

**PREDICTION OF CUSTOMERS WILLINGNESS, ATTITUDE
AND INFLUENCE TOWARDS COUNTERFEIT PRODUCT**

BY

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A PROJECT REPORT

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BONAFIDE CERTIFICATE

Certified that this project report titled “**PREDICTION OF CUSTOMERS WILLINGNESS, ATTITUDE AND INFLUENCE TOWARDS COUNTERFEIT PRODUCT**” is for course completion of Major Project is the Bonafede work of **GOWTHAMANKUMAR V** who carried out the project under my supervision. Certified further, that to the best of my knowledge the work reported herein does not form part of any other project report or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

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on

Internal Examiner
(Signature with date)

External Examiner
(Signature with date)

DECLARATION

I hereby declare that this Research project report entitled as, **“PREDICTION OF CUSTOMERS WILLINGNESS, ATTITUDE AND INFLUENCE TOWARDS COUNTERFIET PRODUCT”** has been undertaken for academic purpose for the course submitted to Anna University in partial fulfilment of requirement for the award of degree of Master of Business Administration. The project report is the record of the original work done by me under the guidance of VIVEK RAJ S N, Assistant Professor, KCT-BS during the academic year 2020.

I, also declare hereby, that the information given in this report is correct to the best of my Knowledge and behalf.

Place: Coimbatore

Name and Signature

Date:

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ABSTRACT

This research paper is about the willingness and the factors that affects the buying of the counterfeit product. Study was done in the pandemic period of Covid 19 in the month of July and August of 2021. The TRA (theory of reasoned action) model is used in the study about the human behaviour and interest towards the counterfeit products. This study also collects the data about how and which category of counterfeit products are highly preferred and brought by the customer. Variables used in the study are value consciousness, price, brand loyalty, personal gratification, subjective norm, attitude, satisfactory level, information susceptibility. These data are collected in the Questionnaires format with the measuring unit of Likert scale where the highest is 5 and the lower is 1. The dependent variable is willingness to buy and this study shows how the variable affects another variable, where it is collected by an yes or no question in the Questionnaires. The demographic variables are also considered in this study, like Gender, Education, Professional, Living Area of people and their income level. This study uses machine learning algorithm SPSS software to run the logistic regression and artificial neural networks and r code for doing analysis on the variables to analyse the emotion and sentiment of people towards the counterfeit product. The study concludes that the value consciousness income level and price are the main variables that makes the customer to buy the counterfeit products.

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I. Introduction:

The study is mainly done on the counterfeit product in the locality of Tamil Nadu. The counterfeit product is a kind of duplicate and look and like of exact original product in the market it is mainly spread along all over the world. The two main countries facing these problems are China and USA in the global level economy. The counterfeit product is a kind of illegal product which uses a high-level brand's image or logo which are made patent by the company, to sell them in the market with the same and lower cost. The manufacturing cost of the counterfeit product is low when compared to the original equipment or brand manufacturers. The counterfeit products for INDIA are mainly towards from the China and some percentages of goods are manufactured in India. The products entry is mainly done on three ways of transportation which are by sea ways such as cargo and courier and postal services and by roadways. The high level of counterfeit products is shipped through air transports. The article in recent survey says that the growth of the counterfeit product will be high in the year 2030 to 2037 where it will be 7% of global economy. There are various kinds of counterfeit product. They are

- Clothing
- Apparels
- Wines
- Electronics
- Toys
- 3D printers
- Cigarettes
- Cosmetics
- Military items
- Food
- Pharmaceuticals
- Helmets
- Tyres
- Beverages
- Bag packs

1.1 Rationale of the Study:

The counterfeit products in INDIA have been increased in very large amount while compared in early days. These are due to increase of goods price due to inflation and drop in GDP of INDIA in the recent days and the main objective of the study is to examine and study that which category of people or age group is more attracted towards the counterfeit products and also to study that income level of the individual is a main impact or pushing a customer towards the counterfeit products. The counterfeit product is also entered into the online shopping platform by two different category one by selling it as counterfeit and the other one is by entering illegally by selling it as original product in online. The study also uses the machine learning analysis about the purchasing behaviour and prediction of purchase of counterfeit products.

1.2 Theoretical foundation of the Study:

The study found that there are more people who likely or forcibly to purchase the counterfeit products in both online and offline modes to show them off and also get recognised by surroundings. Most of the purchase ability people are educated having a professional or an undergraduate degree which shows that most of them aware of the products as well about original brand. The other main finding is some of them also interested in buying the counterfeit medicines in this decade with knowledge. The highly purchased counterfeit products are shoes and slippers, watches, electronics, apparels and bag packs. The people buying counterfeit are more of them fall under unmarried status with low level income in the society. Where the family size also indicates that it's a normal which has four members in the family, it also tells that there is a lot of comfortless in the counterfeit product while compared to the original product. The other main part is price of the product which is highly drastic between the original and counterfeit product, it also shows that there are very low number of respondents are loyal to the original brand.

1.3 OBJECTIVE OF THE STUDY:

- To predict the customer willingness to buy the counterfeit product.
- To know the relationship between the factors influencing customer to buy counterfeit product.
- To explore the factors of TRA model that create willingness to buy the counterfeit rather than original products.
- To analyze the customer willingness and attitude using machine learning algorithm with preferred variables.

1.4 Research Gap:

Earlier the study was only about the category of the counterfeit products such as software to medicines. In this research it aims to predict the customer willingness and attitude towards buying the counterfeit product rather than the original product in the market. The variable like value consciousness and repeated buying are mainly discussed in this study. The research is done for all kind of counterfeit product in the earlier it was on specified items. The machine learning algorithm is used for analyzing variables. There were no subjective responses considered. The studies involved collecting demographic factors and other variables based on a Likert scale. Adding to this, the research studies suggested promotional strategies based on the variables analysed and their significance in purchase intention but did not cover specific customer targeted promotion.

1.5 Problem Statement:

The research aims to predict the customer willingness and attitude towards buying the counterfeit product rather than the original product in the market. The variable like value consciousness and repeated buying are mainly discussed in this study. The study also tries to understand the relationship between ages and income level and also their repeated buying activity towards the counterfeit products and their category. The study also aims to research about the social attributes and is there is any influencing variable towards the purchasing of the counterfeit product. The purchase mode is also a important form towards the future to restrict the counterfeit product.

1.6 Research Frame Work:

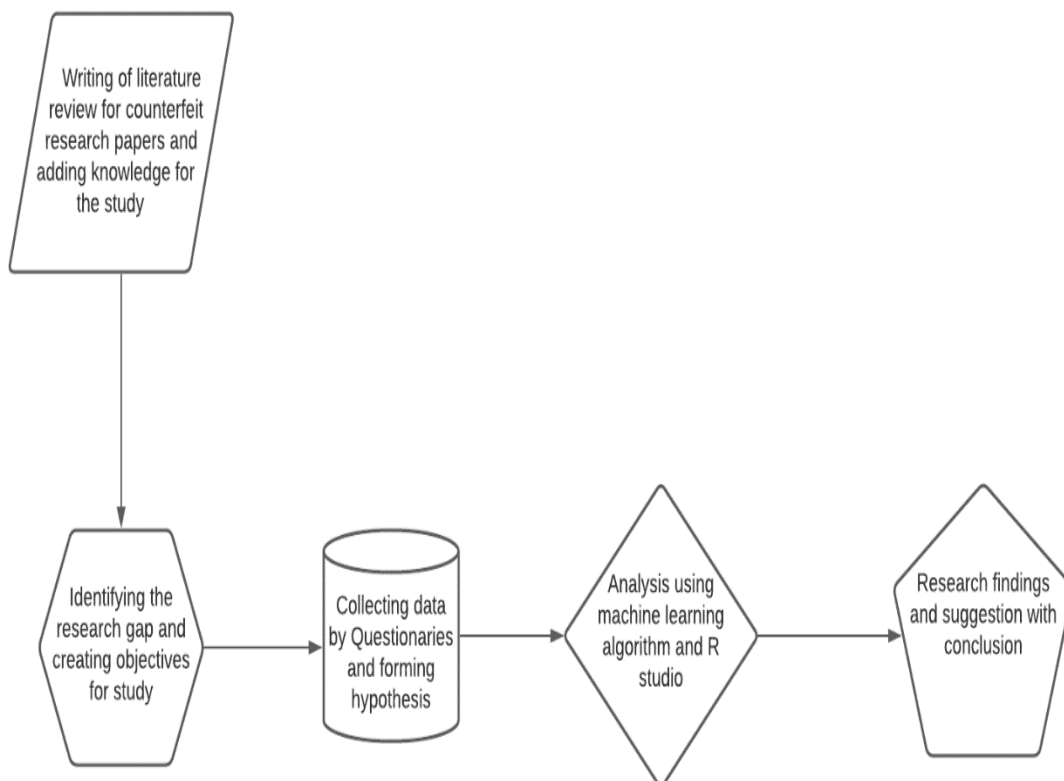


Fig 1 (research frame work)

1.7 Scope and limitation:

The analysis part of the study covers the concepts of machine learning, text mining and sentimental analysis through text mining. It aims at predicting the customer willingness to buy counterfeit product rather than the original product in the market. Because of the time constraints and the Covid-19 pandemic, the sample of the data is from respondents based in Tamil Nadu cities and rural places. The constructs used for the study is total based on the individual's perception towards price, quality, attitude, satisfactory level, purchase intention, perception and their brand loyalty toward the original brand and some social values that makes them or move towards the counterfeit product.

1.8 Expected Outcomes:

Around nine constructs/variables are used to determine the purchase willingness, so that the significance of each factor in deciding the willingness of the customer towards buying and suggesting of counterfeit products. The study uses machine learning models that can be used to predict the willingness of people in buying counterfeit products and this also shows that which age group or what kind of gender or the income level of individuals are a reason to buying behaviour are studied. This also shows that how the economy of the country gets affected and how its going to be affected in the future because of the counterfeit product.

II. Industry Profile:

Counterfeit products are illegal in nature so they are available in small domestic markets they can't be sold in major market places and there are some local markets in metro cities like Delhi, Bombay, Chennai, Bangalore. In latest trends the counterfeit products have been entered into online shopping sites. According to the survey of world trade the value of trade made on counterfeit product is nearly 3.3% of world trade which is done in 2019 before the pandemic.

A research claims that Global counterfeiting market value is 4.9 billion and it will increase to 17.47 billion by growing 17.25% of CAGR.

2.1 Government policies:

There are several policies, act and agencies in India to prevent the counterfeiting in markets. The acts are

Trademarks Act 1999

Copyright Act 1957

Designs Act 2000

Geographical Indications Act 1999

Indian Penal Code 1860

Drugs and Cosmetics Act 1940

Food Safety and Standards Act 2006

Prevention of Money Laundering Act 2002

INDRP (In Domain Name Dispute Resolution Policy)

Cybersecurity and brand protection

these are the various kinds of acts in these some of the acts are introduced towards new emerging digitalisation of economy and market towards the future of global system and India.

2.2 Challenges Faced by the Industry:

The challenges mainly faced by the counterfeit industry is legal issues and the raids done in their shipments while transporting the products from hub to market places. In case the goods have been seized by the government authorities and it will lead to destroy of the counterfeit products with the help of original brand manufacturer. Marketing their product market towards the customer publicly and very less amount of profit is entertained in this industry.

III. Literature Review:

Viot C., Le Roux A., Kremer F. (2014), Second order factor analysis is used to determine the attitude of the customer towards the counterfeit product. It also has two different constraints which is societal consequences and individual values and the analysis shows there is no relation between attitude and societal consequences and there is a strong relationship between individual value and attitude.

Ravi Kumar, Dr. Rakesh Kumar Shukla (2009), Simple random sampling is used and TRA (Theory of Reasoned Action) model is also used in this study it also has social economic variables and purchase intention towards the counterfeit products. Linear regression and chi square test are used to analyse the data. The result indicates that education level and individual values are more related and favour towards the counterfeit products and the relation is negative between social values.

Saurabh Verma, Rajendra kumar, Sunil kumar Yadav (2019) This study also uses TRA (Theory of reasoned action) model. The study is done under the purpose of intellectual property rights act to give some knowledge and ideas of counterfeit product and also what factors affect the buying of counterfeit products. The primary data was collected in Delhi counterfeit market with self-administrated questionnaires. The variables like price consciousness and buying intention and novelette are physiographic determinants used in this study where the result indicates that there is no relation or influence of value consciousness towards the factors affecting the buying of counterfeit products.

Ravi Kumar, Rakesh K Shukla¹ , Kuldeep C. Rojhe², (2016), Convenience sampling and TRA method is used in this study where attitude is the mediator between subjective norm and the purchase intention of the counterfeit products.

The demographic variable income level has also a main influence on purchase intention towards the counterfeit product.

Suvarna patil, Arun Handa (2014), This paper is a general awareness paper about the counterfeit product in Indian and international markets. The paper also explains the demand and supply and also the customer intention about the counterfeit products and their social and illegal terms towards the society.

Adarsh Ullas, Soni Vivek,(2019), The study uses two types of data primary collected within amrita college and the secondary data collected from journals and articles the analysis is done using MS excel. The result shows that there are very high number of users of counterfeit product where they mainly fall on teenagers category and the sample does not take any risk by buying beverages and medicals in counterfeit category.

G Prakash and P Pathak (2017) In this study they used TPB(Theory of planned behaviour)model and Structural equational modelling is used to analyse the data where the result indicates that price and value consciousness are more influence than other variables towards the buying intention or attitude of customer towards the counterfeit products in the domestic market. The data was collected in the questionnaire model and it is the primary data.

Arvid Cademan, Richard Henriksson, Viktor Nyqvist,(2012) the study has a rational and quantitative approach in which the data was gathered by spreading the forms with questions about the predictive variables, it also aims to show that the perception of customer towards luxury brand get disturbed or made change by the perception about the counterfeit products.it also concludes that it brings a negative effect about the perception of customers towards the luxury brands in the society.

Adrian Furnham*, Halldor Valgeirsson(2007) The study is about willingness of buying the counterfeit products. In this study the customer answer was measured by RMS Richins materialism scale and also with the help of schwartz values inventory and also ask them about why they are willing to buy the counterfeit product and it falls on which category. The variables are attitudes, beliefs and personality traits of individual variables. Hierarchical regression analysis is used in the study to analyse the data where the result indicates that there is influence of factors in buying the counterfeit product.

Mathumita Mukherjee Basu, Sumit Basu & Jung Kook Lee(2015)The study is about the customer's intention towards counterfeit products where the data is collected by questions by using TRA model and chi square, regression analysis is done to analyse the data. The variables used are social motivation, personal gratification, perception, value, brand loyalty, and ethics. The result indicates that there is a strong relation or influence to the customer's intentions and variables.

Dr. Aarthy Chellasamy, Abhijith Satya Varma, Nikithaa Paarakh(2020) Study uses a convenient random sampling method and also with TRA model the Anova and graphical analysis model is used to analyse the data,the data is collected in the survey model to analyse where the test is fully done in bangalore where the analyse tells that this metro city people don't go for counterfeit products,

Khaloud Nasser Alsaid & Mahmoud Abdel Hamid Saleh (2019) , Average Variance Extracted (AVE), Composite Reliability (CR), and Cronbach's alpha coefficients the analysis method used in the study. Convenience sampling collected in questionnaire format. Paper concludes that the trade of counterfeit product has increased in Saudi market. quality, emotional, price, and social values are the variables used in this study.

Mohammad Osman Gani, Muhammad Intisar Alam, Mostaquim-Al-Islam, Shahin Ahmed Chowdhury Mohammad Omar Faruq (2019) the paper has a sample size of 242 and data are collected in Questionnaires forms. The paper uses TPB theory of planned behaviour which describes the purchasing intention and consumer behaviour towards counterfeit product. Convenience sampling method is used, KMO and Bartlett's test is used for testing the data suiting for analysis. The variables affect the buying behaviour of consumers towards counterfeit product. Descriptive statistics, reliability statistics, one-way ANOVA, and multiple regression analysis is used to analyse the data.

Simranjit Singh¹ & Sonia Bajwa² (2017), the paper has a sample size of 100 and convenience sampling method is used, only 66 percentage of the sample used to identify the counterfeit product. Cost and social status makes them to buy counterfeit products. The paper also states that income level also makes a impact of buying. Multiple regression analysis, anova two factor are the analysis methods used in the study.

Mohammad Babamiri , Rashid Heidari moghadam , Hamid Saeidnia & Mehdi Zemestani (2020) the paper is a cross sectional type study conducted within the teenage and students circle, the sample size is about 700 and randomly simple sampling manner, questionnaire and NEO Personality Inventory is used to collect data. Paper indicated that personality characteristics affected consumers' attitude toward counterfeit goods purchasing. The variables create a negative attitude to buy counterfeit products. Independent t test and Pearson correlation analysis are used to analyse the data.

IV. RESEARCH METHODOLOGY:

4.1 INTRODUCTION:

It is a kind of systematic study to collect the details and action towards the counterfeit product and also shows that which kind of variable impacts them most.

4.2 Research Design:

This is an analytical research paper it contains various analysis work to deeply the result of various kinds of independent variables towards the dependent variable.

4.3 Sampling Design:

Sampling is a kind of data that is used to make a study of a population in a random manner without any kind of limit, in this study convenience random sampling technique.

4.4 Sampling Area:

The sampling area is the part where the study is made about the counterfeit product, it is done across Tamil Nadu with all kind of age and income level of people.

4.5 Population Size:

The population is where the total population of the Tamil Nadu is considered in this analytical study.

4.6 Sample Size:

Assuming that confidence level 95% and confidence interval 5 and the Z value is 1.96 and population is set as infinite in regular range of data collection.385 is the sample size.

4.7 Method of Data Collection and Research Instrument:

The data was collected by online due to the pandemic situation by using the TRA variables with the help of google forms in the Questionnaires format by spreading over social media.

4.8 Period of study:

The study was done in this pandemic period in the 2nd wave of covid 19 when there was some relaxation in the lockdown restrictions from July 2021 to August 2021.

4.9 Statistical tools used for the Study:

The statistical tools used for this analytical study and examining are Excel for some basic data collection works and the graph plotting for demographic variables and the other main tool used for the analysis is SPSS which a machine learning tool, logistic regression and automatic neural networks are done in this tool for predicting and influence of variables. The R studio is programming tool used for analysing the sentimental analysis of the sample where they can see what the sample thinks about the product.

V. Data Analysis:

5.1 Gender:

It shows which kind of the gender like male or female is responded to the study activity were most of the responds are done by male which is 55 in count and the female responds are nearly 20 in count. This shows that male gender is highly focused towards the counterfeit product rather than female gender. The Gender is the main demographic responding variable in which we can analyse that which gender is highly preferring the counterfeit product.

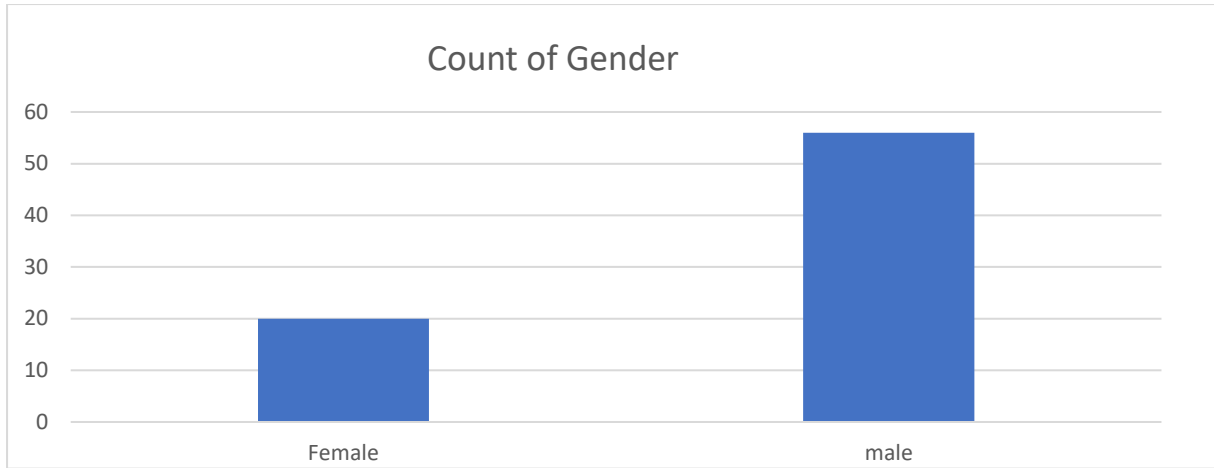


Fig 2(Gender graph)

5.2 Buying Category:

Which category of product do you often buy

77 responses

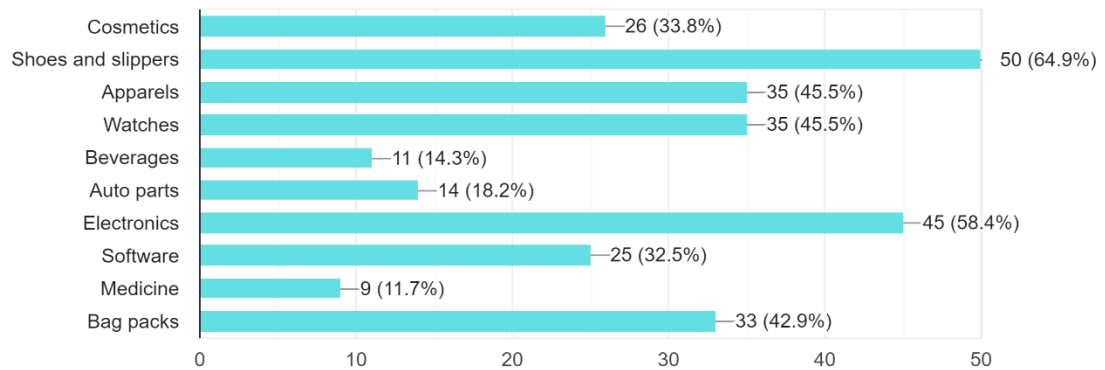


Fig 3(product category)

This graph shows that in which kind of counterfeit product category is highly purchased by the sample respondents in the recent times and also which kind of category they purchase in their future where most of the people gone for shoes and slippers and electronic gadgets which is a kind of show off products and in this study some of the respondents are even willing to buy some kind of counterfeit medicine products today because of very high inflation. The lowest category of buying is a food item which is beverages.

5.3 Education Level:

This pie chart represents the educational level of the respondents or sample, where it shows that the most of the buyers are good educated and most of them are holding or doing their undergraduate degree and then 36.4% of people are doing or holding a post graduate degree and the chart shows that nearly 10.4% of people are doing or only done their schooling in this study, it shows that most of the counterfeit buyers are having a good educational background.

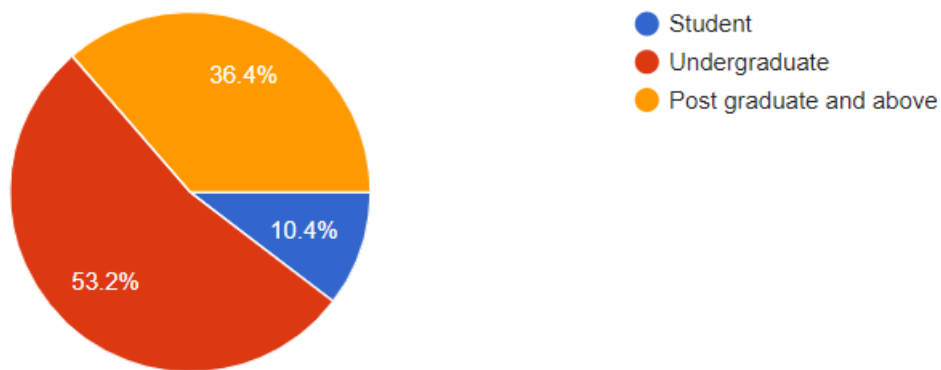


Fig 4(Educational level)

5.4 Family members:

This chart explains that how much of members are there in each respondent's family where this shows that most of the respondents belong to a family where there is 4 members. The chart shows that 23.4% of the respondents are having 3 members in their family and it also shows that 16.9% of the respondents are having a big family which is there are 5 or more than 5 members in their family this shows that higher the family members they go for the counterfeit product.

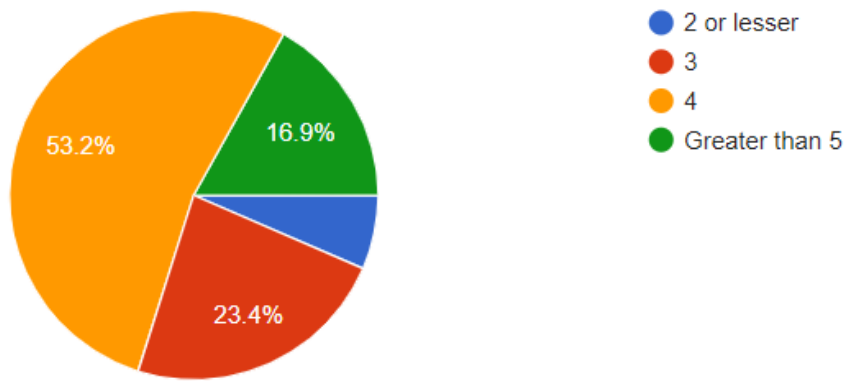


Fig 5(no of members in family)

5.5 Income Level:

The income level is the major play variable in this study where it is the main thing that makes them to buy or not to buy the counterfeit product. The income level is classified into 4 categories where the 1st category is less than 10000 which has highest respondents nearly 49.4% of the respondents are in this state of income. The 2nd category is 10000 to 20000 which is 18.2% of the sample population in t6he income level were the 22% of the population lies on the 3rd category of income level which is from 20000 to 35000. And the remaining 10.4% is lying on 4th category of income level which is more than 35000 of income where this category of people doesn't go for counterfeit product. The income level mentioned here is by monthly wise of each respondent.

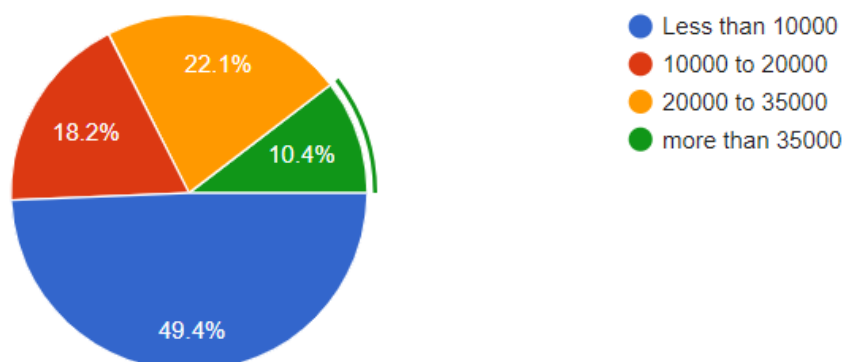


Fig 6 (Income level)

5.6 Living Area:

The living area is also a main part in the counterfeit product where it shows that the people in the rural are only about 4 % who are buying the counterfeit product when it is compared with the semi urban it has the population of 45.5% of the total respondents and urban has a population percentage of 49.4% were the maximum buyers of the counterfeit product is on the urban and semi urban places.

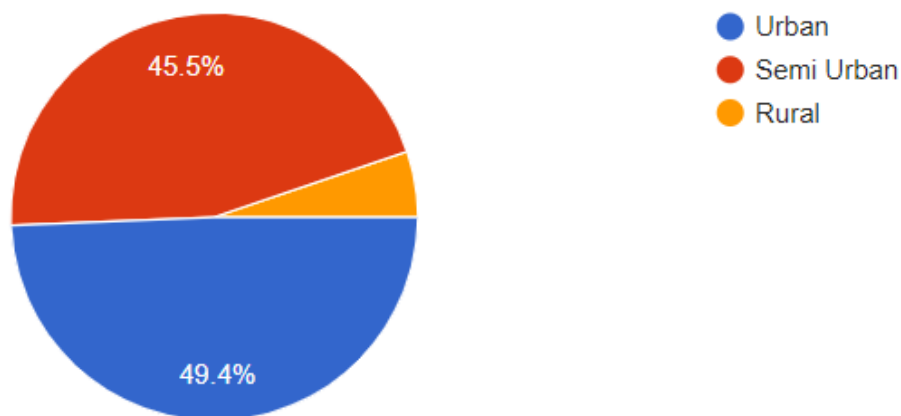


Fig 7 (living area of respondents)

5.7 Marital Status:

The collected data shows that the maximum number of respondent or buyers are single in their relation or marital status which has a population percentage of 80.5% and remaining 18.2% of people comes under the married status and the rest 2% of the respondent population are not single and married in this study data. This shows that the single in marital status has high number of buyers towards the counterfeit product.

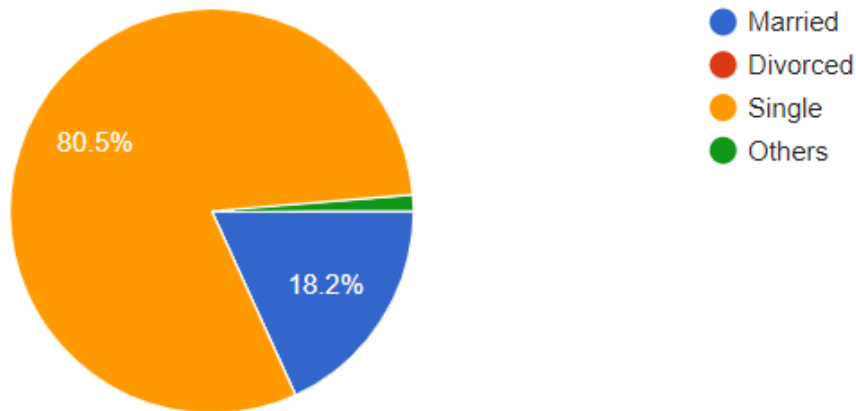


Fig 8(marital status of the respondents)

5.8 Profession:

The profession is a variable to know what kind of profession respondent are willing and often buying the counterfeit product, Student is having a size or count percentage of 49.4% which is a half-size of sample population of respondents and the employed people are nearly 39% of the population were entrepreneur and homemaker are the remaining 20% of the respondent population in this mode of data.

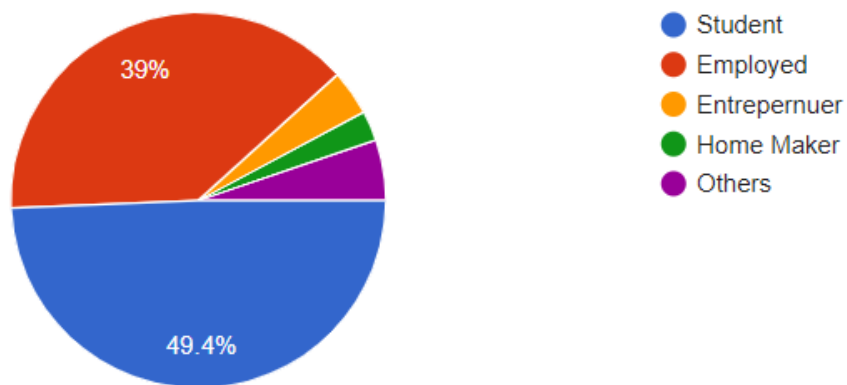


Fig 9 (profession of respondents)

5.9 Sentimental Analysis:

It is a kind of analysis done in the words they used by the respondents to describe about the counterfeit product.

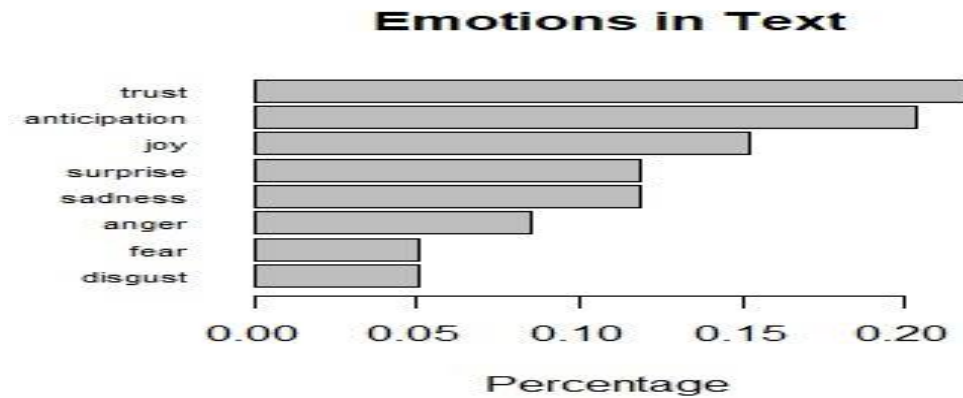


Fig 10 (emotions exposed by respondents)

The graph shows that emotions of the sample in collected data. Trust is the highest emotion shown towards the counterfeit product and anticipation is the second highest percentage value which sample expects from the product. Joy is the other valuable emotion given by the sample and the surprise and sadness has a same percentage of emotion towards the counterfeit product. The anger is a common part of emotion while using a counterfeit product, were fear and disgust has same low percentage in emotions.

5.10 Logistic Regression:

It's a kind of machine learning algorithm mode of analysis used for prediction and verifying the range of accuracy towards prediction level done in the analysis. In this module forward and backward logistic regression is done for the prediction on purchasing the counterfeit product.

Forward Regression:

Case Processing Summary			
Unweighted Cases ^a		N	Percent
Selected Cases	Included in Analysis	76	88.4
	Missing Cases	10	11.6
	Total	86	100.0
Unselected Cases		0	.0
Total		86	100.0
a. If weight is in effect, see classification table for the total number of cases.			

Table 1 (case processing summary)

The table case processing summary is about the data size and their missing cases in the data. In which we have 76 data as normal data included to analysis with 88.4% and having a missing case of 10 data with 11.6 both of them are added to the analysis and gives us a total of 86 cases which is 100% data of our analysis.

Dependent Variable Encoding	
Original Value	Internal Value
NO	0
YES	1

Table 2 (dependent variable coding)

The dependent variable encoding table represents the coding done for our dependent variable intention to buy a counterfeit product in online and offline mode. Where the sample says yes, it is coded as 1 and when they say no it is coded as 0 and evaluated for analysis.

Categorical Variables Codings						
		Frequency	Parameter coding			
			(1)	(2)	(3)	(4)
Profession	Employed	30	.000	.000	.000	.000
	Entrepreneur	2	1.000	.000	.000	.000
	Home Maker	2	.000	1.000	.000	.000
	Others	4	.000	.000	1.000	.000
	Student	38	.000	.000	.000	1.000
Education	Postgraduate	28	.000	.000		
	Student	8	1.000	.000		
	Undergraduate	40	.000	1.000		
Living	Rural	3	.000	.000		
	Semi Urban	35	1.000	.000		
	Urban	38	.000	1.000		
Gender	Female	20	.000			
	Male	56	1.000			

Table 3(independent variable coding)

This table is used to show us the coding of demographic categorical variables like profession, education, living area and gender.

Classification Table ^{a,b}					
	Observed		Predicted		
			Intention		Percentage Correct
			NO	YES	
Step 0	Intention	NO	0	25	.0
		YES	0	51	100.0
	Overall Percentage				67.1
a. Constant is included in the model.					
b. The cut value is .500					

Table4(classification table of logistic regression)

Classification table used to show the prediction accuracy range as 67.1% before the analysis using the dependent variable for the prediction.

Omnibus Tests of Model Coefficients				
		Chi-square	df	Sig.
Step 1	Step	6.422	1	.011
	Block	6.422	1	.011
	Model	6.422	1	.011

Table 5(omnibus test)

This test is used to produce the result of the predictor and predicting variable like hood ratio of logistic regression test which indicates that the data is correctly fit for the analysis. If the significance p value is less than 0.05 the test ends in the first step and when it shows higher than the significance p value in the first step the test moves to second step for making the data fit for the analysis. Table consists of predictors or model in the step that is analysed where df is referred as degree of freedom of coefficients where the predictor variable is one so the co eff of degree of freedom is one. The chi square and sig represents the effect between independent and predictive variable where the value of chi square is 6.422 and has a significance p value as 0.011.

Model Summary			
Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	89.859 ^a	.081	.113
a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.			

Table 6 (model summary)

This table represents the value of log like hood and the value of regular R square value of 0.081 where it represents 8% and the negligible R square value of 0.113 which is 11.3%. This shows that there is a variation the prediction.

Hosmer and Lemeshow Test			
Step	Chi-square	df	Sig.
1	5.303	5	.380

Table 7 (Hosmer and Lemeshow test)

It is test used to refer that the data collected is adequately fitting for the analysis which shows that the chi square value of the test on data is 5.303 and has a degree of freedom as 5 and has a significance value of 0.380.

Classification Table ^a					
	Observed	Predicted			
		Intention		Percentage Correct	
		NO	YES		
Step 1	Intention	NO	6	19	24.0
		YES	3	48	94.1
	Overall Percentage				71.1

a. The cut value is .500
Table 8 (tested classification table)

This table is analysed the data and increases the prediction rate and percentage of 71.1% while comparing to the old prediction rate or percentage as 67.1%.

Variables in the Equation									
		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
								Lower	Upper
Step 1 ^a	Price	.746	.311	5.772	1	.016	2.109	1.147	3.878
	Constant	-1.773	1.048	2.861	1	.091	.170		

a. Variable(s) entered on step 1: Price.

Table 9 (variable in equation forward regression)

This table represents the variable that lies in the equation in the forward logistic regression, where the table shows that the one variable that lie in the equation is price which is a variable that is asked in the Likert scale. It shows that it has a significance p value of 0.016 where we accept the null hypothesis. The values in the table or log odd units. Equation value of the price variable is 0.746 it is calculated by a linear equation in this analysis. The S.E is referred as standard error co eff of the variable price has a value of 0.311 which is the t value. Wald and sig are the value of chi square two tailed is 5.772. The df is degree of freedom co eff of single variable price. It also shows that the price is a kind of social and

economic factor that influence the predictor variable intention of buying the counterfeit product.

Backward Logistic Regression:

The backward logistic regression is where all the variables are added in the first step of analysis and it reduces to two or three variables in the final step were the variables are significant towards the predictor variable.

		Variables in the Equation						95% C.I.for EXP(B)	
		B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Step 10 ^a	Value consciousness	.754	.374	4.053	1	.044	2.125	1.020	4.427
	Price	.642	.361	3.160	1	.075	1.899	.936	3.854
	Brand Loyalty	-.393	.449	.763	1	.382	.675	.280	1.630
	Gender (1)	1.131	.590	3.672	1	.055	3.099	.975	9.853
	Constant	-3.844	1.670	5.298	1	.021	.021		
Step 11 ^a	Value consciousness	.615	.332	3.444	1	.063	1.850	.966	3.543
	Price	.526	.331	2.520	1	.112	1.692	.884	3.238
	Gender (1)	1.110	.583	3.618	1	.057	3.033	.967	9.516
	Constant	-4.257	1.608	7.009	1	.008	.014		
Step 12 ^a	Value consciousness	.743	.335	4.904	1	.027	2.101	1.089	4.054
	Gender (1)	1.315	.571	5.306	1	.021	3.726	1.217	11.413
	Constant	-3.183	1.451	4.813	1	.028	.041		

Table 10 (backward LR variable in equation)

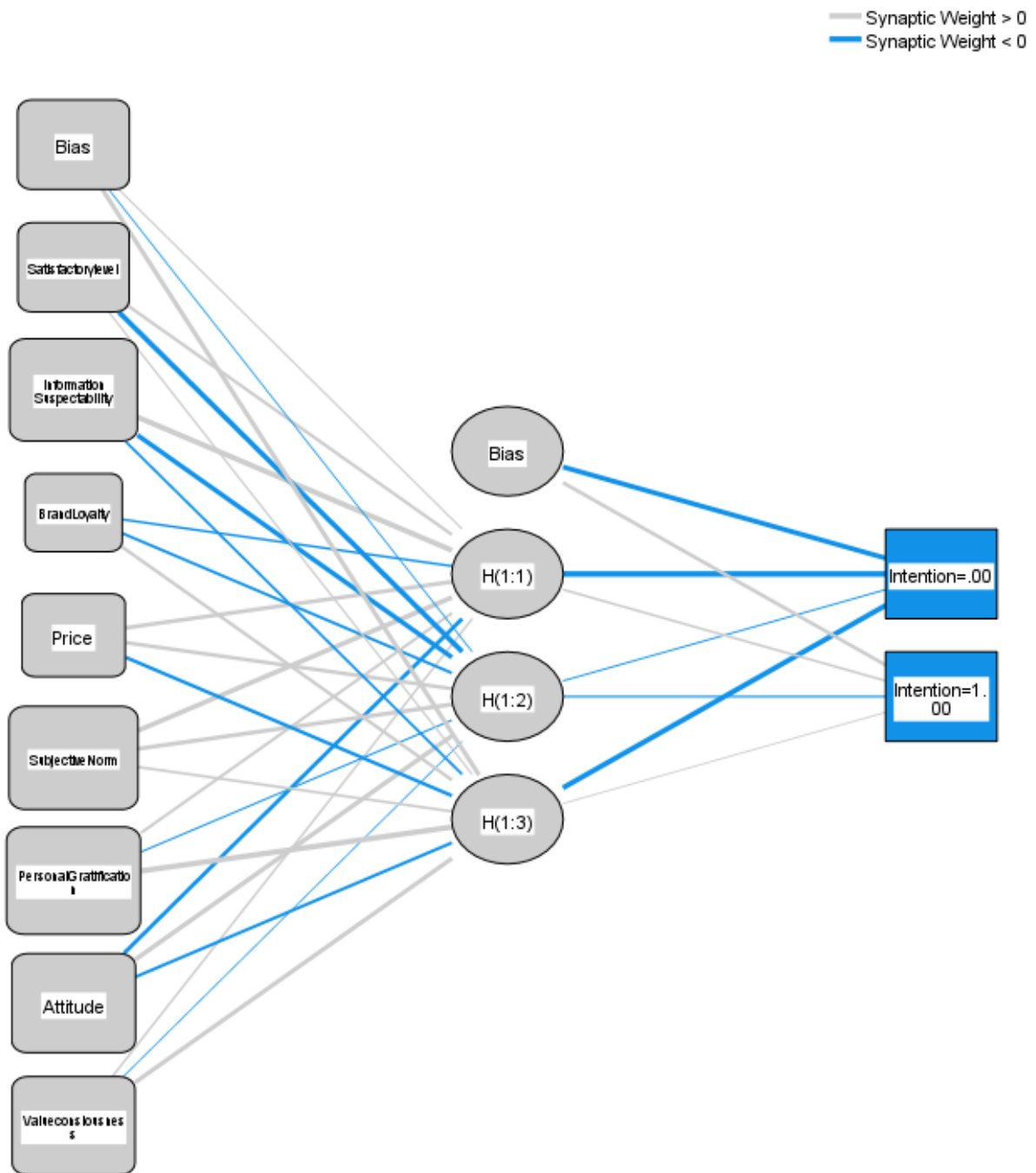
The variable in equation consists of 12 steps where in each step the variables are reduced in the step-by-step process in the 1st step the variables all the variables are considered for the analysis. Gender a demographic variable has a highest B value as 1.315 and in all the steps gender variable has the highest value were the other variables are lesser than value. The df is referred as degree of freedom coefficient were the variable which used for analysis has only 1 degree of freedom except the profession because of its category it has 4 degrees of freedom. S. E is defined as the standard error and it gives the t value of each variable for backward

analysis. These are a coefficient value of the test in which the variable profession has the highest value of standard error which results a low impact towards the dependent variable intention of buying a counterfeit variable. The Wald and Sig are the chi square values and significance p value of the variables in the 1st step of analysis every variable has an impact and influence towards the dependent variable where we reject the null hypothesis and in the second step the value consciousness an independent variable which has a p value less than 0.05 which is 0.045 where we accept the null hypothesis and it has no influence on dependent variable were other variables were having a significance on dependent variable. The process continues in the 3rd step where they remain the same and, in this step, the demographic variable income has a main influence towards the dependent variable with a p value of 0.790. From the next steps the variables are reduced for the analysis the demographic variable living area is removed in the 4th step of the analysis and in the 5th step the process continues and the values slightly vary from the previous step, in the next step the demographic variable income living and education has been removed from the analysis where the other variables except the value consciousness all have a significant on dependent variable. The variable value consciousness rejects the null hypothesis in the 11th step of the analysis and in the final step the variable value consciousness and gender are having a p value which is less than 0.05 which are 0.021 and 0.027 and it shows that in this step those variables have not any significance or influence towards the dependent variable intention to buy the counterfeit product.

5.11 Artificial Neural Networks:

It is a kind of analysis which is used by the nodes like neurons how the human brain works and analysis with the help of neuron and nodes. In this analysis it shows the nodal connection between the predictive and the predictor variable with the help of nodal connections and it takes the variables as input and

produces the result as yes or no which is our predictor variable or dependent variable.



Hidden layer activation function: Hyperbolic tangent

Output layer activation function: Softmax

Fig 11(Network diagram)

This diagram is a feedforward structure diagram or figure where it uses the nodes and neural to analysis the input to represent the output in a categorical variable. The hidden layer consists of a hyperbolic tangent activation function with the help of nodes and neurons of the predictor variable. Each function in the feedforward figure is user controllable specification.

Model Summary		
Training	Cross Entropy Error	30.544
	Percent Incorrect Predictions	25.9%
	Stopping Rule Used	1 consecutive step(s) with no decrease in error ^a
	Training Time	0:00:00.03
Testing	Cross Entropy Error	13.862
	Percent Incorrect Predictions	36.4%
Dependent Variable: Intention		
a. Error computations are based on the testing sample		

Table 11(Model summary of ANN)

The table consists of two sets of data where there is trained sample and testing sample where both has cross entropy error and incorrect prediction. It is the final network of the holdout sample of training and testing data. Cross entropy is a network error function which tries to minimise them in the training and testing period and it is stopped because it has attained the lowest percentage of the error.

Classification				
Sample	Observed	Predicted		
		NO	YES	Percent Correct
Training	NO	4	13	23.5%
	YES	1	36	97.3%
	Overall Percent	9.3%	90.7%	74.1%
Testing	NO	0	8	0.0%
	YES	0	14	100.0%
	Overall Percent	0.0%	100.0%	63.6%

Table 12(classification table of ANN)

The classification table presents two level of predictions training and testing where the prediction percent is 74.1% which is correct rate on the other side the testing prediction correct range is 63.6%.

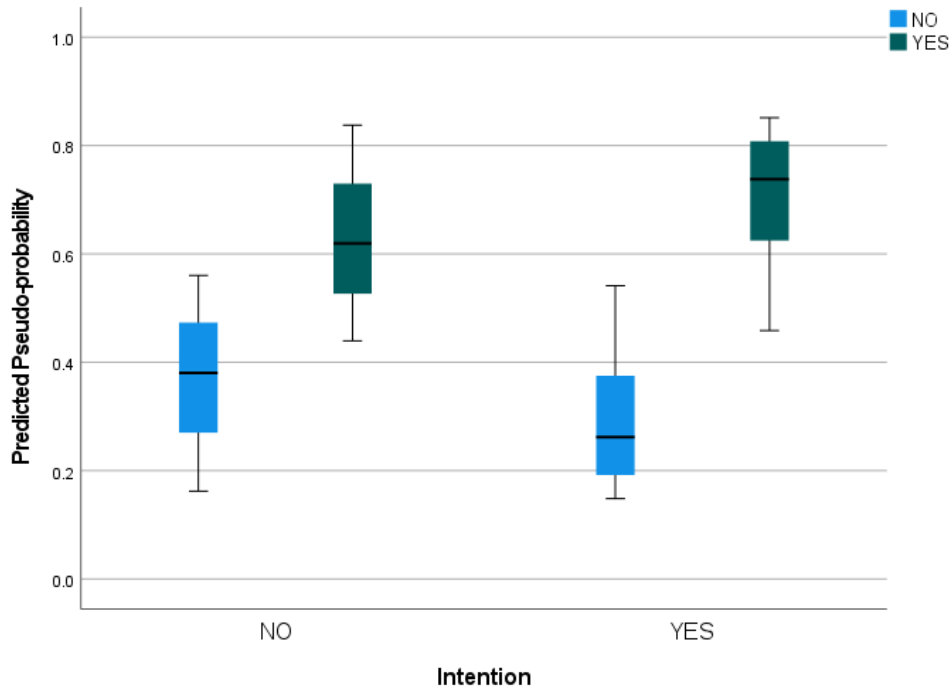


Fig 12 (cluster boxplots of training an testing samples)

The figure represents the cluster boxplots of the predicted pseudo probabilities of training and the testing samples. The first two bars represents that the correction value of data saying no and yes towards the dependent variable intention to buy counterfeit product. In this we can conclude that the bar representing no has low level of accuracy where the yes boxplot has a good amount of accuracy which has a pseudo probability value greater than 0.5. The other two boxplot represents the same category yes and no value of the targeted variable were this also resembles that the no boxplot has more incorrect predictions than yes boxplot where the yes boxplot has a good prediction rate which has a pseudo probability value higher than 0.6.

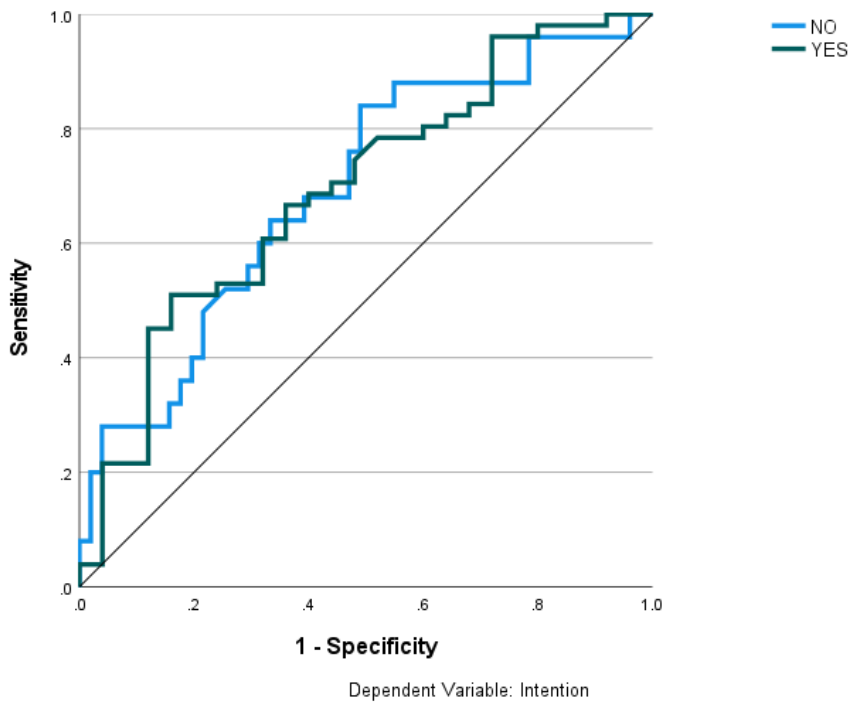


Fig 13(Receiver operating characteristic curve)

The receiver operating characteristic curve which is a graphical representation of the sensitivity and the specificity for every possible cut off for a training and testing samples. The curves in the graph represents the yes and no option of the dependent variables. The curves give an accurate rate when they are in top left side and when it touches the 45-degree inclined line it shows the lowest level of accuracy. The ROC curve is calculated by true positive rate and the false positive rate of training and testing samples.

Area Under the Curve		
		Area
Intention	NO	.693
	YES	.693

Table 13(Area under the curve ROC)

The are under the cure is a kind of useful test that used to check whether the test made gives an accuracy in highest point. The value of predicted pseudo probability of two categories yes or no is 0.693.

Independent Variable Importance		
	Importance	Normalized Importance
Satisfactory level	.094	49.3%
Information Susceptibility	.164	86.1%
Brand Loyalty	.034	18.0%
Price	.061	31.8%
Subjective Norm	.168	88.5%
Personal Gratification	.190	100.0%
Attitude	.147	77.1%
Value consciousness	.143	75.1%

Table 14 (importance of independent variable)

This table shows the importance of the independent variables to predict the target or dependent variable where the variable personal Gratification and Subjective norm, information susceptibility are the three main variables which has a high importance in the prediction and the value consciousness and the attitude variables are given high importance and make some influence on target variable. Satisfactory variable has a 50% value in the importance of prediction of the target variable and the last two variables price and brand loyalty has very less important and influence towards the target variable.

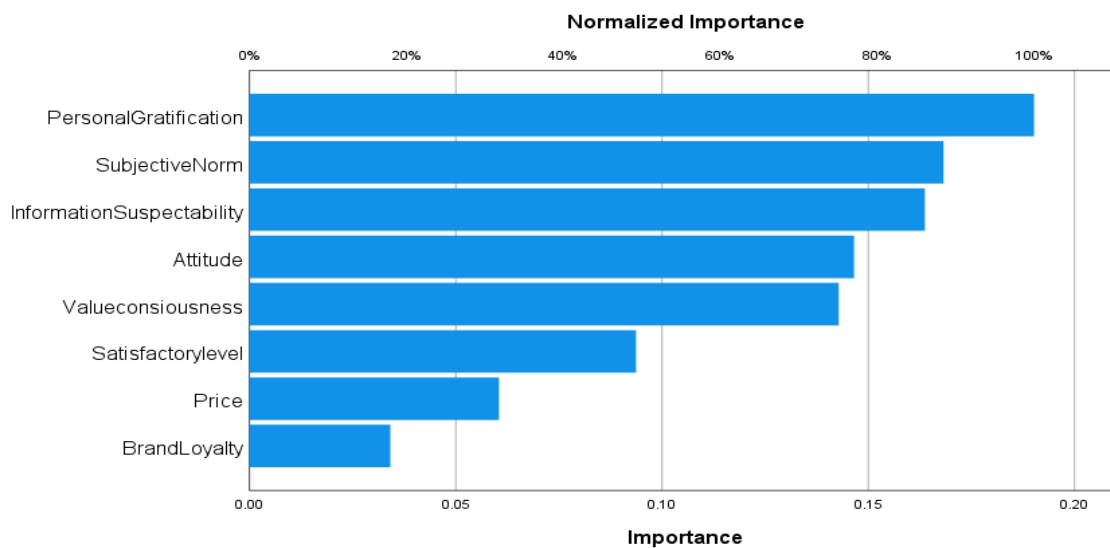


Fig 14(graph of independence variable)

VI FINDINGS AND CONCLUSION

6.1 Findings:

- The first objective which is intent to know about the customer willingness to buy the counterfeit product is our dependent variable, it is used in all kind of analysis where many of the responses shown interested in buying the counterfeit product. The accuracy is checked using the logistic regression and the prediction analysis artificial neural network shows that customer are willing to buy counterfeit product.
- The TRA(Theory of reasoned action) model variables are used in this study to the prediction analysis of buying the counterfeit product where the variable value consciousness, attitude, Subjective Norm and the demographic variable Gender and Income level as the main variables that used to significant impact on the dependent variable that highly influences the customer's intention to buy the counterfeit product.
- The third objective is based on the analysis technique which is using the machine learning algorithm and we used machine learning algorithm like logistic Regression and Artificial Neural Networks and with this analysis also done by using R program to find the sentiment analysis.
- The study also shows that the social factors influence the customer towards the counterfeit product, where the social factors are price, value consciousness and personal gratification.
- The result of the study shows that there are lot of educated people are having an idea about the counterfeit product and also showing their interest towards the purchase of the counterfeit product and it also claims that the purchasing power towards the counterfeit product is increasing. Which shows that there a greater number of buyers in the future for counterfeit product.

- This study also claims that people are moving towards the product which is illegal due the crises in recent periods like covid 19 and inflation and also the downfall of GDP in our country.

6.2 Conclusion:

The study claims that more people are interested in buying the counterfeit product where they think usage of the counterfeit product gives them a social value and also a kind of confidence feeling towards the society. Income is also other main factor which forcefully makes them to buy a counterfeit product to show them off. The study shows that people are highly interested in apparels and shoes and cosmetics and electronics and bag packs also watches to pretend a show toward society. The study also shows that maximum of them are students. The study also claims that the social factors influence the major number of the buyers of the counterfeit product. This shows there is threat to the economy and high risk towards the original brand manufactures because of increase in the purchase of the counterfeit product towards the society and future. The new set of legal restrictions towards the counterfeit product has also increased to overcome the counterfeit situation.

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Annexure:

Value consciousness (5 scale qn) -Lichtenstein et al. (1990)

- 1)I am concerned about price and quality of the counterfeit product
- 2)I compare prices for the best value for money.
- 3) I like to be sure that I get my money worth.
- 4)I try to maximize the quality for the money spent

Subjective Norm (5 scale qn)- Mohammad Hossein Delshad 2019

- 1)People praise me by seeing my appearance in public when using branded counterfeit product.
- 2)People around me respect when I use a branded counterfeit product.
- 3)The society and friends make me to buy branded counterfeit product.

Attitude towards Counterfeit product (5 scale qn)- Hongxia Zhang and Hengjia Zang 2005

- 1)They are more similar to original brand products
- 2)Counterfeit product gives the same social value as original product
- 3)They give same reliability as original brand product gives

Personal Gratification (5 scale qn) - Katalin Eibel-Spanyi 2013

- 1)The usage of counterfeit product gives me some value social recognition
- 2)A usage of branded counterfeit product represents me having a branded life style.
- 3)I am highly engaged on arts and culture with new branded counterfeit products.

Brand loyalty and Status consumption (5 scale qn)- Jacqueline K. Eastman 2011

- 1) I would buy a product just because it has status
- 2) A product is more valuable to me when it adds respect or culture to me
- 3) I usually buy brand name products
- 4) The well-known brands are best to me

Information susceptibility (5 scale qn)- Bearden et al. (1989), Ian Phau and Min Teah 2009

- 1) When buying products, I generally purchase those brands counterfeit that I think others will approve of
- 2) I often consult other people to help choose the best alternative available from a product class
- 3) It's important that others like the products and brands I buy

Price (5 scale qn)- Katalin Eibel-Spanyi 2013

- 1) I usually purchase the counterfeit product because of low cost at good Quality
- 2) I usually purchase counterfeit product on offers day only
- 3) I often find myself checking and comparing the prices of counterfeit product in both online and offline.

Purchase intention (5 scale qn) - Hongxia Zhang and Hengjia Zang 2005

- 1) I would like by a counterfeit product because its low cost than the product.
- 2) I would like to buy a counterfeit product in domestic market rather than online

3)I would recommend my friends and family toward buying counterfeit product.

Satisfactory level (5 scale qn)- Jacqueline K. Eastman 2011

1) Does the counterfeit product give the same comfort or fitting as regular product.

2)Rate the product toward your satisfaction.

3)Do you suggest the counterfeit product to friend and family.

Demographic variables

1. Gender
2. Education level
3. Income level
4. No of family members
5. Marital Status
6. Profession
7. Living Area

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