

CZU 339.138:004.8

<https://doi.org/10.52507/2345-1106.2026-1.33>

**NEUROMARKETING - UNDERSTANDING THE INFLUENCE OF EMOTIONS AND MEMORY ON
CONSUMER BEHAVIOR THROUGH THE MEDIATING ROLE OF ARTIFICIAL INTELLIGENCE AND
DIGITAL CUSTOMER EXPERIENCE**

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SUMMARY

Historically, companies shouted their message into a void, hoping something would stick. Today, the approach has shifted toward a more intuitive "conversation" between a brand and the human brain. By leveraging advanced data analysis, businesses have moved past guesswork; they now act as architects of Digital Experience (DX), designing virtual environments that mirror how our minds naturally process information. The process begins with Neuromarketing, which acts as the compass. It tells us that for a brand to be successful, it must first spark a positive emotional reaction and then anchor that feeling in the consumer's memory. If a digital platform is clunky or boring, the brain effectively "ignores" the data. However, when the experience is interactive and visually compelling, the consumer becomes an active participant rather than a passive observer. This engagement acts as a "mediator," turning raw digital interaction into a lasting mental impression. Of course, a beautiful website cannot save a bad product. The most successful brands understand that the digital experience is a powerful chapter, but it's still part of a larger book that includes fair pricing, high quality, and smart strategy. When all these elements align, the digital experience serves as the final, persuasive bridge. It ensures that when a customer is ready to make a choice, the memory of that brand is the most vivid, positive, and trusted option available to them.

Key words: artificial intelligence, Digital experience, Neuromarketing, Consumer behavior, Memory encoding.

NEUROMARKETING - ÎNȚELEGEREA INFLUENȚEI EMOȚIILOR ȘI A MEMORIEI ASUPRA COMPORTAMENTULUI CONSUMATORILOR PRIN ROLUL MEDIATOR AL INTELIGENȚEI ARTIFICIALE ȘI AL EXPERIENȚEI DIGITALE A CLIEȚILOR

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REZUMAT

Inteligența artificială (IA) ajută companiile să transforme volume uriașe de date în informații valoroase, analizând informațiile despre clienți pentru a le oferi soluții personalizate. Într-un studiu recent, cercetătorii au descoperit cum IA și experiența digitală (DX) influențează legătura dintre neuromarketing și comportamentul consumatorilor. Neuro-marketingul studiază modul în care impactul emoțional și codificarea memoriei influențează luarea deciziilor de cumpărare. Rezultatele au confirmat că IA și experiența digitală joacă într-adevăr un rol de mediere în relația dintre neuro-marketing și comportamentul consumatorilor. Acest studiu a arătat că o experiență digitală pozitivă provoacă emoții pozitive clienților și îi ajută să rețină mai bine informațiile. De exemplu, atunci când o companie creează vizualizări atractive, interactive și captivante, utilizatorii rămân interesați mai mult timp, iar informațiile despre brand sunt mai bine memorate. Cu toate acestea, trebuie reținut faptul că experiența digitală nu este singurul factor care influențează consumatorii. Alte elemente, cum ar fi strategia de marketing, calitatea produsului, prețurile și semnalele externe, joacă, de asemenea, un rol important. O analiză complexă a tuturor acestor factori ajută companiile să înțeleagă mai bine modul în care experiența digitală influențează conștiința consumatorului. În final, atunci când clienții văd, aud și rețin informații pozitive despre brand, acestea devin un factor cheie în luarea deciziilor privind achizițiile viitoare.

Cuvinte-cheie: Inteligența artificială, Experiența digitală, Neuromarketing, Comportamentul consumatorului, Codificarea memoriei.

Introduction. Neuromarketing is an innovative approach to marketing those studies how the brain responds to advertising and other marketing stimuli. The term was coined in 2002 by Ale Smidts, but the foundations were laid back in the 1990s. One of the pioneers was Gerald Zaltman, who developed the ZMET method to identify consumers' hidden thoughts and feelings. Companies spend more than 400 billion USD on advertising every year. However, traditional methods are often ineffective because they are based on the words of consumers themselves, who cannot always accurately explain their decisions [1, 2]. Neuromarketing allows us to directly study the brain's response and obtain more accurate data.

This approach has become particularly relevant in the digital age, especially during and after the COVID-19 pandemic. Modern technologies such as artificial intelligence, blockchain, and the Internet of Things make neuromarketing an even more powerful tool. The neuromarketing market is growing rapidly. In 2023, its volume amounted to 3.32 billion USD, and by 2032, it is projected to reach 6.57 billion USD. The growth of 8.9% per year speaks for itself. Large companies such as PepsiCo, eBay, Daimler, and Frito-Lay are already actively using neuromarketing in their work, confirming its practical value and growing influence in the marketing industry [3].

Neuromarketing is a field at the intersection of marketing, artificial intelligence, and digital experience. Its main goal is to predict consumer behavior. New technologies raise new questions, primarily about data

protection and ethics, especially in light of regulations such as the European GDPR.

To understand how the brain responds to advertising, specialists use various tools:

Electroencephalography (EEG): This measures brain activity in real time, allowing us to see which areas of the brain are activated in response to marketing stimuli.

Eye tracking: This technology records where a person is looking and helps assess their attention and engagement.

By combining these methods, companies obtain multidimensional data on consumer responses—from attention and engagement to memory and decision-making processes.

Companies that use this comprehensive approach report significant improvements in key business metrics. A deep understanding of consumer responses to marketing stimuli helps create more effective advertising campaigns and better meet customer needs.

Neuromarketing is becoming increasingly important for companies that want to better understand their customers. Using biometric methods such as EEG, specialists can study how the brain responds to advertising, revealing hidden cognitive and emotional processes that influence choice. This is much more accurate than traditional surveys, where people are not always able to express their true feelings.

Understanding these implicit reactions helps companies create more effective marketing strategies.

Research shows that insights from neuromarketing influence:

- ✓ advertising,
- ✓ pricing,
- ✓ branding.

The ability to see the cause-and-effect relationship between marketing stimuli and brain responses allows for the development of more accurate and effective tactics.

In light of this, our research focuses on two key elements of neuromarketing: memory encoding and emotional impact. We analyze how these factors influence consumer behavior and what role artificial intelligence and digital experience play in this process.

Literature review. Essentially, neuromarketing is not just about sales, but about the desire to better understand ourselves and how we interact with the world. This discipline combines marketing with neuroscience to decipher what happens in our minds when we choose a product, transforming complex cognitive processes into meaningful stories. Imagine you are looking at a shelf of products [4]. Although you think you are choosing rationally, your eyes follow a path that neuromarketing can "read." Through eye-tracking technologies and the analysis of micro-facial expressions, researchers can see what catches your eye and what makes you smile involuntarily [5]. They notice subtle details, such as how much your pupils dilate when you are excited or how long you linger on a color. It's all based on two pillars: how strongly something moves us (emotional impact) and how well we retain that information (memory encoding) [6]. The most fascinating part takes place inside. Emotional impact is not just an abstract idea; it has roots in the limbic system, the "command center" of our feelings.

To understand this inner dialogue, tools that seem like something out of the future are used:

Mind mapping: Devices such as EEGs or fMRI scans measure brain activity, showing exactly which areas "light up" with joy or curiosity.

Body echo: Our physical reactions, such as how fast our heart beats (HRV) or that slight sweating of the palms when we are excited (galvanic skin response), are honest indicators of our feelings.

This approach humanizes data. Instead of seeing us as mere statistics, companies can now understand our sincere and hidden reactions. When an advertisement truly moves us, it doesn't just sell us a product, it creates a memory. This invisible connection, measured by heart rate and brain activity, is what transforms a simple viewing into a memorable experience.

The Facial Coding system interprets emotional responses by analyzing micro-expressions and facial movements [1, 2]. At the same time, sentiment analysis

methods use natural language processing (NLP) technologies to identify key user preferences and biases towards specific brands and products.

Memory encoding involves transforming a marketing event into a lasting impression in a person's mind. Its main principles include assessing cognitive load, neuroimaging memory centers, testing implicit memory, priming, and the influence of context [7]. One of the most significant capabilities of memory encoding is the ability to assess the cognitive load that people experience when perceiving marketing content. This ability makes it possible to extract an individual's perceptions of the information processing process. In addition, it paves the way for understanding the mechanisms of information encoding by the brain.

Results and discussions. Functional magnetic resonance imaging (fMRI) is a key technique for tracking activity in brain areas associated with memory [8]. In particular, the hippocampus is often activated when perceiving advertising materials.

When it comes to testing implicit memory, neuromarketing uses tools such as the Implicit Association Test (IAT). This tool effectively assesses the quality and consistency of memory encoding processes. At the same time, understanding is achieved without the need for explicit recall, as the method works by assessing unconscious associations [9].

There are many studies devoted to the influence of contextual factors and priming on the memory encoding process in marketing. A number of sources indicate that elements such as musical accompaniment and visual appeal have a significant impact on the quality of memory encoding during advertising campaigns.

The emergence and continuous improvement of artificial intelligence are gradually becoming a hallmark of best practices in e-commerce in the modern business environment. Key areas of application include social networks and product recommendation systems.

Social networks are considered one of the main sources of customer information and have become promising targets for AI modeling with the aim of influencing consumer behavior. AI-driven behavioral analytics is particularly important for training models that analyze vast amounts of data to understand human behavior and identify trends [6].

Machine learning and intelligent data analysis methods are widely used to predict the tastes and preferences of social media users based on their profiles. Artificial intelligence also uses natural language processing (NLP) algorithms to analyze sentiment in social media content [10]. The results provide deep insights into consumer attitudes and emotions toward brands, products, or campaigns (Figure 1).

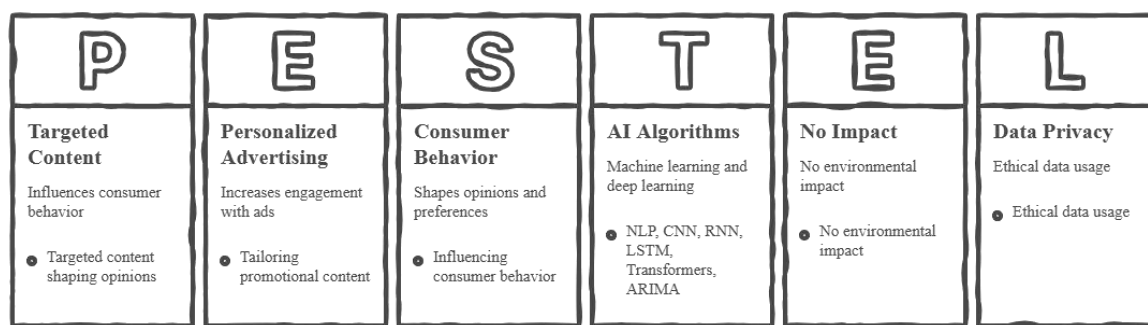


Figure 1. PESTEL analysis of neuromarketing influence for AI modeling with the aim of influencing consumer behavior

Source: Author approach following specialized references [1, 4]

Content on social media also plays an important role in the personalized delivery of advertising material: predictive analytics is used to tailor promotional content in users' feeds. This approach increases engagement with advertising messages [11]. In addition, based on previous interactions with promotional content, systems determine what content to show the user.

AI-based social media platforms significantly influence consumer behavior, shaping their opinions and preferences through targeted content. However, this technique has led to both more informed and impulsive purchasing decisions.

In addition to NLP, other models and frameworks are used to leverage social media data in the creation of AI-based systems and programs. Convolutional neural networks (CNN) and recurrent neural networks (RNN) are examples of such approaches. CNNs are particularly useful for processing image-based content on social media, mainly for understanding and categorizing visual posts. On the other hand, RNNs are effective for analyzing sequential data, such as timestamps of user interactions.

More complex deep learning models, such as long short-term memory (LSTM) networks and transformers, have also proven effective in using social media data for predictive analytics. They provide a more detailed analysis of sentiment in text content and help identify complex patterns in text data.

The ARIMA (Auto-regressive Integrated Moving Average) model also plays a key role in studying the behavioral trends of social media users. It predicts future user actions based on their past behavior. These models can be used individually or in combination with each other to build more powerful hybrid predictive analytics systems.

Product recommendation algorithms are an integral part of artificial intelligence in the business sector, especially in e-commerce. These are machine learning and deep learning technologies that predict user preferences based on their previous purchases and associated emotions [2, 6, 8].

One of the most common approaches is collaborative filtering, which is used to identify potential

user intentions when making a purchase. It comes in three forms: user-based, item-based, and hybrid.

- User-based collaborative filtering involves predicting the interests of a specific user based on what other users with similar preferences have purchased, but which the target user has not yet purchased [4].
- Item-based collaborative filtering focuses on the item that the user has shown interest in. The algorithm collects data about other users who have expressed a similar attitude towards this item and forms a list of their preferences.
- The hybrid model combines the advantages of both approaches to create a more accurate predictive algorithm [2].

Other methods used in product recommendations include content-based filtering, the contextual bandit method, and deep learning technologies to improve accuracy.

The digital customer experience can have a significant impact on customer behavior in the marketplace. As Lee (2020) notes, providing customers with a better shopping experience makes them more receptive to promotions and other marketing initiatives.

Modern technologies based on immersive solutions have greatly simplified this process, as they can be adapted without the need for development from scratch. Two striking examples are virtual reality (VR) and augmented reality (AR).

• Virtual reality (VR) is a technology that immerses users in a digital environment where they can interact with objects within it [8].

• Augmented reality (AR) superimposes virtual objects onto the existing environment, allowing the user to interact with them.

Immersive technologies have significantly improved the customer experience, especially in the fashion and cosmetics industry [13]. However, the high cost of implementation remains a deterrent for small and medium-sized businesses.

Consumer behavior is a key component of marketing, as it is the ultimate goal of all marketing initiatives. Other studies [3, 7, 8] show that this is a

complex area involving many concepts. To successfully influence the target audience, management needs to consider consumer psychology, the purchase decision-making process, cultural influences, group dynamics, and behavioral economics.

Consumer decision-making behavior is substantially shaped by social variables, among which family unity, reference groups, and social status stratification stand out. Interaction with members of the group to which one belongs and validation from opinion leaders exert a coercive or aspirational influence on the purchasing process. These external determinants restructure the individual's attitude system, conditioning their behavioral trajectory within the market. In-depth investigation of consumer psychology is the foundation for developing successful marketing strategies. This knowledge allows organizations to optimize the marketing mix—price, distribution, product, and promotion—by aligning them with the imperatives and expectations of the targeted market segments. Thus, the effectiveness of advertising campaigns depends directly on the degree of personalization of the message in relation to the psychographic profile of the audience.

At the cognitive level, the architecture of digital experiences directly influences the effectiveness of memory encoding. The use of methods to "humanize" content, by integrating interactive elements and gamification mechanisms, facilitates greater user engagement. These personalized experiences optimize information retention by stimulating selective attention and deep cognitive processing. By generating unique user experiences, digital platforms reinforce resilient impressions over time, which underpin purchase intent and receptivity to brand messages. The process of long-term memory storage, characterized by a "deep immersion" of stimuli, guides future decisions through mechanisms of recall, recognition, and utilization of previously stored experiences.

Digital experiences act as a channel through which people can encode information. In this way, they have a direct impact on consumer behavior. Users associate visual and emotional impressions of a product with subsequent behavior through digital technologies. This represents the condition or background against which perception processes occur, and explains and shapes the relationship between these elements.

Personalized digital experiences that are designed to evoke emotions or enhance memory encoding, which better reflect consumer characteristics, are a tactic that companies can use to achieve more accurate and effective impact.

This study examined the mediating effect of artificial intelligence (AI) and digital experience (DX) on the relationship between neuromarketing (emotional impact and memory encoding) and consumer behavior. The results are expected to have both theoretical and practical significance.

From a theoretical point of view, this study should contribute to the development of a conceptual framework describing the complex network of relationships between emotions, memory, AI, and digital activity, the understanding of which is necessary for a more accurate definition of consumer behavior. Moreover, the digital experience is the result of the mediating role of AI between emotional impact or memory encoding and the corresponding response of the end user. Such integration brings us closer to understanding what exactly happens in the psychological thinking of consumers every time they make a purchase.

From a practical point of view, the study highlights the applied significance of solutions based on personalization driven by artificial intelligence in shaping the digital experience. AI is becoming one of the key tools for businesses in analyzing customer data, preferences, and behavior, enabling the creation of personalized content, recommendations, and offers.

In addition, this study shows the important role of organizing a digital experience filled with positive emotions and a close emotional connection to memory. For entrepreneurs, the key task is to make their interfaces attractive and offer users interactive elements and immersive forms of storytelling that can evoke emotional engagement and contribute to the formation of memorable impressions.

Conclusions. The study confirms that neuromarketing, based on emotional impact and memory encoding processes, has high potential for explaining and predicting consumer behavior. The Convergence of Artificial Intelligence and Neuroscience in Market Strategy Configuration

The implementation of artificial intelligence, coupled with the refinement of the digital experience, acts as a catalyst for strategic personalization. This synergy not only optimizes user interaction but also redefines the fundamentals of brand communication. From a conceptual perspective, the integration of these technologies facilitates the development of an innovative theoretical framework that interconnects emotional processes, mnemonic mechanisms, and technological advancement. In practical terms, neuromarketing is no longer a niche discipline, but a fundamental pillar of the business ecosystem. It provides the tools needed to design high-impact advertising campaigns capable of generating authentic engagement and strengthening organizations' market presence.

In a technological landscape marked by accelerated dynamics, the relevance of neuromarketing becomes undeniable. Organizations that adopt biometric tools and artificial intelligence solutions to analyze subconscious reactions—often imperceptible through traditional methods—gain a superior understanding of the human psyche. This analytical approach opens up new horizons for the development of resilient business strategies. By harmonizing cognitive psychology with the digital habits of modern consumers, companies can

build lasting relationships based on a deep understanding of human needs and emotions, transcending the simple analysis of raw data.

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