

Role of Neuromarketing and Artificial Intelligence in Futuristic Marketing Approach: An Empirical Study

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Abstract

Neuromarketing and Artificial Intelligence (AI) will be very important in the future of marketing for knowing how people behave and creating personalized experiences. Neuromarketing uses methods from neuroscience to look into people's subconscious minds and figure out what they like and how they make decisions. Neuromarketing is a field that studies how people think about and respond to marketing by looking at things like brain activity, eye movements, and biometric reactions. On the other hand, AI changes marketing by making it possible for predictive analytics, personalised suggestions, and automatic tasks. Machine learning algorithms can look at huge amounts of data to guess how people will act, make marketing strategies more effective, and send personalised material to each person in real time. Chatbots and virtual assistants that are driven by AI make interactions with customers better by giving them instant help and personalised suggestions. Neuromarketing insights and AI capabilities work together to help marketers make campaigns that are both highly targeted and emotionally powerful, which successfully engages customers on a deeper level. Study survey was conducted among 269 people from the marketing department to know the factors that determine different roles of Neuromarketing and Artificial Intelligence in Futuristic Marketing Approach and found that Understanding Behavior, Personalization and targeting, User Experience Enhancement and Ethical Considerations are the factors that determine different roles of Neuromarketing and Artificial Intelligence in Futuristic Marketing Approach.

Keywords: Neuromarketing, Artificial Intelligence (AI), Predictive analytics, Personalised experiences, Machine learning algorithms, Chatbots, Emotional engagement.

Introduction

Artificial Intelligence (AI) and Neuromarketing are two major players in the marketing industry that are positioned to influence how consumers engage with brands in the future. These dynamic domains give marketers unprecedented insights

and capabilities to analyse and affect customer behaviour because they reflect the fusion of behavioural science with state-of-the-art technology. When combined, Neuromarketing and artificial intelligence (AI) offer a futuristic marketing strategy where science and technology meet to produce meaningful, tailored encounters that deeply connect with customers. Scholarly endeavours have revealed a remarkable evolution of neuromarketing and artificial intelligence (AI) in India's marketing scene. Srivastava and Bag (2024) concentrated on combining Neuromarketing concepts with "face recognition" technology. They shed light on how these approaches transformed marketing tactics by offering hitherto unseen insights into customer behaviour. Through the use of AI algorithms, marketers were able to decipher these data and customise advertisements so that they would have a deeper impact on Indian audiences. This integration made it easier to understand customer preferences in more detail, which improved the efficacy of marketing campaigns in a variety of industries.

In the Indian context, Sharma et al. (2023) assessed the potentials, difficulties, and unique applications of neuromarketing. They showed the complex relationship between consumer psychology and technology progress by integrating AI technologies. This enabled the creation of precisely calibrated promotional tactics that were sensitive to the complex inclinations and actions of Indian customers. The companies might raise customer engagement and promote long-term success in the cutthroat world of online retail. According to Kumar et al. (2020), artificial intelligence (AI) is essential for managing these complexity and serving as a beacon of guidance for marketers in the always changing world of consumer preferences and behaviours. Marketers were given strong tools to identify patterns, forecast trends, and customise marketing campaigns for the wide range of Indian consumers by utilising the potential of AI-driven technologies. This revolutionary change prepared the way for more meaningful and effective marketing initiatives that would build long-lasting brand loyalty and stronger ties with customers.

The growing on-demand app economy in India and neuromarketing principles have the potential to work together, as assessed by Panwar and Khan (2020). In this fast growing industry, marketers can seize never-before-seen opportunities to comprehend and impact consumer behaviour by utilising AI-driven algorithms in conjunction with "Neuromarketing" tactics. With the aid of artificial intelligence, marketers can now examine enormous amounts of data produced by on-demand apps, which gives them the capacity to identify complex trends and make remarkably accurate predictions about customer preferences. This enables marketers to provide individualised experiences that strongly connect with Indian consumers by dynamically tailoring their strategies. Furthermore, AI-powered chatbots and virtual assistants improve client interactions by offering prompt assistance and suggestions, which promotes higher levels of engagement and happiness. The combination of AI and neuromarketing improves marketing campaigns' efficacy and efficiency while also helping companies more precisely negotiate the intricacies of the Indian market. Marketers may create strategies that truly connect with a wide range of audiences throughout India's diverse environment and break down cultural barriers by comprehending the subconscious motives of consumers and utilising AI-driven insights. This all-encompassing approach to marketing has the potential to strengthen bonds between companies and customers, spurring innovation and success in India's dynamic and quickly changing market landscape.

Literature Review

The combination of "Neuromarketing" and "Artificial Intelligence" (AI) has become a powerful force in the ever-changing field of Indian marketing. Oberoi et al. (2024) examined the present trends in "Neuromarketing" and emphasised its importance and potential in influencing marketing tactics, especially in the digital age. Neuromarketing provides marketers with insights into the subconscious motives and decision-making processes of Indian customers in the digital age. This enables them to create focused and effective campaigns that resonate with their target audience.

Kajla et al. (2024) examined the correlation between "Neuromarketing" and customer behaviour. They emphasise the crucial significance of "Neuromarketing" in uncovering the unconscious motivators behind customer choices, offering marketers priceless knowledge to guide strategic decision-making. Through the integration of AI technologies, marketers may utilise extensive data to accurately forecast customer behaviour patterns, resulting in improved marketing campaign effectiveness and stronger consumer relationships. In addition, Gupta et al. (2023) assessed the utilisation of "Neuromarketing" to forecast voting patterns, with a specific emphasis on India's national elections. Their emphasis was on the capacity of "Neuromarketing" tools to comprehend intricate decision-making processes, such as political choices. Through the utilisation of AI algorithms to examine neuroscientific data, marketers can acquire a more profound

comprehension of voter preferences and attitudes, hence allowing them to customise political ads with more effectiveness. The fusion of "Neuromarketing" and AI not only improves political marketing methods but also demonstrates the wider usefulness of these methodologies in several fields.

Bhardwaj et al. (2023) focused on "Neuromarketing" to explore its potential for innovation and advancement, pushing its boundaries through methodical examination. Their findings highlight the necessity of ongoing investigation and improvement of "Neuromarketing" methods to reveal fresh understandings of customer behaviour. Through the utilisation of AI-powered technology, marketers have the opportunity to improve the accuracy and expand the reach of "Neuromarketing" methods, thus enabling the development of more advanced and influential marketing campaigns. The combination of "Neuromarketing" with AI represents a positive future for marketing. This integration brings together data-driven insights and advanced technology to enhance customer engagement, loyalty, and corporate success in a highly competitive environment.

Shah and Shukla (2022) showed the profound powers of AI, highlighting its capacity to enhance human intelligence and bring about a revolution in marketing strategies. Artificial intelligence algorithms enable marketers to analyse large databases, forecast customer preferences, and customise marketing strategies with exceptional accuracy. This technology expertise allows marketers to effectively negotiate the intricacies of the Indian market, adjusting plans in real-time to match the changing wants of consumers. By utilising artificial intelligence (AI), marketers are able to optimise client interaction and stimulate business expansion through the delivery of personalised experiences that strongly resonate with the diverse Indian consumer base. Dwivedi et al. (2024) examined the impact of "Neuromarketing" on the growth of businesses in the digital age, highlighting its importance in comprehending and exploiting consumer behaviour patterns. They emphasise the necessity for firms to adopt "Neuromarketing" tactics in utilising digital platforms to improve consumer engagement and brand positioning. Marketers utilise AI technologies to analyse "Neuromarketing" research and create emotionally impactful campaigns that are customised to the specific tastes of Indian consumers.

Gill and Singh (2021) examined the convergence of machine learning and neuroscience via the lens of "Neuromarketing." They highlighted the capacity of sophisticated analytical methods to decipher consumer behaviour. Through the utilisation of machine learning algorithms, marketers are able to examine neuroscientific data with exceptional accuracy, revealing hidden insights that inform specific marketing tactics. The integration of "Neuromarketing" with AI enables marketers to predict customer preferences and customise experiences to strongly resonate with specific consumers. This enhances engagement and drives business success in a highly competitive industry. In addition, Dangwal et al. (2023) showed the progression from the field of "Neuromarketing" as a scientific discipline to its use in commercial settings. They emphasised the rise of start-up companies that are utilising the ideas of "Neuromarketing". This highlights the tangible uses of "Neuromarketing" in influencing company strategies and promoting innovation. By utilising artificial intelligence (AI) technologies, these start-ups can expand their operations and provide customised experiences to consumers, thus obtaining a competitive advantage in the market. This innovative approach to "Neuromarketing" showcases the capacity of AI-powered solutions to transform marketing processes, opening up new avenues for customer interaction and brand development in the digital era.

Srivastava and Sharma (2024) showed the progression of "Neuromarketing" research, emphasising significant patterns and developing focal points. By integrating AI-driven techniques into "Neuromarketing" study, academics can augment the comprehensiveness and profundity of discoveries derived from neuroscientific data, stimulating innovation and progressing our comprehension of consumer behaviour. The collaboration between "Neuromarketing" and AI enhances academic discussions and provides valuable insights for actual marketing applications, influencing the development of future marketing strategies.

Tirandazi et al. (2023) highlighted the interdependence between digital ecosystems and the research of consumer behaviour, showing how the Internet of Everything (IoE) enables the merging of AI-powered analytics with insights from "Neuromarketing". Through the utilisation of IoE technology, marketers may obtain unparalleled access to immediate data streams from various digital touchpoints. This empowers them to create customised experiences and focused messaging that deeply resonate with individual consumers. In addition, Misra (2023) explored the field of "Neuromarketing" to get

insights into consumer behaviour, revealing the underlying factors that impact buying choices at a subconscious level. By comprehending intricate neurological reactions and emotional stimuli, marketers may customise their tactics to elicit desired consumer reactions with great effectiveness. By incorporating artificial intelligence (AI) into "Neuromarketing" approaches, marketers can utilise machine learning algorithms to examine extensive datasets and derive practical insights. This AI-driven methodology allows marketers to forecast customer preferences, enhance campaign effectiveness, and provide highly tailored experiences across several digital channels. By leveraging the synergistic potential of "Neuromarketing" and AI, marketers may effectively negotiate the intricate dynamics of the contemporary marketplace with flexibility and accuracy, establishing stronger bonds with consumers and fostering sustainable business expansion in the digital age.

Objective

To know the factors that determine different roles of Neuromarketing and Artificial Intelligence in Futuristic Marketing Approach.

Methodology

Study survey was conducted among 269 people from the marketing department to know the factors that determine different roles of Neuromarketing and Artificial Intelligence in Futuristic Marketing Approach. "Random sampling method" and "Factor Analysis" were used to collect and analyze the data.

Findings

Table below is sharing respondent's general details. Total 269 people were surveyed in which male are 60.6% and 39.4% are female. Among them 30.5% are below 38 years of age, 41.6% are between 38-40 years of age and rest 27.9% are above 40 years of age. 18.9% are working as marketing specialist, 25.6% marketing manager, 27.1% are marketing and promotions manager, 22.7%, 22.7% are marketing analyst and rest 5.6% are working on other positions in marketing department.

Table 1 General Details

Variables	Respondents	Percentage
Gender		
Male	163	60.6
Female	106	39.4
Total	269	100
Age (years)		
Below 38	82	30.5
38-40	112	41.6
Above 40	75	27.9
Total	269	100
Designation		
Marketing specialist	51	18.9
Marketing manager	69	25.6
Marketing and promotions manager	73	27.1
Marketing analyst	61	22.7
Others	15	5.6
Total	269	100

Table 2 "KMO and Bartlett's Test"

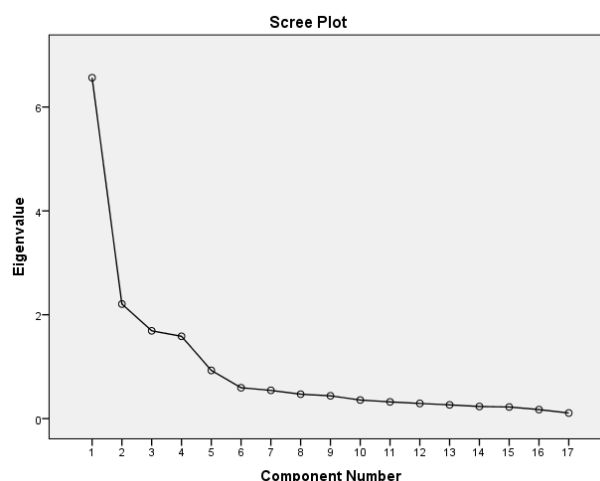
"Kaiser-Meyer-Olkin Measure of Sampling Adequacy"		.849
"Bartlett's Test of Sphericity"	Approx. Chi-Square	2816.381
	df	136
	Sig.	.000

In the table above KMO value is 0.849 and the “Barlett’s Test of Sphericity” is significant.

“Table 3 Total Variance Explained”

“Component”	“Initial Eigen values”			“Rotation Sums of Squared Loadings”		
	“Total”	“% of Variance”	“Cumulative %”	“Total”	“% of Variance”	“Cumulative %”
1	6.565	38.619	38.619	3.824	22.495	22.495
2	2.206	12.979	51.598	3.212	18.894	41.388
3	1.691	9.947	61.545	2.773	16.313	57.701
4	1.586	9.327	70.871	2.239	13.170	70.871
5	.928	5.460	76.331			
6	.595	3.498	79.829			
7	.544	3.198	83.026			
8	.470	2.767	85.793			
9	.439	2.582	88.375			
10	.358	2.105	90.480			
11	.322	1.897	92.377			
12	.292	1.719	94.096			
13	.265	1.558	95.654			
14	.233	1.373	97.027			
15	.224	1.316	98.343			
16	.174	1.024	99.367			
17	.108	.633	100.000			

The “principal component analysis” method was applied to extract the factors and it was found that 17 variables form 4 Factors. The factors explained the variance of 22.495%, 18.894%, 16.313% and 13.170% respectively. The total variance explained is 70.871%.



The graph above depicts the Eigen values generated from the "Total Variance Explained table" for an elbow with 4 components.

“Table 4 Rotated Component Matrix”

“S. No.”	“Statements”	“Factor Loading”	“Factor Reliability”
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	Understanding Behavior		.921
1	Neuromarketing investigates deep into the subconscious drivers of human behavior	.851	
2	Help to know how consumer perceptions and purchasing decisions is influenced	.843	
3	Provides insights into the underlying psychological mechanisms driving consumer behavior	.840	
4	AI analyze vast amounts of data generated by consumer interactions, transactions, and online behaviors	.837	
5	AI identify patterns, correlations, and trends in consumer data	.826	
	Personalization and targeting		.895
6	AI excels in personalizing marketing messages	.880	
7	Neuromarketing identify specific triggers and stimuli that resonate with individual consumers	.851	
8	Helps in crafting personalized campaigns	.843	
9	Predict individual preferences and recommend products	.751	
	User Experience Enhancement		.858
10	Provide personalized assistance and content recommendations	.866	
11	Optimize user interfaces and experiences to provoke desired emotional responses and engagement	.827	
12	AI enhance user experience by personalizing interactions	.782	
13	Improving customer service and support through personalized assistance in real-time	.668	
	Ethical Considerations		.727
14	Neuromarketing raises ethical concerns related to privacy and manipulation	.779	
15	AI raises concerns about ethical use of consumer data	.713	
16	Ethical concerns of potential manipulation of consumers' subconscious desires and decision-making processes	.704	
17	Concern of influencing consumer behavior without their clear consent or awareness	.649	

Table 4 is showing different roles of Neuromarketing and Artificial Intelligence in Futuristic Marketing Approach. Understanding Behavior is factor one which includes the variables like Neuromarketing investigates deep into the subconscious drivers of human behavior, help to know how consumer perceptions and purchasing decisions is influenced, provides insights into the underlying psychological mechanisms driving consumer behavior, AI analyze vast amounts of data generated by consumer interactions, transactions, and online behaviors and AI identify patterns, correlations, and trends in consumer data. Second factor namely Personalization and targeting is associated with the variables like AI excels in personalizing marketing messages, Neuromarketing identify specific triggers and stimuli that resonate with individual consumers, helps in crafting personalized campaigns and predict individual preferences and recommend products. Third factor is User Experience Enhancement which consist of variables like Provide personalized assistance and content recommendations, optimize user interfaces and experiences to provoke desired emotional responses and engagement, AI enhance user experience by personalizing interactions and Improving customer service and support through personalized assistance in real-time. Fourth factor is Ethical Considerations and its associated variables are Neuromarketing raises ethical concerns related to privacy and manipulation, AI raises concerns about ethical use of consumer data, Ethical concerns of potential manipulation of consumers' subconscious desires and decision-making processes and Concern of influencing consumer behavior without their clear consent or awareness.

“Table 5 Reliability Statistics”

“Cronbach's Alpha”	“No of Items”
.897	17

The reliability for 4 constructs with total of seventeen elements is 0.897.

Conclusion

To sum up, the combination of neuromarketing and artificial intelligence (AI) has the potential to completely transform the marketing industry. By probing into the subconscious, neuromarketing provides marketers with crucial information to properly customise their strategies and delivers insights into customer behaviour and preferences. Marketers can process enormous volumes of data in real-time and identify previously undiscovered patterns and trends by utilising AI. Marketers can create hyper-personalized experiences for customers with this synergistic strategy, increasing engagement and boosting conversion rates. Companies can remain ahead of the curve in a market that is changing quickly thanks to AI-powered algorithms that can analyse customer moods, predict purchasing behaviour, and even foresee future trends. Additionally, marketing procedures are streamlined by AI-driven automation, giving marketers more time to concentrate on strategy creation and innovation. Additionally, the fusion of AI and neuromarketing encourages morality in marketing strategies. Marketers can create ads that connect with audiences while upholding their privacy and autonomy by having a greater understanding of consumer psychology. Furthermore, AI algorithms can lessen prejudices in decision-making, advancing equity and inclusivity in marketing initiatives. But there are difficulties and moral considerations to take into account, just like with any new technology. To be credible and trustworthy in the market, it is critical to protect customer data and provide transparency in AI algorithms. Furthermore, in order to guarantee that neuromarketing strategies are used properly and ethically, rules governing their application must be developed. As technology develops, marketers need to use these tools wisely, maximising their potential to achieve desired results while maintaining moral principles and customer confidence.

The study was conducted to know the factors that determine different roles of Neuromarketing and Artificial Intelligence in Futuristic Marketing Approach and found that Understanding Behavior, Personalization and targeting, User Experience Enhancement and Ethical Considerations are the factors that determine different roles of Neuromarketing and Artificial Intelligence in Futuristic Marketing Approach.

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