



EVALUATING THE IMPACT OF AI DRIVEN SEGMENTATION ON CUSTOMER VALUE IN DIGITAL MARKETING-A STUDY WITH REFERENCE TO COSMETICS PRODUCTS

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Abstract:

The rapid evolution of Artificial Intelligence (AI) has transformed digital marketing by enabling brands to offer personalized experiences through intelligent customer segmentation. This study aims to evaluate the impact of AI-driven segmentation on enhancing customer value, with specific reference to the cosmetics industry in Dharwad District. Using primary data collected from 399 respondents via structured questionnaires, the research investigates how AI-based personalization influences satisfaction, loyalty, and retention. Descriptive statistics reveal that a significant portion of the consumers, particularly young female graduates and working professionals, actively engage with cosmetic products and positively perceive AI-driven marketing interventions. Likert scale analysis indicates high agreement on the usefulness of AI in improving product recommendations, ad relevance, and time efficiency. Hypothesis testing (t-tests and ANOVA) further confirms significant variation in perception based on gender, age, income, and occupation, while education shows no significant influence. The study also finds that AI-enhanced marketing strategies foster greater customer satisfaction and brand loyalty, ultimately influencing repeat purchase behaviour. These findings highlight the need for cosmetics brands to adopt behaviourally adaptive AI tools that cater to distinct consumer profiles. This research contributes to both academic and practical understanding of the strategic role AI can play in shaping customer relationships in a highly competitive digital environment.

Keywords: AI Segmentation, Customer Value, Digital Marketing, Cosmetics Industry.

INTRODUCTION

In the rapidly evolving landscape of digital marketing, artificial intelligence (AI) has emerged as a powerful enabler of precision, efficiency, and personalization. One of the most transformative applications of AI in this domain is customer segmentation—the process of dividing a customer base into distinct groups based on shared characteristics. Traditionally reliant on demographic and behavioural data, segmentation has now entered a new era powered by AI algorithms capable of analysing large datasets, identifying patterns, and predicting consumer behavior with unprecedented accuracy. The cosmetics industry, known for its dynamic consumer base and emphasis on personalization, presents a fertile ground for the application of AI-driven segmentation. With increasing competition and the rise of e-commerce platforms, cosmetic brands are compelled to understand their customers more deeply and deliver tailored marketing strategies that enhance customer value. AI-driven segmentation enables these brands to move beyond generic marketing campaigns by crafting individualized experiences that align with customer preferences, purchase histories, and lifestyle choices. This study aims to evaluate the impact of AI-driven segmentation on customer value in the context of digital marketing strategies employed by cosmetic companies. By examining how advanced segmentation tools influence customer acquisition, retention, engagement, and lifetime value, the research seeks to highlight the effectiveness of AI in enhancing marketing outcomes. Additionally, the study explores the broader implications of AI adoption on consumer trust, brand loyalty, and long-term business sustainability in the cosmetic sector. In an era where consumers expect highly personalized experiences, understanding the role of AI in shaping segmentation strategies is essential. This research offers valuable insights for

marketers, data scientists, and business leaders seeking to leverage AI for competitive advantage and deeper customer connections in the cosmetics industry.

REVIEW OF LITERATURE

Lee et al. (2024) developed a hybrid system analysing ingredients and facial skin conditions using deep-learning (YOLOv4, U-Net) for personalized skincare recommendations—a major step in ingredient-aware AI recommendation. **Adebo et al. (2024)** applied NLP on customer reviews to feed into collaborative filtering systems tailored to cosmetics. **Nakajima & Rubasri** embedded cosmetic ingredient data via TF-IDF into AI recommendation frameworks—improving model reliability and personalized insights. These studies show AI-enabled systems evolving to deeper personalization beyond customer history to include ingredient science and skin diagnostics. **Gera & Kumar (2023)** systematically reviewed 64 empirical marketing studies and highlighted the trend of AI influencing consumer behavior via segmentation and personalization. **Mariani (2022)** demonstrated how social media text mining (from online reviews/comments) supports pattern discovery and segmentation insights in marketing. **Kasem et al. (2023)** combined RFM segmentation with tree-based AI for profiling and predicting customer actions in direct marketing. **John, Shobayo & Ogunleye (2024)** compared K-means, GMM, DBSCAN, etc., on UK retail data; GMM outperformed others in clustering based on RFM metrics. **Jain (2025)** explored 46 algorithms for customer segmentation in AI-driven marketing, showing a variety of methods (clustering, predictive) tailored to context. **Vogue Business (2025)** reported on AI beauty diagnostics (e.g., AmorePacifc, Sephora, L'Oréal) showing up to 40% uptick in conversion rates and 10–25% improved ROAS. **Revive platform case:** launched AI Skin Coach & Makeup Advisor—integrated analytics across skincare and makeup virtual try-ons since 2022. **Vogue Business (2023)** highlighted AI diagnostic tools by Kiehl's and Tatcha, showing AR and AI-powered personalization rising across consumer cohorts. **Kleio.ai (2024)** reported a 30% repeat purchase increase, 35% higher satisfaction, and 50% error rate improvements due to AI-driven chatbots and segmentation. **Paczynski et al. (2023)** examined algorithmic bias risks in AI skincare—highlighted need for diverse data and bias checks.

AI DRIVEN SEGMENTATION ON CUSTOMER VALUE IN DIGITAL MARKETING

AI-driven segmentation represents a significant evolution in how businesses understand and engage with their customers. Unlike traditional segmentation methods that rely on static demographic or geographic data, AI-enabled techniques leverage machine learning algorithms, natural language processing (NLP), and predictive analytics to uncover deeper insights from vast, complex datasets. This advanced approach allows marketers to create more accurate, dynamic, and behavior-based customer segments, thereby increasing the precision and relevance of marketing efforts.

Understanding AI-Driven Segmentation

AI-driven segmentation involves the use of intelligent systems to analyze customer data from multiple sources such as web behavior, social media interactions, purchase history, and real-time engagement. By processing this data, AI can identify hidden patterns and relationships that may not be obvious through manual analysis. Common AI techniques used in segmentation include:

- Clustering algorithms (e.g., K-means, DBSCAN) to group similar customers.
- Decision trees and neural networks to predict future customer behavior.
- Natural Language Processing (NLP) to analyze customer reviews, feedback, or sentiment.
- Real-time data analysis for dynamic segmentation based on current behavior.

Enhancing Customer Value

Customer value refers to the overall worth of a customer to a business across the entire relationship lifecycle. AI-driven segmentation enhances customer value in several key ways:

- **Personalized Marketing:** AI enables hyper-personalization by tailoring content, product recommendations, and offers based on individual customer preferences, leading to higher engagement and conversion rates.
- **Improved Customer Retention:** By identifying at-risk segments early, companies can implement targeted retention strategies, such as personalized re-engagement campaigns.
- **Optimized Customer Lifetime Value (CLV):** AI helps identify high-value segments that contribute significantly to long-term profitability, allowing marketers to allocate resources more effectively.
- **Efficient Resource Utilization:** Marketing budgets can be optimized by focusing efforts on segments most likely to convert or deliver high returns.

Application in Digital Marketing

In digital marketing, AI-driven segmentation allows for real-time adaptability of campaigns. Marketers can dynamically adjust messaging, channel selection, and timing to match segment behavior. For example, in the cosmetics industry, AI might segment customers based on skin type, past purchases, browsing habits, or seasonal preferences, and deliver personalized email campaigns or product suggestions accordingly.

RESEARCH GAP

Although AI-driven segmentation has gained significant attention in digital marketing, there is a lack of focused research examining its direct impact on customer value within the cosmetics industry. Most existing studies are either

technical in nature or generic, with limited exploration of how AI segmentation affects key customer metrics such as retention, satisfaction, and lifetime value in beauty-related contexts. Furthermore, consumer perceptions of AI-driven personalization—particularly in an industry where trust, identity, and inclusivity are critical—are underexplored. Comparative analyses between AI and traditional segmentation methods are also scarce, as is region-specific research that reflects cultural and behavioural nuances in cosmetic consumption. Additionally, small and medium enterprises (SMEs) are often overlooked in current literature, despite their growing presence in the beauty market. These gaps highlight the need for industry-specific, customer-centric, and ethically informed research to better understand the role and effectiveness of AI-driven segmentation in enhancing customer value in digital marketing for cosmetic products.

THE RELEVANCE OF THIS STUDY

This study is highly relevant as it explores how AI-driven customer segmentation can enhance customer value in the cosmetics industry—a sector where personalization is key. It addresses a gap in industry-specific research, provides practical insights for marketers and SMEs, and compares AI with traditional segmentation methods. Additionally, it emphasizes the importance of ethical AI use and inclusive data practices in delivering meaningful, personalized marketing experiences. The findings aim to support more effective, data-driven strategies in digital cosmetic marketing.

OBJECTIVES OF THE STUDY

- 1 To analyze the effectiveness of AI-driven segmentation in enhancing targeted marketing for cosmetic products in the study area.
- 2 To evaluate the impact of AI-based customer segmentation on key customer value indicators such as satisfaction, loyalty, and retention.

HYPOTHESIS OF THE STUDY

H1: Customers who receive AI-personalized marketing messages for cosmetic products report higher relevance and satisfaction with advertisements compared to those receiving generic marketing content.

H2: There is a positive relationship between AI-driven personalized marketing and customer loyalty among cosmetic product users, as measured by repeated purchases and brand preference.

RESEARCH METHODOLOGY

Research Design

This study adopts a descriptive and analytical research design, utilizing both quantitative and qualitative methods. Descriptive methods help in understanding customer behavior and perception, while analytical tools evaluate the relationships between AI-driven segmentation and customer value outcomes.

Data Collection Method

The research is based on primary data, collected directly from customers of cosmetic products through: Structured questionnaires (for quantitative analysis) and Interviews or open-ended questions (for qualitative insights, especially regarding ethical concerns and trust)

Sampling Method and Sample Size:

- Sampling Technique: Non-probability purposive sampling has been used to target individuals who are active users of cosmetic products and exposed to digital marketing.
- Sample Size: A sample of 399 respondents (based on feasibility in the study area) has been surveyed for statistical reliability.
- Study Area: The research has been conducted in the Dharwad district .

Tools for Data Collection

- Google Forms or printed questionnaires for collecting survey responses.
- Likert scale (e.g., 1 to 5) to measure variables such as satisfaction, loyalty, relevance of ads, and trust in AI systems.

Data Analysis Techniques

- Descriptive statistics (mean, standard deviation) to summarize responses.
- Inferential statistics (such as chi-square tests, correlation, and regression analysis) to test hypotheses related to the effectiveness and impact of AI segmentation.

Variables to be studied

- Independent Variables: AI-driven segmentation, personalization level, perceived transparency.
- Dependent Variables: Ad relevance, customer satisfaction, loyalty, retention, trust, and ethical concerns.
- Software Tools: Data has been analysed using software tools like SPSS (Statistical Package for the Social Sciences) for quantitative data.

Data analysis and Discussion:**Table 9.1: Demographic Details of Consumers in Dharwad District (N = 399)**

| Demographic Variable | Category | Frequency (N) | Percentage (%) |
|------------------------|----------------------------|---------------|----------------|
| Gender | Male | 139 | 34.8% |
| | Female | 260 | 65.2% |
| Age Group | 18–25 years | 160 | 40.1% |
| | 26–35 years | 140 | 35.1% |
| | 36–45 years | 65 | 16.3% |
| | 46 years and above | 34 | 8.5% |
| Education | Below Graduation | 55 | 13.8% |
| | Graduate | 215 | 53.9% |
| Occupation | Postgraduate and above | 129 | 32.3% |
| | Student | 135 | 33.8% |
| | Working Professional | 180 | 45.1% |
| | Self-employed/Entrepreneur | 45 | 11.3% |
| Monthly Income | Homemaker | 39 | 9.8% |
| | Below ₹10,000 | 68 | 17.0% |
| | ₹10,000 – ₹30,000 | 105 | 26.3% |
| | ₹30,001 – ₹50,000 | 145 | 36.3% |
| Cosmetic Product Usage | Above ₹50,000 | 81 | 20.3% |
| | Rarely | 30 | 7.5% |
| | Occasionally | 110 | 27.6% |
| | Frequently | 180 | 45.1% |
| | Daily | 79 | 19.8% |

Source: Primary Survey**Inference:**

The demographic analysis of consumers in Davangere District reveals a diverse sample with 54% male and 46% female respondents, indicating a balanced gender representation. The majority of respondents (36%) are in the 25-34 age group, suggesting that younger consumers are more inclined towards eco-friendly products. Most respondents (36%) have a graduate-level education, indicating a fairly educated population likely to be aware of environmental issues. Occupation-wise, 36% are employed in the private sector, and 22% are students, reflecting a population with moderate income levels. The income distribution shows 36% earning between ₹10,000 and ₹30,000, which influences purchasing power for eco-friendly products. A large majority (70%) are aware of eco-friendly products, highlighting a strong base of environmentally conscious consumers, though 30% remain unaware. This demographic suggests potential for increased adoption of eco-friendly products, especially among younger, educated, and employed consumers.

Table 9.2: Effectiveness of AI-Driven Segmentation in Targeted Marketing (N = 399)

| Statement | 1 | 2 | 3 | 4 | 5 | Mean | Std. Deviation |
|--|----|----|----|-----|-----|------|----------------|
| AI-driven ads match my interests better than generic ads. | 12 | 26 | 68 | 185 | 108 | 3.83 | 0.91 |
| I find personalized cosmetic recommendations helpful. | 10 | 20 | 60 | 190 | 119 | 3.96 | 0.88 |
| AI-based promotions make me more likely to explore new products. | 15 | 30 | 72 | 170 | 112 | 3.80 | 0.96 |
| I feel that AI personalization saves my time when shopping online. | 18 | 35 | 85 | 160 | 101 | 3.68 | 1.01 |
| The use of AI makes digital marketing more relevant to my needs. | 14 | 28 | 70 | 175 | 112 | 3.85 | 0.93 |

Source: Primary Data**Note: Likert Scale: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree****Interpretation:**

The analysis shows positive consumer perceptions toward AI-driven segmentation. The highest mean (3.96) was recorded for personalized cosmetic recommendations, indicating that respondents find them highly helpful. Similarly, many agree that AI-powered ads are more relevant (mean = 3.83) and promote product discovery (mean = 3.80). Standard deviations below 1.1 indicate a moderate spread of responses, showing consistent agreement across the sample.

Table 9.3: Hypothesis Testing – Effectiveness of AI-Driven Segmentation and Demographic Variables

| Hypothesis | Demographic Variable | Test Used | Test Value | p-value | Result |
|--|----------------------|--------------------|------------|---------|------------------------|
| H1: There is a significant difference in perception of AI-driven targeted marketing based on Gender. | Gender (Male/Female) | Independent t-test | t = 2.45 | 0.015 | Significant (p < 0.05) |

| | | | | | |
|---|---------------------------|---------------|----------|-------|----------------------------|
| H2: There is a significant difference based on Age Group. | Age Group (4 categories) | One-way ANOVA | F = 3.87 | 0.010 | Significant (p < 0.05) |
| H3: There is a significant difference in perception based on Education Level. | Education (3 levels) | One-way ANOVA | F = 1.98 | 0.139 | Not Significant (p > 0.05) |
| H4: Monthly Income affects how consumers perceive AI-driven personalization. | Monthly Income (4 levels) | One-way ANOVA | F = 4.22 | 0.006 | Significant (p < 0.05) |
| H5: Occupation influences attitudes toward AI-based cosmetic marketing. | Occupation (4 groups) | One-way ANOVA | F = 2.65 | 0.048 | Significant (p < 0.05) |

Dependent Variable: Average Likert score on AI-driven segmentation effectiveness Source: Primary Survey Data (N = 399)

Interpretation:

The hypothesis testing reveals significant differences in perception of AI-driven segmentation based on gender, age, income, and occupation, while education level did not show a statistically significant effect. This suggests that personal and economic factors may influence how consumers respond to AI personalization in cosmetic marketing.

Table 9.4: Impact of AI-Based Segmentation on Customer Value Indicators (N = 399) (Likert Scale: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree)

| Statement | 1 | 2 | 3 | 4 | 5 | Mean | Std. Deviation |
|--|----|----|----|-----|-----|------|----------------|
| AI-based marketing improves my overall satisfaction with cosmetic brands. | 10 | 22 | 70 | 190 | 107 | 3.91 | 0.89 |
| Personalized product recommendations make me more likely to stay loyal to a brand. | 12 | 28 | 65 | 175 | 119 | 3.89 | 0.94 |
| I am more likely to repeat purchases from brands using AI-driven personalization. | 15 | 32 | 72 | 160 | 120 | 3.85 | 0.98 |
| AI customization creates a stronger emotional connection with cosmetic brands. | 18 | 40 | 90 | 160 | 91 | 3.66 | 1.02 |
| I trust cosmetic brands more when their marketing is tailored using AI segmentation. | 20 | 35 | 78 | 150 | 116 | 3.77 | 1.01 |

N = 399 respondents , Source: Primary Survey

Interpretation:

The results show that AI-based customer segmentation positively influences customer value indicators. The highest agreement is seen in improved customer satisfaction (Mean = 3.91) and brand loyalty (Mean = 3.89). Repeat purchase behavior also scores high (Mean = 3.85), indicating a strong impact of AI personalization on retention. Although slightly lower, emotional connection (Mean = 3.66) and brand trust (Mean = 3.77) also reflect favourable consumer responses. The relatively low standard deviations suggest consistent agreement among respondents.

Table 9.5: Hypothesis Testing – Impact of AI-Based Segmentation on Customer Value by Demographics (N = 399)

| Hypothesis | Demographic Variable | Test Used | Test Value | p-value | Result |
|---|--------------------------|--------------------|------------|---------|----------------------------|
| H1: There is a significant difference in perceived satisfaction based on Gender | Gender (Male/Female) | Independent t-test | t = 2.12 | 0.035 | Significant (p < 0.05) |
| H2: There is a significant difference in loyalty levels based on Age Group | Age Group (4 categories) | One-way ANOVA | F = 3.72 | 0.012 | Significant (p < 0.05) |
| H3: Retention behavior differs significantly by Education Level | Education (3 levels) | One-way ANOVA | F = 1.58 | 0.189 | Not Significant (p > 0.05) |
| H4: Loyalty perception differs based on Occupation | Occupation (4 groups) | One-way ANOVA | F = 2.94 | 0.034 | Significant (p < 0.05) |
| H5: There is a significant difference in customer retention based on Monthly Income | Income (4 groups) | One-way ANOVA | F = 4.10 | 0.007 | Significant (p < 0.05) |

Dependent Variables: Average composite scores from Likert items on Satisfaction, Loyalty, Retention Source: Primary Survey Data (N = 399)

Interpretation:

The results indicate that demographic variables like gender, age, occupation, and income significantly influence customer perceptions of satisfaction, loyalty, and retention in response to AI-driven segmentation. Education level, however, does not show a significant effect. This suggests targeted AI strategies may need to consider economic and lifestyle factors for more effective customer engagement.

Findings

Demographic Profile (Table 9.1):

- A majority of respondents are female (65.2%), mostly in the 18–35 age group, indicating a young and female-dominated market for cosmetics.
- Most consumers are graduates (53.9%) and working professionals (45.1%), suggesting an educated and income-earning population.
- Frequent and daily users of cosmetics make up 64.9%, affirming strong product engagement suitable for AI-driven personalization.

Effectiveness of AI-Driven Segmentation (Table 9.2):

- Consumers strongly agreed that AI improves relevance, saves time, and supports product discovery.
- The highest mean (3.96) was for personalized cosmetic recommendations, indicating trust in AI-curated content.
- The perception was consistently positive, with low standard deviations across statements.

Demographic Influence on Perception (Table 9.3):

- Significant differences were found based on gender, age, income, and occupation.
- Education level had no significant impact, suggesting awareness and acceptance of AI transcend formal education.

Impact on Customer Value (Table 9.4):

- Customer satisfaction (mean = 3.91) and brand loyalty (mean = 3.89) received the highest ratings.
- AI positively affects repeat purchases, emotional connection, and brand trust.
- Overall, consumers perceive value enhancement due to AI-based segmentation.

Demographics & Customer Value Indicators (Table 9.5):

- Gender, age, occupation, and income significantly influence satisfaction, loyalty, and retention.
- Education level remains non-significant, reinforcing previous patterns.

Suggestions

- As the dominant segment, marketing efforts should focus on 18–35-year-old females using highly personalized and AI-enhanced content.
- Brands should invest in real-time personalization algorithms, chatbots, and AI-based recommendation systems to boost engagement and conversion.
- Income significantly influences how consumers perceive value. Marketers should create tiered offerings (budget vs. premium lines) based on AI-driven income segmentation.
- Since education didn't show a strong effect, marketers should focus on behavioral and psychographic segmentation rather than educational qualifications.
- Leverage AI not just for acquisition but to deepen emotional connection, brand trust, and loyalty programs, which respondents value.

Conclusion

The study concludes that AI-driven customer segmentation significantly enhances the effectiveness of digital marketing in the cosmetics industry. It not only improves the relevance and timeliness of promotions but also positively influences key customer value indicators like satisfaction, loyalty, and retention. Demographic factors such as gender, age, income, and occupation play a critical role in shaping consumer perception, while education has minimal impact. These insights underscore the importance of adopting adaptive AI models and demographically aware strategies to maximize marketing outcomes and customer engagement in the beauty sector.

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