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## *Predicting Switching Intentions of the Indian Mobile Consumers*

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### I. INTRODUCTION

World's second-largest telecommunications market – India has shown strong growth in the last one and half decade. Growing at 10.3% year- on year, it is expected to reach 103.9 Billion USD by the year 2020. The Indian mobile economy is growing rapidly and is expected to contribute substantially to India's Gross Domestic Product (GDP).

The liberal and reformist policies of the Government of India have been instrumental along with strong consumer demand in the rapid growth in the Indian telecom sector. The government has enabled easy market access to telecom equipment and a fair and proactive regulatory framework that has ensured availability of telecom services to consumer at affordable prices. The deregulation of Foreign Direct Investment (FDI) norms has made the sector one of the fastest growing and a top five employment opportunity generator in the country.

Driven by strong adoption of data consumption on handheld devices, the total mobile services market revenue in India is expected to touch US\$ 37 billion in 2017.

Smartphone subscription in India is expected to increase four-fold to 810 million users by 2021, while the total smartphone traffic is expected to grow 15-fold to 4.5 exabytes (EB) per month by 2021

India' has the second largest mobile subscriber base in the world. According to Telecom Regulatory Authority of India (TRAI), the total telecom subscriber base in December 2015 stood at 1.04 billion, out of which 1.01 billion were mobile subscribers and 25.52 million were wireline subscribers.

As per telecom regulatory Authority of India (TRAI), India has a wireless (or mobile) tele-density of 81.7% as on June 2016, of which the urban wireless tele-density is at 147.95% and rural wireless tele-density is at 51.19%.

More than 12 telecom operators continuously fight for the market share to sustain their subscriber base, revenue and margins.

TRAI implemented the Mobile Number Portability (MNP) in the year 2010. Through MNP, a customer could change the mobile service operator (switch to competition) without changing his/her mobile number ie the customer could retain the mobile number but choose to get the services from a different mobile service provider. In April 2016 alone 4.91 million requests were received for MNP. The total number of mobile portability request since the inception of the service stands at 214.04 million at the end of Apr-16. With the total wireless subscriber base at 1034 million subscribers, this translates to 20% of subscribers switching from their existing mobile service provider to its competitors.

Given the high churn rate, immense competition, and high acquisition costs, the best core marketing strategy in the cell phone industry now would be to try to retain existing customers by heightening customer loyalty and customer value.

Companies recognize the relevance of maintaining a solid base of loyal customers for long-term survival, growth, and financial performance (Reichheld, 1996).

## II. RESEARCH GAP

As explained earlier, the Indian telecom operator are faced with two areas of concerns – one is the large number of players and the second is a quickly saturating urban markets (penetration at 147.9%) and rural markets (penetration at 51%), making it imperative for the telecom operators to protect their market share while trying to attract new customers.

Though there are various studies conducted on customer satisfaction and factors leading to satisfaction and loyalty amongst the customers of telecom operators' customers, telecom operators would want to identify the customers intending to switch to competition and the reasons for the same.

This study attempts to create a model which will enable the telecom operator's managers to identify the switching intentions amongst the customers on the basis of what they deliver to customers ie the service delivery attributes.

## III. LITERATURE REVIEW

A review of extant pertinent literature reveals that numerous studies have been conducted by eminent researchers in the telecom sector but only limited aspects of customer switching intentions have been covered. For example, Gerpott, Rams, and Schindler (2001) showed that customer satisfaction (CS) had a significant impact on customer loyalty (CL), which in turn impacted a customer's intention to terminate/extend the contractual relationship with his mobile network operator. Further, the study demonstrated that price of mobile service and perceptions of personal service benefit were the supply-related variables with the strongest effects on network operator (Gerpott, Rams, & Schindler, 2001).

Kumar and Lim conducted study of 298 mobile phone users in United States, in two age group (college students and old age group). They observed that quality and reliability of network, billing services and customer services found to be essential attributes of service quality of mobile phone services (Kumar & Heejim, 2008)

Seth, Momaya, & Gupta, (2008) analyzed that there is relative importance of service quality attributes and showed that responsiveness is the most importance dimension followed by reliability, customer perceived network quality, assurance, convenience, empathy and tangibles. This would enable the service providers to focus their resources in the areas of importance. The research resulted in the development of a reliable and valid instrument for assessing customer perceived service quality for cellular mobile services

(Kumar, Liu, & Sengupta, 2010) looked past wireless phone technology. According to him, the first generation (1G) has fulfilled the basic mobile voice, while the second generation (2G) has introduced capacity and coverage. This is followed by the third generation (3G), which has quest for data at higher speeds to open the gates for truly "mobile broadband" experience, which will be further realized by the fourth generation (4G). The Fourth generation (4G) will provide access to wide range of telecommunication services, including advanced mobile services, supported by mobile and fixed networks, which are increasingly packet based, along with a support for low to high mobility applications and wide range of data rates, in accordance with service demands in multi-user environment.

Kumaresh & Praveena(2011), in their study on consumer switching behavior towards mobile number portability" used Factor Analysis in their research .The results revealed that promotional offers, family orientation and service affordability is the most important factor influencing the mobile subscriber intention to switch service provider. From this study most of the respondents were satisfied with the Mobile Number portability

A study on cellular mobile service providers shows that communication and price were most influential and most preferential factors in selecting telecommunication service provider. However, product availability has a significant impact on

consumer perception choice in selecting cellular mobile service provider (Parulrajan & Rajkumar, 2011). Hence indicating that the tariff rate and recharge availability play an important role in the selection and satisfaction towards a telecom operator.

#### IV. RESEARCH METHODOLOGY

The purpose of the research is to identify whether customer's perception of telecom operator's service delivery attributes is related to customer churn. Scholarly literature was reviewed to identify the factors that lead to satisfaction amongst the mobile or telecommunication customers. Further a focus group discussion was conducted to check the relevance of the factors found through literature review among the Indian mobile customers.

Through these two exercises it was found that customer satisfaction of Indian mobile customers were based on extent of network coverage, clarity of network or voice calls, internet (data) speed, availability of recharge and attractiveness of tariff plans, responsiveness of customer care executives and the availability of service centers. Details of these are given in table 1.

Table I Predicting Variables of the Study

Service delivery factors (predicting variables of the study)	Explanation
Network_coverage	It is the vastness and extensiveness of its telecom operator's network. Thereby ensuring that the mobile phone can be used across the length and breadth of the country
Network_clarity	It refer to the quality of the telecom operator's network. It is characterized with low call drops, strong signal strength and voice clarity.
Data_speed	Refers to the speed of the internet on mobile.
Recharge_availability	Refers to the ease with which recharge is available to the customer.
Tariff_plan	Refers to the attractiveness of the tariff plans of the telecom operator
Customer_care	Is the usefulness and promptness of the customer care executives
Service_center	Refers to the availability of the various service centers.

Hence these are considered as the predictor variables which may have an impact on the independent variable ie the switching intention, which the study will investigate.

Hence the hypothesis is:

H<sub>0</sub>: There is no relation between the perceptions of telecom operator's service delivery factors (network coverage, network clarity, internet speeds, availability of recharge, tariff plans, service centers and customer care service) and switching intention of the customer.

A survey approach was used for this study which collected primary data using a structured questionnaire. The population for this study is anyone who has been using mobile telephony service (of any service provider for more than a year). In the given population convenient sampling was used as the target audience was easily available and enabled timely completion of the study. Of the 220 questionnaires, 14 were deemed unusable due to missing data on key measures and hence were excluded from analysis. Hence 206 responses were found suitable for the analysis which was the final sample size. The research was conducted between August to October 2016 in the Mumbai city.

SPSS 22 was used to analyze the primary data collected. Statistical tools like cross- tabulation and discriminant analysis were used to analyze data and infer from it.

#### V. DATA ANALYSIS AND FINDINGS

Of the 206 questionnaires administered and analyzed it was found that 61% of the respondents were male and 39% were females. Majority of the respondents were in the age group of 19-30 years (77.2%) and have been availing the service of their

telecom operator for more than 3 years (54.4%). The respondents fairly represented the market share of the telecom operators in Mumbai city. There were 40% Vodafone subscribers, 31% Airtel subscribers, 10% Reliance Communications, 10% Tata Docomo, 3% MTNL and 6% other telecom operators.

To test the hypothesis of the study the data was analyzed through discriminant analysis.

A pre-requisite of the discriminant analysis is that the predicting variables need to be truly independent. Hence before undertaking the discriminant analysis, the factors of service delivery are checked for multi-collinearity.

Table II Multi-collinearity test

	Dependent Variables						
	Network_ coverage	Network_ clarity	Data_ speed	Tariff_ plans	Customer_ care	Service_ center	Recharge_ a vailability
	VIF	VIF	VIF	VIF	VIF	VIF	VIF
Network_ coverage		1.426	1.150	1.334	1.371	1.141	1.484
Network_ clarity	1.400		1.351	1.519	1.152	1.435	1.509
Data_ speed	1.497	1.205		1.160	1.481	1.521	1.566
Tariff_ plans	1.159	1.360	1.545		1.536	1.559	1.215
Customer_ care	1.359	1.546	1.155	1.412		1.184	1.349
Service_ center	1.511	1.141	1.409	1.521	1.565		1.534
Recharge_ availability	1.162	1.351	1.391	1.489	1.193	1.194	

As seen from table 2, the Variance Inflation factor (VIF) values are much below 3, and hence there is no multi-collinearity amongst the predicting variables.

Further, for discriminant analysis, the independent variable is taken as switching intention which measures the interest of the customer to switch the telecom operator or in the past at any time have initiated the process of MNP. The above mentioned predicting variables were taken as independent variables

Table 3 shows the group statistics of the predictor variables in the 2 customer groups that is the customers who do intend to change their telecom operator and those who don't.

Table III Group Statistics

Switching_ intention	Mean	Std. Deviation	Valid N (listwise)	
			Unweighted	Weighted
1.0				
Network_ coverage	3.190	.9347	79	79.000
Network_ clarity	2.734	.9158	79	79.000
Data_ speed	2.835	.8833	79	79.000
Tariff_ plans	2.646	1.1098	79	79.000
Customer_ care	2.987	.9405	79	79.000
Service_ center	2.975	1.0250	79	79.000
Recharge_ availability	3.468	1.0959	79	79.000
2.0				
Network_ coverage	3.583	.7709	127	127.000
Network_ clarity	3.787	.7520	127	127.000
Data_ speed	3.764	.7711	127	127.000
Tariff_ plans	3.346	.9031	127	127.000
Customer_ care	3.354	.9303	127	127.000
Service_ center	3.488	.9247	127	127.000
Recharge_ availability	3.898	.7952	127	127.000
Total				
Network_ coverage	3.432	.8570	206	206.000
Network_ clarity	3.383	.9645	206	206.000
Data_ speed	3.408	.9312	206	206.000
Tariff_ plans	3.078	1.0424	206	206.000
Customer_ care	3.214	.9489	206	206.000
Service_ center	3.291	.9939	206	206.000
Recharge_ availability	3.733	.9431	206	206.000

Table 3 shows difference in the means of Network\_coverage, Network\_clarity, Data\_speed, Tariff\_plans, Customer\_care, Service\_center and Recharge\_availability amongst the two groups ie. Customers who intend to switch and customer's who don't.

Further, to check the above variables are statistically significant, the table (3) of 'test of equality of group means' is analyzed.

Table IV Tests of Equality of Group Means

	Wilks' Lambda	F	df1	df2	Sig.
Network_coverage	.950	10.718	1	204	.001
Network_clarity	.717	80.638	1	204	.000
Data_speed	.764	63.065	1	204	.000
Tariff_plans	.893	24.547	1	204	.000
Customer_care	.964	7.516	1	204	.007
Service_center	.937	13.812	1	204	.000
Recharge_availability	.951	10.563	1	204	.001

Tests of Equality of Group means is used to analyze whether the mean scores of the predictor variables in the 2 groups is statistically significantly different.

From table 4, shows it is seen that the p-value for the predictor variable Network coverage, Network clarity, Data speed, Tariff\_plans, Customer\_care, Service\_center and Recharge\_availability is less than 0.05 thereby proving that the difference in the mean of all the predictor variables in the 2 groups is statistically significant.

Next the Canonical Correlation coefficient is analyzed. The canonical correlation gives the measure of association between discriminant functions and the 2 groups under study.

Table V Eigenvalues				
Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	.728 <sup>a</sup>	100.0	100.0	.649
a. First 1 canonical discriminant functions were used in the analysis.				

As observed from Table 5, the canonical correlation is high at 0.649, which indicates a strong relationship between the predictor variables and the outcome. Squaring the canonical correlation gives us the Effect size. The effect size is the quantitative measure that gives the magnitude of the actual effect of the predictors on the outcome. In this case the effect size is 0.421 implying that 42.1% of the variation in the outcome ie switching intentions are explained by the predictor variables.

Further the study evaluates the statistical significance of the prediction model. Wilk's lambda is used for this purpose.

Table VI Wilks' Lambda

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1	.579	109.721	7	.000

From table 6 it is seen that the Wilks' lambda is low at 0.579 and the p-value (0.000) is also less than 0.05 hence predictor variables predict the outcome (switching intentions) at a statistically significant level.

Table VII Standardized Canonical Discriminant Function Coefficients

	Function
	1
Network_coverage	-.111
Network_clarity	.757
Data_speed	.431
Tariff_plans	.497
Customer_care	-.021
Service_center	-.049
Recharge_availability	.035

Table 7 indicates that network\_clarity (0.757) has the highest predicting capability followed by Tariff\_plans (0.497) and Data\_speed (0.431).

Using the Canonical Discriminant Function coefficients as given in table 7, the discriminant model is created

Table VIII Canonical Discriminant Function Coefficients

	Function
	1
Network_coverage	-.133
Network_clarity	.925
Data_speed	.528
Tariff_plans	.504
Customer_care	-.023
Service_center	-.050
Recharge_availability	.038
(Constant)	-5.925

Unstandardized coefficients

Hence the discriminant model that predicts the outcome of switching intention is

$$Z = -5.925 - 0.133(\text{Network\_coverage}) + 0.925(\text{Network\_clarity}) + 0.528(\text{Data\_speed}) + 0.504(\text{Tariff\_plans}) - 0.023(\text{Customer\_care}) - 0.050(\text{Service\_center}) + 0.038(\text{Recharge\_availability})$$

This model tells us that the customers's switching intention can be predicted using the perception that the customer has of the predictor variables. Of the seven predictor variables Network\_clarity, Data\_speed and Tariff\_plans have the maximum influence and customer\_care has the least.

The accuracy of the prediction model is analyzed through Table 8 which shows the Classification Results.

Table IX Classification Results

		Switching_intention	Predicted Group Membership		Total
			1.0	2.0	
Original	Count	Switch	55	24	79
		Don't_switch	10	117	127
	%	Switch	69.6	30.4	100.0
		Don't_switch	7.9	92.1	100.0
Cross-validated <sup>b</sup>	Count	Switch	55	24	79
		Don't_switch	15	112	127
	%	Switch	69.6	30.4	100.0
		Don't_switch	11.8	88.2	100.0

a. 83.5% of original grouped cases correctly classified.

- b. Cross validation is done only for those cases in the analysis. In cross validation, each case is classified by the functions derived from all cases other than that case.
- c. 81.1% of cross-validated grouped cases correctly classified.

From Table 9, it is observed that the hit ratio is very high at 83.5%. Hence the model is very good. The cross-validated grouped cases is 81.1% and hence the Classification result is correct and significant.

Using the prediction model, we could correctly predict 69.6% of customers who want to switch to ad different operator (ie have strong switching intention) and 88% of customer who do not want to switch to another telecom operator.

## VI. CONCLUSION AND DISCUSSION

The findings of this study provide some insights into variables that influence the behavior of the customer to change to different telecom operator or not. Network\_coverage, Network\_clarity, Data\_speed, Tariff\_plans, Customer\_care, Service\_center and Recharge\_availability are the factors which discriminate/ divides between the customers who would want to churn to competition and those who would not. These factors are important for the Indian telecom operators, who in the current competitive landscape are striving to retain their customers.

The study proposes a model that can predict the intentions of the customer to churn to another telecom operator given the customer's perceptions on critical service delivery factors mentioned above.

By order of importance, in order to focus on customer who intend to switch, the telecom operators will have to primarily focus on the network clarity component. This means that the customers should experience little or no call drops, the voice received during the call should be clear without any disturbances and the signal strength should be strong. This implies that the telecom operators need to invest in the hardware and software components that makeup the network infrastructure to make the robust.

The second criterion that discriminates the customer's switching intention is the tariff plans. Tariff plans dictate the price the customer pays for making a call, sending a SMS or browsing the internet. The Indian subscriber is an extremely price conscious customer. It is easy for the customer to make direct comparison of tariff plans across operators and would like to use the services of the mobile operators which is delivering the maximum value for the same price. Hence to prevent switching the telecom operators needs to price its service such that it has perception of equality when compared to other operators.

By order of importance the third criteria that discriminates the customer's switching intention is the data speeds. Data speeds refer to the upload and download speeds of the internet on the mobile device. It is usually measured at bits/ second or kilobits/ second. Given that India is the third largest market of internet users, with more penetration of the internet usage on the mobile device than the personal computer, data speeds are critical for good customer experience. Telecom operators need to have uncluttered network to optimum speeds.

The other factors like the easy access to service centers, responsiveness of call centers are less important than the factors mentioned above in driving customer stickiness. The reason being that these are infrequently used, only in case of service delivery failure. However it is only in those situations that the criticality of these factors are appreciated by the customers and hence cannot be ignored.

## VII. MANAGERIAL IMPLICATIONS

With the urban wireless tele-density is at 147.95% and rural wireless tele-density is at 51.19%, growth in market share is not coming easily for the telecom operators in India. New entrants like JIO are promising better service and are alluring the customers with lot of freebies and offers. In this cut throat competition it is imperative that the operators do not lose customers

to competition. Operators can retain their customers only if they are aware of what causes the customers to churn- and this is very much what this study investigates.

It gives the managers a model by which they can predict whether a customer is planning to churn to competition given the customer's perception on various service delivery factors as described in the study.

### VIII. LIMITATIONS OF THE STUDY AND THE WAY FORWARD

Like most research studies, this study also has some limitations. The study was restricted in Mumbai city and hence may not be a representative of other geographical area such as rural areas. The sample size was limited to 206 respondents, a bigger sample size would provide more insights into the switching intentions of the customers.

Further studies can explore the impact of making one of the service delivery factors like data speed much more attractive than competition, keeping other constants on the customer's switching intentions.

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