

**Determinants of Mobile Number Portability – a predictive analysis on the switching intentions**

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**ABSTRACT**

**Purpose:** The mobile number has become a unique identification of number of a person, from the super market to banks, the mobile number of a person has been omnipresent for almost all kind of service. Mobile Number Portability (MNP) enables a person to switch their service providers without changing their mobile number. The objective of this research article is to identify the determinants of mobile number portability and the switching intentions of the mobile users.

**Research Methodology:** Telephonic interview was used in this research to identify the determinants of mobile number portability. A structured questionnaire was developed and the respondents were interviewed over the telephone to answer the questions in Likert's Five point Scale. Snowball sampling method was used in this research and the total number of sample respondents were 2481. The responses are collected and are analysed with the help of IBM SPSS software. The statistical tools used in this research study are simple percentage analysis and binary logistics regression.

**Findings:** The research study indicated five most important determinants for mobile number portability in case of mobile service providers namely service quality, awareness about mobile number portability, perceived usefulness and perceived ease of use, reputation and switching barriers. The relative importance of the identified determinants was also analysed and are listed in the findings section.

**Practical Implications:** The findings of the research study will have a direct implications on the telecommunication industry. The policy makers and the telecom authorities can benefit from the research study. The mobile service providers can predict the customers who have intentions to use the mobile number portability. By understanding the customers switching behaviour in advance, the mobile service providers can try retaining them with innovative retention strategies.

**Keywords:** Mobile Number Portability, Switching Intentions, predictive analysis

## 1. INTRODUCTION

The mobile number portability enables and empowers a customer to change the service provider without altering their mobile number. Mobile number portability was introduced in India in the year 2011. Before that, the mobile users have to change their mobile number in case if they are not satisfied with their mobile service providers. But after the introduction of mobile number portability, the customers enjoy the benefit of changing the mobile service provider without changing their mobile number. Before 2011, the mobile users were not given any options to use mobile number portability options. The concept of mobile number portability was introduced initially in Singapore in the year 1997 followed by England in the year 1999.

**Table 1: Table Showing Countries and the Year in which MNP was introduced**

Year	Countries Where MNP was Introduced
1997	Singapore
1999	England, Netherlands, Hong Kong
2000	Spain, Switzerland
2001	Denmark, Sweden, Norway, Portugal, Australia
2002	Italy, Belgium, Germany
2003	Finland, France, Austria, Greece
2004	Lithuanian, South Korea, Slovakia, America
2005	Czech Republic
2006	Estonia, Latvia
2008	Bulgaria, Romania, Turkey
2011	India

Mobile number portability (MNP) was introduced and have been implemented in various countries before it was introduction in India. The countries like Singapore, England, Hong Kong and Australia has introduced mobile number portability during the years 199-1997. Singapore was the first country to implement MNP in April 1997, followed by England, Netherland and Hong Kong in the year 1999. Australia introduced mobile number portability in the year 2001. United States of America introduced it in the year 2003 and South Korea announced the usage of mobile number portability to its mobile service providers in the year 2004. After that several countries started introducing the model of mobile number portability, the year of introduction of mobile number portability was listed in the table. The worldwide markets has reached a mobile penetration rate of almost 50 percent during the implementation of mobile number portability. The idea was to prevent market stagnation by urging service providers to offer more services that are competitive and compelling.

### 1.1 Need for the study:

The need for the research study is to investigate the factors influencing the Mobile Number Portability decision of the customer. The number of subscribers of mobile network has crossed 95.7 million by July 2017 and this number is in an increasing phase. The mobile service provider market is oligopolistic in nature, very few players is controlling the entire industry. The number of players in the mobile network service

provider industry can be counted with fingers namely Airtel, Aircel, Vodaphone, Idea, Tata Docomo, Jio, BSNL etc. With Airtel having a largest subscriber bases in India and the market leader. These market players to sustain in the business is following several retention strategies. In this scenario, it is important to understand the pulse of the customers and when does the spark of changing their mobile networks strike their mind. This research will provide a way to identify the important factors that influence the customers' mobile number portability.

## 2. LITERATURE REVIEW:

**Bedi (2015)** identified the antecedents of mobile number portability in the context of Indian telecommunication sector perceived value, perceived switching cost and trust has to be taken in to consideration for developing strategies for sustaining customer loyalty. Regression analysis was used to analyse the relationship among customer's perceived service quality, employee quality, trust and corporate image, switching costs, and switching intention. The author indicated that service quality, employee quality, perceived value, trust, and switching costs are the most important dimensions influencing switching intention. The dimension corporate image, was used for analysing the switching intention but the authors found that, it was not statistically significant in the purposed model. The authors concluded that the service organizations should design and implement the strategies that enhance positive behaviour of the customers and exclude negative ones.

**Ida, T. (2012)** in the article titled "Beyond mobile number portability: measuring consumer preferences for service portability in Japan's mobile phone market" identified the factors that influences the Japan's mobile phone market. As per the view of the author, the Japan's mobile phone market is an oligopolized market with three major players. These three players are seeking vertical integration business model. The vertical integration is done to prevent the competitors from using platform layers to provide original services. The authors used conjoint analysis to measure the stated preferences of the consumers. The authors found that there are several factors that trigger the mobile number portability that affect the perception of the customers.

Among the existing literature about Mobile Number Portability (MNP), the noteworthy studies are from Korean. **Kim (2005)** estimated the consumer-stated preferences for third generation services including video calling features in the mobile phone, roaming charges across the and internet based multimedia applications. The author concluded that the consumers generally valued video calling in mobile over multimedia mobile Internet.

**Kim et al. (2005)** investigated the consumer-stated preferences for future multi-use mobile terminals. The authors concluded that the consumers preferred a keyboard and a medium-sized display over the availability of various applications and quality Internet services. **Lee et al. (2006)** estimated consumer-stated preferences for Mobile Number Portability services and concluded that the cost of switching was lowered since the beginning of such services. Based on the literature reviewed the following hypothesis were made.

H1: Service Quality of the mobile service provider has a significant negative impact on mobile number portability decision

H2: Awareness about Mobile Number portability has a significant positive impact on mobile number portability decision.

H3: Reputation of the mobile service provider has a significant positive impact on mobile number portability decision.

H4: Perceived usefulness and Perceived ease of use has a significant positive impact on mobile number portability decision.

H5: Switching barrier has a significant positive impact on mobile number portability decision.

### 3. RESEARCH METHODOLOGY

Descriptive research was followed in this research study. A well-structured questionnaire was developed from the existing literature. The primary data required for the study was collected through telephonic interview method. The sample respondents are requested to spare their valuable time to answer the questionnaire and the responses were recorded by the researcher. The sample respondents were selected based on snow ball sampling method. A sample size of 2481 sample respondents were used in this research study. The collected responses were analysed using simple percentage analysis, and binomial logistic regression analysis. IBM- SPSS 21.0 was used in this research study for statistical analysis.

### 4. ANALYSIS

The binomial logistic regression model output of the collected data shows that there is a significant positive relationship between the variables used and the mobile number portability decision. The table 3 shows the beta coefficient, standard error, degrees of freedom, significance value and 95 percent confidence interval of the exponential of beta coefficient of the proposed model.

Stepwise regression method was followed to analyse the variables. In the step 1, one variable was used in the regression. The switching barrier and its impact on mobile number portability decision was analysed in first step of the regression. The one variable predictor model with switching barrier as an independent variable showed significant negative impact on the mobile number portability decision. In the second step of regression analysis one more variable was named awareness about mobile number portability was included, hence the new regression model now consist of two predictor variables, the model showed 0.1 percent level of significant, similarly in each and every step a predictor variable was included and the significance of the model was tested. In step 5, five predictor variables were included and the model was found to be highly significant at 0.1 percent level. The lower and upper confidence limits were also under the accepted threshold limits. From the results of stepwise binary logistics regression it can be concluded that, the overall model is statistically significant and the beta coefficients of the independent variables can be used for prediction.

**Table 2: Table Showing the Regression results and significance value of the Model**

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		B	S.E.	Df	Sig.	95% C.I. for EXP(B)	
						Lower	Upper
Step 1 <sup>a</sup>	SwchBar	-.002	.000	1	.000	1.000	1.000
Step 2 <sup>b</sup>	Awareness	1.253	.161	1	.000	2.555	4.801
	SwchBar	.130	.000	1	.000	1.000	1.000
Step 3 <sup>c</sup>	Awareness	1.315	.162	1	.000	2.713	5.118
	Reputation	-.664	.147	1	.000	1.456	2.593
	SwchBar	-.200	.000	1	.000	1.000	1.000
Step 4 <sup>d</sup>	SQ	.025	.007	1	.001	1.011	1.041
	Awareness	1.351	.165	1	.000	2.796	5.334
	Reputation	.565	.151	1	.000	1.307	2.368
	SwchBar	-.101	.000	1	.000	.999	1.000
Step 5 <sup>e</sup>	SQ	-.040	.008	1	.000	1.025	1.058
	Awareness	1.275	.166	1	.000	2.586	4.954
	Reputation	.531	.152	1	.000	1.263	2.293
	PUPE	.273	.057	1	.000	.680	.852
	SwchBar	-.381	.000	1	.000	.951	.999

To identify the relative importance of the independent variables, the change in log likelihood ratio of the model was calculated. The absence of the predictor variable in and its impact on the likelihood ratio was calculated. In the initial step the constant only model (dumb model) was in a position to 1050 percent of variance in the mobile number portability decision, whereas the absence of the predictor variable switching barrier reduced the likelihood by 669.16 points. Thus in each and every step the absence of the predictor variable and its impact on the likelihood of the model was analysed in the final step the absence of switching barrier reduced the likelihood value by 130 points, the absence of awareness about the mobile number portability reduced the likelihood value by 57.64 points, the absence of service quality reduced the likelihood by 57.604 points, the absence of perceived usefulness and perceived ease of used reduced the likelihood by 24.8 basis points and the reputation of the mobile service provider reduced the likelihood by 11.796 points. Hence it can be inferred that the relatively important independent variables in predicting the mobile number portability are switching barriers, awareness about mobile number portability and service quality of the mobile service providers.

**Table 3: Showing the Log Likelihood of the Model if the term is removed**

Variable		Model Log Likelihood	Change in -2 Log Likelihood	df	Sig. of the Change
Step 1	SwchBar	-1719.698	669.169	1	.000
Step 2	Awareness	-1382.128	58.766	1	.000
	SwchBar	-1719.653	733.816	1	.000
Step 3	Awareness	-1374.947	63.845	1	.000
	Reputation	-1352.754	19.458	1	.000
	SwchBar	-1715.506	744.962	1	.000
Step 4	SQ	-1343.033	11.508	1	.001
	Awareness	-1370.009	65.461	1	.000
	Reputation	-1343.987	13.416	1	.000
	SwchBar	-1394.078	113.597	1	.000
Step 5	SQ	-1337.392	24.904	1	.000
	Awareness	-1353.742	57.604	1	.000
	Reputation	-1330.838	11.796	1	.001
	PUPE	-1337.340	24.800	1	.000
	SwchBar	-1390.010	130.141	1	.000

From the results of binomial regression it was found that the hypothesis H1, H2, H3, H4 and H5 are supported. Thus it can be inferred from the findings that the service quality of the mobile service providers has a negative impact on the mobile number portability decisions of the customers. The awareness about the mobile number portability has a positive impact on the mobile number portability decisions. The reputation of the mobile service provider has a positive impact on the mobile number portability decisions of the customers. The perceived usefulness and the perceived ease of use of the closest alternative mobile service provider or the competitor has a positive influence on the mobile number portability decision. Switching barrier has a negative impact on the mobile number portability decisions.

**Table 4: Table showing the stated hypothesis and the final results**

Hypothesis		P Value	Decision (Supported/ Not Supported)
H1	Service Quality of the mobile service provider has a negative relationship with mobile number portability decision.	0.000	Supported
H2	Awareness about MNP has a strong positive relationship with mobile number portability decision	0.000	Supported
H3	Reputation of the mobile service provider has a strong negative impact on mobile number portability decision	0.000	Supported
H4	Perceived usefulness and perceived ease of use has a significant positive impact on mobile number portability decision	0.000	Supported
H5	Switching barrier has a negative impact on mobile number portability decision.	0.000	Supported

## 5. FINDINGS

From the detailed analysis of the primary data collected from 2481 mobile service users it was clear that, the switching barriers has a strong influence on the mobile number portability decision. The mobile service providers can make use of this to formulate strategies to retain their existing customers. The mobile service providers to prevent customer spill over to other service providers has started introducing plans that attract the customers and retain them for a foreseeable time period. The next important factor that determine the mobile number portability decision is the awareness about the mobile number portability, customers are now well informed and have gained stronger bargaining power. This seamless flow of information has made the customers to have awareness not only just about the mobile service providers they are using but also other mobile service providers. Therefore the customers have the higher hand in choosing the optimal service available in the industry. The factors service quality and perceived usefulness have almost similar change in log likelihood ratio when they are removed from the overall model. In the context of practicality both the factors are equally important. The perceived usefulness and perceived ease of use in the minds of the customers play a significant role while deciding to move for mobile number portability. Therefore the companies should advertise the usefulness and the ease of use of their mobile service, in order to occupy the top of mind awareness of the customers.

The classification table for one factor model, two factor model, three factor model, four factor model and five factor model is shown in the classification table as step 1, step 2, step 3, step 4 and step 5 respectively. The '0' is coded as not using mobile number portability and '1' is coded as used mobile number portability. The confusion matrix in the classification table explains the observed and the predicted customers who

used mobile number portability (1's) and who did not use mobile number portability (0's). The overall accuracy of the model increases in each and every step by adding one more factor in the model. The overall accuracy of the one factor model is 72 percent and the overall accuracy of the five factor model was found to be 91.65 percent.

**Table 5: Classification table for stepwise regression models**

	Observed		Predicted		
			MNP		Percentage Correct
			0	1	
Step 1	MNP	0	1788	0	100
		1	693	0	0
	Overall Percentage				61.24
Step 2	MNP	0	1722	66	96.3
		1	416	277	40.0
	Overall Percentage				80.6
Step 3	MNP	0	1731	57	96.8
		1	361	332	47.9
	Overall Percentage				83.2
Step 4	MNP	0	1780	8	99.6
		1	243	450	65.0
	Overall Percentage				89.9
Step 5	MNP	0	1788	0	100
		1	207	486	70.1
	Overall Percentage				91.65
a. The cut value is .500					

The accuracy in predicting the customers who will not use mobile number portability (0's) was found to be 100 percent. Whereas the final model accurately predicted 70.1 percent of the customers who use the mobile number portability, the remaining 29.9 percent of the customers might have chosen mobile number portability other than the stated reasons like service quality, perceived ease of use and perceived usefulness, reputation, switching barriers and awareness.

## 6. SUGGESTIONS

The mobile service providers should take utmost care of the quality of service delivered to the customers in order to avoid them using mobile number portability. If the companies can deliver superior service quality, their customers will spread a positive word of mouth, which in turn will increase the business for the mobile service providers.

The mobile service providers has to improve their reputation and build trust in the minds of the customers. Loss of signal, cross talk, inappropriate answers given by the customer service executives will largely affect the reputation of the mobile service providers, hence they need to take care of the reputation and relationship building activities.



Switching barrier was found to be the most influencing factor in determining the mobile number portability decisions, the mobile service providers has to constantly impose barriers to retain their customers. The relationship building strategies, pride of ownership, usefulness of owning the brand, ease of use of the mobile service, offers, discounts, competitor analysis and making moves appropriate with the competition, will help business to sustain and flourish in the business.

## 7. LIMITATIONS AND SCOPE FOR FURTHER RESEARCH

The research study is conducted at a limited time interval for a period of six months, hence it may have temporal limitations. The results of the research study are limited to the statistical tools used. The primary statistical tool used in the research is binary logistic regression hence the results of the research study is limited to the binary logistic regression.

Further research can be carried out in this research based on the data available from the mobile service providers. They have a better access to the customers' data and can be easily used for getting business insights. The retail shop keepers providing SIM cards and the executives of mobile service providers can be interviewed and valuable insights can be obtained from them by analysing the collected data, thus a 360 degree view point about the issue can provide better insights to the mobile number portability issue.

## 8. CONCLUSION

The research was carried out to explore the following objectives.

- To investigate the factors influencing the mobile number portability decision in the minds of the customers
- To identify the relative importance of the factors influencing mobile number portability decision of the customers.

The research study has successfully identified the factors that influence the mobile number portability decision of the customers and the switching barrier was found to be the relatively important factor that help retaining the customers.

The findings of the research study will have a direct implication on the telecommunication industry. The policy makers and the telecom authorities can benefit from the research study. The mobile service providers can predict the customers who have intentions to use the mobile number portability. By understanding the customers switching behaviour in advance, the mobile service providers can try retaining them with innovative retention strategies.

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