

MOBILE NUMBER PORTABILITY IN COIMBATORE: AN EMPIRICAL ANALYSIS OF CONSUMER SWITCHING BEHAVIOR

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ABSTRACT

Indian mobile market is one of the fastest growing markets and is forecasted to reach 868.47 million users by 2013. India has seen rapid increase in the number of players which caused the tariff rates to hit an all time low. This allowed the players to target the low income population thereby increasing the market share. The availability of a number of subscriber options for consumers and varied tariff rates of each player, lead the consumers to switch between service providers. Mobile number portability permits to a mobile subscriber to switch operators without changing his/her telephone number. This study focuses on the mobile number portability among the mobile users in Coimbatore.

Mobile number portability is now a crucial issue for mobile service providers. The most challenging job for the present day is that retain existing mobile customers. The mobile operator's ability to retain its customer has a direct impact on its profitability and effectiveness. Losing a customer will affect the mobile operators in terms of cost. Percentage analysis, Garrett ranking and Factor Analysis were used for this research. The findings have revealed that Promotional offers and Service Affordability is the most important factor influencing the mobile subscriber Intention to switch service provider compared to Service Quality. From this study most of the respondents were satisfied with the Mobile Number portability.

Keywords: *Mobile Number Portability, Switching Behaviour, Service, Customer satisfaction.*

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INTRODUCTION

The telecom industry is one of the fastest growing industries in India. India has about 200 million telephone lines making it the third largest network in the world after China and USA. With a growth rate of 45 per cent, Indian telecom industry has the highest growth rate in the world (www.telecommunications.com). The mobile communication plays a major role in telecommunication industry. Indian telecommunication sector is prosperous as Indian economies are considerably good. Mobile network comes under the service sector, which is experiencing a rapid development which in turn is supporting the growth in Indian economy, provides ample chances employment and self employment generation. As mobile number portability has been introduced in India, retaining existing customers is now a very tough job for network providers. After the introduction of mobile number portability in India, the mobile user's switching turnover is more. This paper brings to light the reasons behind that Mobile Number Portability on Switching Behavior-Indian Mobile Market.

Mobile Number Portability is the process by which, one can move to another operator of one's choice, but one can retain the old number. The advantage is that one need not have to go through the problem of informing all your friends & family that your number has changed - it stays the same. Subscriber can keep with the same technology, GSM/CDMA. Also shift to CDMA or vice versa. Both post-paid & prepaid subscribers can use it.

Switching behavior is a consumer behavior where the behavior of the consumers differs based on the satisfactory level of the consumers with the providers or companies. Switching behavior can be enunciated as the process of being loyal to one service and switching to another service, due to dissatisfaction or any other problems. Even if a consumer is loyal to a particular brand, if the brand does not satisfy his/her needs, the consumers switch to a competitor brand. There are different factors and determinants which affect the consumers in switching their service from one service to another. Losing a consumer is a serious setback for the firm in terms of its present and future earnings. In addition to losing the benefits discussed above, the firm needs to invest resources in attracting new consumers to replace the ones it has lost (advertising, promotion, initial discounts). Consequently, retaining the current consumer base is much more attractive and viable than searching for new consumers

History of Mobile number Portability

Globally, the introduction of MNP across markets has witnessed a mixed response from customers. The push for MNP implementation has always been led by market regulators in an effort to provide mobile customers with the freedom to move between service providers and

drive healthier competition. Globally, among the major countries, Singapore was the first to implement MNP In 1997, followed by Hong Kong, Australia, Germany, US and France etc., MNP has been introduced in India, in two phases. It has been introduced first in Indian metro city and group A telecom zones, on December 31, 2009, and afterward in the remaining part of the country, by March 20, 2010. Subscribers have to pay up all due bills before making an application for MNP. The mobile porting fee is to be paid to the latest operator. No fee payment is necessary to be given to the operator for porting. TRAI said that porting between mobile operators be supposed to be accomplished within four days. Prepaid users must keep in mind that their balance talk time and SMS will disappear if they switch to a different operator. According to the Indian telecom regulator TRAI, nearly 8.54 million subscribers were issued porting requests in the month of April 2011, an increase of 32.98% month on month. (www.mnp-india.com).

PROBLEM FOCUS

The present study seeks to examine the impact of Mobile Number Portability on mobile users Switching behavior-Indian mobile market. It aims to analyze the magnitude of mobile number portability. An attempt is also made to identify the major factors influencing the switching behavior of mobile number portability. With greater choice and increasing awareness, Indian consumers are increasingly demanding better quality of service or else switchover over to other better service. The main aim of this research is use to determine the effect of Mobile Number Portability (MNP) among the mobile users of Coimbatore.

OBJECTIVES

The general objective of the study was to find out network switching behavior of mobile users. The specific objectives of the study are to find out the factors influencing customer mobile number portability, to identify the problems encountered by the respondents to switchover another service provider and to suggest strategies to retain the customers for the service providers.

CONCEPTS AND REVIEW

Gerpott et al. (2001) investigated the structural relationships of subscriber retention, subscriber satisfaction, and loyalty in German mobile subscribers. He found that subscribers have positive impact towards the MNP.

Jeong and Park (2003) examined the difference of subscribers' switching intention before and after the introduction of MNP in Korea. He reported that brand image, price and service were major factors of MNP.

Yang and Choi (2003) identified factors of brand perceived level, service quality, a charge cut and value-added Service for the retention strategy of telecommunication carriers with MNP.

Buehler and Haucap (2004) investigated the effect on MNP implementation on consumers' welfare. They reported that MNP implementation will benefit the entrant firm and will hurt the incumbent.

Lee et al. (2004) used contingent valuation techniques to estimate the prospective demand for MNP in South Korea. They found that they have positive attitude towards the mobile number portability option.

Pagani (2004) identified the determinants of adoption of 3G mobile multimedia services and found that perceived usefulness, ease of use, price, and speed of use are the most important determinants of adoption of 3G multimedia mobile services.

Park et al. (2004) estimated the impact of MNP on the competition and social welfare and conclude that the MNP has achieved effective competition in mobile market, but MNP has not contributed to social welfare

Smura (2004) reported that MNP helps the firms to acquire new subscribers, but operators are faced with the task of having to retain their existing subscribers, which may sometimes be harder to do.

Kim (2005) estimated switching costs for customers of two of the country's mobile network operators by applying a random utility model to cross-sectional subscriber-level user data and reported that MNP reduces the switching cost in both countries.

Shin (2006) investigates the effect of MNP in the USA and reported that MNP was an important cause of decreasing switching cost.

Wu et. al., (2008) identified the behavioral Intention of 3G mobile telecommunication services has positive influence towards use behavior and Social Influence of 3G mobile telecommunication services has positive influence towards behavioral intention.

METHODOLOGY

In order to study the Mobile Number Portability in Coimbatore city, both primary and secondary data were collected. Secondary data was collected from different magazines, newspapers and government publications. For collection of primary data from respondents (customers) separate well structured interview schedule was prepared based on the objectives of the study and pretested. For this purpose 100 MNP customers randomly selected from the different mobile services in Coimbatore city. The following statistical techniques were used

to analyze the data Percentage analysis, Factor analysis, Discriminant analysis and Garrett ranking.

RESULTS AND DISCUSSION

General Profile of the Respondents

The general profile of the respondents comprises of basic details such as age, gender, family income, occupational status. The profile of the customers influences their decisions and use of Mobile Number

Table 1. Age wise distribution of the respondents

S.No	Age Group (years)	No of respondents	Percentage to total
1.	<20	3	3.00
2.	21-30	45	45.00
3.	31-40	22	22.00
4.	41-50	20	20.00
5.	>50	10	10.00
	Total	100	100.00

From the Table 1, it could be inferred that majority of the respondents (45.00 per cent) belonged to age group of 21- 30 years followed by age group of 31-40 years (22.00 per cent). Hence it could be concluded that majority of the respondents were young age and middle aged persons.

Table 2. Gender of the respondents

S.No	Gender	No of respondents	Percentage to total
1.	Male	80	80.00
2.	Female	20	20.00
	Total	100	100.00

From the above table, it revealed that 80 per cent of the respondents were male and the remaining 20 per cent were female respondents. Thus the study clearly indicates that most of the customers of MNP were male.

Table 3. Educational Status of the Respondents

S.No	Educational Status	No of Respondents	Percentage to total
1.	Illiterate	9	9.00
2.	SSLC	9	9.00
3.	HSC	10	10.00
4.	Under Graduates	23	23.00
5.	Post Graduates	32	32.00
6.	PhD	18	18.00
	Total	100	100.00

From the above table, it indicated that most of the respondents were educated. Thus the study clearly indicates that most of the MNP customers were well educated and it would be easy for the case firm to communicate to the customers regarding the promotional activities, to explain the product features and to introduce any new variety of products.

Table 4. Occupation of the respondents

S.No	Occupation	No of Respondents	Percentage to total
1.	Self employed	12	12.00
2.	House wife	7	7.00
3.	Government employee	13	13.00
4.	Private sector	26	26.00
5.	Students (unemployed)	32	32.00
6.	Farmers	10	10.00
	Total	100	100.00

From the Table 4, it is clear that majority of the respondents were students (32 percent) followed by employee in private and Govt sector. The remaining respondents were self employed, house wives and farmers.

Table 5. Monthly income of the respondent's family

S.No	Monthly Income (In Rs.)	No of Respondents	% to total
1.	<25,000	4	4.00
2.	25,001-50,000	34	34.00
3.	50,001-75,000	21	21.00
4.	75,001 – 1 lakh	20	20.00
5.	>1 lakh	13	13.00
	Total	100	100.00

Considerable respondents' were house wife and students, hence the family income of the respondents was considered for this study. Major share of the respondents (34 per cent) have a family income of Rs.25,001-50,000 per annum followed by respondents with family income of Rs. 50001-75000 (21 per cent). Thus the firm should concentrate on low income and middle income group while designing products, schemes and pricing of mobiles and services to increase customer base.

Mobile usage among the respondents

In this section brand of mobile phones used by the respondents, reasons for using mobile phones, factors influencing the purchase of mobile phones, number of connections, phone connectivity, number of calls made per day and recharge payment were discussed.

Table 6. Brand of Mobile phones used by the respondents

S.No	Brand	No of Respondents	Percentage to total
1.	Nokia	58	58.00
2.	Samsung	21	21.00
3.	Reliance	5	5.00
4.	LG	4	4.00
5.	Song Ericson	3	3.00
6.	Gfive	6	6.00
7.	Karbon	1	1.00
8.	Apple	2	2.00
	Total	100	100.00

Now a days large number of brands of mobiles are available in the market. It could be concluded that, major share of the respondents (58 per cent) were using Nokia followed by

Samsung brand (21 per cent). Other brands used by the respondents were Reliance, GFive, LG and Sony Ericson, Karbon and Apple.

Table 7. Reasons for using mobile phones

S.No	Reasons	Garrett score	Rank
1.	Personal needs	80.12	I
2.	To stay in touch while move	61.87	II
3.	Business needs	58.39	III
4.	as a substitute for land line phones	57.72	IV
5.	Emergency needs	53.76	V
6.	Influence of friends	50.06	VI
7.	Prestige	47.43	VII

Majority of the respondents were using mobile phone for their personal needs followed by to stay in touch while move, business needs, substitute of land line phones and emergency purpose.

Table 8. Factors influencing the purchase of mobile phones

S.No	Factors	Number of Respondents
1.	Price of the mobile	46
2.	Appearance of the mobile	19
3.	Advertisement	3
4.	After sales service	2
5.	Features of the mobile	31
6.	Brand name	41
7.	Warrantee	7

The reason for purchasing a particular brand of mobile is important because customers have wide variety of options to buy mobiles. Understanding the factors that influence the customers' choice of handset will enable the companies to design the handset product mix to suit customer needs. The above table showed the multiple responses of the respondents. It could be concluded that Price of the mobiles was the most important factor influencing the purchase of mobiles followed by brand name of the mobiles. Features of mobiles, Advertisement, after sales

service and warranty are the other factors that should be considered factors considered while selecting the mobile phones.

Table 9. Number of connections

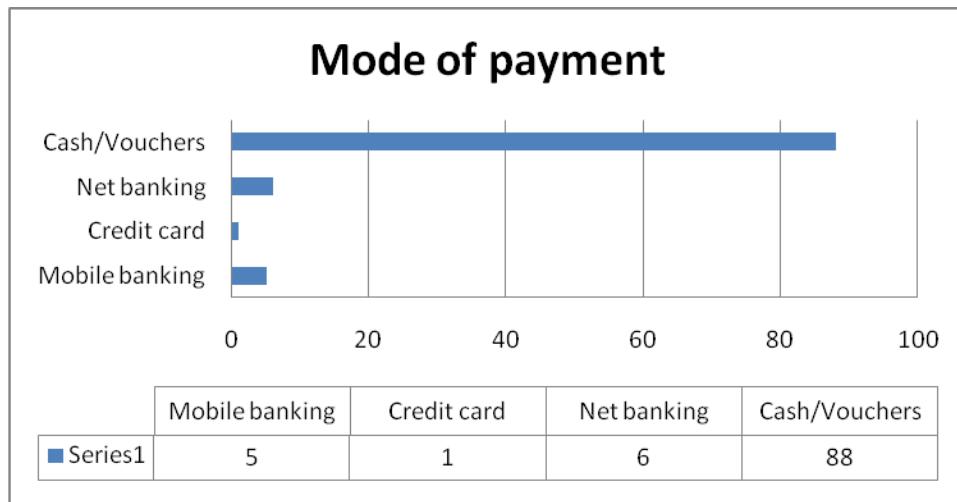
S.No	Connection	No of Respondents	Percentage to total
1.	1	70	70.00
2.	2	28	28.00
3.	3	2	2.00
	Total	100	100.00

From the above table, it could be concluded that majority of the respondents having only one connections followed by two connections. Some of the respondents were self employed and employee in private respondents.

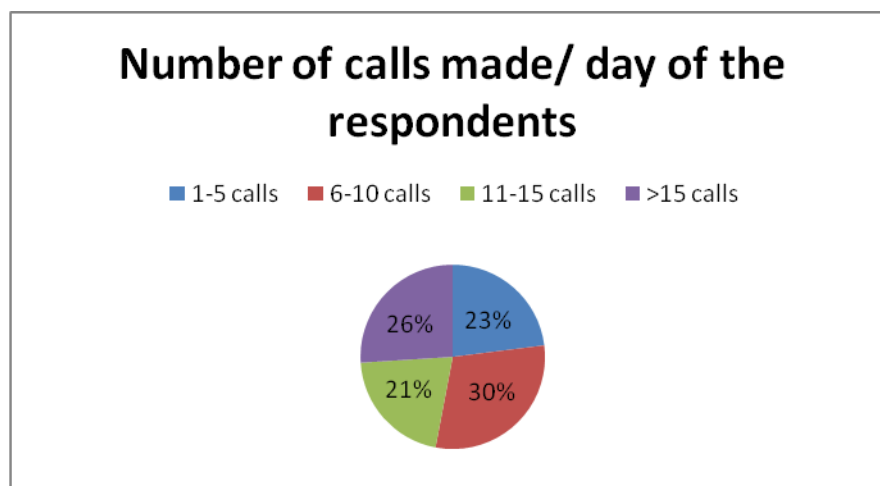
Table 10. Payment for phone connectivity

S.No	Service availed	No of Respondents	Percentage to total
1.	Prepaid	90	90.00
2.	Post paid	8	8.00
3.	Both	2	2.00
	Total	100	100.00

From the above table, Most of the respondents (90 per cent) were using prepaid service and the remaining respondents (8 percent) using post paid services. Interaction with the respondents also revealed that most of the respondents switched over from postpaid to prepaid due to billing problems. Hence the case firm should concentrate more on the billing systems to increase the number of post paid customers.

Chart 1. Mode of recharge or payment

The above graph reveals that most of the respondents using cash vouchers for their mode of recharge followed by net banking and mobile banking.

Chart 2. Number of calls made per day

Major share of the respondents (30 per cent) made 6-10 calls per day while 26 per cent of the respondents made more than 15 calls per day. This reflects the intensity of usage of mobile phones.

Table 11. Sources of information

S.No	Source of information	No of Respondents	Percentage to total
1.	Advertisement	43	43.00
2.	Relatives	13	13.00
3.	Retailers	7	7.00
4.	Friends	31	31.00

5.	Family	6	6.00
	Total	100	100.00

It is evident from the Table 11, that major share of the respondents (43 per cent) advertisements was the major source of information followed by friends, relatives and retailers. Considerable share of the respondents were aware of MNP through friends and relatives, so the case firm should provide promotions like offers and discounts for the persons who motivate their relatives and friends to subscribe their own service. The sales person also should be trained to communicate the promotions effectively to non-customers in a friendly manner and not as product pusher.

Table 12. Type of cellular service provider at present

S.No	Service provider	No of Respondents	Percentage to total
1.	Public sector (BSNL)	3	3.00
2.	Private		
	i) Airtel	34	34.00
	ii) Aircel	21	21.00
	iii) Vodafone	20	20.00
	iv) DOCOMO	22	22.00
	Total	100	100.00

From the above table it could be concluded that most of the respondents using Airtel followed by DOCOMO, Vodafone and Aircel. BSNL could take necessary steps to increase the customers and also retain the customers by providing better offers and promotions.

Table 13. Number of times ported

S.No	Port	No of Respondents	Percentage to total
1.	1	98	98.00
2.	2	2	2.00
3.	3	0	0.00
	Total	100	100.00

From the above table it could be concluded that major share of the respondents ported at one time followed by two times ported. As per TRAI regulations, the eligibility of porting times is up to four times.

Respondents' switching behavior

The respondents' switching behavior towards various services that can act as a measure of impact made by the firm in the minds of the customers. It can help the firm to frame policies towards promotional activities. Respondents' switching behavior was analyzed and the results are presented in further tables.

Table 14. Respondents' switching behavior from institutional to Noninstitutional

S.No	Switching from BSNL	Number of Respondents	Percentage to total
1	Vodafone	7	21.87
2	Airtel	10	31.25
3	Aircel	13	40.63
4	DOCOMO	2	6.25
	Total	32	100.00

The above table showed the respondents switched over from BSNL to other service provider. It could be concluded that from the institutional to non institutional category, most of the BSNL users switched over to Aircel and Airtel because of offers and promotion. Here Airtel and Aircel are the gainers. Family influence and better offers are the main reasons for switching.

Table 15. Respondents' switching behavior from Non institutional to Institutional

S.No	Switching to BSNL	Number of Respondents	Percentage to total
1	Vodafone - BSNL	2	66.67
2	Aircel - BSNL	1	33.33
	Total	3	100.00

The above table showed the respondents switched over to BSNL from other service provider. In this category, poor coverage and poor customer service are the main problems faced by the respondents to switch over to other service.

Table 16 a). Respondents' switching behavior from Non institutional to Noninstitutional

S.No	Switching from Airtel	Number of Respondents	Percentage to total
1	Airtel	3	25
2	Vodafone	4	33.33
3	DOCOMO	5	41.67
	Total	12	100.00

The above table showed the respondents switched over from Airtel to other service provider. Most of the Airtel users switched over to DOCOMO and Vodafone because of less call rate. Most of the respondents faced frequently getting advertisements, unwanted messages and calls from the Airtel service provider are problems faced by the respondents.

Table 16 b). Respondents' switching behavior from Non institutional to Noninstitutional

S.No	Switching from Airtel	Number of Respondents	Percentage to total
1	Airtel	8	36.36
2	Vodafone	6	27.28
	DOCOMO	8	36.36
	Total	22	100.00

The above table showed the respondents switched over from Airtel to other service provider. Most of the Airtel users switched over to DOCOMO and Airtel because of call rate and family influence. Most of the respondents faced poor customer service from the Airtel service provider.

Table 16 c). Respondents' switching behavior from Non institutional to Noninstitutional

S.No	Switching from Vodafone	Number of Respondents	Percentage to total
1	Airtel	6	35.30
2	Airtel	4	23.52
3	DOCOMO	7	41.18
	Total	17	

The above table showed the respondents switched over from Vodafone to other service provider. Most of the Vodafone users switched over to DOCOMO and Airtel because of good customer service. Poor coverage is the main problem faced by the respondents in Vodafone service.

Table 16 d). Respondents' switching behavior from Non institutional to Noninstitutional

S.No	Switching from	Number of Respondents	Percentage to total
1	Airtel	10	71.43
2	Aircel	1	7.14
3	Vodafone	3	21.43
	Total	14	100.00

The above table showed the respondents switched over from DOCOMO to other service provider. Most of the DOCOMO users switched over to Airtel because of less roaming charge compare with DOCOMO. Less promotion and poor coverage is the main problem faced by the respondents in Vodafone service.

Table 17. Reasons for switching behavior

S.No	Reasons	No of respondents
1	Family members	30
2	Friends	27
3	Brand image	11
4	Network coverage and strength	41
5	Rates (Call rate and message rates)	67
6	Subscription plan price	24
7	Better offers / Promotion	58
8	Better customer service	34
9	Billing	8
10	Tariff	28
11	3G technology	6

The above table showed the multiple responses of the respondents. It could be concluded that call rates were the major influencing factor to switch particular service provider followed by

better subscription plan, network coverage, better offers and promotion, influence of friends and family members.

Table 18. Influences of Brand Ambassadors for Selection of Service Provider

S.No	Reasons	No of respondents	Percentage to total
1	Strongly disagree	38	38.00
2	Disagree	21	21.00
3	Neutral	30	30.00
4	Agree	8	8.00
5	Strongly agree	3	3.00
	Total	100	100.00

From the above table it reveals that major share of the respondents disagree (59 percent) with the Influence of Brand ambassadors for selection of service provider. Nearly 30 percent of the respondents were neutral with the influence of brand ambassadors while selecting the service provider. About 11 percent of the respondents only agree with the above statement.

Factor Analysis

Factor analysis is a multivariate statistical technique used to condense and simplify the set of large number of variables to smaller number of variables called factors. This technique is helpful to identify the underlying factors that determine the relationship between the observed variables and provides an empirical classification scheme of clustering of statements called factors.

Table 19. Factor analysis total variance explained

Component	Initial Eigen Values			Rotation sum of squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7.159	34.088	34.088	3.893	18.539	18.539
2	2.431	11.577	45.665	3.524	16.829	35.368
3	1.968	9.373	55.038	2.907	13.842	49.210
4	1.647	7.841	62.874	2.217	10.557	59.769
5	1.094	7.241	70.227	1.774	8.448	68.215

6	0.804	5.203	75.430	1.514	7.215	75.430
Note: Extraction : Principal component analysis						

Principal component analysis was used for extracting factors. Among the twenty one factors six factors were retained depending on component matrix, Eigen values and scree plot. Eigen value represents the total variance explained by each factor. From the Table 19, it could be inferred that the eight statements extracted from the 21 statements are explaining more than 75 per cent of the variance in the 21 services related variables.

Table 20. Communalities

S.N	Statements	Communalities
1.	Well informed progress of action on complaint	0.713
2.	Bills are received in time	0.784
3.	Billing system accurate and error free	0.738
4.	Queries taken seriously	0.748
5.	Quick complaint resolving	0.661
6.	Friendly and politeness of staff	0.745
7.	Adequate knowledge of staff to handle queries	0.784
8.	Retailer location (distance to get cash voucher)	0.758
9.	Materials associated with service (e.g. pamphlets') are visually located	0.731
10.	Easy payment for post paid services	0.730
11.	Simple application formalities	0.655
12.	Provides sufficient geographic coverage	0.826
13.	Clear and undisturbed voice	0.717
14.	Able to make calls at peak hours	0.699
15.	STD / ISD call rate	0.835
16.	Free local SMS	0.787
17.	Booster packs/ call cutter cards	0.797
18.	Pricing structure / scheme	0.847
19.	Discounts and offers via SMS	0.820
20.	Value added services	0.541
21.	Promotion and offers	0.859
Note: Extraction method: Principal component Analysis		

The extraction communalities are given in the table 20. Small values (< 0.5) indicate variables that do not fit well in the factor solution and should possibly be dropped from the analysis. In order to reduce the number of factors and enhance interpretability, the factors are rotated. The rotation increases the quality of interpretation of the factors. There are several methods of the initial factor matrix to attain simple structure of the data. The varimax rotation is one such method to attain better result for interpretation and it was employed and the results are given in Table 20, Among the total twenty one statements included promotion and offers, pricing structure and scheme, STD / ISD rate, geographic coverage, Discounts and offers via SMS, booster packs/ call cutter cards was accounted in the 21 factors among twenty eight based on the component matrix value and communalities. Thus the factor analysis condensed and simplified the 21 statements into six statements with 75.430 percent of the variability of all the 6 statements.

The six factors identified as most important are:

- Promotion and offers
- Pricing structure and scheme
- STD / ISD rate,
- Geographic coverage
- Discounts and offers via SMS
- Booster packs/ call cutter cards

From the factor analysis it could be inferred that the six factors influence switching behavior of the respondents.

Table 25. Problems faced by the respondents in MNP

S.No	Problems	No of respondents	Percentage to total
1.	Yes	35	35.00
2.	No	65	65.00
	If Yes,		
	• Difficulty in understanding the procedure	19	19.00
	• Time consuming	16	16.00
	Sub total	35	35.00
	Total	100	100.00

From above table it could be concluded that majority of the respondents were not facing problem with MNP. Nearly 35 per cent of the respondents facing problems with MNP. In that, nearly 19 per cent of the respondents stated that difficulty in understanding the procedure as the major problem in MNP followed by time consuming (16 per cent). The case firm should concentrate more on these aspects to switch over the customers.

Table 26. Perception about the MNP among the respondents

S.No	Perception	No of respondents	Percentage to total
1	Highly satisfied	26	26.00
2	satisfied	72	72.00
3	Neutral	2	2.00
4	dissatisfied	0	0.00
5	highly dissatisfied	0	0.00
	Total	100	100.00

Most the respondents were satisfied with the Mobile number portability. About 26 percent of the respondents were highly satisfied with the MNP service. Hence efforts must be taken to improve the MNP service.

CONCLUSION AND RECOMMENDATIONS

- ◇ Most of the sample respondents belonged to the age group of 21-30 years and they were male. Majority of the respondents were graduate and students with an average family annual income of Rs.25,000 – 50,000. To attract the low income and high income group of people, the case firm should provide more schemes and offers as provided by its competitors to increase the Mobile number portability respondents.
- ◇ Considerable share of the respondents were aware of MNP through Advertisement, friends and relatives, so the case firm should provide promotions like offers and discounts for the persons who motivate their relatives and friends to avail MNP.
- ◇ Major share of the respondents stated that poor coverage and no promotion and offers as their major problem in their past service. The case firm should concentrate more on sufficient coverage.
- ◇ The sales person also should be trained to communicate the promotions effectively to non-customers in a friendly manner and not as product pusher.

- ◇ All case firms should concentrate more on the influencing aspects (ISD call rate, free local SMS, booster packs and call cutter cards) in customer point of view in order to utilize the services more.
- ◇ Considerable share of respondents were faced problems in MNP because of the procedure was so difficult and it was time consuming. Major share of the respondents were satisfied with the service provided by the present service provider.

REFERENCES

1. Buehler, S. and Haucap, J. (2004), ‘‘Mobile number portability’’, *Journal of Industry, Competition, and Trade*, Vol. 4 No. 3, pp. 223-38
2. Gerpott, T.J., Rams, W. and Schindler, A. (2001), ‘‘Subscriber retention, loyalty, and satisfaction in the German mobile cellular telecommunications market’’, *Telecommunications Policy*, Vol. 25 No. 4, pp. 249-69.
3. Jeong, J.H. and Park, M.C. (2003), ‘‘A study on service churning intention in Korean mobile communication industry: impact of mobile number portability’’, *JCCI 2003*, 2003.4.
4. Kim, J. (2005), ‘‘The effect of mobile number portability on switching costs in the telecommunication industry’’, paper presented at the University of Wisconsin-Madison, Department of Economics Workshop, 19 October, available at: www.ssc.wisc.edu/econ/workshop/switching_percent20costs.pdf
5. Lee, S.-W., Kim, D.J. and Park, M.-C. (2004), ‘‘Demand for number portability in the Korean mobile telecom market’’, *Proceedings of the 37th Hawaii International Conference on System Sciences*
6. Pagani, M. (2004): Determinants of adoption of Third Generation mobile multimedia services, *Journal of Interactive Marketing*, 18(3)
7. Shin, D. (2006), ‘‘A study of mobile number portability effects in the United States’’, *Telematics and Informatics*, Vol. 24 No. 1, pp. 1-14.
8. Smura (2004), Mobile number portability: Case in Finland, *Journal of Arts, Science & Commerce*, Vol. II(4), 200-205.
9. Yang, H.T. and Choi, M.K. (2003), ‘‘Study on customer retention strategies for the wireless telecommunication service providers at the introduction of MNP’’, *Journal of Korean Institute of Communication Sciences*, Vol. 28 No. 2B, pp. 157-69.
10. Wu, Y. L., Tao, Y., and Yang, P. C. (2008): The use of unified theory of acceptance and use of technology to confer the behavioral model of 3G mobile

telecommunication users, *Journal of Statistics and Management Systems*, 11(5): 919–949 c’Taru Publications

11. www.telecommunications.com

12. www.mnp-india.com