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FROM IMPULSE TO LOYALTY: LEVERAGING NEUROMARKETING FOR DEEPER BRAND ENGAGEMENT

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Abstract: Neuromarketing is a more than multi-disciplinary research area that has become a significant subject of research, providing useful information into the unconscious cognitive mechanisms of consumers that boost the effectiveness of the marketing strategy. The given study explores the application of neuromarketing methodology within the context of enhancing brand management discussing the current applications, advantages and ethical issues surrounding the application. The paper is going to discuss the known methods of neuromarketing, their benefits and focus on the dangers and threats to the ethical issues. The method was a mixture of qualitative and quantitative approach whereby extensive interviews were conducted to collect the views of the marketers regarding the application, benefits and challenges of neuromarketing in brand management. Online and face-to-face interviews were conducted between August and November 2023 among 114 marketing people working in different organizations where neuromarketing is actively practiced. Results indicate that neuromarketing has been highly applied in the management of brand in order to better understand consumer behavior, develop more meaningful products and come up with advertisements that are more effective. The adoption rates differ according to techniques and some are more popular due to the affordability and simplicity of application. The authors have categorized six types of integrated neuromarketing practices. Moreover, it affirmed that neuromarketing creates particular ethical concerns and possible threats that should be taken into consideration in order to promote the practice of brand management. These findings offer a practical guide to how neuromarketing can be implemented within the brand management process where marketing teams can offer viable suggestions of how the brand strategies should be developed.

Keywords: Neuromarketing, Brand Management, Consumer Behaviour, Marketing

INTRODUCTION

The recent years have seen a swift growth in the digital technology, which is the initial catalyst that led to a significant transformation in the innovation of a business, as it became an essential component of the current operations in the market and social structure (Pascucci et al., 2023). Several breakthrough tools, such as artificial intelligence (AI) (Haleem et al., 2022; Verma et al., 2021), analysis of high volumes of data (Manko, 2022), conversational agents (Ramesh and Chawla, 2022), immersive experiences, like Virtual Reality (VR) (Alcaniz et al., 2019; Kostyk and Sheng, 2023), and decentralized ledger (Wasiq et al., 202 At the same time, studies note that there is a paradox in modern marketing, where consumers have become significantly more empowered (Darmody and Zwick, 2020; Hudders et al., 2019) but personal privacy has significantly decreased (Fernandez-Rovira et al., 2021). Digital transformation has had a dramatic impact on brand management as it has re-invented the way organizations formulate and sustain brand identities (Chukurna et al., 2022). Digital solutions are a common approach used by brands nowadays to create engaging experiences (Marmat, 2021), keep track of their reputations and awareness (Li et al., 2023), and make sure that their public image is desirable (Deepaa and Geeta, 2021). The global coverage of the audience is also achieved with the help of digital tools, branded content production, and broadcasting (Dens and Poels, 2023), and risk mitigation and informed decision-making support in the marketing activity (Chen, 2023). Consumer buying patterns are a burning challenge of marketing professionals despite the emergence of new technologies, which has been mentioned in various recent publications (Alsharif et al., 2023; Cenizo, 2022; Garczarek-Bak et al., 2021). It is on this backdrop that the field of neuromarketing has been developed as a new interdisciplinary specialty between neuroscience, psychology, and marketing knowledge.

The area attempts to discover non-conscious forces behind consumer behavior to optimise the effectiveness of marketing (Alsharif et al., 2023). Neuromarketing analyzes the motivations behind customer behavior, the factors that affect likes and dislikes, and decision-making by monitoring physical and neurological signals to inform the creative campaigns, new product development, and pricing strategies (Bhardwaj et al., 2023). Neuromarketing also enhances understanding of consumer behaviors (Yadete and Kant, 2023), allows more memorable interactions

between the brand and its market (Casado-Aranda et al., 2023), influences design and developmental decision-making (Alsharif et al., 2023; Antoniak, 2020), streamlines branding strategies (Cerro Rodriguez et al., 2022), and empowers decisions about strategy based on data (Garczarek-Bak et al., 2021).

REVIEW OF LITERATURE

According to a common agreement among scholars and practitioners, the underlying emotional responses, attitudes, and unconscious likes are the key determinants of purchase decisions (Alsharif et al., 2023). In this context, product or service choice is considered a multilayered cognitive procedure with separate mental and behavioural stages (Klein and Sharma, 2022; Marc et al, 2022). Neuromarketing is closely connected with these processes, as it also studies the brain activity, identifying how the consumer decision is guided by the work of the brain (Ouzir et al., 2024). The field is characterised by the use of neuroimaging (Gill and Singh, 2022), biometric monitoring (Aldayel et al., 2021), and psychological indicators (Singh et al., 2023) to unravel the neural approach to market behaviours. It further examines psychological pointers and subconscious opportunities such as emotion and symbolic significance that can influence the decision-making process (Chen, 2023; Kalaganis et al., 2021; Ouzir et al., 2024).

Neuromarketing goes beyond emotion and considers major cognitive functions, such as focus, perception, recall and problem solving (Garczarek-Bak et al., 2021; Halkiopoulos et al., 2022), which makes it relevant in advertising, product development, packaging, pricing, and client experience management (Cerro Rodriguez et al., 2022). The ever-developing field of neuromarketing, bound by the emerging neuroscience technology, is committed to the improvement and enhancement of its techniques (Casado-Aranda and Санchez-Fernandez, 2022).

A study by Hurzhyi et al. (2023) offers an in-depth discussion of the way the neuromarketing approach enhances brand management and proves that the mixed application of many methods can be of great benefit. Their study points out six common integration combinations (e.g., the use of self-reporting and behavioural observation, physiological monitoring and self-report questionnaires), commonly used at various stages of brand campaigns to give a more detailed picture. Marketers consider self-report and behavioural methods to have the most effects as far as enhancing brand outreach because neuroimaging and physiological methods are regarded as less valuable as they are more pragmatic and costly.

Kamal and Das (2025) provide a recent review of the recent developments and real-life applications of neuromarketing, synthesising 57 studies published within the last five years. Their results outline the existing techniques and analysis tools in the study, as they often apply market stimulus, namely product images and advertisement videos, in the recent studies on neuromarketing. They also note increasing interest in the application of neuromarketing in measuring campaigns oriented towards the population. In neuroscience terms, studies have mostly focused on the frontal and prefrontal areas of the brain in interpreting the consumer decision-making and emotional reactions, though the focus has been on the frontal alpha asymmetry which is used to decode emotion in accordance to the well-known neuropsychological models.

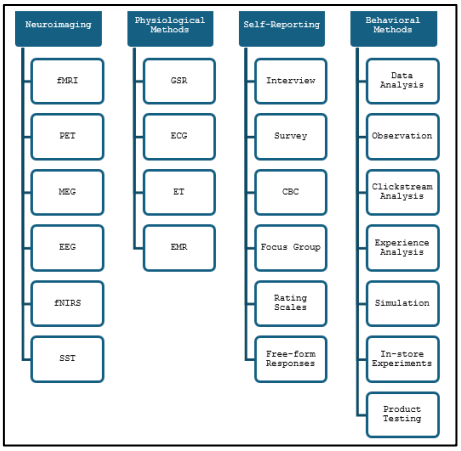

Figure 1: Categorisation of Neuromarketing Techniques
Source: Hurzhyi et al (2023)

During the last ten years, researchers have performed a comprehensive research on the implementation of the principles of neuromarketing in the framework of a wide range of research methods. An overview of the existing literature on the role of neuromarketing in brand management identifies four major methodological groups, namely neuroimaging, physiological monitoring, direct self-reporting, and behavioral observation (Alsharif et al., 2023). Neuroimaging refers to a series of methods used to determine the functionality of the brain and nervous system, and thus the ability to evaluate the neurological reaction of consumers to advertising and advertising campaigns

(Gill, 2022). The most frequently used forms of neuroimaging in branding research are functional magnetic resonance imaging (fMRI; Antoniak, 2020; Zhu et al., 2022), positron emission tomography (PET; Rawnaque et al., 2020; Zhu et al., 2022), magnetoencephalography (MEG; Alsharif et al., 2023; Fred et al., 2022), and electroencephalography (EEG; Costa- Other methods which are also commonly used are functional near-infrared spectroscopy (fNIRS; Meyerding and Mehlhose, 2020) and steady-state topography (SST; Alsharif et al., 2023; Singh et al., 2023).

Physiological measurement is focused on the identification of bodily reactions that indicate the emotional or cognitive conditions of consumers (Fauzi and Widyarini, 2023). The most common methods are electrocardiography (ECG; Alvino et al., 2020), galvanic skin response (GSR; Vences et al., 2020), electromyography (EMG; Alsharif et al., 2023; Singh et al., 2023), and eye-tracking (ET; Gheorghe et al., 2023). Self-reporting, on the contrary, involves direct consumer input in the form of interviews, surveys, focus groups, choice based conjoint analysis, open-ended feedback or rating (Alsharif et al., 2023; Garczarek-Bak et al., 2021; Hakim et al., 2020; Sanchez-Fernandez et al., 2021). On the behavioral side, methods track consumer behavior and interaction with brands throughout the purchasing process; they are observational studies and large-scale data mining (Alsharif et al., 2023; Yadete and Kant, 2023; Mariani et al., 2022), web navigation analysis, experience sampling, simulation, store-based tests, and tests on products (Blasco-Arcas et al., 2022; Mariani et al., 2022). An extensive amount of literature is presented in support of the combination of various neuromarketing methods to develop a more holistic picture of consumer behavior (Alsharif et al., 2023; Antoniak, 2020; Garczarek-Bak et al., 2021). Due to the fact that both methods have their own benefits and drawbacks, a multimethod approach is better to increase the strength of the results and produce more credible information.

Bhardwaj et al. (2023) note that the modern interest in neuromarketing is predetermined by its ability to increase the strategic worth of marketing campaigns and by the progress that cutting-edge neuroimaging technologies allow making. The impact of the field is growing, which is supported by the introduction of new innovations like virtual and augmented reality (Russo, Bilucaglia, Zito, 2022) and the integration of interdisciplinary cooperation to shed light on consumer decision-making processes (Singh et al., 2023). According to recent studies, the role of neuromarketing in brand leadership is especially significant in acquiring immediate feedback, uncovering emotional stimulants (Russo, Bilucaggio, Circi et al., 2022; Vences et al., 2020; Zito et al., 2021), and discussing how cultural settings can determine consumer responses (Crespo-Pereira et al., 2020). One must admit that the use of neuromarketing implies various viewpoints and issues.

Since neuroscience is a field of study with strong ethical implications, the issue of participant privacy and consent has become a matter of concern (Clark, 2020). Another risk is the misinterpretation of statistical data of the brain (Birknerova et al., 2022). The studies related to it have shown that neuromarketing utility can depend on different geographic locations, cultural contexts (Cardoso et al., 2022a; Crespo-Pereira et al., 2020; Traymbak et al., 2023), and industries (Azman et al., 2023; Russo, Bilucaggio, Circi et al., 2022; Crespo-Pereira et al., 2020). Neuromarketing, therefore, can be regarded as a supporting tool, which can be used as the supplement to the conventional ones to enhance the knowledge. To recap, neuromarketing has strong benefits in terms of brand development (Alsharif et al., 2023; Cerro Rodriguez et al., 2022), but it is also faced with a number of risks: marketers can be confronted with risks of possible manipulation (Antoniak, 2020), reliability of the data (Traymbak et al., 2022), increased costs (Antoniak, 2020; Gill and Singh, 2022), and insufficient

Thus, although neuromarketing has a deep ability to explain the neural basis of consumer behavior and be used to control the brands, its ethical implementation, in terms of privacy and transparency, is central. Finally, the success of neuromarketing is predetermined by a range of determinants: the availability and advanced technological back-end, such as neuroimaging equipment and analysis software (Gill and Singh, 2022; Yadete and Kant, 2023; Mariani et al., 2022); high-quality research methodology (Zhu et al., 2022); the attitude of people (and professional ethics) (Antoniak, 2020; Bilgin Turna and Babus, 20 The proper management of these dimensions is crucial to the successful introduction of neuromarketing in brand strategies.

RESEARCH METHODOLOGY

This study aims at evaluating the impact of the neuromarketing techniques on brand management and to determine the potential areas of future improvement. To achieve this, the scholars used a complex design that combined a comprehensive analysis of the previous studies on neuromarketing methods and a mixed-methods approach. The empirical aspect revolved around in-depth interviews which brought about first-hand information on the part of the marketing gurus. Such interviews were well designed to elicit the finer feedback on how neuromarketing is practically applied in the management of the brand, the perceived advantages included, and the challenges associated with it.

Primary data was collected via virtual and face-to-face interviews and 114 practitioners, representing various organisations, who current practice the use of neuromarketing in their daily activities, were sampled. The period of data-collection was between June and September 2025. All the participants were well briefed about the purpose of the study, and measures were taken to make participants aware of their rights as well as to induce them to give truthful and honest answers. The interview guide was an integration of open-ended and closed-ended questions to

generate qualitative and quantifiable data. To protect the integrity of data, the validation plans were cross-referencing with other sources and supplemental interviews (when it was necessary to clarify some information). The choice of instrumentation was based on the credibility and durability (Lehmann et al., 2023), relevance to target population (Taherdoost, 2022), and general feasibility in the research (McLeod, 2021). The element of ethics was stringently followed to ensure that the rights of the participants were not violated during any phase of the research (Arellano et al., 2023; Potthoff et al., 2023). All instruments and methods were carefully directed at the research topic and adjusted in order to measure the attitude towards neuromarketing reliably. Care was given with respect to the fact that questions and assessment were made close to the purpose of the research, the population it was aimed at and the methodology involved. It was required that the systematic use of these specified methods was the key to the proper collection of data, its thorough analysis, and the production of the substantive knowledge, which would be applicable in terms of business management as well as in terms of promoting the marketing breakthrough.

RESULTS

The paper shows that the neuromarketing practices have been extensively integrated in brand management. They have the main uses related to gaining deeper understanding of consumer behaviour, developing products in the most optimal way, and improving advertising. The rates of utilisation of these methods vary significantly based on the particular technique mainly because of financial expenditure, and the relative ease or difficulty of the implementation. Self-reporting and behavioural approaches, which represent the most commonly used in modern marketing campaigns, and are perceived as both useful and affordable, are the most popular among the variety of the offered neuromarketing options that are available to the practitioners.

Table 1: Comparative Analysis of Neuromarketing Techniques

Neuromarketing Technique	Frequency of Use (%)				
	Always	**Often**	**Sometimes**	**Rarely**	**Never**
Neuroimaging					
fMRI	2.2	11.1	23.5	36.8	26.3
PET	1.2	12.3	25.6	42	18.7
MEG	1.8	9.7	23.2	45.8	19.6
EEG	3.5	15.1	27.4	49.3	4.8
fNIRS	3.4	17.7	26.3	40	12.5
SST	3.5	17.5	26.5	40.2	12.3
Physiological Techniques					
ECG	9.9	11.8	28.8	45	4.4
GSR	7.6	14.4	32	50.1	3.3
EMG	8.1	19.2	25.3	45.3	2.3
ET	6	16.6	27.8	48.2	1.3
Self-Report					
Surveys	22	33.7	30.1	11.3	3
Interviews	23.7	35	27	15.6	6
Focus Groups	20	28.2	30.1	15.6	6.2
CBC	17.2	22.5	33.6	13.7	13
Free-form Responses	22.7	30.7	28.7	10.3	7.6
Rating Scales	25.9	30	31	9.2	4.3
Behavioural Techniques					
Observation	22	23.6	30.7	12.2	11.6
Data Analysis	27.2	28.7	30	13.2	1.3
Clickstream Analysis	20.5	27	25.8	15	12.2
Experience Analysis	23.1	24.7	27	20.2	5.1
Simulation	18.7	20.5	28.4	22.2	10.4
In-Store Experiments	18.9	19.8	31.1	23.3	6.9
Product Testing	20.6	21.9	32.5	19.4	5.5

Source: Author's Own Source (2025)

Statistics show that in self-report methods, rating scale (25.9%) instruments, interviews (23.7%), free form responses (22.6%), and surveys (22.1%) are especially prominent in the brand-related campaigns. The most frequently applied on the behavioural side are data analysis customer-experience analysis, observation, and product testing. Conversely, more sophisticated neuroimaging methods, such as PET (1.%), MEG (1.7 %), and fMRI (2.3 %), are not embraced as frequently due to their high cost, complexity and the need of specialised technical knowledge, which make them unaffordable to a large number of smaller organisations. The research also established that the combination of various methods of neuromarketing could increase its effectiveness

considerably (Alsharif et al., 2023; Antoniak, 2020; Garczarek-Bak et al., 2021). Six combinations were chosen to be analysed neuroimaging plus physiological techniques, neuroimaging with behavioural methods, neuroimaging with self-report, physiological with behavioural, physiological with self-report, and self-report with behavioural. The combination of self-report and behavioural techniques was most common at the start (28.9%) and mid-point (23.6%) of campaigns when these combinations were monitored at these stages of a brand campaign. In the same vein, the combination of physiological and self-report technique was common during the initial (23.4%), and intermediate (26.5 %) campaigns, but the technique of neuroimaging with self-reporting was the least employed during the final stages of the campaign, which was used by only 8 percent of marketers. According to feedbacks of marketing professionals, neuromarketing strategies can significantly enhance brand campaigns and allow marketers to learn more about consumer behaviour. Self-report methods are especially ranked as the most useful in general, as they are widely used (43.1⁝) in brand campaigns and make it possible to optimise advertising. They are considered to be very effective by 8.9% of the respondents, moderately effective by 25.7% of respondents, less effective by 22.1% of respondents and very few (0.2) consider them as ineffective. The methods based on behaviour, too, prove to have a substantial effect: 6.5% of the professionals think that they can dramatically change campaigns, 23.4% of the professionals think that they can moderately change the campaigns, and 39.7% of the professionals think that they can change the campaigns sufficiently.

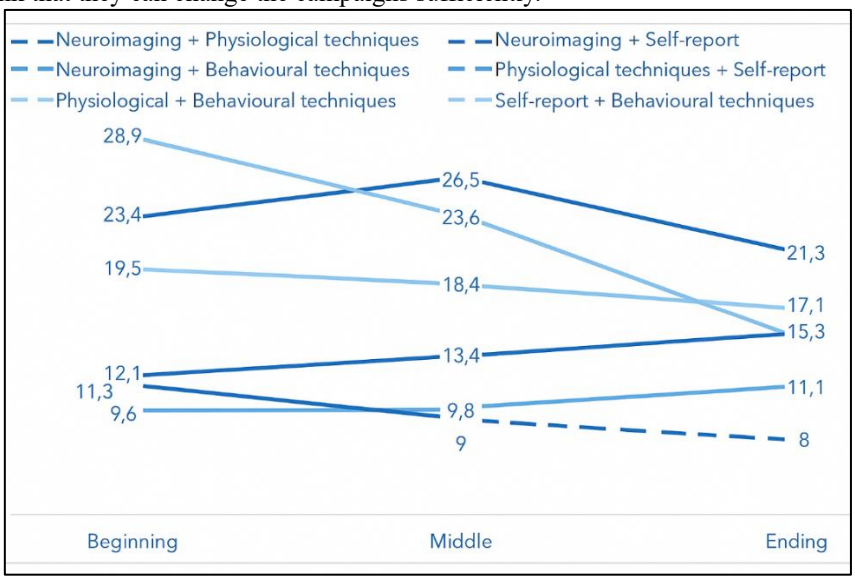

Figure 2: Application of Integrated Neuromarketing Techniques
Source: Author's Own Source (2025)

Fewer respondents, 20.8% of them, have indicated that behavioural approaches were not highly efficient, and 9.6% of them found out that they are absolutely ineffective when it comes to brand campaigns. The analysis also shows the general low perceived effectiveness of neuroimaging and physiological methods. In particular, the neuroimaging has been considered to be of no use by 12.8% of the marketers mainly due to the complexities and risks involved in these techniques. Similarly, 14.2% said that physiological instruments are not useful to provide significant value in their brand-management operations as seen in the visualised data.

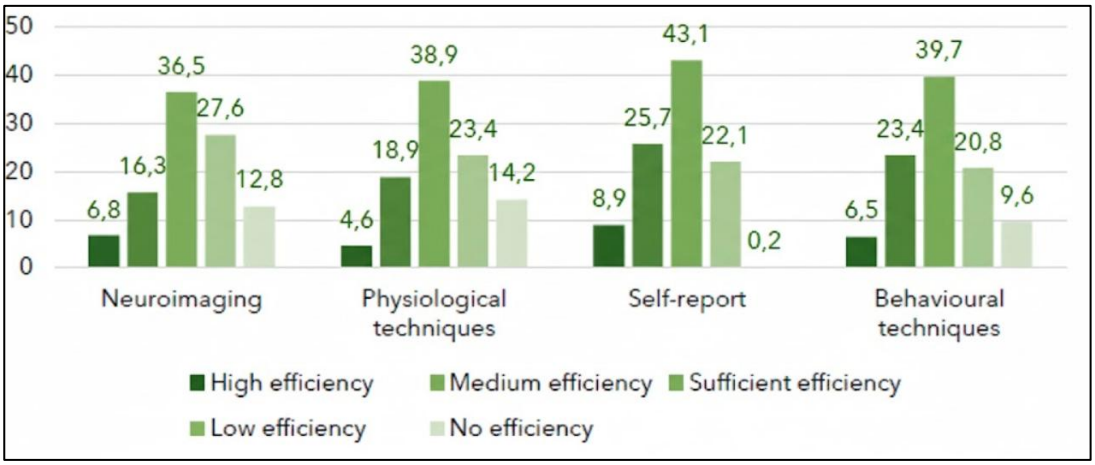

Figure 3: Efficiency of Neuromarketing Techniques
Source: Author's Own Source (2025)

DISCUSSIONS

The current research provides the framework upon which the diversified neuromarketing concepts would be implemented, and the goal of brand management is the deeper understanding of consumer insights, preferences, and behavioral patterns. The first essential process is related to the clear identification of the project goals as it helps to choose the appropriate methodologies and align the research interest with the key business interests which are strengthening the brand image, shaping the product image, or streamlining marketing strategies.

The preliminary audit of the current consumer data before the initiation of neuromarketing activities defines situations under which the approaches will be most effective and outlines relevant marketing issues. Knowledge of the target audience through analysis of the demographics, psychographics and actions taken would be useful as the results are significant and can be acted upon in future brand activities. As an additional planning factor, the setting of achievable campaign schedules and budgets, covering the expectations of stakeholders and paying detailed attention to ethical imperatives during the research is considered. The synergy between marketing experts, neuroscientists, psychologists, and data scientists is highly encouraged; this collaboration will allow accurately reading neuromarketing data, as well as making the results easily and effectively translated into concrete practice recommendations.

The combination of knowledge in different fields makes the process more comprehensive in the characterization of consumer dynamics and encourages a never-ending learning process based on systematic discussion and teamwork. Through a combination of different knowledge, teams can break silos, align data analyses, and value different opinions, which will allow them to obtain a more comprehensive view of consumer behavior. The chosen neuromarketing approach must correspond to the particular aspect of consumer behavior that is being studied, and at the same time consider the inherent strengths and weaknesses of the individual approaches and the underlying feasibility of the available resources and expertise. As an example, some electroencephalography (EEG) might be preferred due to its low cost and ease of applied implementation at the expense of functionality magnetic resonance imaging (fMRI) at high cost and equipment. Use of various modalities comes up with a more comprehensive picture and strengthens campaign evaluations. Initial pilot studies are essential to testing the reliability and relevance of the adopted neuromarketing strategies so that the quality of data obtained is of high standards and required modifications are allowed before the full-scale campaign is launched.

Since neuromarketing often requires gathering of delicate physiological and neurological information, it is important to ensure that high standards of ethics are observed to ensure that the participants are not harmed and their confidentiality is not violated. Best practices include procedure of informed consent, giving of clear disclosures on purpose of research, anonymization of personal data, provision of great cybersecurity, and guarantee of voluntary participation. Combining neuroscientific data with the traditional metrics, including surveys and behavioral analytics, results in a complex, multi-layered dataset and allows to cross-validate the results. The combination of subjective and objective measurement helps the teams create more integrated models and therefore capture consumer responses more fully, thus making most brand management efforts as reliable and relevant as possible.

CONCLUSION

Neuromarketing is an interdisciplinary field, which combines the concepts of neuroscience, psychology, and marketing to clarify the role of unconscious processes in consumer decision-making and to maximize the effectiveness of market interventions. By proceeding with the analysis of physiological and neural activity data, the practitioners get to know the underlying factors that motivate preferences, and purchasing behaviors. Such insights can be invaluable in streamlining the most important business processes, like advertising design and product development, as well as making pricing decisions, based upon objective empirically validated metrics. This method is based on stringent scientific tools like neuroimaging, biometric analysis, and psychological examination to investigate the neurological basics of consumer reactions. Neuromarketing is not limited to affective stimuli, but it also involves cognitive abilities like attention, perception, memory and problem solving which are critical in consumer-brand and consumer-product interactions. The field has several underlying concepts such as emotional connection, simplification of the cognitive load, alternative evaluation, neuroethical considerations, and implicit associations.

The strategies of neuromarketing fall into four broad areas namely neuroimaging, physiological measurement, self-reported feedback, and behavioral tracking. The appeal of these techniques to commercial users is determined by their ability to provide high-level strategic value and technological developments like neuroimaging that provides a greater predictive capacity to marketing decisions. Current studies support numerous advantages of brand management, but in practice, it is associated with such problems as high expenses, ethical considerations, data accuracy, and lack of uniform guidelines. The practical performances of neuromarketing depend on such factors as the availability of technology, the quality, and rigor of research, the existence of favorable attitudes in society, the ability to build successful collaborations with other fields, and the standard level of the industry. To be able to use these issues responsibly and productively, it is necessary to proactively address them so that organizations could attain outstanding brand dominance and customer interactions. The paper presents a systematic guide to the

opportunities of neuromarketing in identifying the perceptions and behavior of customers, specifying six key steps the creation of specific research objectives, cross-disciplinary cooperation, the most appropriate methodologies, preliminary validation, the focus on ethics in each stage of the work and the ability to integrate neuroscientific measures with traditional methods.

These suggestions contribute to helping marketing crews and consultations to create more effective brand campaigns and to develop a broad insight into customers. An important limitation as observed is a challenge of the harmonisation of neuroscientific data with conventional research results. Although combining these in the approaches brings wider and deeper insights and improved marketing effectiveness, they bring complexity as well. The development of hybrid frameworks which facilitate the correspondence between the two types of data can contribute to the definition of the field of neuromarketing and reduce the threats of neuromarketing usage in brand management.

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