Available online @ https://jjem.jnnce.ac.in
https: www.doi.org/10.37314/JJEM.SP0479
Indexed in International Scientific Indexing (ISI)
Impact factor: 1.395 for 2021-22
Published on: 31 May 2025

User Experience Testing of Online Consumers: A Neuromarketing Perspective

Usha K[1*], Dr. Sarala K. S[2]

[1*]Kuvempu University, Shankaraghatta., [2]Sahyadri Commerce & Management

Abstract

Technological integration advancements have made the prospects for creating various research tools to increase user experience during online purchases. Multi-disciplinary approach of studies has helped marketers to understand consumers, their behaviour and perception towards various technological and digital transformation. This paper intends to understand online purchase activity and shopping experience of consumers in the study area in view of novel approach of Neuromarketing through set research objectives. The study is an attempt to understand user experience during shopping through various websites and applications by identifying the aspects influencing consumers while purchasing online through the application of neuromarketing research outputs. The exploratory study has considered 100 sample online consumers from Shivamogga and Chickmagalur districts using purposive sampling method and their responses are collected by sharing structured questionnaire through Google forms. Data is analyzed using SPSS Software, descriptive statistics are used, Reliability test is done using Cronbach alpha, simple pie charts are used. Normality test was checked to choose the test and to test the hypothesis set independent sample t-test are used.

Keywords: *User Experience, Online Consumers, Neuromarketing, Online platforms, Online shopping*

1.Introduction

The advancement in technology has made products, services and applications to be more user-friendly and fulfilling expectations of different consumers. User experience and user interface has made the integration of technology with commerce activities for designers of websites and applications. User experience testing is testing of usability of products and services for the purpose of evaluating consumer's feelings while using them which aims at enhancing consumer experience and satisfaction level. Consumer feelings and emotions towards various marketing strategies, products, services, websites and applications can be studied by using the application of neuro marketing tools and techniques. Neuromarketing is a new concept of study of consumers' cognitive responses for various strategies used by marketers. Neuromarketing is a global trend in marketing research which uses new methods and techniques like fMRI and EEG to observe, record and analyse consumers' behaviour, emotional and cognitive responses and its processes towards marketing stimuli**(Alsharif et al., 2021)**. Application of neuroscience, digital and marketing knowledge to increase the consumer satisfaction and achieve organisational objectives, Businesses and Marketers have started using this Neuromarketing tools and techniques and

also touse the advancement in technology in these fields towards the maximum benefit.

User Experience:

'User Experience' term is first coined by Dr. Donald Norman in 1990's who is a Cognitive science researcher, he has described the importance of design decisions and choices based on needs and wants of its user and explained User Experience (UX) as a trending concept in designing websites, applications and also physical products. International Organization for Standardization defines user experience as "A person's perception and responses that result from the use or anticipated use of a product, system or service" which clearly states that the expectations of consumers from usage of products, services and systems provided by marketers and businesses and also the responses from consumers after using the same is explained as user experience.

A user experience testing is also called as usableness testing of users, which is used to measure the lenience of an application. The idea to implementusableness testing is to estimate the effortlessness and flexibility of using applications and online platforms from the user's perspective. This user experience testing can be done by testing the product in the laboratory, testing through random users and testing a web application remotely from digital labs.

Neuromarketing:

Neuromarketing is the study of human brain activity in real time environment to various stimuli for neuromarketing techniques like fMRI, EEG, Eye-Tracking, GSR etc. The tools and techniques of Neuromarketing which are mostly used are-

- **Functional Magnetic Resonance Imaging (fMRI):** This is a neuro imaging technology measuring brain activity using blood flow changes in the brain.
- **Electroencephalography (EEG):**Technology that measures the electrical activity of brain when exposed to various stimuli in the real time environment.
- **Eye-Tracking:** This technology studies the eye movement and its pattern of individual in real time situation.
- **Galvanic Skin Response (GSR):** This technology is used to study various skin responses like sweat, movement of skin etc. towards different stimuli present in the situation.

Many other neuromarketing technologies like Implicit Association Test (IAT), Biometric Sensors, Facial Expression Analysis etc. are used most commonly and effectively used technologies are mentioned in the above content.

Online Consumers:

Online consumers are those who purchase online through various online platforms like websites and applications. Soumya Mohanty, MD of Insights division tells that India's online shopping base is going to be 500-600 million shoppers and globally second largest by the year 2030. Invest India says that near to 100% of pin codes have adopted e-commerce in India, new trend is e-commerce is gaining major popularity in tier-II and tier-III cities and smaller towns are shopping in e-retail platforms.

2.Review of Literature:

Chandrasekhar et. al (2024) identified that online retailers have greater opportunities to simulate consumers for impulsive buying through personalized recommendations, providing incentives based on locations and activity and also streamlined checkout process in mobile

shopping applications which enhances user experience and resulting impulsive buying. Also states that mobile shopping applications and e-commerce websites are different and distinctive platforms providing unique and customized offerings to its consumers through this digital technology.

Dwivedi et. al (2024) states that neuromarketing in era of digital revolution plays vital role in enhancing personalized experience of consumers while using online platforms. Neuromarketing analyses neural responses of consumers at subconscious level towards different stimuli customized and created by various businesses, which results in higher consumer engagement, retention rate and also conversion rates. The valuable information from leveraging neuromarketing techniques like EEG, Eye-Tracking, fMRI etc. helps in increasing user experiences of consumers through designing elements of digital platforms accordingly.

Singh et. al (2024) studied the importance of color eliciting emotional responses, influencing purchase decisions and building brand loyalty and found that integrating neuroscience and other disciplines will have significant potential in product and services designing, interface design, graphic communication design and fashion design. Also stated that by using consumer neuroscience, designers can create products and experiences which are more effective in consumer engagement and influencing their behavior through advanced, innovative and impactful designs.

Qutb et. al (2024) state that neuromarketing as a new approach integrates marketing strategies and neuroscience tools which studies the use of different neuromarketing tools and its application in understanding consumer responses to advertisements, product design and website design. In case of online service marketing and technology enabled businesses EEG and Eye-Tracking technologies are accepted by participants. Authors have studied an online restaurant reservation platform "Eatigo" and suggested to use biometric, physiological and other neuromarketing techniques to re-design and re-shape websites and also increase digital experience of consumers.

Traymbak et. al (2023) found that neuromarketing plays a significant role in tracking brain activity of consumers and the study used constructs of neuromarketing like buying behavior, social, attention, technology and emotions to predict consumers' unpredictable behavior and also concluded that neuromarketing research acts as a guide to marketers to study buying behavior and its pattern of consumers and suggests that study can be applied to understand Indian market.

Shahzad et. al (2023) provide information about the use of EEG technology to understand brain responses of consumers towards tourism products and choosing a particular travel destination and their brain activity while watching travel destination videos. The study found that consumer induced videos created by tourism marketers has positive impact on selecting a particular place of visit by comparing the same to organic or voluntary videos created by traveler's and youtubers. Authors concluded by mentioning the importance of applying this multidisciplinary approach called neuromarketing and fill the gap between neuroscience research and tourism research.

Significance of the Study:

Previous studies have shown that to enhance user experience of consumers while visiting online platforms like shopping websites and applications,businesses need to consider proper designing of content, layout, navigation, ease of use etc. This study is to understand the consumer awareness of neuromarketing, perception of online consumers towards neuromarketing

strategies used in websites and applications designing towards enhancing user experience.

3.Objectives of the Study:

The paper intends to understand online purchase activity and shopping experience of consumers in the study area in view of novel approach of Neuromarketing through following research objectives.

- To know the neuromarketing awareness among online consumers in the study area
- To understand the perception of online consumers towards integrating Neuromarketing strategies to website and application designing.
- To examine the influence of neuromarketing strategies on online consumers.
- To understand ethical perspective of online consumers towards neuromarketing applications.

Hypotheses of the Study:

H1: There is no significant awareness level of neuromarketing among online consumers

H2: Neuromarketing strategies are not significant for websites and applications designing.

H3: There is no significant influence of neuromarketing strategies on online consumers

H4: Ethical issues in neuromarketing applications are not significant for online consumers

4.Research Methodology:

The study is exploratory research to know the awareness level of consumers about neuromarketing and its strategies influence on online consumers using existing reviews for conceptual work from various secondary sources and qualitative and quantitative data collection from primary sources.

Scope of the Study:

As the respondents of the study need to be online consumers,theywere chosen randomly from Shivamogga and Chikmagalurdistricts of Karnataka state.

Sample Selection:

Purposive Sampling is used to select the consumers who purchase online. Accordingly, atotal of 100 responses (one error response) have been collected from each of twodistricts equally.

Period of Study:

Data was collected from respondents by sharing google forms and the period of study was during the months of Sept-Nov 2024.

Data Sources:

Primary data is collected through survey method by sharing structured questionnaire throughGoogle forms to online consumers while Secondary data from published articles, Journals, Books and online sources.

Data analysis and Statistical tools:

Data is analyzed using SPSS Software, descriptive statistics are used, Reliability test is done using Cronbach alpha, simple pie charts are used, word cloud is prepared by using Wordart.com, Normality test was checked to choose the test and to test hypothesis independent sample t-test are used.

Table 01: Demographic Data.

Details		Responses	Per cent
Gender	Male	47	47.47
	Female	52	52.53
	Total	**99**	**100**
Age group	Below 20	56	56.57
	21-30	35	35.35
	31-40	02	2.02
	41-50	02	2.02
	Above 51	04	4.04
	Total	**99**	**100**
Employment Status	Businessman/Self employed	04	4.04
	Housewife	04	4.04
	Professional	20	20.20
	Salaried	49	49.49
	Student	22	22.22
	Total	**99**	**100**
Marital Status	Married	41	41.41
	Single	58	58.59
	Total	**99**	**100**
Source: Survey Data			

Above table reveals that out of 99, more than 50% of respondents are female, more than 55% arebelow the age group of 20 and nearly half of the respondents belong to salaried class.

Table 02: Data Reliability Test.

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.832	.847	17
Source: Survey Data		

Data reliability test is done by using Cronbach's Alpha statistical tool, the alpha value is 0.8 which shows that the data is reliable and consistent.

Chart 01: Data on Internet users and Online buyers.

Chart representing Internet users among respondents

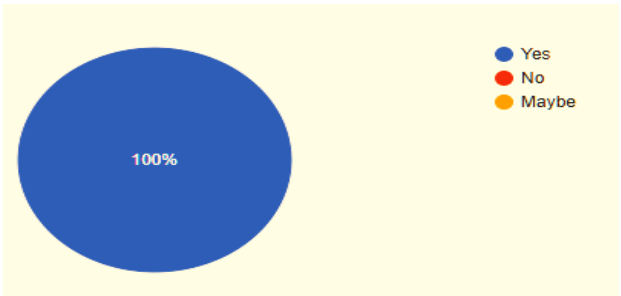
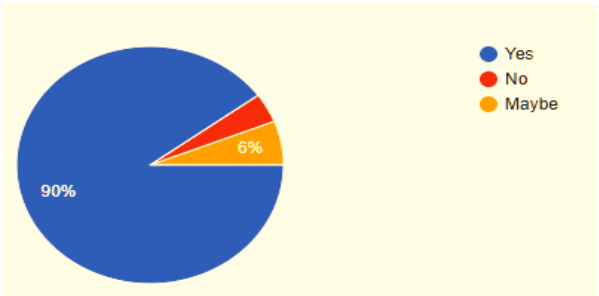


Chart representing Online buyers among respondents



(Source: Survey Data)

Above charts shows that 100% respondents are internet users and 90% of them use websites and applications for shopping.

Chart 02: Wordcloud on respondents using websites and applications for shopping.

Source: Survey Data, word cloud generated from wordart.com

The word cloud above describes the websites and apps used by respondents for online purchases, here **Flipkart** is ranked as most preferred website (68%) and the next is **Amazon**(66%) followed by Meesho, Myntra and likewise. Based on multiple selection option given to respondents.

Table 03: Awareness level of online consumers about Neuromarketing.

Variables	Responses		Percentage
Have you heard of the term Neuromarketing?	Yes	57	57.58
	No	30	30.30
	Maybe	12	12.12
Do you know that Neuromarketing is a Marketing Research Tool?	Yes	59	59.60
	No	28	28.28
	Maybe	12	12.12
Are you aware of Neuromarketing tools like fMRI, EEG, Eye-Tracking, Galvanic Skin Response etc.?	Yes	45	45.45
	No	50	50.51
	Maybe	4	4.04
Do you think Neuromarketing will provide accurate information of Customer Experience?	Yes	53	53.54
	No	16	16.16
	Maybe	30	30.30
Source: Survey Data			

Above table shows that there is good amount of awareness level (57%) among respondentsabout neuromarketing while53% feel that neuromarketing will provide accurate information about customer experience.

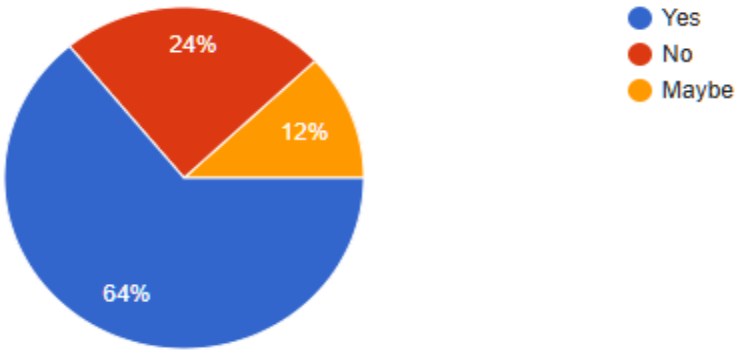
H1: There is no significant awareness level of neuromarketing among online consumers.

Table 04: Hypothesis testing for awareness level of neuromarketing.

Hypothesis Test Summary				
	Null Hypothesis	**Test**	**Sig.[a,b]**	**Decision**
1	Have you heard of the term Neuromarketing?	One-Sample Chi-Square Test	0.000	Reject null hypothesis
2	Do you know that Neuromarketing is a Marketing Research Tool?		0.000	Reject null hypothesis
3	Are you aware of Neuromarketing tools like fMRI, EEG, Eye-Tracking, Galvanic Skin Response etc.		0.000	Reject null hypothesis
4	Do you think Neuromarketing will provide accurate information of Customer Experience?		0.000	Reject null hypothesis
a. The significance level is .050				
Source: Survey Data				

By applying One-Sample Chi-Square Test to know awareness level of neuromarketing among online consumers, it is clear that there is a significant level of awareness among online consumers. Significance value is less than 0.05. Hence, Null hypothesis is rejected.

Chart 03: Online consumers abandoning online shopping platforms due to poorly designed and maintenance of websites and applications:



Source: Survey Data

Above chart shows that due to poor maintenance of websites and shopping applications 64% respondents have abandoned at least one or the other time while making onlinepurchases.

H2: Neuromarketing strategies are not significant for websites and applications designing.

Table 05: Perception of online consumers towards application of Neuromarketing on websites and application designing.

Hypothesis Test Summary				
	Null Hypothesis	**Test**	**Sig.[a,b]**	**Decision**
1	Neuro Marketing principles will contribute to pleasant user experience of websites and apps.	One-Sample Chi-Square Test	0.000	Reject null hypothesis
2	Fear of Missing out" or "2 Left" or "Buy Now" or "Offers Valid till __" are results of Brain study of Consumers.		0.000	Reject null hypothesis
3	Design and layout of Websites and apps are the contributions of Neuromarketing.		0.000	Reject null hypothesis.
4	Websites and app's background color, screen position and screen movement or motions have influence on consumer's brain.		0.000	Reject null hypothesis
5	Color of websites and apps draw attention of consumers.		0.000	Reject null hypothesis
6	Logos, product image, color grab attention of consumers.		0.000	Reject null hypothesis
a. The significance level is .050.				
Source: Survey Data				

By applying One-Sample Chi-Square Test, p value is less than 0.05 level of significance, which shows that Neuromarketing strategies play a significant role in designing of shopping websites and applications. Hence, Null hypothesis is rejected. This data can be interpreted as respondents feel that neuromarketing principles contribute at a greater extent towards increasing user experience and pleasant feel while using websites and apps.

H3: There is no significant influence of neuromarketing strategies on online consumers.

Table 06: Influence of Neuromarketing strategies on online consumers.

Hypothesis Test Summary				
	Null Hypothesis	**Test**	**Sig.[a,b]**	**Decision**
1	You purchase the product based on ratings.	One-Sample Chi-	0.000	Reject null hypothesis

2	You watch product video and key highlights before purchasing the product.	Square Test	0.000	Reject null hypothesis
3	Does product and price comparison in websites and apps help you to choose better product?		0.000	Reject null hypothesis
4	You feel pleasant about website layout, design and interactive motions during online shopping.		0.000	Reject null hypothesis
5	You purchase products on the basic of images and videos posted in customer review section.		0.000	Reject null hypothesis
6	The ease of payment made you to purchase product from the same website and apps.		0.000	Reject null hypothesis
7	Return policy influence you to purchase in particular website or app.		0.000	Reject null hypothesis
8	You purchase product based on assurance given by particular website and app.		0.000	Reject null hypothesis
a. The significance level is .050.				
Source: Survey Data				

By using One-Sample Chi-Square Test, as the p value is less than the level of significance i.e. less than 0.05. it is proven that Neuromarketing strategies has a significant influence on online consumers. Hence, Null hypothesis is rejected by interpreting that there is an influence of neuromarketing strategies on online consumers in each and every aspect of websites and applications like ratings, reviews, influencer's video description, layout design, customer review section, comparison of products chosen and also return policy.

H4: Ethical issues in neuromarketing are not significant for online consumers.

Table 07: Ethical Perspective of Neuromarketing Studies among Online consumers.

Hypothesis Test Summary **Ethical issues in neuromarketing**				
	Null Hypothesis	**Test**	**Sig.[a,b]**	**Decision**
1	I feel my brain should not be read without my consent by marketers.	One-Sample Chi-Square Test	0.000	Reject the null hypothesis.
2	I feel Neuromarketing technology unethically interferes in privacy matters during online shopping or visit to websites and apps.		0.000	Reject the null hypothesis.

3	I feel Informed consent should be taken before applying Neuromarketing techniques on shopping websites and apps.		0.000	Reject the null hypothesis.
a. The significance level is .050.				
Source: Survey Data				

Above statistical table shows that p value is less than 0.05 using One-Sample Chi-Square Test, Hence, Null hypothesis is rejected. As neuromarketing is study of brain activity respondents feel their privacy should not affected while making online purchases. But, to enhance user experience in building customized applications and websites the insights from consumers are very much necessary. Hence, they feel that informed consent can be taken before applying neuromarketing study.

5.Findings:

- Online consumers perceive positively on application of Neuromarketing on websites and application designing as more than 50% respondents feel pleasant experience while using websites and apps during online purchases while 32% feel neutral experience.
- A Total of 85% Agree that Fear of Missing Out strategy makes them to purchase as soon as possible.
- On an average of 80% of respondents agreed that Background color, screen position designing and attention grabbers on website layout are contributions of Neuromarketing study.
- The influence of Neuromarketing strategies on online consumer is also tested as significant, each and every content and aspects of websites and apps have the influence on brain activity, responses and emotions of consumers.
- Nearly 50% respondents agreed that their brain should not be read without the consent by marketers while more than 45% feltthat Neuromarketing is unethical interferes in privacy matters during online shopping and 40% agreed that informed consentshould be taken before applying Neuromarketing techniques on shopping websites and applications.

6.Conclusion:

As more technological advancements are made towards making ease for online consumers to get satisfied with interface of usage of websites for making online purchases. In this process exact needs and wants of consumers are gathered by proper building of user interface which is required to be studied and modified for better user experience enhancement for online consumers.

To enhance the user experience of online consumers, study need to be conducted by adopting available technology. In this way a proper integration of websites and application designing needs to be built based on the requirement of consumers to create customized and personalized experience in using online shopping platforms.

The Computer Science subject studies the designing of websites and applications but proper integration with the field of consumer study needs to done to improve personalized and customized experience of consumers. The experience of

consumers while using online shopping websites and shopping applications are studied here with integrating the study of neuromarketing and computer science. Proper creation of online shopping platform through well designed user-friendly navigation, ease of using application, best and relevant content display with pleasant journey of online shopping will result in enhancement of user experience during online shopping.

Further, studies can be conducted by using EEG and Eye-Tracking technology to understand the exact performance of websites and application in enhancing user experience of online consumers, ease of making online purchases and also design and layout of shopping applications to retain existing consumers and attract potential buyers also.

Integrated and multi-disciplinary study may be made jointly by Computer Science department and Neuromarketers to build websites and apps to provide customized experience and also user-friendly experience for online consumers.

References

1.Lindstrom, M. (2008). *Buy ology: truth and lies about why we buy*. New York, Doubleday.

2.Chandrasekhar, K., Das, S., Gupta, N., & Jena, S. K. (2024). Comparative Analysis of Impulse Buying Behaviour Across Retail Channels: A Study of Physical Stores, E-commerce Websites and Mobile Shopping Apps. *Economic Affairs*, *69*(02), 1109-1120.

3.Dwivedi, D. P. K., Gohain, T. T., Rajagopal, G., Armosh, F., Armosh, F., Nagaraj, G., &Yadaganti, R. (2024). A Study on Role of Neuromarketing in Digital Era Business Development. *Migration Letters*, *21*(S4), 1600-1605.

4.Qutb, M. M., Nada, M., & Azmy, A. (2024). An Innovative Methodology in Neuromarketing for Supporting Technology-Enabled Companies. *International Design Journal*, *14*(1), 491-504.

5.Shahzad, M. F., Yuan, J., Arif, F., & Waheed, A. (2024). Inside out. Social media videos and destination branding. Neuromarketing using EEG technique. *Journal of Islamic Marketing*, (ahead-of-print).

6.Singh, M., Singari, R. M., & Bholey, M. (2024). The Impact of Color Perception on Cognitive and Behavioral Processes on Decision Making: Insights from Neuroscience, Neuromarketing, Neuroeconomics, and Neurodesign. *Boletin de Literatura Oral-The Literary Journal*, *11*(1), 199-211.

7.Traymbak, S., Shukla, A., & Dutta, M. (2023). A Study of Reliability and Validity of Constructs of Neuromarketing Among Indian Consumers. *Annals of Neurosciences*, 09727531231181868.

8.Alsharif, A. H., Salleh, N. Z. M., Baharun, R., Alsharif, Y. H., &Abuhassna, H. (2021). A Bibliometric Analysis of Neuromarketing: Current Status, Development and FutureDirections. *International Journal of Academic Research in Accounting, Finance and Management Business Sciences*, *11*(3), 828-847

Online sources:

1.https://www.indiaretailing.com/2024/09/01/indian-consumers-prefer-offers-faster-online-than-offline-report/

2.https://www.investindia.gov.in/sector/retail-e-commerce/e-commerce#:~:text=The%20e%2Dcommerce%20industry%20in,transactions%20in%20FY%202023%2D24.

3.https://wordart.com/edit/wcr18pis7ntf

4.https://www.productplan.com/glossary/user-experience/#:~:text=Definition%3A%20User%20Experience%20refers%20to,the%20content%20displayed%20is%20etc

5.https://www.finalsite.com/blog/p/~board/b/post/what-is-user-experience

6.https://www.interaction-design.org/literature/topics/ux-design?srsltid=AfmBOorBw9gbEva0AO0xVx-4Py6UqqjNFzbGnoSDlyomlxLTouUiH9ny

7.https://influencermarketinghub.com/ux-statistics/

8.https://www.browserstack.com/guide/what-is-ux-testing#:~:text=A%20user%20experience%20test%20is,application%20from%20the%20user's%20perspective