

## **PREDICTIVE DECISION TREE MODEL TO FORECAST CUSTOMERS COMPULSIVE BUYING BEHAVIOR FOR SUSTAINABLE FUTURE IN RETAIL MARKET**

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### **ABSTRACT**

*Consumer behaviour has changed significantly during the past ten years. Each Consumer is undoubtedly unique as a person. Therefore, a successful company needs to have a thorough understanding of how customers choose products. It is essential to know impulsive buying in order to recognise the nature of "Purchasing power" and its impact on a purchasing decision. In order to investigate compulsive purchase behaviour among Indian urban customers, this study focuses on urban retail market settings near important cities like Bangalore. Due to the growth of the Indian IT industry, Bangalore's consumer lifestyle and spending power have undergone considerable changes. According to their predisposition for obsessive shopping, in this study are classified into a variety of groups. In this work, we adopted Predictive Decision Tree to forecast analysis approach is used for better quality shoppers therefore, an effective differentiation strategy of a firm is to provide a better version of an existing product in terms of quality of service we refer to this quality upgrade as a next-generation decision tree model which help retailers to predict mind set of young IT shoppers.*

**Keywords: Decision analysis, factors influencing shopping, Shopping behaviour.**

## 1. INTRODUCTION

Customers may now buy a variety of customised goods online, including computers and fitness equipment. Instead of reading their daily newspapers, more individuals now read the internet editions, and news is increasingly being found on social media. To succeed in today's dynamic and rapidly evolving economy, marketers need to have a thorough understanding of consumers. This entails comprehending their requirements, viewpoints, operating methods, and spending habits. They must ascertain the contributing elements that influence client preferences. Researchers are interested in exploring different consumer consumption and possession attributes. These traits include excessive purchasing and consumerism. What we refer to as purchasing power is the distinction between "Feelings and exhilaration" that a buyer experiences from an unexpected purchase vs a planned purchase (Faber and O'Guinn, 1989). Power to buy has always had a positive impact on purchasing choices. Scholars of consumer behaviour and economists have only recently examined compulsive purchasing. This is very different from impulsive buying, which happens when a buyer makes an unplanned purchase. However, someone who purchases excessively develops a shopping addiction, which can have major negative consequences including placing them in debt. On occasion, it can cause conflict in personal relationships and instability in consumers' daily lives.

## 2. SIGNIFICANCE OF STUDY

The primary objective of this study is to validate the Consumer Compulsive Buying Behavior Scale in an Indian context. Retailer would also benefit from having a thorough understanding of the various subgroups of compulsive consumers, their demographic makeup, and the multiple factors they weigh while buying goods and services. This would help retailers create marketing strategies for India's compulsive consumers.

## 3. RESEARCH METHODOLOGY

This study focuses on Bangalore's urban marketplaces because the growth of the Indian IT sector in this city has caused substantial changes in consumer spending power and lifestyle. According to their predisposition for compulsive shopping, children are segmented into numerous groups in this study. This study makes use of predictive analytics, decision trees, and time series modeler forecasting analysis. This would help marketers create marketing strategies for India's neurotic consumers

## 4. OBJECTIVES OF THE STUDY

In an Indian context, to validate the scale for compulsive purchasing behavior.

1. To ascertain the factors influencing consumers' purchasing behavior.
2. To classify Bangalore's young consumers into different groups based on their obsessive buying tendencies.
3. To ascertain whether there is a connection between their demographics and compulsive shopping habits.

## 5. RESEARCH DESIGN

Exploratory research is used in the investigation's opening phase. This study aims to identify and explore the various invisible factors that affect young customers' purchase decisions. It is beneficial to look into the pleasure of shopping, spending tendencies, customer mindsets, usage, impulsive purchases, invisible drives, thoughts, attitudes, and hidden factors that affect these customers' purchasing decisions.

Descriptive research is used for the investigation's second section. In particular, this methodology helps to describe the traits of distinct consumer segments in Bangalore. It also helps to identify the characteristics of compulsive shopping. Using this description as a model, marketers may create numerous strategies to target distinct subgroups of neurotic consumers.

## 6. DATA SOURCES

The data that are gathered directly from consumers are referred to as primary data. These information is gathered straight from the youthful consumers who live in Bangalore. The Compulsive Purchasing Behavior Scale, created by Elizabeth A. Edwards in 1993 for the study "Development of a Novel Scale for Assessing Compulsive Buying Behavior," is included in secondary data. The questionnaire used in this study was created using Likert scale. By using a structured, open-ended questionnaire in a survey, primary data are directly obtained from consumers. The reliability, discriminant validity, and convergent validity of the survey are all evaluated.

## 7. SAMPLING DESIGN

In this study, convenience sampling was used. The sampling components for this study were chosen based on two criteria. The two requirements are:

The responders must fall between the ages of 21 and 35, the responders must have lived in Bangalore for two years, and the study used samples around 200 in bangaloreans.

## 8. LITERATURE REVIEW

An irresistible and repetitive urge to buy is characterized by compulsive buying disorder, also known as oniomania. While the literature contains different descriptions, the vast majority of people with this disorder are experiencing excessive worry and poor impulse control related to spending, chronic purchasing, and repetitive, compulsive purchasing of unnecessary.

Compulsive buying is chronic, repetitive buying, according to O' Guinn and Faber (1989), which becomes a primary response to negative events or feelings. Compulsive buyers tend to buy too many items they don't need and can't afford at times (Hoyer and MacInnis, 2001

Compulsive purchasing is different from impulse purchasing: impulse purchasing centers on a particular product at a particular time and is temporary, while compulsive purchasing is an enduring behavior that focuses on the purchasing process, not the purchasing itself (Solomon, 2004)

Compulsive purchasing is one form of compulsive consumption which is considered the dark side of consumption in the realm of abnormal consumer behaviour (Shiffman and Kanuk, 2000)

According to Faber et al. (1987), compulsive consuming is improper, frequently excessive, and obviously harmful to the lives of those who exhibit it. The other types of compulsive consuming include excessive eating, gambling addiction, drug addiction, and alcoholism (Shiffman and Kanuk, 2000). Similar to the behaviours listed above, compulsive purchasing has serious negative effects on one's financial, emotional, and interpersonal well-being as well as the well-being of their families and even the society to which they belong. Research was conducted to quantify and detect compulsive purchasing as the phenomenon gained increasing attention. Faber and O'Guinn (1992) used a scale to quantify obsessive shopping.

The scale developed by Valence et al. measures respondents' propensities for compulsive buying, according to Cole and Sherrell (1995)<sup>25</sup>. The scale developed by Faber and O'Guinn detects more extreme compulsive buyers. Rindfleisch et al. (1997)<sup>26</sup> found that materialism and family structure have an impact on adolescents' compulsive purchasing.. D'Atous et al. (1990) discovered that environmental factors including peers, family communication, and parental compulsiveness have an impact on adolescent compulsive shopping trends. O'Guinn and Faber (1989) discovered that compulsive buyers are likely to exhibit compulsiveness

as a personality trait and have lower self-esteem, and that the consequences of compulsive buying include extreme levels of debt, anxiety, and frustration, subjective suffering, and a lack of self-control.

According to (Edwards, 1993) obsessive shopping is an abnormal kind of shopping. In a sense, spending becomes an addiction for people, which might lead to debt for them. Additionally, it is characterised by customers' insatiable drive to spend money on shopping and other purchases. This was widely acknowledged by financial counsellors and therapists who believed that compulsive shopping conduct is the cause of financial difficulties. The validity and reliability of the scale are assessed. The outcome shows that obsessive spending may be broken down into five different dimensions or components. These included the need or compulsion to spend money, feelings related to shopping and spending, a propensity to spend money, dysfunctional spending, and guilt following a purchase.

According to Gwin, C. F (2005), Compulsive buyers form a significant percentage of the entire population. The authors feel that compulsive spending behaviour is a burden to the society. It is important to study the compulsive spending behaviour as it causes harm not only to the individuals but also to the society in the form of debt, bankruptcies and dysfunctional families. The consequences of compulsive buying seem positive in the short-term as the buyer receives the immediate gratification of the purchase; however, the long-term consequences are negative as compulsive buyers deal with economic and psychological consequences including high levels of credit card debt, low savings, depression, anxiety, frustration, low self-esteem, and interpersonal conflict (Roberts 1998).

The behaviours of compulsive consumption, according to Faber and O' Guinn (1989), can include pathological

gambling, kleptomania, obsessive sexuality, and eating disorders. According to authors, compulsive buying is described as "chronic, repetitive purchasing that occurs as a reaction to negative events or feelings." According to (McElroy, 1994), there is a connection between college students' obsessive shopping habits and their credit card debt. In particular, a number of variables, including gender, credit card use, rate of time preference, and income, were linked to the compulsive purchasing behaviour of college students. Regression analysis served to demonstrate this. Using the data from this survey, university policies are made or amended to include financial education and counselling.

## 9. RESEARCH GAP IDENTIFICATION

The term "compulsive buying" is used in the current study to refer to all forms of unusual buying behaviours, even though terminology like "impulsive buying" and "compulsive buying" are also sometimes used to refer to unplanned purchase (Solomon, 2002). Many studies on compulsive behaviour have been conducted, including studies on the gender and economic influences of compulsive behaviour (Block & Morwitz, 1999; Muller et al., 2007), however none of these studies specifically addressed obsessive purchasing behaviour in the Indian urban market. Given that China and India together account for a third of global population, a study of compulsive buying in such a market environment is of importance. This study focuses on consumer purchasing patterns in Bangalore in an effort to pinpoint the city's compulsive shoppers.

## 10. DATA ANALYSIS AND DISCUSSION

Predictive analytics is a branch of advanced analytics that makes predictions about future outcomes using historical data combined with statistical modelling, data mining techniques and machine learning. Companies employ predictive analytics to find patterns in this data to

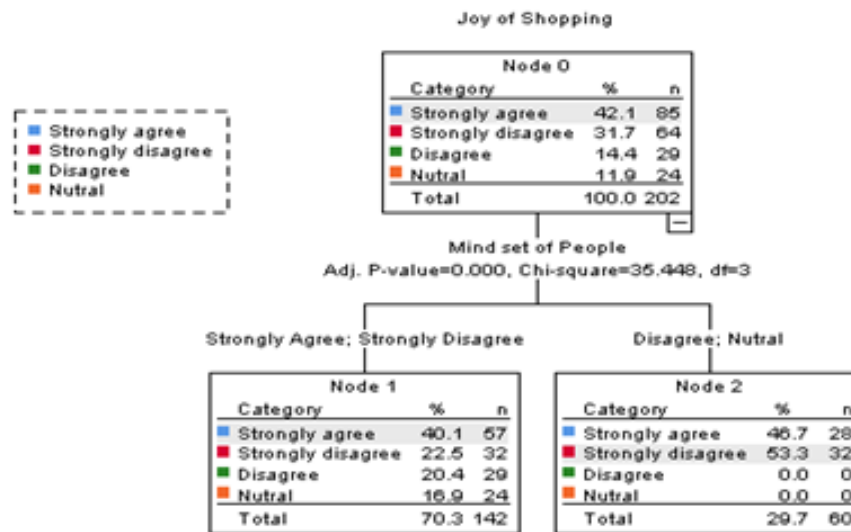
identify risks and opportunities.

A decision tree is a non-parametric supervised learning algorithm, which is utilized for both classification and regression tasks. It has a hierarchical, tree structure, which consists of a root node, branches, internal nodes and leaf nodes.

### PREDICTIVE ANALYTICS WITH CLASSIFICATION AND DECISION TREE

Specifications	Growing Method	CHAID
	Dependent Variable	Joy of Shopping
	Independent Variables	Usage of Product, Mind set of People
	Validation	None
	Maximum Tree Depth	3
	Minimum Cases in Parent Node	100
	Minimum Cases in Child Node	50
Results	Independent Variables Included	Mind set of People
	Number of Nodes	3
	Number of Terminal Nodes	2
	Depth	1

**Figure1. Decision Tree**



Looking at the Table1: It is discerned that the variable joy of Shopping being Parent Node has got strongly agree with other two Child nodes by 40.1% & 46.7 % this shows that the joy of shopping has got correlation with the mind set of People by 40% which is 60% to the Total observed value hence this Variable is a determining Factor for deciding compulsive buying behaviour.

**Table2. Tree Table**

Node	Strongly agree		Strongly disagree		Disagree		Neutral		Total		Predicted Category	Parent Node	Primary Independent Variable			
	N	Percent	N	Percent	N	Percent	N	Percent	N	Percent			Variable	Sig. <sup>a</sup>	Chi-Square	df
0	85	42.10%	64	31.70%	29	14.40%	24	11.90%	202	100.00%	Strongly agree					
1	57	40.10%	32	22.50%	29	20.40%	24	16.90%	142	70.30%	Strongly agree	0	Mind set of People	0	35.448	3
2	28	46.70%	32	53.30%	0	0.00%	0	0.00%	60	29.70%	Strongly disagree	0	Mind set of People	0	35.448	3

**Table 3. Classification**

Observed	Predicted					Percent Correct
	Strongly agree	Strongly disagree	Disagree	Neutral		
Strongly agree	57	28	0	0	67.10%	
Strongly disagree	32	32	0	0	50.00%	
Disagree	29	0	0	0	0.00%	
Neutral	24	0	0	0	0.00%	
<b>Overall Percentage</b>	<b>70.30%</b>	<b>29.70%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>44.10%</b>	

Looking at the Table 2 & 3 : It is discerned that the Tree diagram with four counts has 70.3% under acceptance and 29.7 % disagree with neutral being zero percent. This vouches that the joy of shopping when taken as dependent variable has P Value of 0.000 with

chi square being 35.448 in both the cases. However, when chi square value being 35.448 in the two nodes, the difference between the strongly agree and strongly disagree has not been significant as values show .000. Hence, the child nodes approves the parent joy of

Under the predicted classification by referring to Growing Method, the disagree and Neutral have both become zero to mean that the joy of shopping has got only two extremes with the ends being strongly agree and strongly disagree. Hence, there is no other variable in this continuum throughout and it is decided that the joy of shopping is the predicting variable.

**Table 4. Time Series Modeler -Forecasting Analysis**

Model Description			
			Model Type
Model ID	Joy of Shopping	Model_1	ARIMA(1,0,11)
	Tendency to Spend	Model_2	ARIMA(2,0,5)

**Table 5. Model Fit**

Fit Statistic	Mean	SE	Minimum	Maximum	Percentile						
					5	10	25	50	75	90	95
Stationary R-squared	0.495	0.034	0.471	0.519	0.471	0.471	0.471	0.495	0.519	0.519	0.519
R-squared	0.456	0.077	0.401	0.51	0.401	0.401	0.401	0.456	0.51	0.51	0.51
RMSE	0.604	0.174	0.481	0.728	0.481	0.481	0.481	0.604	0.728	0.728	0.728
MAPE	25.765	8.291	19.902	31.628	19.902	19.902	19.902	25.765	31.628	31.628	31.628
MaxAPE	108.359	34.975	83.628	133.09	83.628	83.628	83.628	108.359	133.09	133.09	133.09
MAE	0.418	0.178	0.292	0.544	0.292	0.292	0.292	0.418	0.544	0.544	0.544
MaxAE	2.649	0.063	2.605	2.694	2.605	2.605	2.605	2.649	2.694	2.694	2.694
Normalized BIC	-0.848	0.568	-1.249	-0.446	-1.249	-1.249	-1.249	-0.848	-0.446	-0.446	-0.446

Looking at the Time Series Modeller Forecasting analysis with which R squared values are measured fall below 0.5 meaning they are having variability when used as independent variable. If joy of shopping is correlated with tendency of spending, it goes without saying that the Normalised BIC turns negative that the two variables are positively correlated and an increase in one variable makes the other variable also increase.

**Table 6. Model Statistics**

Model	Number of Predictors	Model Fit statistics	Ljung-Box Q(18)			Number of Outliers
		Stationary R-squared	Statistics	DF	Sig.	
Joy of Shopping-Model_1	2	0.519	53.327	14	0	0
Tendency to Spend -Model_2	1	0.471	41.401	14	0	0

Looking at the Graph Ljung Box Q18 chart with df as 14 when plotted for the two variables equivocally vouches for the size of the population in these two variables scattered between 1 to 101 and from 101 to 200. Hence, this charts proves there is negative correlation between the joy of shopping and tendency to spend under this Q18 chart. However, taking the df as 14 and significance at 0.000, it is presumed that the R Squared divides the data into two equal halves. Hence, the joy of shopping is a predictor variable.

## 11. CONCLUSION

The basic idea of this paper speaks on unplanned buying and given the compulsive buying behaviour of the young IT officials as respondents in this study, it is brought that there are few factors that are to be elucidated as 'predictors'. The survey of the respondents mostly restricted to Bengaluru city have expressed their propensity to suddenness in buying. Statistically, Decision tree model was found to be adaptive for this study as it has got nodes in Young star mind-set with two factors namely Joy of Shopping and the Tendency to spend emerging as predictor variables, Decision tree model has found positive correlation between the two. As the df in both the cases are 14 and with significance ruling at 0.000, it is concluded that these two variables are predictors for this study and the youngster respondents throw more light on the compulsive buying behaviour which help sustainable future for retailer understand these variables for designing new strategies to attract the younger generation tendency for a product with better quality is more attractive to consumers, who are willing to pay more for a better quality. Therefore, an effective differentiation strategy of a firm is to provide a better version of an existing product in terms of quality we refer to this quality upgrade as a next-generation decision tree model which help retailers to predict mind set of young IT shoppers.

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