Factors Influencing Prepaid Consumer Behavior in Mobile Telecom Industry of Bihar & Jharkhand

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By

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THESIS COMPLETION CERTIFICATE

This is to certify that the thesis entitled **"Factors Influencing Prepaid Consumer Behavior in Mobile Telecom Industry of Bihar & Jharkhand",** submitted by Abhishek Singh in partial fulfilment of the requirements for the award of the Degree of Doctor of Philosophy is an original work carried out by him under our joint guidance. It is certified that the work has not been submitted anywhere else for the award of any other Degree or Diploma of this or any other University. We also certify that he complied with the plagiarism guidelines of the University.

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DECLARATION OF AUTHORSHIP

I declare that this research thesis titled **"Factors Influencing Prepaid Consumer Behavior in Mobile Telecom Industry of Bihar & Jharkhand",** submitted by me in partial fulfilment of the requirements for the award of the degree of Doctor of Philosophy in Management by the ICFAI University, Jharkhand, Ranchi is my own work. It contains no material previously published or written by another person nor material which has been accepted for the award of any other degree or diploma of the University or other Institute of higher learning, except where due acknowledgement has been made in the text. I further state that I complied with the plagiarism guidelines of the University, while preparing the thesis.

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Abhishek Singh

Date

Place

EXECUTIVE SUMMARY

India is reported as the world's second-largest telecommunications market by the Indian Telecom Industry Analysis, (2019)with around 1.20 billion subscribers as on December 2018. According to a report by by Embassy of India Belgrade, (2019)India's telecommunications market with increased number of non-voice revenues would grow further and gets more penetration in rural market. Through many mergers and acquisition, currently the telecom sector is entering into consolidation phase. With the Tele-density at 91.45% (Urban 159.98 and Rural 59.50), getting new subscribers is becoming difficult nowadays. Consumers are highly volatile, spoilt by options and ease of movement amongst operators.

When the Industry gets so competitive and fast moving it becomes vital for the business entities to get their strategies right. The success of any Telecom operator is directly dependent on its customers and their loyalty to the Brand. When the market is so deeply penetrated Acquisition of new subscribers gets tough and hence ring fencing the existing subscriber base takes centre stage.India;s churn rate is represented between 3-5 to 6 percent per month which a highlighted as one among the highest churn rate in the Asia Pacific region (Rajeshwari & Ravilochan, 2011). The network operators are looking forward for increasing the quality of their service for the subscribers, companies are nurturing and cherishing the existing customers for enhancing the customers loyalty.

The telecom sector has to manage the huge volume of customers and their diverse demands. The reaction time available to retain a customer is very limited. Current churn

prediction models are primarily based on business variables and usage patterns and to make a fairly accurate prediction 3 months of data points are a must. This further delay the reaction time and the high acquisition churn badly dents the profits.

OBJECTIVES AND SCOPE

The aim of the research work is to study the consumer behaviour of telecom users and derive a comprehensive Churn prediction model which is not limited to only usage patterns but also factors in the socio demographic affiliation of the consumer. This will help the industry define an effective and timely Retention strategy, thereby providing competitive edge to the Telecom operators reeling under severe competitive pressure.

The objectives of the research are:

- To identify major variables influencing a consumer (Prepaid) to switch or be loyal to a specific telecom service provider and then Group them into factors
- Rank the identified factors in order of priority.
- Devise a formula to generate a discriminant score that will judge the loyalty of a consumer in the prepaid telecom sector.

The scope of the research covers:

- The study covers two districts of Jharkhand namely Ranchi and Dhanbad, and also four districts of Bihar namely Patna, Begusarai, Bhagalpur and Muzaffarpur considering the feasibility of data collection.
- The study did not only cover the external factors like Product, Price, Service, Delight but also factors intrinsic to customers viz. socioeconomic background, educational level, gender, geography etc.
- The respondents belong to Loyal (>2yrs in Network) as well as Churners. Factors important to both the groups were studied.
- The current study focused on Vodafone (Prepaid) on the basis of their popularity and market share.

Hypotheses

- It is not possible to identify various demographic factors and thesocio economic factors which influence churn or Loyalty
- It is not possible to develop a suitable predictive Model, based on demographic factors and the socio economic factors, to assess the churn and loyal behaviour of a new customer

Research Methodology

The research design of the study is **Exploratory** as it explores the important factors, which are influencing the Loyal or Churn behaviour of consumers. The study does not limit itself with the external factors such as Delight, Product, Service etc., but also

includes some of the intrinsic factors related to the consumers such as educational background, geographical location, socio economic background, gender etc., The study is also **Descriptive** in nature as the research tries to describe the characteristic of the consumers and also the reason for consumers staying with the same service provider or switching from one service provider to another.

All the relevant variables that influence consumer behaviour loyal or churn was identified through primary data collections (Call Centre, Marketing and customer service teams) and secondary data sources through literature reviews. With an aim of doing a pilot study draft questionnaire was developed and with sixty respondents the Pilot study was conducted from the 6 zones of Bihar and Jharkhand. Based on the inputs gained from the pilot study, the final questionnaire was drafted on the 5 points Likert scale.

The operator specific data points viz. Value Band, Age on Network has been provided (Without the identification of the customer) by the operator for the benefit of the research. These data points were used to presegment the consumer before the survey was conducted. The segmented consumers were then met through customer Melas and the responses collected in the questionnaire.

The study follows stratified random sampling for selecting a sample of consumers of both loyal and churn. Out of 2134 responses 580 were Churn customers (Customers who frequently switch in less than or equal to 6months in the network) and 1554 were loyal customers (> 2yrs). Data collection period: January to July, 2015.

Data Analysis

After the data collection, data cleaning was done, in which the collected data was edited,

coded and treated for outliers through the statistical package SPSS 17 for analysis purpose. Frequency tables were employed in order to describe the sample composition based on their demographic profile. Apart from measures of central tendency and measures of variation in descriptive statistics, factor analysis, t-test, ANOVA, discriminant analysis and cluster analysis were used.

Exploratory Factor Analysis has been made use of for finding the most important factors influencing a particular behaviour. Exploratory Factor Analysis has been done on the full set of data i.e. Churn (580) and Loyal (1554). Total data points were 2134

We found the analysis significant, hence NULL Hypothesis that the identified parameters '34' are mutually exclusive has been rejected. Our Output having 14 Factors and Eigen value more than '1' could explain more than 74% of the Variance of the Data

In the study, we have run **„Discriminant Analysis"** to construct a discriminant equation that can assign a discriminant score so that we can forecast the possibility of consumers exhibiting Loyal or Churn behaviour.We have used these mutually exclusive 14 Factors as independent Variables. Against each customer Loyal or Churn factor loadings of the corresponding 14 factors have been used to run the Discriminant Analysis

Cluster Analysis was used in the Research to enable grouping of customers into specific clusters with dominant characteristics. These dominant clusters would facilitate appropriate retention strategies per dominant cluster. Data for 580 churned customers has been collected. Using Hierarchical (Agglomerative) cluster procedure, we have drawn the dendrogram. On the basis of the dendrogram we decided to put the Churned customers into 6 clusters and accordingly '**K**' mean procedure of clustering has been applied to get the final Output.

All the 34 parameters were found significant at 10% level of significance.

Data for 1554 Loyal customers was collected. Using Hierarchical (Agglomerative) cluster procedure dendrogram was drawn. On the basis of the dendrogram it was decided to put the Loyal customers into 8 clusters and accordingly 'K' mean procedure of clustering has been applied to get the final Output.

All the 34 parameters were found significant at 1% level of significance.

Findings:

Hypotheses Answered

1. Using exploratory analysis it is possible to find out the various Demographic and Socio- Economic Variables that define churn or loyal behaviour amongst consumers. Factor Analysis helps group them into distinct Factors.

2. Discriminant scores derived using discriminant analysis of demographic and socio economic factors provides a predictive model that can accurately predict churn or loyal behaviour of a new customer

- The variables influencing churn or loyal behaviour can be clearly identified and grouped into Factors using factor analysis. The factor loadings suggest the demographic and socio economic variables have a very important role to play in determining consumer behaviour
- Factor analysis can successfully rank these factors into a hierarchy allowing formulation of a discriminant equation

- ‘Discriminant Analysis’ helps construct a discriminant equation that can assign a discriminant score so that we can forecast the possibility of consumers exhibiting Loyal or Churn behaviour
- Cluster Analysis and the demographic construct of dominating cluster provides segmentation to the policy makers to devise Retention strategy on the cluster level.

Contributions:

At First it studies the Socio-economic and demographic variables along with the business and usage specific variables, thereby making the discriminant equation more comprehensive and Robust. Secondly, The Approach provides a predictive Model which is available right at the stage of acquisition and can correctly classify 91% of original grouped cases. Thirdly, the Cluster analysis groups the customers into specific cluster with dominant demographic characteristics, thereby allowing the telecom marketer to make cluster specific Retention strategies.

The research outcome provides a potent tool in the hands of the telecom Marketer to predict customer behaviour timely and more comprehensively. Thus, when used in conjunction with appropriate retention strategies will help operators gain significant competitive advantage in the highly competitive telecom industry.

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MNP	Mobile Number Portability
TRAI	Telecom Regulatory authority of India
VAS	Value-added services
BSNL	Bharat Sanchar Nigam Limited
MTNL	Mahanagar Telephone Nigam Limited
TRA	Theory of Reasoned Action
TPB	Theory of Planned Behaviour
GDP	Gross Domestic Product
EBM model	Engel, Blackwell, &Miniard model
CCP	Customer Churn Prediction
LVC	Low Value Customer
MVC	Medium Value Customer
HVC	High Value Customer

CHAPTER 1

INTRODUCTION

1.1 Overview

Telecommunication is an inseparable part of our everyday life, as mobile phones are now playing a vital role in enhancing effective communication, both at individual and at the organizational level thereby shrinking geographical distances. The importance of communication to human life cannot be overemphasized, as it has been observed that an average human being keeps the mobile phone at arm's length all the time, even while sleeping (Oyatoye, Adebiyi & Amole, 2015). The mobile phone is not only used for making calls, among many other functions, it is used for communicating through text-messages, multi-media messages, social media as well as internet facilities. In all over the world telecom sector is one of the fastest growing industrial segment; the industry has continued its upward surge since its very inception. Over the time there has been a significant rise in the consumer base and the total revenue. The opportunities that lie in the telecommunication market seem endless and the growing demand for mobile telephony systems is creating a worldwide market. Hence, actors in this industry are seeking the most profitable markets throughout the world (Hossain & Suchy, 2013). The word '***Telecommunication***' is derived from the Greek language meaning '***communication at distance***'. Telecommunication sector provides services like rapidly growing local and intercity calls, and other communications services such as voice, fax, email and other data traffic. The number of mobile-cellular subscriptions worldwide is approaching the number of people on earth, with the developing countries accounting for over three quarters of the world's total. We are becoming more and more dependent on our mobile phones – GPS navigation, voice and text over data, and social media exchanges are just a few examples. Telecommunication services are globally recognized as one of the driving forces for overall economic development of a nation. They are also one of the prime support services needed for rapid growth and modernization of

various sectors of the economy. The Telecommunication market is rapidly developing and becoming very competitive in many countries due to regulations and constantly evolving communication technologies.

India is the second most populous nation, one of the emerging economic powers, and the second largest and fastest growing mobile market in the world with more than one billion subscribers. According to **Telecom Regulatory authority of India (TRAI)** Press release 31st December, 2018 the total wireless subscriber base is 1176.00 Mn registering a monthly growth rate of 0.36%. As the subscriber base is increasing so is the churn rate. TRAI's press release shows the Mobile Number Portability (MNP) request has reached 411.98 Mn by December 2018 since MNP implementation in 2011.Far from being the poster boy of reforms, the telecom sector is currently going through the most painful period since the first mobile call was made using GSM cellular technology in 1995. The sector is reeling under mounting losses, a growing debt pile, irrational spectrum costs and high government levies. The entry of Reliance Jio, which has disrupted the market with low-cost data services, has further compounded the woes of incumbent players. The combined effect is that a number of operators, including Reliance Communications and Tata Teleservices, have been forced to exit their loss-making operations. The crisis also severely impacted investors, lenders, partners and vendors of these telecom companies. Indicators clearly revealing increased competition inducing the customers to hop for low cost options. As the industry saturates, it becomes imperative for the mobile operators shift their focus from rapid acquisition strategies to strategies which helps to maintain and enhance margins from existing customer base. Though many service industries are affected by the churn phenomenon, the problem is extremely acute in the telecom industry, with customers joining and quitting in short periods. According to research firm Gartner, India's churn rate is anywhere

around 3.5 percent to 6.0 percent per month, one of the highest in the Asia-Pacific region. Considering that the cost of acquiring a new customer is as high as Rs 3,000, the losses are immense.

The operators are focusing on subscriber quality, companies are increasingly betting their money on cherishing and nurturing existing customer, so as to win customer loyalty and build sustainable competitive differentiation. As a result, there is a rising need to have a yardstick to measure Customer Experience at all stages of Customer Life Cycle. For many companies, finding reasons of losing customers, measuring customer loyalty and retaining customer have become very important concepts. Companies organize various studies and campaigns to avoid losing their customers. Across the board, telecom companies are acquiring a laser focus on their customers and trying to enhance their products and services with an aim of maximizing satisfaction and life time value of users. The phenomenon of churn, where customers switch telecom operators due to financial, personal, or social reasons, is a major threat to the life time value of the subscriber. In such a scenario, churn management has emerged as a major problem area for the operators to focus on. Churn management involves not only predicting customers likely to churn based on demographic and behavioural data, it also involves preventive actions and running campaigns to try and salvage predicted churners. Understanding behaviour of customers involves several factors, like understanding calling patterns using social network call graph analysis techniques, modeling social influence, and finding interesting communities of users that are actionable for the operator. A clear up-to-date understanding of customer experience and satisfaction is a key competitive advantage for telecommunication service providers. When the Industry gets so competitive and fast moving it becomes vital for the business entities to get their strategies right. The Success of any Telecom operator is directly

dependent on its customers and their loyalty to the Brand. When the market is so deeply penetrated Acquisition of new subscribers gets tough and hence ring fencing the existing subscriber base takes centre stage.

A survey of telecom literature indicates that the cost of acquiring a new customer is at least 5 times the cost of retaining an existing customer. With mobile telephony penetration curve flattening, market players are eyeing the same market, which is fast shrinking. Mobile connectivity becoming the order of the day irrespective of the geographical reach – be it either urban or rural – customers are forcing network providers to dynamic plans which are pocket-friendly to the customer and at the same time to invest in the back-end infrastructure to reduce call-drops. All these market dynamism on the players' part is expected to play a role in creating the "hygiene factor" for customer retention. However, the players are depended on the "invested" customers to increase their use of data services (2G / 3G/ 4G) and value-added services (VAS) to increase their top-line. Thus, it becomes all the more imperative for the market players to retain their existing customers and induce them to build their relationship for a higher mobile spend on various services offered by them.

Back in 1999 the legendary US business guru Fred Reichheld emphasized that it is not how satisfied you keep your customers, it's how many satisfied customers you keep. Customer satisfaction and customer loyalty are the best predictors of customer retention. There exists an interaction between the desired results and customer satisfaction, customer loyalty and customer retention. Without the customer it is impossible for any business to sustain itself. Achieving the desired results is frequently a result of customer actions. Any business without a focus on customer satisfaction is at the mercy of the market. As former Brian Balfour, former VP of Growth at HubSpot says, "Retention is the core of your growth model and every other input to

your model." Of course, reducing customer churn isn't as easy as waving a magic wand. A big part of reducing churn simply involves innovating and improving on your product -- this is the rising tides approach, and should slowly but surely reduce churn -- albeit over the course of several years. Customer churn is calculated by the number of customers who leave your company during a given time period. In a more down-to-earth sense, churn rate shows how your business is doing with keeping customers by your side.

1.2 Telecom Churn:

- Wireless companies today measure voluntary churn by a monthly figure, such as 1.9 percent or 2.1 percent. This is the average number of customers who quit their service per month. Annual churn rates for telecommunications companies average between 10 percent and 67 percent.

Industry retention surveys have shown that while price and product are important, most people leave any service because of dissatisfaction with the way they are treated. They would not be looking around if they were happy with their current provider, its service and employees.

Roughly 75 percent of the 17 to 20 million subscribers signing up with a new wireless carrier every year are coming from another wireless provider and hence are already churners. It costs hundreds of dollars to acquire a new customer in most Telecom industries. When a customer leaves, we lose not only the future revenue from this customer but also the resources we spent to acquire the customer in the first place.

IBM Corporation (2010) has described ***churn*** as the process of customer turnover (switching or termination of contract with network providers). It occurs wherever stiff competition provides

incentives for customers to switch providers, especially with mobile number portability (MNP) implementation, which gives a legal backing to customers' switching (porting) behaviour from one service provider to the other without losing their original number which might have even been the barrier in switching out-rightly before the period MNP was implemented, for the fear of losing contact with those who know the old contact number or those on the same network service provider (Oyatoye, Adebiyi & Amole, 2015). ***Customer churn*** is haunting Indian mobile telecom services in a big way. Mobile number portability has further aggravated this problem for mobile telecommunication companies, although it has rightly empowered the subscribers of these services. Customer churn (often referred to as customer attrition in other industries) in mobile telecommunication is the movement of subscribers from one service provider to another. It is the propensity of customers to cease doing business with an organization. Customer churn, sometimes known as customer attrition or customer turnover, is the loss of existing subscribers to another company or service provider (Kerdprasop, Kongchai & Kerdprasop, 2013). Business sectors consider customer churn seriously because the cost of retaining current customers has been found from research to be much lower than acquiring new ones (Syam & Hess, 2006). Many subscribers frequently churn one provider to another in search of better rates or services (Kolajo & Adeyemo, 2012). Telecom sector is a very capital-intensive sector, so a customer's stay with a cellular services operator effects its earning. Churn behaviour is a common problem faced by telecom companies as it reduces the revenue, profitability, and damages the brand image of the business (Adebiyi, Oyatoye, & Kuye, 2015). To be able to stitch an effective Retention strategy the Telecom operators need to know their subscribers closely. Customers are diverse and unique in their own rights. Multiple Factors influence their specific behaviours. **Consumer behaviour** is an inter-disciplinary social science that blends elements from

psychology, sociology, social anthropology, ethnography, marketing and economics, especially behavioural economics. It examines how emotions, attitudes and preferences affect behaviour. Characteristics of individual consumers such as demographics, personality lifestyles and behavioural variables such as loyalty, brand advocacy, willingness to provide referrals, in an attempt to understand people's wants and consumption are all investigated in formal studies of consumer behaviour. The study of consumer behaviour also investigates the influences, on the consumer, from groups such as family, friends, sports, reference groups, and society in general. Consumer behavior can be defined as the study of individuals, groups or organizations in a bid to understand the process of their selecting, securing, using and disposing the products, services, experiences or ideas (Raorane & Kulkarni, 2011). Consumer behaviour in the context of this research also includes consumer loyalty and customer churn. **Consumer loyalty** can be defined, according to East et al. (2005) as repeat patronage behaviour which is the combination of attitude and behaviour. In industrial and service marketing, behavioural loyalty is viewed as retention of the brand (Reichheld 1996; Reinartz and Kumar 2000). **Customer churn**, also known as customer attrition or customer turnover, is the loss of existing customers to another company or service provider (Kerdprasop et al., 2013).

It is important to predict customer behavior because; the knowledge of a customer's loyalty would be useful for improving CRM. It will also help in customer model-building process and evaluating the results of CRM-related investments (Buckinx, 2007). Furthermore, it will help to improve the success rate of acquiring customer, increasing sales and establishing competitiveness (*Qiu, 2014).*

The mobile telecom service providers face cut throat competition in India. Globalization paved the way for mushrooming of mobile telecom service providers in Indian peninsula. Mobile telecom service started in India in the year 1995 and it was only in the private sector. Later BSNL and MTNL, the Telcos in the government sector also started their operation in the mobile telecom sector. The last decade witnessed the entry of a large number of mobile telecom service providers in the country. Despite the telecom industry's cutthroat market environment in which brands steal competitors' customers by buying out existing contracts and constantly undercut rate plans to get customers to switch, few have made customer centricity a priority.

Customer demands are diverse and expect quality service with value for money. The recent trends of Mergers and acquisitions in the Indian Telecom are a testimony of the cut throat competition and survival of the fittest. Customers become the most important factor in this realignment of market dynamics. Customer retention is the buzz word in the current telecom market and the operator with the best Retention strategy will be the ultimate winner. The customer experience wave has disrupted several industries and Telecom is one of them. Today, customers aren't just leaving some of the biggest telecom brands but are making it a point to tell their friends and social connections about their frustrating experiences. Given what's happening in the market, it is crucial for telecom brands to not go out all guns blazing and pump millions of cash into advertising and marketing to attract new customers. If anything, it will lead to a complete burn out of resources.

To be able to stitch an effective Retention strategy the Telecom operators need to know their subscribers closely. Customers are diverse and unique in their own rights. Multiple Factors influence their specific behaviours. Consumer behaviour is an inter-disciplinary social science

that blends elements from psychology, sociology, social anthropology, ethnography, marketing and economics, especially behavioural economics. It examines how emotions, attitudes and preferences affect behaviour. Characteristics of individual consumers such as demographics, personality lifestyles and behavioural variables such as loyalty, brand advocacy, willingness to provide referrals, in an attempt to understand people's wants and consumption are all investigated in formal studies of consumer behaviour. The study of consumer behaviour also investigates the influences, on the consumer, from groups such as family, friends, sports, reference groups, and society in general.

With a high churn rate and lowest average revenue per user (Arpu) in the world, Indian telco's are in a unique spot with a high debt burden , declining voice revenues, low spectrum per operator (quarter of global average), congested networks with high subscribers per megahertz spectrum.

- With the Tele-density at 91.45 (Urban 159.98 and Rural 59.50), the search for new subscribers is becoming difficult day by day. Consumers are highly volatile, spoilt by options and ease of movement amongst operators
- When the Industry gets so competitive and fast moving it becomes vital for the business entities to get their strategies right. The success of any Telecom operator is directly dependent on its customers and their loyalty to the Brand. When the market is so deeply penetrated Acquisition of new subscribers gets tough and hence ring fencing the existing subscriber base takes centre stage

The aim of this research is to study the consumer behaviour of telecom users and derive a comprehensive Churn predictive model so as to define an effective Retention strategy thereby providing competitive edge to the Telecom operators reeling under severe competitive pressure.

1.3 Research Motivation

"*Good customers are an asset which, when managed and served, will return a handsome lifetime income stream for the company*" – Philip Kotler.

This research has been motivated by the professional marketing practice of the researcher in the telecom domain. Across telecom market, globally, there is an ardent need to study the consumer behaviour and define strategies around it.

1.4 Relevance of the Topic

- When the number of subscribers has reached its saturation point, creating and acquiring new customers is not only difficult but also costly
- Competition is fierce and subscribers are limited, hence, the need is to safeguard existing valuable customer base
- To retain the customers, it is important to understand factors influencing customer behaviour and reasons why they switch to competing service providers
- The study so far on this topic has primarily been centred around business variables and usage behaviours without delving much on the socio demographic structure of the customer. The topic aims to construct a Churn predictive model which considers variables not only business related, but also intrinsic to the customer. This will provide a

much more potent tool that can predict more accurately and timely the churn behaviour of a customer.

1.5 Business Challenge:

- The Telecom sector has witnessed rapid growth over the last decade and is now entering the phase wherein the growth is plateauing. With the Teledensity at 91.45 (Urban 159.98 and Rural 59.50), the search for new subscribers is becoming difficult day by day. Profitability and sustained growth of a Telecom firm is possible only if it can successfully ring-fence its valuable customers. Retention of existing subscriber base is hence taking the centre stage.
- At the core of the business is the Customer who is being influenced by a number of factors in and around him. There are factors which make a subscriber stick to a particular service provider and there are factors which triggers switch. These factors stretch much beyond the usual factors like Product, service, experience etc. and also include personal, Cultural, socio-economic, psychological, demographic factors. To be successful a service provider has to understand all those factors that influence a specific behaviour of a customer: *Know your Customer*.

- The consumer base in the sector is huge and the competition fierce. Reaction time in the hands of the operators is very small and the demands diverse.

The current predictive models used by the operators are primarily based on usage behaviours once the subscriber has been acquired. Any predictive model needs at least 3 months of usage trends to make a reasonable prediction. Hence the felt need to have a comprehensive model that

does not only depend on the usage metric but also learns from the socio economic and demographic affiliation of the subscriber.

A predictive model that is more comprehensive and which can predict possibly at the time of acquisition itself is much sought after. Any such model with reasonable accuracy can lend a huge competitive edge to any operator.

C H A P T E R 2

Literature Review

2.1 Literature Review Table

SL	Type of Literature Review	International	Indian	Total
1	Ph. D Thesis	6	8	14
2	Importance of Customer Retention	7	22	29
3	Customer Retention Telecom: International Perspective	10	0	10
4	Consumer Behaviour	6	18	24
5	Predicting Customer loyalty	2	9	11
6	Research Methodology	5	19	24
7	Others	28	24	52
TOTAL		64	100	164

2.2 Literature Review Importance

Literature review is an essential part of any research project as it covers all previous research done on the topic and sets the platform on which the current research is based. A well planned literature review helps to critically summarize the current knowledge in the area under investigation, identifying any strengths and weaknesses in previous work, thus helping us identify our own research and eliminate the potential weaknesses, whilst bringing to the fore the potential strengths. In addition, a good and full literature search will provide the context within which to place the study. It helps in finding out the research gap and also in proper correlation of the research findings with the earlier research on the subject matter.

An exhaustive literature review has been carried out related to the research topic so as to gain clarity on the direction of research. The review is not limited to telecom domain but also spreads across banking industry so as to gain wider knowledge base. This is also done to draw parallels with other industry and gain holistic view of customer behaviour. Hence, the literature review is divided into

various sub heads and will be covered in subsequent sections. The review is however restricted to publications in English language only. Out of the vast numbers of papers / articles reviewed only those relevant to the study has been included in the subsequent sections.

2.3 Sub Heads for the Literature Review:

- 2.3.1 Importance of Customer Retention
- 2.3.2 Customer Retention Telecom: Indian & International Perspective
- 2.3.3 Consumer Behaviour
- 2.3.4 Predicting Customer Loyalty
- 2.3.5 Literature on Research Methodology

2.3.1 Literature Review: Importance of Customer Retention

Telecom service providers around the world are facing challenging market conditions and revenue declines. High subscriber churns rate is the biggest risk to any industry and hence in the telecom industry as well. As they continue to compete for new customers, their key revenue challenge is to arrest losses by retaining their existing customers and enhancing the income stream from each of these customers.

It has been shown in the literature that customer retention is profitable to a company because: (1) acquiring new clients costs five to six times more than retaining existing customers (Bhattacharya, 1998; Colgate et al., 1996; Athanassopoulos, 2000); (2) long-term customers generate higher profits, tend to be less sensitive to competitive marketing activities,become less costly to serve, and may provide new referrals through positive word-of-mouth, while dissatisfied customers might spread negative word-of mouth (Mizerski, 1982; Stum and Thiry, 1991;Reichheld, 1996; Zeithaml et al., 1996); (3) losing customers leads to opportunity costs

because of reduced sales (Rust and Zahorik, 1993). A small improvement in customer retention can therefore lead to a significant increase in profit (Van den Poel and Lariviere, 2004)

Competition in Indian telecom sector is fierce with 12 service providers competing against each other in their tryst to gain market share. The Telecom sector has witnessed rapid growth over the last decade and is now entering the phase wherein the growth is plateauing. New subscriber additions month on month is on a declining trend (0.7%) and with the Teledensity at 72.18(Urban 139.42 and Rural 42.43) according to TRAI report, the search for new subscribers is becoming difficult day by day. Profitability and sustained growth of a Telecom firm is possible only if it can successfully ring-fence its valuable customers. Retention of existing subscriber base is hence taking the center stage.

Nurturing as many of your customers into advocates as possible makes good business sense. Research over the past few years continues to prove that existing customers are worth more than newly acquired ones. According to Gartner Group (world's leading information technology research and advisory company), 80% of a company's future revenue will come from just 20% of the existing customers. While Adobe reported that online retailers spend nearly 80% of their digital marketing budgets acquiring shoppers, for each 1% of shoppers who return for a subsequent visit, overall revenue will increase by approximately 10%. This means if online retailers retained 10% of their existing customers, they would double their revenue.

This new focus on Retention Marketing is mostly due to customer choice having reached an all-time high while attention spans have dipped to an all-time low. This means companies need to take a more customer-centric approach in order to keep them interested. Customers now demand

a more engaging and personalized experience, and companies must respond accordingly in order to nurture them into advocates.

As per Harvard Business School report, on average, increasing customer retention rates by 5% increases profits by 25%-95%. This substantiates the importance of customer retention in driving sales and revenue.

Customer churning, customer migration or customer loss, as it is called, has been treated as a main concern because of the different costs associated with it. When customers change their current service provider to another, costs are imposed to the losing company and not on the customers.The highly competitive nature of the telecommunication sector and the absence of a differentiation strategy in terms of products and services offered are what makes subscribers churn from one company to another. Customers are always looking for innovative and original products; if their actual provider cannot meet their needs, their loyalty and retention are in question. As disloyalty increases, churn rate tends to rise, leading to a minimization of the firm's value. Churn is considered a "profit killer." As the customer base decreases, the revenues associated go down.

According to statistics, the global telecommunication industry is recording huge losses that amount to billions of dollars due to churning. The rule of thumb known by marketers is that it costs 5 times more to acquire a new customer than to retain the existing one. So, it is preferable for companies to not lose the path of their existing customer base and focus on actions and measures to reduce churn. Sometimes, a new customer may churn before the company recovers the whole acquisition costs.

Since it is difficult to detect the potential churners, it is necessary for the Telco firms to takes the necessary actions to identify those with the intention to churn before they solidify their act and lead to profit decrease. Customers switch easily when the competitors offer what they consider to be in their best interest. Mutanen (2006) pointed out that customer lifetime value is a valuable asset for business life. Customers have to feel a strong affiliation with the company so they can continue doing business with it. The idea here is that the more involved they feel, the less likely customers are to churn. Brodsky (2006) stated, "Winning is not just about closing the sale. You win when you close the sale and also lay the foundation for a good relationship that will allow you to keep the customer for a long, long time". The Telco firm has to focus on customer retention rate rather than sales volume it wants to achieve; since without customer base, no sales volume can be recorded.

(Kundah, 2017)opined that getting a customer in the door is the first step, but customer turnover, or "churn rate," can be a quiet killer of a company's potential. He summarized his study by stating:

Focusing on customer retention can increase revenue over an 18-24 months period by as much as 80%+, reduce customer acquisition costs by 30%+, and increase total customers by 1.5x. Customer Retention is becoming a key determinant of an organization's success

His key findings were:

1. Retention Increases Revenue

    - Focusing on retention decreases churn, which means you need fewer new customers to still increase your customer base
    - Loyal customers spend more per order

- Loyal customers have a much greater customer lifetime value

2. Retention Increases Profitability

- A retention-focused strategy helps keep your fixed costs under control
- Loyal customers are better at word of mouth and so your customer acquisition costs decrease
- It is easier to up sell to loyal customers than to new ones.

2.3.2 Customer Retention Telecom : International perspective

Retention Marketing is a buzzword in the Telecom sector and it does not have geographical boundaries. The Industry has realized the importance of Customer retention in establishing competitive advantage and sustained business. A number of studies and research on the topic has happened worldwide as Churn has become an all pervasive issue.

Umman(2010) focused on determining customers who want to churn, and to create specific campaigns to them by using a customer data of a major telecommunication firm in Turkey. In Turkey, Retention Marketing has become a pioneer in various researches in telecommunication sector which suffers from huge losses of customers.

In this study, the data of a company which was operating in telecommunication sector was analyzed with data mining techniques with the aim of demonstrating models to predict churner customer behavior, improve customer relationship management, and develop various campaigns and marketing strategies for customer retention and loyalty. After eliminating non-related data

and preparing stages, Logistic Regression Analysis and C&RT Decision Tree were applied for determining the reasons for customer churn.

It was observed that subscribers, who are not being offered a discounted package, have very high churning tendency. Hence, various attractive packages should be created to fulfil different calling behaviours. Also, subscribers who don't belong to any discount plan should be informed about various plans. Thus, creating different marketing strategies and different plans that fulfil various customers' profiles can help firms to keep customers happy and can reduce the number of churned customers. The other influential factor contributing in churn analysis is the incoming local and long distance calls. Packages that are developed based on inner-city and long distance call records, can resolve concerns of subscribers. It was found that being under contract and receiving calls from subscribers, who are in the same service provider, are the reasons that increase commitment and loyalty to firm. Also, it was found that a decrease in the percentage of receiving calls through the same operator increases the tendency of churn. Based on these outcomes, it was proposed that the firm should promote switching from prepaid plans to under contract or postpaid plans. Moreover, to increase incoming calls from subscribers who are with the same operator discounted rates can be applied for in service calls. When standard deviation of calls from other GSM operators increases, the churn rate increases too, hence making agreements with other GSM operators to provide the same or lower rates for between providers' calls was proposed to be a wise maneuver. Also, a plan such as one rate to all providers was suggested. The study was limited in its scope to consider only economic perspective. Demographic aspects of a consumer were ignored and hence the trigger for the specific behaviour couldn't be ascertained.

Ojiako (2009) investigates how customer-oriented strategies facilitate the enhancement of service experience. This paper explores a conceptual strategic approach for the effective delivery of customer focused change. They opined that there is an urgent need to enhance the experience of UK telecommunications customers, especially as these companies now recognize the relationship between exploitation of core organizational competencies and customer experience enhancement. Customer Experience is usually different for each customer, primarily because of the potential for much greater diversity in demands from customers seeking a wider variety of different services or products. This research methodology was based on participative action research within a single case study. This approach was chosen as it was deemed fit for exploratory studies. It was established that for change strategy to be successful, it needs to be systematically designed, planned, and implemented in order to produce a desirable and predictable outcome. In this scenario, its success becomes equated with intent and purpose. Nevertheless, there are those who vehemently argue that existing theory on strategic change and its complexity presents a major challenge to current and relevant ways of thinking about customers. As expected, such calls lead to a need for radical rethinking on customer-oriented programs.

Nicolas Hamelin(2010 investigates churn behavior within the Moroccan telecom sector. The Moroccan telecommunication sector is considered one of the most developed telecom sectors in the African region and one of the most developed economic forces in the country. The privatization of the market, new services, the emergence of new operators, as well as the changing socio-economic factors contributed to a change in attitude of Moroccan consumers. In this study, high churn rate of over 21% was measured and the mechanism behind customer churn was examined. Causes of customer churning were investigated through a survey of 500

respondents conducted in Morocco's two most important cities. Logistic regression identified a clear correlation between customer churning behavior and customer personal characteristics, operator services, and the mobile phone characteristics. The two main research questions were: What are the main triggers that explain customer churning? And was there a relationship between personal characteristics and churn decisions?

A survey was designed to test the potential churning factors given above and questionnaires were administered face to face to respondents in the capital city Casablanca. A first pilot study was conducted in the city of Fez with 30 respondents randomly selected. Only interval questions were used to compute this reliability test. The "Cronbach Alpha" was calculated to be 0.733, which indicates that the questionnaire is reliable. The demographic profile of the customer was studied viz Gender, Age, Education level.

Subscribers" intention to churn is linked to perceived difference in tariffs between operators, although communication price is not free and controlled by the national regulatory agency of Telecom sector (ANRT). Transparency level of operators is also an important churn driver; clients have lost their confidence in their current telecom operator either because of misleading advertising or opaque information about tariffs and services. Subsequently customers are more likely to choose a competitor promoting a higher level of transparency. The findings of the research have shown that the quality of coverage network, customer service quality, response to complaints and billing-error frequency had no statistically significant impact on customer intention to churn. Technical assistance, degree of privacy respect and diversity of promotions were identified as main churn drivers. It was suggested that specific attention should be given to the "risky subscribers;" mobile operators must detect their dissatisfaction factors and try to convert them into loyal customers. The real differentiation between operators will be no longer

based on price cutting or technology but will be associated with the capability of the carrier to: deliver high quality service, keep subscribers informed, respond to customer requests or complaints, and deliver faster services. The study had a few limitations as in it was limited to Casablanca area and hence could not be generalized to the whole Moroccan population, Factor analysis to determine which factors are important was not used and analysis of data concerning subscribers with 2 mobile cards was not included.

AbbasimehrH et al.(2013) proposed a predictive model to identify churn. A two-phase framework for prediction of high value customer churn was proposed. Phase 1 was the identification phase which took into account social network based variables of customers in identifying the high-value ones. The data of an identified high-value customer was used as the input for Phase 2 to prepare the churn prediction model. Data of a major telecommunication company was used to implement the framework. The customers were clustered by using K-means algorithm. After ranking clusters, the top-cluster was selected according to clusters ratings. The data belonging to the top cluster were used in churn prediction model building phase. In this phase, two neuro-fuzzy techniques, namely the adaptive neuro-fuzzy inference system (ANFIS) and the locally linear neuro-fuzzy (LLNF) were applied together with locally linear model tree (LoLiMoT) learning algorithm on churn data. A new algorithm was devised for comparing these methods with the most widely used neural networks such as multi-layer perceptron (MLP) and radial basis function (RBF) networks. Results of comparison indicate that the neuro-fuzzy techniques perform better than neural network models and they are a good candidate for churn prediction purposes.

Molapo in his research titled Customer retention strategies in the South African mobile phone network industry published in January 2015 investigated the influence of the individual

marketing mix strategies on customer retention in the mobile phone network industry. Customer retention was determined by customers' subscriptions to a particular network that had no intention to switch to another network. Using self-administered questionnaires, data was collected from a sample of 479 respondents at three campuses representing two tertiary institutions (University of the Free State and two Maluti Technical and Vocational Education and Training (TVET) Colleges situated in the eastern Free State in South Africa). Cross tabulations, the Chi-Squared Test for Independence of Association, the Bivariate Chi-Squared Test and the Probit Model analysis were used to analyse the data.

Communication technologies have evolved rapidly over the past two decades. Speed, quality, affordability, and information richness have all developed out of early systems. As the demand for simple and effective communication has increased, so has the adoption of personal communication devices. With the resulting economies of scale in place, the price of these technologies and associated services has dropped dramatically (Carr, 2003), and the information being delivered has expanded from simple voice-communications to more data-rich services (Kim et al., 2004). The companies that can attract and retain customers in this highly competitive and increasingly saturated market stand poised to make considerable gains. As wireless penetration continues to increase worldwide, companies are changing their strategies from a growth model to a value-added one (Light et al., 2010). One of the strategies available in the value-added model is innovation (Berry et al., 2006), as well as increasing customer satisfaction (Rust and Zahorik, 1993).

There have been several notable satisfaction and retention case studies in various mobile telecoms markets, such as those in France (Lee et al., 2001), Germany (Gerpott et al., 2001), South Korea (Kim et al., 2004), Turkey (Tu¨rkyilmaz and O zkan, 2007), and Sweden (Fornell,

1992). However, these studies used conceptual models to undertake their causal analysis, without a comprehensive examination of the relationships among the various customer retention concern factors, and their relative importance. Moreover, the effectiveness of the current customer recruitment strategies that are implemented in the telecoms industry is unknown.

Customer satisfaction has been studied extensively, and models of customer satisfaction (Fornell, 1992; Fornell et al., 1996) and service quality (Parasuraman et al., 1988) frequently proposed and reassessed. These models have been shown to provide insights into the mindsets of consumers with regard to a variety of products and services, measuring how customers perceive a consumed good or service in terms of personal satisfaction

Saleh Saad Alqahtani and Hassan Al Farraj,2016 in their study 'Customer satisfaction with mobile services in telecommunication companies' published in JCS Vol. 24 (3), 2016, examined the antecedents of customer satisfaction and loyalty through an empirical investigation of 372 cellular subscribers in Saudi Arabia by adapting the American Customer Satisfaction Index (ACSI). The study found that overall customer satisfaction is comparatively low among customers. Overall, this study offers insights for service providers, regulators and subscribers, while forming a foundation for future benchmarking of the performance of wireless network operators in terms of user satisfaction and loyalty.

The research offered five major findings:

- First, perceived quality has a positive and direct effect on perceived value and customer satisfaction of mobile services, therefore, as the level of perceived quality increases, the level of perceived value and satisfaction also increases.

- Second, perceived value has a strong positive and direct impact on customer satisfaction towards mobile services.
- Third, customer satisfaction has a negative effect on customer complaints.
- Fourth, customer satisfaction has a significantly positive direct impact on customer loyalty. Thus, as the level of customer satisfaction increases, the level of customer loyalty increases
- Finally the research resulted in a score for the satisfaction according to the ACSI model for the Saudi Arabian mobile services industry.

Claudio Marco et. Al, 2017 proposed a model for measuring customer satisfaction in users of telecommunications services. The methodology used was quantitative descriptive and explanatory type, using a survey as data collection tool, with a sample of 415 users of telecommunications services (landline telephone, television and Internet services) in the city of Medellin. They found that the service in the Call Centers and timely response to requests, inquiries, or complaints, and an effective service are among the factors that have the most influence in the satisfaction of users of telecommunications services. In addition, it is noted that the perception of a favorable cost-benefit services is influenced by the offered plans and promotions, and the proper settlement of claims and applications in their companies, showing that these are issues that need to be strengthened in telecommunication services companies. The analysis of results was initially raised with an Exploratory Factorial Analysis, in order to get a basic structure of the theoretical model to present and then validate it with Confirmatory Factorial Analysis. The process of measuring customer satisfaction with the provision of services has been proposed with less than 10 questions in order to not be cumbersome for customers.

However, such measurements cannot adequately identify the main factors that have an impact on satisfaction with the service provided.

Simon Morgan and Krishna Govender published a Research Article 'Exploring customer loyalty in the South African mobile telecommunications sector' in Cogent Business & Management (2017), 4: 1273816. An online survey which comprised questions on loyalty, customer satisfaction, brand image, perceived quality and perceived value, was conducted among 110 customers of the South African (SA) mobile telecom industry. The findings which resulted from structural equation and multiple regression modelling, revealed that customer satisfaction has the most significant positive effect on customer loyalty. Customer brand image and perceived value have a significant positive effect on customer satisfaction, but not customer loyalty. By implication, brand image and perceived value indirectly influence customer loyalty, through influencing customer satisfaction. The findings imply that the management of mobile telecommunications businesses in SA should focus on customer satisfaction and its antecedents, if they wish to develop a cadre of loyal customers.

The Telecommunications Trends & Aspiring to digital simplicity and clarity in strategic identity a publication by strategy& (part of PwC network of firms) highlights the current trends in telecom industry. The paper opines that the industry is approaching a tipping point. To a large extent, telecom companies have not succeeded in their efforts to monetize the flood of data running through their networks. Their services have become more commoditized. Their ability to reinvest in network upgrades and digital advances has been severely constrained. At the same time, many carriers have tried to be all things to all people, delivering a wide variety of services to their customers. But as a group, they have not managed to excel at any of those services. So now they are vulnerable to competition. The competition has arrived. Over-the-top (OTT)

players, which offer apps and streaming content directly to consumers through the Internet, have increased their dominance, even in core communication services such as messaging and voice. WhatsApp, Viber, and Apple's iMessage already represent more than 80 percent of all messaging traffic, and Skype alone accounts for more than a third of all international voice traffic minutes. As a result, many telecom carriers are facing significant decreases in their basic communication service revenues: drop-offs of as much as 30 percent in SMS messaging, 20 percent in international voice, and 15 percent in roaming. Combined with intense competition due to lagging industry consolidation, this pattern has led to steep declines in average revenue per user; at best, minimal revenue growth; and tightening margins. If you are a telecom executive at this critical juncture, you need to make two different moves at the same time. First, begin the task of modernizing operations. Second, redefine your strategic identity (your value proposition) for the future — specifically, what you can expect to offer customers five or 10 years from now.

It is suggested that instead of going after costs, take a more dynamic approach to simplification, one that could serve as a basic foundation for growth. The purpose of this drive should be to pare basic offerings down to a limited portfolio of products and digital services. But they should be essential enough to your customers that you can maintain a deep and loyal customer base, and they should allow your company to transition to the cloud for infrastructure needs. Depending on your own most distinctive capabilities, you could gain a reputation as "the quality- of-service telecom company," the "ultimate cybers security telecom company," the "most innovative Internet telecom company," or the avatar of some other powerfully charged strategic identity.

The operators have to be on the vanguard of adopting digital technologies, both in services and in the back office. Network upgrades is the most compelling requirement. A promising choice for telecom companies is a strategy that could be called seeking adjacent verticals — that is,

providing branded content, financial services, lifestyle services, and e-commerce services over your pipes as an ancillary business. Due to increasing competition, it is projected that it will be difficult for telecom companies to embrace a new strategic identity by themselves; many of them don't have the capabilities required to create the product offerings and services needed for repositioning in the marketplace. For that reason, acquisitions are an attractive vehicle for entering new markets.

The situation in the telecom industry is dire. But it is survivable, by intelligent, innovative companies that have the courage to fund essential modernization and the farsightedness to embrace new strategic identities suitable for their capabilities, market, and culture. If you're a telecom company leader, the need to clarify who you are and what you can be is more pressing than ever before.

2.3.3 Literature Review: Consumer Behaviour

Consumer behaviour is the study of individuals, groups, or organizations and all the activities associated with the purchase, use and disposal of goods and services, including the consumer's emotional, mental and behavioural responses that precede or follow these activities. Consumer behaviour emerged in the 1940s and 50s as a distinct sub-discipline in the marketing area. Consumer behaviour is an inter-disciplinary social science that blends elements from psychology, sociology, social anthropology, ethnography, marketing and economics, especially behavioural economics. It examines how emotions, attitudes and preferences affect buying behaviour. Characteristics of individual consumers such as demographics, personality lifestyles and behavioural variables such as usage rates, usage

occasion, loyalty, brand advocacy, willingness to provide referrals, in an attempt to understand people's wants and consumption are all investigated in formal studies of consumer behaviour. The study of consumer behaviour also investigates the influences, on the consumer, from groups such as family, friends, sports, reference groups, and society in general.

Consumer is the centre of all business activities, hence the subject of major interest in the corporate studies and researches. Many theories have evolved around the consumer behaviour and there patterns.

To be a successful seller of products and services organisations need to understand consumer needs and behaviour and draft their marketing strategies to incorporate such behavioural needs of consumers.

Walters in his study defined Consumer as " an individual who purchases, has the capacity to purchase, goods and services offered for sale by marketing institutions in order to satisfy personal or household needs, wants, or desires." As will be noted from the definition above, referral is made to an individual. Therefore, one should first focus on human behaviour, since consumer behaviour, according to Walters represents a subset of human behaviour. Human behaviour, therefore, "... refers to the total process whereby the individual interacts with his environment". Human behaviour encompasses every thought, feeling or action by people. This implies that every thought, motive, sensation and decision that is made every day, is classified as human behaviour. Belch & Belch (1991) provide a link between human behaviour and consumer behaviour, by stating that consumer behaviour has been defined as the study of human behaviour in a consumer role. Consumer behaviour, according to Walters (1974), represents specific types of human actions, namely those concerned with the purchase of products and services from

marketing organisations. Walters defines consumer behaviour as: " ... the process whereby individuals decide whether, what, when, where, how, and from whom to purchase goods and services. “Mowen, 1993 provides a different definition by explaining consumer behaviour as: "... the study of the buying units and the exchange processes involved in acquiring, consuming, and disposing of goods, services, experiences, and ideas". This definition focuses on buying units in an attempt to include not only the individual, but also groups that purchase products or services. **Schiffman & Kanuk** define consumer behaviour as: "The behavior that consumers display in searching for, purchasing, using, evaluating, and disposing of products, services, and ideas." They elaborated elaborate on the definition by explaining that consumer behaviour is, therefore, the study of how individuals make decisions to spend their available resources (time, money, effort) on consumption-related items. It includes the study of what, why, when, where and how often they purchase and how they use the purchased product. In addition, it encompasses all the behaviours that consumers display in searching for, purchasing, using, evaluating and disposing of products and services that they expect will satisfy their needs. Another definition of consumer behaviour, by Engel, Blackwell & Miniard, states that: "those actions directly involved in obtaining, consuming, and disposing of products and services, including the decision processes that precede and follow these actions". Consumer behaviour is regarded as a relatively new field of study with no historical body of research of its own. The concepts of the development, therefore, were heavily and sometimes indiscriminately borrowed from other scientific disciplines, such as psychology (the study of the individual), sociology (the study of groups), social psychology (the study of how individuals operate in groups), anthropology (the influence of society on the individual) and economics. From a marketing perspective, consumer behaviour most probably became an important field of study with the development of the so-called

marketing concept. The marketing concept was formulated during the 1950s. The Second World War, immediately after the Depression, contributed to the lack of interest in consumer behaviour since product scarcities were the order of the day. With the lack of competitive pressure, manufacturers could sell whatever products they manufactured. The marketing approach for this era, according to **Schiffman & Kanuk,** is called a production orientation, where consumers purchased what was available, rather than waiting for what they wanted. The production orientation was followed by a selling orientation, where marketers attempted to sell products that they unilaterally decided to produce. The assumption of this orientation, according to Schiffman&Kanuk, was that consumers were not willing to purchase products, unless they were actively and aggressively persuaded to do so. The selling orientation did not consider consumer satisfaction, leading consumers to communicate negatively regarding the product by means of word-of-mouth if they were not satisfied with it. In the early 1950s marketers realised that they could sell more products more easily by offering products to those consumers they assumed would purchase them. Through this approach, organisations considered consumer needs and wants, leading to the formulation of the marketing concept. As can be seen from a historical perspective, it is important for any organisation to acknowledge consumer needs as a key to success for both survival and profit generation in a modern economy with multiple products per competitor and multiple competing distribution points. The importance of understanding consumer behaviour can most probably be summarised in a simple, yet powerful, statement by Assael: "Consumers determine the sales and profits of a firm by their purchasing decisions. As such, their motives and actions determine the economic viability of the firm".

Customer churn prediction models aim to indicate the customers with the highest propensity to attrite, allowing to improve the efficiency of customer retention campaigns and to reduce the

costs associated with churn. Although cost reduction is their prime objective, churn prediction models are typically evaluated using statistically based performance measures, resulting in suboptimal model selection.(Verbeke, Dejaeger, Martens, Hur, & Baesens, 2012) in their paper developed a novel profit centric performance measure by calculating the

maximum profit that can be generated by including the optimal fraction of customers with the highest predicted probabilities to attrite in a retention campaign. The novel measure selects the optimal model and fraction of customers to include, yielding a significant increase in profits compared to statistical measures

Most wireless telecom providers already use a customer churn prediction model that indicates the customers with the highest propensity to attrite. This allows an efficient customer management,and a better allocation of the limited marketing resources for customer retention campaigns. Customer churn prediction models are typically applied in contractual settings, such as the postpaid segment in the wireless telecom industry. For these customers usually more information is at hand than in non contractual settings, like for instance the prepaid segment which consists mostly of anonymous customers. Various types of information can be used to predict customer attrition, such as for instance socio-demographic data (e.g. sex, age, or zip code) and call behaviourstatistics (e.g. the number of international calls, billing information,or the number of calls to the customer helpdesk).Alternatively, social network information extracted from call detail records can be explored to predict churn (Dasgupta et al., 2008),which is especially interesting if no other information is available.

Hwang et al. (2004) (Hwang, Jung, & Suh, 2004) termed customer churn an important issue in the highly competitive telecom industry. Customer churn is the number or percentage of regular

customers who abandon their relationship with the service provider (Hwang et al., 2004; Berson et al., 2000 (Berson, Smith, & Thearling, 2000)). Churn in the Indian telecom sector is not only due to fierce competition, but also due to a lack of differentiation among players**(Deloitte, 2011)**; (KPMG, 2010).Telecom operators face two types of financial loss when a customer churns (Otero, 2009), i.e.

(1) Loss of revenue; and

(2) Loss of investment in acquiring the customer.

Reichheld, 1996 found that customer defection has severe effects on firms' profitability because firms have to incur heavy costs to acquire new customers and older customers usually generate greater cash flow and profits than newer ones. Gerpott et al. (2001) have highlighted the criticality of customer retention to the success of a company in the telecommunication sector in comparison to any other sector. Service providers hence have to find out preventive measures for customers churn and earn more revenue by retaining the existing customers. There are three ways by which a service provider can

increase the revenue. They are:

(1) Increase the total number of subscribers using the service.

(2) Increasing the tariff for the service being rendered.

(3) Increase the revenue earning per customer.

Concepts/Theories/Philosophies

What we buy, how we buy, where and when we buy, in how much quantity we buy depends on our perception, self-concept, social and cultural background and our age and family cycle, our attitudes, beliefs values, motivation, personality, social class and many other factors that are both internal and external to us. While buying, we also consider whether to buy or not to buy and, from which source or seller to buy. In some societies there is a lot of affluence and, these societies can afford to buy in greater quantities and at shorter intervals. In poor societies, the consumer can barely meet his barest needs.

Management is the youngest of sciences and oldest of arts and consumer behaviour in management is a very young discipline. Various scholars and academicians concentrated on it at a much later stage. It was during the 1950s, that marketing concept developed, and thus the need to study the behaviour of consumers was recognised. Marketing starts with the needs of the customer and ends with his satisfaction and continued association. When everything revolves round the customer, then the study of consumer behaviour becomes a necessity.

Consumer Behaviour Theory: Approaches and Models

1. Consumer behaviour & consumer decision making

Consumer decision making has long been of interest to researchers. Beginning about 300 years ago early economists, led by Nicholas Bernoulli, John von Neumann and Oskar Morgenstern, started to examine the basis of consumer decision making (Richarme 2007). This early work approached the topic from an economic perspective, and focused solely on the act of purchase (Loudon & Della Bitta 1993). The most prevalent model from this perspective is ‘Utility Theory’

which proposes that consumers make choices based on the expected outcomes of their decisions. Consumers are viewed as rational decision makers who are only concerned with self-interest **(**Schiffman&Kanuk 2007, Zinkhan 1992).

While utility theory views the consumer as a 'rational economic man' (Zinkhan 1992), contemporary research on Consumer Behaviour considers a wide range of factors influencing the consumer, and acknowledges a broad range of consumption activities beyond purchasing. These activities commonly include; need recognition, information search, evaluation of alternatives, the building of purchase intention, the act of purchasing, consumption and finally disposal. This more complete view of consumer behaviour has evolved through a number of discernable stages over the past century in light of new research methodologies and paradigmatic approaches being adopted.

While this evolution has been continuous, it is only since the 1950's that the notion of consumer behaviour has responded to the conception and growth of modern marketing to encompass the more holistic range of activities that impact upon the consumer decision (Blackwell et al. 2001). This is evident in contemporary definitions of consumer behaviour:

"Consumer behaviour…… is the study of the processes involved when individuals or groups select, purchase, use or dispose of products, services, ideas or experiences to satisfy needs and desires."**(Solomon et al. 2006)**

"Consumer behaviour ……. the behaviour that consumers display in searching for, purchasing, using, evaluating, and disposing of products and services that they expect will satisfy their needs" **(Schiffman&Kanuk 2007) (p.3)**

1.2 Theoretical approaches to the study of consumer behaviour

A number of different approaches have been adopted in the study of decision making, drawing on differing traditions of psychology. Writers suggest different typological classifications of these works with five major approaches emerging. Each of these five approaches posit alternate models of man, and emphasise the need to examine quite different variables (Foxall 1990); they will briefly be introduced in turn.

A) Economic Man

B) Psychodynamic

C) Behaviourist

D) Cognitive

E) Humanistic

A) Economic Man

Early research regarded man as entirely rational and self-interested, making decisions based upon the ability to maximise utility at minimum effort. While work in this area began around 300 years ago (Richarme 2007), the term 'economic man' (or even Homo economicus (**Persky 1995**)) was first used in the late 19th century (Persky 1995) at the start of more sustained research in the area.

In order to behave rationally in the economic sense, as this approach suggests, a consumer would have to be aware of all the available consumption options, be capable of correctly rating each alternative and be available to select the optimum course of action (**Schiffman&Kanuk 2007)**. These steps are no longer seen to be a realistic account of human decision making, as consumers

rarely have adequate information, motivation or time to make such a ‘perfect’ decision and are often acted upon by less rational influences such as social relationships and values (Simon 1997).

Furthermore, individuals are often described as seeking satisfactory rather than optimum choices, as highlighted by Herbert Simons Satisficing Theory (Simon 1997), or Kahneman and Tversky’s Prospect Theory (Kahneman&Tversky 1979) which embrace bounded rationality (Simon 1991).

B) Psychodynamic Approach

As per this approach behaviour is subject to biological influence through ‘instinctive forces’ or ‘drives’ which act outside of conscious thought (Arnold, Robertson et al. 1991). While Freud identified three facets of the psyche, namely the Id, the Ego and the Superego (Freud 1923), other theorists working within this tradition, most notably Jung, identified different drives (Ribeaux&Poppleton 1978).

Psychodynamic approach thus believes that behaviour is determined by biological drives, rather than individual cognition, or environmental stimuli.

C) Behaviourist Approach

In 1920 John B. Watson published a landmark study into behaviour which became known as ‘Little Albert’ (Watson & Rayner 1920). This study involved teaching a small child (Albert) to fear otherwise benign objects through repeated pairing with loud noises. The study proved that behaviour can be learned by external events and thus largely discredited the Psychodynamic approach that was predominant at the time.

The trigger of behaviour is attributed to factors external to the individual. The most influential proponents of the behavioural approach were Ivan Pavlov (1849-1936) who investigated

classical conditioning, John Watson (1878-1958) who rejected introspective methods and Burrhus Skinner (1904-1990) who developed operant conditioning. Each of these developments relied heavily on logical positivism purporting that objective and empirical methods used in the physical sciences can be applied to the study of consumer behaviour (Eysenck &Keane 2000).

Initially 'Classical Behaviourism', established by John Watson, required the entirely objective study of behaviour, with no mental life or internal states being accepted. Human thoughts were regarded by Watson as 'covert' speech (Sternberg 1996), and strict monism was adhered to (Foxall 1990). Between 1930 and 1950 Skinner founded 'Radical Behaviourism' which acknowledges the existence of feelings, states of mind and introspection, however, still regards these factors as epiphenomenal (Skinner 1938);(Nye 1979). The assumed role of internal processes continued to evolve in subsequent decades, leading to more cognitive approaches with a new branch of study 'Cognitive Behaviourism' claiming that intrapersonal cognitive events and processes are causative and the primary irreducible determinants of overt behaviour (**Hillner 1984,** p107). While behavioural research still contributes to our understanding of human behaviour, it is now widely recognised as being only part of any possible full explanation (Stewart 1994). Behaviourism does not appear to adequately account for the great diversity of response generated by a population exposed to similar, or even near identical stimuli.

D) Cognitive Approach

In contrast to the foundations of Classical Behaviouralism, the cognitive approach observed action (behaviour) to intrapersonal cognition. The individual is viewed as an 'information processor' (**Ribeaux&Poppleton 1978**). This intrapersonal causation clearly challenges the explicative power of environmental variables suggested in Behavioural approaches, however an

influential role of the environment and social experience is acknowledged, with consumers actively seeking and receiving environmental and social stimuli as informational inputs aiding internal decision making (**Stewart 1994).**

The Cognitive approach is derived in a large part from Cognitive Psychology which can trace its roots back to early philosophers such as Socrates who was interested in the origins of knowledge (Plato 360 B.C.), Aristotle who proposed the first theory of memory (Aristotle 350 B.C.) and Descartes who explored how knowledge is represented mentally in his Meditations (Descartes 1640) (Sternberg 1996). It was not until the middle of the 21st Century, however, that Cognitive Psychology truly emerged as a mainstream and useful field of study with the development of the Stimulus-Organism-Response model by Hebb during the 1950's (Cziko 2000) and the publication of the landmark text by UlricNeisser in 1967 (Neisser 1967). From this point many writers suggested that Cognitivism had taken over from Behaviourism as the dominant paradigmatic approach to decision research (Furedy& Riley 1987).

Figure 1.1: Stimulus-Organism-Response Model of Decision Making

Source: (Cziko 2000)

While there are distinct branches of cognitive psychology, they all share an abiding interest in exploring and understanding the mental structures and processes which mediate between stimulus and response (Kihlstrom 1987). Contemporary Cognitive Psychology has identified and developed a wide range of factors which are thought fundamental to these intrapersonal processes, including: perception, learning, memory, thinking, emotion and motivation

(Sternberg 1996). While this is far from a complete list of the possible constructs at play, it does serve to outline the complexity and multiplicity of issues inherent with this approach.

Early Stimulus-Organism-Response models suggest a linear relationship between the three stages with environmental and social stimuli acting as external antecedents to the organism. This approach assumes that stimuli act upon an inactive and unprepared organism (Eysenck & Keane 2000). Most modern theorists now, however, acknowledge that information processing is conducted by an active organism whose past experience will influence not only the processing of such information but even what information is sought and received. Information processing will be both stimulus driven and concept driven **(Moital 2007**); (Groome, Dewart et al. 1999). This development has resulted in more recent depictions of consumer decision making being circular in fashion (**Peter & Olson 2008**), or drawn through a Venn diagram (Jacoby 2002).

Despite coming from a Radical Behavioural perspective, **Foxall (1990**) identifies four key strengths of cognitivism as a means of explaining consumer behaviour: Stimulus Organism Response

- Its closeness to the common-sense explanations of everyday discourse make it an intuitively attractive means of offering explanations of everyday behaviours such as purchasing and consuming;
- The ability of consumers to describe their experiences in terms of their attitudes, wants, needs and motives ensures that an explanation proceeds in the same terms as the description of what is explained;
- It brings a measure of unity and consensus to a still young field of inquiry;

- The extensive use made by other social science and humanity disciplines of cognitive explanation has assisted the conceptual development of this line of consumer research by making possible the borrowing of theoretical and methodological inputs.

Furthermore, Cognitivism has the capacity to explain complex behaviours, an acknowledged deficiency of the competing Behavioural perspective where it is impossible to ascertain the contingencies that control response **(Foxall 1993**). However, the cognitive approach is also criticised for a number of reasons. Foxall comments that the cognitive approach "…relies extensively upon the use of abstract and unobservable explanatory variables which seldom prove amenable to empirical investigation and evaluation" (1990 p. 96). Additionally, cognitivism assumes the consumer is rational, discerning, logical and active in decision making; assumptions that have been questioned by a number of writers (Bozinoff 1982) (Solomon, Bamossy et al. 2006) (**Schiffman&Kanuk 2007**).

Despite these criticisms, a cognitive approach is more appropriate in the examination of ethical purchasing behaviour. Firstly, the complexity of such actions cannot be accommodated through behavioural models and secondly, the benefits of ethical consumption are largely vicarious in nature, requiring extensive interpersonal evaluation. Key existing studies into ethical purchasing have all accepted the role of intrapersonal examination (Hines & Ames 2000, **Nicholls & Lee 2006**, Ozcaglar-Toulouse, Shiu et al. 2006).

Prescriptive Cognitive Models

Theories of Reasoned Action (TRA) and Planned Behaviour (TPB)

Prescriptive Cognitive Models were first developed in the 1960's when marketing researchers increasingly focused on beliefs and attitudes as determinants of consumer buying behaviour

(Ahtola 1975). The most influential work in this area was forwarded by Martin Fishbein, who proposed a model of attitude formation that became known as the 'Fishbein model'; the first of a breed of 'expectancy value' models (Fishbein 1963, Fishbein 1965, Fishbein 1967, Fishbein& Bertram 1962). The Fishbein model proposed that a person's overall attitude toward an object is derived from his beliefs and feelings about various attributes of the object (Ahtola 1975, Loudon & Della Bitta 1993).

While this model provided a significant contribution in the area, it was developed further, and significantly extended, to not only assess attitudes, but behaviour (Ajzen&Fishbein 1980, Fishbein&Ajzen 1975). This revised model became known as the Theory of Reasoned Action (TRA).

Behaviour is said to be equal to behavioural intention, which can be derived from a combination of the consumer's attitude toward purchasing the product and the subjective norms about the behaviour. Through the concept of 'subjective norm' the theory acknowledges the power of other people in influencing behaviour (Solomon, Bamossy et al. 2006); explicitly, it accounts for the thoughts of others toward the certain behaviour, and is moderated by the extent to which the consumer is motivated to comply with the views. The relative contributions of attitudes and subjective norms will not necessarily be equal in predicting behaviour (Miller 2005), depending on the individual consumer's propensity to care about other's views, the consumption situation, or the product type under consideration, with conspicuously consumed products tending to be influenced to a greater degree by the subjective norm variable than less conspicuous products would be (Schultz 2006).

Another notable change in approach seen in TRA is that attitude toward the behaviour (the act of buying) is measured rather than simply the attitude toward the object. This was a necessary amendment once behaviour was being measured, as a consumer may have a very favourable attitude toward a product, but not toward the act of purchasing it (Solomon, Bamossy et al. 2006).

In empirical tests and applications of the TRA, a high correlation of attitude toward behaviour and subjective norms to behavioural intentions has been found, however, some studies have proposed that the stated high relationship between behavioural intention and actual behaviour is simplistic because of circumstantial limitations (Oliver & Berger 1979, Sheppard,Hartwick et al. 1988). For a variety of reasons it is purported that behaviour is not always within the complete control of the actor, and as such an additional variable mediating between intentions and behaviour is necessary (Warshaw 1980). Ajzen provided this additional variable in 1985 when he published the Theory of Planned Behaviour (TPB) (Ajzen 1985).

The Theory of Planned Behaviour is simply an extension of the TRA which seeks to address the seeming over reliance on intentions to predict behaviours.

The construct 'perceived behavioural control' is formed by combining the perceived presence of factors that may facilitate or impede the performance of behaviour and the perceived power of each of these factors. Actual behavioural control refers to the extent to which a person has the skills, resources, and other prerequisites needed to perform a given behaviour. Actual behavioural control is difficult to accurately assess and so perceived behavioural control is measured through specially designed questionnaires and serves as a proxy measure of the influence. In the TPB, behavioural intention is controlled by a dynamic mix of the attitude,

subjective norm and perceived behavioural control variables. Actual behaviour is again derived largely from behavioural intention, but is mediated to some degree by perceived behavioural control (Ajzen 2006).

Since its publication the TPB has become the dominant expectancy-value theory, and has been applied in a wide variety of behavioural domains (Shaw, Shiu et al. 2000). Empirical tests have often found that the TPB has significantly improved predictive ability over the earlier TRA (Beck &Ajzen 1991, Giles & Cairns 1995).

In the past 20 years a number of studies have proposed modification to the TRA and TPB. In most cases these modifications do not alter the fundamental architecture of the theory, but do change or add variables in an attempt to improve the predictive ability in specific contexts. Ajzen is supportive of such modifications or additions, stating in 1991 that:

"The theory of planned behaviour is, in principle, open to the inclusion of additional predictors if it can be shown that they capture a significant proportion of the variance in intention or behaviour after the theory's current variables have been taken into account" (Ajzen (1991, p. 199)

One of the most notable adaptations is the Technology Acceptance Model proposed by Davis in 1989 in an attempt to explain the determinants of computer acceptance (F. Davis 1989, F. Davis, Bagozzi et al. 1989). Of greater relevance to this study is work that has proposed the addition of ethical obligation as a determining variable (Kurland 1995, Raats, Shepherd et al. 1995, Shaw, Shiu et al. 2000, Sparks, Shepherd et al. 1995), self-identity (Shaw, Shiu et al. 2000, Sparks & Guthrie 1998, Sparks & Shepherd 1992, Terry, Hogg et al. 1999) and environmental behaviours (Harland,Staats et al. 1999).

Critique of the models:

Meta-analytic reviews of the TPB provide strong support for the predictive validity of the theory (Conner & Armitage 1998).(Conner, M., & Armitage, C. J. (1998). Extending the theory of planned behavior: A review and avenues for further research. *Journal of applied social psychology*, *28*(15), 1429-1464.)The theory provides a 'parsimonious explanation of the informational and motivational influences on behaviour' (Conner & Armitage 1998 p. 1430); it is easy to comprehend, and can be applied to a wide range of research scenarios. There are, however, a number of limitations which limit the scope of use and the extent to which it can be deemed to be a complete model of consumer purchase decisions.

The predictive ability of the TRA and TPB relies on the researcher's ability to accurately identify and measure all salient attributes that are considered by the consumer if forming their attitude (Solomon, Bamossy et al. 2006). Clearly many consumption situations are highly complex, and influenced by a plethora of both conscious and sub-conscious factors rendering this premise optimistic. The models rely upon the assumption that the consumer undertakes comprehensive cognitive processing prior to purchase behaviour, an assumption that is challenged by other philosophical approaches (Bagozzi, Gurhan-Canli et al. 2002). The reliance on cognition appears to neglect any influence that could result from emotion, spontaneity, habit or as a result of cravings (Hale, Householder et al. 2002). Solomon et al. comment (2006) that behaviour in certain circumstances may result not from attitude evaluation, but overall affective response in a process called 'affect-referral'. These are thought to be important limitations in the context of clothing shopping where overall affective evaluation and hedonistic impulses are thought to influence some purchases.

The TRA and TPB have been widely applied in Western cultures, however it is not clear that the assumptions underpinning it are well suited to other cultures (Solomon, Bamossy et al. 2006). Very few cross-cultural studies have been undertaken; however the limited findings suggest that the theories are not equally effective in different cultures (Bagozzi, Wong et al. 2000).

Finally, it is thought that intention is likely to be a dynamic concept, constantly under re-evaluation by the consumer as situations change, or as more information becomes available. This will make it difficult for the model to accurately predict behaviour prior to the purchase event as intentions are only likely to be provisional (Sutton 1998). Similarly the model does not well cater for any inhibiting factors to purchase, for example the retail store being out of stock of the intended item.

The Theory of Trying

The Theory of Trying (Bagozzi&Warshaw 1990) provides an interesting alternate approach to the models previously considered. Rather than examining explicit behaviour, the model assesses trying to act. Subjective norms, attitude toward the process or means of trying, attitudes and expectations of success and attitudes and expectations of failure are posed as the key antecedent variables to intention to try; itself the key precursor to trying. Past behaviour has been found to influence consumer choice in a number studies (Bagozzi& Kimmel 1995, Leone, Perugini et al. 1999, Norman & Conner 1996), and is thus integrated as a key influence within the theory.

Bagozzi et al. (2002) suggest in discussion of this theory that rather than consumers having behavioural intentions, they rather have behavioural goals in many situations, and they must expend effort and make the purposive endeavour to fulfil these goals.

According to Kotler, it is an extremely difficult task to uncover the reasons why people buy, as they are subject to many influences. One reason is that humans are greatly influenced by their psyche, which eventually leads to overt purchase responses. Runyon & Stewart explain the theory of human behaviour by stating that it represents the beliefs held regarding the nature of human beings as well as the causes of their behaviour. Human beings can therefore be viewed from many perspectives. If, for instance, human beings are viewed from an economic perspective, marketers may attempt to influence them with economic incentives. If, however, viewed from a social theory perspective, marketers may attempt to influence people through appeals to group norms, references and values. According to Runyon & Stewart, in discussing models of human behaviour, it is important to note that the models proposed are viewed as being an incomplete description of human beings, where different models may be appropriate for different marketing situations. Despite the above view, models of human behaviour provide valuable input to consumer behaviour, since they attempt to provide insights into why human beings, and therefore consumers, rationalise purchase decisions.

The Marshallian economic model, the Pavlovian learning model, the Freudian psychoanalytical model and the Veblenian social-psychological model were significant in defining the different approaches to studying the Human Behaviour.

Maslow’s Hierarchy of needs was another pioneering work that focused on the hierarchy on needs triggering specific behaviours in human beings. Maslow's well-known hierarchy of needs, although not classified as a model of human behaviour, provides valued input to the theory of consumer behaviour, since it provides theory on the motivation of human beings based on a hierarchy of human needs. The theory of the consumer decision-making process commences with the identification or recognition of a need, therefore underlying the importance of

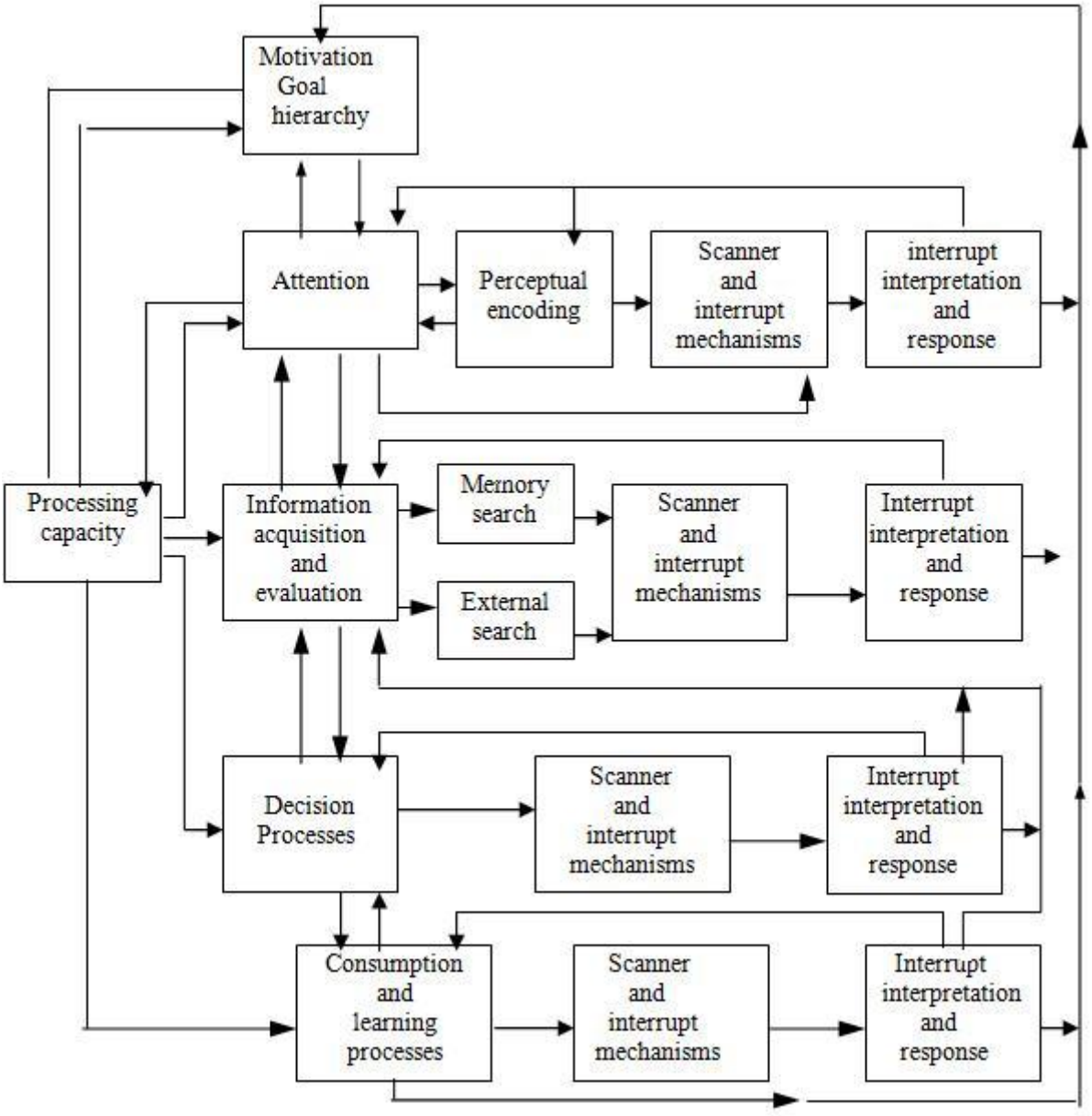
considering the hierarchy of needs theory by Maslow. According to Schiffman&Kanuk, Maslow's theory postulates five basic levels of human needs, ranging from lower-level (biogenic) needs to more important, higher-level (psychogenic) needs. Consumers, therefore, seek to first satisfy lower-level needs before attending to higher-level needs. Only once a lower-level need is satisfied, will a new (higher-level) need emerge, motivating the consumer to fulfil such a need. The process continues, leading the consumer to aspire to the fulfilment of higher-level needs, each time higher than the need before. Physiological needs represent the most basic needs that are required to sustain life and include food, clothing and shelter. Safety and security need concern more than physical safety and include order, certainty and control over the environment and own life. The third level, social needs (referred to as affiliation needs by Churchill & Peter), refers to needs such as friendship, love, affection, belonging and acceptance. Egoistic needs (called esteem needs by Belch & Belch, and Churchill & Peter) comprise inwardly-directed needs (for example concerned with the individual's need for success, independence, self-acceptance and personal satisfaction with something well done) and outwardly-directed needs (including, for example, the need for reputation, status and prestige). The final and highest level of needs is that of self-actualisation, implying the desire to fulfil one's potential, becoming everything an individual is capable of becoming. Worth mentioning is that Maslow believed that most people do not satisfy their egoistic needs sufficiently, thereby keeping them from ever moving to the final, self-fulfilment needs. Comments on Maslow's hierarchy of needs According to Schiffman&Kanuk the major problem of Maslow's theory is that it cannot be tested empirically, implying that there is no means of measuring precisely how satisfied one need must be before a next, higher need becomes operative. Solomon continues by stating that the influence thereof on marketing is somewhat Simplistic since, according to the

theory, consumer's first need to satisfy basic needs before progressing to higher-level needs, where one product can satisfy a number of different needs. In addition to the above, Solomon and Schiffman&Kanuk argue that the theory may be culture-bound, perhaps restricting it to Western culture, or even only certain Western cultures, with other cultures possibly questioning the order of levels specified by the model. For example, Eastern cultures may regard the welfare of a group to be more valued than the needs of an individual. Despite the criticism on the Maslow theory, Schiffman&Kanuk believe that it is useful in marketing strategy, since it provides an understanding of consumer motivations, primarily because consumer goods often serve to satisfy each of the need levels. In addition to the above, the hierarchy offers a comprehensive framework for marketers when developing advertising appeals for their products. The theory is adaptable in two ways, firstly enabling marketers to focus advertising appeals on a need level that is likely to be shared by a large segment of the intended audience and secondly, providing input to product positioning and repositioning. Solomon indicates the relevance of the hierarchy of needs by stating that, rather than viewing consumer needs as a progression to higher-level needs, marketers should acknowledge that consumers have need priorities at different times. This view is supported by Walters who states that the importance of needs to marketers is found in the fact that motives for purchasing are established by the needs.

Factors Influencing Consumer Behaviour:

The Bettman information processing model, according to Runyon & Stewart attempts to model a specific field of consumer behaviour, namely information processing. Lilien& Kotler (1983) add that the model provides an analytical 'framework for understanding consumer behaviour in an environment where choice is made by selecting between a set of alternatives. The model focuses on the information processing perspective by viewing the type of information used by

consumers, how the information is evaluated and finally, how decisions are made. The Bettman information processing model is shown in Figure belowas a function of prior experience and information obtained by the consumer.



Source*: The figure has been adopted from Bettman (1979)*

Attention, the second component, comprises voluntary attention (implying the consumer's allocation of the information-processing effort) and involuntary attention. The third component, information acquisition and evaluation, stipulates that attention is influenced by the goals pursued and therefore activates the search for information. The evaluation component of the model determines when sufficient information is obtained for the purpose of decision-making. The next component of the model, the decision process, is continuously active in the model by focusing on the comparison of possible alternatives. The final element of the basic hierarchy, namely consumption and learning, focuses on the purchase and consumption of the product and offer a new source of information to the consumer. The final stage in the basic hierarchy will, therefore, affect the structure of future choices. The intermediate processes, also referred to as modulating processes, focus on four elements, namely perceptual encoding, processing capacity, memory and external search and finally, scanner and interrupt mechanisms. The first component of the intermediate process, "perceptual encoding", comprises the interpretation process of an individual once being exposed to a stimulus. Bettman argues that this process is influenced by memory, implying the way things were, and by the stimulus itself, implying the way things are. The implications of processing capacity, the second component, are that capacity has to be allocated to a decision task since the complete information-processing process is limited by capacity. Capacity is furthermore positively related to effort and motivation. Runyon & Stewart continue by pointing out a relation between processing capacity and education, intelligence and previous experience. According to the memory and external search components, information may be obtained, in a choice situation, through internal search of the memory and external search, where attention and perceptual decoding is focused on stimuli outside the consumer's memory. Runyon & Stewart continue by listing advertisements, other people and other sources

external to the consumer as external sources. The cost of information search versus the benefits of the information, together with the availability of information, time pressure and the difficulty of the choice task, will determine the level of information search. The final component, scanner and interrupt mechanisms, indicates that consumers are interruptible and not single-minded when pursuing a goal. The scanner monitors the environment in an effort to note conditions that may warrant changes in current actions or beliefs. By reaching a theoretical scanner threshold, an interrupt mechanism is triggered, resulting in the generation of new responses. It is therefore suggested in the model that scanner and interrupt mechanisms affect virtually the entire decision-making process. Considering the Bettman information processing model, Lilien& Kotler suggest that the model represents an attempt to develop a complete theory on the consumer choice process. Knowledge obtained from the model, beneficial for the development, presentation and timing of marketing communications, includes insight into the information consumer's desire, how information is obtained and the probable processing of such information. In addition to the above, the model offers a broad view of purchase decisions, including choices among product classes as well as competing alternatives within a specific product class. The theory of the model is therefore perceived to position decision rules or choice heuristics within the broader concept of decision making. The main limiting factors in the model, according to Lilien& Kotler, are that the model is not directly operational and does not provide quantitative support for marketing decisions. Runyon & Stewart add to the above by stating that, while the schematic model suggests complex relationships involving interactions and feedback, these are not specified in the model and have not been empirically tested. Despite the limitations, the model provides insight in terms of the structure of the process and guidance on the kind of issues that can be expected to affect and influence consumer choices. Runyon & Stewart add that the model has proven useful

to managers concerned with effective communication with consumers and also as a guide for further research on consumer information processing.

The Nicosia model According to Runyon & Stewart (1987), the Nicosia model provides a sophisticated attempt to show the interrelationship between attributes of the consumer, the consumer decision-making process, the marketing communication of an organisation and feedback of the response of the consumer to the organisation. Schiffman&Kanuk (1987) provide a simplistic explanation of the model by stating that it is interactive in design, where the organisation attempts to influence consumers through marketing actions and the consumers in return influence the organisation through their purchase actions (or lack of action if products are not purchased). Runyon & Stewart (1987) continues by stating that if the reaction or attitude resulting from field one is favourable, the consumer will search for the product and evaluate it in terms of other alternatives. Schiffman&Kanuk (1987) add that the output of the second field is motivation to purchase the organisation's brand. The evaluation could, however, also lead to rejection of the brand although the model illustrates a positive response. The positive evaluation leads to purchase of the product, the third field of the model. According to Schiffman&Kanuk (1987), the final field of the Nicosia model, field four, consists of two types of feedback from the purchase experience. The first type of feedback relates to the organisation where sales data will be obtained and the second to the consumer in the form of experience, leaving the consumer either satisfied or dissatisfied. The experience obtained by the consumer relating to the product will affect the predisposition and attitudes with regard to future messages from the organisation. Limitations of the Nicosia model according to Runyon & Stewart (1987), are the questionable assumptions that the consumer has no prior knowledge or experience of the product, as well as an inadequate understanding of subfield two, the influences and interrelationships among the

consumer attributes. A final limiting factor is that, for repetitive decisions (considered a significant part of consumer purchases), the operation of the model is ambiguous. Engel, Blackwell &Kollat (1978) criticise the Nicosia model by claiming that the model never received the necessary elaboration and empirical support nor has it been revised to reflect changes. In conclusion to the Nicosia model, Runyon & Stewart express the opinion that despite the limitations of the model, it attempts to explicitly incorporate the marketing actions of the organisation within a model of consumer behaviour.

The Howard-Sheth model of buying behaviour, according to Foxall (1990), presents a sophisticated integration of the psychological and various social and marketing influences on consumer choice, into a coherent sequence of information processing. Runyon & Stewart (1987) and Foxall (1990) add respectively that the model attempts to explain rational brand choice behaviour within the constraints of incomplete information and limited individual capacities, and also that it provides an empirically testable description of behaviour in terms of cognitive functioning together with its outcomes. Schiffman&Kanuk (1987) explain the Howard-Sheth model explicitly distinguishes between three different stages or levels of decision-making, also referred to as levels of learning namely extensive, limited and routinised problem-solving. Extensive problem-solving implies that the consumer has very little or no knowledge and beliefs about brands. The consumer actively seeks information on a number of alternatives at this point due to the lack of a brand preference. Foxall (1990) adds that in order to reduce brand ambiguity, the consumer is involved in a decision process and undertakes prolonged deliberation contemplating which brand to purchase or whether to buy at all. Limited problem-solving occurs when the consumer cannot fully assess the brand differences to arrive at a preference, since knowledge and beliefs about the brands are only partially established. According to Foxall

(1990) other factors to be considered in limited problem-solving are that consumers have formed choice criteria, know a few brands well and favour them equally because they have already tried several brands at this stage. Price, service, distinctiveness and availability, while symbolic stimuli are portrayed by the mass media and sales people and influence the consumer indirectly. The third type of stimuli is provided by the social environment of the consumer and includes social class, family and reference groups. The three types of stimuli provide input to the consumer regarding the product class or specific brands. The second variable, perceptual and learning constructs, forms the central component of the Howard-Sheth model. At this stage of the model, psychological variables are assumed to operate when the consumer is contemplating a decision. Although forming the so-called heart of the model, these constructs are treated as abstractions that are not defined operationally or directly measured. The perceptual constructs are concerned with how the consumer receives and processes information obtained from input stimuli and other parts of the model, i.e. the function of information processing. Learning constructs, the second component of this variable, includes the consumer's goals, preferences, criteria for evaluating alternatives, information regarding products in the evoked set and buying intentions. The proposed interaction between the perceptual and learning variables together with variables in other segments of the Howard-Shethmodel ensures its distinct character. Runyon & Stewart provide additional information on the second variable, combining perceptual and learning constructs into a single term, called hypothetical constructs. These constructs are responsible for processing and interpreting input stimuli and are characterised by the fact that changes in them can only be inferred from output variables, since they are not observable. The third variable in the model, outputs, represents the possible response to stimuli by the consumer and includes five variables, namely attention, brand comprehension, attitude, intention and

purchase. The final variable, exogenous variables, is not depicted in the model, since it is not perceived to be directly part of the decision-making process. The reason for mentioning this variable is that it should impact on the segmentation efforts of the marketer, since the consumer is influenced by external variables. Exogenous variables considered relevant in terms of impacting on consumer behaviour include time pressure, consumer personality traits, financial status and importance of the purchase. The value of the Howard-Sheth model, according to Runyon & Stewart (1987), is that the model attempts to identify and organise major variables that may influence consumer behaviour. The model is also perceived to be dynamic in nature, since it reflects the complexity of consumer behaviour in an attempt to understand it. The consumer is portrayed to form generalisations as a guide to decision-making through an active information search from the environment by employing past experiences. Criticism towards the model, highlighted by Runyon & Stewart, is that the hypothetical constructs portrayed in the model are not operationally defined in unambiguous terms and the specific interrelationships are therefore somewhat speculative.

The Howard model has been revised a number of times from the early 1970s to the current version published in 1994.The model indicates the revisions that reflect insights gained from testing the Howard-Sheth model, as well as the contributions of other authors who often approached consumer behaviour from different theoretical perspectives. The 1974 version of the Howard model specifies 12 primary functional relationships in such a way that it can be tested empirically. The testable equations of the Howard model ensure that the model can be evaluated in two different, yet related, ways. The model can first be evaluated metatheoretically, implying evaluation in terms of the internal structure of the theory itself. Secondly, it can be measured empirically in terms of its utility in describing real life behaviour.

According to the model, extended decision-making implies that the consumer has not formed a concept of either the product class or the product category. Limited decision-making implies that the consumer has a concept of the product category, but has not formed a concept of new brands falling into a familiar product category. Once the consumer has formed a concept of both the product category and all the product brands within the category, routine problem-solving applies. In view of the product category, Howard dismisses the utility of the product life cycle for brands. The movement from extensive problem-solving to routine problem-solving, therefore, is a movement towards a state of total understanding of a brand, although not implying that the consumer becomes an expert on brands. The consumer does, however, know the physical characteristics of the brand, leading to brand recognition. In addition to the above, the consumer knows the strengths of a brand based on the benefits thereof, as manifested in an attitude towards a brand. This so-called understanding of brands by consumers, referred to by Howard as the ABC of marketing (comprising brand recognition, attitude and confidence), constitutes brand image. The Howard model portrays the consumer decision process, comprising six interrelated concepts, namely Information (F), Brand recognition (B), Attitude (A), Confidence (C), Intention (I) and Purchase (P). The six interrelated concepts will be briefly discussed to provide greater clarity on the Howard model. Information (F) refers to the precept that is caused by stimuli. The precept is measured by recall, implying that information comprises of all that is recalled by the stimulus. Brand recognition (B) involves categorisation, resulting in the consumer needing information on both the functioning of the product and the form. Brand recognition is viewed as being causally linked to both Attitude (A) and Confidence (C). Attitude (A) towards a brand refers to the measure of the extent to which consumers expect the brand to meet certain

expectations. The measure of attitude is argued to be multidimensional, where each benefit is measured in terms of its importance to the consumer and the multiplication of each weighting by the corresponding envisaged performance of the brand, resulting in the overall sum being the measure of attitude. Attitude is viewed as being causally linked to Intention (I). Confidence (C) refers to the degree of certainty experienced by consumers regarding the correctness of their judgements about a brand and its benefits. Confidence is suggested to be causally linked to Intention (I), especially when Attitude (A) is high. Intention (I) to purchase represents the mental stage reflecting the consumer's intention to purchase a specified quantity of a particular brand within a specified period. Intention (I) is viewed as a predictor of Purchase (P). Purchase (P), the final interrelated concept of the Howard model, occurs once the consumer either has bought the brand or when the consumer has financially committed to purchasing the brand. Intention (I) is influenced by Pr and PL, defined by Howard (1994) as Price (Pr) and Availability (PL). Price and availability, directly influencing Intention (I), represent the regular price of the brand and the Place (PL) where the brand can be purchased. Although price and availability are considered important influencing factors of the purchase process, these variables change often and Information (F) can therefore bypass the thinking process by directly influencing Intention (I). Intention (I) is not only influenced by Price (Pr) and Place or availability (PL) but, also by motives. Howard (1994) indicates that motives represent the motives operating in each specific situation. Drawing a conclusion from the Howard model; It should be noted that the variables impacting on consumer behaviour changes for each of the three different stages of decision-making.

The Engel, Blackwell, Miniard model has its origin in decades of work on the subject of consumer behaviour by Engel, Kollat, Blackwell, and Miniard. These authors were responsible

for the evolution of the model from 1968 to its present form. According to Engel et al. (1978), the Engel, Kollat, Blackwell model (referred to as the EKB model) was a revision of a previous version of the model and had several distinct purposes, namely: a) the interrelationship between stages in the decision-process and the endogenous and exogenous variables which are highlighted; b) to clarify the relationship between attitudes and behaviour as well as the introduction of beliefs and intentions as explicit variables and the introduction of normative compliance; and c) to define variables with greater precision and specify functional relationship for the purpose of empirical testing.

The EKB model was revisited and together with a new author, Miniard, the model became known as the Engel, Blackwell, &Miniard model (referred to as the EBM model). According to the EBM model, the consumer decision-making process is influenced and shaped by a number of factors and determinants, categorised in three broad categories, namely individual differences, environmental influences and psychological processes.

The EBM model suggests that consumer behaviour is influenced by five major categories of individual differences. These individual differences are consumer resources; knowledge; attitudes; motivation; personality, values and lifestyle.

1) Consumer resources: each decision situation is characterised by the involvement of three different consumer resources. First, the consumer uses time, which is valued since time is often more important to consumers than money due to the increasing lack of time in a modern society. The second resource is money or economic resource, and the third is information reception and processing capabilities. Consumer's perception regarding the availability of these resources may affect the willingness to spend time and money on

products, which causes the consumer to carefully allocate these resources due to the limited availability thereof.

2) Knowledge defined as the information stored in memory, encompasses a wide variety of information, including the availability and characteristics of products and services. Information contained in memory regarding products include awareness of the product category and brands within the product category, attributes and beliefs of both the product category and specific brands, and the availability of products in terms of the distribution channels and competitors selling products within these channels. In addition to the above, knowledge regarding products also includes when to purchase, since the consumer may be aware of specials at certain times during the year and may therefore delay the purchase decision. A final component of knowledge is the information contained in memory regarding the uses and requirements to use a product. Consumers may, therefore, be aware of the uses of products, although they are not able to actually operate them.

3) Attitudes: An attitude can be defined as an overall evaluation of alternatives, ranging from positive to negative. Attitudes are considered important in viewing consumer behaviour, since behaviour is strongly influenced by attitudes towards a given product or brand. In addition to the above, attitudes influence the future choice and are difficult to change, even though being a common marketing tool.

4) Motives: Needs and motives, where need is a central variable in motivation, influence all phases of the decision process. Activated needs, defined as a perceived difference between an ideal and the present state that is sufficient to activate behaviour, lead to energised behaviour or drive that is channelled towards certain goals that have been

learned as incentives. In addition to the above, it should be noted that needs fall within two categories, namely the utilitarian or functional category which has practical benefits, and the hedonic or subjective category with emotional benefits.

5) Personality: Personality, values and lifestyle encompass what is known as psychological research, where the emphasis is placed on individual traits, values, beliefs and preferred behaviour patterns that combine to characterise market segments. Personality, defined as consistent responses to environmental stimuli, provides for orderly and coherently related experiences and behaviour. Personality is also the component that makes one individual unique from all others and provides consistency of responses.
6) Values represent an individual's beliefs about life and accepted behaviour, therefore expressing both the goals that motivate people and appropriate ways to achieve those goals. Values are classified as either being social, implying shared beliefs that characterise a group of people and thereby defining behaviour for the group that will be accepted as "normal", or personal, responsible for defining "normal" behaviour of r an individual.

Lifestyle reflecting an individual's activities, interests and opinions, represents certain patterns in which people live and spend their time and money. Lifestyle can, therefore, be viewed as the result of all the economic, cultural and social life forces that contribute to an individual's human qualities. Environmental influences impacting on consumer behaviour include culture, social class, personal influences, family and the situation. Culture, from a consumer behaviour perspective, implies the values, ideas, artefacts and other meaningful symbols assisting individuals to communicate interpret and evaluate as members of society. According to the EBM model, the importance of culture from a consumer behaviour perspective is that it provides

people with a sense of identity and understanding of acceptable behaviour within society. In addition to the above, culture influences attitudes and behaviour, including the sense of self and space, communication and language, time and time consciousness, values and norms, food and feeding habits, relationships with family, organisations and government, dress and appearance, beliefs and attitudes, mental processing and learning, as well as work habits and practices. **Social class :** the second environmental influence, "social class", can be defined as divisions within society where individuals share similar values, interests and behaviours. Social classes are differentiated by socio-economic status differences, often leading to consumer behaviour differences, for example the make of a vehicle or the favourite style of dress. The impact of social class on consumer behaviour can often be observed when viewing consumer time spent, products purchased, where, and how they purchase products, especially since brands of products and services are associated with specific social classes. **Personal influences** : Consumers are often influenced by people they associate with, where they conform to the norms and expectations of others or simply value their opinions in the buying process. This influence can either be the observation of others or alternatively the active seeking of advice, where the person providing the advice becomes an influential or opinion leader. **Family** : The family is often the primary decision-making unit with different roles and functions, often resulting in simultaneous co-operation and conflict. Two behavioural roles of the family can be distinguished, namely instrumental or functional roles, involving financial, performance and other "functional" attributes, such as conditions of purchase and expressive roles, involving the support of other family members in the decision-making process by expressing the family's emotional needs and upholding of family norms. **Situation** : The final environmental influence impacting on consumer behaviour according to the EBM model is that of the situation, since behaviour

changes as the situation changes. The importance of considering the situation is due to changes impacting on consumers sometimes being unpredictable and erratic, for example retrenchments from work result in the postponement of purchases. Situational factors can be divided into three categories, namely communication, purchase and the usage situation. Communications situations influencing consumers are, for instance, affected by marketing messages, where, for example, the impact of a television advertisement is in part determined by the programme during which it is broadcast. The purchase situation includes elements of the information environment, for instance the availability thereof externally or internally in memory, the volume of information, determined by the number of choice alternatives as well as the number of attributes per alternative. Other aspects from the information environment influencing the purchase situation are the format, implying the manner in which it is organised, and form of information. In addition to information influences, the retail environment or store atmospherics also influence the purchase situation. Factors comprising the retail environment include music, layout, point of purchase material, colours and crowding caused by the density of shoppers in a store. The final situational influence, "product consumption", plays an important part in consumer behaviour, since consumers may alter their purchase patterns due to usage situations. An example of the consumption situation is where it is acceptable to drink a certain brand of wine at home, yet when with friends it may be unacceptable. C) Psychological processes: the psychological processes in the EBM model comprise the decision-process behaviour of consumers which, together with the environmental influences and individual differences, form an elaborated consumer behaviour and decision model.

The decision-making process in the EBM model comprises the following components: need recognition, search for information, information processing, pre-purchase alternative evaluation,

purchase, consumption and post-purchase alternative evaluation as well as divestment. i) Need recognition The first stage of the decision-making process is that of need recognition, where the consumer senses a difference between what is perceived as an ideal state of affairs compared to the actual state at any given time. Need recognition is therefore a state of desire, initiating a decision process that occurs throughout the interaction of individual differences and environmental influences. ii) Search for alternatives The second stage of the decision process is that of internal search into memory to determine whether or not enough is known about alternatives to make a decision without additional information searches. If there is not sufficient information contained in memory, consumers will engage in external search. Individual differences and environmental influences, influence external search. For example, some consumers are cautious and unwilling to purchase products without searching for extensive and detailed information, whereas others may purchase products without comparing alternatives. External sources used when searching for information are categorised as either being marketer dominated or other. Marketer dominated sources imply any activities by suppliers of products for the purpose of offering information or persuasion, including for example point of sale material and advertising. The "other" external source of information in the EBM model includes for instance word-of-mouth from others, product rating and consumer reports. iii) Information processing: the information processing process commences when the consumer is exposed to an external search. In the information processing process, five distinctive steps can be identified, namely exposure, attention, comprehension, acceptance and retention. Exposure forms the first step of information processing since communication first needs to reach consumers, resulting in the activation of one or more senses and therefore the start of preliminary processing. Once exposed to information, consumers need to allocate information processing capacity to the

incoming information, or alternatively decide not to allocate processing capacity. Attention to information will most likely occur if the incoming message and the contents thereof are considered relevant. At this stage of the process, consumers may ignore marketing dominated messages, thereby exercising their capabilities of selective attention. During the third step of the information processing process, comprehension, the message to which attention was attracted, is further analysed against categories of meaning stored in memory. At this point, the marketer wishes for accurate comprehension of the message. The goal of the marketer's message is to modify or change beliefs and attitudes held by consumers. At this stage of the information processing process, acceptance of an incoming message can be assumed if it has not been screened out as being unacceptable. Of importance to note with acceptance is that there will be, at least to some degree, changes in consumer beliefs and attitudes if the message was accepted. The final step in the process is that of retention, where the marketer will aim to not only achieve acceptance for its information, but also the storing thereof in memory for future use. It should be noted in conclusion to the information processing process that attention to stimuli will be attracted and held only if the information is relevant to the needs and motives of the consumer. Due to the massive volume of competing messages to which consumers are exposed, only a small subset will be processed as a result of the selective information processing capabilities of consumers. iv) Pre-purchase alternative evaluation: At the pre-purchase evaluation phase of the EBM model, the consumer will examine products in terms of their attributes as compared to personal standards and specifications, defined as evaluation criteria. The evaluation criteria, expressed in the form of preferred attributes, present the desired outcomes from the purchase and consumption of products. Evaluation criteria, influenced by individual and environmental influences, can therefore be perceived as becoming a product-specific manifestation of the

consumer's needs, values and lifestyle. v) Purchase The purchase process occurs in either a retail-type environment or through in house shopping, and often requires the assistance of a highly skilled salesperson, although this does not necessarily imply that the decision and evaluation process is executed at the point of purchase. vi) Consumption and post-consumption alternative evaluation: the consumption of products has traditionally not been the concern of marketers, since the primary objective used to be to sell the product. This view has changed since marketers need to remain competitive by ensuring consumer satisfaction with the purchase and the consumption of products in an effort to retain consumers. Marketers can, therefore, learn a great deal from consumers by examining how products are consumed, noting preferences and suggestions on how to improve on products, and 'finally to probe into reasons why products are returned.vii) Divestment The final stage of the decision process model is divestment, where the consumer faces the options of disposal, recycling or re-marketing.

Cohen,1968 in his Article ‘Toward an Interpersonal Theory of Consumer Behavior’ published in California Management Review opined: A promising direction for future research on consumer behavior in the marketplace is the identification and measurement of relevant independent variables—such as personality. The consumer was defined as an Interpersonal Man. “The things people buy are seen to have personal and social meanings in addition to their functions."***** -- The things which we own, just as the opinions we hold, fit the picture we hold of ourselves in relation to others

Studying the factors defining the consumer behavior PanayiotaLyssiotou, PanosPashardes and ThanasisStengos published an Article: Age Effects on Consumer Demand: An Additive Partially Linear Regression Model in The Canadian Journal of Economics / Revue canadienned'Economique, Vol. 35, No. 1 (Feb., 2002), pp. 153-165. They highlighted how

expenditure and age affect consumer demand and in turn influence consumer behavior. Additive partially linear regression model was used to study the correlation.

An Article: 'Age and factors influencing consumer behaviour' appearing in the International Journal of Consumer Studies 33 (2009) 302–308 by Catherine Hervé and Etienne Mullet focused on identifying the factors that influence consumer behavior. Price, Durability and Suitability as factors across the Age segments were studied and correlated.

Rakesh Kumar in his study: 'Impact of Demographic Factors on Consumer Behaviour - A Consumer Behaviour Survey in Himachal Pradesh' published in the Global Journal of Enterprise Information System (2014) found 10 demographic factors viz. Age,Sex,Marital status, Income, Family Background, education, occupation, family size, geographic factors and Psychological factors that influence consumer behavior. As the change comes in these factors, consumer behaviour also changes.

Varsha Agarwal published an Article: 'a study of demographic factors influence on consumers' impulse purchase behavior' in the international journal of research in commerce & management, volume no. 6 (2015), issue no. 11. The main purpose of the study was to determine the relationship between consumers' demographic factors and the impulse purchase behavior with use of correlation. Stratified random sampling was used on a sample size of 250 respondents in Bangalore. Percentage analysis, correlation analysis and regression analysis was used as major statistical tools for analysis of data. It was observed that Impulse purchase behavior is positively affected by demographic factors. According to the result of this study, disposable income creates majority of the variance in impulse purchase behavior of consumers. This proves that individuals with high income and have money to spend on shopping show more impulse purchase behaviors.

On the other hand, age created non-significant variance in the impulse purchase behavior of consumers. There are various causes behind the impulse purchase behavior of consumers, but demographic factors are the most important reason among all.

2.3.4 Literature Review: Predicting Customer loyalty

Customer Churn Prediction (CCP) is a challenging activity for decision makers and machine learning community because most of the time, churn and non-churn customers have resembling features. From different experiments on customer churn and related data, it can be seen that a classifier shows different accuracy levels for different zones of a dataset. In such situations, a correlation can easily be observed in the level of classifier's accuracy and certainty of its prediction.

Sebastián Maldonado in his study ‘Churn prediction via support vector Classification: An empirical comparison’ published in Intelligent Data Analysis 19 (2015) S135–S147, DOI 10.3233/IDA-150774 compared two SVM-based techniques. Experiments on four customer churn prediction datasets show the advantages of SVDD: it outperforms standard SVM in terms of predictive performance, demonstrating the importance of techniques that take the class imbalance problem into account.

The SVDD method outperformed SVM in terms of predictive performance, even using different sampling techniques, demonstrating the importance of tackling the class imbalance problem from an algorithmic perspective. This model promises to become a real alternative for the customer churn prediction task, given its virtue in terms of prediction capabilities.

– The presence of noisy variables in the churn prediction problem strongly affects the performance of classification approaches. Simple filter methods such as Fisher Score can be very useful in identifying a subset of relevant variables for the problem, and feature selection should be studied as another model selection parameter in the training process. Feature selection is not only important for improving prediction; it also provides very important insights into customer behavior, which allows the company to design better retention campaigns and to define an efficient acquisition strategy.

– The choice of the model parameters, the resampling strategy and the subset of ranked features is crucial to obtaining adequate results, and avoiding over fitting or under fitting. An adequate grid search on the training set is mandatory for all choices, while the final assessment in an independent test set is required in order to validate the results obtained in the model selection procedure.

Lokesh Jasraiin in his study 'Predicting Customer Satisfaction Towards Mobile Value-Added Services: An Application of Multiple Regression evaluated Value Added Service as a product and customers satisfaction from it. MVAS plays a significant role in generating non-voice revenue for the mobile telecom sector as service providers are facing a big challenge to sustain profitability due to continuous decline in minutes of use per connection per month, average revenue per user per month, steep fall in voice tariffs, and huge competition in the industry. Analyzing the customers' preferences, demand and satisfaction creates a win-win situation for both customers and service providers. The service providers can make a distinct image for themselves and differentiate themselves across the service providers by inculcating innovation in VAS. The present study is conducted to predict customer satisfaction towards MVAS.

Catalin CIMPOERU, Anca ANDREESCU in the paper Predicting Customers Churn in a Relational Database published in Informatica Economică vol. 18, no. 3/2014 explores how two main classical classification models work and generate predictions through a commercial solution of relational database management system. The development of the relational database management systems, such as Microsoft SQL Server or Oracle, led not only to the addition of the data mining technology to the software package, but also to the simplification and automation of processes like setting-up predictive models. However, the data mining facilities provided by the software should be joined, on the user side, by things like: a proper understanding of the raw data and the context they are collected (eg. the business conditions) and the relevance of the predictive activities in relation with the objectives and the business issues.

2.3.5 Literature Review: Research Methodology

Factor analysis is a statistical method used to describe variability among observed, correlated variables in terms of the potentially lower number of unobserved variables called factors. For example, it is possible that variations in six observed variables, mainly reflect the variations in two unobserved (underlying) variables. Factor analysis searches for such joint variations in response to unobserved latent variables. The observed variables are modelled as linear combinations of the potential factors, plus "error" terms. Factor analysis aims to find the independent latent variables. The theory behind factor analytic methods is that the information gained about the interdependencies between observed variables can be used later to reduce the set of variables in a dataset. Factor analysis is commonly used in biology, psychometrics personality theories, marketing, product management, operations research, and finance. Proponents of factor analysis believe that it helps to deal with data sets

where there are large numbers of observed variables that are thought to reflect a smaller number of underlying/latent variables. It is one of the most commonly used inter-dependency techniques and is used when the relevant set of variables shows a systematic inter-dependence and the objective is to find out the latent factors that create a commonality.

Factor analysis is related to principal component analysis (PCA), but the two are not identical. There has been significant controversy in the field over differences between the two techniques (see section on exploratory factor analysis versus principal components analysis below). PCA can be considered as a more basic version of exploratory factor analysis (EFA) that was developed in the early days prior to the advent of high-speed computers. Both PCA and factor analysis aim to reduce the dimensionality of a set of data, but the approaches taken to do so are different for the two techniques. Factor analysis is clearly designed with the objective to identify certain unobservable factors from the observed variables, whereas PCA does not directly address this objective; at best, PCA provides an approximation to the required factors. From the point of view of exploratory analysis, the eigenvalues of PCA are inflated component loadings, i.e., contaminated with error variance.

Linear discriminant analysis (LDA), normal discriminant analysis (NDA), or discriminant function analysis is a generalization of Fisher's linear discriminant, a method used in statistics, recognition and machine learning to find a linear combination of features that characterizes or separates two or more classes of objects or events. The resulting combination may be used as a linear classifier, or, more commonly, for dimensionality reduction before later classification.

LDA is closely related to analysis of variance (ANOVA) and regression analysis, which also attempt to express one dependent variable as a linear combination of other features or

measurements. However, ANOVA uses categorical independent variables and a continuous dependent variable, whereas discriminant analysis has continuous independent variables and a categorical dependent variable (i.e. the class label). Logistic regression and probit regression are more similar to LDA than ANOVA is, as they also explain a categorical variable by the values of continuous independent variables. These other methods are preferable in applications where it is not reasonable to assume that the independent variables are normally distributed, which is a fundamental assumption of the LDA method.

LDA is also closely related to principal component analysis (PCA) and factor analysis in that they both look for linear combinations of variables which best explain the data. LDA explicitly attempts to model the difference between the classes of data. PCA on the other hand does not take into account any difference in class, and factor analysis builds the feature combinations based on differences rather than similarities. Discriminant analysis is also different from factor analysis in that it is not an interdependence technique: a distinction between independent variables and dependent variables (also called criterion variables) must be made.

LDA works when the measurements made on independent variables for each observation are continuous quantities. When dealing with categorical independent variables, the equivalent technique is discriminant correspondence analysis.

Discriminant analysis is used when groups are known a priori (unlike in cluster analysis). Each case must have a score on one or more quantitative predictor measures, and a score on a group measure. In simple terms, discriminant function analysis is classification - the act of distributing things into groups, classes or categories of the same type

Cluster analysis or clustering is the task of grouping a set of objects in such a way that objects in the same group (called a cluster) are more similar (in some sense) to each other than to those in other groups (clusters). It is a main task of exploratory data mining, and a common technique for statistical data, used in many fields, including machine learning, pattern recognition, image analysis, information retrieval, bioinformatics, data compression, and computer graphics.

Cluster analysis itself is not one specific algorithm, but the general task to be solved. It can be achieved by various algorithms that differ significantly in their understanding of what constitutes a cluster and how to efficiently find them. Popular notions of clusters include groups with small distances between cluster members, dense areas of the data space, intervals or particular statistical distributions. Clustering can therefore be formulated as a multi-objective optimization problem. The appropriate clustering algorithm and parameter settings (including parameters such as the distance function to use, a density threshold or the number of expected clusters) depend on the individual data set and intended use of the results. Cluster analysis as such is not an automatic task, but an iterative process of knowledge discovery or interactive multi-objective optimization that involves trial and failure. It is often necessary to modify data preprocessing and model parameters until the result achieves the desired properties.

Cluster analysis was originated in anthropology by Driver and Kroeber in 1932 and introduced to psychology by Zubin in 1938 and Robert Tryon in 1939 and famously used by Cattell beginning in 1943for trait theory classification in personality psychology.

Summary of Literature Review

1.Title/ Author /Journal/Year	Purpose	Sample/ Setting	Methods	Key Findings	Conclusions	Limitations/ Gaps/ Further Study
Customer loyalty in telecom service sector: the role of service quality and customer commitment Ernest Emeka Izogo Department of Marketing, Ebonyi State University, Abakaliki, Nigeria 7 March 2016 The TQM Journal Vol. 29 No. 1, 2017 pp. 19-36 © Emerald Publishing Limited 1754-2731 DOI 10.1108/TQM-10-2014-0089	The purpose of this paper is to examine how firms can influence customer loyalty through customer commitment by leveraging two constructs of service quality: service assurance and service reliability	138 responses retrieved from experienced users of mobile phone services in one of the big cities in the South-eastern part of Nigeria	Survey Questionnaire The validity and reliability of the measurement model as well as the proposed hypotheses were examined through the partial least squares structural equation modelling procedure.	Service reliability is a direct predictor of customer loyalty while service assurance is not. Affective commitment has a direct positive effect on customer loyalty and partially mediates the relationship between service reliability and customer loyalty. In contrast, the mediating effects of affective and continuance commitment on the relationship between service assurance and customer loyalty were positive but insignificant. Finally, affective commitment mediates the effect of continuance commitment on customer loyalty.	customer loyalty can be initiated from the lenses of both service quality and customer commitment, but the latter mediates the effects of service quality constructs on customer loyalty.	Small sample size of 138

2.Title/ Author /Journal/Year	Purpose	Sample/ Setting	Methods	Key Findings	Conclusions	Limitations/ Gaps/ Further Study
Valuing Customers Author(s): Sunil Gupta, Donald R. Lehmann and Jennifer Ames Stuart Source: Journal of Marketing Research, Vol. 41, No. 1 (Feb., 2004), pp. 7-18 Published by: American Marketing Association	In this article, the authors focus on the most critical aspect of a firm: its customers. Specifically, they demonstrate how valuing customers makes it feasible to value firms, including high-growth firmswith negative earnings. The authorsdefine the value of a customer as the expected sum of discounted future earnings. They find that a 1% improvement in retention, margin, or acquisition cost improves firm value by 5%, 1%, and .1%, respectively.	They demonstrate their valuation method by using publicly available data for five firms. One traditional firm (Capital One) and four Internet companies (Amazon.com, Ameritrade, eBay, and E*Trade).	Descriptive research design is followed for study.	Retention elasticityis in therangeof 3 to 7 (i.e., a 1% improvement in retention increases customervalueby 3%-7%). Retentionratehasa significantlylarger impacton customerandfirmvalue than doesthediscountrateor costof capital.	Customer lifetimevalue is receiving increasing attention in marketing, especiallyin database marketing. Inthis article, attempt has been made to show that the concept notonly is important fortactical decisions but also can provide a useful metric to assess the overall valueof a firm.The underlying premiseof the modelis thatcustomersare important intangible assetsof a firm, and theirvalues shouldbe measured and managed like any other asset.	The study has been limited to a very small sample size of 5 Firms. It is difficult to quantify the value of Retention in such straight terms basis a small sample study.

3.Title/ Author /Journal/Year	Purpose	Sample/ Setting	Methods	Key Findings	Conclusions	Limitations/ Gaps/ Further Study
The Effects of Customer Satisfaction, Relationship Commitment dimensions, and Triggers on Customer Retention. Author(s): Anders Gustafsson, Michael D. Johnson and Inger Roos Source: Journal of Marketing, Vol. 69, No. 4 (Oct., 2005), pp. 210-218 Published by: American Marketing Association	In a study of telecommunications services, the authors examine the effects of customer satisfaction, affective commitment, and calculative commitment on retention. The study further examines the potential for situational and reactional trigger conditions to moderate the satisfaction - retention relationship. The results support consistent effects of customer satisfaction, calculative commitment, and prior churn on retention. Prior churn also moderates the satisfaction - retention relationship. The results have implications for both customer relationship managers and researchers who use satisfaction surveys to predict behavior.	customers of a large Swedish telecommunications company that provides fixed-phone service, mobile phone service, modem-based Internet service, and broadband Internet service	Qualitative Interviews Periodic Survey Reliability and Discriminant Validity	Customer satisfaction has a consistent negative effect on churn (a positive effect on retention). In contrast, affective commitment does not predict churn when it is included with customer satisfaction. Other findings involve the effects of prior churn on future churn. Rather than rely solely on psychometric constructs to explain churn, the finding included prior churn as a state dependent variable to explain subsequent churn.	Effective CRM strategies vary considerably depending on which factors are driving retention. If customer satisfaction is the primary driver of retention, a firm should improve product or service quality or offer better prices. If affective or calculative commitment is more important, a firm should either build more direct relationships with customers or build switching barriers in relation to competitor	A limitation of the study is that it explores only nine months of retention. Another possible limitation is that customers self-selected into the various trigger conditions using the company's own survey. However, study identified the trigger categories using qualitative inter- views from a separate sample of the company's customers. More in-depth interviews with the customers who actually responded to the survey would help ensure the more accurate prediction of the type of switching path each customer may be on.

4.Title/ Author /Journal/Year	Purpose	Sample/ Setting	Methods	Key Findings	Conclusions	Limitations/ Gaps/ Further Study
Blinded by Delight Why Service Fails and How to Fix It CEB EXECUTIVE GUIDANCE FOR 2014	Simply satisfying customers is no longer adequate; companies need to delight them, dedicating significant resources to the effort because the reward seems worth it. This unquestioning dedication of resources prompted CEB to research how customer service quality affects customer behaviors—specifically loyalty.	More than 97,000 consumers and business customers globally	Exploratory.	Service is critical to preventing customer disloyalty and that certain service experiences are far more likely to cause customer churn than others. Specifically, customers will punish organizations that require them to expend a great deal of effort to handle their service request. Ninety-six percent of customers who put forth high effort in service interactions are more disloyal, while only 9% of those with low-effort interactions are more disloyal. Organizations rarely succeed in delighting customers (only 16% of the time), and doing so is costly.	Customers whose expectations have been exceeded are no more loyal than are those whose expectations have simply been met. Although customers seldom reward organizations that provide a delightful service experience, they will harshly penalize those that do not meet their expectations.	

5.Title/ Author /Journal/Year	Purpose	Sample/ Setting	Methods	Key Findings	Conclusions	Limitations/ Gaps/ Further Study
Corporate image and corporate reputation in customers' retention decisions in services By : Nha Nguyen & Gaston Leblanc Journal of Retailing and Consumer Services : July 2001	In the present competitive environment, corporate reputation and corporate image are acknowledged as having the potential to impact on customer loyalty toward the firm. However, the literature reveals that the precise nature of the relationships that exist between reputation and image and the understanding of their effect on customer behaviour remains a key challenge for both academia and management alike.	3 service industries, namely 222 consumers in the retail sector, 171 clients of a major long-distance company and 395 students of a faculty of business administration. Study in Canada.	Exploratory.	Strong correlation between Corporate Image and reputation in ensuring customers loyalty.	The results of the study reveal that the degree of customer loyalty has a tendency to be higher when perceptions of both corporate reputation and corporate image are strongly favourable. Moreover, the addition of the interaction between both constructs contributes to better explain customer loyalty.	Correlation of image and reputation in Retention was established however it didn't talk about its weightage or precedence over other factors influencing customer retention.

6.Title/ Author /Journal/Year	Purpose	Sample/ Setting	Methods	Key Findings	Conclusions	Limitations/ Gaps/ Further Study
The American Customer Satisfaction Index: Nature, Purpose, and Findings. Journal of Marketing. Oct 1996. Authors :Fornell, Claes; Johnson, Michael D.; Anderson, Eugene W.; Jaesung Cha; Bryant, Barbara Everitt	The American Customer Satisfaction Index (ACSI) is a new type of market-based performance measure for firms, industries, economic sectors, and national economies. The authors discuss the nature and purpose of ACSI and explain the theory underlying the ACSI model, the nation-wide survey methodology used to collect the data, and the econometric approach employed to estimate the indices	seven major economic sectors	Nation-wide survey to collect data & Econometric approach to estimate the indices.	(1) customization is more important than reliability in determining customer satisfaction, (2) customer expectations play a greater role in sectors in which variance in production and consumption is relatively low, and (3) Customer satisfaction is more quality-driven than value- or price-driven.	The authors find customer satisfaction to be greater for goods than for services and, in turn, greater for services than for government agencies, as well as find cause for concern in the observation that customer satisfaction in the United States is declining, primarily because of decreasing satisfaction with services.	

7.Title/ Author /Journal/Year	Purpose	Sample/ Setting	Methods	Key Findings	Conclusions	Limitations/ Gaps/ Further Study
Customer satisfaction and its consequences on customer behaviour revisited: The impact of different levels of satisfaction on word-of-mouth, feedback to the supplier and loyalty Magnus Söderlund, (Stockholm School of Economics, Stockholm, Sweden) International Journal of Service Industry Management (1998)	Explores the extent to which the form of the relationship between customer satisfaction and customer behaviour is different under conditions of "low" satisfaction and "high" satisfaction.	Three behavioural variables (word-of-mouth, feedback to the supplier, and loyalty) were examined.	Factor analysis	Different patterns emerge for each behavioural variable.	The results point to the fact that differences in the form do exist. Moreover, the results show that differences exist between the differences, in the sense that different patterns emerge for each behavioural variable.	

8.Title/ Author /Journal/Year	Purpose	Sample/ Setting	Methods	Key Findings	Conclusions	Limitations/ Gaps/ Further Study
Factors Affecting Consumer Behavior DR. NILESH B. GAJJAR International Journal of Research In Humanities and Social Sciences April , 2013	Studying other factors, apart from the economic factor of maximization of resource that influences customers behavior / buying decision.		Survey method. Factor analysis	Factors can be clubbed into : 1) Cultural (Culture , Subculture & Class) 2) Social (Reference Grp , Family , Role & Status) 3) Personal : Age , Occupation , Economic situation Lifestyle , Personality , 4) Psychological : Motivation , Perception , Beliefs & attitudes ,	The study of Consumer Behaviour is quite complex, because of many variables involved and their tendency to interact with & influence each other.	

9.Title/ Author /Journal/Year	Purpose	Sample/ Setting	Methods	Key Findings	Conclusions	Limitations/ Gaps/ Further Study
Factors Affecting Consumer Choice of Mobile Phones: Two Studies from Finland Journal of Euromarketing Authors : HeikkiKarjaluotoa, JariKarvonena, ManneKestia, TimoKoivumäkia, MarjukkaManninena, JukkaPakolaa, AnnuRistolaa&JariSaloa University of Oulu, Faculty of Economics and Business Administration , Finland	Mobile phone markets are one of the most turbulent market environments today due to increased competition and change. Thus, it is of growing concern to look at consumer buying decision process and cast light on the factors that finally determine consumer choices between different mobile phone brands	196 respondents in finland	focus group interviews Survey		While technical problems are the basic reason to change mobile phone among students; price, brand, interface, and properties are the most influential fact ors affecting the actual choice between brands.	Study confined only to student group.

10.Title/ Author /Journal/Year	Purpose	Sample/ Setting	Method s	Key Findings	Conclusion s	Limitations / Gaps/ Further Study
A practical approach to maximizing customer retention in the credit card industry Journal of Marketing Management 04/199 5; 11:151-163.	The overall objective of this paper, therefore, is to construct a customer database model with the capacity to predict which customers are most likely to close their accounts and to identify certain	The database model is constructed using linear discriminant analysis, which is applied to a sample of approximately 17 000 UK bank credit card holders using various	Sample Survey	Total number of credit cards held by consumers is declining by approximatel y 0–6% per month, and the number of new applicants is also running at an all time low (less		

Author : Robert Hamilton & Barry howcraft Loughborough University	customer characteristics which can be used by the card issuer as part of a marketing or relationship strategy to maximize retention and increase customer profitability	behavioural and sociodemographic variables, and tested on a holdout sample of 10 000 cases.		than 1% per month).		

11.Title/ Author /Journal/Year	**Purpose**	**Sample/ Setting**	**Methods**	**Key Findings**	**Conclusions**	**Limitations/ Gaps/ Further Study**
CreditCardCust omer Retention by ZilvinasBareisis, June 14, 2011 Report Type: Operations/ Benchmarking GeoLocation: Global, Asia-Pacific, EMEA, Latin America, North America	In this report, Credit Card Customer Retention: Benchmarking Study Results, Celent explores customer retention performance and practices among ten credit card issuers and a UK bancassurance player	The study participants represent a diverse group of card issuers from the UK, Spain, and the US.	Survey	1) The study found that all participants were focused on reactive retention, with only 45% also engaged in proactive retention 2)While most deploy specialised resources, the degree to which the unit is dedicated to cards retention varies widely across the issuers	1)Proactive Retention 2) One of the biggest improvement opportunities for most issuers is to ensure that "outlier" retention (e.g., written and "out-of-hours" requests for issuers geared up for an inbound retention model) is actively managed.	

12.Title/ Author /Journal/Year	Purpose	Sample/ Setting	Methods	Key Findings	Conclusions	Limitations/ Gaps/ Further Study
How to Retain Credit Card Customers by Arthur Middleton Hughes May 15, 2015	Devise mechanism to retain credit card customers	Credit card customers in US	Defection Analysis	Credit cards are suffering from the same disease that ails long distance and cellular phone service: lowball price offers. No matter how low you get, some rival can always undercut you.	Loyalty Management is vital to Retain subs Cross sell : Loyalty is a product of number of relationships or Goods sold	

13.Title/ Author /Journal/Year	Purpose	Sample/ Setting	Methods	Key Findings	Conclusions	Limitations/ Gaps/ Further Study
15 Customer Retention Strategies that Work GREGORY CIOTTI | AUGUST 8, 2013	Identify Retention strategies			1) Stand for something 2) Utilize positive Social Proof 3) Invoke the inner ego 4) Use the words they Love to hear 5) Reduce pain points and friction 6) Realize that budget is negligible 7) Utilize surprise reciprocity 8) Make it personal 9) Speed is secondary to quality 10) Customers enjoy businesses who know them 11) Choose the right platform 12) Make it a communal effort 13) Get people started 14) Get Ideal customers to be VIPs 15) label		

14.Title/ Author /Journal/Year	Purpose	Sample/ Setting	Methods	Key Findings	Conclusions	Limitations/ Gaps/ Further Study
Portfolio Peak Performance: Acquisition, Activation, Usage and Retention Strategies that Work Robert Legters , Vice President of Loyalty Services Amber Smith, Director of Loyalty Services 2010 Client Conference		Creditcard holders US	Survey Analysis	Two-thirds of cardholders surveyed said they would consider switching their primary credit card if a better feature were offered.	The survey found that credit card shoppers: – Prefer no or low annual fees – Believe a brand name is important – Value rewards Loyalty Management is vital	

15.Title/ Author /Journal/Year	Purpose	Sample/ Setting	Methods	Key Findings	Conclusions	Limitations/ Gaps/ Further Study
Art of Customer Retention in Developing Economy Author: Saleem, Irfan; Saleem, Anjum; Kayani, ArqamJaved	This research is conducted to measure the effect of company's after sales services practices for increased customer retention in the telecom sector of developing economy. Subsequently this study is an attempt to measure the importance of the components which can improve the quality of after sales services and their individual impact for competitive advantage.	The sample is taken from the customers of the telecom products which are using the services of telecommunication sector in Pakistan.		Result show partially significant correlation of after sales services and customer's retention, while the components involved in after sales services has significant impact on customer retention. However the overall relationship between variables is positive. The research suggests that in order to retain more customers, there is a dire need to adopt new and advanced ways of providing a better quality after sales services	The above research is clearly indicating the impact of after sales services and their positive effects but the main thing which should be given more importance is that only the after sales is not enough but the components involved which enhances the quality of the of the services must be kept in mind. In order to get more and more customer we need to give good impression of the company which needs something different or unique from the competitors and this competitive advantage can be increased by improving the customer care in a healthy manner	

16.Title/ Author /Journal/Year	Purpose	Sample / Setting	Methods	Key Findings	Conclusions	Limitations / Gaps/ Further Study
Managing Customer Retention By : AkashMathapati Published on May 22, 2012	Devise effective Customer Retention Strategy			An easy way to increase retention rates is to offer lower prices to the best customers} This would be true if max attainable retention ensured max profits } Maximizing customer retention is synonymous with maximizing a firm's profits } It makes sense to treat some customers as "transaction " customers, not relationship ones} A firm should strive for 100 percent customer retention }Myths about Customer Retention	Databases & Data sources: To manage retention process, a firm needs to understand what influences repeat-purchasing decisions. (expectations , actual experience, perceived value}Data sources for Retention & This suggest the need for database that track all customer interactions} If we believe that every interaction with the firm and the customers affects the customer's attitude and satisfaction with firm }satisfaction)	

17.Title/ Author /Journal/Year	Purpose	Sample/ Setting	Methods	Key Findings	Conclusions	Limitations/ Gaps/ Further Study
Customer retention, loyalty, and satisfaction in the German mobile cellular telecommunications market Torsten J Gerpotta, , , Wolfgang Ramsb, , Andreas Schindlerc, Telecommunications Policy Volume 39, Issues 3–4, Pages 159-374 (May 2015)	This study tests hypotheses suggesting that CR, CL, and CS should be treated as differential constructs which are causally inter-linked.	684 residential customers of digital cellular network operators in Germany		LISREL analyses support a two-staged model in which overall CS has a significant impact on CL which in turn influences a customer's intention to terminate/extend the contractual relationship with his mobile cellular network operator (=CR).	Mobile network operators' perceived customer care performance had no significant impact on CR. The findings suggest that an important lever for regulators to promote competition in cellular markets is the enforcement of efficient number portability procedures between mobile network operators.	

18.Title/ Author /Journal/Year	Purpose	Sample/ Setting	Methods	Key Findings	Conclusions	Limitations/ Gaps/ Further Study
Customer service in the retention of mobile phone users in Nigeria OmotayoOyeniyi Lagos state University African Journal of Business Management 03/2008; 2:26-31.	This paper attempts to find the relationship between customer service on customer retention in telecommunication industry in Nigeria			The hypotheses are supported except that a higher level of customer satisfaction does not lead to customer loyalty.	If retention is not managed, customer's loyalty may be lost. This study examined the potential constructs in customer retention by investigating the chain of effects of retention from customer service, satisfaction, value and behavioural intention	

19.Title/ Author /Journal/Year	Purpose	Sample/ Setting	Methods	Key Findings	Conclusions	Limitations/ Gaps/ Further Study
The Effect of Customer Trust on Customer Loyalty and Customer Retention: A Moderating Role of Cause Related Marketing By Muhammad ZamanSarwar, KashifShafiqueAbbasi&SaleemPervaiz Mohammad Ali Jinnah University Islamabad Pakistan Global Journal of Management and Business Research Volume 12 Issue 6 Version 1.0 March 2012	This study analyses the Effect of Customer Trust on Customer Loyalty and Customer Retention and the Moderating Role of Cause Related Marketing in Cellular Service Operators likeMobilink, Telenor, Warid, Ufone and Zong.		Questionnaire Statistical Method Correlation Analysis		The outcome of the study refer that the Customer Trust, Customer Loyalty and Cause Related Marketing have a positive association but surprisingly the Customer Trust and Customer Retention have negative association in Pakistani context. Pakistani Cellular Service Operators have need to clearly define and reframe their policies regarding religious aspect, creating more ease to understand complex price structure and thoroughly understanding buying patterns of customers to retain them for a long life.	

Research Gap

- Telecom industry globally is plagued with the common challenge of churn. The intensity varying depending on the lifecycle of the business
- Search for a potent tool to predict churn timely and accurately has been a constant endeavour
- Churn predictors are primarily based around business/usage variables which delays the prediction time and is ineffective to arrest Acquisition Churn
- Can the study of factors, impacting churn, extend beyond the business variables and also include the factors intrinsic to the customer viz. socioeconomic background, educational level, gender, geography etc.
- Is it possible to derive a scientific formulae that will predict a customer's churn propensity at the stage of acquisition thereby allowing the Telecom industry to prepare an appropriate retention strategy right from the time of Acquisition

C H A P T E R 3

RESEARCH METHODOLOGY

In words of William G. Zikmund (2003) “research design refers to the detailed plan of a study that specifies the procedures and methods for collecting and analysing the data for the purpose of obtaining the solution for a research problem”. In this chapter, discussions were made on the type of research design, population of the study, sample size, area of the study, sampling techniques, data collection instrument and the statistical tools used for the analysis.

Research Problem

Even though Indian mobile telecommunications marked tremendous growth, it is facing very fierce competition and churn in the market. Churn behaviour is a common problem faced by telecom companies as it reduces the revenue, profitability and damages the brand image of the business(Adebiyi et al., 2015). They have also reported that, customer use their right from switching from one operator to the other. Moreover, Mobile Number Portability (MNP) has become a choice and provides path for the disstatified customers for switching from one service

provider to the other by retaining the existing number. It is quiet difficult to analyze the factors that are influencing the loyal and churn behaviour of the customers and also their level of satisfaction or dissatisfaction from the cellular service providers.

Competition in the market is so fierce that there is practically No response time for the service providers. Current predictive models primarily focused on Business / Usage patterns. The idea of a consumer at the end of the number is lost. Demographic and socio economic influences on the behaviour has been downplayed. Also, making an analysis on the churn and loyal behaviour of the customers from a holistic view provide competitive advantage to the cellular service providers. Industry is alarmed about the importance of retention over acquisition in the overly saturated market,but need the tool to correctly and timely identify the defectors.

Research Objectives

- To identify major factors influencing a consumer (Prepaid) to switch or be loyal to a specific telecom service provider and then Group them into factors
- Rank the identified factors in order of priority.
- Devise a formula to generate a discriminant score that will judge the loyalty of a consumer in the prepaid telecom sector

Research Hypotheses

- It is not possible to identify various demographic factors and thesocio economic factors which influence churn or Loyalty
- It is not possible to develop a suitable predictive Model, based on demographic factors and the socio economic factors, to assess the churn and loyal behaviour of a new customer.

Research Design

Research design refers to the overall strategy adopted for the purpose of integrating the different components of the study in order to address the research problem effectively. Survey research design was chosen for the study as it provides better answers for the study. In this type only few or group of respondents were considered as the representation and the data were collected and analysed. In words of McBurney (1994) survey research infers to the accessing of public opinion through the questionnaire.

The research design of the study is **Exploratory** as it explores the important factors, which are influencing the Loyal or Churn behaviour of consumers. The study does not limit itself with the external factors such as Delight, Product, Service etc., but also includes some of the intrinsic factors related to the consumers such as educational background, geographical location, socio economic background, gender etc., The study is also **Descriptive** in nature as the research tries to describe the characteristic of the consumers and also the reason for consumers staying with the same service provider or switching from one service provider to another.

Scope of the Research

- The study covers two districts of Jharkhand namely Ranchi and Dhanbad, and also four districts of Bihar namely Patna, Begusarai, Bhagalpur and Muzaffarpur considering the feasibility of data collection

- The study did not only cover the external factors like Product, Price, Service, Delight but also factors intrinsic to customers viz. socioeconomic background, educational level, gender, geography etc.

- The respondents belong to Loyal (>2yrs in Network) as well as Churners. Factors important to both the groups were studied.

- The current study focused on Vodafone (Prepaid) on the basis of their popularity and market share

Pilot Study

Pilot study refers to the trial run of a major study (Polit et al., 2001). Before conducting the pilot study, the questionnaire developed for fulfilling the objectives were distributed to industry experts and subject experts for their feedback on its suitability. Based on their suggestions, corrections were incorporated and the pilot study was carried out with 60 respondents, with ten respondents each from six districts mentioned in the sampling unit. The pilot study was made with an intention to test the respondents understanding of the questionnaire and the time timeconsumed for completing the survey and other practical difficulties that would occur during the data collection process. An initial reliability analysis was made on the survey instrument using cronbach alpha test and was found that, the instrument had a reliability score of 0.81 which was found to be above the cut-off value of 0.70 as suggested by Nunnally (1978).

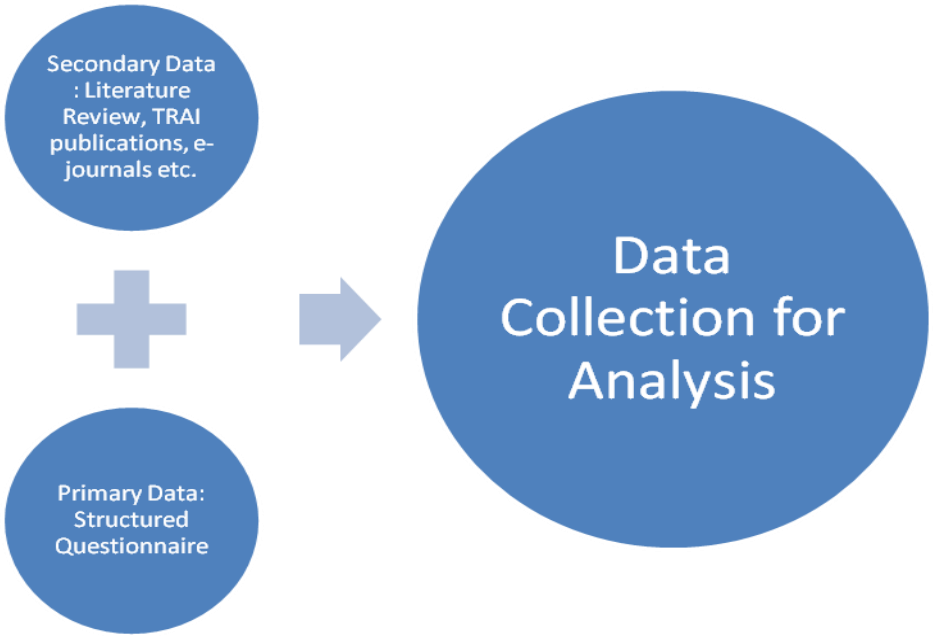
Learnings:

- The questionnaire has to be very short and precise to ensure data reliability and continuing interest of the respondent. The questionnaire was made into a single sheet

- There are items that bring in inherent bias and discomfort like Salary and hence was removed from the scope of the study

- The questionnaire was clearly demarcated into a 5 point Likert scale defining each scale and its relevance.
- Attached the finalized questionnaire for ready reference.

DATA COLLECTION METHOD



Data collection for the study was carried in two major aspects namely Primary data where the data was collected firsthandand through structured questionnaire. Primary data collection was made from the customers, call center Officials and from the customer care through personal interview methodusing a structured questionnaire. These responses were collected during the customer's meet organized for the purpose. The participants to these meets were carefully stratified and selected keeping in mind the research target group.

The questionnaire contained questions related to factors leading to a specific behaviour of a customer: churn or loyal behaviour. The questionnaire underwent changes basis observations during the pilot study (covered under Pilot study section)

Secondary Data for the study were collected from TRAI Publications, books, telecom journals, trade feedback and from the online sources.

The operator specific data points viz. Value Band, Age on Network has been provided (Without the identification of the customer) by the operator for the benefit of the research. These data points were used to presegment the customer before the survey was conducted.

Sampling Design

Population

Population refers to the individuals eligible to participate in a research. In this research the customers using Vodafone mobile network were eligible as a respondent. The target respondents were selected and grouped into two major types:

1) Loyal (Greater than 2yrs with the operator) &
2) Churners (frequent switchers less than or equal to 6months in the network)

Each segment was carefully sub segmented to have a representation from varied mix of customer base. The sub segments being Gender, Age, Zone, Location, Value Band, Education, Occupation, Multi Sim and Multi Sim Phone.

Gender : Male /Female

Age (Years) :<18, 18-25, 25-40, 40-60, 60+

Zone :Begusarai, Bhagalpur, Dhanbad, Muzzafarpur, Patna, Ranchi

Urban / Rural: Urban or Rural

Value Band: Low Value (LVC):Rs.0-50, Medium Value (MVC): Rs.50-200, High Value (HVC): Rs.200-500, and Ultra high Value (UHVC): Rs.500+

Segment*	Rupees/Month
LVC	0-50
MVC	50-200
HVC	200-500
UHVC	500+

Education : Matriculation, Graduates, Post Graduates

Occupation : Agriculture, Business, Home maker, Service, Student

Multi Sim : Yes or No

Multi Sim Phone : Yes or No

Sampling frame

Prepaid head (Bihar & Jharkhand region) of Vodafone (Prepaid) was contacted to receive the data set of prepaid customers. Primary data was collected from customers through personal as well telephonic interviews based on structured questionnaire

Sampling Technique

The study follows stratified random sampling for selecting a sample of customers of both loyal and churn set of customers.

Sampling Unit

Sample Unit refers to the single most units of the population from whom the questionnaire was administered for collecting the data. In this case, the sampling unit refers to individual customer of Vodafone (Prepaid) in Patna, Begusarai, Bhagalpur, Muzzafarpur, Ranchi and Dhanbad districts of Bihar and Jharkhand. Vodafone operations define the entire geography as per the above 6 districts.

Size of Sample

Sample size refers to the number of units drawn from a given population for collecting the data. As per Krejcie and Morgan (1970), a sample size of 384 is more than sufficient to represent a population of 10, 00,000. Keeping in view the response error, a sample size of 400 was fixed to each district, namely Begusarai, Bhagalpur, Dhanbad, Muzzafarpur, Patna and Ranchi resulting in a total of 2400 samples. Out of 2400 filled responses for the survey 2134 responses were found to be valid representing 88.9% of valid response. Out of 2134 responses, 580 were Churn customers (Customers who frequently switch in less than or equal to 6months in the network) and 1554 were loyal customers. Data collection period: January to July, 2015

Table for Determining Sample Size of a Known Population

N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	265	3000	341
20	19	120	92	300	169	900	269	3500	346
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	278	4500	354
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	191	1200	291	6000	361
45	40	170	118	400	196	1300	297	7000	364
50	44	180	123	420	201	1400	302	8000	367
55	48	190	127	440	205	1500	306	9000	368
60	52	200	132	460	210	1600	310	10000	370
65	56	210	136	480	214	1700	313	15000	375
70	59	220	140	500	217	1800	317	20000	377
75	63	230	144	550	226	1900	320	30000	379
80	66	240	148	600	234	2000	322	40000	380
85	70	250	152	650	242	2200	327	50000	381
90	73	260	155	700	248	2400	331	75000	382
95	76	270	159	750	254	2600	335	1000000	384

Note: N is Population Size; S is Sample Size *Source: Krejcie & Morgan, 1970*

Data Analysis

After the data collection, data cleaning was done, in which the collected data were edited, coded, treated for outliers and were analysed using the statistical pacakge SPSS 17. Frequency tables were employed in order to describe the sample composition based on their demographic profile. Apart from measures of central tendency and measures of variation in descriptive statistics, factor analysis, t-test, ANOVA, discriminant analysis and cluster analysis were used.

Reliability

The reliability of the data is checked using the Cronbach's alpha through SPSS. The value ranges between 0 and 1. If the value of cronbach's alpha coefficient iscloser to 1.0, it means greater internal consistency of the items in the scale(Rahim, 2016). The obtained reliability value was found to be greater than 0.6. Hence the instrument used for data collection is reliable

Descriptive Statistics

As introductory necessity the elementary statistics of the data were studied to understand the nature of the data and also to confirm suitability of the data series for further analysis. For this purpose, following measures have been used by the researcher:

Simple Percentage

Percent implies "for every hundred". Percentages are one of the most common means used to describe what's happening in our world.Percentages are used in reporting information because they are easier to understand and compare than other types of fractions. It is simple and powerful because it always uses the same base number, 100.

Mean

It refers to the average value obtained by adding all elements in a set and dividing by the number of elements. Mean is given by

$$\bar{y} = \sum_{i=1}^{N} \frac{y_i}{N}$$

Where, N is the number of observations and $y_i$denotes observed value of the variable y

Standard Deviation

Standard Deviation is measure of dispersion or spread in the series around its mean. Standard deviation for a series y is computed as:

$$s = \sqrt{(\sum_{i=1}^{N}(y_i - \bar{y})^2)/_{N-1}}$$

Where, $\bar{y}$ is mean of the series.

Factors analysis

Factor analysis is a class of procedure mainly used for data reduction and summarization. It is a process in which the values of observed data are expressed as functions of a number of possible causes in order to find which are the most important. It is an exploratory technique applied to a set of experimental variables that try to find fundamental factors from which the observed variables were created. It is also carried out on the correlation matrix of the perceived variables' and the factor is a weighted average of the original variables. This is the method which helps to find out the few factors from which the original correlation matrix came out. In factor analysis Eigen value represent the total variance explained by each factor and factor loading depicts the simple correlation between the variables explained by each factor. Kaiser-Meyer-Olkin (KMO)

measures the sample adequacy of the data and communality is the amount of variance a variable shares with all the other variables being considered.

Exploratory Factor Analysis has been used in the study to identify the most Important Factors influencing a particular behavior.

Exploratory Factor Analysis has been done on the full set of data i.e. Churn (580) and Loyal (1554). Total data points were 2134

We found the analysis significant hence NULL Hypothesis that the identified parameters '34' are mutually exclusive has been rejected.

Our Output having 14 Factors and Eigen value more than '1' could explain more than 74% of the Variance of the Data

T-test

T-test referes to the analysis to find whether the mean of two groups are differing significantly from each other. When there are two groups in order to compare the mean , t-test will be adopted.

ANOVA

Analysis of variance (ANOVA) is an extremely important method in exploratory and confirmatory data analysis. ANOVA tells whether the regression equation is explaining a statistically significant portion of the variability in the dependent variable from variability in the independent variables.

Discriminant Analysis

Discriminant analysis is a technique for analysing data when the criterion or dependent variables is categorical and the predictor or independent variables are interval in nature (Malhotra, N.K, 2013). The major function of this method is to able to differentiate between two or three sets of things or people, based on the information of some of their features. Its prime work is to develop linear combination of the independent or predictor variables, which will best discriminate between the categories of the dependents groups. It has two types, two-group discriminant analysis where the criterion or dependent variables has two categories and multiple discriminant analysis where criterion or dependent variables involves three or more categories.

In the study, we have run 'Discriminant Analysis' to construct a discriminant equation that can assign a discriminant score so that we can forecast the possibility of customers exhibiting Loyal or Churn behavior.

We have used these mutually exclusive 14 Factors as independent Variables. Against each customer Loyal or Churn factor loadings of the corresponding 14 factors have been used to run the Discriminant Analysis.

Cluster analysis

According to(**Malhotra, N.K, 2013**), cluster analysis or classification analysis or numerical taxonomy is a class of methods used to categorize things or cases into relatively homogenous group and each cluster tend to be similar to each other and dissimilar to objects in the other clusters. It has been using different statistics such as agglomeration schedule giving information on the objects or cases being combined at each stage of a hierarchical clustering process and cluster centroid depicting the mean value of the variables for all the cases or objects in a particular cluster.

Cluster Analysis was used in the Research to enable grouping of customers into specific clusters with dominant characteristics. This dominant clusters would facilitate appropriate retention strategies per dominant cluster.

Data for 580 churned customers has been collected. Using Hierarchical (Agglomerative) cluster procedure we have drawn the dendrogram. On the basis of the dendrogram we decided to put the Churned customers into 6 clusters and accordingly '**K**' mean procedure of clustering has been applied to get the final Output.

All the 34 parameters were found significant at 10% level of significance

Data for 1554 Loyal customers was collected. Using Hierarchical (Agglomerative) cluster procedure dendrogram was drawn. On the basis of the dendrogram it was decided to put the Loyal customers into 8 clusters and accordingly 'K' mean procedure of clustering has been applied to get the final Output.

All the 34 parameters were found significant at the 1% level of significance.

Limitations:

- The principle restriction of the present study was data availability, therefore only Vodafone customer in Bihar and Jharkhand's 6 districts were chosen for the study.
- Only Prepaid mobile customers were taken into account for the study purpose and the postpaid and landline customers were not kept in the scope of this research.
- Individual consumers were studied, 'Enterprise' as a segment was excluded from the current study.

- Study was conducted before Reliance Jio and its Market disruption strategy.
- The occurrence of sampling error and respondent's biasness during data collection cannot be underestimated as a limitation of the study.

CHAPTER -4

DATA ANALYSIS, INTERPRETATIONS AND FINDINGS

Data Analysis, Interpretations and Findings

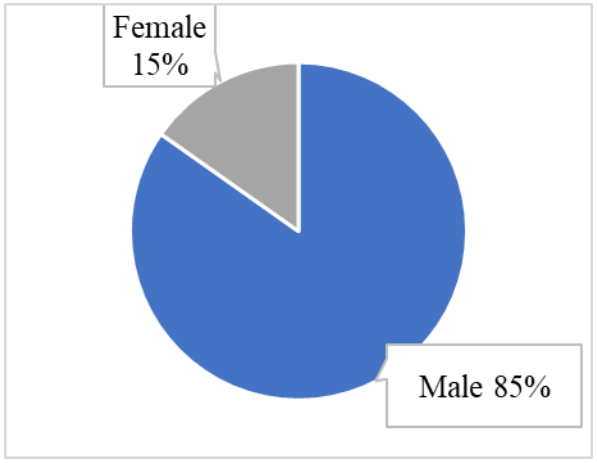
Table 4.1: Demographic Profile of the Respondents (N=2134)

In this table the Demographic profile of the respondents such as Gender, Age of the Respondents, Zone, Location, Value, Educational Qualification, Occupation, Number of Sim Used and Multi-Sim Phone is represented in percentage

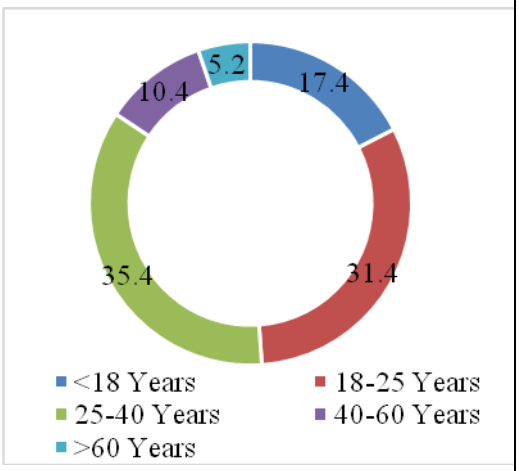
		Count	Column N %
Gender	Male	1809	84.8%
	Female	325	15.2%
Age of the Respondents	<18 Years	372	17.4%
	18-25 Years	671	31.4%
	25-40 Years	756	35.4%
	40-60 Years	223	10.4%
	>60 Years	112	5.2%
Zone	Patna	302	14.2%
	Muzzafarpur	297	13.9%
	Dhanbad	201	9.4%
	Bhagalpur	529	24.8%
	Begusarai	381	17.9%
	Ranchi	424	19.9%
Location	Rural	1224	57.4%
	Urban	910	42.6%
Value	High Value Customer	432	20.2%
	Medium Value Customer	617	28.9%
	Low Value Customer	712	33.4%
	Ultra High Value Customer	373	17.5%
Educational Qualification	Graduates	762	35.7%
	Higher Secondary and Below	868	40.7%
	Post-Graduates	504	23.6%
Occupation	Service	500	23.4%
	Home Maker	112	5.2%
	Business	567	26.6%
	Agriculture	511	23.9%
	Students	444	20.8%
Multi-Sim	Yes	936	43.9%
	No	1198	56.1%
Multi-Sim Phone	Yes	975	45.7%
	No	1159	54.3%

Fig 4.1.1 Demographic Profile of the Respondents (N=2134)

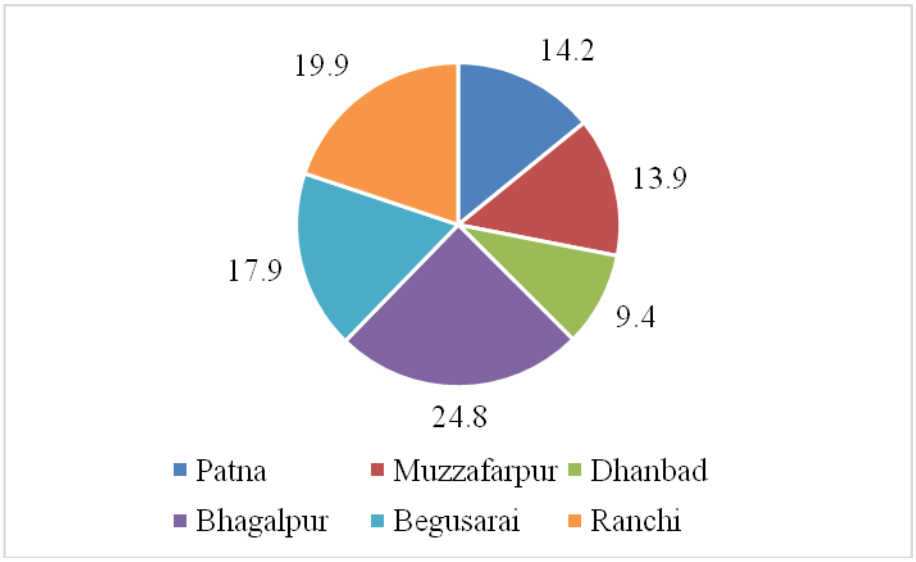
Gender



Age

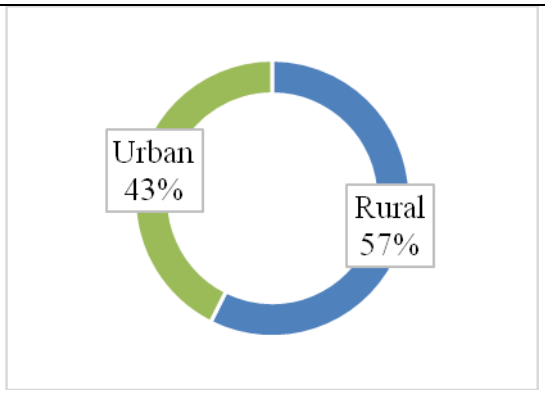


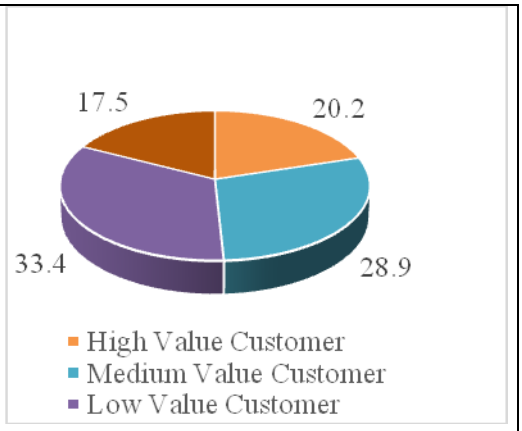
Zone



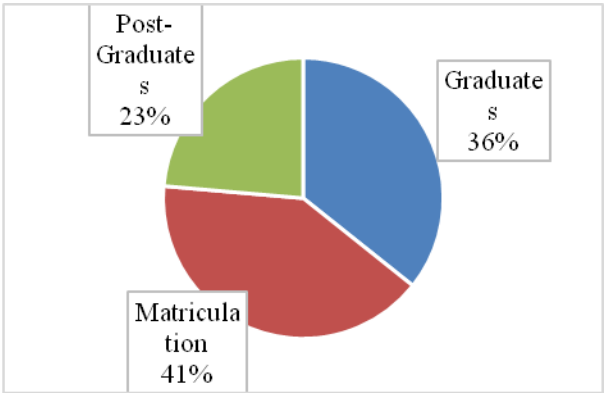
Location

Customer based on Value

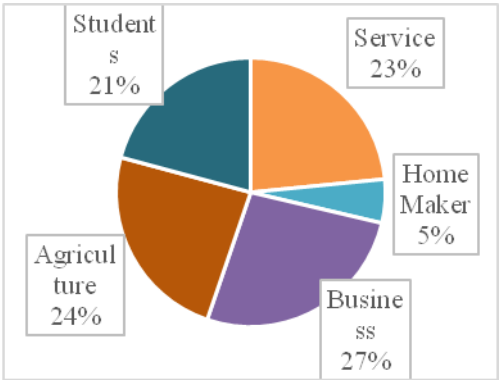




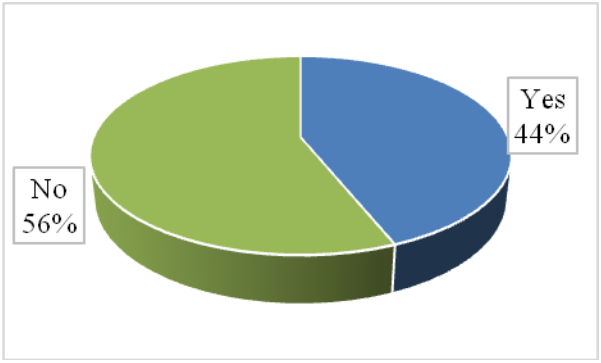
Educational Qualification



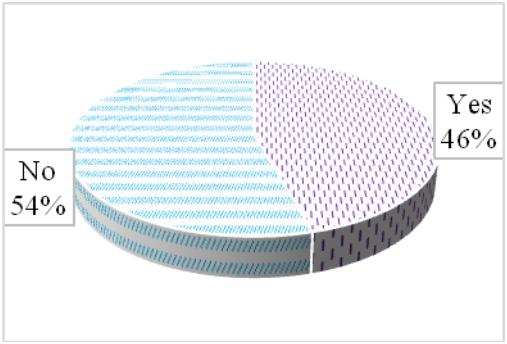
Occupation



Multi Sim



Multi Sim Phone



The table above refers to the Demographic profile of the respondents participated in the study. The total number of valid responses obtained for the study was 2134. Among the respondents it was found that, 84.8 percent of the respondents were male and 15.2 percent of them were female. With regard to the age of the respondents, 35.4 percent of the respondents were in the age group between 25-40 years of age, followed by 31.4 percent of the respondents between 18-25 years, 17.4 percent were less than 18 years, 10.4 percent between 40-60 years and 5.2 percent of the respondents were more than 60 years of age. The Zone wise distribution of the respondents showed that, 24.8 percent of them were from Bhagalpur, 19.9 percent from Ranchi, 17.9 percent from Begusarai, 14.2 percent from Patna, 13.9 percent from Muzzafarpur and 9.4 percent from Dhanbad. It was found from the table that; 57.4 percent of the respondents were from Rural location and 42.6 percent from Urban location. With respect to the classification of respondents based on Value, 33.4 percent of the respondents were Low Value Customers, 28.9 percent were Medium Value Customers, 20.2 percent were High Value Customers and 17.5 percent were Ultra High Value Customers. Sample proportion based on educational qualification inferred that, 40.7 percent of the respondents had Higher Secondary and below as their qualification followed by 35.7 percent as Graduates and 23.6 percent as Post-Graduates. While looking into the occupation-wise classification, 26.6 percent of the respondents were doing business, 23.9 percent were doing agriculture, 23.4 percent were in service sector, 20.8 percent were students and 5.2 percent of the respondents were Home Makers. With regard to the use of multi sim, 56. 1 percent of the respondents were using and 43.9 percent were not using. With regard to use of Multi-sim phone 54.3 percent were using and 45.7 percent of the respondents were not using multi sim phone.

Table 4.2: Descriptive Statistics of the study Variables

This table represents the mean score and the Standard Deviation of each variables considered for the study, namely Network, Call charges Price, Internet Speed, Innovative VAS Services, Uncalled for activation of VAS services, Accessto Credit balance or recharge facility, Easeofuse Self Service, SecurityPrivacy, BrandLoyalty, PromotionalPrograms, PeerPressure and CustomerService.

	Mean	**Std. Deviation**
Network	4.10	0.778
CallchargesPrice	4.30	0.698
InternetSpeed	3.38	0.862
InnovativeVASServices	1.52	0.668
UncalledforactivationofVAS Services	3.36	0.578
AccesstoCreditbalanceorrechargefacility	1.78	0.524
EaseofuseSelfService	2.42	1.008
SecurityPrivacy	1.35	0.478
BrandLoyalty	1.74	0.768
PromotionalPrograms	1.37	0.585
PeerPressure	1.92	0.790
CustomerService	2.48	0.960

Chart 4.2.1: Descriptive Statistics of the study Variables

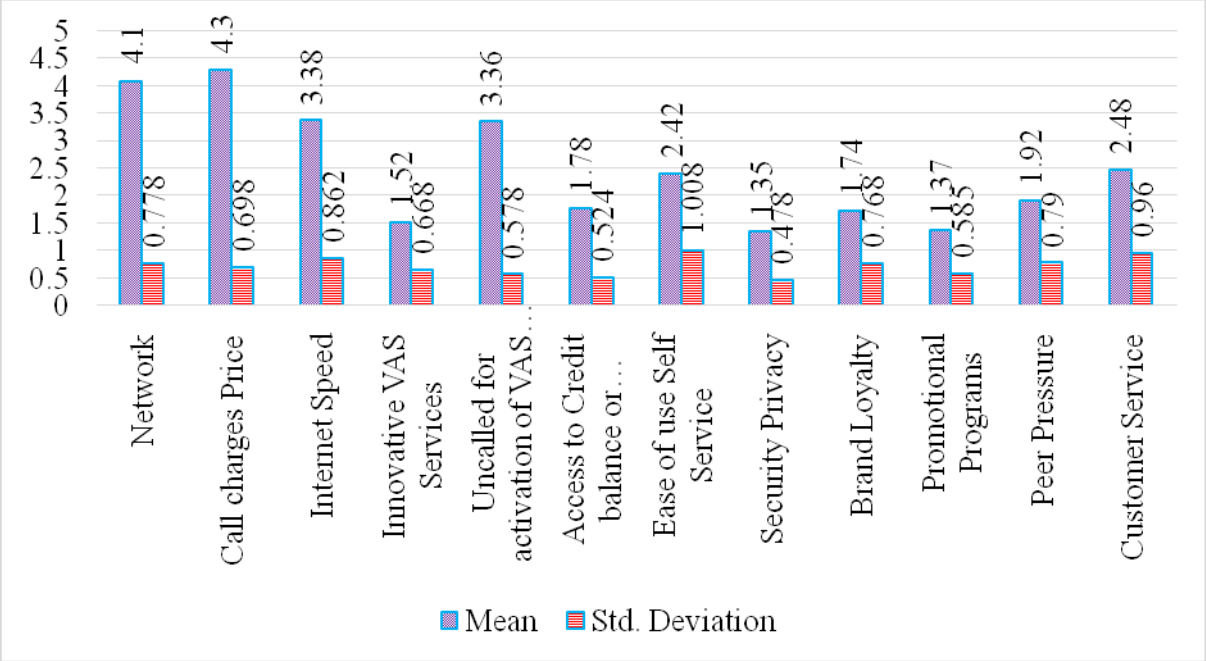


Table 4.2 infers to the mean and standard deviation of the variables considered for the study. It was found from the table that, Call charge price had the highest mean score (*M*=4.3, *S.D* = 0.698) followed by Network (*M*=4.1, *S.D* = 0.778), Internet Speed (*M*=3.38, *S.D* = 0.862), Uncalled for activation of VAS (*M*=3.36, *S.D* = 0.5788), Customer Service (*M*=2.48, *S.D* = 0.96), Ease of use in self-service (*M*=2.42, *S.D* = 1.008), Peer Pressure (*M*=1.92, *S.D* = 0.79), Access to Credit balance (*M*=1.78, *S.D* = 0.524), Brand Loyalty (*M*=1.74, *S.D* = 0.768), Innovative VAS Services (*M*=1.52, *S.D* = 0.668), Promotional Programs (*M*=1.37, *S.D* = 0.585) and Security Privacy (*M*=1.35, *S.D* = 0.478).

Table 4.3: Independent Sample t-test: Gender and study Variables

Independent Sample t-test is made in an objective to find the difference of Opinion existing among the respondents based on Gender on the Variables considered for the study namely Network, Call charges Price, Internet Speed, Innovative VAS Services, Uncalled for activation of VAS services, Access to Credit balance or recharge facility, Ease of use Self Service, Security Privacy, Brand Loyalty, Promotional Programs, Peer Pressure and Customer Service.

Gender		N	Mean	Std. Deviation	Std. Error Mean	t-value
Network	Male	1809	4.166	.7497	.0176	9.015***
	Female	325	3.751	.8404	.0466	
CallchargesPrice	Male	1809	4.285	.6858	.0161	-2.084*
	Female	325	4.372	.7616	.0422	
InternetSpeed	Male	1809	3.378	.8445	.0199	-.481^{ns}
	Female	325	3.403	.9561	.0530	
InnovativeVASServices	Male	1809	1.532	.6578	.0155	1.287^{ns}
	Female	325	1.480	.7225	.0401	
UncalledforactivationofVASservices	Male	1809	3.357	.5909	.0139	.359^{ns}
	Female	325	3.345	.5012	.0278	
AccesstoCreditbalanceorrechargefacility	Male	1809	1.759	.5093	.0120	-
	Female	325	1.914	.5816	.0323	4.935***
EaseofuseSelfService	Male	1809	2.443	1.0128	.0238	2.490***
	Female	325	2.292	.9738	.0540	
SecurityPrivacy	Male	1809	1.362	.4829	.0114	3.373***
	Female	325	1.265	.4418	.0245	
BrandLoyalty	Male	1809	1.767	.7646	.0180	4.295***

	Female	325	1.569	.7692	.0427	
PromotionalPrograms	Male	1809	1.353	.5502	.0129	-2.378*
	Female	325	1.437	.7453	.0413	
PeerPressure	Male	1809	1.931	.7921	.0186	1.005^{ns}
	Female	325	1.883	.7769	.0431	
CustomerService	Male	1809	2.563	.9711	.0228	9.499***
	Female	325	2.025	.7449	.0413	

Note: * significant at p<0.05; **significant at p<0.01; ***significant at p <0.001; ns = not significant

Table 4.3 refers to the Independent Sample t-test administered between the demographic variable gender, with the variables considered for the study. It was found that, the variables namely Network(Male: *M* = 4.166, *S. D* = 0.749, Female:*M* = 3.751, *S. D* = 0.840),Call charges Price(Male: *M* = 4.285, *S. D* = 0.686, Female:*M* = 4.372, *S. D* = 0.762),Access to Credit balance or recharge facility(Male: *M* = 1.759, *S. D* = 0.509, Female:*M* = 1.914, *S. D* = 0.582),Ease of use of Self Service(Male: *M* = 2.443, *S. D* = 1.013, Female:*M* = 2.292, *S. D* = 0.974), Security Privacy(Male: *M* = 1.362, *S. D* = 0.483, Female:*M* = 1.265, *S. D* = 0.442),Brand Loyalty(Male: *M* = 1.767, *S. D* = 0.765, Female:*M* = 1.569, *S. D* = 0.769),Promotional Programs(Male: *M* = 1.353, *S. D* = 0.550, Female:*M* = 1.437, *S. D* = 0.745) and Customer Service(Male: *M* = 2.563, *S. D* = 0.971, Female:*M* = 2.025, *S. D* = 0.745) were found to be significant at 5 % level of significance. Hence the null hypothesis is rejected and the alternative hypothesis is accepted stating that there is a significant difference of opinion exists among the respondents on the stated variables based on their gender.

The other variables namely Internet Speed, Innovative VAS Services and Peer Pressure does not show any statistical significance as the P-value is more than 0.05. Hence the null

hypothesis is accepted and concluded that, the above stated variables does not have any significant difference of opinion among the respondents based on their gender.

Table 4.4: Independent Sample t-test between Location and the study Variables

Independent Sample t-test is made in an objective to find the difference of Opinion existing among the respondents based on Location on the Variables considered for the study namely Network, Call charges Price, Internet Speed, Innovative VAS Services, Uncalled for activation of VAS services, Access to Credit balance or recharge facility, Ease of use Self Service, Security Privacy, Brand Loyalty, Promotional Programs, Peer Pressure and Customer Service.

Location		N	Mean	Std. Deviation	Std. Error Mean	t-value
Network	Rural	1224	4.223	.7005	.0200	8.422***
	Urban	910	3.941	.8461	.0280	
CallchargesPrice	Rural	1224	4.324	.6522	.0186	2.020*
	Urban	910	4.263	.7551	.0250	
InternetSpeed	Rural	1224	3.399	.8014	.0229	1.043^{ns}
	Urban	910	3.359	.9378	.0311	
InnovativeVASServices	Rural	1224	1.484	.6117	.0175	-3.234***
	Urban	910	1.578	.7342	.0243	
UncalledforactivationofVASservices	Rural	1224	3.433	.5353	.0153	7.299***
	Urban	910	3.251	.6160	.0204	
AccesstoCreditbalanceorrechargefacility	Rural	1224	1.724	.4808	.0137	-6.056***
	Urban	910	1.862	.5673	.0188	
EaseofuseSelfService	Rural	1224	2.493	1.0126	.0289	3.899***
	Urban	910	2.322	.9943	.0330	
SecurityPrivacy	Rural	1224	1.364	.4848	.0139	1.975*

	Urban	910	1.323	.4679	.0155	
BrandLoyalty	Rural	1224	1.785	.6901	.0197	3.356***
	Urban	910	1.673	.8588	.0285	
PromotionalPrograms	Rural	1224	1.401	.5319	.0152	3.229***
	Urban	910	1.319	.6462	.0214	
PeerPressure	Rural	1224	2.018	.7984	.0228	6.461***
	Urban	910	1.797	.7603	.0252	
CustomerService	Rural	1224	2.534	.7927	.0227	2.994***
	Urban	910	2.409	1.1432	.0379	

Note: * significant at p<0.05; **significant at p<0.01; ***significant at p <0.001; ns = not significant

Independent Sample t-test between the study variables and the location shows that, except Internet speed all the other variables were found to have statistical significance at 5% level of significance. Hence, we reject the null hypothesis for the significant variables and accept the alternative hypothesis stating that, there exists a significant difference of opinion among the respondents on the significant variables based on their location.

Table 4.5: Independent Sample t-test between Multi Sim Usage and the study Variables

Independent Sample t-test is made in an objective to find the difference of Opinion existing among the respondents based on Multi Sim Usage on the Variables considered for the study namely Network, Call charges Price, Internet Speed, Innovative VAS Services, Uncalled for activation of VAS services, Access to Credit balance or recharge facility, Ease of use Self Service, Security Privacy, Brand Loyalty, Promotional Programs, Peer Pressure and Customer Service.

Multi-Sim		**N**	**Mean**	**Std. Deviation**	**Std. Error Mean**	**t-value**
Network	Yes	936	4.154	.7456	.0244	2.691**
	No	1198	4.063	.8012	.0231	
CallchargesPrice	Yes	936	4.408	.6719	.0220	6.498***
	No	1198	4.212	.7069	.0204	
InternetSpeed	Yes	936	3.419	.7513	.0246	1.748ns
	No	1198	3.353	.9391	.0271	
InnovativeVASServices	Yes	936	1.672	.7658	.0250	9.228***
	No	1198	1.408	.5540	.0160	
UncalledforactivationofVASservices	Yes	936	3.361	.6100	.0199	.417ns
	No	1198	3.351	.5520	.0159	
AccesstoCreditbalanceorrechargefacility	Yes	936	1.792	.5926	.0194	.709ns
	No	1198	1.775	.4630	.0134	
EaseofuseSelfService	Yes	936	2.077	.9737	.0318	-14.583***
	No	1198	2.689	.9520	.0275	
SecurityPrivacy	Yes	936	1.404	.4953	.0162	4.902***

	No	1198	1.302	.4594	.0133	
BrandLoyalty	Yes	936	1.585	.7023	.0230	-8.182***
	No	1198	1.856	.7968	.0230	
PromotionalPrograms	Yes	936	1.462	.6414	.0210	6.743***
	No	1198	1.291	.5245	.0152	
PeerPressure	Yes	936	1.896	.8446	.0276	-1.409ns
	No	1198	1.945	.7439	.0215	
CustomerService	Yes	936	2.465	.8901	.0291	-.682ns
	No	1198	2.493	1.0110	.0292	

Note: * significant at p<0.05; **significant at p<0.01; ***significant at p <0.001; ns = not significant

Test for finding the difference of opinion among the respondents on the study variables based on Multi-sim showed that, Internet Speed, Uncalled for activation of VAS services, Access to Credit balance or recharge facility, Peer Pressure and Customer Service does not show any statistical significance at 5 % level. Hence, the null hypothesis for the mentioned variables is accepted and concluded that, respondents does not have any difference of opinion among them on Internet Speed, Uncalled for activation of VAS services, Access to Credit balance or recharge facility, Peer Pressure and Customer Service based on the usage of Multi-sim.Few of the variables namely Network(Yes: *M* = 4.154, *S. D* = 0.746, No:*M* = 4.063, *S. D* = 0.801), Call charges Price(Yes: *M* = 4.408, *S. D* = 0.672, No:*M* = 4.212, *S. D* = 0.708),InnovativeVASServices(Yes: *M* = 1.672, *S. D* = 0.766, No:*M* = 1.408, *S. D* = 0.554),Ease of use Self Service(Yes: *M* = 2.077, *S. D* = 0.974, No:*M* = 2.689, *S. D* = 0.952),Security Privacy(Yes: *M* = 1.404, *S. D* = 0.495, No:*M* = 1.302, *S. D* = 0.459),Brand Loyalty(Yes: *M* = 1.585, *S. D* = 0.702, No:*M* = 1.856, *S. D* = 0.797) and Promotional Programs(Yes: *M* = 1.462, *S. D* = 0.641, No:*M* = 1.291, *S. D* = 0.524) were to have significant difference of opinion among the respondents based on their usage of Multi-sim at 5% level of significance. Hence, the null hypothesis is rejected for the mentioned variables and the alternative hypothesis is accepted.

Table 4.6: Independent Sample t-test between Multi Sim Phone and the study Variables

Independent Sample t-test is made in an objective to find the difference of Opinion existing among the respondents based on Multi Sim Phone on the Variables considered for the study namely Network, Call charges Price, Internet Speed, Innovative VAS Services, Uncalled for activation of VAS services, Access to Credit balance or recharge facility, Ease of use Self Service, Security Privacy, Brand Loyalty, Promotional Programs, Peer Pressure and Customer Service.

Multi-Sim Phone		**N**	**Mean**	**Std. Deviation**	**Std. Error Mean**	**t-value**
Network	Yes	975	4.070	.7217	.0231	-1.791^{ns}
	No	1159	4.130	.8225	.0242	
CallchargesPrice	Yes	975	4.443	.6587	.0211	8.961***
	No	1159	4.176	.7078	.0208	
InternetSpeed	Yes	975	3.390	.7991	.0256	.385^{ns}
	No	1159	3.375	.9123	.0268	
InnovativeVASServices	Yes	975	1.682	.7483	.0240	10.271***
	No	1159	1.391	.5591	.0164	
UncalledforactivationofVASservices	Yes	975	3.378	.6040	.0193	1.706^{ns}
	No	1159	3.336	.5548	.0163	
AccesstoCreditbalanceorrechargefacility	Yes	975	1.851	.5563	.0178	5.598***
	No	1159	1.725	.4875	.0143	
EaseofuseSelfService	Yes	975	2.076	.9981	.0320	-15.240***
	No	1159	2.710	.9221	.0271	
SecurityPrivacy	Yes	975	1.404	.4951	.0159	5.112***

	No	1159	1.299	.4578	.0134	
BrandLoyalty	Yes	975	1.641	.7476	.0239	-5.332***
	No	1159	1.818	.7767	.0228	
PromotionalPrograms	Yes	975	1.417	.6321	.0202	3.740***
	No	1159	1.323	.5381	.0158	
PeerPressure	Yes	975	1.889	.8282	.0265	-1.846^{ns}
	No	1159	1.953	.7552	.0222	
CustomerService	Yes	975	2.436	.9219	.0295	-1.983*
	No	1159	2.519	.9893	.0291	

Note: * significant at p<0.05; **significant at p<0.01; ***significant at p <0.001; ns = not significant

With regard to the usage of Multi Sim Phone, it was found from the table that, Call charges(Yes: *M* = 4.443, *S. D* = 0.659, No:*M* = 4.176, *S. D* = 0.708), PriceInnovative VAS Services(Yes: *M* = 1.682, *S. D* = 0.748, No:*M* = 1.391, *S. D* = 0.559), Access to Credit balance or recharge facility(Yes: *M* = 1.851, *S. D* = 0.556, No:*M* = 1.725, *S. D* = 0.486), Ease of use Self Service(Yes: *M* = 2.076, *S. D* = 0.998, No:*M* = 2.710, *S. D* = 0.922), Security Privacy(Yes: *M* = 1.404, *S. D* = 0.495, No:*M* = 1.299, *S. D* = 0.458), Brand Loyalty(Yes: *M* = 1.641, *S. D* = 0.748, No:*M* = 1.818, *S. D* = 0.777), Promotional Programs(Yes: *M* = 1.417, *S. D* = 0.632, No:*M* = 1.323, *S. D* = 0.538) and Customer Service(Yes: *M* = 2.436, *S. D* = 0.922, No:*M* = 2.519, *S. D* = 0.989) were found to be showing statistical significance at 5% level. Hence the null hypothesis is rejected and the alternative hypothesis is accepted. With respect to the other variables namelyNetwork, Internet speed,UncalledforactivationofVASservices and PeerPressureno statistically significant difference was found among the respondents and hence the null hypothesis is accepted.

Table 4.7: ANOVA: Age with Study Variables

Analysis of Variance (ANOVA) test is conducted in an objective to find the difference of Opinion existing among the respondents based on the age groupon the Variables considered for the study namely Network, Call charges Price, Internet Speed, Innovative VAS Services, Uncalled for activation of VAS services, Access to Credit balance or recharge facility, Ease of use Self Service, Security Privacy, Brand Loyalty, Promotional Programs, Peer Pressure and Customer Service.

		N	Mean	S. D	Std. Error	F-Value	Sig
Network	<18 Years	372	4.220	.6847	.0355	32.011	.000
	18-25 Years	671	4.319	.7100	.0274		
	25-40 Years	756	3.940	.8124	.0295		
	40-60 Years	223	3.830	.7088	.0475		
	>60 Years	112	4.054	.9381	.0886		
	Total	2134	4.103	.7784	.0169		
Call charges Price	<18 Years	372	4.239	.6843	.0355	15.375	.000
	18-25 Years	671	4.154	.6362	.0246		
	25-40 Years	756	4.407	.7338	.0267		
	40-60 Years	223	4.444	.7323	.0490		
	>60 Years	112	4.330	.6061	.0573		
	Total	2134	4.298	.6984	.0151		
Internet Speed	<18 Years	372	3.169	1.0542	.0547	23.132	.000
	18-25 Years	671	3.411	.7634	.0295		
	25-40 Years	756	3.310	.8375	.0305		
	40-60 Years	223	3.816	.7869	.0527		

	>60 Years	112	3.536	.6702	.0633		
	Total	2134	3.382	.8622	.0187		
Innovative VAS Services	<18 Years	372	1.581	.6413	.0332	12.014	.000
	18-25 Years	671	1.422	.5777	.0223		
	25-40 Years	756	1.501	.6991	.0254		
	40-60 Years	223	1.722	.7963	.0533		
	>60 Years	112	1.705	.6387	.0603		
	Total	2134	1.524	.6682	.0145		
Uncalled for activation of VAS services	<18 Years	372	3.151	.5581	.0289	25.036	.000
	18-25 Years	671	3.435	.6021	.0232		
	25-40 Years	756	3.394	.5331	.0194		
	40-60 Years	223	3.462	.4997	.0335		
	>60 Years	112	3.080	.6863	.0648		
	Total	2134	3.355	.5781	.0125		
Access to Credit balance or recharge facility	<18 Years	372	1.790	.4142	.0215	24.744	.000
	18-25 Years	671	1.684	.4748	.0183		
	25-40 Years	756	1.774	.5523	.0201		
	40-60 Years	223	2.076	.6634	.0444		
	>60 Years	112	1.821	.3847	.0364		
	Total	2134	1.783	.5237	.0113		
Ease of use Self Service	<18 Years	372	2.169	1.1774	.0610	9.710	.000
	18-25 Years	671	2.385	.9931	.0383		
	25-40 Years	756	2.532	.9492	.0345		
	40-60 Years	223	2.466	.9621	.0644		
	>60 Years	112	2.625	.7841	.0741		
	Total	2134	2.420	1.0082	.0218		
Security Privacy	<18 Years	372	1.317	.4660	.0242	23.045	.000
	18-25 Years	671	1.231	.4288	.0166		
	25-40 Years	756	1.414	.4929	.0179		
	40-60 Years	223	1.529	.5003	.0335		

	>60 Years	112	1.321	.4691	.0443		
	Total	2134	1.347	.4780	.0103		
Brand Loyalty	<18 Years	372	1.761	.7869	.0408	20.925	.000
	18-25 Years	671	1.934	.8853	.0342		
	25-40 Years	756	1.598	.6569	.0239		
	40-60 Years	223	1.565	.6107	.0409		
	>60 Years	112	1.759	.6610	.0625		
	Total	2134	1.737	.7684	.0166		
Promotional Programs	<18 Years	372	1.298	.5084	.0264	50.932	.000
	18-25 Years	671	1.221	.4626	.0179		
	25-40 Years	756	1.444	.5575	.0203		
	40-60 Years	223	1.771	.8988	.0602		
	>60 Years	112	1.125	.3322	.0314		
	Total	2134	1.366	.5847	.0127		
Peer Pressure	<18 Years	372	1.656	.6400	.0332	28.904	.000
	18-25 Years	671	1.928	.8781	.0339		
	25-40 Years	756	2.093	.7329	.0267		
	40-60 Years	223	1.991	.8328	.0558		
	>60 Years	112	1.509	.5534	.0523		
	Total	2134	1.924	.7898	.0171		
Customer Service	<18 Years	372	2.586	1.1565	.0600	10.068	.000
	18-25 Years	671	2.483	.9317	.0360		
	25-40 Years	756	2.398	.8308	.0302		
	40-60 Years	223	2.350	.7251	.0486		
	>60 Years	112	2.938	1.3838	.1308		
	Total	2134	2.481	.9597	.0208		

Note: * significant at p<0.05; **significant at p<0.01; ***significant at p <0.001; ns = not significant

It was found from the results that; significant difference of opinion exists among the respondents belonging to different age group on the all the study variables at 5 %

level of significance. With regard to Network and Brand Loyalty, respondents in the age group between 18-25 years had the highest mean score (Network; M = 4.319, $S.\ D$ = 0.710, F = 32.011) and Brand Loyalty; M = 1.934, $S.\ D$ = 0.885, F = 20.925). With respect to Call Charges price, Internet Speed, Innovation VAS Services, Uncalled for activation of VAS Services, Access to credit balance or recharge facility, Security Privacy and Promotional Programs, respondents in the age group between 40-60 years differed in their opinion (Call Charges price; M = 4.444, $S.\ D$ = 0.732, F = 15.375, InternetSpeed; M = 3.816, $S.\ D$ = 0.786, F = 23.132, Innovation VAS Services; M = 1.722, $S.\ D$ = 0.796, F = 12.014, Uncalled for activation of VAS Services; M = 3.462, $S.\ D$ = 0.499, F = 25.036, Access to credit balance or recharge facility; M = 2.076, $S.\ D$ = 0.663, F = 24.744, Security Privacy; M = 1.529, $S.\ D$ = 0.500, F = 23.045 and Promotional Programs; M = 1.771, $S.\ D$ = 0.899, F = 50.932). Hence the null hypothesis is rejected and the alternative hypothesis is accepting confirming that, there is a significant difference of opinion existing among the respondents based on their age group on the study variables.

Table 4.8: ANOVA: Type of Value Customer with Study Variables

Analysis of Variance (ANOVA) test is conducted in an objective to find the difference of Opinion existing among the respondents based on the Type of Value Customer on the Variables considered for the study namely Network, Call charges Price, Internet Speed, Innovative VAS Services, Uncalled for activation of VAS services, Access to Credit balance or recharge facility, Ease of use Self Service, Security Privacy, Brand Loyalty, Promotional Programs, Peer Pressure and Customer Service.

		N	Mean	S. D	Std. Error	F-value	Sig.
Network	High Value Customer	432	4.204	.8061	.0388	11.408	.000
	Medium Value Customer	617	4.053	.7742	.0312		
	Low Value Customer	712	4.007	.7491	.0281		
	Ultra-High Value Customer	373	4.249	.7757	.0402		
	Total	2134	4.103	.7784	.0169		
Call charges Price	High Value Customer	432	4.037	.6768	.0326	87.466	.000
	Medium Value Customer	617	4.486	.6622	.0267		
	Low Value Customer	712	4.469	.6723	.0252		
	Ultra-High Value Customer	373	3.962	.6079	.0315		
	Total	2134	4.298	.6984	.0151		
Internet Speed	High Value Customer	432	3.644	.9102	.0438	30.499	.000
	Medium Value Customer	617	3.207	.9004	.0363		
	Low Value Customer	712	3.287	.6808	.0255		
	Ultra-High Value Customer	373	3.550	.9480	.0491		
	Total	2134	3.382	.8622	.0187		
Innovative VAS Services	High Value Customer	432	1.593	.6680	.0321	2.606	.050
	Medium Value Customer	617	1.476	.6395	.0257		

	Low Value Customer	712	1.518	.6913	.0259		
	Ultra-High Value Customer	373	1.534	.6657	.0345		
	Total	2134	1.524	.6682	.0145		
Uncalled for activation of VAS services	High Value Customer	432	3.269	.6961	.0335	37.865	.000
	Medium Value Customer	617	3.331	.5444	.0219		
	Low Value Customer	712	3.524	.5054	.0189		
	Ultra-High Value Customer	373	3.174	.5279	.0273		
	Total	2134	3.355	.5781	.0125		
Access to Credit balance or recharge facility	High Value Customer	432	1.833	.4670	.0225	16.564	.000
	Medium Value Customer	617	1.796	.5069	.0204		
	Low Value Customer	712	1.829	.5676	.0213		
	Ultra-High Value Customer	373	1.614	.4930	.0255		
	Total	2134	1.783	.5237	.0113		
Ease of use Self Service	High Value Customer	432	2.292	.9002	.0433	14.606	.000
	Medium Value Customer	617	2.269	1.0011	.0403		
	Low Value Customer	712	2.527	1.0943	.0410		
	Ultra-High Value Customer	373	2.617	.9072	.0470		
	Total	2134	2.420	1.0082	.0218		
Security Privacy	High Value Customer	432	1.243	.4294	.0207	13.746	.000
	Medium Value Customer	617	1.387	.4942	.0199		
	Low Value Customer	712	1.404	.4911	.0184		
	Ultra-High Value Customer	373	1.290	.4542	.0235		
	Total	2134	1.347	.4780	.0103		
Brand Loyalty	High Value Customer	432	2.056	.9690	.0466	43.921	.000
	Medium Value Customer	617	1.608	.6282	.0253		
	Low Value Customer	712	1.596	.6403	.0240		
	Ultra-High Value Customer	373	1.853	.8147	.0422		
	Total	2134	1.737	.7684	.0166		
Promotional Programs	High Value Customer	432	1.231	.5117	.0246	16.499	.000
	Medium Value Customer	617	1.408	.5826	.0235		

	Low Value Customer	712	1.452	.6391	.0240		
	Ultra-High Value Customer	373	1.287	.5193	.0269		
	Total	2134	1.366	.5847	.0127		
Peer Pressure	High Value Customer	432	1.796	.7401	.0356	9.172	.000
	Medium Value Customer	617	1.930	.7297	.0294		
	Low Value Customer	712	2.031	.9011	.0338		
	Ultra-High Value Customer	373	1.855	.6803	.0352		
	Total	2134	1.924	.7898	.0171		
Customer Service	High Value Customer	432	2.789	1.1539	.0555	49.569	.000
	Medium Value Customer	617	2.199	.6699	.0270		
	Low Value Customer	712	2.385	.7836	.0294		
	Ultra-High Value Customer	373	2.772	1.2155	.0629		
	Total	2134	2.481	.9597	.0208		

Note: * significant at p<0.05; **significant at p<0.01; ***significant at p <0.001; ns = not significant

Ultra-High value customers had a higher mean score when compared to the other category of customers relating to Network (*M* = 4.249, *S. D* = 0.776, *F* = 11.408) and Ease of Use in Self Service (*M* = 2.617, *S. D* = 0.907, *F* = 14.606). With respect to High Value Customers, Internet Speed (*M* = 3.644, *S. D* = 0.910, *F* = 30.499), Innovative VAS Services (*M* = 1.593, *S. D* = 0.668, *F* = 2.606), Access to Credit balance or Recharge facility (*M* = 1.833, *S. D* = 0.467, *F* = 16.564), Brand Loyalty (*M* = 2.056, *S. D* = 0.969, *F* = 43.921) and Customer Service (*M* = 2.789, *S. D* = 1.154, *F* = 49.569). Low value customer had higher mean score in Promotional Programs (*M* = 1.452, *S. D* = 0.639, *F* = 16.499), Peer Pressure (*M* = 2.031, *S. D* = 0.901, *F* = 9.172) and Security Privacy (*M* = 1.404, *S. D* = 0.491, *F* = 13.746).

Table 4.9: ANOVA: Occupation with Study Variables

Analysis of Variance (ANOVA) test is conducted in an objective to find the difference of Opinion existing among the respondents based on the Occupation on the Variables considered for the study namely Network, Call charges Price, Internet Speed, Innovative VAS Services, Uncalled foractivationofVASservices, AccesstoCreditbalanceorrechargefacility, EaseofuseSelfService, SecurityPrivacy, BrandLoyalty, PromotionalPrograms, PeerPressure and CustomerService.

		N	Mean	S. D	Std. Error	F-value	Sig.
Network	Service	500	4.218	.7010	.0314	76.278	.000
	Home Maker	112	3.866	.7165	.0677		
	Business	567	4.256	.7542	.0317		
	Agriculture	511	4.311	.5765	.0255		
	Students	444	3.597	.8720	.0414		
	Total	2134	4.103	.7784	.0169		
Call charges Price	Service	500	4.082	.8103	.0362	16.250	.000
	Home Maker	112	4.411	.5782	.0546		
	Business	567	4.353	.5241	.0220		
	Agriculture	511	4.360	.5970	.0264		
	Students	444	4.372	.8334	.0396		
	Total	2134	4.298	.6984	.0151		
Internet Speed	Service	500	3.316	1.0745	.0481	6.780	.000
	Home Maker	112	3.545	.8791	.0831		
	Business	567	3.265	.6703	.0282		
	Agriculture	511	3.476	.7764	.0343		
	Students	444	3.457	.8789	.0417		

	Total	2134	3.382	.8622	.0187		
Innovative VAS Services	Service	500	1.502	.6978	.0312	3.785	.005
	Home Maker	112	1.375	.5870	.0555		
	Business	567	1.487	.6201	.0260		
	Agriculture	511	1.601	.5505	.0244		
	Students	444	1.545	.8120	.0385		
	Total	2134	1.524	.6682	.0145		
Uncalled for activation of VAS services	Service	500	3.318	.6854	.0307	3.104	.015
	Home Maker	112	3.214	.4335	.0410		
	Business	567	3.390	.5927	.0249		
	Agriculture	511	3.387	.4956	.0219		
	Students	444	3.351	.5400	.0256		
	Total	2134	3.355	.5781	.0125		
Access to Credit balance or recharge facility	Service	500	1.842	.3706	.0166	49.067	.000
	Home Maker	112	1.741	.4400	.0416		
	Business	567	1.713	.4530	.0190		
	Agriculture	511	1.597	.4950	.0219		
	Students	444	2.029	.6796	.0323		
	Total	2134	1.783	.5237	.0113		
Ease of use Self Service	Service	500	2.296	1.0112	.0452	16.736	.000
	Home Maker	112	2.366	.9004	.0851		
	Business	567	2.360	.9196	.0386		
	Agriculture	511	2.730	1.0979	.0486		
	Students	444	2.295	.9601	.0456		
	Total	2134	2.420	1.0082	.0218		
Security Privacy	Service	500	1.422	.4944	.0221	13.876	.000
	Home Maker	112	1.116	.3218	.0304		
	Business	567	1.367	.4896	.0206		
	Agriculture	511	1.272	.4454	.0197		
	Students	444	1.381	.4861	.0231		

	Total	2134	1.347	.4780	.0103		
Brand Loyalty	Service	500	2.026	.9997	.0447	39.775	.000
	Home Maker	112	1.786	.9146	.0864		
	Business	567	1.660	.6448	.0271		
	Agriculture	511	1.793	.6199	.0274		
	Students	444	1.435	.5802	.0275		
	Total	2134	1.737	.7684	.0166		
Promotional Programs	Service	500	1.172	.4763	.0213	42.644	.000
	Home Maker	112	1.196	.3991	.0377		
	Business	567	1.282	.4582	.0192		
	Agriculture	511	1.528	.4997	.0221		
	Students	444	1.547	.8202	.0389		
	Total	2134	1.366	.5847	.0127		
Peer Pressure	Service	500	1.678	.7480	.0334	38.536	.000
	Home Maker	112	1.821	.8406	.0794		
	Business	567	1.829	.7089	.0298		
	Agriculture	511	2.243	.7617	.0337		
	Students	444	1.980	.8268	.0392		
	Total	2134	1.924	.7898	.0171		
Customer Service	Service	500	2.616	1.0931	.0489	50.720	.000
	Home Maker	112	2.018	.8381	.0792		
	Business	567	2.508	1.0796	.0453		
	Agriculture	511	2.800	.7080	.0313		
	Students	444	2.043	.6789	.0322		
	Total	2134	2.481	.9597	.0208		

Note: * significant at $p<0.05$; **significant at $p<0.01$; ***significant at $p<0.001$; ns = not significant

Test results on Analysis of Variance test results relating to the difference of opinion existing among the customers with different occupation on the study variables revealed

that there exists significant difference of opinion among the respondents at 5 % level of significance. Respondents with agriculture as their occupation had highest mean score with respect to Network (*M* = 2.617, *S. D* = 0.907, *F* = 76.278), Innovative VAS Services (*M* = 2.617, *S. D* = 0.907, *F* = 3.785), Ease of use of Self Service (*M* = 2.617, *S. D* = 0.907, *F* = 16.736), Peer Pressure (*M* = 2.617, *S. D* = 0.907, *F* = 38.536), Customer Service (*M* = 2.617, *S. D* = 0.907, *F* = 50.720). With respect to difference of opinion among the students highest mean score was found with Promotional Program(*M* = 1.547, *S. D* = 0.820, *F* = 42.644), Security privacy (*M* = 2.617, *S. D* = 1.381, *F* = 13.876), Access to Credit balance or recharge facility (*M* = 2.029, *S. D* = 0.680, *F* = 49.067).Home Makers had highest mean score with regard to Call Charges Price (*M* = 4.411, *S. D* = 0.578, *F* = 16.250) and Internet Speed (*M* = 3.545, *S. D* = 0.879, *F* = 6.780). Service people had highest mean score on Brand loyalty (*M* = 2.026, *S. D* = 0.999, *F* = 39.775)and Business people had highest mean score on Uncalled for activation of VAS Service (*M* = 3.390, *S. D* = 0.593, *F* = 3.104).

Table 4.10: Exploratory Factor Analysis- Churn Customers

Factors represent the underlying concepts that cannot be adequately measured by a single variable. Factor analysis is carried with an objective to reduce a large number of variables into manageable smaller factors for further analysis. Principal Component Analysis technique was adopted with Varimax rotation. Before making the factor analysis, the demographic variables were dummy coded as mentioned below

DUMMY Variables:

Age: < 18, 18-25, 25-40, 40-60, 60+

AGE Group	A1	A2	A3	A4
<18	0	0	0	1
18-25	0	0	1	0
25-40	0	1	0	0
40-60	1	0	0	0
60+	0	0	0	0

A1 — 1 for 40-60 age group, 0 for others

A2 — 1 for 25-40 age group, 0 for others

A3 — 1 for 18-25 age group, 0 for others

A4 — 1 for <18 age group, 0 for others

Similarly:

Zones	Z1	Z2	Z3	Z4	Z5
Begusarai	0	0	0	0	1
Bhagalpur	0	0	0	1	0
Dhanbad	0	0	1	0	0
Muzzafarpur	0	1	0	0	0
Patna	1	0	0	0	0
Ranchi	0	0	0	0	0

Z1 — 1 for Patna, 0 for others

Z2 — 1 for Muzzafarpur, 0 for others

Z3 — 1 for Dhanbad, 0 for others

Z4 — 1 for Bhagalpur, 0 for others

Z5 — 1 for Begusarai, 0 for others

Value/Revenue	V1	V2	V3
LVC* (Low Value)	0	0	1
MVC* (Medium Value)	0	1	0
HVC* (High Value)	1	0	0
UHVC* (Ultra High Value)	0	0	0

V1 — 1 for HVC, 0 for others

V2 — 1 for MVC, 0 for others

V3 — 1 for LVC, 0 for others

Education	E1	E2
Matriculation	0	1
Graduates	1	0
Post Graduates	0	0

E1 — 1 for Graduates, 0 for others

E2 — 1 for Matriculation, 0 for others

Segment*	Rupees/Month
LVC	0-50
MVC	50-200
HVC	200-500
UHVC	500+

Occupation	O1	O2	O3	O4
Agriculture	0	0	0	1
Business	0	0	1	0
Home Maker	0	1	0	0
Service	1	0	0	0
Student	0	0	0	0

O1 – 1 for Service, 0 for others

O2 – 1 for Home Maker, 0 for others

O3 – 1 for Business, 0 for others

O4 – 1 for Agriculture, 0 for others

Gender:

G1 – 1 for Female, 0 for Male

Rural/Urban:

L1 – 1 for Urban, 0 for Rural

Multi Sim :

MS1 – 1 for No, 0 for Yes

Multi Sim Phone :

MSP1 – 1 for No, 0 for Yes

Total Variance Explained

Component	Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %
1	6.370	18.735	18.735
2	3.293	9.685	28.420
3	2.808	8.257	36.678
4	2.425	7.132	43.810
5	1.935	5.690	49.500
6	1.890	5.558	55.058
7	1.768	5.201	60.259
8	1.559	4.585	64.843
9	1.326	3.899	68.743
10	1.213	3.569	72.311
11	1.126	3.312	75.623
12	1.028	3.023	78.646

Rotated Component Matrix[a]

	Component											
	1	2	3	4	5	6	7	8	9	10	11	12
Network	-0.76	-0.08	-0.18	0.04	-0.09	0.04	0.08	-0.01	0.00	-0.21	0.13	0.22
Call charges / Price	0.70	0.25	0.02	-0.11	-0.06	-0.03	-	-	-	0.01	0.04	0.09

							0.11	0.50	0.04			
Internet Speed	-0.77	-0.07	0.06	0.10	0.06	0.06	0.11	0.22	-0.04	0.16	-0.05	-0.20
Innovative VAS Services	-0.46	0.23	0.42	0.26	-0.11	-0.11	0.00	0.17	0.11	0.11	-0.13	-0.04
Uncalled for activation of Vas services	0.47	0.42	-0.09	0.02	-0.13	0.15	0.08	-0.37	-0.11	0.25	-0.03	-0.05
Gender	0.12	0.56	0.17	0.19	-0.15	0.23	0.20	-0.08	0.41	-0.11	0.27	0.00
A1	-0.11	-0.39	0.35	-0.33	0.04	-0.30	-0.44	-0.08	0.34	-0.09	0.01	-0.09
A4	0.00	0.54	0.53	0.16	-0.03	-0.17	0.31	-0.12	-0.22	0.09	0.12	-0.07
E1	-0.09	-0.76	-0.08	0.27	0.01	-0.01	0.10	0.14	0.01	0.01	-0.09	0.04
E2	0.22	0.81	0.17	-0.15	-0.04	-0.14	-0.21	-0.08	0.15	-0.08	0.03	-0.04
O1	-0.26	-0.61	-0.03	0.03	0.09	0.00	0.16	0.16	-0.08	0.10	0.60	-0.04
Access to Credit balance or recharge facility	0.16	0.17	0.76	0.06	0.04	-0.15	0.02	-0.13	-0.18	0.06	0.16	0.07
Rural /Urban	0.08	-0.32	0.26	0.68	0.11	-0.12	0.27	0.01	-0.02	0.04	0.03	-0.21
V1	-0.20	-0.46	-0.18	0.58	0.15	-0.12	0.08	-0.06	-0.09	0.09	0.23	-0.02
Z1	0.00	0.02	0.02	0.80	0.01	0.11	0.03	0.13	-0.15	-0.06	-0.05	-0.10
Muliti SIM	0.00	-0.05	0.07	0.04	0.96	-0.06	-0.05	0.06	-0.05	-0.04	0.02	-0.04
Muliti SIM Phone	-0.03	-0.08	-0.01	0.05	0.95	-0.02	-0.08	0.08	-0.02	-0.07	0.04	-0.01
A2	-0.08	0.04	-0.77	0.08	-0.10	-0.38	0.21	0.02	-0.15	0.09	-0.05	-0.01
A3	0.28	-0.05	0.12	0.02	-0.10	0.84	0.00	0.05	0.01	-0.09	-0.12	0.05

Security/ Privacy	-0.30	0.02	-0.12	-0.04	-0.01	0.73	0.17	-0.04	-0.07	0.11	-0.02	-0.01
Z3	-0.01	0.03	0.08	0.03	0.06	-0.01	-0.80	-0.04	-0.06	0.00	0.09	0.00
O4	0.08	0.27	-0.17	-0.35	0.09	-0.20	-0.70	-0.04	-0.05	-0.12	0.01	-0.04
Ease of use / Self Service	-0.22	-0.06	0.13	0.16	0.22	0.27	0.12	0.71	0.01	0.16	-0.13	-0.15
Z2	-0.15	-0.01	0.02	-0.24	-0.04	-0.21	0.01	0.00	0.79	-0.11	-0.13	-0.15
O2	0.18	0.25	-0.22	0.00	-0.03	0.22	0.11	-0.01	0.73	0.16	0.21	0.02
V2	0.09	0.27	0.01	-0.13	0.04	-0.01	-0.13	-0.05	0.04	-0.88	-0.15	-0.06
V3	0.29	0.37	0.09	-0.27	-0.18	0.01	-0.06	-0.01	0.08	0.67	-0.14	0.24
O3	0.00	-0.16	-0.21	0.00	-0.04	0.14	0.19	-0.04	-0.06	-0.04	-0.84	0.08
Z4	0.06	-0.03	0.04	-0.28	-0.04	0.09	0.09	0.01	-0.18	0.16	-0.08	0.85
Z5	0.07	0.20	-0.11	-0.49	0.05	0.17	0.18	0.02	-0.42	-0.03	0.07	-0.52

Exploratory Factor Analysis has been used in the study to identify the most Important Factors influencing a particular behaviour.

Exploratory Factor Analysis has been done on the full set of data i.e. Churn (580) and Loyal (1554). Total data points were 2134

We found the analysis significant hence NULL Hypothesis that the identified parameters ‘34’ are mutually exclusive has been rejected.

Our Output having 14 Factors and Eigen value more than '1' could explain more than 74% of the Variance of the Data

Churn:

The Null hypothesis that all the variables (Including the DUMMY Variables) are mutually Independent has been Rejected.

Factor Analysis has reduced 34 Variables into 12 factors explaining 78.64% of the Variance of the Data.

To explain the Identified Factors we have considered those 'Factor Loadings' which has values>=0.65. Based on this value, Variables Associated with F1-F12 have been identified, as under, on the basis of 'Rotated Component Matrix'.

F1 : Network (-0.761), Call charges (0.702), Internet Speed (-0.774)
F2 : E1 (-0.757), E2 (0.810)
F3 : A2 (-0.771), Recharge Facility (0.759)
F4 : Z1 (0.801), R/U (0.682)
F5 : Multi Sim (0.957), Multi Sim Phone (0.954)
F6 : A3 (0.840), Security/Privacy : (0.731)
F7 : Z3 (-0.803) ,O4 (-0.696)
F8 : Ease of Use (0.714) , Brand loyalty (0.733)
F9 : Z2 (0.789) , O2 (0.726)
F10 : V2 (-0.786), V3(0.669)
F11 : O3 (-0.839)
F12 : Z4 (0.853)

The obtained factors were named as stated below

F1: Service Experience- This factor mainly comprises of Peer Pressure, Bad Network connection, High Call Charges and Bad Internet Speed

F2: Education- Level of Education influences the Churn Behaviour and among the churners Matriculates are most vulnerable

F3: Age and Recharge Facilities- Customers of a particular age group (25-40 yrs.) are very sensitive to availability of Recharge Facilities

F4: Urbanization- Rural urban divide (Patna) influences Churn Behaviour

F5: Technical Options- Consumers with access to Multi SIMs influences Churn

F6: Age and Security/Privacy- For a particular Age Group (18-25yrs.) Security/Privacy is very important and a churn determinant

F7: Place and Occupation- Non-Agriculturist in Dhanbad exhibit higher churn behavior

F8: Customer Experience- Overall customer experience with the Service Provider decides churn propensity

F9 : Place and Occupation- Homemakers of Muzzafarpur has higher tendency to Churn

F10 : Value of Customer- Value of Customer influences his churn behavior (Medium & Low)

F11 : Occupation- Consumers in Business occupation are not stable

F12: Place - Geographical location (Bhagalpur) also influences the churn behaviour of a customer

Table 4.11: Exploratory Factor Analysis- Loyal Customers

Factors represent the underlying concepts that cannot be adequately measured by a single variable. Factor analysis is carried with an objective to reduce a large number of variables into manageable smaller factors for further analysis. Principal Component Analysis technique was adopted with Varimax rotation. The table below represents the Factor Analysis for the Loyal customers.

Component	**Rotation Sums of Squared Loadings**		
	Total	**% of Variance**	**Cumulative %**
1	2.699	7.937	7.937
2	2.695	7.927	15.863
3	2.678	7.877	23.741
4	2.295	6.749	30.490
5	2.179	6.408	36.898
6	1.683	4.949	41.847
7	1.680	4.941	46.788
8	1.678	4.937	51.725
9	1.659	4.880	56.605
10	1.576	4.635	61.239
11	1.520	4.470	65.709
12	1.284	3.775	69.485
13	1.210	3.560	73.044
14	1.161	3.414	76.458

Rotated Component Matrix[a]

	Component													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
A2	0.80	-0.02	0.00	-0.08	0.05	-0.20	0.09	0.05	0.02	0.21	-0.14	0.01	0.00	-0.10
A3	-0.63	-0.02	-0.07	0.07	-0.04	-0.21	-0.22	-0.08	-0.10	0.52	0.10	-0.03	-0.03	0.09
V1	0.65	0.07	-0.13	0.06	0.07	-0.03	-0.28	0.25	-0.12	0.03	0.12	-0.02	-0.07	0.12
E1	-0.62	-0.12	-0.59	0.03	0.03	-0.07	-0.03	-0.02	-0.06	0.06	-0.07	-0.13	-0.10	0.00
Call charges / Price	-0.23	0.62	0.14	0.18	0.09	-0.03	0.04	-0.48	-0.12	0.09	-0.07	0.01	0.09	-0.01
Uncalled for activation of Vas services	0.15	0.56	0.06	-0.09	-0.36	-0.18	0.17	-0.01	0.04	0.16	0.14	0.02	-0.06	0.05
Access to Credit balance or racharge facility	0.02	0.75	-0.10	-0.21	0.08	-0.07	-0.07	0.18	-0.01	0.08	0.00	-0.11	-0.03	0.01
Ease of use / Self Service	-0.03	-0.47	0.12	0.35	-0.06	-0.03	0.33	0.35	0.03	0.06	0.05	0.24	0.01	0.10
Security/ Privacy	-0.17	0.63	0.13	-0.20	-0.23	0.19	0.07	-0.32	-0.08	-0.12	0.07	0.15	0.09	0.03
Rural /Urban	-0.10	0.02	-0.59	-0.04	0.49	0.10	-0.03	-0.09	0.05	-0.23	0.02	0.24	0.04	0.02
E2	0.01	-0.01	0.85	0.08	0.03	0.21	0.06	-0.01	0.01	-0.08	-0.13	0.12	0.06	0.03
O4	-0.11	-0.23	0.77	0.24	-0.14	-0.06	-0.01	-0.01	0.09	-0.08	0.27	-0.04	-0.01	-0.01
Network	0.29	-0.37	0.26	-0.51	-0.28	-0.14	-0.13	-0.23	0.14	-0.06	-0.05	-0.07	-0.07	-0.04
Innovative VAS Services	-0.08	-0.02	0.10	0.82	0.00	0.06	-0.09	-0.09	0.07	-0.02	-0.06	-0.01	0.00	0.02
Gender	-0.09	-0.02	-0.17	-0.09	0.84	0.01	0.00	-0.04	0.03	0.05	0.11	-0.02	-0.02	0.04
O2	0.26	0.04	0.07	-0.06	0.84	-0.06	0.01	0.03	0.03	0.04	-0.01	0.01	0.01	-0.01
A4	-0.12	0.08	0.14	-0.04	-0.07	0.80	0.26	0.14	-0.02	-0.06	-0.04	-0.03	-0.08	0.02
Z5	0.12	-0.08	-0.05	0.18	0.06	0.65	-0.29	-0.20	0.08	0.27	0.26	-0.19	-0.10	0.15
V2	-0.51	0.10	0.11	-0.11	-0.03	-0.13	-0.56	-0.03	-0.12	0.03	-0.10	0.02	0.01	-0.05
V3	-0.04	0.05	0.09	-0.03	-0.01	0.04	0.91	-0.12	0.01	0.06	0.04	-0.05	0.04	-0.01
Internet Speed	0.00	-0.17	0.17	0.02	0.13	0.39	0.00	0.58	-0.03	0.25	-0.06	0.05	0.02	-0.01
Muliti SIM	0.13	0.07	-0.03	0.10	0.07	0.02	-0.02	0.05	0.85	-0.04	0.03	-0.03	-0.03	0.05
Muliti SIM Phone	-0.10	-0.12	0.08	-0.01	-0.01	-0.01	0.08	0.04	0.87	-0.02	0.04	0.00	0.03	-0.03
A1	-	-	0.04	0.00	-	-	-	-	0.04	-	0.09	0.00	-	0.02

	0.08	0.04			0.04	0.11	0.09	0.05		0.89			0.02	
O1	0.32	0.15	-0.43	-0.11	-0.26	-0.07	-0.05	0.05	0.05	-0.13	0.62	0.09	0.07	-0.02
O3	0.15	0.02	-0.19	0.02	-0.23	-0.10	-0.12	-0.13	-0.06	0.03	-0.84	0.04	0.05	0.01
Z1	0.04	-0.04	0.03	0.02	0.02	-0.10	-0.03	0.01	-0.02	-0.02	-0.01	0.93	-0.09	0.08
Z2	-0.01	0.05	0.05	0.01	-0.01	-0.13	0.06	0.02	0.02	-0.01	-0.04	-0.12	0.94	0.10
Z4	-0.07	0.14	0.02	-0.03	-0.08	-0.31	0.15	0.16	0.20	-0.25	-0.30	-0.36	-0.46	0.39
Z3	0.02	0.00	-0.02	-0.04	-0.03	-0.09	0.01	0.00	-0.01	-0.01	0.00	-0.09	-0.09	-0.95

Factor analysis has been done on the loyal customers. Output is significant so we reject the Null hypothesis. KMO close to 0.5 indicates that data is adequate to run Factor Analysis.

On the basis of the Rotated Component Matrix and Factor loading of more than '0.6' the following 14 Factors have been extracted (with eigen value>1) which explains 76.46% of the variance of the data. The last 3 factors being purely zone have been clubbed and only 12 factors have been used for any further analysis.

F1 : A2 (0.804), V1(0.645)
F2 : Access to credit (0.748)
F3 : E2 (0.847), O4 (0.772)
F4 : Innovative VAS service (0.824), Customer service (0.798)
F5 : G (0.844), O2 (0.837)
F6 : A4 (0.801) , Z5 : (0.654)
F7 : V3 (0.908)
F8 : Brand loyalty (0.733)
F9 : Multi Sim (0.854) , Multi Sim Phone (0.870)
F10 : A1 (-0.893)
F11 : O3 (-0.839)
F12 : Z1 (0.928)
F13: Z2(0.94)
F14: Z3(-0.95)

The obtained factors were named as stated below

F1 : Customer Age And Value
Customer Age (25-40yrs) and Value (HVC) are the most important factor determining Loyalty

F2 : Customer Experience
Credit facility is an important factor for loyalty

F3 : Education and Occupation
Level of Education and type of Occupation influences Loyalty

F4 : Customer Service
The Overall Experience with the service and Innovative VAS service determines customers Loyalty

F5 : Gender And Occupation
People of a particular Gender (Female) and in a specific occupation (Home Maker) are found to be more Loyal

F6 : Age and Place
Customers of a specific Age bracket (<18yrs) in a particular geography (Begusarai) exhibit more loyalty than others

F7 : Value of Customer
Value of the customer determines Loyalty

F8 : Brand Loyalty
Brand Loyalty is directly related to loyal behavior

F9 : Technical Options
Technical Options available to the customer determines his Loyalty

F10 : Age
Age of the customer is in direct correlation with his Loyal behavior

F11 : Occupation
Consumers in Business occupation are not stable

F12: Zone
Geography (Patna) is an important determinant of Loyalty

F13: Zone

Geography (Muzzafarpur) is an important determinant of Loyalty

F14: Zone

Geography (Dhanbad) is an important determinant of Loyalty

Table 4.12: Exploratory Factor Analysis- Overall Customers

Factors represent the underlying concepts that cannot be adequately measured by a single variable. Factor analysis is carried with an objective to reduce a large number of variables into manageable smaller factors for further analysis. Principal Component Analysis technique was adopted with Varimax rotation. The table below represents the Factor Analysis for the Overall customers.

Total Variance Explained

Component	Rotation Sums of Squared Loadings		
	Total	**% of Variance**	**Cumulative %**
1	2.726	8.018	8.018
2	2.378	6.995	15.013
3	2.161	6.356	21.369
4	2.005	5.896	27.265
5	1.991	5.855	33.120
6	1.856	5.459	38.579
7	1.724	5.070	43.649
8	1.624	4.776	48.425
9	1.603	4.713	53.139
10	1.558	4.582	57.721
11	1.507	4.431	62.152
12	1.494	4.395	66.547
13	1.378	4.051	70.598
14	1.190	3.499	74.098
Extraction Method: Principal Component Analysis.			

Rotated Component Matrix[a]														
	Component													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Rural /Urban	-.566	.027	-.107	.104	.411	.175	-.076	.155	-.041	.067	.081	.042	.364	.012
E1	-.748	-.359	.070	-.059	-.080	.149	.020	-.104	-.083	.046	-.037	.026	-.045	-.031
E2	.846	-.141	-.032	-.032	.097	.099	.079	.206	.030	.015	-.089	-.020	.071	.030
O4	.711	-.207	.083	.146	-.216	.135	.191	-.170	-.055	.028	.194	-.101	-.088	-.092
A2	.083	.768	.047	-.061	.072	-.176	.029	-.226	.141	-.119	-.204	-.130	-.027	-.059
A3	-.201	-.614	-.006	-.127	-.079	-.218	.198	-.294	-.184	-.277	.008	.188	.065	.161

V1	-.213	.675	.106	-.045	-.029	.109	.005	-.010	-.145	-.054	.164	.005	.175	.090
V2	.119	-.374	-.104	-.092	.015	-.139	.003	-.047	-.742	.041	-.122	.039	-.037	-.041
Call charges / Price	.164	-.154	-.741	-.119	.016	-.004	-.034	.035	.019	-.069	-.097	.411	.003	-.011
Internet Speed	.089	.058	.647	-.157	.065	.204	-.132	.232	-.032	-.196	-.016	.064	.008	.014
Ease of use / Self Service	.081	-.156	.634	.372	-.052	-.102	.163	-.159	.180	-.020	-.046	.120	.166	.009
Brand Loyalty	.009	.361	.524	.109	-.093	-.073	.113	-.032	-.146	.162	.203	.268	-.118	.063
Muliti SIM	.003	.093	.036	.887	.029	-.059	-.016	.027	-.021	-.018	.017	.081	-.045	.029
Muliti SIM Phone	.046	-.085	.094	.857	-.015	-.062	.015	-.040	.017	.011	.032	-.059	.009	-.015
Gender	-.103	-.129	-.028	-.020	.837	-.079	.061	.109	-.028	-.053	.068	.084	.038	.027
O2	.079	.171	.022	.019	.814	-.040	-.005	-.125	.064	-.015	-.004	.044	-.030	.026
Innovative VAS Services	.047	.025	-.107	-.242	-.076	.720	.153	.110	.018	-.043	-.009	.072	.087	.111
Uncalled for activation of Vas services	.236	.107	-.308	-.051	-.152	-.519	.008	.021	.166	-.060	.012	.343	.047	.116
Customer Service	.018	.113	.324	.069	-.291	.608	.180	-.180	.105	.012	-.018	.207	.097	.060
Security/ Privacy	.072	-.204	-.248	-.138	-.233	-.201	-.604	.092	.092	-.087	.066	.101	.182	.148
Promotional Programs	.132	-.221	-.124	-.159	.010	.141	.641	.225	.064	-.005	.055	-.213	.133	.014
Peer Pressure	.204	-.012	.020	.036	-.060	.004	.727	-.110	.056	-.122	.011	.291	.012	.036
A4	.189	-.138	.074	-.028	.023	.071	-.037	.798	.184	-.187	.012	.055	.034	.023
Z2	.242	-.043	-.088	-.133	.209	.353	-.311	-.431	.064	.115	.046	.079	-.145	.084
Access to Credit balance or racharge facility	-.049	.118	-.351	-.133	.051	-.130	-.017	.473	-.104	.212	.168	.349	-.047	.068
V3	.166	-.196	-.082	-.066	.043	-.107	.045	.085	.869	.078	-.030	.076	-.108	-.006
A1	.046	-.082	-.118	.157	-.054	.350	-.185	.024	-.136	.620	.214	-.150	-.143	-.117
Z4	-.091	.001	.011	.144	-.158	-.241	.176	.124	.068	.487	-.229	.019	-.351	.474
Z5	.037	.004	-.016	.150	.007	.105	.015	.231	-.117	-.783	.119	-.026	-.270	.074
O1	-.381	.367	-.020	.016	-.222	-.012	-.181	-.100	.031	.015	.664	-.045	.054	.025
O3	-.175	.132	-.088	-.041	-.195	.004	-.097	-.102	-.059	.042	-.847	-.032	.022	.038
Network	.144	.167	-.013	-.056	-.159	-.104	-.029	-.078	-.039	.056	.003	-.824	.010	.041
Z1	-.025	.073	.047	-.019	-.003	.046	.033	.039	-.056	.071	-.014	-.017	.903	.053
Z3	-.011	.013	-.029	.008	-.078	-.112	.060	.004	-.009	.104	-.009	.022	-.081	-.904

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.[a]

Factor analysis has been done on the Overall customers data. On the basis of the Rotated Component Matrix and Factor loading of more than '0.6' the following 14 Factors have been extracted (with eigen value>1) which explains 74.10% of the variance of the data.

Factor loading of more than '0.6' the following 14 factors has been identified:

F1 : Education: E1 (-.748),Education:E2 (.846) and Occupation:04(.711)
F2 : Age: A2 (.768), Age:A3 (-.614) and Value:V1 (.675)
F3 : Call Charges (-.741), Internet Speed (.647) and Ease of Use (.634)
F4 : Multi Sims (.887), Multi Sim phones (.857)
F5 : Gender (.837), Occupation: O2 (.814)
F6 : Innovative VAS service (.72)
F7 : Security/Privacy (-.604)
F8 : Age:A4 (.798)
F9 : Value:V2(-.742), Value:V3(.869)
F10 : Age:A1(.620), Zone:Z5(-.783)
F11 : Occupation:O1(.664), Occupation:O3 (-.847)
F12 : Network (-.824)
F13 : Zone:Z1(.903)
F14 : Zone:Z3 (-.904)

We have done this exercise to ensure that the identified factors are mutually exclusive

Table 4.13: Discriminant Analysis

Discriminant Analysis was run to construct a discriminant equation that can assign a discriminant score so that, the forecasting possibility of customers exhibiting Loyal or Churn behaviour can be identified.

Tests of Equality of Group Means

	Wilks' Lambda	F	df1	df2	Sig.
REGR factor score 1 for analysis 1	.999	1.234	1	2132	.267
REGR factor score 2 for analysis 1	.981	40.439	1	2132	.000
REGR factor score 3 for analysis 1	.920	184.932	1	2132	.000
REGR factor score 4 for analysis 1	.781	597.267	1	2132	.000
REGR factor score 5 for analysis 1	.999	1.096	1	2132	.295
REGR factor score 6 for analysis 1	.799	536.875	1	2132	.000
REGR factor score 7 for analysis 1	.996	9.106	1	2132	.003
REGR factor score 8 for analysis 1	.984	35.432	1	2132	.000
REGR factor score 9 for analysis 1	1.000	.072	1	2132	.789
REGR factor score 10 for analysis 1	.999	2.039	1	2132	.153
REGR factor score 11 for analysis 1	.993	15.099	1	2132	.000

REGR factor score 12 for analysis 1	.985	31.369	1	2132	.000
REGR factor score 13 for analysis 1	.998	3.332	1	2132	.068
REGR factor score 14 for analysis 1	.994	12.140	1	2132	.001

Wilks' Lambda

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1	.430	1792.786	14	.000

Box's Test of Equality of Covariance Matrices

Log Determinants

Identifier Loyal or Churn	Rank	Log Determinant
0	14	-1.640
1	14	-3.370
Pooled within-groups	14	-.837

The ranks and natural logarithms of determinants printed are those of the group covariance matrices.

Test Results

Box's M		2713.239
F	Approx.	25.603
	df1	105

	df2	4049905.304
	Sig.	.000

Tests null hypothesis of equal population covariance matrices.

We have used these mutually exclusive 14 Factors as independent Variables. Against each customer Loyal or Churn factor loadings of the corresponding 14 factors have been used to run the Discriminant Analysis.

In dependent variables Loyal and Churn Customers were captured in 2 nominal scale data '0' and '1' respectively.

The value of Wilks's lambda is .430 and is significant. This means the NULL Hypothesis that Independent Variables do not have discriminating power between Loyal and Churn customer groups is rejected.

Out of the 14 factors below 5 are not found significant:

F1 : Education:E1 (-.748), Education:E2 (.846) and Occupation:04(.711)

F5 : Gender (.837), Occupation: O2 (.814)

F9 : Value:V2(-.742), Value:V3(.869)

F10 : Age:A1(.620), Zone:Z5(-.783)

F13 : Zone:Z1(.903)

The othernine Factors were found to be significant at 5% significance level.

F2 : Age:A2 (.768), Age:A3 (-.614) and Value:V1 (.675) : Age and Value

F3 : Call Charges (-.741),Internet Speed(.647)and Ease of Use (.634): Experience

F4 : Multi Sims (.887), Multi Sim phones (.857): Options

F6 : Innovative VAS service (.72): Innovation

F7 : Security/Privacy (-.604): Privacy Issues

F8 : Age:A4 (.798) : Age

F11 : Occupation:O1(.664), Occupation:O3 (-.847) : Occupation

F12 : Network (-.824) : Network Quality

F14 : Zone:Z3 (-.904) : Location

Hence only the above nine factors have been considered relevant in the case and a new analysis has been done taking these 9 factors as independent Variables.

Based on the Structure Matrix the canonical loadings or discriminant loadings of the identified Variables (Factors) are as follows:

D = -.463(F4)+.439(F6)-.258(F3)+.121(F2)+.113(F8)-.106(F12) +.074(F11)+.066(F14)+.057(F7)

Function at Group Centroids:

Identifier Loyal / Churn	Function
0 (Loyal)	- .698
1 (Churn)	1.869

<-- (*-0.698*) ----------|*0*|----------(*1.869*)->

The above table represents the group centroids. If a customer's score on the discriminant function is closer to 1.869, then the customers is more likely to Churn. If the customer score is closer to -.698, then the customer is more loyal.

Classification Results[a]

		Identifier Loyal or Churn	**Predicted Group Membership**		**Total**
			Loyal	Churn	
Original	Count	Loyal	1484	70	1554
		Churn	122	458	580
	%	Loyal	95.5	4.5	100.0
		Churn	21.0	79.0	100.0

a. 91.0% of original grouped cases correctly classified.

The above table infers to the result pertaining to actual group membership and predicted group membership. It was found that, Overall percentage correctly classified is 91%, the sensitivity is 95.5 % and specificity is 79 %.

Table 4.14: Cluster Analysis- Churn

Using Hierarchical (Agglomerative) cluster procedure the dendrogram was drawn. On the basis of the dendrogram it was decided to put the Churned customers into 6 clusters and accordingly '**K**' mean procedure of clustering has been applied to get the final Output. It was found that all the 34 parameters significant at 10% level of significance.

Number of Cases in each Cluster

Cluster	1	212.000
	2	17.000
	3	247.000
	4	12.000
	5	84.000
	6	8.000
Valid		580.000
Missing		.000

Final Cluster Centers

	Cluster					
	1	2	3	4	5	6
Gender	0	0	0	0	0	0

A1	0	0	0	0	0	0
A2	0	0	0	0	0	1
A3	0	0	0	0	0	0
A4	0	0	0	0	1	0
Z1	0	0	0	1	0	1
Z2	0	0	0	0	0	0
Z3	0	0	0	0	0	0
Z4	0	0	0	0	0	0
Z5	0	0	0	0	0	0
Rural /Urban	0	1	0	1	1	1
V1	0	0	0	1	0	0
V2	0	0	0	0	0	0
V3	0	0	0	0	1	1
E1	1	1	0	1	0	1
E2	0	0	1	0	1	0
O1	1	1	0	1	0	0
O2	0	0	0	0	0	0
O3	0	0	0	0	0	0
O4	0	0	0	0	0	0
Muliti SIM	0	0	0	1	0	0

Muliti SIM Phone	0	0	0	1	0	0
Network	5	4	4	4	4	4
Call charges / Price	4	3	5	4	5	4
Internet Speed	4	4	3	4	3	4
Innovative VAS Services	2	3	2	2	3	2
Uncalled for activation of Vas services	3	2	4	2	4	3
Access to Credit balance or recharge facility	2	2	2	2	3	2
Ease of use / Self Service	2	3	1	3	1	2
Security/ Privacy	2	1	1	1	1	1

Final Cluster Centers

	Cluster					
	1	2	3	4	5	6
Brand Loyalty	2	4	1	3	1	2
Promotional Programs	1	3	2	2	3	1
Peer Pressure	1	2	2	2	3	5
Customer Service	3	5	2	5	2	4

Distances between Final Cluster Centers

Cluster	1	2	3	4	5	6
1		4.326	2.838	3.559	4.086	4.482
2	4.326		5.310	1.980	5.967	4.993
3	2.838	5.310		4.469	2.573	4.043
4	3.559	1.980	4.469		5.147	4.305
5	4.086	5.967	2.573	5.147		4.523
6	4.482	4.993	4.043	4.305	4.523	

Cluster	Count
1	212
2	17
3	247
4	12
5	84
6	8
Valid	**580**

From the cluster membership table, the members of each cluster can be identified. It was found that, the cluster 3, cluster 1 and cluster 5 are the most important clusters. The

analysis on the demographic profile of the members of these 3 clusters will provide us idea of the customer segments which are most likely to Churn.

Demographic Profile:

Churn Demographic										
Cluster	Count	Gender	Age	Zone	Rural/Urban	Value	Education	Occupation	Multi SIM	Multi SIM Phone
3	247	M	<18 yrs	Dhanbad	Rural	LVC	Matriculation	Home Maker	Yes	No
1	212	M	> 60 yrs	Muzaffarpur	Rural	UHVC	Post Graduate	Service	Yes	No
5	84	F	40-60 yrs	Patna	Urban	LVC	Matriculation	Students	Yes	Yes

Table 4.15: Cluster Analysis- Loyals

Using Hierarchical (Agglomerative) cluster procedure the dendrogram was drawn. On the basis of the dendrogram it was decided to put the Churned customers into 8 clusters and accordingly '**K**' mean procedure of clustering has been applied to get the final Output.It was found that all the 34 parameters are significant at 10% level of significance.

Cluster	Count
1	124
2	143
3	119
4	118
5	402
6	253
7	158
8	237
Valid	**1554**

Number of Cases in each Cluster

Cluster	1	124.000
	2	143.000
	3	119.000
	4	118.000
	5	402.000
	6	253.000
	7	158.000

	8	237.000
Valid		1554.000
Missing		.000

Final Cluster Centers

	Cluster							
	1	2	3	4	5	6	0	0
Gender	0	0	0	0	0	0	0	0
A1	0	0	0	0	0	0	0	1
A2	0	0	0	0	0	0	0	0
A3	1	0	0	0	1	0	0	0
A4	0	0	0	0	0	0	0	0
Z1	0	0	0	0	0	0	0	0
Z2	0	0	0	0	0	0	0	0
Z3	0	0	0	0	0	0	0	0
Z4	0	0	0	0	0	0	0	0
Z5	0	0	0	0	0	0	0	0
Rural /Urban	0	1	0	1	1	0	0	0
V1	0	0	0	0	0	0	0	0
V2	0	0	0	0	0	0	1	0

V3	0	0	1	0	0	0	0	0
E1	0	0	0	0	1	0	1	0
E2	1	0	0	0	0	0	0	0
O1	0	0	0	0	0	0	0	0
O2	0	0	0	0	0	0	0	0
O3	0	0	0	1	0	0	1	0
O4	1	0	0	0	0	0	1	1
Muliti SIM	1	1	1	1	1	1	1	1
Muliti SIM Phone	1	1	1	1	0	1	4	5
Network	4	3	4	3	4	5	5	4
Call charges / Price	4	4	4	4	5	4	4	3
Internet Speed	4	5	3	3	3	3	1	1
Innovative VAS Services	2	1	1	2	1	1	4	4

Uncalled for activation of Vas services	3	3	3	3	3	3	2	2
Access to Credit balance or recharge facility	1	2	1	1	2	1	3	3
Ease of use / Self Service	3	3	5	3	2	3	2	1
Security/ Privacy	1	1	1	1	2	1	0	0

Final Cluster Centers

	Cluster							
	1	2	3	4	5	6	7	8
Brand Loyalty	2	2	2	3	1	1	2	2
Promotional Programs	1	1	2	1	1	2	1	1
Peer Pressure	3	2	2	2	2	2	2	2

Customer Service	3	2	3	5	2	2	3	2

Distances between Final Cluster Centers

Cluster	1	2	3	4	5	6	7	8
1		2.790	2.809	3.193	3.564	2.560	2.360	3.008
2	2.790		3.523	3.822	3.176	2.973	2.802	2.916
3	2.809	3.523		3.136	3.933	3.073	3.063	3.522
4	3.193	3.822	3.136		4.146	3.884	3.353	3.930
5	3.564	3.176	3.933	4.146		2.496	2.349	2.663
6	2.560	2.973	3.073	3.884	2.496		2.693	1.887
7	2.360	2.802	3.063	3.353	2.349	2.693		2.875
8	3.008	2.916	3.522	3.930	2.663	1.887	2.875	

From the cluster membership table, the members of each cluster can be identified. It was found that cluster 5, cluster 6 and cluster 8 are the most dominating clusters. However, since all the clusters are having sizeable membership the analysis on the demographic profile of all clusters is being conducted in order to provide the idea on the customer segments which are most likely to be Loyal.

Demographic Profile:

Loyal Demographic										
Cluster	Count	Gender	Age	Zone	Rural/Urban	Value	Education	Occupation	Multi SIM	Multi SIM Phone
5	402	F	25-40 yrs	Begusarai	Urban	MVC	Graduates	Students	Yes	Yes
6	253	F	> 60yrs	Dhanbad	Urban	MVC	Graduates	Business	Yes	No
8	237	M	< 18 yrs	Bhagalpur	Rural	HVC	Post Graduates	Service	No	No
7	158	M	> 60 yrs	Muzaffarpur	Rural	LVC	Matriculation	Agriculture	No	No
2	143	F	40-60 yrs	Begusarai	Urban	HVC	Post Graduates	Home Maker	No	Yes
1	124	M	25-40 yrs	Begusarai	Rural	MVC	Matriculation	Agriculture	No	No
3	119	M	<18 yrs	Patna	Rural	LVC	Matriculation	Agriculture	No	No
4	118	M	> 60 yrs	Muzaffarpur	Urban	UHVC	Graduates	Business	No	No

CONCLUSIONS

OVERVIEW

This thesis proposed and verified a comprehensive discriminant equation that can accurately predict loyal or churn behaviour of a customer right at the point of acquisition. The research answered the two research hypotheses:

1. Using Exploratory Analysis, it is possible to identify various Demographic and Socio Economic Variables that define churn or loyal behaviour amongst consumers. Factor Analysis helps group them into distinct Factors.

2. Discriminant scores derived using discriminant analysis on demographic and socio economic factors provides a predictive model that can accurately predict churn or loyal behaviour of a new customer

The resultant discriminant equation provides a potent tool in the hands of the industry using which the Marketers can draw an effective Retention strategy thereby gaining substantial competitive advantage.

Summary of Major Findings of the Research:

Exploratory Factor Analysis helped in identifying the most important factors influencing a particular behaviour. The analysis was done on the full set of data i.e. Churn (580) and Loyal (1554). Total data points were 2134.

It was found from the analysis that, the values are significant at the specified level, hence the null Hypothesis is accepted and the identified parameters i.e. ‘34’ are mutually exclusive was rejected.

Our Output having 14 Factors and Eigen value more than '1' could explain more than 74% of the Variance of the Data.

'Discriminant Analysis'was run to construct a discriminant equation that can assign a discriminant score so that we can forecast the possibility of customers exhibiting Loyal or Churn behaviour.

Factor analysis was done on the combined data set of Churn & Loyal customers. On the basis of the Rotated Component Matrix and Factor loading of more than '0.6' the following 14 factors has been identified:

F1 : Education: E1 (-.748), Education: E2 (.846) and Occupation:04(.711)

F2 : Age: A2 (.768), Age: A3 (-.614) and Value: V1 (.675)

F3 : Call Charges (-.741), Internet Speed (.647) and Ease of Use (.634)

F4 : Multi Sims (.887), Multi Sim phones (.857)

F5 : Gender (.837), Occupation: O2 (.814)

F6 : Innovative VAS service (.72)

F7 : Security/Privacy (-.604)

F8 : Age: A4 (.798)

F9 : Value: V2 (-.742), Value: V3 (.869)

F10: Age: A1 (.620), Zone: Z5 (-.783)

F11:Occupation:O1(.664), Occupation:O3 (-.847)

F12: Network (-.824)

F13: Zone: Z1 (.903)

F14: Zone: Z3 (-.904)

This exercise was done to ensure that the identified factors are mutually exclusive.

'Discriminant Analysis' was run to construct a discriminant equation that can assign a discriminant score so that we can forecast the possibility of customers exhibiting Loyal or Churn behaviour.

These mutually exclusive 14 Factors as independent Variables. Against each customer Loyal or Churn factor loadings of the corresponding 14 factors have been used to run the Discriminant Analysis.

In dependent variables we captured Loyal and Churn Customers in 2 nominal scale data '0' and '1' respectively.

Our analysis shows value of Wilks's lambda is **.430** and is significant. This means the NULL Hypothesis that Independent Variables do not have discriminating power between Loyal and Churn customer groups is rejected.

Out of these 14 factors below 5 were not found significant:

F1 : Education: E1 (-.748), Education: E2 (.846) and Occupation: O4(.711)

F5 : Gender (.837), Occupation: O2 (.814)

F9 : Value: V2 (-.742), Value: V3 (.869)

F10: Age: A1 (.620), Zone: Z5 (-.783)

F13: Zone: Z1 (.903)

It was found that the below 9 Factors as significant at 5% significance level.

F2 : Age: A2 (.768), Age: A3 (-.614) and Value: V1 (.675): Age and Value

F3 : Call Charges (-.741), InternetSpeed (.647) and Ease of Use (.634): Experience

F4 : Multi Sims (.887), Multi Sim phones (.857): Options

F6 : Innovative VAS service (.72): Innovation

F7 : Security/Privacy (-.604): Privacy Issues

F8 : Age: A4 (.798): Age

F11: Occupation: O1 (.664), Occupation: O3 (-.847): Occupation

F12: Network (-.824): Network Quality

F14: Zone: Z3 (-.904): Location

Hence only the above 9 factors was considered relevant in our case and a new analysis has been done taking these 9 factors as independent Variables.

Based on the Structure Matrix the canonical loadings or discriminant loadings of the identified Variables (Factors) are as follows:

D = -.463(F4)+.439(F6)-.258(F3)+.121(F2)+.113(F8)-.106(F12) +.074(F11)+.066(F14)+.057(F7)

Function at Group Centroids:

Identifier Loyal / Churn	Function
0 (Loyal)	- .698
1 (Churn)	1.869

Our Result shows 91% of original grouped cases were correctly classified.

The discriminant equation can be used at the stage of acquisition by capturing a few factors at point of sale. The other factors can be captured through a small interactive contest during onboarding. The score identified by the equation can be captured in the CRM thereby providing

a yardstick to the telecom marketer to define an appropriate onboarding experience to respective customers. This helps customizing the onboarding experience and defining the retention strategy for the newly acquired customers.

The research went ahead and used cluster analysis to club customers into dominant clusters exhibiting specific socio- demographic and behavioural pattern.

Using Hierarchical (Agglomerative) cluster procedure, we have drawn the dendrogram for 580 churned customers. On the basis of the dendrogram we decided to put the Churned customers into 6 clusters and accordingly 'K' mean procedure of clustering has been applied to get the final Output.

It was found that all the 34 parameters significant at 10% level of significance.

From the cluster membership table, we identified the members of each cluster. Cluster 3, cluster 1 and cluster 5 are the most important clusters.

The analysis of the demographic profile of the members of these 3 clusters helped us identify the customer segments which are most likely to churn.

Churn Demographic										
Cluster	Count	Gender	Age	Zone	Rural/Urban	Value	Education	Occupation	Multi SIM	Multi SIM Phone
3	247	M	<18 yrs	Dhanbad	Rural	LVC	Matriculation	Home Maker	Yes	No
1	212	M	> 60 yrs	Muzaffarpur	Rural	UHVC	Post Graduate	Service	Yes	No
5	84	F	40-60 yrs	Patna	Urban	LVC	Matriculation	Students	Yes	Yes

Similarly Cluster analysis was performed on 1554 loyal customers.Using Hierarchical (Agglomerative) cluster procedure we have drawn the dendrogram. On the basis of the

dendrogram we decided to put the loyal customers into 8 clusters and accordingly '**K**' mean procedure of clustering has been applied to get the final Output.

It was found that all the 34 parameters significant at 1% level of significance.

From the cluster membership table, we identified the members of each cluster. Cluster 5, cluster 6 and cluster 8 are the most dominating clusters. However, since all the clusters are having sizeable membership the analysis of the demographic profile of all clusters is being conducted to provide us the idea on the customer segments which are most likely to be Loyal.

Loyal Demographic										
Cluster	Count	Gender	Age	Zone	Rural/Urban	Value	Education	Occupation	Multi SIM	Multi SIM Phone
5	402	F	25-40 yrs	Begusarai	Urban	MVC	Graduates	Students	Yes	Yes
6	253	F	> 60yrs	Dhanbad	Urban	MVC	Graduates	Business	Yes	No
8	237	M	< 18 yrs	Bhagalpur	Rural	HVC	Post Graduates	Service	No	No
7	158	M	> 60 yrs	Muzaffarpur	Rural	LVC	Matriculation	Agriculture	No	No
2	143	F	40-60 yrs	Begusarai	Urban	HVC	Post Graduates	Home Maker	No	Yes
1	124	M	25-40 yrs	Begusarai	Rural	MVC	Matriculation	Agriculture	No	No
3	119	M	<18 yrs	Patna	Rural	LVC	Matriculation	Agriculture	No	No
4	118	M	> 60 yrs	Muzaffarpur	Urban	UHVC	Graduates	Business	No	No

This clustering helps the Telecom marketer to devise appropriate retention strategies for the dominant clusters. This is again useful as it's very tedious to define user level strategies. The consumers in each cluster can thus be covered under the retention strategy for the cluster.

The researcher using his 14 years of global experience in the Telecom domain moves further to suggest a few Retention strategies as per the current industry trend. These suggestions can be used as guidelines and can be implemented depending on the lifecycle of the business and the relevant market.

Suggestions

Demographic and Socio-economic factors influencing consumer behaviour cannot be ignored. These variables provide a holistic view of the consumer and also helps prepone and predict the churn or loyal behaviour

Discriminant equation should be tweaked to match the geography of operation to predict consumer behaviour at the point of on boarding itself

The researcher's suggestion on the retention strategies is on a conceptual level, keeping in mind the recent developments in the telecom sector and is for reference purpose. The individual business has to construct their own detailed retention strategy depending upon the 1) Stage of business life cycle, 2) overall business goal, 3) availability of options etc. The research study identifies the important clusters and provides the target audience which needs special care. Definition of special will differ from operations to operations.

1. Differentiated Onboarding Experience: The discriminant equation will suggest the discriminant score which in turn predicts the consumer behaviour to be loyal or churn. As such scores are available there can be a differentiated onboarding for customers high on Churn score
2. Fast Track CRM : Customers high on churn score can be labeled as a fast track for any complaints or queries raised by them
3. Campaign Management and Analytics : The strategies at the cluster level and the campaigns linked to it can be premapped and ready to execute on a specific trigger

4. Customer lifecycle Value Management based on Analytics : The latest developments on contextual Marketing and the Artificial intelligence can suggest the next best action on a consumer level to the retention team depending on the lifecycle of the customer
5. Cross sell and upsell analysis: Higher the number of subscribed products lower is the churn rate is the thumb rule in business. The effort should be to identify the product affinity through advanced analytics and upsell and cross sell different product propositions from the operator. Music Apps, E books, Cine apps, broadband , landline, satellite TV etc. is the cross sell and upsell trend in the current market
6. Optimized pricing strategy: T Test and Anova hints at the different demographic segments and the extent of impact of variables on certain behaviours. Today's market is highly competitive and it's a digital world hence It is important for the business to define the Optimized pricing of the products for the segment intended based on pricing analytics and market research
7. Real Time Triggers: The span of attention of consumers in today's digital world is very short. They don't carry impressions on their mind for long as it is constantly shifting under various advertisement exposures. It is hence vital to reach the consumer at the right time with the right offer. While contextual Marketing and Next Best Action defines the product a real time campaign management platform ensures timely action which can be the competitive differentiator
8. Predictive Analytics: Predictive analytics based on advanced analytics helps the business to stay prepared and short list the target base to a great accuracy. The predictive models like Product affinity, Next best Action, Cost Benefit analysis etc. are a few potent tool in the hands of the marketers

9. Tower of Control: While less campaigns can leave a void, over campaigning can be an irritant. It is important to have a right strategy and tool to track and limit all communications to the consumer

10. Proactive Measures: It is mostly difficult to revert a decision which has already been created in the minds of the consumer so the idea should be to intervene before the consumers mind has already evaluated options.

SCOPE FOR FUTURE RESEARCH

This thesis uncovered and evaluated significant new dimensions with the aim of creating and testing a robust, holistic framework for predicting customer churn. Based on the contributions and limitations of the thesis various avenues of future research can be undertaken.

The study was undertaken in the Bihar & Jharkhand state for Vodafone operations. Future studies should attempt to test the framework discussed in the thesis across other Telecom operators and regions of India. It will also be interesting to expand the study to cover multiple operators provided the data points are available

Future study should delve into other lines of Telecom business like Postpaid, Enterprise and landline. It will be an interesting study to see if the different product lines throws back different customer behaviour.

Reliance JIOs introduction in the market has badly shaken up the Indian telecom industry. The entire industry has undergone a metamorphosis and a new trend of mergers and windups is in place. It will be interesting to study the customer behaviour in the new market setup once this metamorphosis crystallizes in a couple of years from now.

ANNEXURE

Questionnaire

A) Factors Impacting change of Mobile Operators:

(Preference on a scale of (1 – 5), where 1:Not Important, 2: Slightly Important, 3: Moderately Important, 4: Important and 5: Very important

		Not Important				Very Important
1	Network / Connectivity	1	2	3	4	5
2	Call Charges	1	2	3	4	5
3	Internet Speed	1	2	3	4	5
4	Innovative VAS Services	1	2	3	4	5
5	Uncalled for activation of VAS services	1	2	3	4	5
6	Access to credit balance/recharge facility	1	2	3	4	5
7	Ease of Use / Self Service	1	2	3	4	5
8	Security, call block, call tracking services	1	2	3	4	5
9	Brand Loyalty / Image	1	2	3	4	5
10	Promotional program	1	2	3	4	5
11	Peer / Onnet community / Word of Mouth	1	2	3	4	5
12	Quality of customer services	1	2	3	4	5

B) Other Details :

1	How Many Operators SIM do you currently Own	1	2	3+
2	Is it a Multi SIM phone	Yes	No	

C) Personal Details:

- Age:
  a) <18 b) 18 – 25 c) 25 – 40 d) 40 – 60 d) 60+
- Gender:
  a) Male b) Female
- Education:
  a) Matriculation b)Graduate c) Post – Graduate d)Others _____
- Occupation:
  a) Student b) Business c) Service d)Homemaker e) Agriculture

Name:-_____

Location: - _____

Contact No.-_____

Major Publication and Presentations

- Published a paper titled **"A Framework for Studying Customer Behaviour in the Context of Developing Customer Retention Strategies in Telecom Industry of Bihar (India)"** in **American Research Journal of Business and Management Vol. 1,Issue 3, 2015, (ISSN No. - 2379-1047).**

- Presented a Paper titled **"Marketing through the technology lens: Telecom perspective"** in **5th International Engineering Congress, Columbia 2018**.

- Presented a Paper titled **"Consumer Churning in Telecom Industry of Jharkhand"** in the **National Doctoral Conference 2017** organised by The ICFAI University, Jharkhand.

- Participated as a **delegate** in **23rd Convergence India 2015 International Exhibition and Conference.**

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