# Chapter 15
# fMRI, EEG, and Eye Tracking

**Pawan Kumar**
https://orcid.org/0000-0003-2059-9818
*SRM University, India*

**Aayushi Jain**
https://orcid.org/0009-0007-9322-1775
*SRM University, India*

## ABSTRACT

*This chapter investigates the developing topic of neuromarketing and its possible impact on consumer purchasing decisions. Neuromarketing integrates neuroscience, psychology, and marketing to better understand consumer decision-making. This chapter explores neuromarketing techniques like FMRI, EEG, and Eye tracking and how they reveal subconscious elements that impact consumer behavior. This chapter raises ethical questions about neuromarketing, specifically the manipulation of customer behavior. It indicates that neuromarketing has the potential to transform how marketers understand and affect consumer behavior. Neuromarketing has the ability to transform how organizations understand and interact with customers. Keywords: Neuromarketing, FMRI, EEG, Eye Tracking, Marketing, Consumer Buying Behaviour*

## INTRODUCTION

Marketing has evolved significantly since its inception, but the underlying principle remains the same: to promote a company's products or services. Historically, marketers depended primarily on impersonal, wide campaigns like print ads,

DOI: 10.4018/979-8-3693-8222-6.ch015

television commercials, and billboards. Marketing is now a game of developing genuine relationships, gaining customer trust, and targeting a specific audience *(Bartels, 1976)*. In the nineteenth century, businesses attempted to capture consumers' attention through sales promotions and advertising in newspapers, radio, and television. Companies began investing a lot of money on commercialization. It began to grow swiftly but soon faded due to customer memories *(Mari, 2020)*. Users interact with mass media platforms at their own pace and retain information for a long time. When mass media was compared to digital marketing, it was discovered that digital marketing has greater control over the content of commercials, which consumers can recall easily. With the increased use of the internet, digital marketing has emerged as a shining star in the world of marketing, displaying advertisements through social media platforms such as Facebook and Twitter. It has a significant impact on consumer decision-making. However, consumers frequently wonder why we want something, and the responses to this question are sometimes ambiguous. People are unable to express their opinions on their behavior and preferences for a particular product *(Srivastava & Bag 2024)*. Martin Lindstrom is the individual who decided to investigate the factors that contribute to the success or failure of brands today *(Lindstorm, 2008)*. He capitalizes on the Neuromarketing movement, promising to uncover the realities and falsehoods behind why we buy.

Neuromarketing was introduced in 2002 by Ale Smidts. Neuromarketing is a cutting-edge marketing field that employs neuroscience to investigate consumer behavior. The application of neuroscience to marketing is known as neuromarketing. Neuroscience is the study of how the nervous system develops and is structured *(Kahneman, 2011;Gakhal & Senio, 2008)*. Neuroscience aims to unlock the intellect and radically alter the purchasing process of each commodity or service through the application of market research results. This type of marketing uses cutting-edge neuroscience techniques like brain imaging, eye tracking, and facial recognition technologies to get insights into how individuals think and make purchasing decisions. It also aims to unearth underlying reasons that can assist brands in better connecting with their intended audience *(Lindstrom, 2008;* Stasi et al., 2018; Bhardwaj, Kaushik, & Arora, 2024*)*.

The basic goal of neuromarketing is to understand the interaction between customers and brands, specifically why people choose certain products or services over others. To do this, neuro marketers employ a variety of research techniques, including EEG scans (to measure electrical activity in the brain), eye tracking (to assess visual attention), and facial recognition software (to study emotional responses). Brain scanning enables brands to track all brain activity, such as eye movement, pupil change, face expression, heart rate, and emotions, and provides them with client insights *(Garcia and Saad, 2008;Leiva et al., 2019)*. By gathering data from these tests and analyzing it using advanced algorithms, neuromarketers can acquire