

EMOTIONAL BOTS, ARTIFICIAL INTELLIGENCE AND 10G NETWORK: THE FOUNDATION OF A NEW DIMENSION AND PERSONALIZED MARKETING

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ABSTRACT

For decades, advancements in different technologies have shaped personalized marketing strategies. Recently, the emergence of emotional chatbots empowered by AI and soon widely supported by 10G network has introduced new possibilities for adaptive consumer interactions and real-time, ultra-high data transfer rates. Employing a qualitative methodology, this research synthesizes findings from a review of current literature on emotional bots, 10G network, neuromarketing, and AI ethics. Additionally, case studies illustrate practical applications and evaluate diverse technological approaches. The findings demonstrate that empathetic, socially oriented chatbots significantly improve consumer emotions, satisfaction, and trust during engagements, thereby enabling brands to build deeper and more authentic relationships with their customers. This emotional connection, when supported by advanced technologies such as a 10G network, allows for real-time, hyper-personalized interactions that further strengthen customer loyalty and enhance overall marketing effectiveness. At the same time, ethical issues such as algorithmic bias require attention through bias detection tools, fairness-aware machine learning practices, and transparent governance mechanisms using explainable AI. These insights underscore the transformative potential of emotionally intelligent AI supported by innovative network capabilities for enhancing personalized marketing while highlighting the necessity of responsible AI deployment.

KEYWORDS: emotional bots, 10 G network, personalized marketing, artificial intelligence

1. INTRODUCTION

The integration of emotionally intelligent artificial agents with 10G network infrastructure represents a frontier in consumer neuroscience, enabling real-time decoding of psychophysiological states for hyper-personalized marketing. Grounded in Picard's [1995] foundational work on affective computing, modern emotion AI leverages multimodal affect detection - facial action coding, prosodic analysis, and EEG (Electroencephalography) correlation - to surpass traditional sentiment analysis [D'Mello and Kory, 2015].

This technological advancement is further boosted by the emergence of a 10G network, providing exceptionally high data transfer speeds and supporting connectivity for a large

volume of devices [Reeves, 2024]. These features enable seamless, real-time emotional exchanges between consumers and brands, creating a new era of interactive and adaptive marketing experiences. Also, recent systematic reviews verify that fMRI (functional Magnetic Resonance Imaging) and other neuroimaging techniques are used across the board in neuromarketing studies to measure neural response to marketing stimuli, especially in prefrontal regions commonly linked to emotion, preference, and decision-making [Aditya and Sarno, 2018; Kopton and Kenning, 2014].

Previous research has found that chatbot communication style and empathetic comprehension are the strongest predictors of consumer satisfaction, trust, and engagement, particularly in service settings. Cai et al. [2024] established that chatbots using a social-oriented and empathic communication style have significant effects on user satisfaction even when bad experiences occur. Perceived competence and warmth also mediate the impact, such that social bots outperform task bots in minimizing consumer negative affect.

Similarly, Al-Oraini [2025] demonstrated that trust, perceived competence, and social-oriented communication style are the strongest predictors of customer satisfaction with AI-driven chatbots. Furthermore, Paulsson et al. [2025] have recently confirmed that perceived reliability and empathy are significant predictors of consumer confidence in AI customer service chatbots. Customers require not only technical correctness but also emotional correspondence and an empathic approach from AI bots; thus, emotional intelligence emerges as the prime element of digital trust establishment.

On a broader scale, advanced AI technologies enable companies to craft marketing messages and product suggestions that align closely with the emotional profiles of their audience, creating more impactful and tailored interactions [Korath and Sangheethaa, 2024]. As these systems become increasingly skilled at interpreting and responding to human emotions, experts caution that they could create a sense of artificial closeness and emotional reliance. This development introduces complex ethical and psychological considerations for both businesses and their customers [Fang et al., 2025; Wu, 2024].

Nevertheless, in situations that demand higher ethical standards, a strong legal framework is essential. The challenge of algorithmic bias in emotion recognition, especially across diverse demographic groups, demands clearer standards for accountability. As per Wachter et al. [2017], GDPR does not imply a legally binding "right of explanation" for decisions made by computerized (automated) systems. Instead, it offers a narrower "right to be informed," including the logic, meaning, and implications of the computerized (automated) decision process. The European Court of Justice (CJEU) has declared that a person is entitled to be given a clear and transparent explanation whenever a computer-made decision affects them [Cooper et al., 2025]. This must involve being aware of what data was used, in what way, and how it has influenced the decision, as well as what the most likely consequence could be, preferably based on concrete facts [Stibbe, 2025].

2. METHODOLOGY

For this paper, a qualitative methodology was applied. The primary research method is a systematic review of relevant scientific and professional literature in the field of emotional bots, 10G network, personalized marketing, neuromarketing, and AI ethics. The review included the latest research articles, review papers, books, and reports addressing the

development and application of emotionally intelligent bots in marketing, the impact of 10G network on digital transformation, and personalized user experience.

The literature review enables the identification of key trends, challenges, and opportunities, as well as a critical analysis of existing solutions and recommendations for future development [Paré and Kitsiou, 2017]. In addition to the literature review, a case study approach was used to illustrate concrete applications of emotional bots that are currently in use. Based on the previously stated developments, challenges, and represented methodology, several research questions arise that guide this study:

RQ1: How do emotionally intelligent AI agents integrated with a 10G network enhance personalized marketing and consumer engagement?

RQ2: What are the key ethical and governance challenges associated with AI emotion recognition technologies in marketing?

RQ3: What are the practical applications of emotional bots, and how do they impact users?

These questions frame the scope of this paper, which seeks to provide a comprehensive analysis of the opportunities and risks presented by the upbringing of emotional bots and next-generation network technologies in the context of personalized marketing.

3. LITERATURE REVIEW

Recent research papers underscore the transformative impact of emotionally intelligent chatbots and emotion AI in marketing. Emotion AI enables machines to recognize, interpret, and respond to human emotions, thereby enhancing the quality of human-machine interaction and customer experience [Al Mazrouei, 2025; Chaturvedi et al., 2025].

A systematic review of AER (automated emotion recognition) in marketing points to the application of sophisticated tools such as Noldus FaceReader and iMotions for real-time, large-scale emotion analysis in e-commerce and social media environments [Bohorquez Camacho et al., 2025]. Positive emotional expressions (e.g., happiness, surprise) are linked to higher purchase intentions, while negative emotions can reduce engagement and sales. The literature also notes that the effectiveness of emotional bots depends on the quality of information, system reliability, and the ability to deliver both hedonic (pleasure-related) and utilitarian (task-related) value to users [Križanec Cvitković et al., 2025].

Furthermore, the launch of 10G network infrastructure is a key enabler for real-time, hyper-personalized marketing. A 10G network offers ultra-high data transfer rates, low latency, and massive device connectivity, supporting seamless data exchange between consumers and brands [CableLabs, 2019]. In today's digital world, 10G will enable innovators to create a wide variety of new services and applications that will revolutionize everything about the way we live, learn, work, and play [Dietz, n.d.]. This technological leap is allowing the integration of advanced AI systems, including emotional bots, into marketing ecosystems, enabling real-time emotional data analysis and adaptive marketing strategies. A fundamental driver of the economic value of 10G resides in its capability to enable innovative applications and use cases. These applications will be deployed within the consumers, enterprises, and public services markets. They will have a significant impact on enterprise productivity, health care, and consumer well-being [Katz and Callorda, 2020].

Moreover, AI-driven personalization is revolutionizing how brands interact with consumers. By analyzing vast amounts of customer data, purchase history, browsing behavior, and social media activity, AI systems can deliver highly tailored content, offers, and recommendations. This approach increases customer engagement, loyalty, and conversion rates [Sario et al., 2024; Upadhyaya, 2024]. For example, Amazon's recommendation engine is responsible for 35% of its total sales [Marianantoni, 2025], while Netflix attributes 80% of its views to AI-driven content suggestions [Krysik, 2024]. In e-commerce, AI-powered personalization has led to measurable improvements in customer satisfaction, repeat purchases, and operational efficiency.

Nevertheless, consumer neuroscience research, using tools like fMRI, EMG, GSR, and ECG, reveals that emotional engagement activates brain regions associated with decision-making and preference formation [Alsharif and Khraiwish, 2024]. Automated emotion recognition systems are increasingly used to decode consumer responses to marketing stimuli, enabling brands to segment audiences based on emotional profiles and deliver more effective, personalized experiences [Bohorquez Camacho et al., 2025]. The integration of emotion AI with neuroscientific insights allows marketers to refine strategies and establish deeper emotional connections with consumers.

These findings directly inform and contextualize this study's focus on how advanced emotional bots and network technologies might redefine consumer-brand interactions and support systems. Thus, the review sets a foundation for addressing the research questions regarding both enhanced 10G network personalization in marketing (RQ1) and practical applications of emotional bots (RQ3).

Alongside its many advantages, the deployment of emotional AI and hyper-personalized marketing presents significant ethical and governance challenges. Key concerns include, once again, algorithmic bias. At the same time, privacy and data security are also critical, given the sensitive nature of emotional data, which requires strong protection measures and explicit user consent [Denecke and Gabarron, 2024; Wu, 2024]. As emotional AI becomes more advanced, it also increases concerns about pseudo-intimacy and emotional manipulation, potentially undermining user autonomy and well-being [Wu, 2024].

Recent research on AI regulation and data ethics highlights how biases can develop due to low-quality training data, weak model assumptions, or limited dataset diversity, usually in a manner that causes discriminatory decisions, reinforcing or deepening existing social inequalities [Bahangulu and Owusu-Berko, 2025; Holistic AI, 2024]. To tackle these issues, organizations are encouraged to adopt bias detection tools, develop machine learning models that prioritize fairness, and conduct ongoing inspections that involve a wide range of stakeholders throughout the AI development process [Wiggins, 2025]. Strong governance also requires clear accountability measures, transparency in how algorithms are created, and the use of explainable AI (XAI) techniques to help people understand and, if needed, intervene in automated decisions [Phiri, 2023; Schneider, 2025]. These insights form the basis for addressing RQ2, which examines key ethical and governance challenges of AI emotion recognition technologies.

3.1. CASE STUDIES AND EXAMPLES OF EMOTIONAL BOTS

Literature reviews, in the absence of concrete case studies, may remain abstract and insufficiently grounded in real-world applications. With that being said, the next part of the paper presents and explains the use cases of emotional bots - with a particular focus on their practical implications and user impact, as explored in RQ3.

The first example is Replika. Replika is an AI chatbot specifically designed to provide users with emotional companionship and support. Its architecture supports adaptive, continuous conversations where the bot learns from user interactions, slowly customizing its responses to match the user's personality, preferences, and emotional states. Most users also report a strong emotional connection with their Replika, often addressing it as a friend or even confidant. Possati's [2023] analysis presents a unique psychoanalytic perspective on Replika, highlighting that the bot is more than just a technology or an app - it is also a psychosocial construct shaped by the unconscious influences of both its creators and users. Possati [2023] explains that Replika was rooted in personal trauma and loss of its creators, which shapes Replika's design and purpose narrative. This background influences how users interact with the bot and how they express their unconscious desires, fears, and needs to the AI. In marketing, this approach enables extremely personalized and emotionally resonant experiences that create a tight bond between brands and customers. With the responsiveness and strength of a 10G network, AI platforms can react instantly to user behavior, creating captivating experiences that build trust, loyalty, and a sense of greater proximity to the brand.

Additionally, EmpathyBot is a prototype robot service that identifies and addresses human emotions using facial emotion recognition and cloud-based AI. It is built on the Raspberry Pi platform, utilizing a camera and sensors, as well as the Google Cloud Vision API to detect emotional facial expressions of happiness, sadness, anger, and surprise in real-time [Dexter Industries, n.d.]. After detecting a person, the robot, with the use of an ultrasonic sensor, captures an image of their face. Then, this photo is dispatched to Google Cloud Vision, which examines facial expressions and returns a list of likely displayed emotions. EmpathyBot then adjusts its chat responses appropriately, based on the identified state of emotion, to offer empathetic and contextually appropriate interactions [Dexter Industries, n.d.]. The use of technology like EmpathyBot in marketing strategies adds another level of hyper-personalization, in which the emotional state of the user has a direct influence on the marketing interaction, elevating customer experience to a more responsive, human-empathetic extent. This kind of empathetic response system is right in harmony with directions in personalized marketing that are centered around building long-term brand relationships.

One more example in this domain is Realeye. It is an organization that uses leading-edge neuromarketing tools such as eye-tracking and facial coding to measure customers' emotional reactions to advertising content [Neuroscience Marketing, n.d.]. Unlike surveys, Realeyes captures actual behavior and feelings, allowing brands to see how individuals honestly respond to ads and content. This information enables brands to offer more tailored marketing strategies according to real user emotions and interaction, enhancing the performance of ads. Realeyes also utilizes AI to track video content, monitoring attention, emotional interest, and viewer fatigue for enhanced digital advertising [Realeyes, n.d.].

The examples like Replika or Realeye clearly illustrate how emotionally intelligent chatbots and similar technologies can be leveraged to deliver highly individualized experiences and psychosocial support across various service domains, aligning with both primary research questions of this paper. This integration of technological and psychological innovation underscores not only the growing possibilities for deeper consumer engagement but also the real-world impact of such solutions [Dexter Industries, n.d.; Possati, 2023; Realeyes, n.d.]. This is especially important in marketing, where the ultimate focus lies on creating added value for the customer, making emotionally intelligent technologies crucial for enhancing personalized customer experiences and building stronger brand relationships.

4. CONCLUSION AND LIMITATIONS

In response to the first research question - how emotionally intelligent AI agents integrated with 10G network enhance personalized marketing and consumer engagement - the findings demonstrate that the ultra-fast, low-latency connectivity enabled by 10G network is a key enabler for real-time emotion recognition and adaptive communication. This synergy allows for brands to send highly personalized and emotionally resonant marketing messages, significantly boosting consumer engagement, increasing user satisfaction, and strengthening credibility and trust in their communication [Al-Oraini, 2025; CableLabs, 2019; Korath and Sangheethaa, 2024; Paulsson et al., 2025]. In conclusion, the results for RQ1 indicate that emotionally intelligent AI agents combined with a 10G network bring new possibilities of personalized marketing through instant, emotion-sensitive interaction that deepens consumer engagement and brand trust. The author is convinced that the union of these technologies represents a key step towards responsive marketing systems with an emphasis on consumers' emotional behavior.

As of governance and ethics question (RQ2), the study identified several challenges, particularly how consent management and privacy issues, as well as algorithmic bias, can become problematic for emotion recognition technology. To address these challenges, implementing open data practices, designing transparent algorithms, communicating openly, fostering user engagement, and ensuring constant monitoring are crucial to prevent manipulation and discrimination. Everything stated is essential to maintain user trust and ethical practice in an increasingly complicated digital world [Bahangulu and Owusu-Berko, 2025; Holistic AI, 2024; Wiggins, 2025]. Resolving ethical and governance issues such as privacy, bias, and consent will be essential to maintaining trust and equity in the application of emotion recognition technology. The author emphasizes that transparency, especially towards users, and good regulation are key ways through which companies can make such technologies serve society ethically.

Regarding the usage of AI emotional bots and their impact on users (RQ3), these systems have already demonstrated concrete value in numerous service areas, most prominently in customer (marketing) services. Their capability in recognizing and appropriately reacting to users' emotional cues enables better problem resolution as well as improves overall user experience. Examples include Replika, which builds deep emotional bonds through adaptive conversations [Possati, 2023]; EmpathyBot, which recognizes and responds to user emotions in real time [Dexter Industries, n.d.]; and Realeye, which tracks genuine emotional reactions to ads to tailor marketing strategies better [Realeyes, n.d.]. Applying these technologies with a 10G network brings a new level of personalization, instant responsiveness, and emotional connection, significantly enhancing user-brand relationships.

Hyper-personalized marketing is truly seen through emotionally intelligent bots that deliver highly tailored, adaptive, and emotionally aware customer interactions. It improves customer engagement, satisfaction, and loyalty by addressing both practical requirements and emotional/psychological ones. Therefore, the application of emotional bots enhanced by a 10G network in marketing represents a transformational shift, bringing together emotional intelligence, real-time responsiveness, and data-driven personalization to fuel customer relationships and drive business success.

The study also acknowledges its limitations. First and foremost, it relies primarily on secondary literature and theoretical analysis, which limits its applicability to specific real-world contexts and dynamic technological developments. Secondly, due to page limitations, this literature

review is brief - a more comprehensive and detailed analysis is necessary to obtain a broader picture. Furthermore, rapid advancements in emotion AI and a 10G network may cause some findings to be outdated without continuous empirical validation. Additionally, ethical considerations are discussed conceptually, but there is a lack of in-depth case-based insights into real-world challenges. And lastly, the interdisciplinary complexities of AI governance are not fully addressed in this context, underscoring the need for collaborative, empirical, and longitudinal research to validate and extend these findings.

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