Q^2), used to assess the predictive capacity of the structural model through blindfolding within the PLS-SEM framework. Positive Q^2 values are evidence that the model possesses predictive capacity for the internal constructs under study.

The Q^2 value for CM reached (0.499), while for CI it reached (0.331), both greater than zero, confirming appropriate predictive relevance for both internal variables. According to PLS-SEM standards, values exceeding (0.35) reflect strong predictive capacity, while values between (0.15–0.35) indicate moderate predictive capacity. CM therefore possesses strong predictive capacity, while CI demonstrates moderate predictive capacity tending towards high.

The RMSE and MAE values also support the predictive analysis results, with RMSE values of (0.713) for CM and (0.824) for CI, while MAE values were (0.533) and (0.627) respectively — acceptable levels indicating relatively low prediction error.

Overall, these results confirm that the proposed model — linking DCM with both CM and CI under the interaction role of AIP — possesses satisfactory to strong out-of-sample predictive capacity, enhancing the model's reliability and the possibility of benefiting from its results in interpreting and predicting the behaviour of five-star luxury hotel guests.

5. Discussion on Findings

The study results indicate that the digital content marketing mix and AI personalization perception represent key factors influencing the formation of customer insight in the five-star luxury hotel sector. This finding is consistent with recent trends in digital marketing literature affirming that the true value of digital content lies not only in transmitting information, but in its capacity to generate deeper understanding of customer behaviour, needs, and preferences.

The results showed a significant positive effect of AIP on CI, indicating that guests who perceive the hotel as using AI technologies to personalise offers and services develop a more accurate understanding of the services and hotel brand. This result can be interpreted in light of Personal Relevance Theory, which posits that information directly linked to an individual's interests receives a higher level of attention and cognitive processing. This is also consistent

with (Huang & Rust, 2021) and (Dwivedi et al., 2023), who confirmed that AI applications contribute to improving customers' perception of services by providing content more closely related to their individual needs.

The results also showed that AIP has a positive effect on CM, consistent with the logic of Social Exchange Theory, as customers tend to increase their participation and engagement levels when they feel that the organisation is investing in understanding their needs and delivering personal value to them. In the luxury hotel sector, intelligent personalisation becomes an important indicator of service quality and individual attention to the guest, enhancing engagement with the hotel's digital platforms.

A significant positive effect of DCM on CI was also found. High-quality digital content represents a primary source of information in the pre-purchase stage, especially in the luxury hospitality industry characterised by high perceived risk. Customers rely on images, videos, reviews, and digital stories to form their perceptions of hotel quality. This is consistent with (Lemon & Verhoef, 2016) and (Hollebeek & Macky, 2019), who confirmed that digital content represents one of the most important sources of knowledge and awareness formation.

The digital content marketing mix also demonstrated a positive effect on CM, which can be explained through Engagement Theory — attractive and purposeful content motivates individuals to interact and participate. In a luxury hotel environment, digital content extends to creating an initial digital experience that reflects the quality of the expected actual experience, encouraging guests to interact with the hotel brand.

In contrast, CM did not show a significant direct effect on CI. Luxury hotel guests are typically characterised by high levels of purchasing experience and awareness, making them more reliant on the quality of information and its personal relevance compared to the level of digital engagement per se. Engagement may therefore reflect a behavioral or emotional response more than a cognitive process leading to the construction of insight.

This reinforces the non-significance of the indirect effect of DCM on CI through CM, confirming the non-achievement of the mediating role. The cognitive value of digital content transmits directly to CI without the need to pass through high levels of engagement. From a managerial perspective, luxury hotels should focus on information quality and cognitive value more than an exclusive focus on increasing digital engagement rates.

The non-significant interaction effect of AIP on the DCM–CI relationship indicates that good digital content remains capable of building customer insight regardless of the level of awareness of intelligent personalisation, reflecting that informational content value represents an independent and influential factor. In contrast, the significant negative interaction effect of AIP on the DCM–CM relationship can be explained by the concept of over-personalisation; high levels of personalisation may reduce customers' reliance on general marketing content. This is consistent with recent studies regarding the limits to the positive relationship between digital personalisation and engagement.

Finally, AI personalization perception represents the strongest determinant of customer engagement ($f^2 = 0.388$), a moderate to large effect size according to (Cohen, 1988) standards. This confirms the increasing shift towards data-driven and AI-based marketing in the luxury hospitality sector, where intelligent personalisation has become more influential than traditional digital marketing tools in building long-term relationships with customers.

6. Concluding Remarks

This study demonstrated that the formation of customer insight in five-star luxury hotels is influenced by an interconnected interplay among the digital content marketing mix, customer engagement, and AI personalization perception. Notably, the empirical findings confirm that a high-quality digital content marketing mix directly and substantially contributes to developing a deeper understanding and capturing customer insights (CI). Intriguingly, contrary to conventional marketing assumptions, customer engagement (CM) was found to have a non-significant mediating role in this mechanism ($p = 0.089$). This demonstrates that in five-star luxury hotels, the cognitive and informational value embedded within professional digital content is powerful enough to directly construct guests' insights and guide their ultimate perceptions, without necessitating continuous online behavioral interactions or overt

public engagement on social media platforms. Therefore, luxury hotel consumers tend to process and leverage digital marketing content directly for internal evaluation and decision-making.

6.1. Contribution of the Study

The present study contributes to enriching marketing literature through examining the effect of the digital content marketing mix on customer insight within the five-star luxury hotel sector, with a focus on the mediating role of customer engagement and the moderating role of AI personalization perception. Despite the expansion in the use of digital content and AI technologies in the hospitality sector, the literature still lacks a clear understanding of the mechanisms that transform digital marketing activities into actionable customer insight.

Drawing on Engagement Theory and Personalisation Theory, the study posits that the digital content marketing mix contributes to enhancing customer insight through raising customer engagement levels, and that this effect becomes stronger when customers perceive that the services and content provided to them are being personalised effectively using AI technologies.

The theoretical contribution of the study lies in integrating contemporary variables within a single explanatory model in a luxury hospitality environment, while its practical contribution lies in providing hotel managements with indicators that help them develop digital content strategies and leverage AI technologies to enhance customer understanding, support marketing decisions, and achieve sustainable competitive advantage.

6.2. Practical Implications

The findings of this study carry important practical implications for five-star luxury hotel managements. The results indicate that developing digital content marketing mix elements — through providing rich, reliable, and relevant content across various digital channels — contributes directly to enhancing customer insight and forming a more accurate understanding of their preferences and purchasing behaviours.

The results also confirm the importance of enhancing customer engagement as a primary mechanism for transforming digital marketing efforts into deeper customer knowledge. Hotels should therefore design interactive content that encourages guests to participate, comment, share experiences, and provide feedback via digital platforms, enabling the hotel to collect valuable information that contributes to improving services and future accommodation experiences.

The results also highlight the pivotal role of customer perception of AI personalisation, where hotels can leverage AI technologies to analyse guest data and provide personalised recommendations, services, and offers that align with their interests and individual needs. This level of personalisation helps increase the effectiveness of marketing content and enhance the hotel's capacity to discover behavioural insights and latent preferences among customers.

Accordingly, investment in AI-supported digital content marketing strategies, alongside building an interactive digital environment that enhances customer engagement, can provide luxury hotels with a more accurate knowledge base about their customers. This will support marketing and strategic decision-making, raise the quality level of services provided, and enhance hotels' competitiveness in the luxury hospitality market.

6.3. Recommendations for Policymakers and Stakeholders

Policymakers and stakeholders in the hospitality and tourism sector should give higher priority to developing digital infrastructure and legislation supporting digital transformation in luxury hotels, ensuring the delivery of integrated, secure, and customer-centric digital experiences. This requires establishing clear standards for managing guest personal data, enhancing information security, and ensuring the ethical use of AI technologies in personalizing hotel services, contributing to building customer trust and raising the quality of their digital interactions with hotels.

Regulatory bodies and professional associations in the tourism and hospitality sector should also encourage hotels to invest in digital content marketing technologies that provide rich, reliable, and attractive information to

customers across various digital channels. It is also important to support the adoption of AI systems capable of providing personalised content, offers, and services aligned with guest needs and preferences, enhancing their perception of personalisation value and raising their engagement levels with the hotel brand.

Furthermore, institutions concerned with developing the hospitality sector must provide continuous training programmes for hotel staff to enhance their capacities in digital content management, customer data analysis, and the effective and responsible deployment of AI technologies. Encouraging digital innovation and adopting data-driven marketing strategies will help hotels understand customer needs more deeply and develop more accurate insights into their behaviour and expectations.

6.4. Limitations and Future Research

Despite the importance of the study's findings, they are limited to guests of five-star luxury hotels, which may constrain the possibility of generalizing the results to other service or hotel sectors. The study also relied on cross-sectional data collected during a specific time period, which does not allow for tracking changes in customer behaviour and perceptions over time. Future research is therefore recommended to apply the model in different sectors and contexts, use longitudinal studies to verify the stability of the examined relationships, and test additional variables such as digital trust, digital customer experience, and perceived value to enhance the explanatory capacity of the proposed model.

Data Availability Statement: The datasets generated during the current study are available from the corresponding author upon reasonable request.

Funding Declaration: No Funding.

Conflict of Interest Statement: No author has competing interests.

Clinical Trial Number: Not Applicable

Ethics Declaration: This study is conducted under the guidelines of the ethical committee of the University. The University is committed to ensuring the well-being of participants and adhering to the highest standards of research integrity. All participants provided informed consent to participate in the study. Data collection followed all ethical guidelines for maintaining the privacy and security of personal information. This study was approved by the Department of Research and Innovations Ethics Board Committee of the University.

Consent to Publish Declaration: Not applicable.

Consent to Participate Declaration: Informed consent forms in writing, in accordance with institutional guidelines, were obtained.

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