# Consumer Perception towards Integration of Neuromarketing in M-Commerce Website/Application Designing with Reference to India

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***Abstract –*** *With the rising usage of neuroscience techniques in website/ Apps designing by the name of neuromarketing; which conducts customer brain research to identify preferences or constraints improve marketer's visual presence.  As most of human brain is occupied in visual processing so neuromarketing is playing conducive role to improve marketer's visual presence. (As per neuroscientific technology as soon as visual processing takes entry in the 'Reptilian Brain' of consumers it can develop a very prompt and effective sense of true decision-maker). The main purpose of this paper is to discover the Indian Consumer's perception towards the concept of Neuromarketing as well as the applications of neuroscientific techniques in m-commerce website/application designing. Finally this paper analyses with the help EFA & CFA to conclude about the Indian Customers Awareness towards Neuromarkeing.*

***Keywords:*** *Consumer Perception, Neuromarketing, Neuroscientific Techniques, Visual Presence*

## INTRODUCTION

It has been reviewed from previous research studies that with the use of neuroscientific techniques marketers could actually look into and correctly gathers consumer thoughts without a social filter. Neuromarketing has the capacity to improve incorrect market research data and help in developing and promoting a more efficiently marketing of products or services. Generally existing market research strategies are expensive and may collect erroneous data about expectations/desires of customers, because at the time of reporting responses respondent can feel undue influenced of social bias, and mislead the research by giving. This could the consciously manipulated responses to marketers and do not disclose their actual feelings related to product. Marketers hope that neuromarketing will be an effective upgraded version of market research.

Neuromarketing is simply a process of applying neuroscientific technologies to view which areas of the consumer's brain are being activated by given marketing stimuli. The various neuroscientific methods available in this marketing research like body language, facial coding, empathic design, eye tracking, fMRI, EEG, MEG, galvanic skin conductance and heart rate, etc.

It has been observed that most of human brain is involved in visual processing so neuromarketing is having number of corrective actions to improve marketer's visual presence. neuromarketing suggests at the time of m-commerce website/application designing marketer should consider neuromarketing driven outcomes like limit choice, make choice obvious, visually bias, manipulate context and order, understand that price is pain.

This paper will measure Indian Consumer's perception towards the concept of Neuromarketing as well as the applications of neuroscientific techniques in m-commerce website/application designing by data collected through survey on likert scale based questionnaire and later on by statistical analysis with R package.

**LITERATURE REVIEW**

In this digital era marketers have adopted an integrative marketing research field as neuromarketing that have been strengthening the marketers to have clear explorative information, anticipating in understanding the neural relationship behind Indian consumer purchase decision and the fundamental cause of choice.

Braeutigam (2005) argued neuromarketing, as sub-systems of neuroscience, that helps in understanding consumer's brain areas interactions or it helps in giving meaning to complex brain systems interact.

Sanfey, Lowenstein, McClure & Cohen, (2006) researched that now days marketers have adopted an integrative field as neuromarketing, that have been been strengthening the marketer to have clear explorative information, anticipating in understanding the neural relationship behind Indian consumer purchase decision and the fundamental cause of choice. Neuromarketing works as human behavioral theory to understand the real desires and expectations of consumers by integrating conclusion from neuroscience. Neuromarketing plays a vital role in distinguishing the neurological factors and physiological basics of consumer behavior. It also helps to identify the role of somatic factors that control consumer behavior. It can be explained the field of neuromarketing has been taken birth from the amalgamation of marketing and neuroscience and promotes as an interdisciplinary approach to probe the cause of consumer decision-making.

Zurawicki, (2010) found that human brain comprises of different brain areas related to vision (approximately 25% of the brain). The primary functioning of visual awareness gets stared as soon as human eyes receive light signals. These are particular expert neurons known as photoreceptors that lead the information from human eyes to human brain. Photoreceptors main role is to convert light signals into encoded electrochemical signals.

Author and Neuromarketing Expert Martin Lindstorm's bestselling book "Buyology - Truth and Lies About Why We Buy" (2010) claims from various experimental researches conducted by him, Neuromarketing is not a new kind of marketing - it is an innovative mode to study marketing, so it is a contributory field for additional information to market research. Lindstrom claimed neuromarketing has been commonly used for six major areas: Branding, Product design and innovation, Advertising effectiveness, Shopper decision making, On-line experiences, Entertainment effectiveness.

Schneider & Woolgar (2012) claimed that neuromarketing is the newest medium used by marketing researchers to understand consumer behaviour. In his reviewed literature he found primary contribution of neuromarketing is to understand consumer behavior, secondly it also helps in understanding the choice pattern process of consumers.

Hammou et al., (2013) explained neromarketing has capacity to convey explicit information to marketer related to customer's feeling for marketing stimuli by analyzing data, images. It also probe human brain for getting insight about different areas of human brain to know how different brain areas are dealing with attention, emotion, memory, and personal implication.

Barkin (2013) after studying the individual brain explained that human brain is a complex mechanism, filled with conflicting needs and a steaming mess of feelings it is an unpredictable black box.

Uprety & Singh (2013) defined Neuroeconomics as it started with the use of neuroimaging, He specifically observed that researcher dealing in the field of marketing research are quite slow in terms of understanding the benefits of brain imaging studies. He further defined neuromarkeing as it is a new field of marketing research that studies customers' sensor motor, cognitive and affective response to marketing stimuli and NM goals to investigate and understand customer behavior by reviewing the brain.

R. Thomson (2013) discussed about the functioning of neuromarketing, he observed that neuromarketing helps in so many different ways but the main purpose of it is to examine consumers' conscious and non-conscious responses to marketing stimulus and directing marketers to develop most suitable action plan. It means neuromarketing measures customers' brainwaves when they involved in purchasing activities and enables researcher to look into the black box (consumer brain) whey they involved in watching advertisement.

Solnais, Andreu-Perez, Sánchez-Fernández, & Andréu-Abela, (2013) conducted research and wanted to spot on the application of Eye Tracking as a technique of neuromarketing in marketing research. They have shared their understanding about eye tracking as it is a proven tool for the measuring the customers' visual attention against a marketing stimuli and from the outlook of Neuromarketing; it attempts to find out association of consumer's visual attention with the consumer's cognitive and emotional responses.

**OBJECTIVE OF RESEARCH**

(a)    To measure Indian consumer's perception towards neuromarketing.

(b)    To identify the perception of Indian consumer's about integration of neuroscientific techniques in m-commerce website/application designing.

## METHODOLOGY

This research measures consumer's perception about integration of neuroscientific techniques in m-commerce website/application designing in India for that quantitative survey has been conducted to record consumer's perception regarding integration of neuroscientific techniques in m-commerce website/application designing.

**(a)    Research Design-** Descriptive & Exploratory research designs are used.

**(b)    Sources of Data-**Primary and secondary sources of data are used.

**(c)    Research Instrument-**Questionnaire (Likert Scale questionnaire)

**(d)    Sample Size-**The proposed study is based on primary as well as secondary data. For the purpose of primary data collection for Sample Size determination; As per Hair et al. (2006), every Likert scale item must have 10 responses (**10:1 rule**).

The total number of Likert scale items in the survey instrument was 8, so the minimum sample size should be 80. However, in order to be on safer side, sample of 100 has been taken.

**(e)    Tools & Techniques used for Data Analysis-** It includes the various statistical tools & techniques.

Statistical tools help in analyzing the data and the data analysis assists in framing conclusions.

**(f)**     For analysis the data of this research- **Factor analysis (Exploratory Factor Analysis and Confirmatory Factor Analysis)** has been used.

## ANALYSIS AND INTERPRETATION

Data analysis is considered to be important step and heart of the research in research work. Data analysis entails that the analyst break down data into constituent parts to obtain answers to research questions. Here researcher has divide data analysis into three sections:

### Section-A

It is based on the various issues related to Validation of the Survey Instrument.

### Section-B

It refers to check the dimensional validity and the underlying factor structure exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were performed.

### Section C (Item Wise Descriptive Statistics & Scale Wise Descriptive Statistics)

It refers to check the scale wise descriptive statistics of questionnaire.

**Section A-** The reliability of the constructs is checked through Cronbach's Alpha. Field (2009) recommends a cut-off value of alpha $\geq$ 0.7 for a construct to be reliable. As per table 5.1, all the constructs have Cronbach's Alpha value above the 0.7 threshold.

### Table 5.1 Average Variance Extracted and Reliability

| Factor | Average Variance Extracted (AVE) | Cronbach's Alpha |
|---|---|---|
| Indian Consumer's Perception towards Integration of of Neuromarketing on M- Commerce Website / M- Commerce Apps Designing | 0.836895 | 0.9507 |

**(a)    Section B-** In order to measure the various identified dimensions associated with consumer's perception towards neuromarketing, a self-administered survey was conducted. A total of 100 valid responses were obtained from the survey process on the identified 8 items. The responses on these 7 items were measures on a 5 point Likert scale.

In order to check the dimensional validity and the underlying factor structure, exploratory factor analysis (EFA) was performed. The exploratory factor analysis (EFA) was conducted using the psych (Revelle, 2017)

package in R. Table 5.2 summaries the preliminary results of the exploratory factor analysis. The KMO (Kaiser-Meyer-Olkin factor adequacy) estimated for the data collected is 0.93. Kaiser (1974) recommends a bare minimum value of 0.5 of KMO for factor analysis to work. However, values greater than 0.9 are considered superb (Field, 2009). Table 5.1 also summarizes the factor extracted. Factor extracted have Eigen Values (SS loadings) greater than 1, which is in accordance with the criteria mention by Field (2009) for factors to be considered significant.

### Table 5.2 Factor Analysis Summary

| Kaiser-Meyer-Olkin factor adequacy: 0.93 | |
|---|---|
| **ML1** | |
| SS loadings | 5.122 |
| Proportion Var | 0.146 |

The factor solution obtained from the EFA was also subjected to confirmatory factor analysis (CFA). CFA allows the testing of the hypothesis that a relationship between

observed variables and their underlying latent constructs exists. CFA was conducted using the lavaan (Rosseel, 2012) package in R. The values are shown in Table. 5.3, the value of the fit indexes CFI and RMSEA are 0.950 and 0.079. The acceptable value for CFI for a CFA model should be greater than 0.9 and for RMSEA, this value should be less than 0.1 (Bryne, 2012). Since both the fit indexes have values within the specified limits, therefore, it can be concluded the observed data fits the factor structure.

### Table 5.3 CFA Results

Comparative Fit Index (CFI):                    0.950
Root Mean Square Error of Approximation (RMSEA): 0.079
**Latent Variables:**

| | Estimate | Std.Err | z-value | P(>\|z\|) |
|---|---|---|---|---|
| **Indian Consumer's Perception towards integration of Neuromarketing in website/ Apps designing** | | | | |
| ap1 | 0.925 | 0.050 | 18.428 | 0.000 |
| ap2 | 0.874 | 0.043 | 20.380 | 0.000 |
| ap3 | 0.884 | 0.044 | 20.103 | 0.000 |
| ap4 | 0.886 | 0.042 | 21.252 | 0.000 |
| ap5 | 0.862 | 0.042 | 20.474 | 0.000 |
| ap6 | 0.919 | 0.044 | 21.085 | 0.000 |
| ap7 | 1.010 | 0.043 | 23.237 | 0.000 |
| ap8 | 0.960 | 0.045 | 21.255 | 0.000 |

(a) **Section C (Item Wise Descriptive Statistics & Scale Wise Descriptive Statistics)**- It refers to check the scale wise descriptive statistics of questionnaire.

### Table 5.4 Item Wise Descriptive Statistics

| Item | Mean | Sd |
|---|---|---|
| **Indian Consumer's Perception towards integration of Neuromarketing in website/ Apps designing** | | |
| ap1 | 3.4625 | 1.1883283 |
| ap2 | 3.5300 | 1.0496926 |
| ap3 | 3.5150 | 1.0712815 |
| ap4 | 3.5900 | 1.0366226 |
| ap5 | 3.5000 | 1.0332808 |
| ap6 | 3.3825 | 1.0812569 |
| ap7 | 3.6325 | 1.1205279 |
| ap8 | 3.5875 | 1.1227177 |

(i) The first item in the smart buyer's perception towards application of neuromarketing on website apps designing scale (ap1) is titled "I am a smart buyer as I purchase from M-commerce websites and apps." the

mean score on this item is 3.4628 (sd: 1.18), this signifies that majority of the respondents of the sample neither agree nor disagree with this statement.

(ii)    The second item in the smart buyer's perception towards application of neuromarketing on website / apps designing scale (ap2) is titled "I think the goal of neuromarketing is to increase conversion rates and the percentage of visitors who take action by using specific cognitive biases in the design and content of the website." the mean score on this item is 3.5300 (sd: 1.04), this signifies that majority of the respondents of the sample agree with this statement.

(iii)   The third item in the the smart buyer's perception towards application of neuromarketing on website / apps designing scale (ap3) is titled "I think that neuromarketing principles will contribute to create low-stress, low friction websites/ apps that provide a pleasant user experience and result in higher engagement." the mean score on this item is 3.5150 (sd: 1.07), this signifies that majority of the respondents of the sample agree with this statement.

(iv)    The fourth item in the smart buyer's perception towards application of neuromarketing on website / apps designing scale (ap4) is titled "Marketing Websites/ apps offers are designed to create a "buy now" (FOMO or "fear of missing out"), is a result of brain study of customers." the mean score on this

item is 3.5900 (sd: 1.03), this signifies that majority of the respondents of the sample agree with this statement.

(v)     The fifth item in the smart buyer's perception towards application of neuromarketing on website / apps designing scale (ap5) is titled "I think due to the contributions of neuroarketing, Websites/ apps apply decoy effect; uses alternate (less / more desirable) choices as a benchmark against product or service." the mean score on this item is 3.5000 (sd: 1.03), this signifies that majority of the respondents of the sample agree with this statement.

(vi)    The sixth item in the smart buyer's perception towards application of neuromarketing on website / apps designing scale (ap6) is titled "Websites/ Apps share number of happily associated customer affects my psychology as social proof is evidence of legitimacy." the mean score on this item is 3.3825 (sd: 1.08), this signifies that majority of the respondents of the sample neither agree nor disagree with this statement.

(vii)   The seventh item in the smart buyer's perception towards application of neuromarketing on website / apps designing scale (ap7) is titled "Screen position, background colour, human face, visual space or motions etc. have their influence on customer's brain." the mean score on this item is 3.6325 (sd: 1.12), this signifies that majority of the respondents of the sample agree with this statement.

(viii) The eighth item in the smart buyer's perception towards application of neuromarketing on website / apps designing scale (ap8) is titled "Colour selection in web/app design is supported by eye tracking study to pull visitors attention toward the color and the logos." the mean score on this item is 3.5875 (sd: 1.12), this signifies that majority of the respondents of the sample agree with this statement.

## FINDINGS AND CONCLUSIONS

This study was conducted to consumer's perception towards emerging integration of neuromarkeing techniques in m- commerce website and m-commerce application with particular reference to India. This study was done with the help of review of secondary data and analysis of primary data. This study evaluated the perception of Indian buyer towards neuromarketing with special reference to m-commerce website or m-commerce application designing.

On the basis of responses received from the respondents and the data analysis, following are the major findings of the study:

(a) Respondents are not completely denying themselves as a smart buyer as they purchase from M-commerce websites and apps as well as they are not completely agreeing about this statement.

(b) Respondents in the sample think that the goal of neuromarketing is to increase conversion rates and the percentage of visitors who take action by using specific cognitive biases in the design and content of the website.

(c) Respondents in the sample think that neuromarketing principles contribute to create low-stress, low friction websites/ apps that provide a pleasant user experience and result in higher engagement.

(d) Respondents in the sample think that marketing websites/ apps offers are designed to create a "buy now" (FOMO or "fear of missing out"), is a result of brain study of customers.

(e) Respondents in the sample think that due to the contributions of neuroarketing, Websites/ apps apply decoy effect; uses alternate (less / more desirable) choices as a benchmark against product or service.

(f) Respondents in the sample are somewhat suppose Websites/ Apps share number of happily associated customer affects my psychology as social proof is evidence of legitimacy as well as they are not completely agreeing about this statement.

(g) Respondents in the sample think that Screen position, background colour, human face, visual space or motions etc. have their influence on customer's brain.

(h) Respondents in the sample think that Colour selection in web/app design is supported by eye tracking study to pull Visitors attention toward the colour and the logos.

As far as conclusions of this research are concerned it has been found that as per the demographic analysis of survey it came to know majority of respondents indicated that they are an internet user. Also, a vast majority of the respondents also indicated that they make purchases using m-commerce and vast majority also indicated that they identify themselves as a smart buyer. the goal of neuromarketing is to increase conversion rates and the percentage of visitors who take action by using specific cognitive biases in the design and content of the website, neuromarketing principles contribute to create low-stress, low friction websites/ apps that provide a pleasant user experience and result in higher engagement, marketing websites/ apps offers are designed to create a "buy now" (FOMO or "fear of missing out"), is a result of brain study of customers, due to the contributions of neuroarketing, Websites/ apps apply decoy effect; uses alternate (less / more desirable) choices as a benchmark against product or service, screen position, background colour, human face, visual space or motions etc. have their influence on customer's brain and colour selection in web/app design is supported by eye tracking study to pull visitors attention toward the colour and the logos.

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