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Use of Knowledge Management for the Ethical Use of AI in Neuromarketing – Shaping an Ethical Code of Conduct

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Abstract

This research investigates the ethical issues of applying Artificial Intelligence (AI) in Knowledge Management (KM) in the field of neuromarketing, specifically the influence of these technologies on consumer behaviour and decision making. The study is aimed at the problems of privacy, data security, and the use of personal data, and the establishment of an ethical code that can be applicable to any market across the world based on the Hofstede Index.

The use of AI in neuromarketing increases the analysis of consumer data but there are ethical issues that come with this practice; algorithmic bias and privacy. KM is vital in the development of an ethical framework for the use of AI in neuromarketing in order to make the application both efficient and ethical. Some of the values that should be embraced in this framework are data protection, transparency, and consent, and this framework should be endorsed by ethics committees drawn from other disciplines.

The study also examines how the 6D model of Geert Hofstede can be used to develop an ethical standard that is appropriate for the ethnic audience and the consequences of the AIF model's success on ethical standards. It also aims to determine the best practices in data management and the need for an ethical code from the perspectives of AI ethics experts, data scientists, neuromarketing professionals, and policymakers.

Keywords: Artificial Intelligence, Knowledge Management, neuromarketing, ethics, consumer behavior

INTRODUCTION

The purpose of this research is to explore the **ethical implications** of the use of Artificial Intelligence, which is backed up by Knowledge Management systems in the field of neuromarketing.

In particular, this study aims to examine how these technologies influence consumer behavior and decision-making processes while addressing potential concerns related to privacy, data security, and the manipulation of personal information in order to explore the possibility of the creation of an **ethical code of conduct**, which in combination with **Hofstede Index** will provide an ethical tool that can be adapted in the various markets around the world.

This framework will enhance the understanding of ethical practices in neuromarketing and promote responsible innovation that respects consumer rights, and fosters trust between businesses and their clients.

By establishing clear guidelines and standards, an ethical code of conduct can serve as a foundation for companies to navigate the complexities of neuromarketing while ensuring that their strategies align with societal values and cultural sensitivities.

More precisely, this approach emphasizes the importance of ethical considerations and encourages a collaborative dialogue among stakeholders, enabling businesses to adapt their practices in effective and socially responsible ways. Such a proactive stance mitigates potential ethical dilemmas and positions companies as leaders in responsible marketing, ultimately benefiting both consumers and the broader community.

RESEARCH FIELD - BACKGROUND

Integrating artificial intelligence (AI) in neuromarketing presents both opportunities and challenges, particularly concerning ethical considerations. Neuromarketing, which combines neuroscience with marketing strategies, aims to decode consumer emotions and behaviors. The use of AI in this field enhances the ability to analyze consumer data, offering deeper insights into consumer behavior. However, the ethical implications, such as privacy concerns and algorithmic bias, necessitate the development of a robust ethical code of conduct. Knowledge management (KM) can play a crucial role in shaping this ethical framework by ensuring that AI applications in neuromarketing are both effective and responsible.

Artificial Intelligence is the simulation of the intelligence process of human by computer systems and machines. It entails the development of algorithms and models that enable machines to perform tasks that were previously thought to be only within the realm of human intelligence, such as reasoning, learning, decision making, problem-solving, and language comprehension. (Russell & Norvig, 2020), (Goodfellow et al., 2016).

Neuromarketing is a discipline that combines neuroscience, psychology, and marketing to study consumers' neural responses to marketing stimuli, such as advertisements, product design, and branding. It uses techniques like **functional Magnetic Resonance Imaging (fMRI)**, **Electroencephalography (EEG),** and **eye-tracking** to analyze and understand decision-making processes and emotional engagement beyond conscious responses (Kukharska, 2025).

Knowledge Management (KM) is the systematic process of capturing, organizing, sharing, and efficiently using knowledge and information within an organization. It involves creating environments and practices that facilitate the transfer and use of both explicit knowledge (documented information) and tacit knowledge (personal insights and experiences) to improve decision-making and innovation (Nonaka & Takeuchi, 1995). KM aims to leverage intellectual assets to enhance organizational efficiency and achieve strategic goals (Dalkir, 2011).

Ethics, also known as moral philosophy, is the discipline concerned with what is morally good and bad, right and wrong. It involves examining and systematizing concepts of morality, including principles that define acceptable conduct in society and guide individual behavior (Singer, 1994). Ethics serves as a foundation for evaluating actions, responsibilities, and values in various fields of human interaction (Beauchamp & Childress, 2019).

Hofstede method - 6D Model is a framework for understanding cultural differences across countries, which can greatly influence ethical perspectives and decision-making processes within organizations. By analyzing dimensions such as power distance, individualism versus collectivism, and uncertainty avoidance, leaders can better navigate the complexities of global business environments while fostering an inclusive culture that respects diverse viewpoints.

RESEARCH PROBLEM, AIM, OBJECTIVES, PRESUMPTIONS AND LIMITATIONS

Although KM can improve the accuracy of the AI-based neuromarketing analysis, as mentioned before, there are some issues that should be discussed. Ethical concerns like bias in AI and concerns about consumer privacy still pose a significant problem that requires a solution. Moreover, the effectiveness of AI in neuromarketing is directly linked to the quality and diversity of data used, making data management practices robust and solid (Ukil et al., 2023).

Besides, the above-stated ethical issues include data protection and how to deal with bias, which is important to ensure consumers' trust and marketing sustainability. Furthermore, human and AI collaboration is essential for meaningful context understanding and emotional intelligence in marketing strategies (Kotha, 2024), (Semwal et al., 2024). Developing clear guidelines and frameworks for ethical AI use in marketing will be crucial to navigate these challenges, ensuring that both technological advancement and consumer rights are upheld. Establishing a multidisciplinary approach involving stakeholders from technology, ethics, and marketing will enhance the effectiveness of these guidelines and promote responsible innovation in the field.

As a result, forming a framework for an ethical and effective neuromarketing process is considered critical to guarantee the ethical and sustainable use of the data gathered.

The Ethical Framework should be a marketing AI use code of ethics and include values like data protection, openness, and consent and involve interdisciplinary ethics committees in decision making. On top of that, since it is the Ethical part of the use of data, it should consider the various meanings of the term ‘ethics’ in different parts of the world and, therefore, should be flexible between the different cultures internationally. This adaptability will help ensure that marketing practices are respectful and relevant across diverse cultural contexts, fostering a global approach to ethical standards in AI-driven marketing. Such a comprehensive Ethical Framework not only enhances trust among consumers but also promotes responsible innovation in marketing practices, ultimately leading to more sustainable

business relationships worldwide. This framework should also prioritize transparency and accountability, enabling consumers to understand how their data is being used while ensuring that companies are held responsible for their ethical commitments.

In order to achieve international adaptability of the Framework (Ethical code and also the ethical use of the data), it is proposed to take under consideration the 6D Model of Geert Hofstede, which would play a significant role in the formation of an extremely flexible - code of conduct, which could be adapted accordingly on the nationality of the target group of the Framework.

Research aim and objectives

This research aims to explore the feasibility of formulating a provisional General Code of Ethics for the use of AI in Neuromarketing with the help of the 6 dimensions model of Geert Hofstede.

The main research objective is to understand how KM can guarantee the ethical use of consumer data in AI-based neuromarketing processes. In particular:

- To explain the ethical dilemmas that arise (such as data protection, biased algorithms, transparency, and consent in using AI in neuromarketing).
- To investigate how the 6D model of Geert Hofstede can affect the formation of an ethical standard that is relevant to the ethnic background of the audience.
- To find out the perception and behavior of marketing practitioners and consumers towards the use of AI in marketing and data protection issues and bias.
- To identify the best practices in data management and the need for an ethical code from AI ethics experts, data scientists, neuromarketing professionals and policy makers.
- To determine the initial guidelines of the ethics framework in groups of experts from ethical, marketing and consumer advocacy groups.
- To develop an ethical framework that entails principles (such as data protection, openness, and consent and integrate the recommendations from interdisciplinary ethics committees).
- To find out how the use of AI improves the analysis of predictive analytics by explaining human behaviour and decision making and how knowledge management increases the accuracy of these predictive models.
- To find out how the AI technologies offer more accurate analysis of consumer behaviour through patterns of neurodata that are hard to identify using conventional methods to tackle critical ethical concerns like data protection and bias to guarantee consumer trust and marketing strategy sustainability.

Presumptions/ assumptions and limitations

The presumptions of our research are the following:

- Implementing KM systems would be expected to improve the ethical handling of consumer data in the AI-based neuromarketing processes.
- It is expected that acknowledging and solving issues on ethical concerns such as data privacy, algorithmic bias, transparency, and consent will increase consumer confidence in marketing AI.

- It is contended that the Geert Hofstede's 6D model offers a good model of adapting ethical guidelines to cultural differences and, therefore, increase the applicability of ethical standards across the different national cultures.
- A general code of practice for the ethical use of AI in marketing can be developed.
- It is believed that the integration of the opinions of marketing professionals, consumers, AI ethics experts, and policy makers will help to develop a critical and effective and ethical code of conduct.
- It is therefore necessary to use AI in neuromarketing for ethical purposes in order not to violate the rights of the consumer and to steal his or her privacy. Implementing such a code will not only foster trust among consumers but also ensure that AI technologies are utilized responsibly, promoting transparency and accountability in marketing practices.

The limitations of our research are the following:

- The study recognizes that bias in AI algorithms and consumer privacy issues are still major problems that need solutions.
- The success of AI in neuromarketing is dependent on the quality and quantity of the data available which means that data management has to be solid.
- Ethical perception could be different across cultures which makes it difficult to develop a framework that can be used in all organizations and this may need flexibility and compliance to the organization's culture.
- The fast changing nature of AI technologies and neuromarketing strategies they need to be revised from time to time.
- The term 'ethics' can have different connotations in different countries.

DISCUSSION

AI systems can be divided into three main categories, the **narrow or weak AI** (Russell & Norvig, 2020)**,** which is designed to perform specific tasks, the **general or strong AI** (Goertzel, 2014), hypothetical systems capable of performing any intellectual task that a human can perform, with autonomous learning and problem-solving abilities, and **Superintelligent AI** systems that surpass human intelligence in all domains, often a theoretical concept at this point (Bostrom, 2014),

Based on **functionalities, the types of AI** are as follows:

1. **Reactive machines:** These AI models provide responses to certain inputs without the use of previous experiences (e.g. IBM's Deep Blue) (Goodfellow, Bengio, & Courville, 2016)
2. **Limited Memory:** Those AI systems that use the historical data in order to make the decisions, for instance, self-driving cars (Russell & Norvig, 2020).
3. **Theory of mind (experimental):** Theoretical AI that will comprehend emotions and mental states (Tegmark, 2017).
4. **AI with self-awareness (hypothetical):** AI systems that have self-awareness and consciousness.

KM is critical in compiling data for AI-based neuromarketing insights by ensuring that neuro-data is organized and systematically collected and analyzed to understand consumer behavior. This organized KM process enhances the reliability of AI algorithms, enabling them to generate more precise and actionable insights that can significantly improve marketing strategies.

This process is crucial for converting the data into information that can be used to improve marketing strategies. Thus, with the help of AI technologies, businesses are able to capture and make sense of large amounts of data which means that marketing campaigns can be personalized and targeted to the consumer.

However, the use of KM has some implications. Bias in AI algorithms and privacy issues remain important issues that need to be addressed. The effectiveness of AI in neuromarketing is dependent on the data used, thus the need for good data management (Ukil et al., 2023).

In particular, the manner in which KM brings about this change is as follows:

- **Enhanced Data Analysis**: Through the help of the latest in AI technologies, experts can now precisely analyze the neurodata of consumers and detect behaviors and patterns that other methods may not detect (Anupama & Rosita, 2024) AI-driven technologies such as facial recognition and sentiment analysis provide real-time feedback that help in the dynamic optimization of marketing strategies (342 Kusá & Beličková, n.d.)
- **Improved Predictive Analytics:** AI improves the accuracy of predictive analytics by giving insights into consumer behavior and preferences which are very useful in creating relevant marketing strategies (Yadav, 2024) This is because knowledge management ensures that these models are regularly updated and refined to increase their precision with time (Fahim et al., 2024)
- **Ethical Concerns:** The use of AI in neuromarketing is only consider to be ethical in the sense that it is used properly to ensure that the **consumer's rights to privacy** is protected. These ethical concerns should be addressed by the knowledge management systems and specifically by ensuring that there is **transparency** and **accountability** in the **use of data** (Anupama & Rosita, 2024), (Kusá & Beličková, n.d.). Another crucial issue to be addressed is the **protection of consumer data** and the **equality in the use of AI** in neuromarketing, issues that should be addressed in any given market (Semwal et al., 2024). Knowledge management systems are useful in this regard to guarantee the transparency of the process when dealing with such data. Also, the collaboration between AI and human expertise is crucial for the contextual understanding and emotional aspect of marketing strategies (Kotha, 2024), (Semwal et al., 2024). In this context, an **ethical framework** is necessary in order to guarantee the principles mentioned above (data protection, transparency of data processing and collection, and consumer consent for all of the above).
- **Data Collection and Preprocessing:** Neurodata is collected through the use of AI technologies such as EEG, fMRI, and facial recognition to capture the subconscious consumer response to marketing stimuli (Yadav, 2024). Effective KM involves preprocessing this data to make sure that it is accurate and relevant which is very vital in order to produce good analysis and insights (Kopare et al., 2024).
- **Pattern Recognition and Predictive Analytics:** This is because AI improves the capacity to detect important patterns in neurodata which means that companies can understand consumer preferences and behaviors that they may not have been able to identify using other methods (Anupama & Rosita, 2024). Machine learning algorithms are used to forecast the future behavior of consumers and provide real-time personalization and targeted marketing solutions (Kopare et al., 2024).
- **Personalization and Customer Engagement:** The process of organizing and analyzing data by AI-driven insights produces marketing initiatives that are emotionally powerful and

customized to meet consumer preferences (Anupama & Rosita, 2024). The combination of artificial intelligence and human expertise in marketing operations has been found to greatly enhance customer engagement and conversion rates (Kotha, 2024).

CONCLUSION

Integrating AI in neuromarketing raises ethical concerns, especially regarding consumer privacy, data security, and the potential for manipulation. An ethical code of conduct is needed to ensure that AI applications in neuromarketing are both effective and responsible. This code should consider cultural sensitivities and promote responsible innovation that respects consumer rights. KM plays a crucial role in shaping the ethical framework for AI in neuromarketing. It ensures that AI applications are used responsibly by managing and organizing data effectively. KM enhances data analysis, improves predictive analytics, and addresses ethical concerns through transparency and accountability. The ethical framework should include values such as data protection, transparency, and consent. It should also involve interdisciplinary ethics committees in decision-making. Adaptability to different cultural contexts, using models like Hofstede's 6D model, is essential for international applicability.

Bias in AI algorithms and consumer privacy issues remain significant problems. The effectiveness of AI in neuromarketing depends on the **quality and diversity of data**. **Differing ethical perceptions across cultures** pose challenges in developing a universally applicable framework. The **rapidly changing nature** of AI technologies and neuromarketing strategies requires continuous revision of ethical guidelines. AI improves the accuracy of predictive analytics by providing insights into consumer behavior. It enhances the ability to detect patterns in neurodata that are difficult to identify using conventional methods. AI-driven insights can personalize marketing initiatives and enhance customer engagement.

Potential Fields for New Research and Dilemmas

In terms of potential areas of research and development, new strategies could be developed to mitigate the bias in AI algorithms used in neuromarketing for equal and fair outcomes. There is also scope for further exploration and development of new robust protocols for protection policies aimed at data protection in neuromarketing applications as well as consumer privacy. In the same context, further investigation is needed on the issue of power imbalance between businesses and consumers in the context of AI-enabled neuromarketing and the need to maintain the balance.

In another aspect, there is a large field of research concerning the impact of AI-based neuromarketing on vulnerable groups as well as the establishment of ethical recommendations to protect them.

There is also an important field of research to monitor the medium-term effects of personalised marketing on consumer autonomy and decision-making.

With regard to the data collection mechanism, further research can be done to assess the success of different strategies to obtain consumer consent for the use of their data in neuromarketing, while in a parallel context the possibility of establishing and implementing international standards and norms for the ethical use of AI in neuromarketing, which takes into account cultural differences and legal systems, can be explored.

Finally, a particularly important area of investigation is opening up with regard to the combination of the use of AI with other new technologies, such as virtual and augmented reality in neuromarketing, and the ethical issues involved.

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