
Critical Analysis on Artificial Intelligence and Sustainable Marketing Practices of FMCG Goods

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Abstract: In the context of digital business, AI and its applications are the business integrators for search engine optimization. The role of digital consumers in social marketing is currently increasing. AI is crucial for social media analytics and digital marketing as it evaluates prospective clients and helps businesses make money. Digital media and digital platforms are essential for global companies and sustained marketing strategies. Every foreign consumer is curious about digital KYC, historical self-trends, and promotional strategies of the fascinating FMCG sector clients. AI technologies assist in ensuring that FMCG goods are delivered to clients worldwide on time. The researcher analyzed and interpreted the data in this study using secondary data. Conclusions are derived from data analysis using statistical methods like the t-test.

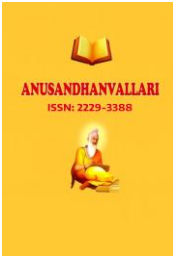
Keywords: Artificial Intelligence, Sustainable Marketing Practices, FMCG Goods, Search Engine Optimization, Global Customer, Digital KYC, Digital Business

1. Introduction

AI has revolutionised a number of sectors, including FMCG industry. As sustainability becomes a priority for businesses, AI-driven marketing practices have emerged as a powerful tool in achieving sustainable goals. FMCG companies are increasingly integrating AI technologies to enhance consumer engagement, optimize global customer reach, improve cost efficiency, ensure digital data security, boost search engine optimization (SEO) performance, and reduce environmental impact. These AI-driven strategies not only contribute to the sustainability agenda but also offer competitive advantages by aligning with the evolving expectations of environmentally conscious consumers.

FMCG marketing relies heavily on consumer involvement, and AI has the power to completely transform how companies communicate with their consumers. By using ML algorithms and sophisticated data analytics, AI enables companies to deliver highly personalized content, predict consumer preferences, and offer tailored recommendations. This enhanced engagement leads to stronger relationships with consumers and drives higher conversion rates. Chatbots, voice assistants, and automatic customer support systems driven by AI further simplify communication, guaranteeing prompt replies and a smooth experience for customers. In an increasingly globalized market, global customer reach is vital for the growth of FMCG brands. AI helps companies scale their marketing efforts by analysing vast amounts of data from diverse regions, identifying emerging trends, and customizing campaigns for specific demographics. By leveraging AI, FMCG companies can target global audiences more effectively, ensuring that their messaging resonates with consumers from various cultural backgrounds, thus expanding their market presence.

Cost efficiency is another key benefit of AI-driven marketing. Traditional marketing campaigns often require significant resources, but AI allows companies to optimize their budgets by automating processes, identifying the



most effective channels, and minimizing wastage. Predictive analytics powered by AI can forecast campaign outcomes, enabling brands to allocate resources more effectively and reduce unnecessary expenses. This cost efficiency is especially crucial in sustainable marketing, where reducing the environmental and financial costs of campaigns is a priority.

The use of Digital Know Your Customer (KYC) technologies in FMCG marketing ensures enhanced data security. AI-driven Digital KYC processes allow companies to identify and onboard customers efficiently, while also safeguarding sensitive information through advanced encryption and fraud detection systems. This is particularly important as consumers demand greater transparency and security when sharing personal data.

Additionally, AI significantly enhances SEO effectiveness. With search engines continuously evolving, AI tools help FMCG brands stay ahead by optimizing content, identifying relevant keywords, and tracking performance in real-time. This ensures better visibility and higher rankings, leading to increased traffic and engagement.

Finally, AI's ability to reduce the environmental impact of marketing activities, such as energy consumption, is a critical aspect of sustainable practices. By automating energy-intensive processes and optimizing marketing resources, AI contributes to the overall sustainability of FMCG campaigns. As companies look to reduce their carbon footprint, AI emerges as a valuable ally in balancing economic and environmental goals.

In summary, AI has become an essential tool in driving sustainable marketing practices for FMCG goods. AI-driven tactics are changing how FMCG firms sell their goods and interact with global customers in an ever more digital and ecological world. These strategies include boosting consumer interaction, increasing operational efficiency, and minimising environmental effects.

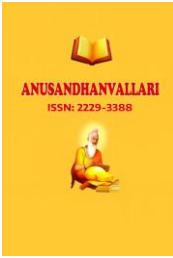
2. Review Of Literature

AI in marketing has completely changed how companies interact with customers, especially in the FMCG industry. Brynjolfsson & McAfee (2017) discuss the potential of AI in transforming businesses by automating complex decision-making processes and enhancing operational efficiency. In the context of consumer engagement, AI's ability to personalize marketing efforts significantly improves the interaction between businesses and their customers, as highlighted by Pappas & Pappas (2020), who examine AI applications in marketing and their effectiveness in reaching consumers more accurately.

Loebl & Walter (2018) examine the corporate and scholarly effects of AI in marketing, highlighting its contribution to enhancing consumer involvement and promoting sustainability in marketing strategies. These findings are echoed by Kim & Sundar (2018), who examine how intelligent service agents influence consumer experiences, further validating the potential of AI to create personalized, efficient customer interactions.

In terms of global customer reach and cost efficiency, Rajagopal (2018) highlights the benefits of digital marketing in emerging markets, illustrating how AI technologies can streamline marketing efforts and optimize costs, especially in regions where traditional marketing may face limitations. Verhoef et al. (2015) also delve into the evolution from multi-channel to omni-channel retailing, emphasizing AI's role in unifying marketing strategies across diverse platforms.

Digital KYC processes, critical for data security, are another area where AI has proven beneficial. Duan et al. (2008) examine the dynamics of online word-of-mouth, which relates to AI's ability to manage and secure customer data more effectively, reducing risks associated with traditional KYC processes. Similarly, Li & Hitt (2008) explore the



information role of online product reviews, a process made more secure and efficient through AI-driven KYC mechanisms.

Cost efficiency is further addressed by Davenport & Beck (2001), who discuss the attention economy and AI's ability to optimize resources in marketing, ensuring sustainable business practices. This is complemented by Godes&Mayzlin (2009), who provide evidence from field tests showing how AI enhances firm-created word-of-mouth communication, offering both cost savings and improved engagement.

3. Research Gap

There are still a lot of unanswered questions regarding the FMCG industry's increasing usage of AI in sustainable marketing. First, there is little empirical data on AI's long-term benefits, despite the fact that its potential to improve customer involvement is recognised. Most studies focus on immediate improvements, such as higher click-through rates or personalized recommendations, but fail to examine how AI-driven marketing fosters lasting relationships and consumer loyalty, especially in the context of sustainability.

Second, though AI is recognized for improving cost efficiency in marketing campaigns, there is a absence of thorough research assessing the financial benefits of AI-driven sustainable marketing over traditional methods. The existing research often overlooks the complexities of balancing cost reductions with the higher upfront investment required for AI technologies, leaving a gap in understanding the long-term cost implications of AI adoption in sustainability-focused FMCG campaigns.

Lastly, while Digital KYC data security is a critical aspect of AI-driven marketing, research on how AI enhances security measures in digital KYC processes remains limited. With growing consumer concerns over data privacy and regulatory pressures, there is a need for deeper analysis on how AI technologies can ensure both cost efficiency and robust data security in the customer identification and onboarding process.

4. Objectives Of The Study

- To examine how AI-driven marketing affects customer interaction and the effectiveness of client recognition and enrolment in the FMCG industry.
- To evaluate how cost-effective AI-driven marketing is in comparison to conventional marketing while implementing sustainable FMCG initiatives.
- To evaluate how AI-driven marketing, as opposed to conventional marketing techniques, improves data security throughout digital KYC procedures in FMCG sustainable efforts.

5. Research Methodology

Research Design:

Utilising opinion-based data gathered from marketing executives of 20 FMCG businesses using Likert scale questionnaires, this study employs a qualitative research approach. The research is to investigate how conventional and AI-driven marketing vary in terms of client engagement, cost effectiveness, and digital KYC data security in FMCG sustainability campaigns. Based on the perspectives of marketing specialists, a comparison study has been carried out to assess the efficacy of both strategies.

Data Collection:

A systematic questionnaire with Likert scale items that vary from 1 (strongly disagree) to 5 (strongly agree) was used to gather the data. The survey has targeted 20 marketing managers from leading FMCG companies that have experience with both traditional and AI-driven marketing approaches in sustainable campaigns. The questionnaire has focused on three key areas:

1. **Consumer Engagement:** Questions measuring perceived differences in consumer engagement in AI-driven versus traditional marketing.
2. **Cost Efficiency:** Questions focusing on cost efficiency in implementing sustainable marketing practices through AI-driven and traditional methods.
3. **Digital KYC Data Security:** Questions evaluating the security of customer data in Digital KYC processes using traditional and AI-driven marketing.

Data Analysis:

Both descriptive and inferential statistical techniques have been used to examine the gathered data.

1. **Descriptive Analysis:** To summarise the promotional managers' viewpoints, the mean and SD have been computed for each of the important variables (customer engagement, cost efficiency, and digital KYC data security). An outline of how each marketing strategy is seen has been given.

2. **Analysis by Inference:**

- o The mean values of the replies for conventional and AI-driven promotion in each of the three crucial areas—consumer engagement, cost effectiveness, and digital KYC data security—have been compared using a T-test. Finding out whether the two methods vary statistically significantly has been made easier with the use of the t-test.
- o The null hypotheses for each variable have been accepted or rejected based on the t-test findings, with the significance threshold set at $p < 0.05$.

Limitations:

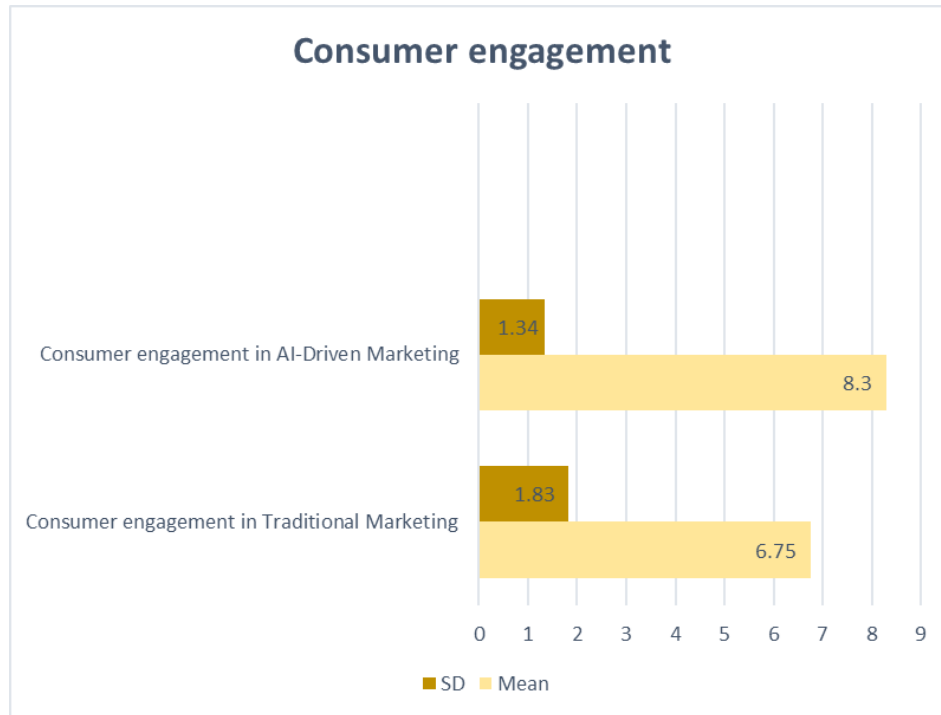
- The study has been limited to the opinions of marketing managers from only 20 FMCG companies, which may not fully represent the broader FMCG sector.
- The data collected is subjective and based on opinions, which could lead to biases.
- As a qualitative study, the findings are not generalizable across all FMCG companies or industries.
- The reliance on a Likert scale means that the nuances of individual perceptions might not be fully captured.

6. Research Hypothesis

- In FMCG sustainable campaigns, conventional marketing and AI-driven marketing do not significantly vary in terms of consumer engagement or the effectiveness of client identification and onboarding.
- The cost-effectiveness of sustainable marketing efforts for FMCG products is not significantly different between conventional and AI-driven marketing.
- Traditional marketing strategies and AI-driven promotion for FMCG initiatives that are sustainable do not significantly vary in terms of data protection during digital KYC procedures.

7. Data Analysis& Interpretation

Consumer Engagement



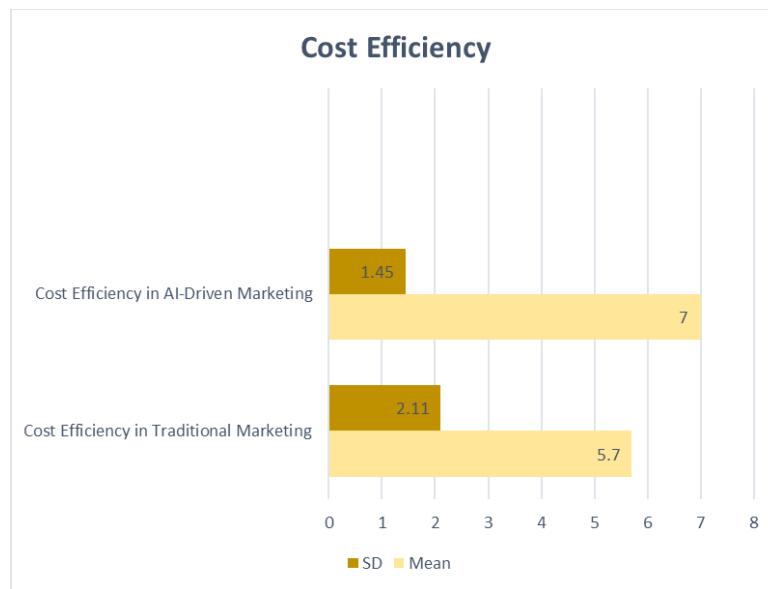
t-Test: Two-Sample Assuming Unequal Variances

	Consumer engagement in Traditional Marketing	Consumer engagement in AI-Driven Marketing
Mean	6.75	8.3
Variance	3.355263158	1.8
Observations	20	20
Hypothesized Mean Difference	0	
df	35	
t Stat	-3.05296114	
P(T<=t) one-tail	0.002154655	
t Critical one-tail	1.689572458	
P(T<=t) two-tail	0.004309311	
t Critical two-tail	2.030107928	

This conclusion is further supported by the mean and SD figures. AI-driven marketing has an average client involvement of 8.3, which is noticeably higher than the mean for traditional marketing, which is 6.75. This indicates

that, on average, AI-driven marketing is more effective at engaging consumers. Additionally, the standard deviation for AI-driven marketing is 1.34, which is lower than the standard deviation for traditional marketing (1.83). This suggests that consumer engagement with AI-driven marketing is not only higher but also more consistent, with less variability in how consumers respond compared to traditional marketing. Therefore, the data strongly supports the hypothesis that AI-driven marketing results in higher and more stable consumer engagement in FMCG sustainable campaigns.

Cost Efficiency

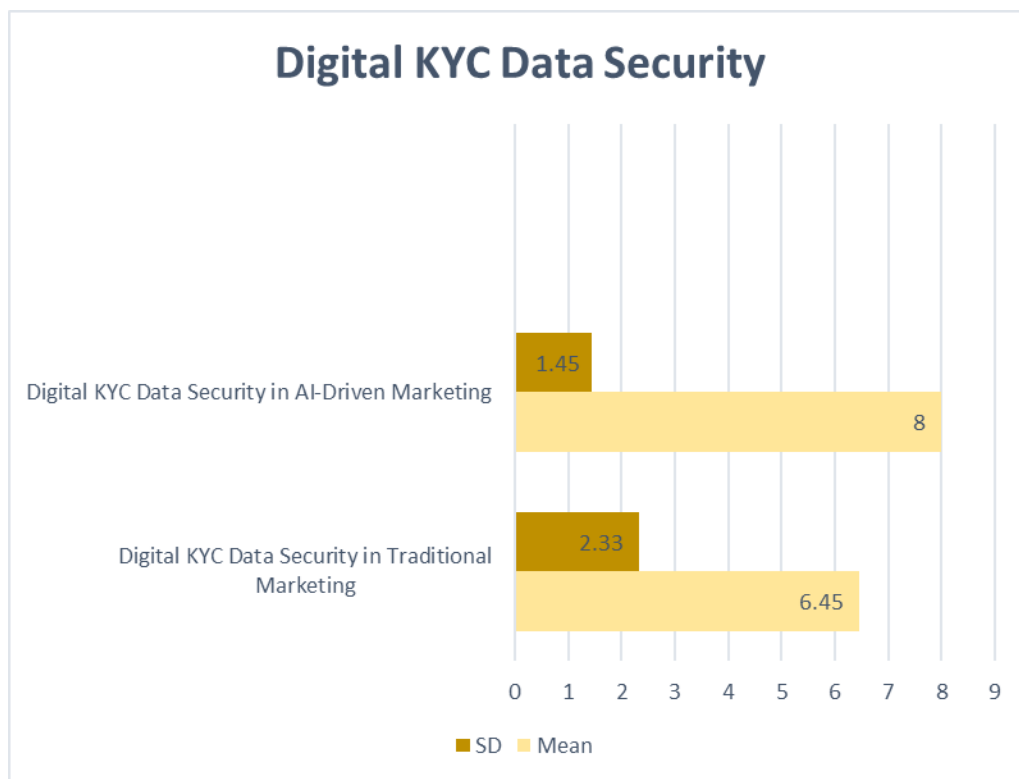


t-Test: Two-Sample Assuming Unequal Variances

	Cost Efficiency in Traditional Marketing Awareness	Cost Efficiency in AI-Driven Marketing
Mean	5.7	7
Variance	4.431578947	2.105263158
Observations	20	20
Hypothesized Mean Difference	0	
df	34	
t Stat	-2.273915661	
P(T<=t) one-tail	0.014701169	
t Critical one-tail	1.690924255	
P(T<=t) two-tail	0.029402338	
t Critical two-tail	2.032244509	

The two-tailed crucial t-statistic value is -2.27, with a corresponding p-value of 0.02, which is significant at the 5% level of significance ($p < 0.05$), according to the findings of the hypothesis test. This enables us to reject the null hypothesis (H_0) and draw the conclusion that conventional marketing and AI-driven marketing in sustainable FMCG campaigns vary significantly in terms of cost effectiveness. In particular, the findings corroborate the alternative hypothesis (H_1), which contends that AI-driven marketing is much less expensive than conventional marketing. This conclusion is further supported by the mean and SD values. AI-driven marketing has a mean cost efficiency of 7, which is greater than conventional marketing's mean of 5.7. This suggests that AI-driven marketing is often thought to provide more cost-effective sustained campaigns. Furthermore, compared to conventional marketing, which has a SD of 2.11, AI-driven marketing, has a standard deviation of 1.45. This implies that, in comparison to conventional marketing, AI-driven marketing not only has more cost efficiency but also exhibits better consistency in its cost-saving advantages with less variability in results.

Digital KYC Data Security



t-Test: Two-Sample Assuming Unequal Variances

	<i>Digital KYC Data Security in Traditional Marketing</i>	<i>Digital KYC Data Security in AI- Driven Marketing</i>
Mean	6.45	8
Variance	5.418421053	2.105263158
Observations	20	20
Hypothesized Mean Difference	0	
df	32	
t Stat	-2.527152306	
P(T<=t) one-tail	0.008319051	
t Critical one-tail	1.693888748	
P(T<=t) two-tail	0.016638101	
t Critical two-tail	2.036933343	

The above table suggests that AI-driven marketing strategies provide better Digital KYC Data Security compared to traditional marketing methods, and the lower standard deviation in AI-Driven Marketing implies more consistency and reliability in securing KYC data across different cases, as compared to the greater variability in Traditional Marketing.

8. Conclusion

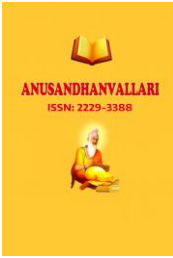
The results of the analysis across consumer engagement, cost efficiency, and Digital KYC data security indicate that AI-driven marketing significantly outperforms traditional marketing in FMCG sustainable campaigns. AI-driven marketing leads to higher and more consistent consumer engagement, with improved cost efficiency and better Digital KYC data security. In each case, the statistical tests provide strong evidence to reject the null hypotheses, showing that AI-driven approaches offer enhanced effectiveness and reliability compared to traditional methods. These findings suggest that adopting AI-driven marketing strategies can provide FMCG companies with both operational benefits and improved consumer interactions, making AI a valuable tool for driving sustainability in the sector.

9. Recommendations

Given that AI-driven marketing significantly improves consumer engagement, FMCG companies should prioritize the adoption of AI technologies such as personalized content delivery, chatbots, and machine learning algorithms to enhance customer interaction and build long-term relationships. These tools will ensure more consistent and targeted engagement across various consumer segments.

FMCG brands should consider increasing their use of AI to optimize resource allocation, streamline marketing processes, and reduce operational costs in sustainable campaigns. Predictive analytics can further aid in reducing marketing waste and improving ROI.

As AI-driven marketing has proven to provide better Digital KYC data security, FMCG companies should integrate AI-powered KYC systems to enhance customer onboarding processes while ensuring data protection and fulfilment.



with privacy regulations. The steadiness and dependability of AI in securing sensitive customer data will help build consumer trust.

Expand AI-Driven Global Marketing Efforts: Since AI can enhance global customer reach by analyzing diverse markets and tailoring campaigns to different regions, FMCG companies should expand their global marketing efforts using AI. This will allow them to effectively tap into emerging markets and cater to the needs of diverse consumer bases with localized, sustainable marketing strategies.

Monitor Environmental Impact Through AI: To further enhance sustainability, FMCG companies should utilize AI to monitor and optimize energy consumption and other environmental impacts of their marketing activities. AI can help track sustainability metrics, ensuring campaigns are not only effective but also environmentally responsible.

By implementing these recommendations, FMCG companies can strengthen their market positioning while simultaneously advancing their sustainability objectives.

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