REVIEW OF LITERATURE

Mobile number portability in India is relatively newer phenomenon. The world has been experiencing the impact of this technology for some time. There have been number of studies which have direct or indirect effect on this research. The purpose of this chapter was to look for previous studies and models and try to find the basic parameters for this study.

The current chapter is being divided into different sections. The first section deals with introducing the present telecom scenario in India. This will deal with mobile number portability, as a recent development which has brought a set of new challenges and opportunities for the sector. The second section brings forth the subscriber churn as a vital factor in the present-day game plan for the firms operating in this industry. This will explain the present model of subscriber churn and experience of mobile number portability as a catalyst through the world. The third section will attempt to understand the factors as observed by different studies, which form the basis for or a precursor to the customer leaving the network. The last section shall consider other relevant factors that influence decision making in customer.

Mobile number portability in India

MNP came into force in all telecom service areas in the country on 20th January 2011 (TRAI, 2012). Mobile number portability (MNP) refers to the ability of mobile phone users to retain their mobile numbers when changing from one network operator to another in the same circle. Mobile Number Portability (MNP) was introduced in Haryana in December 2010 and
thereafter introduced across India in January 2011. With the implementation of MNP, subscribers get a larger choice and are being able to switch between service providers easily.

Donor led MNP has been launched using Unique Porting Code in India. The process of portability in India is fairly simple. At present one can avail this service of changing operators within the same circle. India has been divided into telecom circles, largely on the basis of statehood.

As per (TRAI, 2012)⁴⁶, If a customer wants to shift from service provider inside the circle, he is required to send an SMS to 1900 by typing PORT (his ten digit mobile number). After sending he receives a Unique porting code (UPC) from 1901 which is of eight digit alpha numeric code with an expiry date. He has to provide UPC to next operator to start process.

The charges for process are ₹19 process may take up to seven working days and there can be a “No Service Gap” of two hours (mainly between 12:00 AM to 5:00 AM) after which he has to replace the old SIM with new SIM.

**Mobile number portability (MNP)**

(Buehler & Haucap, 2004)⁵ examined the consequences of introducing mobile number portability (MNP). They found that MNP leads to abolishment of switching costs, and hence is good thing for customers. As telephone numbers no longer identify networks MNP may result in consumer ignorance. They also discussed role of termination charges on customer bills.
(Shi, Chiang, & Rhee, 2006) explained wireless number portability (WNP) (MNP in present context) is a telecommunication regulatory policy that requires cellular phone service providers to allow customers who switch service subscriptions to retain their original phone numbers. They found that MNP leads to lowering of the switching cost for a consumer. Thus, the aim of the policy is to have fair competition with level playing ground for smaller service providers. They found the policy may result in market concentration due to the discriminatory pricing scheme for the calls connected across two networks. Consumers who subscribes to an operator with larger subscriber base would stand to gain. By lowering the barrier of switching, WNP/MNP creates a market condition conducive for a larger network to gain market share. The study was done in Hong Kong where WNP was adopted in March 1999.

Telephone numbers, specifically which are ported do not identify the network it belongs to, though the difference is small in terms of call pricing i.e. the calls terminating within same network are lower priced as compared to calls terminating in different network. This has a negative net effect on the surplus of mobile customers (Kisioglu & Topcu, 2011). Though it is technologically possible there is no consensus among the operators to identify the network in India. In general large operators are against it because they tend to lose on discriminatory termination charges.

(Buehler, Dewenter, & Haucap, 2006) also examined the causes and effects of mobile number portability and provided a survey of its implementation in Europe. Competitive effects, costs of introducing MNP
and charges were examined. Differences in the porting process influence the use of MNP across countries.

MNP in India has been launched after lots of delays. Regulators did quite a bit of brainstorming on price caps and speed of porting. There was no consensus on porting charges with certain operators wanting them quite high as per their communications with TRAI. The regulators stuck on charges which were low and in time period which was reasonable (internationally time periods can be very low), the major impediment was removed as to facilitate the portability.

Though there is vast difference between demographic scenario in India and USA, certain studies need to be referred to. In one such study which (Dong Hee, 2007) conducted on a sample of 684 mobile subscribers in the USA, focused on subscribers' perceptions and behaviours on MNP. The number portability was made mandatory to wireless carriers as FCC believed it to be positive for customer benefits through increased competition in the industry. Subscribers perceived switching barrier to be high in this research, discouraging subscribers from porting. Operators developed new subscriber lock-in strategies that make subscribers stay with them. While there are costs despite MNP that subscribers get burdened with while number porting e.g. recharge is non-transferable (in India). MNP is upheld by subscribers' burden and not carriers or regulators. The findings imply that MNP has affected industries more than subscribers.
One area where Indian Telecom industry has it different from the
global perspective is that subscriber who gets locked in via handsets tied to
plan is a very small segment. Number alone was the major obstacle towards
churn. There are little other hidden costs.

(Shin & Kim, 2008)\textsuperscript{41} investigated switching barriers under the mobile
number portability (MNP) in the U.S. mobile market. In USA's context
Customer satisfactions, switching barriers, and demographics significantly
affect subscribers' intent to switch with lower switching costs and increased
competition among providers.

Mobile number portability in India has effectively ended the switching
cost related with loss of business or social contacts. Hence areas like service
quality, customer satisfaction and related factors would come to the fore
determining the need to churn.

(Shi, Zhou, & Liu, 2010)\textsuperscript{40} reviewed the implementation of mobile
number portability (MNP) in global context. The authors found that
influencing factors of users' switching intention in China has an analogous
situation with Korea having same MNP policy. The results of this research
showed that customer satisfaction and switching costs have significant
effects on users' porting behaviour.

**Customer Churn**

In a basic research on pricing (Morris & Joyce, 1988)\textsuperscript{31} examined the
nature and importance of demand elasticity as a factor when setting
industrial prices. They investigated perceptions of marketing managers
regarding the customer awareness levels and price sensitivities. As per study sensitivity to price is vital but generally ignored by companies.

(Keaveney & Parthasarathy, 2001)\textsuperscript{20} found that there is unprecedented growth in Internet users worldwide which is resulting in exponential growth in the online services industry. Customer churn i.e. switching behaviour in service industry segments customers between continuers and switchers. Behavioural, attitudinal and demographic (income and education) factors are constructs which determine the segments a service user belongs to.

In an unrelated study to telecom (Gao, 2005)\textsuperscript{11} found out attributes of trust by studying factors influencing user trust in online games. Factor analysis lead them to conclude that user trust can be built through paying attention to building brand recognition, enhancing usability and appeal, as well as providing assurance within the interaction.

A path breaking research by (Ruta, Nauck, & Azvine, 2006)\textsuperscript{37} has shown that “in telecom industry high installation and marketing costs make it between six to ten times more expensive to acquire a new customer than it is to retain the existing one”. One of major goals hence for telecom industry is prediction and prevention of customer churn. They emphasised that it is not just classifying customers into churners or non-churners but also taking into account the timing of churn event as pre-requisite for churn management.

According to (Hung, Yen, & Wang, 2006)\textsuperscript{17}, Taiwan deregulated its wireless telecommunication services in 1997. Churn management i.e.
mobile operators wanting to retain subscribers via satisfying their needs under resource constraints becomes a key priority. This can be dealt via churn prediction. Empirical evidence from data mining techniques was used to assign a 'propensity-to-churn' score periodically to all subscribers of a mobile operator. The results indicated good models based on decision tree and neural network techniques by using customer demographics, billing information, contract/service status, call detail records, and service change log.

(Gopal & Meher, 2008)\textsuperscript{13} considered customer churn to be a core issue in telecommunication customer relationship management (CRM). Predictions of churn for retention strategies require customer tenure as a major ingredient. Study found that tenure prediction - survival analysis can be done via ordinal regression.

(Kazienko, Bródka, & Ruta, 2009)\textsuperscript{18} reiterated that mobile subscribers “implicitly create an interactive social network of individuals, which both depend on and influence each other through various complex social relationships grown on friendship, shared interests, locality, etc”. Customer churn and acquisition was examined from social neighbourhood effects dimension. The basic assumption made was that a value loss or gain of a subscriber addition or loss extends beyond the revenue stream.

(Polo & Sesé, 2009)\textsuperscript{34} discovered that customer switching costs have emerged as one of the fundamental drivers of customer retention in Ireland. The study investigated the determinants of switching costs remains in terms
of marketing variables i.e. price, advertising, and relationship characteristics. It was found on using a hierarchical Bayes approach that by using price and advertising corporates were able to create switching barriers for customers. This research pointed out the pivotal role played by competitors’ marketing actions in affecting the switching costs.

As per (Liao & Chueh, 2011) Customers tend to change telecommunications service providers for better price plans. The study is directed at finding marketing activities directed at proactively encountering churn. Fuzzy data mining methods were used to control the rate of customer turnover and find fitting policies customised for various customer groups.

**Determinants Causing Subscriber Churn**

(Keaveney, 1995) established that Customer switching behaviour damages market share and profitability of service firms. Researching a critical incident among more than 500 service customers, the authors identified more than 800 critical behaviours of corporates that made customers leave the services. Customers' reasons for defection were classified into eight general categories, varying from demographic to attitudinal.

(Swait & Sweeney, 2000) found that value has been widely portrayed by retailers as a major determinant in consumers’ store selection and product purchase decisions. Observing the impact of consumers' perceived value on the attitude to purchase and resulting behaviour they found
consumers’ value orientation i.e., their predisposition towards quality and price actually affects their choice behaviour in-store. The buying of products from a specific retailer is associated with the consumer’s demographics. This analysis was based on a survey of over 1000 shoppers actively searching for an electrical appliance in different retail stores.

(Nguyen & Leblanc, 2001) argued that in the present competitive environment, corporate reputation and corporate image can exhibit a strong influence on customer loyalty toward the firm. Data was collected from three service industries including 171 clients of a major long-distance company towards exploring the nature of the relationship between corporate reputation and corporate image and their impact on the customers’ retention. The study found that the higher customer loyalty follows positive perceptions of corporate reputation and corporate image.

(Gerpott, Rams, & Schindler, 2001) in their study discovered that customer retention, customer loyalty, and customer satisfaction were set as objectives by telecommunication network operators in German market. Data from a sample of 684 subscribers resulted in revealing that customer retention, customer loyalty, and customer satisfaction could be treated as causally inter-linked constructs. Customer satisfaction had a significant impact on customer loyalty which had an impact on customer’s decision making regarding his stay with mobile cellular network operator. Price sensitivity’s perceptions combined with mobile number portability between various cellular operators were identified as supply-related variables with
the strongest effects on customer retention, while customer care had no significant impact on customer retention.

(Kim & Yoon, 2004) used a binomial logit model to find the determinants of subscriber churn and customer loyalty in the Korean mobile telephony market. Level of satisfaction, call quality, tariff level, handsets, brand image, income, and tenure were determinants influencing the switching behaviour. Good call quality and brand image made customers brand evangelists. Study also found "spuriously loyal" customers who were staying with present provider just because of switching costs.

(Pura, 2005) analyzed the direct effect of perceived value dimensions (monetary, convenience, social, emotional, conditional and epistemic value) on attitudinal and behavioural components of loyalty and commitment. The study emphasised the role played by spontaneity and situational needs, which many times overpowered monetary value. Marketing tactics could use the context, convenience or emotional value in telecom.

(Malthouse & Blattberg, 2005) researched into relationship marketing in service industry context. Assuming that firms profitability rests on higher revenue providing customers and hence there is need to invest disproportionate marketing resources in them. This strongly depends upon classification on basis of future profitability of customers. They examined the costs of misclassification and accuracy of predictions. They found that methods were not fool proof to judge future value of customers on historical revenue basis.
(Ranganathan, Seo, & Babad, 2006) discovered that subscriber churn had become a critical issue for telecom operators. Studying customers with no contractual obligations they studied demographics correlation with their switching behaviour, based on data on over 30,000 mobile users. This data mining exercise resulted in discovering significant associations between mobile users and their service usage, service bundling and their switching behaviour. Age and gender were also seen impacting the subscriber churn.

(Aydin, zer, & khan, 2006), found that both academics and practitioners agree to the strategic role played by cost of customer switching. Towards their effort to conceptualise and measure customer switching costs, they used different sub-constructs of customer switching and analysed relationships among them with customer loyalty, customer satisfaction and trust. They found statistically significant relationships among variables and sub constructs of switching costs.

(Turel, Serenko, & Bontis, 2007) argued that mobile value-added services (VAS), such as short messaging services (SMS) or other pay-per-use services, should not be ignored. Perceived value of VAS and SMS was found to be determinants of behavioural intentions. Technology adoption was discovered to be driven by price along with value trade-offs of social, emotional and quality factors.

(Yi, Sanguansintukul, & Lursinsap, 2008) deliberated on treatment of the customer in order to earn his loyalty. They underlined relationship
management as an issue in the wireless industry. They reiterated that measurement and management of customer lifetime value (CLV)'s plays a critical role in retaining the right customer in telecommunication industry.

(Turel & Serenko, 47 in 2008 outlined the role played by customer satisfaction and loyalty as factors with respect to mobile telecommunications services. User satisfaction and loyalty were found to be significant for all mobile stakeholders. A general standard measure of satisfaction with mobile services was adapted from the American Customer Satisfaction Model.

In (Sweeney & Swait, 2008)45 were of the opinion that customer churn is critical in the relational services sector (e.g., retail banking, telecommunications), where profitability in industry depends upon customer retention. Credibility of the brand depends upon service quality and other tools of customer relationship management which leads to customer retention. Commitment and word-of-mouth resulting from brand goodwill help reduce switching behaviours among customers.

(Seo, Ranganathan, & Babad, 38(2008), found that the competition in the mobile telecom has increased the cost effectiveness of retaining current customers in USA. Mobile services are not a one-time sale like commodity products but continuous services, service providers can offer additional services over the length of a customer's tenure to increase customer loyalty. The study referred to factors such as length of association, service plan complexity, quality of connectivity that affect switching costs and customer
satisfaction. Customer retention also depends upon demographics, service plan complexity and handset sophistication.

(Blattberg, Malthouse, & Neslin, 2009)\(^3\) discovered that Customer Lifetime Value though difficult to forecast can be a major determinant in profitability. They established by their study that customer satisfaction, marketing efforts, cross-buying and multichannel purchasing all have positive relationships with Customer Lifetime Value. Effects of pricing, earned rewards and promotions were also weakly associated with Customer Lifetime Value.

(Maicas, Polo, & Javier Sese, 2009)\(^28\) found that MNP adoption partially depends on customer-related variables. Switching costs impact market competition leading to change in prices, service quality, and customer welfare. Because of negative impact, national regulatory authorities design policies aimed at reducing switching costs and fostering competition, MNP being significant among them. They investigated the effect of MNP on switching costs using a hierarchical Bayes model. A model explaining MNP adoption by customers using a binary logit specification was proposed in mobile phone services.

(Kuo, Wu, & Deng, 2009)\(^24\) constructed an instrument to evaluate service quality of mobile value-added services. The relationships among service quality, perceived value, customer satisfaction, and post-purchase intention was analysed using structural equation modeling and multiple regression. This Taiwan based study found positive associations between
service quality, perceived value and customer satisfaction and post-purchase intention in mobile value added services.

(Liu, Guo, & Lee, 2011) reiterated that the cost of attracting new customers is much higher than the cost of retaining old customers in Taiwan. Customer’s loyalty is a vital factor which in turn depends upon a construct called relationship quality formed by satisfaction and trust. Antecedents of satisfaction and trust were explored. It was discovered that playfulness and service quality impact satisfaction while service quality and intimacy affect trust. The study outlined the role of playfulness and relationship quality towards reducing the possibility of churn.

Factors in Decision Making

(Spiegel, 1985) in his article discussed the importance of public relations. He felt that with the increasing marketing activities have relegated public relations to the end of the line. Public relations lack the measurable success in generating revenue. Public relations can be used as an invaluable tool for establishing industry awareness, name recognition, and professional credibility which all help create brand image.

(Hensel & Dubinsky, 1986) felt that customers tend to leave the operators who they believe to be unethical or engaging in questionable behaviour. Marketers’ visibility and promotional efforts often gets perceived by society as unethical or questionable behaviours. This perceived behaviour impacts the customer likelihood of churn.
(Darke & Chung, 2005) studied the effect of pricing plans in increasing deal value in retail sector. Price discounts dominate the sales promotions employed by marketers. Without assurance of product quality this may generate negative quality inferences. According to research free gift promotions maintained quality perceptions without affecting perception of quality while Product trial could be used to magnify promotional effects.

(Gustafsson, Johnson, & Roos, 2005) in a study of telecommunications services, examined the effects of customer satisfaction, affective commitment, and calculative commitment on retention. Situational triggers were found to influence satisfaction-retention relationship in this study. The results supported customer satisfaction, commitment and prior churn’s impact on retention.

(Parasuraman, Zeithaml, & Malhotra, 2005; Zeithaml, Bitner, & Gremler, 2006) talked of service quality in terms of SERV-QUAL and E-S-QUAL while trying to capture service quality in general or to capture electronic service quality in latter. Comprehensive review and analysis of services marketing issues, practice, and strategy was done by utilizing the GAPS Model of Service Quality as an organizing framework. Customer behaviour, expectations, and perceptions were discussed to form the basis for understanding services marketing strategy and the managerial content.

(Ahn, Han, & Lee, 2006), discussed that retaining customers is one of the most crucial challenges in the saturating mobile market. There study used customer transaction and billing data to investigate determinants of
customer churn in the Korean mobile telecommunications service market. The major finding of this study was that call quality-related factors and heavy usage influenced customer churn. The study marked the process of churn where active users moved towards non-use without actually having churned.

(Eshghi, Haughton, & Topi, 2007)\(^{10}\) reported the results of research investigating the determinants of the propensity to switch wireless service providers. There study suggested shifting scarce resources to customer retention through improved service, saving costs of customer acquisition campaigns which was shown to be expensive. A strong association between customer satisfaction and customer loyalty was found in the data. Contracts were comparatively ineffectual in generating loyalty.

The results of a study by (Martensen, 2007)\(^{30}\), indicated that tweens are far more satisfied with their mobile phones than adults are and that the mobile phones fulfill children’s expectations to a much higher degree. Still, brands are not able to turn tweens into loyal customers who will recommend their mobile phones to friends. Tweens' loyalty is lower than what is experienced for adults and the relationship between satisfaction and loyalty is very weak.

(Shin & Kim, 2008)\(^{41}\); Shin, Kim, & Lee, 2011)\(^{42}\) investigated switching barriers under the mobile number portability (MNP) in the American mobile market. The structural equation modeling analysis was used to evaluate the causal model, and confirmatory factor analysis was performed to examine
the reliability and validity of the measurement model. There was a significant effect of demographics on switching decision. Their findings indicated that customer satisfaction and switching barriers significantly affect subscribers’ intent to churn. The study was based in USA where contractual obligations have contained MNP to a large extent.

(Kim, Yun, & Kim, 2009) discussed mobile telecommunication companies in Korea. It was a qualitative study through Focused Group Interview on customers’ expectations and customers’ requirements. Study collected Voice Of Customer (VOC) data in relation to the quality attributes. The study resulted in finding that customer need fulfilment is paramount to success of telecom service providers.

(Lai, Griffin, & Babin, 2009) evaluated interactions among service quality, value, image, satisfaction, and loyalty in China telecom industry. Analysis of survey data from 118 customers of a Chinese mobile communications company revealed that service quality had an impact on perceived value and image perceptions which is a significant determinant of customer loyalty. As per study value, satisfaction and customer loyalty are inter related constructs.

(Hu, Kandampully, & Juwaheer, 2009) recorded that today’s world of intense competition, customer satisfaction is not the goal but the eligibility criterion, thus emphasising customers perceptions of service quality. They established the relation between service quality, satisfaction, perceived value and image. They proposed a model indicating high quality service and
superior customer value may lead towards customer satisfaction. Firm’s
corporate image and consumer retention in the model depends upon
customer satisfaction.

(Dierkes, Bichler, & Krishnan, 2011)\(^8\) have written about word of
mouth and customer behaviour. They underlined the role call detail records
can play to establish and predict the customer’s decisions in the context of
churn. The results also provided evidence that word of mouth had a major
influence on customers’ churn and purchase decisions.

(Chuang, 2011)\(^6\) used a binary logit model to investigate the factors
that influence subscribers to stay or migrate in Taiwan’s mobile phone
industry. The results show that “subscribers’ satisfaction, switching costs,
and habit strength negatively influence switching intentions, constituting a
sucking effect that motivates subscribers to stay with their original
providers”. The study discussed variables of alternative attractiveness, pull
effect and strength of habit.

**Conclusion:** Above discussion leads us to understanding of
significance of retaining current customers in telecom sector. Introduction of
MNP is an effort towards the abolishment of switching cost. The purpose of
the policy of introducing MNP is to induce more competition and facilitate
the growth of new or small service providers. It may though accelerate the
process of market concentration due to discriminatory pricing which may be
undertaken by operator. The speed of porting and porting charges majorly
influence the impact of MNP. Customer satisfaction, switching barriers, and
demographics also significantly affect subscribers' intent to switch. The switching costs have significant effects on users' switching intention. Switching costs themselves are influenced by marketing variables such as price and advertising. The other factors strongly affecting switch may range from demographic to attitudinal. The level of satisfaction with service attributes including call quality, tariff level, handsets, brand image, as well as income, and subscription duration have been found to impact subscribers churn behaviour. In presence of switching costs "spuriously loyal" customers may be there. The perceived value may be different from ground realities. Customer lifetime value (CLV) depends upon the antecedents of customer satisfaction and loyalty. MNP adoption or customer churn behaviour partially depends on customer-related variables. The relationships among service quality, perceived value, customer satisfaction along with situational trigger influence post-purchase intention of staying or switching.
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