

A Study on the Role of Sentiment Analysis on buying behavior of customer in E-commerce Websites

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Abstract - In today's era of growing digital technology, different e-commerce websites compete with each other by providing new products and adopting various strategies to attract customers, because customers are the main asset of any business organization, specifically the e-commerce sites. To attract customers and making them by the goods, organizations try to understand the preferences and analyze the buying behavior of customers. Considering the above fact, this paper focuses on the strategies of organization to attract the consumers by gathering the information about customer, past purchase history and analyze the customer's behavior towards the purchase of products using sentiment analysis.

keywords - E-commerce, Customer behavior, Sentiment analysis, Organization strategies.

I. INTRODUCTION

E-commerce means a network where various products stored virtually for online buying and selling purpose of goods and services and payment is possible through credit and debit cards, net banking and cash on delivery time. E-commerce provide various benefits to organization like fast online service, information of market behavior and customer interest and provide benefits to customers are variety of same type of products, reasonable cost, good services and secure transaction and quick delivery. But there are many e-commerce web sites are present that is meant for online shopping, so to increase the growth of an organization and to sustain in market, organization must have to understand the preferences and analyze the behavior of customers.

Considering the statistics report, in today's generation, online purchase decision has the growing importance. Like, in 2016 it is increased by 20%, in 2017, 18% increment globally in B2C and now a days 10% increment in retailing. E-commerce consists of both youngster and middle age customers but an immense increment shown in older consumers like 50 years old and older than that for buying goods and services online ([1], [2], [3]).

This will provide a contribution towards the analysis of customer's buying behavior and purchasing decision making. Customer behavior analysis depends on buying behavior of customer, not only a single one but also focuses on group of customers by applying unique marketing strategies to attract customers for selling of products. With the help of the customer behavior analysis, the customer profiles are generated that contain the needs and interest of customer and allow organization to fulfill the customers demand and satisfy the customer, which is helpful for the organization to grow and survive in market. For this, a detailed product information and improved service attract more people and due to this unavoidable trend of consumer behavior the organization implements the new marketing strategies.

The widely recognized factor for making decision to buy product online, is the result of displaying the reviews of customers effectively. Most research papers have shown that customers' reviews and their ratings on any product put impact on the behavior and intentions of the buying customers and towards the products quality and retailers. ([4], [5], [6]).

The analysis of customer's buying behavior contains detailed information about the history of purchases and predicts the future purchase and this is very helpful for the organization to determine the effective strategies to sustain in market place and growing rapidly. This paper aims to analyze the customer behavior to buy products online by using sentiment analysis, understand the role and impact towards the growth of e-commerce sites of online shopping and determine the factors or strategies that influence the customers for buying products.

Sentiment analysis is a recent technique that consists of various web data like opinions, sentiments, and emotions of people. It has the potentiality to change the business procedure of an organization that depends on customer satisfaction on the products and services provided by organization. Walaa Medhat, Ahmed Hassan and Hoda Korashy have done a survey on Sentiment analysis algorithms and applications that aims to enhance and summarize the customer buying behavior ([7]).

II. LITERATURE REVIEW

Since 2012, E-commerce has played a vital role for many researchers. It focused on the patterns of development, SCM strategy, and consumer buying behavior. Huang and Liu (2014) stated that large e-commerce is possible due to heavy demands in market, but last mile distribution problem is difficult ([8]).

Anshu et.al, 2015 proposed the reasons behind the grow of e-commerce like cost, availability, security, language barriers, various new application and emerged new technology ([9]).

Gupta & Vyas, 2014, stated that E-commerce is considered at developing position in India and complex for adaptation. It have certain benefits like user-friendly, easy to handle etc. and limitations are lack of internet connectivity, language barrier, low graphic resolution, etc. ([10]).

Guritno et al. (2015) stated various influential factors that affect the performance of the product supply as considering the supply chain management and proposed inventory management concept for storage of products ([11]).

Paul Monno & Dazhi Xiao, 2014 provided the reasons behind consumer behavior of using E-commerce applications in foreign markets are differ from Indian market is lack of knowledge and lack of ability to handle the applications. ([12])

Kanwalvir Singh, 2013, researched and analyzed about the factors that influenced the customer behavior for e-commerce websites and the services provided by this and stated that what customer thought about various e-commerce websites and applications which are used in market now a days. The result of his research is critical success rate that influence the intentions of user for using e-commerce websites are: Due to low range and qualitative products present in e-commerce site, most of users under the age of 18 are attracted towards it, due to flexibility and affordable range, urban area consumers are attracted ([13]).

Park et al. stated that the online review qualities had a positive effect on customers' buying behavior, and the increment buying behavior depends on the incremented number of online reviews. ([14]). His research showed that two types of customers are there i.e. less involved customers affected by review quantity and high involved consumers who are affected by the review quality.

As an outcome of e-commerce technology and global marketing concepts, researchers have begun to compare customers' online shopping preferences and behaviors in different cultures [15].

Hwang et al. implemented an analysis of online shopping preferences in three foreign countries and as a result, found a significant differences in online shopping preferences, specifically in case accurate information, security, and cost. [16].

From the above it is shown that, current customer buying behavior depends on sentiment analysis of customer reviews at e-commerce sites and comparing strategies of same products present in different e-commerce sites. So this paper focuses on mainly the consumer buying behavior and organizations marketing strategies to improve the quality of products and provide better services to customers.

III. METHODOLOGY

PROBLEM STATEMENT:

In India, though the technology growing rapidly and plays an important role towards the e-commerce sectors. The several new technologies like AI, Machine Learning, cloud computing, bit coins etc put significant effects in this sector. By providing security, as compared to traditional systems, today's technology creates the trust factor in between retailer, sellers and buyers. The youth and tech-savvy population boost the e-commerce sector in India. Though various e-commerce sites are there now, so organization faces completion to attract customers by providing better quality products, secure environment of payment, quick delivery and better services. So to sustain in market place organization must uses some strategies to approach new customer and maintain a healthy relationship with old customer, which will be accomplished by studying the buying intension or behavior of customers through analysis of their emotions and statements and gathering the feedback or review of existing customers.

OBJECTIVE OF THE STUDY:

The following objectives have been considered for the research study that are:

- i. Understanding of role and impact of emerged e-commerce sites for online shopping
- ii. Determination of organization strategies to influence customers to buy products.
- iii. Analysis of customer behavior and intentions for buying products using net connectivity

i. Role and Impact of Emerged E-commerce sites for online shopping:

Now a day, E-commerce is a trending for people in goods and services by using internet. It consists of various technologies like Mobile commerce, Electronic Fund Transfer, Supply Chain Management, Online Marketing, Online transaction, data collection and processing and inventory management etc. E-commerce Organization's primary concern is to provide online platform and website to each individual customer using wireless and wired device like computer or mobile phone for buying a product or service.

E-commerce provides e-retailing concept like a virtual store on the websites with online catalog that is helpful to buy or sell the products at online market place. It gathers information from social media or web contacts like email to reach the customers and provide secure business transaction.

This study is descriptive by nature where the data is collected from secondary modes like from internet, research paper, survey or review documents etc. From these data, we come to know about the various emerging trends of e-commerce that is beneficial both for organization and customers, because technological advancement put tremendous impact on the world of e-commerce, strengthen the relationship in between customer and organization empowered the customers to buy cost effectively. So e-commerce concept became an integral part of each individual's life. E-commerce is very fast that's why customer can get anything just depend on a single click.

The trends emerged considering the expectation of marketers and consumers are:

- a) **Excessive Growth of Device uses:** From the point of view of E-commerce usage, the much more importance is given to use of electronic device like computers or mobiles, which is used by customers to buy goods online. Now a day, E-commerce businesses are operated with mobile users than desktop users both for design and development.
- b) **Ubiquitous E-commerce and 24/7 Availability for Sale:** Usage of mobile has changed the concept of E-commerce that contributes to every aspect of our daily life, which is an integral tool of day-to-day living. So it is available for 24/7 for buying and selling of products.
- c) **Faster Shipping and Quick Delivery:** Faster Shipping and Quick Delivery is so important for the online shopping like same day delivery which means customer wants to receive their products on the same day after ordering the product. It also includes like next day delivery and 2-day delivery, where next day delivery means products arrived one day later of the given order and 2-day delivery means the product is delivered within 2 days. Same day shipping means the order is shipped on the same day of the order is placed.
- d) **Digital Supply:** On time delivery, is the key differentiating factor for the organization in the environment of e-commerce. Technological innovation enables the critical areas of supply chain like inventory management, brand protection, warehouse management, infrastructure and delivery.
- e) **Integration to AI and Machine Learning to a greater extent:** Machine learning and AI is integrated to e-commerce system for recommending the products and improve the search facility. This technology is used to interact with customers, to analyze and predict the sales and patterns of interest.
- f) **Voice Search and Conversational Marketing:** Voice is one of the leading modes of innovation in e-commerce market place. It is the neat trick to gain the loyalty of customers in the smart speaker market. Conversational marketing means the two way communication medium to achieve numerous successes in e-commerce. These marketing tools drive the future of e-commerce platforms.
- g) **Image Search:** To provide the best facilities to customer's e-commerce organization integrate image searching technique through which customer take snap of the product and searches relevant information about the product with that snap.
- h) **Seamless Payment:** Online payment is considered as an important concept for e-commerce sites. For the successful e-commerce business, various organizations provide secure pay transaction system to the customers.

ii. Organizational Strategies for influencing customers to buy products:

Customers and their feedback are playing a vital role for organizational success. Consumer behavior and their perception means to study the individual, groups and organizations and observing their process of selection, security management, usage and disposal of products, services, sharing experiences and ideas that satisfy the needs and impact of processes on customer and society. The use of product and service influence the business position in market which is considered as a most important matter by marketer that encourages the marketer to implement various strategies for consumption of product and to sustain in the competitive market. So to survive in the competitive environment of e-commerce, organization focuses on customer behavior and interest.

Vital information is present in online comment has a major impact on the perception and buying behavior of customers and that affects the sales factor of products from e-commerce websites and manufacturing enterprises. Online reviews put effect on product marketing, and organizations use online reviews to understand the behavior and interests of customers of their products.

The data present in form of comment in the product reviews is more valuable to Organizers. Positive feedback from customers is further used in retailing and promotion purpose of upcoming product, information about business opponents provides competitive intelligent to produce new products with better design or implemented with latest technology,

information gathered from same minded groups provides a path to target new customers and establish the brand in market place. Organization strategies are responsible to increase the probability and frequency of the customer behavior and it will help the organization to know the consumer and customers' needs. Therefore, most organization implements strategic decisions and provide new ideas to provide better service to customers.

To run the business and stand in market place strongly by facing all competition, E-commerce organization not only focus on the individual customer but also establish the relationship with other organizations, like producers, resellers, government and non-profit groups for buying a huge variety of products that consists of equipment, raw materials, finished items, labour and other various services.

To sustain in the competitive environment, organization always be ready to manage the difficulty and get rid of this with proper solution like to manage time complexity, technical complexity and organizational complexity to become a unique brand in e-commerce environment and also consider the factors like individual perception, organizational perception and Business perception which is consider as unique factors to influence consumer buying behavior.

To influence the customer for buying products organization implement some strategies like:

- a) **Innovation:** Organization always try to implement new innovative technology, because technical breakthrough is now common in every industry. Organization provides innovative ideas and products to make the customer life easier.
- b) **Know your customer:** Every organization must properly know the customers and maintain a record of it. Organizations not only record the general information about the customer but also try to maintain a relationship with customer by observing customer behavior, interest, financial status etc.
- c) **Value Proposition:** Every successful organization have a strong value proposition that make it different from other rivals. This aims to provide new products with new ideas to maintain the consistency and performance as per the brand name, what actually customer expects from it.
- d) **Target customers:** The organization which has strong identity in market place need not to compete but only to focus to get success and try to maintain the value of the company's brand name and this due to this consistency the customer attracted automatically and organization always be ready for the challenges provided by rival companies who are also high value proposition in market.
- e) **Treat customers as asset to grow in market:** To lead in the market place, e-commerce organization should maintain a long term relationship with customers in a constructive manner. Applying this strategy, as a result organization emotionally joined with customer through emotional attribute by providing consistency in price.
- f) **Better ecosystem:** To form a better ecosystem organization establish and maintain a broad network of relationships, not only with customers but also with suppliers, retailers, distributors, industries, institutions, and government agencies. This will help to provide information as per the customer's interest, gives new ideas of development, better service and growth opportunities.
- g) **Direct communication:** To gain the trust of customer organization must provide better customer service, face-to-face interaction, quick message and email reply not before the purchasing but also after the purchasing.
- h) **Excellence Delivery:** To keep the customer happy, organization must be at rank 1 in case of quick delivery and fast shipping of products.
- i) **Reorganizing as per customer:** The aim of this is to make the organization fit for customers. That means design a e-commerce website which is easy to deliver a great customer experience by implementing a formal mechanism and hierarchical structure.
- j) **Culture Impact:** Culture is a huge advantage and to fulfill it organization need a right talent to develop a right organizational culture. It means focus on the behavior of employees who are doing better for customers, instead of going for temporary solution. So it is one of the difficult task to maintain sincerely.

iii. Sentiment Analysis of customer behavior and intentions for purchasing:

Sentiment is the emotion behind the customer engagement. It is the heart of understanding, measuring and improving customer relationship with business organization. It is an automated process to determine the opinions. Customer sentiment varies from lovable or neutral gesture or angry mode. By using sentiment analysis towards product review organization can able to understand about the liking or disliking behavior of customer about a product, compare of review of same products with other competitors, get the latest product information 24/7 in real time and save time by avoiding manual data processing.

The objective of sentiment analysis is to determine the behavior of a person with respect to particular subject. Tracking sentiments of customers helps the organization to understand the 3 major aspects that put effect on the current and upcoming organization strategies. Those are:

- a. **Customer Satisfaction:** It directed towards the questionnaire that customers are happy with the quality of product
- b. **Loyalty:** Customer satisfaction leads to loyalty inform of give references of the organization and its goods to a friend after using the product.
- c. **Intent of Engagement:** Customers are again coming back to the visited e-commerce site in a day or week or month.

Customer satisfaction, customer loyalty and customer engagement gained by an organization, is become a winner in marketing strategy. The four key aspects are used to track customer sentiments that are:

- a) **Word-of-mouth recommendation:** This is an effective method to attract new customers through word-of-mouth recommendations from existing consumers, but the calculation of this is difficult for the marketers. So customer is also considered as a promoter of any organization and it is determined by Net Promoter Score. Loyal customers who will continuously purchase and refer about the organization and their products to other customers consider as Promoters and the Net Promoter Score for this is 9-10. Satisfied consumers called passives may be bending by different offers given by other competitors having Net Promoter Score 7-8. Unhappy consumers are called detractors, can damage the brand name negative statements, having Net Promoter Score 0-6.



Fig- 1: Net Promoter Score

- b) **Customer Review:** Customer reviews are considered as an important aspect to track the sentiments. The mobile apps rating prompts inspire customers to provide their thoughts, which is helpful for e-commerce websites to understand customer sentiments.
- c) **Monitoring through social channels:** Social channels are considered as an important and efficient way for marketers to catch an instant sentiment of customer. This concept provides many benefits like, taking quick picture of brand health, connecting with various customers, notifying trends and identifying the sources etc. All social channels provide the sentiment analysis concept by considering the metrics like velocity of comment, tone of comment, reactions, shares and mentions.
- d) **Feedback of customer:** Most organization can directly contact with customers by digital connectivity like emails, chats etc for collecting the feedback of the customer. Disregarding of the digital medium by which direct feedback is collected, it's worth nothing that all feedback are considered as good feedback. Customer feedback is more valuable and it is always treated as an opportunity to determine and take steps that how to provide a better product to customers. It is a gift of any organization.

IV. CONCLUSION

This is just a review paper that is simply focus on the aspects that put effect on the buying behavior of customers in e-commerce websites. By using sentiment analysis, applying various strategies with the emerged e-commerce technology, organization can easily attract consumer and survive in the competitive market place. The analysis of sentiment of consumers makes the organization to understand the feelings, emotions, behavior and interest of consumer which is helpful for the organization to maintain a strong relationship with customers.

V. FUTURE SCOPE

Sentiment analysis is a new concept that is implemented theoretically depending on the opinions. Though it is a theoretical concern but it play a vital role, so if any technique is associated with it by doing further research then that will became a boon for every organization and consumers in online shopping, transactions and other operations.

REFERENCES

- [1] J.W. Lian, D.C. Yen Online shopping drivers and barriers for older adults: age and gender differences *Computers in Human Behavior*, 37 (2014), pp. 133-143
- [2] M. Law, M. Ng Age and gender differences: understanding mature online users with the online purchase intention model *Journal of Global Scholars of Marketing Science*, 26 (3) (2016), pp. 248-269
- [3] Y.J. Ma, H. Kim, H.-h. Lee Effect of individual differences on online review perception and usage behavior: the need for cognitive closure and demographics *Journal of the Korean Society of Clothing and Textiles*, 36 (12) (2012), pp. 1270-1284
- [4] P.Y. Chen, S.y. Wu, J. Yoon The impact of online recommendations and consumer feedback on sales, *ICIS 2004 Proceedings* (2004), p. 58
- [5] K. Floyd, R. Freling, S. Alhoqail, H.Y. Cho, T. Freling How online product reviews affect retail sales: a meta-analysis, *Journal of Retailing*, 90 (2) (2014), pp. 217-232, 10.1016/j.jretai.2014.04.004
- [6] R.A. King, P. Racherla, V.D. Bush What we know and don't know about online word-of-mouth: a review and synthesis of the literature, *Journal of Interactive Marketing*, 28 (3) (2014), pp. 167-183
- [7] Walaa Medhat, Ahmed Hassan, Hoda Korashy, "Sentiment Analysis algorithms and applications: A survey," Elsevier, pp. 1093 -1113, 2014
- [8] Huang, L.; Liu, P. Key Technologies and Algorithms' Application in Agricultural Food Supply Chain Tracking System in E-commerce. *Comput. Comput. Technol. Agric.* 2014, 420, 269-281
- [9] Anshu aggarwal et.al (2015), M-commerce in India: Promise and problems, *International journal of research in computer and communication technology*, vol-4, issue 4, April 2015

- [10] Gupta, D. S., & Vyas, M. (2014), Benefits and Drawbacks of M-Commerce in India: A Review, IJARCCCE, 3(4), 6327, 6328, 6329
- [11] Guritno, A.D.; Fujianti, R.; Kusumasari, D. Assessment of the Supply Chain Factors and Classification of Inventory Management in Suppliers' Level of Fresh Vegetable. Agric. Agric. Sci. Procedia 2015, 3, 51–55.
- [12] Paul Monno & Dazhi Xiao, Mobile Commerce App Adoption: Consumer Behavior Differences between Europe and Asia, M.Sc. Project, Lund University, Carolina, May 2014
- [13] Kanwalvir Singh et.al (2013), Critical Factors in Consumers Perception towards Mobile Commerce in E-Governance Implementation: An Indian Perspective, International Journal of Engineering and Advanced Technology (IJEAT) ISSN: 2249 – 8958, Volume-2, Issue-3, February 2013.
- [14] Park, D.H., Lee, J., Han, I.: The effect of on-line consumer reviews on consumer purchasing intention: The moderating role of involvement. International Journal of Electronic Commerce 11(4), 125–148 (2007)
- [15] MY., W.: Comparing consumers' on-line shopping behaviors in taiwan and the united states. In: Proceedings of the annual meeting of the International Communication Association (2010)
- [16] Hwang, W., Jung, H.S., Salvendy, G.: Internationalisation of e-commerce: a comparison of online shopping preferences among korean, turkish and us populations. Behaviour & information technology 25(1), 3–18 (2006)

