CHAPTER 6

SUMMARY OF FINDINGS, DISCUSSIONS, CONCLUSION, USEFULNESS OF STUDY AND INDICATIONS FOR FURTHER RESEARCH

India, the second largest in telecommunication industry facing acute rise in mobile churn. Churn rate is very high in prepaid segment when compared with postpaid in India. Even though marketers are devoting huge investments on retention campaigning they could not arrest the churn rate. Many attractive promotional schemes and packages were offered to retain the prepaid customers as the cost of acquisition is very expensive. They were all found to be ineffective since churn rate is pungently alarming every day in prepaid scenario. Hence it is highly imperative to devise proactive retention strategies by percolating the operational churn factors to stem out the churn rate in India. Thus this study focuses on the determinants influencing churn in the prepaid segment. Hence it is imperative to understand the factors that are motivating the customers to choose the particular service provider and to examine the level of satisfaction with their existing service providers. And to identify the factors influencing the customer churn with respect to Indian prepaid mobile services and based on this to develop the conceptual model on customer churn to examine the behavioral constructs about the mobile service provider. Thus with the continuation of the previous chapter, data analysis and interpretation, the summary of findings are presented based on each research objective. They are proceeded with the discussions, conclusion, usefulness of study, limitations and indications of further research in the following paragraphs.

6.0 SUMMARY OF FINDINGS

6.1 PROFILE OF THE SAMPLE RESPONDENTS

From the total of 1102 respondents, 836 of them were males and remaining 266 were females. The breakup of the sample respondents based on age group was,
34 of the respondents were belonged to the age group of 12-18 years, 969 of them were from the age of 19-30 years. It was found that 57 of them were between the age of 31-40 years and 11 of them were belonged to 40-49 years. It was about 11 of them were falling under the frequency interval of 50-59 years and remaining 20 of them were above 60 years.

Based on the income group classification, 878 of the respondents earning the monthly income below 15000 INR. 106 of them were belonged to the monthly income of 15001-30000 INR. It was 45 numbers of respondents were belonged to both the categories of the income groups of 30001 to 50000 and 50001 to 75000 INR. Remaining 28 were earning the monthly income above 75000 INR.

Regarding the profile of the sample respondents based on their frequency of travel, 196 of them mentioned that they would travel in the weekly basis and 417 uttered that they would travel on a monthly basis. There were 232 of the respondents preferred to travel once in every three months and 100 of them would travel once in every six once months and 78 of them would travel once in a year only. Remaining 79 mentioned that they might hardly travel.

With respect to the educational profile of the respondents, 76% of the respondents were post graduates and 12% were under graduates. Remaining 12% of them were twelfth passed outs. Totally 312 of the respondents were professionals and 236 of them were employed in the private companies. 382 of them were self-employed and remaining 172 were employed in Public companies.

Majority [74%] of the sample respondents were churners, that they switched the mobile operators once in every six months and they were 708 and remaining 394 were non churners. When location wise churn was analyzed, Chennai tops the list with 12.7% churn followed by Erode (6.81%), Madurai, Dindigul and Vellore (6.2%).

**6.2 LENGTH AND REASONS FOR CHURN**

According to the churn pattern, majority [87%] of the respondents had churned the prepaid mobile services once in their lifetime and remaining 13% churned twice. From this churn pattern 42% of them stayed with the old service
provider up to three months and 25% of them were with the service provider for more than 19 months. 24% of them continued with the old operator of about four to eight months. And only 9% were remained up to nine to thirteen months. Hence majority [42%] of the respondents churned the old operator in a fast pace of less than three months.

6.3 REASONS FOR CHURN

Descriptive statistics of the sample respondents revealed that majority [47%] of them complained the poor network coverage and because of this reason they switched their operator. Respondents of 31% detested the options and schemes of tariff plans as the main reason to change the operator. Repellent options and facilities of internet facilities made nine percent of the respondents to move to other operator. Four percent of them mentioned that the denomination and procedures of recharge vouchers are unappealing and three percent pointed out unattractive promotional offers and accessibility were the rationale for their churn. Only two percent and one percent of the respondents indicated the lack of performance of customer care and mobile number portability as the grounds for their churn respectively. Henceforth major portion of the respondents reasoned out poor network coverage as the major cause of their churn.

6.4 DISTRIBUTION OF PREPAID MOBILE OPERATOR-WISE CHURN

Initially 56 % of the sample respondents were with Bharti Airtel followed by vodafone of 16%. Twelve percent of the respondents were belonged to Aircel. Only six, five and two percent of them were from BSNL, Reliance and Idea cellular respectively.

6.4.1. Post churn

Majority [60%] of the respondents has churned to Bharti Airtel and 16% of them have moved to Vodafone. Twelve percent of the respondents changed their services to Aircel and only 5% of them switched to BSNL cell one. This obviously depicted that majority of the churn happened to Bharti Airtel.
6.4.2. Prospective churn

It was obvious that majority [37%] of the respondents have planned to switch their prepaid services to Bharti Airtel. It was followed by Vodafone of 24% and 11% of have opted Aircel and BSNL. Only seven and six percent of the respondents have decided to churn to Reliance and Tata Docomo respectively. It was clear that majority of the respondents have planned to churn Bharti Airtel.

6.5 FACTORS INFLUENCING THE SELECTION OF PREPAID MOBILE SERVICE PROVIDERS

The two dimensional perceptual mapping of correspondence analysis have explained the factors that influenced respondents to select specific service providers.

Dimension 1:
Service providers:

In the dimension 1 Reliance infocom was heavily loaded [0.811] and followed by Bharti Airtel [0.679] and BSNL [0.421].

Attributes

The values of contribution made by attributes to each of the dimension indicated that, attributes such as Roaming Charges [0.852], network coverage [0.781], Call Charges [0.756], ring tones [0.357], recharge vouchers [0.279], internet facilities [0.247] and convenience in subscription [0.031] were heavily loaded on dimension 1

Dimension 2:
Service providers

In the dimension 2, Tata Docomo was highly loaded [0.492] and Idea Cellular was closely loaded with Tata Docomo of 0.450. Aircel had meager loading in Dimension 2 with 0.133 when compared with other operators. It was quite surprising that there was no place for Vodafone and other operators in any dimensions because of poor loading.
Attributes:

The attributes such as customer care [0.892], Accessibility [0.825], Multimedia Message Services (MMS) [0.699], Offers [0.424], General Packet Radio Services (GPRS) [0.246] and technology [0.165] were loaded on dimension 2.

Service providers of Reliance, Bharti Airtel and BSNL have to concentrate on Coverage, Call Charges inclusive of Roaming, Schemes on Recharges Vouchers and attributes associated with Internet Facilities. Service Providers, Tata DoCoMo, Idea and Aircel have to fine tune their strategies on Multi –media services by giving options like Point of Parity Purchase, Menu driven Services and offers on various Add-on Packages. They could devise robust networking pattern for enhancing CRM to build loyalty through effective customer care. Hence GPRS, MMS, Offers, Accessibility, customer care, technology were considered as the most important elements for designing action strategies to attract customers.

6.6. ASSOCIATION BETWEEN CONSUMER BUYING FACTORS AND SERVICE PROVIDERS

The above mentioned model of correspondence analysis can be statistically tested only through parametric test involving nominal variables as predictors. Hence hypothesis of above mentioned association was tested using log linear logit analysis.

Table 6.6.1 Summary of Hypotheses

<table>
<thead>
<tr>
<th>Null Hypotheses</th>
<th>Status of acceptance</th>
<th>Inference</th>
</tr>
</thead>
<tbody>
<tr>
<td>NH-1: There is no significant association between network coverage and service providers.</td>
<td>Rejected</td>
<td>Coverage of mobile network is associated with the prepaid service providers</td>
</tr>
<tr>
<td>NH-2: There is no significant association between call charges and service providers.</td>
<td>Rejected</td>
<td>Call charges based on different recharge coupons, tariff plans and other call related charges are associated with the prepaid service providers</td>
</tr>
<tr>
<td>NH-3: There is no significant association between General Packet Radio Service (GPRS) and Service providers.</td>
<td>Rejected</td>
<td>Value added service like GPRS is associated with the prepaid service providers</td>
</tr>
<tr>
<td>Null Hypotheses</td>
<td>Status of acceptance</td>
<td>Inference</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>NH-4: There is no significant association between Multimedia Messaging Services (MMS) and Service providers.</td>
<td>Rejected</td>
<td>Multimedia messaging is associated with the prepaid service providers.</td>
</tr>
<tr>
<td>NH-5: There is no significant association between offers and service providers</td>
<td>Rejected</td>
<td>Offers like discounts, full top ups, benefits in tariff plans, promotional free plans, pay back schemes, add on packages, free SIM ,special plans on voice and data plans are associated with the prepaid service providers.</td>
</tr>
<tr>
<td>NH-7: There is no significant association between customer care and service providers.</td>
<td>Rejected</td>
<td>Customer care services are associated with the prepaid service providers.</td>
</tr>
<tr>
<td>NH-8: There is no significant association between technology and service providers.</td>
<td>Rejected</td>
<td>Technology in mobile services, backward and forward integration of the process associated to mobile services and connection is related to the prepaid service providers.</td>
</tr>
<tr>
<td>NH-9: There is no significant association between e-recharge vouchers and service providers.</td>
<td>Rejected</td>
<td>Online recharging facility, the functional mode and e services are associated with the prepaid service providers.</td>
</tr>
<tr>
<td>NH-10: There is no significant association between internet facility and service providers.</td>
<td>Rejected</td>
<td>Internet facility, connectivity, speed, quality and performance are associated to the prepaid service providers.</td>
</tr>
<tr>
<td>NH-11: There is no significant association between conveniences in subscription and service providers.</td>
<td>Rejected</td>
<td>Convenience in subscription, the easiness and swiftness in activation of prepaid subscription that facilitates the prepaid users are associated with the prepaid service providers.</td>
</tr>
<tr>
<td>NH-12: There is no significant association between ringtones and service providers.</td>
<td>Rejected</td>
<td>Ring tones that have varieties with current additions, quality, affordable price and easiness in activation are associated with the prepaid service providers.</td>
</tr>
</tbody>
</table>

Since there is significant association between service providers and factors influencing the selection of the service providers, the service providers can devise strategies based on their level of importance.
6.7. CHURN DUE TO THE IMPACT OF SOCIAL MEDIA

Using factor analysis, list of predictors and criterions are identified and they were subjected to multiple regressions to determine the effect of each predictor on the criteria.

The R squared value of 89% of variability was determined by the predictors on the criterions. Henceforth the model taken for the analysis, churn due to the impact of social media was mainly influenced by number of Phone usages (1.75), Quality of network coverage (0.21), signal strength of the data card (-0.189), availability and easiness of the services (-0.174), customer care services (0.15), time taken for complaint resolution (-0.12) and pricing on pulsing/timing of call charges (-0.10). Remaining other factors like design of the Mobile phone (0.078) and awareness of Internet Usage (0.065) have meager effect on churn due to social media. Variables

Among the independent variables, the importance of was determined by comparing the standardized value of regression coefficients. It was found that the number of phone usage has a very high coefficient value [0.935] followed by signal strength of the data card [-0.130]. This helps to determine the priority in policy making. Therefore mobile operators have to pave immediate attention to the compatibility of the services with the new versioned handsets and to the signal strength of the data card.

6.8 CHURN DUE TO INTERNET FACILITY

The advancement in information technology triggers the improvement in the internet facilities offered to the prepaid mobile phones. Mobile operators are devising strategies to differentiate their services by giving various rigor internet schemes and this influences customers to switch operators.

The R squared value of 89% of variability was determined by the predictors on the criterions. Henceforth the model taken for the analysis, churn due to the impact of internet facility was mainly influenced by number of Phone usages (1.89), time taken for complaint resolution (-0.21), signal strength of the Data card (-0.178), Internet services (-0.15), Quality of coverage (0.14), customer care (0.14) and
good Impression on the corporate Image (0.10). Remaining other factors like design of the Mobile phone (0.089) and awareness of Internet Usage (0.07).

The most important variables were determined by comparing the standardized value of regression coefficients. It was found that the number of phone usage has a very high coefficient value [0.933] followed by signal strength [-0.113]. This helped to determine the importance of that variable with high standardized coefficient value and use that while designing policies.

6.9 CHURN BY MORAL/ETHICAL VALUES

The R squared value of 89% of variability was determined by the predictors on churn by moral/ethical values. Henceforth the model taken for the analysis. It was found that moral, internal customs, beliefs and ethical support influenced the customers to churn the mobile operators. Churn caused by Moral/ethical values are influenced by the number of mobile phones that the customers use (1.85). Time taken for the complaint resolution also played an important role in reducing churn (0.28). Customer care (0.17), internet facility (-0.17) and quality of coverage (0.12) are also the factors effecting churn. It was found that Signal strength of the data card (-0.1) and recharge vouchers (0.1) are also influencing customers to churn. Design of the Mobile phone (0.06) was having lesser effect on churn.

Among the independent variables, the importance was determined by comparing the standardized value of regression coefficients. It was found that the number of phone usage has a very high coefficient value [0.937] followed by signal strength of the data card [-0.063]. This helps to determine the priority in policy making. Therefore mobile operators have to pave immediate attention to the compatibility of the services with the new versioned handsets and to the signal strength of the data card.

6.10 CHURN BY REGULATORY CERTAINTY OF OPERATORS

The result shows that 88% of variability in the criterion was accounted for by all of the predictors of churn together. It was depicted that Churn based on regulatory certainty of the mobile operators are influenced by number of mobile phone usage Net Speed (1.8), quality of coverage (0.19), Customer Care (0.16), Time taken for
Complaint Resolution (–0.16), Net Speed (-0.10) and design of the mobile phone (0.06).

From the standardized coefficient, the number of phone usage (0.934) was found to be important factor to reduce churn. Since the Customers are shopaholic in purchase of new handsets with recent versions, they are ready to switch from one operator to another based on the compatibility with respect to their handsets and design. It is highly essential for the service providers to concentrate on handset feature based services to cut down churn. They have to concentrate on net speed -(0.072) and improve the technology in order to activate the net speed.

6.11 SUMMARY OF DISCRIMINANT ANALYSIS

The discriminant Analysis for the ten cities, mainly investigated the differences between groups on the basis of the attribute customer satisfaction. It was necessary for the mobile operators to know the diverse opinions of customers belonging to different cities and their intensity of impact on churn. Among the various demographic variables, the city was the best discriminator to investigate the varied responses on the customer satisfaction. The highest Eigen value (0.527) corresponds to the first discriminant function, which showed that it had the strongest power of discrimination. Also, the first function accounts in a ratio of 57.90 per cent for the dispersion of the group means, as compared to the second, which accounted about 32.00 per cent.

The size of the coefficients indicated that functional Product (-2.241), Call centres (1.503), Customer Services (-1.492), Reach of Customer services (1.325), Recharge Process (1.074) and Readiness of customer services (1.018) discriminated best among ten cities.

Based on the functions of centroid, the computed means of cities were compared to examine the level of customer satisfaction for each city. Salem and Thanjavur had high positive score of mean 1.482 and 1.514 respectively. This correspond to that customers had high satisfaction on prepaid mobile operations in these cities but rest other cities had negative mean indicating that customers belonging to these cities were dissatisfied, which might persuade churn.
6.12 FACTORS INFLUENCING THE CUSTOMER CHURN

MANOVA was applied for analysing to test the difference between groups across several dependent variables simultaneously. Hence the factors influencing the customer churn are taken as fixed factors and prepaid mobile operators are taken as criterions. Barlett’s test was significant (p<0.001), MANOVA was appropriate since the correlation between the items were high. The value of significance of basic four test statistics (Pillai’s Trace, Wilks’s Lambda, Hotelling’s Trace and Roy’s Largest Root) were less than .05. Hence the groups differ significantly with respect to the dependent variables. The next level analysis was proceeded to test the following hypotheses.

### Table 6.12.1 Summary of Hypotheses

<table>
<thead>
<tr>
<th>Null Hypotheses</th>
<th>Status of acceptance</th>
<th>Inference</th>
</tr>
</thead>
<tbody>
<tr>
<td>NH-13: There is no significant association between mobile number portability and service providers.</td>
<td>Rejected</td>
<td>Based on the options and benefits given by service providers, customers are switching the service providers. Hence mobile number portability is associated with the prepaid service providers.</td>
</tr>
<tr>
<td>NH-14: There is no significant association between quality of network coverage and service providers.</td>
<td>Rejected</td>
<td>Quality of network coverage includes performance and connectivity of network coverage and it varies according to the service providers. Hence there is significant association between service providers and quality of network coverage.</td>
</tr>
<tr>
<td>NH-15: There is no significant association between compatibility to use new handset and accessories and service providers.</td>
<td>Rejected</td>
<td>Compatibility to use new handset and accessories of other service providers always triggers the customers to churn and move to the service providers offering updated services compatible to the new arrivals. As customers are finding difference in functional features while they are using</td>
</tr>
</tbody>
</table>
Null Hypotheses | Status of acceptance | Inference
---|---|---
NH-16: There is no significant association between easiness to search and adopt the facilities involved and service providers. | Rejected | Customers are highly in need to avail user friendly features and services of prepaid mobile services. Hence there is significant association between service providers and easiness to search and adopt the facilities involved.

NH-17: There is no significant association between quality of service and service providers. | Rejected | Quality of service includes all services starting from activation of subscription to after sales services. Based on the quality of service offered by other service providers, Customers are ready to churn. Hence the qualities of services are associated with the service providers.

NH-18: There is no significant association between regulatory certainty of operators and service providers | Rejected | Regulatory certainty includes licensing, adopting next generation network, convergence of spectrum and other services. It varies according to service providers. Hence there is significant association between service providers and regulatory certainty of operators.

Hence all of the above mentioned null hypotheses were rejected. Therefore it proved that there is a significant association between Mobile Number Portability, Network Coverage, and Compatible to use new handset and accessories, Easiness in usage, Quality of Service and Regulatory certainty and the service providers.
6.13 SUMMARY OF NEURAL NETWORKS

Multilayer Perceptron network was used since the parameters used for modelling are nonlinear with two hidden layers. Average over all relative errors were more or less similar for both training and testing the samples and they were closer to zero proved the accuracy of the network operations. Hence the results were interpreted. The importance of independent variables was prioritized and listed as per the simulated pattern of brain functioning of the customers using the synoptic weights of each neuron.

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>Normalized Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Mobile phones usage($X_{11}$)</td>
<td>100.00%</td>
</tr>
<tr>
<td>Personalization($X_{33}$)</td>
<td>100.00%</td>
</tr>
<tr>
<td>Quality of Coverage($X_{21}$)</td>
<td>77.00%</td>
</tr>
<tr>
<td>Design of the Mobile Phone($X_{22}$)</td>
<td>66.20%</td>
</tr>
<tr>
<td>City</td>
<td>66.20%</td>
</tr>
<tr>
<td>Signal strength($X_{12}$)</td>
<td>64.60%</td>
</tr>
<tr>
<td>Awareness($X_{6}$)</td>
<td>59.80%</td>
</tr>
<tr>
<td>Place of purchase($X_{5}$)</td>
<td>54.70%</td>
</tr>
<tr>
<td>Personal Use($X_{7}$)</td>
<td>53.10%</td>
</tr>
<tr>
<td>Internet Services($X_{16}$)</td>
<td>52.10%</td>
</tr>
<tr>
<td>Quick customer complaint redressed($X_{25}$)</td>
<td>47.50%</td>
</tr>
<tr>
<td>Front End services($X_{30}$)</td>
<td>47.50%</td>
</tr>
<tr>
<td>Net Speed($X_{11}$)</td>
<td>47.10%</td>
</tr>
<tr>
<td>Changing the brand($X_{10}$)</td>
<td>43.70%</td>
</tr>
<tr>
<td>Recharge Vouchers($X_{14}$)</td>
<td>39.00%</td>
</tr>
<tr>
<td>Pulsing/Timing($X_{20}$)</td>
<td>37.70%</td>
</tr>
<tr>
<td>Tariff($X_{9}$)</td>
<td>36.60%</td>
</tr>
<tr>
<td>Easiness in Subscription($X_{22}$)</td>
<td>36.40%</td>
</tr>
<tr>
<td>Alternative choice due to non-availability($X_{8}$)</td>
<td>36.30%</td>
</tr>
<tr>
<td>Readiness of Customer care($X_{28}$)</td>
<td>35.40%</td>
</tr>
<tr>
<td>Recharge Process($X_{23}$)</td>
<td>34.80%</td>
</tr>
<tr>
<td>Welfare to the society($X_{19}$)</td>
<td>34.40%</td>
</tr>
<tr>
<td>Customer Services($X_{31}$)</td>
<td>33.70%</td>
</tr>
<tr>
<td>Availability and Easiness of services($X_{29}$)</td>
<td>32.60%</td>
</tr>
<tr>
<td>Type of the data card($X_{4}$)</td>
<td>32.50%</td>
</tr>
<tr>
<td>Application Process($X_{26}$)</td>
<td>30.00%</td>
</tr>
<tr>
<td>Customer Care($X_{17}$)</td>
<td>28.30%</td>
</tr>
<tr>
<td>Good Impression on the corporate Image($X_{13}$)</td>
<td>28.10%</td>
</tr>
<tr>
<td>Functional Product($X_{24}$)</td>
<td>27.60%</td>
</tr>
<tr>
<td>Tariff Rates($X_{15}$)</td>
<td>27.20%</td>
</tr>
<tr>
<td>Time taken for Complaint Resolution($X_{18}$)</td>
<td>27.10%</td>
</tr>
<tr>
<td>Reach of Customer services($X_{27}$)</td>
<td>25.50%</td>
</tr>
<tr>
<td>Video($X_{3}$)</td>
<td>23.50%</td>
</tr>
<tr>
<td>Call centres($X_{32}$)</td>
<td>5.90%</td>
</tr>
</tbody>
</table>
Hence the customers were giving importance to the mobile phone usage (100%) and purchase of new phones with advanced technology and designs (66.2%). They were giving priority to internet services and personalization (100%) e-services. In connection to this they expect wider coverage of network with high quality (77%) and signal strengths (64.2%). City (66%) and Place of purchase (54.7%) also plays significant factor for the customer. They gave importance to the awareness over various schemes and services (59.8%). As they are main churning factors for the customer, the mobile operators should focus on compatible mobile phone based services. They can revamp their conventional mode of networking and avail the technology transfer to implement robust technology in network coverage and signal strength. Based on this empirical research model was designed.

6.14 DISCUSSIONS

Gerpott et al. (2001) studied the German mobile market based on a sample consisting of 684 residential mobile users. They were mainly concerned in finding the relationship between the three constructs: Customer retention, loyalty and satisfaction. They showed that the three constructs are causally interlinked [294]. In addition, they identified some other factors, which have significant effects on customer retention such as mobile service price, mobile service benefit perceptions and lack of number portability. The main limitation of this study is that it investigates customer behavioural intentions and attitudes and neglects the actual customer usage behaviours. In addition, this study employs traditional statistical techniques, which are now being questioned in the churn literature (Twomey and Cadman, 2002) [295].

Kim and Yoon (2004) analyzed customer churn in the Korean mobile market based on a survey of 973 mobile users. They conducted an empirical analysis to identify the determinants of churn. Their results indicated that churn probability is associated with the level of satisfaction. Furthermore, they identified other services attributes that might affect churn including call quality, tariff level, handsets, and brand image and subscription duration. They concluded that the main cause of customer churn in the Korean mobile market is the desire to change handsets and dissatisfaction with specific service attributes, such as call quality or price level [296]. This study shares the same limitation as Gerpott et al. (2001) study, namely
the use of the questionnaire as a data collection tool. As noted earlier, the mobile market is changing rapidly and more recent and comprehensive research is needed [297].

Wei and Chiu (2002) developed a new model for customer churn prediction in telecommunication service providers by using data mining techniques. In that time, past researches on churn prediction in the telecommunications industry mainly had employed classification analysis techniques for the construction of churn prediction models and they had used user demographics, contractual data, customer service logs and call patterns extracted from call details (e.g. average call duration, number of outgoing calls, etc.), but Wei and Chiu believed that existing churn prediction model had several disadvantages. They listed the disadvantages in two groups; first, use of customer demographics in churn prediction renders the resulting churn analysis at the customer rather than contract (or subscriber) level. In other words, tendency of each customer toward churning was calculated on a per-customer rather than contract basis. It is quite common that a customer concurrently holds several mobile service contracts with particular carrier, with some contracts more likely to be churned than others [298].

One important contribution of Hwang’s et al. (2004) study is that it adds important findings to the empirical customer churn literature by considering customer lifetime value in the churn analysis. However, the study did not take into account other important factors that strongly affect customer churn, such as social influences and market characteristics [299].

Wang et al. (2004) investigated the Korean mobile market and suggested lifetime value model considering propensity to churn, past financial contribution and customer potential value at the same time. They used decision tree, logistic regression and neural network to develop and evaluate their model, which can be used to segment customers and develop customer retention strategies based on the customer lifetime value [300]. Choosing the most profitable customers and retaining them while lessening or terminating relationships with less profitable customers is one of the most successful customer retention strategies to improve business profit (Kim et al., 2006) [301].
Hung et al. (2006) used decision tree and neural networks to analyze customer churn in Taiwan based on data including customer demography data, billing, customer service interaction and call detail records data. Although the results of this study show a significant improvement (based on lift chart) from those in early studies, one major criticism of this work is that it did not take account of social influences along with other factors that may affect customer churn [302].

Lemmens and Croux (2006) applied bagging and stochastic gradient boosting (two data mining algorithms) to predict customer churn in a US mobile company. In their study, they use three groups of predictors: Behavioral, company interaction and customer demographics predictors. According to the study results, using the two algorithms performs comparably better than logistic regression. Another important finding of this study is that using ensemble classifiers produces superior performance over single classification models. In ensemble models, multiple classification models are combined into one classifier by using different methods, such as majority voting. Nevertheless, this study shares the same limitations as others in that it does not consider social influences [303].

In 2006, Ahn, Han, and Lee conducted an exploratory research in which they aimed at finding the most influential factors on customer churn. In their research they considered a mediator factor named “Customer’s Status”, between churn determinants and customer churn in their model, and they’ve mentioned that “Customer’s Status” (from active use to non-use or suspended) change is an early signal of total customer churn. In fact the main focus of this research is on finding determinants of churn and authors have found that call quality related factors influence customer churn. The results show that dissatisfaction indicators such as number of complaints and call drop rate have a significant impact on the probability of churn. Besides, it has been revealed that loyalty points such as membership card programs have a significant negative impact on the probability of customer churn. Moreover, surprisingly the findings showed that heavy users are more likely to churn and also customer status was found to have significant impact on the probability of churn. In addition they found out that customer status has a significant impact on the probability of churn. The customer’s status changes from active use to either non-use
or suspended increases the churn probability. Ahn et al. (2006) investigated the key determinants of churn and reported service quality, customer usage and switching costs as the main determinants of churn [304].

Seo et al. (2008) analyzed customer retention in the US mobile market based on a database of 31,769 customers and call log files for one of the top ten US mobile services providers. They used binary logistic regression modelling to analyze the behavioural and the demographical factors affecting customer retention. They investigated six variables: Service plan complexity, handset sophistication, length of association, connectivity quality, age and gender [305].

6.15. MANAGERIAL IMPLICATIONS

Mobile operators can revamp their operational strategies in the following areas:

1. **Hybrid channelization of customer care services:**

   Robust networking of customer care services can be considered as highly vital to troubleshoot complaints and to manage time taken for complaint resolution.

2. **Event management:**

   Marketing campaigns, inviting and focusing the targeted customer base can be focused as pivotal for establishing brand value in the mindset of the customers.

3. **Market basket analytics:**

   Needs, wants and motives of the customers can be analyzed in all parameters to design marketing plans.

4. **e-mobile systems:**

   High resolution e-mobile system may be developed to enhance net speed, connectivity with swift downloading and uploading videos, songs and other multimedia files.
5. **Differentiation strategies:**

Voice and data tariff plans can be redesigned with differentiated pricing schemes to attract the targeted segment.

6. **Affinity marketing:**

Developing community centers as per the marketing segments and offering services based on each segment may be developed.

7. **Youth marketing strategies** can be devised to attract the youth segment by providing companionable services for smart phones, tablets, dongles, offers and tariff discounts for parity purchase, Tariff offers for MMS, SMS etc

6.16. **RECOMMENDATIONS**

This research is developed focusing mainly on Churn behavior of customers’ prepaid mobile services. From this study it was found that there are unsought segments in services, to be tapped by the marketers. One among that is the predictive analysis about the integration of mobile subscription through banking system. The customers are favouring the factor called easiness and availability of prepaid mobile subscriptions. To enhance customer convenience, the mobile operators can come up with e-prepaid subscription by synchronizing their official web subscription with banking system and mandatory procedures of document verification can also be done through online. Since majority of the customers are having bank accounts, it will facilitate the process of prepaid subscription. This will reduce the operational cost for the operators and at the same time beneficial for the banking sector to raise their revenue. This study can be taken forward for the future research for the benefit of the society.

Mobile operators have to develop the policies by devising the strategies in the following areas:

1. **Network of physical retail outlets:**

Compared to banks, mobile operators do businesses with much larger numbers of retail outlets, which can support cash-in and cash-out services, as
well as perform, know your customer (KYC) procedures. Secure electronic transaction captures (frontend) capability. The operator’s control of the SIM card puts it in a unique position to offer a customer service platform that is both secured and user friendly.

2. Transaction processing (back-end) platform:

The platforms for processing prepaid mobile billing are simple compared to typical core Banking systems, since they do not need to support a high level of customer reporting (e.g., no monthly statements) or regulatory reporting. Though more scalable and cheaper than core banking systems, a prepaid platform would need to be modified to meet the higher reporting requirements of financial transactions. In emerging markets, mobile network operators have strong brands backed by mass marketing capacity that has reached lower income people in ways that banks often have not.

3. Campaign management:

Campaign management has to be organized to create awareness and to generate mass promotion on various schemes in data services.

4. Technology management:

Based on the mobile analytics, networking should be devised with high technology of wide coverage having superior signal strength to reduce churn. New technologies such as high-speed data or bundled high-value service offerings create significant opportunities for carriers to entice competitors’ customers to switch.

5. Participative management:

Conducting contests in schools and colleges through road shows involving customers to decide the various marketing elements.

6. Call management:

It is imperative for the mobile operators of compendium of need-to-know statistics. They have to device their mobile strategy on a sound footing with the latest
research and stats on the mobile commerce and payments market, near-field communications (NFC), mobile retail, mobile ticketing, mobile vouchers.

7. **Collaborative business model:**

Robust networking of customer care services is highly vital to troubleshoot complaints and to manage time taken for complaint resolution.

8. **Customer value propositions analytics:**

Analytics can empower operators to examine through a wide range of network performance metrics and then determine and measure network quality and the associated customer experience. To manage churn risk, analytics will enhance the operator to know the customer’s profitability index and customer life time value.

9. **Promotional strategies:**

Voice and data tariff offers and schemes have to be restyled with discriminated pricing schemes to attract the embattled segment.

10. **Social media marketing:**

To build awareness, advertisements and all sorts of promotions to be channelized through social media.

11. **Affiliate marketing:**

Online advertisements, online contests, multilevel marketing can be done through Internet services. Through this churn can be minimized since majority of the customers are Internet users.

12. **Mobile wallet services** are like a real wallet a” container” to manage financial transactions. So called m-wallets manage the flow of transactions between accounts as directed by the mobile customer. The next step is for the mobile operator to host the accounts of these third parties and to authorize transactions on their behalf. With account hosting services, the accounts are held in the name of a third-party institution that keeps the float, but account management is delegated to the mobile operator. The next level in the value chain is for the mobile transactions provider to also issue accounts where value can be stored before or after the
transaction. The mobile operator is the account issuer, and becomes a financial service provider. These are prepaid or electronic money or simply mobile accounts to basic transactional deposit accounts accessible from a mobile phone.

13. **Mobile banking:**

A mobile banking capability would be one that goes beyond making and receiving payments, enabling the end user to manage on-demand savings balances and potentially use a broader range of products that allow for safe storage of value, as well as credit and insurance.

14. **Mobile Operator Intelligence Centre:**

Operators are being impacted by regulation, technology, price and competition from low cost competitors. The Mobile Operator Intelligence Centre provides complete coverage of the strategies, tactics and trends surrounding the issues. The service includes detailed coverage of the top 40 global operating groups as well as profiles of all significant operators worldwide. The service also covers key trends in mobile telecoms and extensive KPI (Key performance Indicators) data (subscriber numbers, revenues, ARPU [Average revenue per user]) M&A (Mergers and Acquisitions), regulation, licensing and technology coverage. Hence Indian mobile operators have to update information through this Interface.

6.17 **LIMITATIONS**

The focus of the present study is on isolating psychological factors such as perception, expectation and brand loyalty. However, sociological factors, cultural factors and psychobiological factors which may have impact on the churn behaviour of the consumer are not addressed. This is being done to simplify the decision variables. The study is conducted in ten major cities in Tamil Nadu and may not be generalized for India.

6.18 **CONCLUSION**

Research was all about determinants of Customer churn behavior focusing on prepaid mobile services of Tamil Nadu. It was the process by which data from customer behavior was aggregated and analyzed to gain customer mind map, to
reduce churn. This information is used by the cellular businesses for direct marketing and customer relationship management. It plays a very important role in predicting customer behavior and shaping future customer interactions.

Present research dealt mainly composed with the age group of nineteen to thirty years with monthly income of income below 15000INR. It addressed largely with the churners those who have switched once the services within six months. Reasons for their churn being poor network coverage and detested with options and schemes of tariff plans. Majority of the respondents have churned and planned to churn Bharti Airtel and to Vodafone. Reasons for the customers to select specific operators have been identified based on the service providers and they were roaming charges, network coverage, call charges, ring tones, recharge vouchers, internet facilities and convenience in subscription for Reliance Infocomm, Bharti Airtel and BSNL. For Tata Docomo, Idea and Aircel the attributes to concentrate were accessibility, multimedia messaging, offers, GPRS and technology.

The level of customer satisfaction were identified and it was found that the mobile operators have to contemplate mainly on the accustomed services for different updated mobile phones with various i-applications and with advanced technology. Signal strength of the data card and net speed also considered as major driving factors for achieving the higher customer satisfaction.

The factors of churn were identified and they were mainly due to mobile Number Portability, Network Coverage, Compatible to use new handset and accessories, Easiness in usage, Quality of Service and Regulatory certainty and the service providers.

In order to weed out the churn and retain the customers, the major driving factors that are valued as highly important to the customers were categorized and they were the mobile phone usage and purchase of new phones with advanced technology and designs. They were giving priority to internet services and personalization-e services. In connection to this they look forward to wider coverage of network with high quality and signal strengths. Place of purchase also found to be
significant factor for the customer. They gave importance to the awareness over various schemes and services. Based on this empirical research model was designed by focusing on the key elements of marketing mix.

Thus this study identified the basic need of the customer to select particular operator and identifies the level of customer satisfaction. Then it determined the intensity of influence on churn. Reasons for churn were found to be issues related to technology based services, network coverage, net speed, complaint resolution. Based on this model was designed and strategies were devised to seize out the churn. Finally model has been developed to devise policy and strategy to minimize churn.

6.19 USEFULNESS OF STUDY

The major outcome of this study highlights the importance about the customization of mobile phones and their designs in predicting churn. It also mentions the significance of social media and affiliate marketing to control churn. Simulated mode of customer’s mind mapping on various buying attributes revitalizes the mobile operators to design the retention strategies like online catalogues, spot exchanges of mobile phones, B2C auction sites, developing customer community centers.

6.20 INDICATIONS OF FUTURE RESEARCH

After conducting the current research, still some interesting areas exist that worth to be worked on. Additionally the limitations of this study can provide us with the ideas for future researches. The followings are the further studies which can be done in the realm of this research is developed focusing mainly on Churn behaviour of customers’ postpaid mobile services. From this study it was found that there are unsought segments in services, to be tapped by the marketers the sociological, cultural and psychobiological factors of mobile subscribers can be included for further research to know their implications in the results of the churn behaviour. This study can be taken forward for the future research on all India bases for generalizing the results and to gain the benefit of the society.