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NEUROMARKETING AS A TOOL FOR MANAGING CONSUMER BEHAVIOR IN THE DIGITAL AGE

This paper explores the role of neuromarketing as a breakthrough tool in the development of marketing strategies for the next generation. Using neuroimaging and Emotion AI data, it analyses the hidden emotional reactions of consumers that traditional methods fail to capture. Particular attention is paid to the impact of neurotechnologies on creating a personalised user experience in the digital space, especially on social media, where marketing decisions must consider less obvious behavioural patterns. The paper argues that neuromarketing is a new philosophy for working with clients in a hyperconnected world, not just an analytical tool.

Keywords: neuromarketing, behaviour, consumers, marketing decisions, emotional intelligence, neurotechnologies, user experience, personalisation, communication.

Traditional marketing methods do not adequately reveal consumers' unconscious motives and emotions. Neuromarketing uses neuroscience, psychology and marketing to analyse subconscious reactions, helping to increase the effectiveness of marketing strategies. Using neurotechnologies in the marketing decision-making process enables businesses to adapt their communications more effectively and create products and services that best meet customer needs and expectations.

Significant contributions to the development of the topic have been made by researchers such as: Pashchuk L. [3], Karpenko L.F. [4], Kuzminchuk N. [5]. Their work considers the modern possibilities of using neuromarketing to manage consumer behaviour and improve brand efficiency.

The purpose of this article is to demonstrate the feasibility of using neuromarketing tools to enhance the effectiveness of marketing decisions by fostering a deeper understanding of consumer behaviour.

Neurotechnologies in marketing are based on applying neuroscientific knowledge and methods to gain a deeper understanding of consumer behaviour, particularly their unconscious reactions to advertising stimuli. This allows effective promotional strategies to be created that affect all channels of information perception: sight, hearing, touch, taste and smell. Results from neuroimaging studies of consumers' emotional responses to brands demonstrate the significant impact of emotional appeals on consumer behaviour and brand perception. When making a purchase decision, consumers are guided by feelings as well as rational analysis, as confirmed by neuroeconomics research.

Neuromarketing can be divided into two categories: fundamental (theoretical hypotheses) and instrumental (practical research into brain reactions) [1, 2].

Fundamental approach: Theoretical models of behaviour (low cost).

- Instrumental approach: Practical research using EEG, eye tracking and biometrics (high accuracy but expensive).

The two approaches differ significantly in terms of the depth of technology involved, the cost of implementation and the type of interaction with respondents: the fundamental approach is less expensive and focuses on conceptualisation, while the instrumental approach focuses on high-precision measurements and practical hypothesis validation.

Combining fundamental and instrumental approaches is key to the successful development of neuromarketing as a separate discipline. Combining them allows us to achieve both high scientific validity and the practical effectiveness of marketing strategies.

The main areas in which neurotechnology is used in marketing strategies include studying the emotional involvement of consumers, optimising advertising messages, testing packaging design and visual content, improving user experience (UX), forecasting customer behaviour and personalising marketing communications based on the psychophysiological reactions of the target audience (see Table 1).

Table 1

Main areas of neurotechnology use in marketing strategies

The direction of neuromarketing	Description	Targeted sensory impact	Expected effect	Application examples
Aroma Marketing	Use of fragrances in sales areas or products for emotional impact	(olfaction)	Raising mood, forming associations, stimulating purchases	The smell of coffee in a bookstore, the aroma of vanilla in a clothing boutique
Audio marketing	Influence of sounds and music on the customer's mood while in the retail space	(audition)	Increased time spent in the store, emotional attachment	Calm music in a restaurant, jazz in a supermarket
Psychology of color	The influence of color on the psycho-emotional perception of a product and brand	(vision)	Forming associations with the brand, stimulating impulse purchases	Red in fast food, blue in banks
Sensory marketing	Integrated use of all five senses to create a complete consumer experience	Smell, hearing, sight, touch, taste	Creating a deep emotional contact with the brand	Apple Stores, IKEA concept stores
Neuro-linguistic programming (NLP)	Techniques of influencing the consumer's subconscious through language, message structure or visual design	Cognitive information processing	Building trust, improving conversion	Advertising texts with "active" words, UX design of websites

As each approach is based on the principles of neuroscience and consumer behaviour psychology, combining them effectively can significantly improve sales, brand awareness and customer loyalty. Using neurotechnologies to develop promotional strategies enables us to create more personalised, emotionally charged advertising campaigns that influence consumers' subconscious minds and shape their attitudes and behavioural norms.

Neurotechnologies play a pivotal role in shaping the user experience on social media by enabling a deeper understanding of users' psychology and

behavioural patterns. Using neuromarketing algorithms, platforms analyse reactions to content, identify emotional triggers and optimise the presentation of information according to the audience's cognitive characteristics. These approaches help increase engagement, attention retention and the stimulation of desired actions, such as clicking on a link, participating in a discussion or making a purchase. Specialised neurotechnologies are widely used on social media to analyse and influence user behaviour.

Digital aspect:

Social media: Emotion AI uses webcams to analyse facial expressions and optimise content.

- Personalisation: Algorithms take the user's emotional state into account.

- VR/AR: Immersive advertising experiences.

Using emotional analysis to improve interaction between humans and machines, as well as monitoring users' psycho-emotional state using Emotion AI, enables more sensitive, personalised and adaptive interaction, taking into account users' unspoken behavioural cues and emotional reactions. This opens up new opportunities for the timely detection of stress, anxiety or dissatisfaction, the optimisation of digital services, increased trust in technology and the creation of a more comfortable environment in education, healthcare, services and marketing. Neuromarketing transforms marketing decisions from intuitive to scientifically based by using unconscious consumer reactions to increase efficiency. Therefore, incorporating neurotechnologies into marketing strategies is not only innovative, but also a strategic necessity for companies seeking to compete effectively in the digital age.

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