Temporary Protection and Technology Adoption: A Case of Mobile Number Portability

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Abstract
With current scenario, if a customer is dissatisfied on the service by mobile operator either he has to reluctantly accept the service or switch to another service provider that he wishes. In this paper I am highlighting the importance of mobile number portability (MNP) which enables mobile telephone users to retain their mobile telephone numbers when changing from one mobile network operator to another. And requirements and compatibility for switching the network as mobile number is used for all business and family correspondence. This paper provides an in-depth description of how it affects the switching cost for consumer, it also include various flavors of call routing implementation, mobile messages (SMS, MMS) to a number once it has been ported. Despite of so many networks why user wants to switch to other network will be discussed in this paper. The research paper addressed various arguments related to the pros and cons of mobile number portability such as How Could MNP Disrupt Mobile Service Providers and How can Mobile Service Providers Benefit from MNP? A more pronounced effect of MNP is likely to be an increased focus on improving the customer experience. The research papers also give an insight into the disruptive effect of MNP on Indian Telecom Industry.

Keywords
MNP, Portability, Indian Telecom

I. Introduction

With current scenario, if a customer is dissatisfied on the service by mobile operator either he has to reluctantly accept the service or switch to another service provider that he wishes. In the later case, he has to drop his identity, the mobile number. In most cases when the mobile number is used for all business and family correspondence, it becomes generally impossible to leave the number. To overcome these hardships, the concept of MNP (Mobile Number Portability) was introduced. The push for MNP implementation in the industry has always been led by market regulators in an effort to provide mobile consumers with the freedom to move between service providers, with eventual hopes that it will lead to healthy competition in the mobile industry.

II. Establishing MNP Programmes within a Mobile Operator

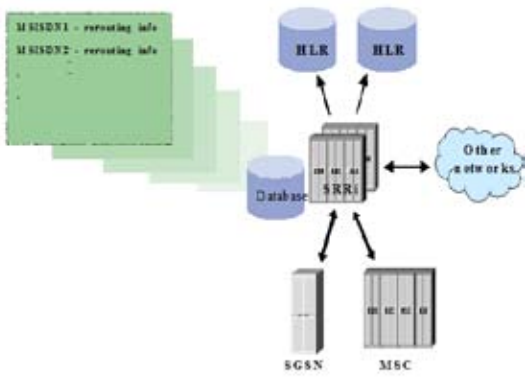

Fig.1 : MNP Architecture

- Donor network: The initial network where the number was located before ever being ported.
- Originating network: The network where the calling party is connected.
- Recipient network: The network where a number is located after being ported.
- Database: The store of ported numbers with their relevant routing numbers.
- Routing number: A specific number that is derived and used by the network to route the call towards a ported number.
- New service provider (NSP): It is the recipient carrier i.e., the new service provider to which the subscriber wishes to subscribe to.
- Old service provider (OSP): The donor carrier is the old service provider, which the subscriber wishes to leave.
- Number Portability Administration Center (NPAC): The authority responsible for maintaining NP solutions
- Different regions: Both the OSP and NSP carriers will have access to their own wireless network, order entry and point of sale terminals. Further, the two competing carriers' WNP architectures will be connected at two points:

• Inter-carrier communications process (ICP)
• Number portability administration center (NPAC).

In number portability the "donor network" provides the number and the "recipient network" Accepts the number. The operation of donating a number requires that a number is "snapped Out" from a network and "snapped into" the receiving network. If the subscriber ceases to need the number then it is normal that the original donor receives the number back and "snaps back" The number to its network. The situation is slightly more complex if the user leaves the first Operator for a second and then subsequently elects to use a third operator. In this case the Second operator will return the number to the first and then it is assigned to the third Calls to ported numbers are completed when a customer who calls a ported number sends the dialed number to a provider's SSP (Service Switch Point), where it is identified either as a local call or not. If the call is local, the switch has the NPA-NXX in its routing table as portable, so it sends

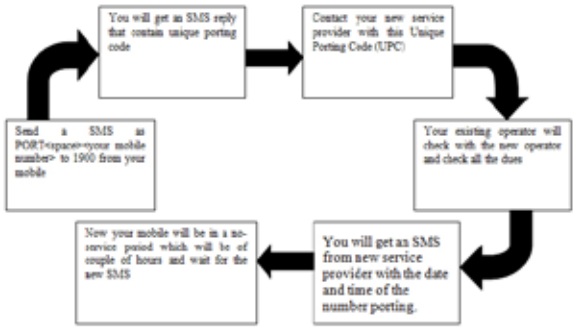

Fig. 2 : Process for Mobile Number Portability

a routing request to the STP (Signaling Transfer Point) which accesses a local database that is updated by an LSMS (Local Service Management System) which holds all routing for all ported numbers to which the carrier is responsible for completing calls.

If routing information is found, a response is sent to the "query" containing the information necessary to properly route the call. If it is not a local number, the call is passed on to the STP and routed until it gets to a local carrier who will perform the "query" mentioned earlier and route the call accordingly.

IV. Database Management for MNP

All implementations of mobile number portability involve the use of databases which contain information of the networks and associated ported numbers. This information is used for a call to determine the correct terminating network of a ported number. Databases relating to Number Portability are typically managed either in a centralized or in a distributed manner. Logically Centralized Database with regionally located databases is setup and managed by neural third party setup by operators. Logically Centralized approach may serve as a common platform for ordering, provisioning, and notification process of number portability

A. Synchronization of Database

Port information is kept in a centralized master of Reference Database. Any update to the Reference Database is broadcasted more or less in real time to all operators.

V. Analyzing the Impact of MNP

When the telecom industry in Western Europe started, mobile phone users were unable to retain their numbers when changing their service from one Network operator to another or from one Service Provider to another. This radically changed when Mobile Number Portability (MNP) appeared, making it easier for the customer to churn while more difficult for the telecom operator to retain. You will get a new SIM from the new service provider this will also be available for SIM cards being used for Internet data connection. Subscriber can stay with same technology, GSM/CDMA. Also change to CDMA or vice versa. Both post-paid & prepaid subscribers can use it. The Costs associated with Number Portability is system setup cost, administration cost, call conveyance cost

VI. MNP Impact on Indian Telecom Industry

A large population, low telephony penetration levels, and a rise in consumers' income and spending owing to strong economic growth have helped make India the fastest-growing telecom market in the world. After BSNL the telecommunication policies were revised to allow private operators, companies such as Voda fone, Bharti Airtel, TataIndicom, Idea,Cellular, Aircel and Loop Mobile have entered the space Bharti Airtel now is the largest telecom company in India.

India's mobile phone market is the fastest growing in the world, with companies adding some 18.98 million new customers India is the world's fastest growing Wireless market and second largest telecommunication network. In November 2007 the telecom ministry decided to introduce MNP in various stages, beginning with metros. The government had announced the plan to introduce mobile number portability in the first phase in the four metros - Delhi, Mumbai, Kolkata and Chennai - by the fourth quarter of 2008. Implementation of MNP in 'A' circles like Maharashtra, Gujarat, Andhra Pradesh, Karnataka and Tamil Nadu were to be taken up from April 2008. Telecom regulator TRAI on 11th April 2008 recommended the implementation of nation-wide mobile number portability from June 2009 onwards in a phased manner. In the some markets, some operators lack many of the data related products and services (3G and EDGE in particular) that its competitors sell. Despite the assumption that these will be a net gainer of subscribers, this lag behind the competitors could encourage movement of high usage subscribers to its competitors.

VII. Lesson Learnt

The implementation of MNP will hit the operating margins of service providers and those with deeper pockets would be better placed to cope up with the new scenario.The nation wide implementation will increase churn of customers, shoot-up the customer acquisition and retention and lower the ARPUs (average revenue per user) as competitive tariff plans will have to be offered. On service quality, operators will have to focus on better customer care and network coverage while differentiated services like 3G can also swing customers towards a particular operator

VIII. Way Forward

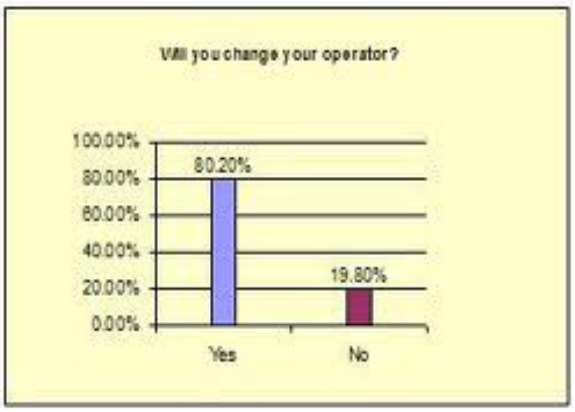

Fig. 3: Graph showing number of MNP user

In an era where consumers are being offered an unprecedented level of choice and service, this practice has taken a significant amount of criticism from consumer forums and action groups. In the some markets, some operators lack many of the data related products and services (3G and EDGE in particular) that its competitors sell. Despite the assumption that these will be a net gainer of subscribers, this lag behind the competitors could encourage movement of high usage subscribers to its competitors. In certain highly penetrated markets, where the fear of increased customer churn is initially perceived to be high, service providers are still able to retain their customer base due to the already competitive pricing, along with the excellent service offerings. There is no compelling reason for customers to change service providers since there is no difference in terms of the services provided.

IX. Conclusion

To be concluded the importance of MNP is expected to increase competition in the mobile telephony market in India as customers will have the choice to shift operators, if they are not happy with the quality of service or the tariff, without having to give up their mobile numbers.on the other hand Indian operators are locked in a price war that has pushed down their margins. According to above study there is much chance that mobile users will change their operator if given a better option. and number portability will also benefit operators as they will strive to offer better service to prevent churn. However, mobile operators are not keen to implement it fearing huge churn. International experience proves that there is substantial improvement in the QoS after introduction of NP.

References

[1] Kumar, P., Satyanarayanan, M. Flexible and Safe Resolution of File Conflicts. In Procedings of the 1995 USENIX Technical Conference. New Orleans, LA, January, 1995.
[2] Kung, H.T., Robinson, J. "On Optimistic Methods for Concurrency Control". ACM Transaction on Database Systems 6(2), June, 1981.
[3] Lu, Q., Satyanarayanan, M. "Improving Data Consistency in Mobile Computing Using Isolation-Only Transactions". In Proceedings of the Fifth Workshop on Hot Topics in Operating Systems. Orcas Island, WA, May, 1995.
[4] Moravec, H. Mind Children. Harvard University Press, Cambridge, MA, 1988.
[5] Kumar, P., "Mitigating the Effects of Optimistic Replication in a Distributed File System". PhD thesis, School of Computer Science, Carnegie Mellon Mind Children, my colleague Hans Moravec draws a University, December, 1994.
[6] Kistler, J.J., "Disconnected Operation in a Distributed File System.PhD thesis, Department of Computer Science, Carnegie Mellon
[7] Satyanarayanan, M., Kistler, J.J., Mummert, L.B., Ebling, M.R., Kumar, P., Lu, Q., University, "Experience with Disconnected Operation in a MobileComputing Environment". May, 1993. In Proceedings of the 1993 USENIX Symposium onMobile and Location-Independent Computing. Cambridge, MA, August, 1993
[8] Satyanarayanan, M., Kistler, J.J., Kumar, P., Okasaki, M.E., Siegel, E.H., Steere, D.C., "Coda: A Highly Available File System for a DistributedWorkstation Environment". IEEE Transactions on Computers 39(4), April, 1990.
[9] Noble, B., Price, M., Satyanarayanan, M., "A Programming Interface for Application-Aware Adaptation in Mobile Computing. Computing Systems 8, Fall, 1995.
[10] Terry, D.B., "Caching Hints in Distributed Systems". IEEE Transactions in Software Engineering SE-13(1),January, 1987.
[11] [Online] Available : http://hellboundbloggers.com
[12] [Online] Available : http://en.wikipedia.org/wiki/Mobile number portability
[13] [Online] Available : http://timesofindia.indiatimes.com
[14] [Online] Available : http://news.oneindia.in

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