THE ROLE OF PERCEPTION IN CONSUMER BEHAVIOR USING FUZZY LOGIC MARKETING MODEL

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ABSTRACT

Due to emergence of E-Commerce in our country the way business is done is completely changed. It is anticipated that the E-Commerce Market in our country will grow to a total of 200 billion US dollars by 2026. And the main reasons behind this growth are the increased use of Internet and smart phones.

The customer purchasing behaviour is significantly influenced by the attitude of the customer of the company and its product or service. Businesses also spend too much money in selling themselves, fine tunning their customer services and doing whatever else they can do to positively affect the target customers' views. With the aid of detailed preparation and implementation of those plans, consumer attitudes can be affected to result in optimistic, profitable consumer behaviours.

Consumers are always exposed to continuous hammering of various marketing messages which lead to consumer tuning. In order to make the consumers to buy the product companies must expose their products and services to customers along with features to make the product unique in the market.

Major Marketing purpose is to figure out the customers' needs and seek to fulfill them through the goods and services. Marketing is therefore considered an art as well as a science. An option might be to combine soft computing with art and science, or to compute with words. This chapter is intended to use principles such as Fuzzy logic and computing linguistic variables. This set of fuzzy methods can be used to influence consumer perceptions and to promote profitable consumer behaviors.

Key words: Consumer Perception, Consumer Behaviour, Fuzzy Logic, Fuzzy Sets, Soft Computing, Linguistic variables and terms

1. INTRODUCTION

Both the researchers and business people have tried to figure out the connection between customer understanding and associated actions to remain in the same market environment.

Thus the marketing model is the necessity that will be flexible, able to customize and fully demonstrate the relationship between consumer perception and buying behaviour through the use of fuzzy logic methods

In this sense, if we take into account the foundations on which the marketing model is based and, in particular, the models of customer behavior trends, we concentrate our research on one of them, such as the modeling estimation techniques, along with improvement and represent the variables that estimation methods based on Fuzzy Association Rules (FAS) theoretically and empirically represent.

From these models we can expect more versatility, exhaustiveness and sophistication as well as offerings like much more quantity of qualitative information than previous estimation techniques used in this field. So we can say that FAS is a good alternative to Structural Equation Modeling (SEM) techniques that have been mostly used in recent decades to estimate complex models of consumer behaviour.

The term that is vague or that is not crystal clear is referred to as nagueness or fuzzy. Much of the time we face a condition in daily life where we can't say if the reality is completely real or false. Fuzzy logic in that case offers the flexibility to consider. This is how we can cope with any situation's inaccuracies and uncertainties.

1 is absolute true when we consider a Boolean law, and 0 is absolute false. Yet if we consider a model of fozzy logic, there is also an intermediate concept to be viewed which is partially true and partially false.

Its architecture includes four components:

RULE BASE: It represents IF-THEN conditions to take the right decisions, by using linguistic information.

FUZZIFICATION: It converts crisp numbers into fuzzy sets. After measuring by sensors inputs are passed to the control system for the purpose of processing, like temperature, pressure etc.

INFERENCE ENGINE: This determines the degree of matching with regard to current data, and defines which rules are to be fired according to the area of data. Before that the control acts are created by combining fired rules.

DEFUZZIFICATION: It transforms the fuzzy sets the inference engine has obtained into a crisp value.

2. THE REVIEW OF LITERATURE

Online Shopping and E-commerce websites are experiencing substantial growth in India. . Online Shopping has become more preferred option as Internet is the daily requirement for people now-a-days. We in Indian markets can see the difference. Due to its convenience, handiness and anytime and anywhere shopping, variety of products and numerous discounts and deals on goods, online shopping is the most favored choice for customers. A lot of study has been done to learn more knowledge about this ever evolving sector. The goal of the

studies is to get an idea of the attitudes of the customers towards shopping online with regard to their growth regarding online shopping. The studies were conducted all over the world over same subject. It was an attempt to gain insight into how different customers develop their attitudes in their respective countries, and what are the factors that impact the attitudes.

Chanana, N and Goele, S. (2012) mapped out the E-commerce future in India. We offered an summary of the future of E-Commerce in India and addressed the potential growth segments of the Indian E-Commerce market. They provided numerous factors that might be necessary for Indian E-Commerce sector growth in the future. Their claim was that retailers, wholesalers, producers and most importantly consumers will be given different opportunities. From their statement we can understand that as far as E-Commerce is concerned there is significant growth potential in the developing Indian Market.

Rastogi, A. K. (2010) addresses the various factors influencing Indian online consumers and their purchasing behaviour in his research. According to his research findings, attitudes towards online shopping were affected due to easy use, utility & enjoyment, personality of the customer, situational influences, distinctive characteristics of the product, perception of previous shopping online and belief in shopping online.

Richa, D. (2012) her study entitled "Impact of demographic factors of consumers on online shopping behaviour: A study of consumers in India" The demographic factors that influence online shopping were addressed. Demographic factors like age , gender, education , marital status, jobs , family size, usability and internet effect on India's online shopping. Indian women like shopping more than Indian men and this can be an indication of how online shopping affects gender. E-Commerce was used at the time of study only for critical services such as reservations and banking and not for items such as clothes, footwear, jewellery etc. The factors like age and marital status didn't have that much impact on online shopping in India. Small Families shop more than extended families.

Xu, Y., & V. A. Paulins (2005) attempted to observe the attitude of studentys in the US especially students from urban as well as rural campuses towards online shopping of apparels. They found that students with a more positive attitude were meant to buy online apparels. Internet use, Job status and car ownership have had a positive impact on online transaction.[1]

Lennon, S. J., Ha, Y., Johnson, K. K., Jasper, C. R., Damhorst, M. L., & Lyons, N. (2009) researched on the purchase by rural consumers of food and other fiber products aimed of figuring pout Health and fiber goods online shopping as a method of local retail and out shopping satisfaction. They used the principle of diffusion of invention for study. Selected samples were surveyed twice from 11 US states (in 2000 and 2003). Dissatisfaction with local retailing is found to have been a strong driver of out buying, online shopping views and purchasing online. For all points in time, traditional shopping has been positively related to online shopping, indicating that variables found to influence shopping within the literature may impact online shopping in a similar way.[2]

Shergill & Chen, G. S. (2005) in their research focused on the main factors that are taken into when buying consumers in New Zealand via E-Commerce websites. The study also sheds light on perception of different shopping websites by online buyers. From their research, they discovered that certain factors such as website design, services and security provided by the website and its reliability are most important in deciding website's consumer perception. Buyers were divided into 4 groups. Regular buyers, Frequent Buyers, Occasional Buyers and Trial Buyers were among the categories. They found that websites perceived differently across all types. For most online buyers Security/privacy issues were significant. The major shift in the understanding of the online customers about website design and usability is due to gap in rates for the online transactions.[3]

Research carried out by Ganguly, B., S. B. Dash, & Cyr, D. (2009) concerned the characteristics of website, the intention to purchase and trust factors in online stores with regards to Indian online consumers. They found that confidence plays significant role in the context of online shopping by Indian customers. They also proposed a model for the impact of the website features on online purchasing confidence.[4]

Hemamalini, K. (2013) tried to evaluate the effect of product styles on consumer behaviour when shopping on E-Commerce websites. Through the empirical study conducted on the Indian Consumers, it was found that online shopping is largely dependent on factors such as internet savvy person, product involvement, attitude and shopping reasons. In the Indian context this type of research is very limited.[5]

Karahanna, E., & Straub, D. W. (2003) proposed an integrated model of trust in online shopping through their research. We demonstrated how, through comfort and sociability, customer attitudes towards online shopping would be positively influenced. The research focused on finding out the effect of socially attractive text and designs like picture on customer perception and attitude based on online shopping. It was also found in the research that the perceived usefulness, trust in the website and enjoying shopping online had a positive impact of high perceived social presence.[6]

G. Nagra, & Gopal, R. (2013) their "study of Factors Affecting on Online Shopping Behavior of Consumers" provided insight into Consumer buying behaviour regarding shopping online through the use of different socio-economic variables. It also provides support to know the drivers of the attitude and goal of consumers to buy on the web, and perceptions of consumers with regard to simple use and utility. This study attempts to provide insights into how consumers form their attitudes and online shopping intentions.[7]

Lim, W. M., & Ting, D. H. (2012) attempted to provide insights into how customers form their perceptions and online shopping preferences so that retailers and advertisers can better represent and encourage consumers to buy online through online shopping technology management.[8]

Lim, W. M., & Ting, D. H. (2012) their research aimed to explore the evolution of consumer attitudes and online shopping preferences based on the context for gratification and uses. They have created managerial implications for electronic business entrepreneurs and marketers to satisfy customers and encourage them to shop online through online technology management. [9]

El Said, G., & Hone, K. (2005) tried to figure out the relationship between cultural element and online shopping based on the attitudes and understanding of Egyptian online shoppers. They studied the Egyptian users' perceptions and attitudes as regards shopping on E-Commerce websites. They described an exploratory study of the sorting of cards carried out with Egyptian consumers. The aim of the attempt was to check the features of the E-Commerce interface that are most outstanding for this user and its relationship with user intentions to have a positive impact on internet shopping. The findings also shown that the orientation of the consumers to the ebsite plays an significant role in predicting culture related purchase intentions and behaviors.[10]

Kumar, S., Ramachandran, T., & Panboli, S. (2014) studied facebook product recommendations and their role as driving factors for the inducement of online shopping. The researchers have tried to find out if social media such as Facebook is useful in motivating others top shop online or not. The TAM model tested the ease of Usefulness, Perceived Usefulness which can also be seen through Facebook. Facebook is one kind of acceptance of social technology through which users use Facebook to spread WOM about product as well as brands. It has been helpful in promoting online shopping.[11]

Makhitha, K. M. (2014) presented growing factors affecting the attitude of generations Y students' towards online shopping. Generation Y students were found to be students mostly using the Internet more. Though they use more of the internet, they are not shopping online. Their spending was more than that of generation X. The internet shopping hasn't improved in specific generation Y students' age group. Perceived Convenience was the most important impacting factor for online shopping for generation Y.[13]

Mathew, P. M., & Mishra, S. (2014) Through their study they have tried to evaluate the effect on Indian online retail in terms of factors such as online shopping threats, website characteristics, online shopping behaviour and internet use. They tried to create interrelation between these factors so as to predict the actions of online shopping Findings have shown that online Indian shoppers have and despite of that their frequency of online buying products via E-Commerce websites is not affected. These results did not suit previous research and it indicates that online Indian buyers have a specific approach to internet use.[13]

Saprikis,V., Markos, A., Zarmpou, T., & Vlachopoulou, M. (2018) studied mobile shopping consumers' behavior by the exploratory study. This research was intended at knowing reactions of online shoppers to various parameters impacting the intentions to use their mobiles while purchasing online. [14]

Previously Adi, P. H., Wihuda, F., & Adawiyah, W. R. (2017) explored the impact of intention to browse social media on the behavioural outcomes of young consumers. The research study aimed at understanding the online shopping orientation of high school students with reference to social media and the mediating effects of social media browsing aimed at the interrelationship between shopping orientations. The authors observed the impact of variables like hedonic and utilitarian motivation, social media browsing intention, word of mouth, and purchase intention.[15]

Rahman, M. A., Islam, M. A., Esha, B. H., Sultana, N., & Chakravorty, S. (2018) consumer behaviour towards online shopping observed through an empirical study of Dhaka City, Bangladesh. The study showed that online shopping in Bangladesh was initially growing. The research was conducted at Dhaka City of Bangladesh. The survey showed that in the case of any product or service, customers shop online so that they can save their time and become exposed to wide variety. All male and female online shoppers had the same kind of behaviour towards liking and disliking factors as they liked home delivery facilities and hated being unable to touch and feel the product.[16]

Liao, G., Zhou, J., Huang, J., Mo, F., Wang, H., & Yi, S. (2016) conducted a research on "Design and evaluation of smart mobile services for cross-channel shopping" in China. The study revealed the big impact of smart mobile services to improve online and offline shopping in a positive way. They developed and used three prototypes on mobile phones, watches. The result indicated that smart service satisfaction was impacted by the factors such as innovativeness, current shopping behaviour and product design.[17]

Jin, L. Y., Osman, A., Romle, A. R., & Haji-Othman, Y. (2015) studied attitudes towards online shopping activities at public universities in Malaysia. They were trying to find out what kind of attitude under graduate and post graduate students are displaying towards shopping on E-Commerce websites at Malaysian public Universities. As regards online shopping, attitude is also a determining factor. This statement was supported by Yulihasri, Aminul and Ku Amir (2011) who conducted a study in Malaysia and that study shows that attitude is the most important in influencing intentions of university students to shop on E-commerce websites. Additionally, Jamil & Mat (2011) research revealed that actual internet shopping is the result of the positive attitude towards online purchase intention Taylor and Todd (1995) also supported that particular person will have a stronger inclination for behaviour if that person has positive buying attitude. However, less inclination to buy

through the website could be the result of negative attitude from the consumers. (Limbu, Wolf & Lunsford, 2012).[18]

Pudaruth, S., & Busviah, D. (2018) tried to create and test a special Natural Flowers Online Shopping platform in Mauritius. The study findings had shown that retailer eputation, price, trust, education and age has significant impact on customers. Analysis of the correlation also revealed that online shopping behaviour for natural flowers is influenced by the factors such as behavioural motives, perceived usefulness, perceived danger, subjective norms and attitude.[19]

Zendehdel, M., Paim, L. H., & Delafrooz, N. (2016) attempted to study the moderating effect of culture on the perceived risk factor for online shopping behaviour. They tried to find out what are the factors that most significantly affect university students' attitudes when shopping through Malaysia's E-Commerce websites. The study draws attention to collectivism or individualism. This study aimed to determine the moderating influence of collectivism or individualism as a cultural dimension on the relationship between attitude and other factors such as protection, perceived risk, privacy and subjective norms. The findings showed important moderation effects related to the combination of subjective standards and attitude, perceived risk and other factors.[20]

Oresanya, A. J., & Oresanya, T. J. (2016) analyzed the attitude of students towards shopping on E trade websites for agri cultural products in selected tertiary institutions in the State of Ogun, Nigeria. This study was intended to shed light on attitudes of tertiary school students in the state of Ogun to shop online. They studied variables such as attitude and factors influencing the decision to shop online.[21]

The study by Dash, S., & Saji, K. B. (2008) intended to determine the extent to which adoption of shopping via E-Commerce websites by customers is influenced by the social presence of a particular website and self efficacy of Indian consumers. They found website customer service, website design, website reliability or performance and website security or privacy to be the major factors to dominate online shopping expectations of customers. The large gap in online buyers' expectations regarding website design and website efficacy accounts for the disparity in the rates of online transaction.[22]

Through their research findings Prashar S., Singh, H., Parsad, C., & Vijay T. S. (2017) by their research findings suggested that if retailers provide shoppers with more facilities they would most likely benefit from gaining the most loyal shoppers. They incorporate various factors which can play a crucial role in gaining loyal malls customers.[23]

Moon, M. A., Khalid, M. J., Awan, H. M., Attiq, S., Rasool, H., & Kiran, M. (2017) analyzed the consumers' views of the utilitarian and hedonic qualities of the website and the intentions to buy online. The study used cognitive-affective approach to attitude. The study was conducted to find out how consumers perceives the different attributes of online shopping websites which are capable of influencing cognitive and affective behaviour and also online purchase intentions. The study showed that the views of the consumers as to utilitarian attributes and hedonic attributes were essential and optimistic predictors of cognitive and affective attitude. Similarly customers' expectations of online shopping can be prected significantly across cognitive and affective attitudes.[24]

Arora, N., & Rahul, M. (2018) Examined the perceived risk's role in influencing women's attitudes in online shopping in India. The study examined key components of perceived risk in e-commerce (Security Risk, Privacy Risk, Product Risk and Non-Delivery Risk) and the impact of perceived risk on the online shopping attitude among online women shoppers in India. They tried to build a model that can explain the attitude of consumers depends on the perceived danger and online shopping attitude often influences buyinf intentions on E-Commerce websites.[25]

Hassan, M. K., Shakthi, S. P., & Sasikala, R. (2017, November) presented an efficacy study of product review classification by tagging a ketword. Reviews were observed on Amazon's websaite. The basics of evaluating, optimistic and negative approach to the commodity were found in the analysis. Then they suggested entirely different methods for extracting unstructured data before classifying comments using Naïve Bayes algorithm.[26]

Hung-Joubert, Y. T. (2017) studied the validity of three respective websites quality related measuring instruments, namely, program information and service quality factors that influence consumers in the South African Online Shopping Environment.[27]

Yogi, K. S. (2015) carried out the study on application of fuzzy logic to product quality and customer purchasing intentions in two wheelers. This research highlighted the reliability impact of an effective braking system, high trade value on performance, engine life on durability, and positive relationship between two wheeler customers that meet requirements and lower maintenance during the purchase process. This study offered a structure for strategy for purchasing and product quality for customers while purchasing two wheelers. It considers the factors influencing the Indian Market's purchase of two wheelers. This analysis is using both an analytical and a fuzzy logic approach to achieving the research goals. [28]

Casillas, J., & Martínez-López, F. J. (2009) Reviewed a knowledge discovery methodology that supports genetic-fuzzy systems – a Soft Computing (SC) method using a combination of symbolic logic and genetic algorithms to be used in the marketing model. The characteristics are very similar to the criteria for market analytics methods currently required by marketing managers. In particular, the emphasis was on finding in-depth how knowledge discovery in databases can be applied to a web based trust user model.[29]

According to Andreas Meier and Nicolas Werro it is very much essential to Build and maintain customer loyalty as far as online marketing is concerned. Marketers can offer better customer service, cost benefits to customers on e commerce websites and rewards to most valued customers which will result in improved customer loyalty and equity. Very few attributes are taken into consideration in case of traditional marketing segmentation. Even if the data values are same for two customers, they can be grouped into different classes. And they can be given different treatment as a customer. They proposed a fuzzy logic model for classification to illustrate extention of webshop which in turn allows webshop managers to have improvements in loyalty, equity and personalization demands.[30]

3. PROPOSED FRAMEWORK

The Fuzzy rules of association will be used to perform a knowledge discovery function. This will essentially consist of preparing the data and setting out the scheme we will implement to represent the information that resides in the data. A particular method or model will be developed based on those fuzzy association rules after defining those aspects.

The Process is as follows:

- Data collection: as commonly done in marketing, it will be collected using a questionnaire in a manner similar to the structural equation modeling modeling models.

- Data processing: This processing is of utmost importance in order to adapt the data collected to a scheme that is compatible with fuzzy methods of system learning.

3. CONCLUSION

As stated in the initial section on the purpose of this study, a method to estimate a proposed customer perception and behavior model must be useful in testing a set of theoretical

relationships that shape such a model as well as in helping to find the right solutions to marketing management problems through right decisions.

With that aim, we will be empirically testing the theoretical relations of our model.

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