



## Neuromarketing: An Emerging Tool of Market Research

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### ABSTRACT

In recent years, a new tool of marketing research has evolved i.e. neuromarketing, which makes use of brain research in a managerial context, has gained increasing popularity in the academic literature as well as the practical world. Neuromarketing, that caught fancy of imagination of advertisers in early 2002, aptly cuts down the path and process probing minds and makes it considerably simpler for the advertisers. Paper studies the conceptual role of neuromarketing as an effective tool for marketer in new era of markets research for our today's intelligent buyer. The objectives of our study focus on the stance and emergence of neuromarketing as well as the practices involved in current scenario as neuroimaging, EEG, FMRI, Eye Tracking etc. Paper measure the consumer dialectic *consumers contradict themselves, saying what they want, but doing what they feel*" Nowadays marketing research has been oriented towards four components of consumers as: *physical body, mind, heart and spirit* with the help of practices of Neuromarketing.

**Keywords---** Neuromarketing, Brain research, Neuroimaging, Eye Tracking, EEG, FMRI

### I. INTRODUCTION

NEUROMARKETING-where brain science and marketing meet in very simple terms, Neuromarketing is medical knowledge, technology and marketing. Neuromarketing is a new field of marketing that studies the consumer's response to marketing stimuli. Neuromarketing is the application of neuroscience to marketing. Neuromarketing includes the direct use of brain imaging, scanning, or other brain activity measurement technology to measure a subject's response to specific products, packaging, advertising, or other marketing elements. In some cases, the brain responses measured by these techniques may not be consciously perceived by the subject; hence, this data may be more revealing than self-reporting on surveys, in focus groups, etc.

### II. CONCEPT OF NEUROMARKETING

This concept was developed by psychologists at Harvard University in 1990. The word Neuromarketing was coined by Ale Smidts in 2002. It is an emerging branch of neuro science in which researchers use medical technology to determine consumer reactions to particular brands, slogans and advertisements. The first ever Neuromarketing conference was held in 2004 at Baylor College of Medicine in Houston. The base of Neuromarketing is "meme". Meme is a unit of information stored in the brain. These units are effective influencing human who is making choices and decisions within 2.6 seconds. If meme is chosen properly we remember the good, joke or song and would share it. Memes stay in our memory and are affected by marketers.

Thus, Neuromarketing is a promising and emerging field with tremendous potential for application in the functional areas of marketing, brand management and advertising. It has emerged after bringing together applicable concepts from the field of neural-science, psychology, human neuro-physiology and even neurochemistry.

*"Understanding the human mind in biological terms has emerged as the central challenge of science in the twenty-first century."* -By Dr. Eric Kandel, Neuroscientist and winner of the Nobel Prize for Physiology or Medicine Millions of people in our global economy have jobs that depend on communicating with and persuading the human brain. So it is vital for us to understand how the human brain really works, what is attractive to it, how it decides what it likes or dislikes or how they decide to buy or not buy the infinite variety of products and services. *"We have learned more about the brain in the last five years than in all human history combined"*. -By Charlie Rose

This has really widened the scope of Neuromarketing. The concepts of Neuromarketing provide a real competitive advantage in a crowded and cluttered

market. The languages of consumers change from country to country and culture to culture, however the language of human brain is the same i.e. universal. Thus, Neuromarketing has greatly affected products, brands, packaging, and advertising as well.

### III. LITERATURE REVIEW

Marketing has traditionally concentrated on the value and competitive advantages of a product or service. However, a more holistic approach to marketing, including the emotional component of the decision-making process is gaining considerable ground in contemporary marketing (Suomala et al. 2012, p. 12).

This line of research corresponds very well with Kotler's latest notion of marketing, *Marketing 3.0*, in which he argues for a need of companies to address consumers as whole human beings, which he defines as consisting of four components: *physical body, mind, heart and spirit* (Kotler et al. 2010, p. 34) In other words, Kotler now argues for the need of companies to address the emotions of their customers and aim to understand their anxieties and their desires, if they want to succeed in the contemporary marketing landscape.

Neuromarketing emerged in the early 2000s and quickly gained great popularity, both within academic and business fields (Fischer et al. 2010, p. 231). Despite the emerging nature of neuromarketing, no particular scholar can be credited as the architect of the practice.

The first studies using neuroscientific tools to link affect and electrical patterns in the brain date back to 1979 (Morin 2011, p. 133) and the application of neuroscience to branding and consumer psychology can be traced even further back. In the book *"The Hidden Persuaders"* published in 1957, the author explores the "(...) possibilities of using the insights of psychiatry and the social sciences to influence our choices and our behaviour" (Packard 1957, p. 1). Packard suggests motivational research and the depth approach (the whys of our behaviour) as a means to research and to approach consumers' unconscious minds, as he acknowledges that consumers' actual buying behaviour often differ from what they say themselves about their buying patterns and buying motivation (Op.cit., pp. 4-13).

Best-known technology of neuromarketing was developed in the late 1990s by Harvard professor Jerry Zaltman (Gerald Zaltman), once it was patented under the name of Zaltman Metaphor Elicitation Technique (ZMET). The essence of ZMET reduces to exploring the human unconscious with specially selected sets of images that cause a positive emotional response and activate hidden images, metaphors stimulating the purchase. Graphical collages are constructed on the base of detected images, which lays in the basis for commercials. Marketing Technology ZMET quickly gained popularity among

hundreds of major companies-customers including Coca-Cola, Genera Motors, Nestle, Procter & Gamble.

During the past decade, methods and insights from the field of neuroscience have received great interest and attention in the field of marketing and consumer research and a hybrid has emerged from the two: neuromarketing. Put in a very simplistic way, neuromarketing can be defined as any marketing or market research activity, which uses methods, techniques or insights from the field of neuroscience (Genco et al. 2013, p. 8).

*"locate a mythical region of the human brain that when activated would drive subsequent consumer behavior, perhaps without consumers being consciously aware of this"* (Op.cit., p. 264).

According to Martínez, author of 'The Consumer Mind' (2012), consumers' minds can be differentiated within four categories; between what they think, what they say, what they do and what they feel (Martínez 2012, p. 5). Martínez emphasises that a critical point of traditional marketing research is that "(...) consumers contradict themselves, saying what they want, but doing what they feel" (Ibid.). Thus, Martínez argues that neuromarketing will help marketers acquire more objective information from and about consumers, than through use of traditional marketing tools such as surveys and interviews. Martínez proposes that the most efficient way to apply neuroscience in relation to marketing is through a combination of qualitative, quantitative and neuroscience research, as they hereby will complement and support each other, yielding the richest information possible (Op.cit., p. 6).

It is the attempt to pinpoint how and where our brain reacts to marketing and advertising stimuli and the attempt to measure the impact of such stimuli. From a general perspective, neuroscientific methods are used to study consumer behaviour, the decision-making processes, emotions in purchase decisions, and marketing phenomena through analyses of the underlying neurobiology (Javor et al. 2013, p. 2).

In neuromarketing, systems neuroscience, which is the study of how different brain areas or complex brain systems interact, is the main focus (Braeutigam 2005, p. 350). A critical distinction is made between *consumer neuroscience*, referring to academic research at the intersection of neuroscience and consumer psychology, and *neuromarketing*, referring to commercial interest in neuro-physiological tools (Javor et al. 2013, p. 3). There are several ways to measure physiological responses to advertising.

Neuromarketing is an emerging field which bridges the consumer purchase decision with neuroscience (Christophe, 2011). Neuromarketing is advancing rapid believability and acceptance among advertising professionals. As everything depends on consumers' willingness and competency to describe how they feel when they are exposed to an advertising campaign,

conventional methods for testing and predicting the effectiveness of huge investments generally have a minimal effect. Cutting edge methods for directly probing minds without requiring demanding cognitive or conscious participation are offered by neuromarketing.

Michael J.R. Butler (2008) determines the emerging field of neuromarketing as a knowledge which has malleability. Different marketing researchers perceive the development and application of neuromarketing knowledge in dissimilar manners. Having different perceptions of knowledge is not a new issue, but finding new interconnections between those perceptions is beneficial to knowledge creation and diffusion. The research–practice gap in neuromarketing was briefly discussed and then resolved through the contribution of that commentary, the proposal of a novel Neuromarketing Research Model. The Model interconnects basic research reporting, applied research reporting, media reporting and power processes.

In neuromarketing, brain stimuli and social interaction are central concepts to understand what motivates consumer behaviour to make the buying decision (Henrik Waltera et al., 2010). Both concepts are investigated in consumers using neuroimaging methods.

The term “neuromarketing” (NM) is a recently invented moniker. The Economist (2004) credits Jerry Zaltman with initially proposing a union of brain-imaging technology with marketing in the late 1990s, and when the Atlanta marketing firm, BrightHouse, opened a neuromarketing division in 2001, the synthesis of neuroscience and marketing began to attract attention in science, business, and journalism. Neuromarketing has been described as “applying the methods of the neurology lab to the questions of the advertising world” (Thompson 2003, 53).

Recently, the International Journal of Psychophysiology called neuromarketing “the application of neuroscientific methods to analyze and understand human behavior in relation to markets and marketing exchanges” (Lee, Broderick, and Chamberlain 2007, 200). Indeed, improvements in neuroimaging technologies have and will continue to advance our knowledge of how people make decisions and how marketers can influence those decisions.

#### IV. RESEARCH OBJECTIVES

- To study the stance of Neuromarketing in current scenario.
- To identify the various techniques used in Neuromarketing.

#### V. RESEARCH METHODOLOGY

Study determine the need for the Exploratory research to understand the conceptualization of

Neuromarketing in the minds of the consumer and marketer. An exploratory research is also attempt to lay the groundwork that will lead to future studies, or to determine if what is being observed might be explained by and examine in the light of the existing literature. Thus qualitative research is conducted with the help of secondary data, previously existing literature review, facts sheet journals and magazines.

### VI. NEUROMARKETING: AN EMERGING

The emergence of Neuromarketing has been reflected in almost all fields of industry as Automobile industries, the IT industries, FMCG Sector and then lastly turn our attention to the entertainment industry. Some Major Stance of its presence are:-

**Hyundai Motors** uses EEG-tests in the design-process of their cars to measure consumers’ reactions, when looking at specific parts of a car’s exterior design. As Macko, manager of brand strategy at Hyundai Motors, expresses it: “*We want to know what consumers think about a car before we start manufacturing thousands of them*” (Burkitt 2009).

**Cheetos** The Orange Underground the American snack producer Frito Lay has used neuromarketing on several occasions (Brat 2010). Through use of neuroimaging Frito Lay found that the glittering, bright-coloured packaging they were using for potato chips in 2008 triggered the anterior cingulate cortex of the brain, an area associated with feelings of guilt. When testing another type of packaging in matte beige colours with images of potatoes and other ingredients perceived as healthy, no activity of the anterior cingulate cortex was evident. Thus, Frito Lay switched out of shiny packaging and opted for the matte design with healthy ingredients depicted instead (Burkitt 2009).

**Yahoo** has a 60-second television commercial that features happy, dancing people around the world. Before spending the money to air the ad on prime-time and cable TV, as well as online, Yahoo ran it by EEG-cap-wearing consumers.

**Ebay’s PayPal** hopes to persuade more e-shoppers to use its online payment service by pitching it as fast. Brain-wave research convinced PayPal that speed turns people on more than safety and security, the earlier themes in its ad campaigns.

**Microsoft** is using EEG data to demonstrate how engaged gamers are when they use an Xbox. Working with EmSense, Microsoft put EEG caps on gamers and showed them ads on the videogame system. It tracked which parts of the brain were stimulated by the ads.

**Ford Motor** DaimlerChrysler, Ford of Europe and other automakers are using medical research tools to examine the way consumers think so they can make sales messages more effective. Among the provocative early

results from electrodes-on-the-scalp and Magnetic Resonance Imaging scanner research: Images of sports cars affect the pleasure center of the male brain the same way as sex, cocaine and chocolate.

In a study from the group of Read Montague published in 2004 in *Neuron*, 67 people had their brains scanned while being given the "Pepsi Challenge", a blind taste test of Coca-Cola and Pepsi.

#### **Media**

Within the business of media, neuromarketing is often applied. For example to test consumers' reactions to movie scripts or trailers, to see which parts of a website attract the eyes of the visitors or to see how people react to certain songs. It is, however, rare that movie studios, moviemakers or others in the business willingly admit to the use of the practice (Randall 2011).

## **VII. RISING USAGE OF NEUROMARKETING**

Neuromarketing has been growing in leaps and bound, and may startups has evolved with the neuromarketing as their major line of service some examples of neuromarketing companies, those are framing marketing mix of renowned marketer are :

- **Brighthouse** The American advertising company Brighthouse was the first to introduce the word neuromarketing in a press release in 2002.
- **NeuroFocus** (Now Nielsen Consumer Neuroscience) NeuroFocus was an American neuromarketing company, which was acquired by the worldwide market research company The Nielsen Company in 2008 and was thus renamed Nielsen Consumer Neuroscience. **Millward Brown** Millward Brown, was founded in Britain and now has several locations in Europe, America, Asia, Middle East and Africa. (Millward Brown 2014c).
- **Neurosense** London-based Neurosense was founded by Gemma Calvert and was allegedly the first to conduct fMRI scans for commercial use (Neurosense 2013a. Neurosense lists several famous brands among their clients, i.e. **BBC, Coca Cola, Ford, Heinz, Intel and L'Oreal (Neurosense 2013b).**
- **Neuro---Insight** Neuro-Insight was founded by Professor Richard Silberstein in 2005, operates in the USA, UK, Germany and Australia and offers neuromarketing services specializing in the field of marketing communications (NMSBA 2013).

## **VIII. TOOL AND TECHNIQUES OF NEUROMARKETING**

**EEG Analysis:** EEG is the abbreviation for Electroencephalography, which means an electrical reproduction of brain activity (Postma, 2012). Although the technique of EEG is a relatively old method, it is still considered to be an appropriate way to measure changes in the electrical field in certain brain regions (Ariely, & Berns, 2010; Morin, 2011; Camerer, Loewenstein, & Prelec, 2004; Madan, 2010). Electroencephalography is a process of brain scanning method that records the electrical activity on the scalp produced by the brain. Electrodes placed on the scalp pick up the subtle changes in electrical activity. We use both 16 and 32 channel EEG systems. The computer records the brain's electrical activity on the screen or on paper as waves. Our in-house designed software analyses the EEG data collected.

**HD EEG :** It is an updated form of EEG can gather very accurate brain activity information while the consumer is exposed to a particular stimulus. This EEG system has 256 channels and has a very deep brain signal analysis with regards to source localization. Additionally the data gathered will allow us to produce highly accurate heat map images of the brain processes which will be included in the report produced.

**Galvanic Skin Response:** Galvanic Skin Response, or skin conductance, is used to measure the temperature of the skin and its electrical conductance, which varies depending on the skin moisture level. Skin conductance is used to identify and measure psychological and physiological arousal. It's most common use is in lie detecting technology. The pulse rate is also measured through galvanic skin response. The fluctuations in the pulse reveal the level of excitement or stress that the person experiences as a response to certain triggers.

**Eye Tracking** Eye tracking technology is used to track the eye positioning as its focus shifts along the surface of a visual trigger. Eye trackers are used in research on product design and software design in the field of neuromarketing. The most popular method of measuring eye movement is through the use of a camera which tracks the movements of the pupil. We use custom-made eye tracking devices and software developed by our engineering team. Neuro Marketing Tools Recording Metabolic Activities in Brain Positron Emission Tomography (PET) Functional Magnetic Resonance Imaging (fMRI) Recording Electrical Activities in Brain Electroencephalography (EEG) Magneto encephalography (MEG) Steady State Topography (SST) Transcranial Magnetic Stimulation (TMS) Without recording Brain activities Eye Tracking Skin Conductance Facial Coding Facial Electromyography

**Cognitive Analysis** Cognitive Analysis is an analytic digital model that combines the results obtained through EEG, galvanic skin response and eye tracking to give a holistic view of a person's reaction to a particular trigger. This ensures there is no mis-reading in any of the biometric readings taken.

**Functional magnetic resonance imaging (fMRI):** FMRI The term MRI stands for 'magnetic resonance imaging' and basically describes a tool, which makes an anatomic representation of the brain by making use of magnets (Postma, 2012). An MRI scanner is used to measure the blood oxygen level, which can give an indication of increased brain activity in certain regions (Ariely, & Berns, 2010). The measurement works as follows: The magnetic field is able to recognize the blood oxygen content in the brain. Therefore, if neural activity in a certain brain area is increasing, the oxygen-rich blood increases too because oxygen is required by the brain to work. FMRI is a form of non-invasive neuroimaging technology that is primarily used for marketing purposes. The interest in it has increased enormously during the past years since it makes it possible to isolate certain systems of neurons that are connected with specific functions of the brain (Postma, 2012; Wilson, Gaines, & Hill, 2008). This isolation of the neural system is a highly complex task and is only facilitated by today's advanced technology (Kumlehn, 2011).

**Empathic design:** Another method where human beings are being analyzed without making use of any devices is called 'empathic design'. The meaning of the word 'empathic' can be also referred to as sensitive. Within this method, observation is made in the consumer's own environment so that it can take place in the normal course of daily routine (Postma, 2012; Leonard, & Rayport, 1997).

## IX. MANAGERIAL IMPLICATION

Research reflects and proof the stance and emergence of neuromarketing as a new tool to market research as the tapping of brain sense of the consumer is utilized in the advertising and attracting them to further buying. Companies as BBC, Coca Cola, Ford, Heinz, Intel and L'Oreal, P&G, Hundai, Microsoft, Yahoo, Ebay has been already adopted the neuromarketing as a tool of market research. For getting better results of marketing research Companies are hiring the outsourcing services of companies like NeuroFocus, Neuro--Insight, Neurosense and Brighthouse. Managers also need to invade this emerging trend of marketing for positioning their brand in the subconscious mind of their consumers. All those companies experts in neuromarketing have been developing the various techniques of neuromarketing with the application of neuroscience as FMRI, EEG, Eye Tracking, GSR, Empathy Design and Cognitive Analysis. Thus neuromarketing will have a great potential for the marketers in the coming years.

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