

НАПРЯМ 7. МАРКЕТИНГ

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DOI: <https://doi.org/10.36059/978-966-397-579-5-33>

NEUROSIGNAL RECORDING TOOLS IN NEUROMARKETING AND THEIR IMPACT ON THE FORMATION OF MARKETING STRATEGIES

Neurotechnology enables the precise analysis of consumers' psychophysiological responses to advertising materials, providing valuable insights into the emotions they evoke and facilitating the adaptation of marketing strategies. Additionally, it enables content personalisation by collecting data on individual preferences and consumer responses, thereby increasing target audience engagement and company competitiveness. Neuromarketing can increase the effectiveness of advertising campaigns by determining which materials attract the most attention and emotional response, thereby contributing to increased sales. The recording of neural signals is considered a key element of neuromarketing research in modern scientific literature, as it allows for the objective measurement of consumers' emotional responses, attention levels and cognitive load. Unlike traditional surveys and focus groups, these methods reduce the influence of conscious distortions and socially desirable responses. Several approaches to classifying neurosignal recording tools have emerged in scientific discourse, based on the classification criteria shown in Fig. 1.

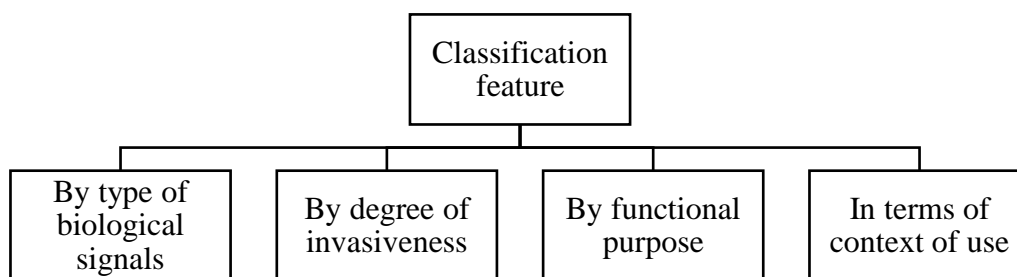


Fig. 1. Classification of neurosignal recording tools in neuromarketing

Source: Compiled by the author based on analyses [1–2]

One of the most common approaches involves categorising neurosignal recording instruments according to the type of biological signals they detect [3]:

- electrical brain activity: electroencephalography (EEG) allows changes in the electrical potentials of the cerebral cortex to be recorded with high temporal resolution. This method is widely used in marketing research to study attention levels, emotional engagement and memory of advertising stimuli;
- haemodynamic activity: functional magnetic resonance imaging (fMRI) allows changes in blood flow in the brain to be measured as an indicator of neural activity. fMRI provides the highest spatial resolution, but is characterised by high cost and low temporal sensitivity;
- peripheral physiological signals: galvanic skin response (GSR), which records changes in skin conductivity under the influence of emotional arousal; heart rate; heart rate variability; electromyography. These methods help assess stress levels and emotional responses;
- eye tracking: this tool tracks eye movements and gaze fixation time. This tool is particularly effective for analysing visual attention to advertising materials;
- a direct neurocomputer interface – BCI (Brain-Computer Interface), which reads neural signals (most often based on EEG) and provides real-time feedback for controlling devices. In marketing, such systems are used for personalised content and adaptive advertising experiments.

According to Blankertz B. [4], neurosignal recording instruments are classified into the following groups based on their degree of invasiveness:

- non-invasive neural methods (EEG, fMRI, MEG, eye tracking and GSR) – these do not penetrate the body and are therefore safe for commercial use;

- although invasive methods (such as implanted electrodes for clinical research) are extremely accurate, they are limited by ethical and medical requirements and are therefore rarely used in marketing practice.

Based on their functional purpose, tools can be categorised as follows:

- Diagnostic: assess the level of emotional arousal (e.g. GSR and heart rate variability).

- Cognitive-analytical: determine the involvement of brain structures (e.g. EEG and fMRI) to study decision-making processes.

- Behavioural: record reactions that reflect the direction of attention (e.g. eye tracking).

- Interactive: provide feedback for personalised marketing decisions (e.g. BCI).

Neurotechnology is becoming a key factor in transforming product promotion strategies on social media. Using EEG, fMRI, GSR, eye tracking and BCI neuromarketing tools enables us to capture not only conscious, but also subconscious consumer reactions. This allows us to gain a deeper understanding of the motivations and emotions that determine audience behaviour in the digital environment, going beyond traditional analysis methods. Neurotechnologies provide a new level of accuracy in assessing the effectiveness of advertising messages by enabling the analysis of emotional responses, attention levels and content memorability. Integrating them into marketing strategies optimises creatives and enables the creation of personalised messages, increasing consumer loyalty and providing a competitive advantage in a globalised market.

References:

1. Khondakar M. F. K., Gupta R., Lee J. A systematic review on EEG-based neuromarketing. *Brain Informatics*. 2024. Vol. 11 (1). P. 1–25. DOI: <https://doi.org/10.1186/s40708-024-00245-6>.
2. Gupta R., Sharma S., Khondakar M. F. K. Neuro-insights: a systematic review of neuromarketing. *Frontiers in Neuroergonomics*. 2025. Vol. 3. P. 1–19. DOI: <https://doi.org/10.3389/fnrgo.2025.1234567>.
3. Haston S., van der Meer M., Vitiello M. A Horizon Scan of Neurotechnology Innovations. *International Journal of Environmental Research and Public Health*. 2025. Vol. 22 (4). P. 1–20. DOI: <https://doi.org/10.3390/ijerph22040321>.
4. Blankertz B., Lotte F., Müller K.-R. et al. The Berlin brain–computer interface: Nonmedical uses of BCI technology. *Frontiers in Neuroscience*. 2016. Vol. 10. Article 530. DOI: <https://doi.org/10.3389/fnins.2016.00530>