LEGAL ISSUES IN POST MNP REGIME

By

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FINAL APPROVAL

It is hereby certified that we have gone through the thesis submitted by **Mr. Zia ul Haq Kayani** and we have come to the conclusion that the research work is upto the mark and fulfills all the requirements for the grant of Mater Degree in Law by the faculty of Shariah and Law, International Islamic University, Islamabad.

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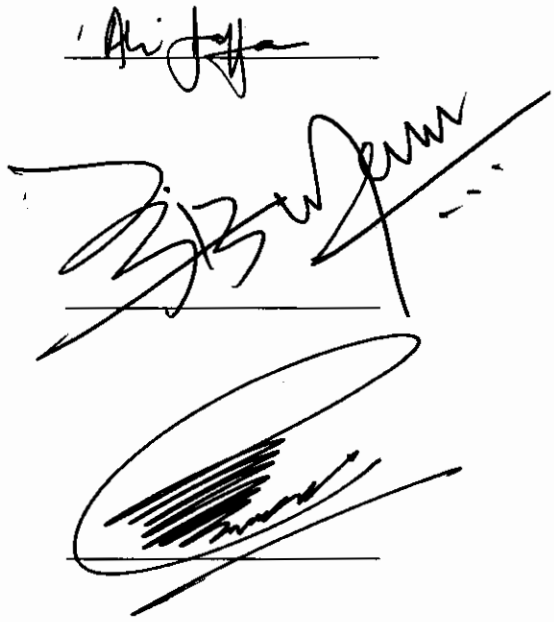

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LIST OF ABBREVIATIONS

ACA	Australian Communications Authority
ACCC	Australian Competition and Consumer Commission
ACIF	Australian Communications Industry Forum
ARPU	Average Revenue per User
Carrier	A licensed company (network Operator) may market any number of communication services for voice and data, offering services to both end-customers (private or business) and other carriers. In the letter case, the service simply consists of transport capacity for long-distance traffic.
CCS7	Common Channel Signaling System 7
Cellular	A technique use in mobile radio telephony to use the same radio spectrum many times in one network. Low power radio transmitters are use to cover a limited area or "cell' such that the frequencies in use can be re used in other parts of the network.
CEPT	European Conference on Postal and Telecommunications Administrations
Churn	Proportion of subscriber disconnections.
CLI	Caller Line Identification
CPP	Calling Party Pays
EC	European Commission
ETSI	European Telecommunications Standards Institute. ETSI helped specify the UMTS radio access.
EU	European Union
FCC	Federal Communications Commission, USA.
FNP	Fixed number Portability

GSM	Global System for Mobile Communication. European Digital cellular technology standard, based on TDMA technology. The 900MHz and 1800 MHz frequencies are widely adopted in Asia, Africa and the Middle East as well as Europe. North American .GSM systems use 1900 MHz frequency.
HDTP	Netherlands Posts and Telecommunication Department
ILDO	Intelligent Long Distance Operator
ICP	Inter-carrier communications process
IN	Intelligent Network. A network that allows functionality to be flexibility positioned at various nodes on and off the network, and permits the architecture to be modified to control the services.
ITU	International Telecom Union
LNP	Local Number Portability
LRN	Location routing number
LSMS	Local service management system
LSOA	Local service order administration
MNP	Mobile number portability. The system that allows customers to switch mobile network provides while keeping their old phone numbers.
MSC	Mobile Switching Center
MSISDN	Mobile subscriber ISDN
NLDO	National Long Distance Operators
NPAC	Number Portability administration center (currently Net star)
NRA	National Regulatory Authority
NSP	New Service Provider
OFF-network Calls	Calls made to other mobile networks and fixed line
OFTA	Office of the Telecommunication Authority, Hong Kong
OFTEL	Offline of Telecommunication (UK)

On network Calls	Calls made on the same mobile network (mobile to mobile)
OPTA	Post and Telecommunications Authority, Netherlands
OSP	Old service provider
OSS	Operational support system. An OSS is set of computerized systems that support the business and operational processes peculiar to the telecoms industry. These are broadly: order management; inventory and workforce management; and mediation and service provisioning. Some analysis also counts network management systems as part of an operator's OSS. The difference between OSS and BSS is that BSS are customer facing, where as OSS sits between the BSS and the network.
Penetration	Number of users per 100 of the population, usually shown as a percentage.
Post – paid	with a post – paid system, the user of a service pays for the service after they use it. The service supplier bills the customer, usually at regular intervals (e.g. monthly).
Prepaid	With a prepaid system, the user of a service pays for the service before they receive it. In the mobile market, this term refers to mobile minutes of use and/or services that are paid for in advance. Users charge their mobile accounts with value (e.g., by buying vouchers) and then depreciate it.
QOS	Quality of Service
SDCA	Short distance changing area
SIM	Subscriber Identity Module
SMS	Short Message Service
Telco	Telecoms Operator
WLL	Wire Line Local Loop

DEDICATION

DEDICATED TO THOSE WHO HAVE QUEST OF LEARNING

AND

MY GRANDFATHER RAJA SULTAN MEHMOOD (LATE)

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All praise to God the Almighty Allah, by whose blessing which enables me in writing this thesis. It is hoped that this thesis will be helpful and have better understanding to the students of Law and professionals working in the field of Telecommunication.

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Zia ul Haq Kiyani
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ABSTRACT

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Mobile Number Portability will allow subscribers to change their service provider while retaining their old telephone number. Portability benefits subscribers and increases the level of competition between service providers, rewarding service providers with the best customer service, network coverage, and service quality. Given the growth of telecom services in Pakistan, and enhanced competition in the mobile sector, it is pertinent to deliberate about the issue of mobile number portability.

Operator portability both for fixed and mobile services, and service portability have been implemented in different parts of the world. It might be thought that Mobile number portability would have the greatest impact in maturing markets when service demand growth has eased and the market structure has become more rationalized. The implementation of Mobile Number Portability (MNP) is going to be introduced according to the commitment of federal government declares a first ever mobile Cellular policy in 2004, in which it may be launched in a time frame of two years.

This Thesis of mine firstly in Chapter I explains the growth of telecom sector, to which it may cover various development stages and may heavily titled toward mobile communication and far as concept of Mobile Number Portability is concerned, the choice of the subscriber

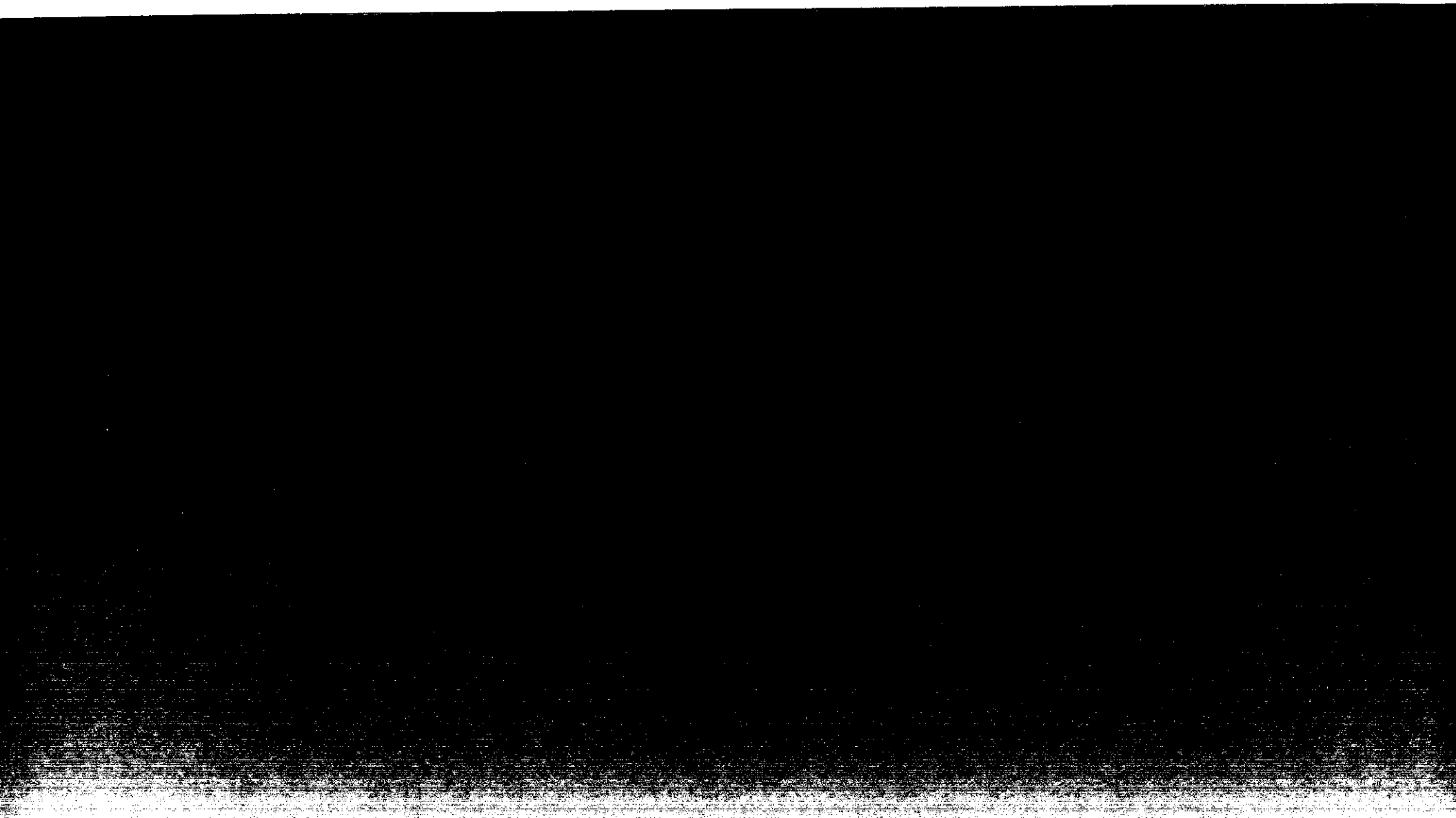
by moving from one operator to another retaining the same number and also its benefit to consumers, operators and also to industry.

Chapter II gives some basic definition of MNP from various countries of the world. Afterward the three types of the MNP are described and lastly the technical, operational, and economic aspects with having wide discussion on the technical solution which are being implemented all over the world with their merits and demerits that might arise out of its implementation in Pakistan.

Chapter III describes the legal framework in different countries of the world, in which MNP is already in progress with comparative analysis between them. PTA had also constituted a supervisor board in which all the six operators are being its members and afterward it may be formed as company limited by guarantee to help in the formation of the centralized database. I have also discussed in this Chapter the solution to MNP in Pakistan with having strategical over view and then with the explanation of onward routing and centralized database system used for implementation of MNP in Pakistan.

In Chapter IV brief overviews of Regulation 2005 is described in general and then it may highlight the legal issues relating to consumers including complaint system ,code of practice, privacy of data, quality of service and complaint issues and also legal issues related to operators and regulators in post MNP regime are discussed in detail.

Lastly in Chapter V the conclusion and recommendations to improve the legal framework will be given, with some valuable recommendation both to operators and authority. And solutions to the potential legal problems in the post MNP regime.



CHAPTER I

A. GROWTH OF TELECOM SECTOR

Pakistan Telecom Sector has registered tremendous growth during the last three years. Various development stages, during which an industry evolves, as in a normal industry business cycle, have either been skipped or bridged quickly for Pakistan telecom industry. This growth, as a whole, is heavily tilted towards mobile, since investments made in the segment are far higher than any other segment of the industry. Basic telephony and value added services have their own specified markets and the industry life cycle is taking a comparatively steady pace.

While measuring the social and economic impact of unprecedented growth in mobile sector, it has become obvious that the impact is positive and evenly distributed to related areas. Provision of access to many of the underserved areas is perhaps the most noticeable benefit of this growth in Pakistan. According to a PTA decision, people are allowed to use mobile phones as PCOs where no fixed access is available. Similarly proactive initiatives by cellular operators are also bringing positive impact on the social transition, such as Mobilinks collaboration with Khushali bank for provision of mobile PCOs in rural areas[1].

[1] http://www.nation.com.pk/daily/june2005/27/bnews6.php 16-4-2006

Therefore communication needs of a common man are now satisfied more conveniently than before. Going in to more sophisticated use of mobile by urban community, access to any information is now in the hands of people where on one hand they are surfing the World Wide Web and on the other hand they have better access to time sensitive information such as updated stock market quotes. All this has resulted in massive job creation not only in mobile sector itself but also in ancillary industries. Network expansion and increased subscriber base has also boosted government revenues. According to estimates, total investment made in mobile segment till the end of the year 2004-05 is approximately US$ 880 million[2]. Mobilink, Instaphone and Paktel are planning to invest US$ 500 million to US$ 1 billion in Pakistan in the next 2 to 3 years, mainly in their network expansion[3].

Currently there are six mobile operators in Pakistan, of which Instaphone, Paktel, Mobilink each are a decade old and Ufone is aged at four & half years, while Telenor and Warid Telecom have recently launched their operations and justifying the opportunities and potential that exists in the Pakistani telecom sector. For instance, two Cellular phone operators, Telenor and Warid Telecom, launched their services with initial investment of millions of dollars few months back are separately claiming to have one million subscribers base. It is an absolute revolution. As more choices are made available to consumers and the markets mature with rationalized tariffs, quality of service is likely to improve. Internet bandwidth consumption, Internet access via ISDN, DSL services,

[2] Imran Ali, Structure of Telecommunication Sector in Pakistan, Working paper number No. 122, http://www.lums.edu.pk/cmer 17-5-06

[3] Yousaf Haroon, Pakistan Mobile Cellular policy, Comparative analysis approaches for telecommunication Competition. 17-5-06

CDMA, GPRS etc, are just some of the technologies that have either grown exponentially in Pakistan or have had a favorable reception by the local consumers.

Additional opportunities that need to be taken into account include the growth of text and multimedia messaging which accounts for nearly 5-10% of telecom revenue around the world[4]. Infrastructure development in situations where capital is constrained and multiple players exist has lead to an increase in the number of secondary companies that offer talent infrastructure, construction support and wireless network design and wireless specific back haul. This is also an area that local organizations can look into the growth of the telecom sector. The major achievements have been made in different telecom areas; the operators should also focus on enhancing teledensity in the rural areas of the country, as majority of villages had not been connected so far.

The year 2004-05 commenced with intense competition among existing mobile operators. Price cuts were made and value added services were offered, including bundled offers of handset and connection, discounts on purchase of scratch cards through bonus airtime and similar incentives that resulted in growing mobile phone euphoria in the market.

As of September 2005, total mobile subscribers stand at 17.7 million whereas a year ago it was less than 5.5 million, indicating a growth rate of 154% till June 2005. Mobile subscribers per 100 inhabitants of Pakistan is approaching 10.1 (Aug-05) showing more than 3 times more penetration than fixed line, which stands at 3.4 per hundred inhabitants of Pakistan. There is a record growth in the sector and average subscribers addition each

[4] http://www.webmethods.com/pdf/industry_datasheet/Mobile -Number-Portability. PDF. 13-7-06

month in the total subscriber base is approximately one million. Correspondingly there has been increase in revenues for the operators. Total revenue earned by mobile operators at the end of year 2004-05 are Rs.58.03 billion, which is almost 40%of total telecom industry revenues for the same period. Average revenue per subscriber, however, has been on a plunge with current Average Revenue per User (ARPU) at US$ 6. Decrease in ARPU, mainly, is due to decrease in airtime tariff. Total investments made in the mobile sector were more than US$ 882 million which is approx. 86% of total investments made in the telecom sector[5].

In addition, rate reductions by mobile operators have resulted in increase in minutes of usage (MoU) per subscriber, including international & domestic incoming and outgoing - for the year 2004-05, total traffic generated on mobile networks was 14.04 billion minutes. Average minute per user per month stands at 155 during the year 2004-05[6].

Six mobile operators cover currently more than 350 cities, with highest mobile penetration in Sindh province, which stands at 11%. Similarly, there has been enormous increase in capacity and coverage through installation of new cell sites.

Closely analyzing the growth in mobile cellular sector and large un-tapped rural population, it is expected that the exponential growth in mobile sector would continue. Timely launch of Telenor and Warid, ongoing expansion of Mobilink, renewal of Instaphone license, privatization of Ufone parent company PTCL, launch of Paktel GSM

[5] http://www.art.telecomm.com/communiues/pressrealease/2005/ang060803-22.htm 19-2-06
[6] Yousaf Haroon, Domestic regulation & Diplomacy in Telecommunication.
lhttp://www.ispak.com.pk/Regulation%20and%20diplomacy%20in%20telecom.pdf 17-5-06

and reduction in government taxes and handset prices are all right ingredients for best possible growth patterns any mobile sector can desire. It is estimated that at the end of year 2005, the mobile subscriber base would be around 20 million.

Rapid expansion of mobile networks and unprecedented growth in number of subscribers has resulted in number of issues for the regulator, the operators, public and government. These include increased environmental hazard due to large number of cell site towers, tax levied by civic bodies for installation of these cell sites, frequency conflict of operators with radio jamming devices, cut throat marketing competition, price wars, data security issues and maintenance of Quality of Services. To address these issues accordingly, appropriate polices are needed to be chalked out, such as; sharing of base stations by operators, directing civic bodies to help operators, approval for installation of jamming devices, regulating prices of market leaders, ensuring possible ways for privacy of operators data, and regular quality of service surveys by regulators and third party assessments for ensuring good quality of services.

Gleaming current figures and magnified future forecasts are supportive of mobile cellular boom in Pakistan. Keeping the above highlighted issues in mind there is a possibility that this current upbeat in the sector might slow down. With high roll out, operational costs and regulatory charges (setup, licensing etc), the new operators would not like to loose the game. Similarly current operators also need to keep up with new operators for their competitive edge. Provision of basic cellular service in order to maximize profits may be the main objective of all operators. To mitigate effects of lower ARPUs and churn rate,

the operators would have to expand to unserved areas since mature markets metropolitan cities are already showing highest penetration level. Similarly, product differentiation can be an effective tool to increase subscriber base. This differentiation may be mobile banking facility, money transfers, payment of utility bills via mobile, internet access at low rates, location based services, content in local language, business on move (corporate emails access) and vehicle tracking system etc[7].

Besides to continue this growth pattern PTA, the regulator, in addition to current initiatives also stress on areas such as regulating SMP operators, providing firm dispute resolution mechanism, implementation of anticompetitive rules and international quality of service parameters, easing consumers through proper complaint mechanism, and using Access Promotion Charges from this segment for rural telecom development. All this would result in a win-win scenario in the long run where consumers would have maximum access in minimum price, operators would be able to grow their business and government would benefit from increased tax revenues. Following the right recipe, current boom in the sector can well be sustained.

B. BRIEF HISTORY OF MNP

Pakistan Telecommunications (Re-organization) Act, 1996 provides that the PTA shall promote and protect the interests of users of telecommunication services in Pakistan, promote the availability of a wide range of high quality, efficient, cost effective and competitive telecommunication services throughout Pakistan and promote rapid

[7] http://acif.org.au/documents_and_guidlines 26-12-06

modernization of telecommunication systems and telecommunication services. These provisions mandate the competition in all aspects of the telecommunications industry[8].

To realize this long awaited consumer commitment the federal government declared the first ever Mobile Cellular Policy (January 28, 2004) of Pakistan, which provided that a major drawback to switching mobile operators is that, at present, customers need to change their mobile telephone numbers. In order to establish market conditions that provide maximum choice, consumers should be able to switch operators in order to take advantage of attractive service offerings, lower prices or improved quality and in addition to broad telecomm sector, promotion of efficient use of radio spectrum with increased choice for customer of cellular mobile services and competitive and affordable prices which enable private investment in the cellular mobile sector. There must be recognition of rights and obligations of mobile cellular operators and fair competition among mobile and fixed line operators which will give rise to an effective and well defined regulatory regime that is consistent with international best practices. To provide flexibility to consumers, all mobile licencess shall implement number portability, according to the PTAs requirements and guidelines.[9]

Mobile number portability (MNP) requires that mobile telephone customers can keep their telephone number including the prefix-when switching from one provider of mobile telecommunications services to another[10]. In the absence of MNP, customers have to give up their number and must adopt a new one when they switch operators. As a result,

[8] Sources: own inquires (in 2004/2005)
[9] History of Pakistan Telecommunication by Yusaf Reza Published by PTA. 13-2-06
[10] http://www.researchandmarket.com/report/c18369. 16-9-06

customers face switching costs associated with informing people about changing their number, printing new business cards, missing valuable calls from people that do not have the new number, etc.

Based on these considerations, many regulatory authorities have imposed mandatory MNP and are about to require its introduction, so as to reduce customers' switching costs, attempting to make mobile telecommunications more competitive.

It is the statutory responsibility of the Pakistan Telecommunication Authority to promote and protect the interests of users of telecommunication services in Pakistan. It is bound to promote the availability of a wide range of high quality, efficient, cost effective and competitive telecommunication services throughout Pakistan. It also has to promote rapid modernization of telecommunication systems and services.

MNP is one of the most important tools that ensure competition with regard to reducing the tariff and providing qualitative services and consumer friendly environment. In the prevailing circumstances, if a consumer is not satisfied with the quality of service and tariff of a telecom service provider and wants to change the operator, he has to buy a new subscriber Identity Module by going through a lengthy process. Implementation of MNP would establish market conditions that provide maximum choice to the consumers by which they would be able to switch operators and take advantage of attractive service offerings.

In general it would solve many of consumers' problems, including saving money and time, ensuring best quality of service with variety of Value Added Services, benefit them of the schemes that would be introduced as the outcome of competition among operators to attract more customers. MNP would enable the consumers to retain an existing mobile subscriber number along with operator code while shifting connectivity from one operator to another.[11]

MNP is a circuit-switch network service provided by the cellular or fixed line operators to the consumers with the ability to change service providers, locations, or service types without changing their telephone numbers. The numbers that can be ported include, without exception, all numbers for which a written agreement or reservation exists between the operator and the consumer or subscriber. The consumer would be able to reactivate the mobile number at the Donor operator and then activate the porting, with the recipient operator, provided this is done within the retention time frame. The recipient operator will then inform all other Operators at completion time of a porting, the new/actual information for routing, charging, single access code and SPC by ensuring this data is recorded at the CDBA.

All Subsequent portability would be handled in the same manner as the first time. The current operator shall become the donor operator and the new operator becomes the recipient operator. If a consumer wants to return to the previous operator, the order would be handled like a standard porting order. There would be no difference even if the recipient operator were the original Number Range holder. If, for any reason, the

[11] Mobile Number portability Regulation, 2005

consumer wants to end his subscription with his current operator, the current operator handles this as a termination in his administrative and technical systems and resets the status of the number in question to not in service or ceased.

The world first country to introduce MNP was Singapore in 1997, followed by the UK, Hong Kong and the Netherlands in 1999. As of 2003, a number of other countries especially in Europe require MNP[12].

Around the world there are a number of different methods for implementations of MNP, and at least 20 more are on the agenda within the next couple of years[13]. PTA sees MNP as an effective and necessary way to maximize competition and consumer choice of telecom services. It has taken a minimalist approach to directly regulate the MNP and has encouraged operators to agree on as many issues as possible regarding the practical implementation of it.

PTA recently initiated consultation on cellular number portability and has devised regulations for it, deferring a decision on geographic portability and services portability implementation apart from fixed-line (Fixed-line Local Loop and Wireless Local Loop Telecom Services) number portability.

All the six cellular mobile operators have formed a Supervisory Board or a Numbering Council chaired by the Telenor CEO Mr. Tore Johnson and a representative from PTA to implement MNP with the help of PTA, of which afterward incorporated named as

[12] Even though implemented in 1997, MNP is limited to voice telephony without the ability to support data service such as SMS and MMS.
[13] http://www.art.telecomm.com/communiques/pressrelease/2003/ang060803-20.htm 21-9-05

"Pakistan MNP Database (Guarantee) Limited" . It become as an independent legal entity of all CMTOs. They shall collectively own, fund and supervise the centralized database operation to be known as the Central Database Administration (CDBA), Which bears the full financial accountability for the creation and ongoing operation of the CDBA and ensure that good governance prevails, which undertakes full responsibility for the overall governance and financing of the CDBA on behalf of all operators and subscribers[14], before the establishment of company.

Approximately 500,000 numbers are porting each month around the world[15]. One can expect this number to grow in the future as the right to change operator while keeping the same code with same number without loosing the contacts is being introduced rapidly in developing countries and more such activities are taking place around the world.

It seems evident that MNP, if adopted in the right way and under the right market conditions with true spirit, has the effect of furthering competition and providing cheaper services for mobile customers. Although, the initial pace of number portability might affect the existing mobile operators, particularly Mobilink and Ufone, in the 11 urban statistical areas, i.e., Karachi, Hyderabad, Sukkur, Lahore, Faisalabad, Gujranwala, Rawalpindi, Islamabad, Peshawar, Noshera, and Mardan, but the better quality with variety of services at affordable rates strategy might works to rescue their existing customer base and might increase it further. Hence, the MNP's ability to change market dynamics should not be underestimated in the new environment.

[14] Sources: own inquires April 2006
[15] Time magazine "statistics of porting process".November,2006.

Where service provider is unable to offer its customers variety of more competitive services, with better quality and at affordable rates, definitely the targets of an Operator for attracting a huge number of subscribers would remain unmet and consequent loss of a subscriber base to it[16].

The thesis will cover the implementation of MNP in the mobile sectors. However, the focus of thesis will remain on those critical legal issues, which are likely to emerge in the post MNP regime. It is obvious that the legal issues are very divergent, covering regulatory issues, operational issues, consumer protection issues, and last but not the least the licensee's issues.

My main aim in the thesis would be to highlight all those legal issues which are involved in it and discuss those in detail which are critical between them. The detailed discussion will try to cover all the aspects of legal issues, the complexities involved therein and possible solution to those problems according to the enforced legal framework.

At the end of thesis, the recommendation to improve the legal framework will also be given and the conclusions reached the relay will be provided. It will also be endeavored to highlight those legal areas, which do not properly give solution to the potential legal problems in the post MNP regime.

[16] Nicklas Beijar, Telephony routing with support for number portability in interconnected circuit snf packet switched networks, HELSINKI UNIVERSITY OF TECHNOLOGY, April 5, 2005.

C. MOBILE NUMBER PORTABILITY

MNP that is facility that allows the mobile subscribers to retain their mobile numbers when moving between different mobile networks. This means the all the mobile customers having any mobile numbers can move to a new operator and keep their existing mobile number.

As there is on entry of new operator it may lead to fall in prices and increase in the range of choice available to users. Despite of high competitive market, there is need for some level of regulations. The interconnect charges are regulated by PTA. Spectrum constraints which may prevent additional entry into the market and also create a need for regulations.

It is one of the key tasks as being promotion of the development of a fair and competitive operating environment for the telecommunication industry in Pakistan.

The regulation authority as an essential considers the availability of MNP for the developments of telecommunication and also for delivery of enhanced benefits to the consumers.

MNP is the ability of the user to retain their mobile numbers when changing operator. MNP can also be defined by giving the subscriber to carry out the following functions when changing mobile operators[17].

- The possibility for circuits which calls to be completed to the subscriber mobile terminal from a fixed telephone with in Pakistan via the international gateway, or from another mobile terminal by dialing same directory number.
- The ability of the subscriber to continue to use his/her mobile terminal with no change of functionality.
- The possibility for supplementary and value added services to be used in the identical way to other subscriber of the new network.

Due to fast growing of the mobile customers day by day and also the choice of the networks available to the customer the PTA believes that there would be some genuine demands and requirements from the customer for MNP. MNP is about facilitating consumer's choice across the mobile operators as it removes the inherent cost of a number change when moving to a new provider. Any number change inherent cost to the user, who would otherwise notify friends and family for a new number or reprint cards or stationary. With the help of MNP, consumer can choose to move between operators where they may get a better deal on tariffs and services with another operator, with our incurring the additional cost and inconvenience of a number change. MNP is available to both prepaid and post paid subscriber of all mobile operators of Pakistan.

[17] Stefan Buehler and Justus Haucap, Mobile Number Portability, University of Zurich, Socio-economic Institute, Working paper No.0303.
website http://www.sio.unizh.ch/research/wp/wp0303.pdf 24-2-06

MNP implementation removes barrier of competition between operator and services and also insure a dynamic, fully competitive market.

The two areas that will benefit from introduction of MNP is Pakistan will the subscriber and operators who may be the price competitive and also provide the quality services. Prior to implementation of MNP in Pakistan, the subscribers required to change their mobile number when they go from one operator to an other operator, the major inconvenience of which results in disadvantages of customers and due to which he may be unable to take full advantage of the growing competition among operators .

MNP may remove all these hurdles and due to which the subscriber/customer benefits may be categories as under:[18]

For having better understanding of the benefits of MNP, We may figure out them under the following three heads:[19]

1. BENEFITS TO CONSUMER

MNP benefits the consumers by the costs savings to the porting customer of not having to change mobile phone numbers, while at the same time have the freedom to choose the

[18]Stefan Buehler and Justus Haucap, Mobile Number Portability, University of Zurich, Socio-economic Institute, Working paper No.0303. website http://www.sio.unizh.ch/research/wp/wp0303.pdf 24-2-06
[19] NEAR/smith(1998), feasibility study and cost benefit analysis for number portability for mobile services in Hong Kong, Final report to OFTA, NEAR/smith: London, 1998

service provider with the best over all value. Business customers experience cost saving by avoiding the costs incurred when changing phone number which may include in following potential caller of the number change, that is changing letter heads or business cards, changing advertising materials and potential loss of business. Callers to ported numbers also benefits from MNP for example include dialing wrong numbers, inquiry to directory assistant and changing entries in directories, databases and abbreviated dialers.

2. BENEFITS TO SERVICE PROVIDERS

All service provider's benefits from MNP by allowing them to compete fairly. The directory for customers by promoting their services and pricing advantages. They also arise out of efficiency and service quality improvements and any associated price reduction resulting from increased competition.

3. BENEFITS TO INDUSTRY

The main benefit of MNP to mobile telecommunication industry as whole is the stimulation to competition with causes. MNP increases competition by either lowering or eliminating the cost of the customer to switch numbers there by increasing the incentives of service providers to compete directly against one another for existing mobile users as well as new users. Increase in competition encourages all service providers to improve the over all value currently afford to customers by improving the quality of service and offering new and innovative products and services. Service providers can only increase

the value on hand to customers over the long term by improving the efficiency of their operations there by improving the health of the industry as whole.

Additionally, subscriber will be benefited from lower prices (E.g. Hong Kong, Australia etc.) as a result of the competition between operators to provide the best service packages, customer service, or other benefits[20].

[20] INTUG(2003), Mobile Number Portability, International Telecommunication user group (INTUG):website, http://www.intug.net/mnp 15-2-06

CHAPTER II

CHAPTER-II MOBILE NUMBER PORTIBILITY

A. DEFINITIONS

All the countries of the world wherever Mobile number Portability was in process or going to be implemented have defined MNP in their own words but all of the definition given by them gives the same meaning. Some of them are as under:

- Mobile Number Portability regulation 2005, defines MNP as "Mobile number portability is the ability to retain an existing mobile subscriber number along with the operator code while shifting connectivity from one operator to an other operator"[21]

- Where as according of OFCOM Mobile MNP is defined as "the ability of a subscriber to change communication provider while retaining their telephone number"[22].

- According to Malaysian Communication and Multimedia Commission (MCMC), MNP is defined as" the ability for end users to retain the same geographic or non-geographic telephone number as they change from one mobile service provider to another"[23].

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[21] In Exercise of the power conferred by the clause (o) of the subsection (2) of section 5of Pakistan Telecommunication (Reorganization) Act, 1996 (XVII of 1996), PTA is Pleased to make there regulation.
[22] Under OFCOM general power & functions, the communication Act, 2003.
[23] Public Inquiry Paper, Implementation of MNP in Malaysia 1st September, 2005 (MCMC)

- Telecommunication Regulatory Authority of India TRAI defines that "Mobile Number Portability will allow subscriber to change their provider while retaining their old mobile number."[24]

- In general it is a circuit switch network service providers by the cellular or fixed line operator to the consumers with the ability to change service providers, locations, or service types without changing their telephone numbers

Introducing number portability will allow some of subscribers to shift between operators and could improve subscriber satisfaction once it is introduced. Operators who provide the best quality of service and coverage, and highest value for money will benefit because consumers will prefer to begin service with them and will no longer hesitate because of changing phone numbers. In the United States, for example, "when unsatisfied cell phone customers want to change their service but not their phone number, more switch to Verizon Wireless than other major carriers." Verizon had the best porting-in to porting out ratio of 3:1 while AT&T Wireless was the worst at 1:5. According to Tole Hart, principal analyst with Gartner, "Verizon is doing well because of the quality of their network and customer service[25]."

[24] Telecom Regulatory Authority of India .
http://www.trai.gov.in/pr22.julo05.htm 21-8-06
[25] Laffont, j.j, Rey, P. and j.Tirole (1998), Networking Computational: Overview and Nondiscriminatory pricing, RAND Journal of Economics 29, 1-37, April 2005

The MNP process has been designed to be as quick and as customer friendly as possible. It is based on two stages process, where the customer will contact the new operator of their choice to setup their new subscription in the usual manner and have the option to keep their existing number with the new operator[26]. To do this, the subscriber has his own number in his name and asked to donor operator, directly or indirectly to port his active mobile number to a designated recipient operator. He may also choose services and payment packages with recipient operator before and after porting, which is being provided by recipient operator to its subscribers.

There are also the provisions of caller's lines identification without interception after the porting as was being provided to him by the donor operator, subject to the right of enmity of the caller and may get mobile communication services from recipient operator on non discriminatory basis as being provided by recipient operator to its subscriber. There is also need that the subscriber will be required to provide certain information's to their new operators who will validate their request to insure that whole the process is secure and that the subscriber making the request is entitled to port that number[27].

Most of the changes will be make in few days. Here in Pakistan the recipient operator may approaches the donor operator in mutually agreed manner then the donor operator shall exceed the request within maximum period of seven days. The processes are designed in such a manner that it will move the number to a new network as timely and straightforward as possible.

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[26] OVUM (2000), Mobile Numbering & Number Portability in Ireland, A Report to the ODTR, OVUM London, October 2000.

[27] The average subscription fee will strictly falls with the introduction of MNP.

Users find it desirable to be able to predict the price of calls, and porting numbers should not undermine this capability. This issue is especially important giving the proliferation of tariff plans that depend on the destination of the call[28]. For example, some cellular service providers charge less for calls within their network, and more for calls to phones on other networks. If portability is implemented, then it may not be possible for a caller to determine what the tariff for a call might be. This could lead to confusion for the calling subscriber, and implementing tariff transparency will help to avoid this situation. Tariff transparency can be achieved through the use of recorded announcements at the start of a call to hear a short tone before the call is connected or when the caller has a terminal with a screen where the tariff or service information could be displayed[29].

Since a database query returns the routing information in the form of a rerouting number (which may be a pre-fixed original called party number), it is important that this re-routing number is recognizable and routable by the transit switches and fits into the National Numbering Plan.

Additionally, the National Numbering Plan needs modification because after introduction of number portability, the recipient network should be allowed to use numbers originally assigned to the donor network. When customers are allowed to port their directory number between operators, the number of customers per number series in a given

[28] OFTAL (1997), Economic Evolution of Number Portability in UK Mobile Telephony Market, OFTAL: London, October 2000.
[29] OVUM (2000) Mobile Numbering & Portability in Ireland, A report to MTN, OVUM Project CLM42: London, Sept 2004.

exchange may become lower, since the total number of connected customers to a particular number series will then be shared by the number of exchanges and operators. The methods used for routing a call to a ported number that originates on another network within the same service area, a network elsewhere in the country, or a network in another country may be distinct[30]. For calls originating in another country, the foreign network will forward the calls to an ILDO in Pakistan, which may have to route the call to the recipient network. For domestic long-distance calls, the NLDO or the originating network may take responsibility for routing the calls. This procedure will depend on the technical solution chosen of which are being explained in the coming chapter.

SMS messages are routed between mobile networks via signaling paths rather than over voice circuits and so the methods used for routing of calls to ported numbers are not applicable to handling of SMS messages forwarded to ported numbers. Service providers may have to use a separate solution for handling SMS traffic for ported numbers.

It is envisaged that the following would be adhered to ensure smooth implementation of MNP for the end-user and both Donor and Recipient Operators and to ensure a well functioning of number portability environment[31]:

- That the Donor operator would not prevent a porting from being completed that has already commenced by using rejection codes.

[30] Website: http://www.heise.de/newsticker/melvung/45307 (18 June 2004)
[31] Corporate Strategies on the Telecommunications Sector Christine Borrmann, in an Environment of Continuing, Liberalization , HWWA Discussion Paper 122, 2001, http://www.hwwa.de/publication/ discussion_paper/2001/122.pdf 24-7-06

- That the Legally binding agreements between an operator and a subscriber and user would be respected and followed in letter and spirit.
- That all operators would maintain subscriber services as well as quality of network performance parameters while providing cellular mobile telecommunication services to its subscriber.
- That all operators apart from other things would compile records and the information regarding ported subscribers from its network, which includes: the failure rate of porting process, average duration of porting process and additional call set up delay time on average calculated by calling ported subscribers.
- That all operators would be capable to provide all telecommunications services to the ported subscribers and shall upgrade their network in a manner to support MNP as per the ITU-T recommendations and other standardization bureausnot applicable to handling of SMS messages forwarded to ported numbers. Service providers may have to use a separate solution for handling SMS traffic for ported numbers.

B. TYPES OF MOBILE NUMBER PORTABILITY

There are three basic types of number portability: operator, location, and service portability[32].

[32] Global System for Mobile Communication .wikpdia, the Free Encyclopedia .http:/www.en.wikipedia.org/wiki/gsm 23-9-05

1. OPERATOR PORTABILITY

This is the ability of a subscriber to retain within the same service area, an existing telephone number even if they change from one service provider/operator to another.

This type of portability is for the same service, that is fixed to fixed, or mobile-to-mobile.

Operator portability can be implemented for geographic, non-geographic, or mobile numbers contained in the National Numbering Plan. Geographic numbers for fixed lines convey the subscriber's location, and convey the location of the customer. A non-geographic number does not imply the location of the customer. Mobile numbers are reserved for subscribers of mobile services.[33] Different categories of operator portability follow from these different types of numbers, and are:

- Fixed Number Portability (FNP) is the portability of fixed geographic numbers.
- Mobile Number Portability (MNP) is the portability of mobile telephone numbers.

Till date, operator portability has been the major type of number portability implemented internationally.

[33] This argument is related to Forrreell & Gallini (1998).

(a) Mobile Number Portability

MNP is operator portability applied to a mobile-to-mobile porting process. There is a latent demand for MNP in Pakistan. A great number of mobile subscribers are likely to shift to an operator offering better service, if given the option to the market share of all mobile operators in Pakistan. Fixed operators will also have to be involved in routing calls correctly to ensure the success of MNP. The options for fixed network operators are Simple since all calls addressed to mobile operators will, by definition, be interconnected calls and will be conveyed to a gateway exchange, the fixed operator can either –

- Undertake a data base inquiry at the gateway, using its own gateway switch equipped with CCS7 signaling, or
- Make arrangements for the data base inquiry to be undertaken by another operator on its behalf at that point, and purchase a related transit service, or
- Connect to the donor network that routes the call to the recipient network. Competition between mobile service providers in Pakistan is already intense. The beneficiary of this Competition would be the Pakistani consumers, and MNP may increase the level of competition further.

2. LOCATION PORTABILITY

Location portability is the ability of a subscriber to retain an existing telephone number when changing from one physical location to another. Location portability is the porting

of a geographic number from one location to another. Location portability can be within exchange area, within numbering area, within charging area, or anywhere[34].

Unless combined with other types of portability such as service or operator portability, it remains an internal network operator issue. Location portability becomes complex in the Pakistan's situation wherever the subscriber moves to a region where her or his original network operator has no footprint. Location portability has varying levels of complexity depending on whether the porting is occurring within or outside an exchange area and charging area.

There might be differing impacts of routing and billing depending on the new Location of the number, it might be comparatively simpler to implement location portability in an area such as short distance charging area (SDCA) by fixed operator that will benefit the customers as long as customer changes location within SDCA. Location portability is not required in the existing mobile services as long as subscriber moves within the service area, i.e. circle or metro. The overwhelming proportion of porting activity may be expected to occur when customers change to another service provider within the service area, i.e. perform operator porting, rather than when they move to live or work for extended periods in another service area.

[34] Imran Ali, structure of telecommunication system in Pakistan, Working Paper No.92-22, march 2000, http://www.lumps.edu.pk/cmer 23-5-06

3. SERVICE PORTABILITY

Service Portability is the ability of a subscriber to retain the existing telephone number when changing from one service to another service, say from fixed to mobile services.[35]

The United States allows for "'intermodal' local number portability (LNP), i.e., the ability of customers to switch from a wire line carrier to a wireless carrier, or from a wireless to a wire line carrier, without changing telephone numbers. In the United States, until November 25, 2005, 732,000 fixed-line telephone users had moved to mobile phones, and up till April 2005, 1,000 subscribers had ported their numbers from mobile to wire-line service.[36]

Implementing service portability might be useful for users who wish to newer telecom services, but value their telephone numbers immensely, such as businesses. Service portability might allow these users to migrate to telecom technologies providing data or mobile connectivity, and simultaneously not lose their existing phone number.

The service portability will encourage the introduction and adoption of new telecom services and technologies. This will not only benefit users but also those service providers who continually upgrade and innovate. Additionally, it is a source of competition between all telecommunications operators whether fixed or mobile.

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[35] Nicklas Beijar , Telephony routing with support for number portability in interconnected circuit snf packet switched networks, HELSINKI UNIVERSITY OF TECHNOLOGY, April 5, 2005.

[36] Time Magazine March 2006, "USA Tele Industry Report".

However, there might be concerns about possible confusion for callers about the charges for different phone calls. For instance tariff transparency is affected. In the current context, this is especially true when wire-line numbers become wireless numbers. A caller would no longer be able to estimate call charges based on the format of the phone number.[37] For introduction of service portability, the capabilities of fixed networks are to be studied in detail.

C. IMPLEMENTAION OF MOBILE NUMBER PORTIBILITY

The rational introduction for Implementing MNP is a simple affair. A number of issues have to be considered, and to be discussed with great concern, such as: Technical solutions for number queries and call routing Processes regarding the porting itself. Regulatory aspects concerning protection of consumer rights Economic aspects concerning implementation costs, running costs, increased interconnection costs and other extra costs for routing calls to ported numbers.

Now we may discuss some of the possible outline of technical options in detail to implement number portability.

1. TECHNICAL OPTIONS

The technical solution adopted for the implementation of number portability is important as it will have cost implications on service providers/network operators, and will affect

[37] Call charges may arise the problem only when so called calling party-pays; regime applies as in most of the countries.

the services offered and the performance of these services made available to the subscriber. Technical solutions may influence, or be influenced by, cost allocation arrangements and form an essential background to questions of cost assessment and recovery. Deciding between different technical options requires us to consider a whole range of issues. These include roaming, operational support system modifications, call charging arrangements, routing arrangements in the National Numbering Plan, interconnection between networks, support of number portability within and across mobile technologies, the timeframes involved in the introduction of solutions, the cost-effectiveness of different solutions, handling of voicemail, data and fax numbers, and routing of SMS traffic in the case of MNP.[38] A key question that needs early resolution is the method used for routing of calls from an originating network to the recipient network. Number portability can be provided by two broad categories of methods: off-switch solutions or on-switch solutions.

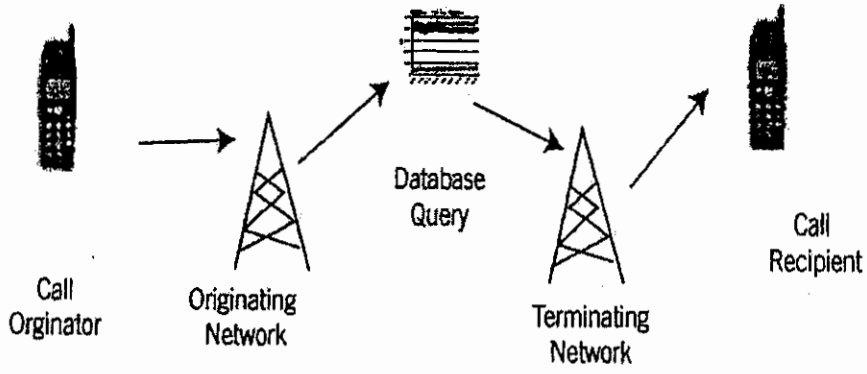
Ib-4741

(a). Off-switch Solutions

Off-switch solutions transfer the knowledge of porting information into one or more external databases that all network switches can access for query. Interception is performed at the originating switch or at some transit switch. This type of solution allows for the efficient routing of the call towards the recipient switch. The originating switch (or some transit switch) can intercept a call to a ported number by querying the database that contains the list of all ported numbers plus routing information associated with each ported number. There could be two ways to access the database, using the All-Call-Query, or the Query-on-Release methods.

[38] OFTEL 1997

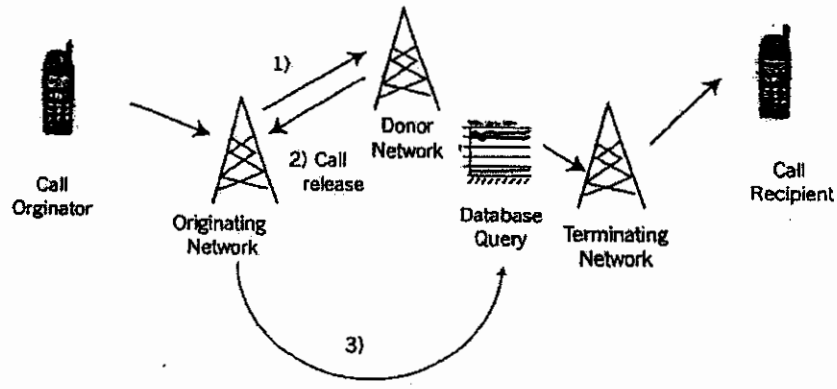
- **All-Call-Query method**: The originating network first checks the location of the dialed number in the central database and then routes the call directly to the recipient network[39] i.e. with all call query the originating network determine the proper recipient network before terminating the call. As the name suggest, as calls from an originating network are checked in database before routing a termination, as seen in Fig 2.1



This insures efficient routing and enables the originating network to differentiate call charges. All Call Query system ensures fast set-up times for calls to ported numbers because no exchange of information with the donor network is needed. On the other hand, call to non ported numbers suffer a soft delay because they have to go through the same look up as ported umber before being routed .All call query system require that the database being queried contain routing information on all ported number from all networks.

[39] Implementation of MNP in CEPT Countries.

- **Query-on-Release**: The originating network first checks the status of dialed number with the donor network. The donor network returns a message to the originating network identifying if the number has been ported or not. The originating network then queries the central database to obtain the information regarding the recipient network and routes the call directly to the recipient network,[40] with query on releases fig 2.2.



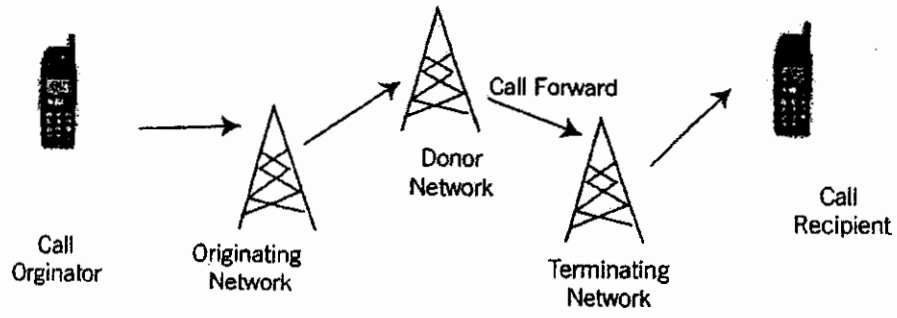
The mobile network originally associated with the called number identifies that the number is ported and returns the message to the originating network indicting that the number has moved. The originating number then quires a data base to obtain information identifying the correct terminating network. This system has the same properties as call drop back systems, but is more complex as specific signaling function needs to be supported by the system.

[40] NEAR/smith, 1998

(b). On-switch Solutions

In the case of on-switch solutions, the donor network manages the routing information for a ported number. Thus, the donor switch performs the interception, either routing the call itself, or providing routing information to the originating network that then routes the call to the recipient network. Consequently, this involves the use of internal databases. The two ways to implement on-switch solutions are:

- **Onward routing (call forwarding)**: Here, the originating network connects to the donor network. If the dialed number has been ported, the donor network itself routes the call to the recipient network or With "Onward routing", a call is routed to the network that originally was associated with the dialed number fig 2.3.

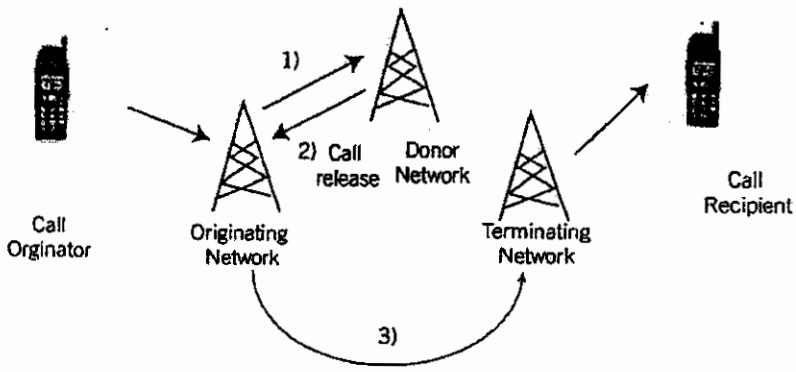


The number range determines this that the number falls within and that has been licensed to a given network. This network then forwards the call to the recipient network. Onward routing is regarded as the simplest and the

cheapest way of implementation of MNP[41]. However call routing in this type of system is not optional because all call to ported numbers have to be routed through the donor network. Further more, the originating network does not have an indication of whether a call has been ported. This is significant if the originating network have different interconnect charges with different networks.

- **Call Drop Back**: Here the donor network checks if the number is ported and if it is, releases the call back to the originating network together with information identifying the correct recipient network. The originating network then routes the call to the recipient network. On-switch solutions are usually seen as a short-term interim solution for number portability. They are relatively easy and quick to implement compared to off-switch solutions. Some countries initially chose a transient, short-term solution[42]. This was not necessarily the mobile network originally associated with the called number checks if the number is ported and releases the call back to the originated network together with the information identifying the correct terminating network. As with on word routing, no central database is necessary as each operator keeps track of its own number range. Signaling information still need to be exchanged with the donor network See Fig 2.4, which can increase the overall load on the network.

[41] Syniverse Technologies. (2004). "A global prospective on number portability. Syniverse technologies Inc."
[42] http://en .wikipedia.org/wiki/Globle_System_for_Mobile_Communication 26-5-06



On the other hand, a call to a ported number will be routed directly from the originating network to the recipient network and the originating network is thus able to differentiate prices most technically efficient solution, but allowed implementation in a timely way and with minimum investment. Simultaneously, a long-term solution was also studied and deployed progressively[43]. The mobile network originally associated with the called number checks if the number is ported and releases the call back to the originated network together with the information identifying the correct terminating network.

(c). Database Management

The various technical options related to the implementation of MNP mentioned above involve the use of databases that contain routing information. The databases can be

[43] GSM Call Flow Diagrams (http://www.eventhelix.com/Realtimemantra/Telecom/) 26-5-06

centralized or distributed.[44] The centralized model involves a single reference database containing data for all mobile numbers or alternately, all ported numbers. This reference data is usually copied to operational databases in each participating network on a frequent basis. A consortium of network operators may manage this centralized number database for mobile number portability, or it may be outsourced to a third party. The distributed model involves multiple databases containing subsets of the total data. For example, in the on-switch case each separate database in the distributed model may comprise only the numbers ported from a particular mobile network operator. The full set of information about all mobile numbers (or all ported mobile numbers) is only available from these separate databases when taken as a whole.

(d). Comparing the Technical Options

Onward routing is often regarded as the simplest routing method to implement and the all call query method as the most complex, with the other methods lying between these two extremes. This is also reflected in the costs of establishment, with onward routing regarded as cheaper to establish than the all call query method. By contrast, the ongoing costs associated with the all call query method are usually regarded as less than those of the onward routing method. Again, the costs associated with the other two methods lie between those of all call query and onward routing. The centralized database solution is perceived as a long-term target solution for number portability. It supports optimal call routing and is adapted to an environment where all operators share number information.

[44] **Centralized Database** is maintained by one of the operators or an independent third party. **Distributed Database** means that operators runs and maintained their own database which number have been ported and of the recipient network.

However, it is technically much more complicated to implement, involves significant investment and requires considerable national co-ordination. Alternatively, distributed database solutions might need less coordination because every operator will have to handle the information only of their ported out or ported in numbers.

2. OPERATIONAL ASPECTS

Although the technical implementation of number portability involves particular challenges, the challenges in devising the administrative arrangements facilitating porting of numbers may need equal, if not more, attention. Inefficiently designed, complex or flawed procedures for porting of mobile numbers may act as a bottleneck to the successful implementation of portability and severely affect the expected benefits. Designing efficient, simple, secure and yet practical porting procedures for number portability may involve addressing issues such as the role of retailers, the need to change SIM cards or handsets, existing customer obligations, authentication of customers requesting a port, communication arrangements between entities during the porting process, refusal to port, time to port, and procedures for porting large quantities of numbers at a given time[45].

3. ECONOMICS ASPECTS

The success of introduction of any service in a telecom network is highly dependent on how cost-effective it is to the end users, and the cost burden it imposes on the concerned

[45] Administrative solutions by Tahira Saleem. Daily Timmes,2nd February 2003.

parties for its implementation. In this respect, the implementation of number portability should be cost-effective to ensure its success.[46]

(a). Costs associated with Number Portability

The costs incurred in the provision of number portability may be broadly divided into three categories[47]:

- **System set-up costs**: These costs ensure that all or most users have the capability to use number portability. These may be the costs of establishing/maintaining routing databases, conditioning existing networks, upgrading network switches, and modifying existing software. These are the costs that a provider may incur in establishing the capacity to provide number portability on its own network and in its associated operational support and administration.

- **Call Conveyance costs**: The costs of additional conveyance of calls to ported numbers in the case that they must transit the donor network.

- **Administration costs**: These are customer transfer costs or porting costs. They include the costs incurred by service providers in closing an existing account, setting-up a new account and coordinating the network operators

[46] Aoki, R, &small, J. (1999). The Economics of number portability. Nov 1999 in MNP
[47] Klemper.p. (1999). Competition when consumers have switching costs. An overview with application to industrial organization, macro economics & International Trade. Review of Economic Studies.

in the switching over of the mobile number and routing of the calls, costs of new handsets or SIM cards and caller costs (the additional delay in setting up a call to a ported number).

There are three main components of costs, the set up cost, the call conveyance cost and the administration cost. It is clear from the discussions so far that the proportion of each of these costs would be different for different methodologies or technical solutions adopted for achieving number portability. In a off-switch system which requires a centralized database there would be a need for someone to set up the data base and then administer it. As already indicated, there is considerable cost associated with this. The other possibility is to use Distributed Data Base solution where the system set up cost is not as high and is necessarily borne by each operator himself. In this situation, it may happen that Call Conveyance Cost may be of high proportion. The next issue is whether these are to be considered as recoverable cost from the tariffs set up by the operators or they are to be taken as customer acquisition cost in the hope of capturing more customers. A question may arise whether such a decision should a regulatory decision or a decision taken by individual operators. Determination of such a cost if it is to be part of the tariffs for the customers has to be carried out on a cost based analysis by the regulator. The setup, conveyance, and administration costs may be allocated according to different cost allocation mechanisms.

CHAPTER III

CHAPTER III SOLUTIONS TO MNP

A. LEGAL FRAMEWORK IN THE VARIOUS COUNTRIES OF THE WORLD

The common trend for all the market/countries has been introduced is that it has happened as a result of regulator or government activities. In most of the cases MNP is imposed on operator either by legislation or by decree. The regulation through which it is being implemented may vary from market to market.[48]

The key European framework regarding number portability states that:
Number portability between fixed line numbers was previously made mandatory in the so-called ONP-Directive 97/33/EC as amended by Directive 98/61/EC. This objective imposed the obligation on EU member states to ensure that fixed-to-fixed number be made available by 1 January 2000at the latest.

In 2002, the European Union adopted a number of new EU telecommunication directives. These directives were:[49]

The framework Directive (2002/21/EC), which out line the general regulatory framework for the telecommunication sector, establishes objectives for regulators and sets out key

[48] Baskerville Management Report By Claus Mortensen,2004.
[49] Opinion of the European Parliament of 13 June 2001 (not yet published in the official journal), Council common position of 17 September 2001 (OJ c337, 30-11-2001, P.55) and Decision of European Parliament of 12 December 2001, Council Decision of 14 February 2002.

procedures for managing the regulatory programme. Notably it provides a new basis for determining significant market power (SMP).

The authorization directive (2002/20/EC), which provides for standardized authorization to replace individual licenses apart from licensing concerning numbers and exclusive use of frequencies.

The access Directive (2002/19/EC) which mainly consolidates the position on access and interconnection, it establishes that operator with SMP, as laid out in framework Directive, may face obligations to provide access and interconnect in the electronic communication markets.

The universal services directive is thus the key regulatory framework for most European Mobile Number Portably. The key requirements are set out in Article 30 of the Directive:[50]

- Member states shall ensure that all subscribers of publicly available telephone services including Mobile services, who so request can retain their number(s) independently of the undertaking providing the service:

    - ✓ In case of geographic numbers at a specific location; and
    - ✓ In case of non-geographic numbers at any location.

[50] Official journal of the European Communities Directive 2002/22/Ec of the European Parliament and of Council of 7 March, 2002.

- National Regulatory Authorities shall ensure that pricing of interconnection related to the provision of number portability is cost oriented and that direct charges to subscribers, if any do not act as a disincentive for the use of these facilities.

- National Regulatory Authorities shall not impose retail tariffs for the porting of numbers in a manner that would distort competition, such as by setting specific or common retail tariff's.

As it can be seen from paragraph one, above, the directive concern fix-to-fix and mobile-to-mobile number portability but does not cover porting between fix and mobile network. However, member states are free to impose obligations regarding fix to mobile number portability on its service provider if they so choose.

The article ensures that operators do not impose charges for number porting that would discourage consumers from using the service. It also imposed an obligation on national regulators to ensure that interconnection charges that result from the implementation of number portability are cost oriented. When assessing this, National Regulatory Authorities may take an account available in comparable markets.

All the directives mentioned above were to be implemented by EU member's states by 25 July 2003. In other words, mobile number portability was to be in place by this date.[51]

[51] http:/ /www.uk-legilation.hmso.gov.uk/acts/acts2003/30021-b.htm 14-6-06

Apart from the what directive states about the implementation dead line, interconnection relates tariff and user fees, no detail is given as how MNP is to be implemented. It is therefore, up to the EU member states to make the necessary decisions, rules and guidelines regarding these issues.

As mentioned above, most member states have resorted to voluntary operator agreements for most of implementations usually only imposing resolution or binding decisions regarding the deadline for the implementations and in many cases regarding user fees.

Over the past decade a numbers types have been implemented in a range of countries. Now we may try to summarize and compare the key features and legal issues/framework associated with mobile number portability in some international jurisdictions.

1. SINGPORE

Singapore was the first country in the world to introduce MNP in April 1997.Mainly due to technology that the Singaporean operators have in placed at the time, a simple call forwarding solutions for routing calls. With this solution the original Mobile subscriber ISDN (MSISDN) remain with the donor operators and calls are forwarded from the donor network to the recipient network. The recipient network issued the customer with a new shadow phone to which call are forwarded. This solution is very simple and cheap to implement but it means that the customer effectively has two subscriptions after porting which may adds to the cost. To accommodate the Singapore regulator IDA allowed the

operators charge monthly fee for the service a fee that has been around SGD 8 (US$ 4.7) to SGD 12 (US$ 7).

The Singapore version of MNP was further measured by the fact that it did not include non-voice service such as SMS.

From August 2003, however, the Singaporean Operators the Infocom development authority of Singapore IDA, mandated Mobile Number Portability to be a free service for subscriber and from October 2003, an extra MNP database was add to the system to enable support for forwarding of SMS, MMS and other data services. The latest statistics raveled in reaching in this report indicate that 312, 000 subscriber had ported their mobile numbers by the end of April 2002, equivalent to 1% of the total Singaporean base at that time.[52]

2. HONG KONG

Hong Kong is a good example how MNP can turn in to a nightmare for operator. The Hong Kong market was fiercely competitive that MNP was introduced. This coupled with the fact the Hong Kong citizens are known among the most price conscious in the world, which means that the introduction of MNP resulted in a price war between the operators that have repercussions on the market for almost two years.

[52] INTUG(2003), Mobile Number Portability, International Telecommunication Users Group (INTUG): (www.intug.net/mnp) 15-2-06

Only by mid 2002 did the Hong Kong operators really return in to profitable businesses. The lessons learnt from Hong Kong MNP introduction is that mobile operators may be better off solely focusing on beating the price afforded by the competition.

After commission of preliminary study OFTA decided to order the limitations of MNP related later that year. Based on findings of this study it was decided to introduce MNP by implementation of this distributed database solution with fixed network operators providing the lookup service and mobile operator implementing self-database system.

In Hong Kong the MNP was introducing according to following time scale:[53]

- Late 1997-OFTA commissioned a feasibility study and cost benefit analysis of number portability for mobile service in Hong Kong.
- 25 February 1998 the preliminary report was presented and discussed at an industry workshop.
- 9 June 1998, the final feasibility study outlining the need for MNP was made public.
- 28 August 1998 the formal decisions on implementations of Mobile Number Portability and introduction of duel services were announced. The Directions were issued to all Hong Kong operators mandating to make MNP available from the same day.
- 1 March 1999 MNP introduced.

[53] "History of MNP development in Asia- Pacific". Economic journal, May,2005.

3. AUSTRALIA

Australia introduced MNP in September 2001, following a mandate from Australian competition and consumer commission. The original deadline was March 2001, but due to the reports of technical difficulties from one or more operators, the Australians communication authority (ACA) revised the implementations dead line.

During an initial startup period agreed by the operators to be from 25 September 2001 to 25 September 2002, operators were allowed to rely on simple onward routing. Since September 2002 however, industry standard required that operators use either direct routing via an internally maintained routing database (distributed) or direct routing via a routing database maintained from an external source (centralized). It is up to each operator to decide which technical routing solutions implement other than onward routing. The number of porting passed the one million mark in 2003 equivalent to 7% of the total Austrian base at that time. In March 2004 to further boost the number of porting the ACA registered revised MNP code prepared by the Australian communication industry from (ACIF). The new code required operator 99% of mobile phone numbers porting with in two business days and 90% of mobile ports with in three standard hours of operations[54].

[54] "History of MNP development in Asia- Pacific". Economic journal May,2005

4. CZECH REPUPLIC

In December 2003, it was reported that the three Czech mobile phone operators had asked for postponement of the launch of number portability services. The IT minister Vladimir Mlynar, wants to introduce number portability from 1st May 2004.

In February 2004, the Czech IT Minister and Czech Telecommunication office (CTU) completed a draft of a new electronic communication act that will bring the regulatory frame work in compliance with EU resolutions and should replace the current telecomm act. The Czech Government is scheduled to discuss the proposal on 29th April 2004, and the Czech parliament has to approve that during autumn 2004. Because this law needs to be adopted before MNP can be mandated. MNP was introduced before late 2004[55].

5. UNITED STATES OF AMERICA

Porting among wire-line carriers has been occurring since 1998. To facilitate greater competition in the telecom industry, the US Federal Communications Commission (FCC) mandated service providers to ensure portability if a subscriber moved wireless carriers, or between a landline and wireless phone, from November 24, 2003. The 1996 Telecommunications Act requires all wire line local exchange carriers to provide local number portability (LNP), and the Commission has mandated that wireless carriers provide wireless LNP (WLNP) as well. On November 24, 2003, wireless carriers began

[55]Ovum (2005) Mobile Number Portability-An International Bench Mark, A Report of MTN, Ovum projects Clm 42, London Sept 2006.

porting in the top 100 markets, and porting also began in those markets between wire line and wireless carriers. On May 24, 2004, wireless local number Portability became available in the rest of the country outside the top 100 markets. By November 25, 2004, one year after the introduction of WLNP, 7.8 million users ported their numbers. In tracking ratios of customers porting-in to porting-out for major carriers in the United States, the Yankee Group noted that Verizon Wireless had the best ratio at 3:1, and AT&T Wireless had the worst at 1:5.[56]

6. FINLAND

Finland introduce in July 2003, following the implementation of EU universal services directive. The Finnish operators opted for all call query solution and they jointly formed new company to mange the central database. IT solution provider, Accentor was chosen to implement and host the MNP master database for 5 years.

The introduction of MNP has let to marked increase in competitive activity and as in case of Denmark, this has especially been due to providers who buy capacity from the 3 major network operators the largest of these providers, ACN and Saunalahti, currently operative over Teliasonera' network.[57]

[56] Journal of Industrial Economics
"State of developed Telecom System" Nov 7th by Charles dikon

[57] Baskerville Management Report by Claus Mortensen, 2004.

7. DENMARK

The National IT and Telecom Agency (NITA) have imposed number portability on all operators and service providers. Those players themselves with no intervention from the regulator have agreed upon the technical solution. The technical solution for number portability in Denmark is based on IN-Query from the first exchange of the carrier responsible for the call. New entrants for normally use All-Call-Query. The incumbent, TDC Tele Denmark, uses Query-on-Release for calls to own numbers and All-Call-Query for calls to other numbers. FNP was introduced in October 15, 1999. MNP was introduced in July 2001.[58]

8. GERMANY

Germany introduce MNP in November 2002 through a strong will of its regulator, Reg TP as German operator were opposed to introduce MNP a head of EU deadline. After the operators argued that the adherence to the original deadline was not technically feasible, the introduction was postponed from Jan 2002 to Nov 2002. The extension of the deadline was given with the extra conditions that mail box numbers also were made portable.

The system seems to be based on all call queries, with quires made to central database. The central database to is run and maintained by T-System, a subsidiary of Deutsche Telekom by the end of January 2003, 14928 customers were said to have ported their

[58] http:/ /www.uk-legilation.hmso.gov.uk/acts/acts2003/30021-b.htm 25-10-06

mobile numbers, and insignificant amount in relation to the 56 millions Germans subscribers based at that time.

According to German legislation the customer can be charged only the cost, which is directly attributable to the change.

The interpretation of this rule has resulted in relatively high fee range. Contrary to most other countries this fee is being paid by the donor network.

This impact on competition from MNP has been relatively small, as the number of porting has been limited. The fact the MNP seems to be having help Germany to gain customers, suggests a positive effect although the 02's increase in market share has not been dramatic.[59]

9. NETHERLANDS

Dutch law mandates that service provider's port fixed, digital mobile, and non-geographic numbers on request from the subscriber. The first steps were taken towards number portability in October 1995, and the legal obligation to port non-geographic and fixed numbers became effective in March 1998. By April 1999, number portability was a legal obligation for all fixed and digital mobile numbers. The Dutch market was in its early growth phase for 2G mobile services at the time the decision in favor of number portability was made. At the time of introduction, the total subscriber base for mobile

[59] http://www.intug.net/mnp.15-7-06

telephones was 4.3 million. This was equivalent to a 27.37% penetration. This was a time when competition was largely for a share of new subscribers, rather than to promote increased competition in the context of a more saturated market. As of February 2004, the penetration of mobile phones is 83.2%.[60]

10. UNITED KINGDOM

The UK was the first European country to introduce MNP in Jan 1999. MNP was received after the regulator, Oftel, mandated mobile network operators to port numbers to other mobile operators on request on reciprocal basis.

However, issues relating to technical solutions and cost sharing was left to UK operators to agree upon and require no regulatory intervention. Due to relatively high cost involved in implementing IN-based solutions such as all call quires and centralized databases, the operators opted for more simple system relaying on onward routing and distributed base. During 2002 Oftel (now Ofcom) proposed to the industry that the system be upgraded or modernized particularly due to what was described as the inhered problem with the efficacy of the existing, "solutions looking forward, lack of an effective block transfer process, the addition cost of conveyance, potential network congestion and the disincentive to setup service establishment".

The two options proposed by the Oftel to modernize the system were either to improve onward routing or to adopt an alternative system. Which would additionally removed the

[60]Ovum (2000): Mobile Number Portability, A Report of the ODTR. London (Ovum). Aug 2002

other identified difficulties of the implemented solutions and gives greater network reliance over all in effect, in all call quires system with a centralized database.

In the subsequent public consultation, however, all UK operators opposed and migration to a different routing system and the current UK system is thus still based on onward routing although some measures are being implemented to update the functionality of the routing and signaling system.

Oftel secured significant improvement to MNP processes in October 2001 (with out recourse to regulatory intervention), reducing the porting time line from 25 days to 5 days.

The original process porting number was fax-based. The service easily enabled all mobile phone operators to be included in the process, and it was deemed a sufficient process when at the time the demand for MNP could not be predicted.

To change the system the 4 UK mobile operators agreed to work together to introduce a web based facility. To this end the operators appointed a logica (Now logica CMG) programmer manger in September 2002 to take full responsibility of coordinating the MNP activities of the 4 operators, to define the project need and to coordinate with the software provider, a company called soft Wright solutions Ltd., and the new automated system was finally introduced in October 2001[61].

[61] OFCOM 2003 REPORT.

Ofcom admit that number porting has been lower than expected but explained this with the fact that the implementation of MNP coincided with massive growth in the Mobile uptake. As the UK mobile operators were competing with each other to signup new customers MNP may be viewed of relative insignificance during this period.

Now that the UK market is saturated and operators and focusing more on customer retention, increasing ARPU, and " life time customer values", Ofcom suggests that the significance of MNP has increased and likely to do so.

11. CONCLUSION

MNP has now been implemented in about 25 countries worldwide, and at least 12-15 countries are scheduled to introduce MNP by 2007. Eastern Europe currently has most interest in MNP, as the new EU member states get their telecoms regulation in line with the EU Universal Services Directive and other countries implement EU legislative standards to make future EU membership easier.

Other regions include Asia, where both Japan and Taiwan have announced plans to introduce MNP in 2005 or 2006; other countries in the region may follow suit soon after. In addition, the Middle East and South & Central America are likely to see implementations by 2007, whereas won't be the agenda in Africa (with the exception of South Africa) before 2009[62].

[62] Baskerville Management Report by Claus Mortensen ,2004.

Some of the early adoptions of MNP have relied on onward routing and distributed databases as a technical solution due to the fact that network technology at the time was not mature enough to support advanced IN solutions and that centralized databases were too costly to implement. More recent implementations tend to favour more routing efficient solutions, such as all call query as well as centralized databases to ensure higher efficiency for both porting processes and member queries.

However, it may be that some of the MNP implementations to come will again rely on "Cheap and easy" onward-routing solutions as some of these countries may not have the funding or the technical infrastructure to justify more complex MNP solutions.

The advent of MNP has had very different consequences for the different markets around the world. Some countries, such as Hong Kong, have seen major shake-ups in the market as a direct result of MNP; in other countries, such as France, Singapore and Portugal, MNP has changed very little.

The overall picture that is emerging from the numerous implementations in that MNP does not seem to result in a long-term increase in operator's churn rates. The evidence from several countries shows that churn increase, typically for the incumbent operator, in the three to six months following the introduction of MNP, but after that the churn levels stabilize at values similar to the period before MNP.

In a number of countries, the introduction of MNP has been followed by a variety of new services and price plans. These plans and services may be either tailor made for operators MNP campaigns or operators may have chosen to time the launch of these to coincide with MNP. In any case, the result often seems to be lower tariffs and more inventive services. To what degree tariffs are affected depends on the collective strategies of the operators. In markets with one or two aggressive operators, prices are almost guaranteed to go down, as was the case in Hong Kong. However, in markets lacking such hungry and aggressive players, operators may choose to respond to the "threat" of MNP by playing down its existence. If all operators in a market choose this strategy, be it by quiet mutual consent or otherwise, tariffs and churn rates will almost certainly remain unaffected.

But, as a whole, even though churn rates may not be affected in the long run, it seems evident that MNP, when introduced in the right way and under the right market conditions, encourages competition and provides cheaper and better services for the end-user. In addition, MNP boosts operators' awareness of the importance of customer retention and customer loyalty.

To get the complete picture of the pro-competitive effect of MNP; it is necessary to look at factors other than just churn rates, tariff comparisons, market shares and ARPU; factors such as customer satisfaction and operator innovation should also be included. These factors fall outside the scope of this report, but the predominantly stable churn

rates across MNP markets suggest that operator in general have been relatively successful in these areas.[63]

Experience from across the globe has shown that MNP is a subject that generates hopes, disappointments and controversy. With all the recent implementations and the numerous implementations planned within the next few years, MNP will continue to be an interesting topic to keep an eye on with many more lessons to teach both operators and regulators.

The following table shows the MNP Implementation by country and tables showing country Planed Implementation of MNP[64].

MNP Implementations by country (3.1)

Date	Country	Implementation model		Database
		Short Term	Long Term	
Sep – 01	Australia	Onward Routing		
Oct – 02	Belgium	All call query		Centralised
July – 01	Denmark	All call query		Centralised
July – 03	Finland	All call query		Centralised
Jun – 03	France	Onward Routing	All call query	
Nov – 02	Germany	All call query		
Mar – 04	Greece	Onward routing		
Mar – 99	Hong Kong	All call query		Distributed
July – 03	Ireland	Onward routing		
May – 02	Italy	Onward routing		
Jan – 04	Lithuania	Call forward		Centralised
Apr – 99	Netherlands	All call query		Centralised
Dec – 01	Norway	Onward routing	All call query	
Jan – 02	Portugal	Query on release		

[63] INTUG (2005),Mobile Number Portability < International Telecommunication User Group (INTUG): (www.intug.net/mnp)15-7-06

[64] Source: Baskerville management report by Clause Mortensen, 2004

Nov – 03	Puerto Rico	All call query		Centralised
Apr – 97	Singapore	Call forward		
Jan – 04	South Korea	All call query		
Dec – 00	Spain	Onward routing for small ops: All call query for larger ops		Distributed for smaller ops; centralized larger ops
Sep – 01	Sweden	All call query		Centralised
Mar – 00	Switzerland	Onward routing	Query on release	
Jan – 99	UK	Onward routing		Distributed
Nov – 03	USA	All call query		Centralised

Note: Long-term implementation plan is the same for short-term unless indicated otherwise.

Planned implementation of MNP (3.2)

Year	Country	Implementation Model		Database
		Short Term	**Long Term**	
2004	Austria	Onward routing		
2004	Jordan	Call forward		Centralised
2004	Latvia	Onward routing		
2004	Luxembourg			Centralised
2004	New Zealand			Centralised
2005	Croatia			
2005	Pero			
2005	South Africa			Centralised
2005	Taiwan	All call query		Either
2006	Brazil			
2006	Japan			

Source: Baskerville management report by Clause Mortensen, 2004

B. EASTABLISHMENT OF PAKISTAN MNP DATABASE (GUARANTEE) LIMITED:

1. BACKGROUND

In Jan 2004 IT & Telecommunication division M/O Information Technology Government of Pakistan announced a Mobile Cellular Policy in which duty was assigned to Pakistan Telecom Authority (PTA) to under take a consultation process on the implementation process of Mobile Number Portability with an aim to implement it in a time frame of two year.[65]

PTA interacts with the industry to establish the most appropriate and effective method for implementation of MNP.

Therefore in context of this process the PTA is pleased to make the regulations that is "Mobile Number Portability Regulation, 2005".In these Regulations the rights and obligation of subscribers and operator are discussed in detail[66].

The rights and obligations of the subscribers who are being desirous of getting his number ported as regarded to the contractual obligation with both the donor and recipient operator with having the rights of his own number issued in his own name. The subscriber may ask his donor operator to port his active number to the telecom system of

[65] Mobile Cellular Policy, January 2004,IT & Telecommunication Division M/O Information Technology , Government Of Pakistan.
[66] Mobile Number Portability Regulation 2005.

recipient operator with having selection of services and package planes of their choice before porting. There is also identification of line without any interruption and the services provided by the recipient operator are all on the non discriminatory basis.

As for as operators are concerned, only one porting request is being lodged at one time. In case of any delay in the porting process the concerned operator would immediately inform the nature of delay and also the expected execution time. At the time of conversion of the number from one operator to another, there is no service being provided to the subscriber whom number is being ported, that delay may not exceed 24 hrs as being agreed by all the operators and after the activation of the number on the recipient operator the competition messages is being sent to the central database which would activate and modification of the routing plan of the calls of the subscriber.

The operator may consider only those subscribers whom dues are already cleared. Both the donor and recipient may coordinate during the changing porting data and time with the subscriber.[67]

The operator shall maintain the database of the ported numbers separately in accordance with the instructions of the authority. The authority shall supervise and issue guidelines from time to time. The authority is approving only one time and cost based tariff. They shall provide the services to the subscriber for both the prepaid and postpaid on non-discriminatory basis. The PTA had lastly made a MNP supervisory board consortium

[67] Mobile Number Portability Regulation 2005.

(MNPC) to which all the six cellular operators are being its members. It is being chaired firstly by one office member i.e. Telenor CEO Mr. Torey Johnsen and representative from PTA to implement MNP. The board may also consult under instructions of PTA to determine which method may apply[68]. It is proposed that a MNP Supervisory Board (Consortium) (MNPC) will be responsible for governance and financial accountability of the Central Database Administration (CDBA). The final details will be defined in Regulations and ratified by Cabinet.

The following provides an overview of the structure, roles and responsibilities of the Board, the CDBA and proposed MNP Launch Programme Team.

2. SUPERVISORY BOARD

The intention is to form the supervisory Board with representatives from each of the CMTOs, the managing Director of the CDBA, an independent Finance Director and an appointed member of the PTA as a non-Executive Director. The CMTO representatives will then be asked either vote one of the CMTO representatives to be the MNP Supervisory Head (to serve a fixed term), or for each representative to become the Supervisory Head in a 'round robin' approach, also serving a fixed term. The Supervisory Head would also sit on the Management Board of the CDBA.

The primary purpose of the MNPC is to ensure good governance and financial accountability of the CDBA. It will also ensure that the respective CMTOs are aware of

[68] PTA Press release March, 2004

their financial responsibilities for ensuring that there are sufficient funds available for the CDBA to operate and to make capital acquisitions when necessary.[69]

(a). Funding overview

The MNPC will be fully responsible for all non-transaction based funding that will be required to mange the setting up and the ongoing of the CDBA entity. MNPC members will need to deposit sufficient funds, to be held in escrow and released as payments are to be made for various authorized activities. These activities almost have been approved in advance by 4/6 of the MNP Board. Any access funds will be held for a period of one year before being either redistributed back to the MNPC member organizations or made available for further capital purchases. If there are insufficient funds available to provide payments for authorized expenditures, each MNPC member organization will be required to 'top–up' the funds in equal amounts. Independent advisors will provide financial management for the MNP.

(b). Interim Steps before Official Creation of MNPC

It is understood that the MNPC may take some time to setup as it will require the Regulations to be approved by Cabinet.

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[69] Khalid sherwani (Ex) legal consultant of Ufone, Pak Telecomm Mobile LTD (PTM).

Since much of the future activities of the CDBA including all project work, acquisition of the MNP solution etc. depend upon financing that will come from the MNPC the CMTOs will be encouraged to provide initial funding or 'seed capital' so that the first stages can be started without delay.

The initial funding should be sufficient to cover the establishment of MNP Launch Programme Team.

(C). MNP Launch Programme Overview

This team will oversee, on behalf of the MNPC and working with the CMTOs, the following activities:[70]

- The programme Director would be a non-voting member of the Supervisory Board and of the CDBA for the period of the MNP Programme
- Final preparation of the RFP
- Issuing RFP
- Analysis of Vendor responses
- Recommendations on appropriate solution
- Contract negotiations with the successful bidder
- Coordination with CMTOs own MNP Project Teams as regards overall programme planning, working policies and procedures

[70] Recommendation Report after Consultation Process.

Any expenditure that is specific to a CMTO must be funded by that CMTO. This would include activities such as:

- The creation of CMTO and MNP Project Teams – responsible for individual CMTO Commercial, IT & Network processes and infrastructure, connectivity. It will be required that the Project Manager will also report into the MNP Launch Programme Director to ensure continuity and consistency of actions.

(d). MNP Programme Problem Escalation

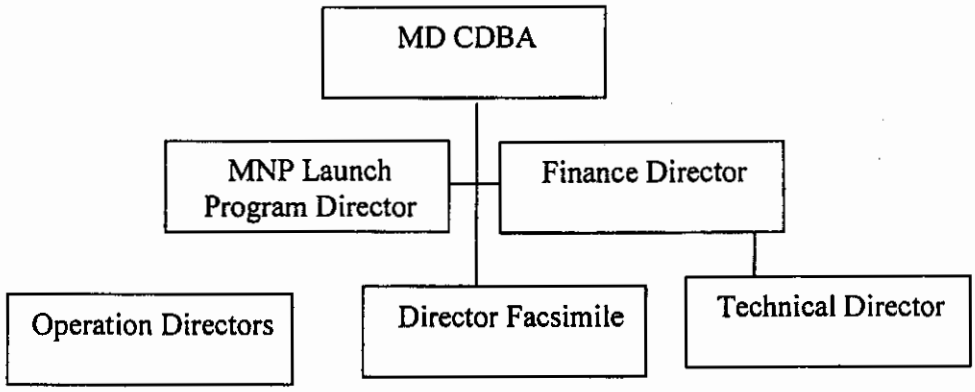
- As CMTO level, into CMTO Management Sponsor together with MNP Launch Programme Director.
- At CDBA/Consortium level, into Consortium Key Sponsor
- Final arbitration must be done through involvement of PTA

(e). CDBA Team Structure

The CDBA is the entity that will manage the day to day central database operations on behalf of the Supervisory Board. The vendor may possibly run the overall operation if they have proposed a turn-key solution however there will be certain obligations and requirements placed upon them with regards to the overall security of the operation and

to ensure local awareness is present in the Management Team. The CDBA Will be defined in more detail in the Regulations.[71]

CDBA Management Board



There are several methods which are being investigated and also negotiated by all the operators to develop and maintain viable terminology in terms of network codes for authorization of access to the database and subscriber number routing information prior to the implementation of time scheduled of MNP. The method which is being discovered more efficient is centralized database which may insure higher efficiency for both porting process and number queries. The location routing number (LRN) method has also appeared to be most efficient method for both the porting process and number queries which are being successfully implemented.

[71] PTA Press release in 2004.

3. PAKISTAN MNP DATABASE (GUARANTEE) LIMITED

On 18th January 2006 the supervisory board of the cellular operators may become a company limited by guarantee with in accordance of companies' ordnance 1984. The name of the company is "Pakistan MNP Database (Guarantee) Limited". The registrar office of the company is in Islamabad. These members may include one as an representative from PTA and all the other six operators which are as under:[72]

- Mobilink, Pakistan Mobile Communications LTD (PMCL)
- Ufone Pak Telecomm Mobile LTD (PTML)
- Telenor, Telenor Pakistan (Pvt) LTD
- Warid Warid Telecomm (Pvt) LTD
- Instaphone Pakcom LTD.
- Paktel Paktel (Pvt) Limited.

The main objects to establish a company are to own, operate and maintain the Central Database System with the objective to provide MNP services and facilities to subscribers of all member operators of the company and to do all such other things as identical or conclusive to the attainment of these objectives. All the administrative procedure and administrative interfaces between operators are defined at commercially agreed terms in the number portability process. There shall be written agreement or reservation, which may exist on the numbers to be ported. All the six leading cellular companies are

[72] Memorandum & Article of Association under the Companies Ordinance, 1984 (XLVII OF 1984).

contributing equally in funding Pakistan MNP Database (Guarantee) Limited, therefore the company is responsible for facilitating the porting process among cellular operators. The company has also laid down its memorandum of association and memorandum of article so that they may abide by the laid down procedure in to it

C. PAKISTAN SOLUTIONS TO MNP

1. MNP STRATEGY OVERVIEW

MNP enables a mobile subscriber with either pre or post paid services to retain his/her subscriber number when changing network operators. MNP is an important mechanism to enhance fair competition among different CMTO and to improve customer service quality through removing one of the "barriers to change", namely the need today to give up ones current mobile number if one wishes to move to another CMTO for whatever purpose.

After extensive research, the PTA has concluded that to achieve a rapid and effective deployment of MNP in Pakistan within the timescales of the Policy it will require the implementation of an on-line Central Mobile subscriber Number reference database and Porting-Mediation System, to be known as Central Database Administration (CDBA). The administration of this central system will be undertaken by an independent third-party, 100% owned by the Company referred to above.

The PTA acknowledges that this step will require all operators' adjustments to their respective business processes & procedures within almost all departments, and to implement a number of technology changes as such a central system will impose a common set of procedures and timeframes across all impacted parties. However, to enable MNP between any two CMTOs to be carried out in a consistent and effective manner, so that the customer receives the real benefits the PTA will require each and every Operator to work towards achieving MNP in the timescales set out in the next section. Through implementing MNP each Operator has the opportunity of gaining new consumers.[73]

Although the primary purpose is to enable an effective means of achieving MNP the main database will actually be a repository for all released mobile subscriber numbers (ported, not ported, active, inactive, not released, etc.) After an initial database upload prior to final MNP Launch or "Go Live" all CMTOs will need to ensure that ongoing procedures for uploading subscriber number details to the central database are developed and implemented. This will ensure that the most up-to-date data is always available whenever an inquiry is made for porting details, and also for 'Dips' when the number is called.

The deployment of a central database will also mean that all operators (fixed and mobile) needing to root calls to a registered mobile subscriber will now access the pertinent routing details from the central repository rather than 'assuming' that the number still belongs to the original range holder. To ensure that information can be accessed in the quickest way possible it is suggested that a separate but integrated database system

[73]"Background of MNP development in Pakistan." Daily Times, 6th February 2003

holding only the call routing details for all mobile numbers is made available as an 'All Call Query" environment. Operators making a Dip will have the transaction recorded and the information used for establishing charges.

(a) Telecom Operators in Pakistan

The main carriers PTCL, NTC, Fixed Local Loop (FLL) and wireless Local Loop (WLL) operators provide public telephony services using the National Numbering Plan in Pakistan. MNP will impact on the method of successfully routing any calls to subscribers using cellular mobile services.[74] There are six licensed cellular operators in Pakistan: Instaphone, Mobilink, Paktel, and Telenor. Ufone and Warid Telecom.

(b) Pakistan Mobile Numbering Plan

Mobile numbers in Pakistan use the following format:

(3XX) XXX XXXX

The 3XX NDC ranges have been allocated to CMTOs through Table (3.3) as follows:

NDC	Operator
300	Mobilink-GSM
301	Mobilink-GSM
302	Mobilink-GSM

[74] "Roadmap for Mobile Number Portability Service in Pakistan". By Hassan Alam

305	Mobilink-GSM
306	Mobilink-GSM
303	Paktel-D-AMPS
304	Paktel-GSM
320	Instaphone-D-AMPS
321	Warid-GSM
333	Ufone-GSM
334	Ufone-GSM
345	Telenor-GSM
346	Telenor-GSM

When MNP is activated, the delineation between the Operator based NDC's will no longer be relevant as the complete number will be ported, e.g. a Paktel GSM number 304XXX XXXX ported to Ufone will remain 304XXX XXXX and not be changed to 333XXX XXXX. It is also possible that the same number could be further ported to a third or forth operator overtime, or even ported back to the original number range holder.[75]

The subscriber will be issued with a new SIM (subscriber Identity Module) containing a new IMSI (International Mobile subscriber Identity) paired together with the original

[75] Technical Solution Report by the technical department of the Supervisory board.

subscriber number or MSISDN (Mobile Station Integrated Services Digital Network Number).

- The implication will be that all operators who have based customer services and retail tariffs on allocated NDC's will no longer be able to promote those services and tariffs as stated, as it will not follow that a subscriber on a particular number still belongs to a specific operator or number grouping.

- The local designation of a mobile subscriber number will also cease to be relevant as the subscriber is free to move wherever within Pakistan, and to receive services from their operator of choice.

- A decision has been taken that a subscriber that is linked to a ceased service will, after a period in quarantine (currently defined as 6 months), be returned to the originals range holder operator for re-use.

- The PTA may, in specific instances, designate that a particular subscriber number be retained 'out of service' indefinitely>

(c) Single Number Ports Verses Single subscriber Multi-Number Ports

Although at the core porting level the actual operation will be single number based, the operation will also need to deal with porting requests covering multiple subscriber

numbers which will need to be ported together (corporate porting). A further consideration is that the Corporate subscriber's initial ser of numbers may not actually all be from a single Donor Operator and therefore in-depth investigation using the CDB will need to be undertaken before activating the actual porting request process.

This type of porting scenario or situation supports the need to maintain a central database of all mobile number ranges together with the current and original network. Business procedures must therefore be implemented which will allow such corporate number porting to handled effectively and efficiently.

(d) Handsets

Although there is no CMTO who is currently linking handsets to subscriber number as part of their service offering, it is possible that this will occur in the future. The opportunity to port a subscriber number should not be dependent on the use of the handset and providing there is an adequate and just business arrangement, not withstanding any term contract, the subscriber's decision to port their number alone should be upheld.[76]

(e) Porting restrictions

There may be justifiable reasons why the porting of a subscriber number cannot be fulfilled. These can be categorized into either Business/Commercial or Technical.

[76] New Business Services Offerings Daily Nation dated 5th January, 2006.

A working party off representatives from each of the CMTOs will be asked to draw up a list that is mutually agreed between all operators. In the event of a force Majuro the matter will be put before the PTA for final and binding arbitration.[77]

(f) Voice Mail

CMTOs must be able to ensure continuity of voicemail services during and after porting, assuming that the Recipient Operator will offer the same services.

(g) Data Services

Data services linked to the subscriber mobile number must remain in place during and post-porting, assuming that the Recipient operator will offer the same services.

(h) International Roaming

The international roamers visiting Pakistan should be handled at CMTOs switch routing level and not be included in the central database. The Roaming partner(s) of the Recipient Operator should recognize Pakistani handset used abroad with numbers that have been ported.

[77] Strategically Decisions by PTA. April 5th, 04

(i) SMS Services

Efficient and effective SMS delivery must be maintained during and post-porting[78].

(j) Scope of NP in Pakistan

As part of cellular mobile policy, number portability will only be available in Pakistan to mobile cellular users. The MNP service will be restricted to all Mobile to Mobile porting (GSM &D-AMPS).

Porting from Mobile to Fixed, Fixed to Mobile or Fixed to Fixed is outside the scope of this thesis.

(k) Porting Traffic and Porting Volume

Pakistan has a population of 160 million people and of which approx. 7 million currently have a mobile subscription. The number of mobile subscribers is expected to grow by 200% over the nest 5-10 years.

There are an estimated 200 million mobile to mobile calls per month and 300 million fixed to mobile calls per month in Pakistan. This is expected to rise at a rate of 15-18% per annum.

[78] SMS Payments: Uncertain futures as alternative emerge. http://baskerville.telecoms.com/smspayments 26-7-06.

It is expected that heavy porting volumes will occur during the first few months of this functionality being made available, slowing down as the market settles and as contracts run their curse. This translates to approximately between 10-15% (0.7m-1m) in the first year and stabilizing at approximately 1 million per year in further years.

The impact of this estimated volume of activity will be that the CDBA Center will need to accept 2.5 million port queries and requests per year and 6,000,000,000 dips/year in the first year and rising by 200% over the coming 5-10 years.

All cellular Mobile Telecommunication Operators are also network operators. Service providers without network have not been introduced. The introduction of Number Portability has been limited to Mobile Number Portability including the GSM network operators, AMPS & DANPs network operators and CDMA network operators[79].

The PTA has instructed the Supervisory Board later on formed as an incorporated company to determine which number portability method to employ. Several routing methods are being investigated what is essential is that all Operators need to negotiate, develop and maintain a technically viable methodology in terms of network codes for authorization for access to the database and subscriber number routing information prior to the implementation time schedule of MNP.[80]

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[79] Paper Studied on Seminar on MNP Implementation 5th May, 2005.
[80] Briefing of Chief Executive of
Pakistan Database (Guarantee) Limited. Reported in Daily Times, 7th Dec 2006

As a technical solution MNP implementation relied on individual routing and distributed databases, this was because network technology could not support advanced IN solutions, and centralized databases were costly to execute. Recent implementations have discovered more routing-efficient solutions such as centralized databases to ensure higher efficiency for both porting processes and number queries, the Location Routing Number (LRN) method has also appeared to be the most efficient method for both porting processes and number queries and is successfully implemented.

In the number portability process the administrative procedures and administrative interfaces between Operators are defined at commercially agreed terms. The numbers that can be ported include, without exception, all numbers for which a written agreement or reservation exists. The subscriber shall reactivate the mobile number at the Donor Operator, and then activate the porting, with the Recipient Operator providing this is done within the retention time frame. The Recipient Operator shall inform all other Operators of the mobile number's, at completion time of a porting, the new/actual information for routing, charging, single access code and SPC by ensuring this data is recorded at the CDBA. All Subsequent portability shall be handled in the same manner as the first time. The current Operator shall become the Donor Operator and the new Operator becomes the Recipient Operator. If a subscriber wants to return to the previous Operator, the order shall be handled like a standard porting order. There shall be no difference even if the Recipient Operator was the original Number Range holder. If, for any reason, the subscriber wants to end his subscriber relationship with his current Operator, the current Operator handles this as a termination in his administrative and

technical systems and shall reset the status of the number in question to 'not in service' or 'ceased'. At the expiration of the Retention or Quarantine period the subscriber Number shall revert to the original Range Holder.

The PTA does require that MNP should be transparent to consumers meaning remote callers should automatically be connected to ported subscribers, requiring no procedural or dialing changes to the originating caller. It also supports Central Database for IT porting, i.e., the database holding all relevant details regarding all mobile subscriber number ranges for all CMTOs together with the history of any porting activity for any particular subscriber number and should be available for port inquiries, recording porting request status, and for providing specific statistical information.[81]

The exchange of telephone data, as well as the maintenance of the integrity and content of the data, between the database administration and Operators participating in MNP could be managed effectively. The MNP order data exchanged between Operators in connection with implementation of MNP also shall be used to perform the function of MNP. The issues the Operators may consider as they ramp up for full porting implementation includes: inter-company testing, telephone directory listings for customers who opt to switch their services from one operator to an other service provider and wish to publish directory information, troubleshooting, interconnection agreements, cost recovery and bill reconciliation, as well as the Inter-carrier Communications pre-porting process.

[81] Meeting with (AD Technical), PTA. 4th April,2006

At last after the long discussion and investigation for reaching at a viable and maintainable technology in terms of codes being essential for the operators and where all of them are consistent for its adoption to launch MNP through a system called onward routing.[82]

This system may also be called as call forwarding. As discussed earlier it is an on-switch solution. In this system as being implemented here in Pakistan the originating network with having the consent of the donor network of whose number is being ported may itself rent the call to the recipient network.

In this method the numbers range determines this that the numbers falls within that has been licensed to a given network. The number range determines this that the number falls within and that has been licensed to a given network. This network then forwards the call to the recipient network. Onward routing is regarded as the simplest and the cheapest way of implementation of MNP[83]. However call routing in this type of system is not optional because all call to ported numbers have to be routed through the donor network.[84]

[82] Reported by Daily times on 3rd November,2006.
[83] Syniverse Technologies. (2004) A global prospective on number portability. Syniverse technologies Inc.
[84] Presentation given by managing director of company to its entire member including chairman PTA. The News, Dec,2006.

2. DIRECTIVE REGARDING MNP ON-WARD ROUTING CHARGES

According to Reference made to PTA letter dated 13th October, 2006 and subsequent meeting of the committee, held in PTA Headquarters, on 30th October, 2006 regarding the MNP onward routing charges for fixed to mobile calls.

The Authority chaired the meeting and the purpose of this meeting was to deliberate and determine the onward routing charges from fixed to mobile calls. Director (Commercial Affairs) presented his study on the subject to the Authority and highlighted the issues that needed decision from the Authority. The participants of the meeting included representatives from Ministry of IT&T, PMD, PTCL, Mobilink, Telenor, Ufone, Paktel, Warid Telecom, and Telecard, who actively participated in the meeting and put forth their viewpoints and stances on the issue. During the meeting various aspects of the onward routing charges were deliberated upon which lead to recommendation that the cellular mobile operators providing the onward routing facility would be entitled to receive a total of Rs 0.30 per minute.

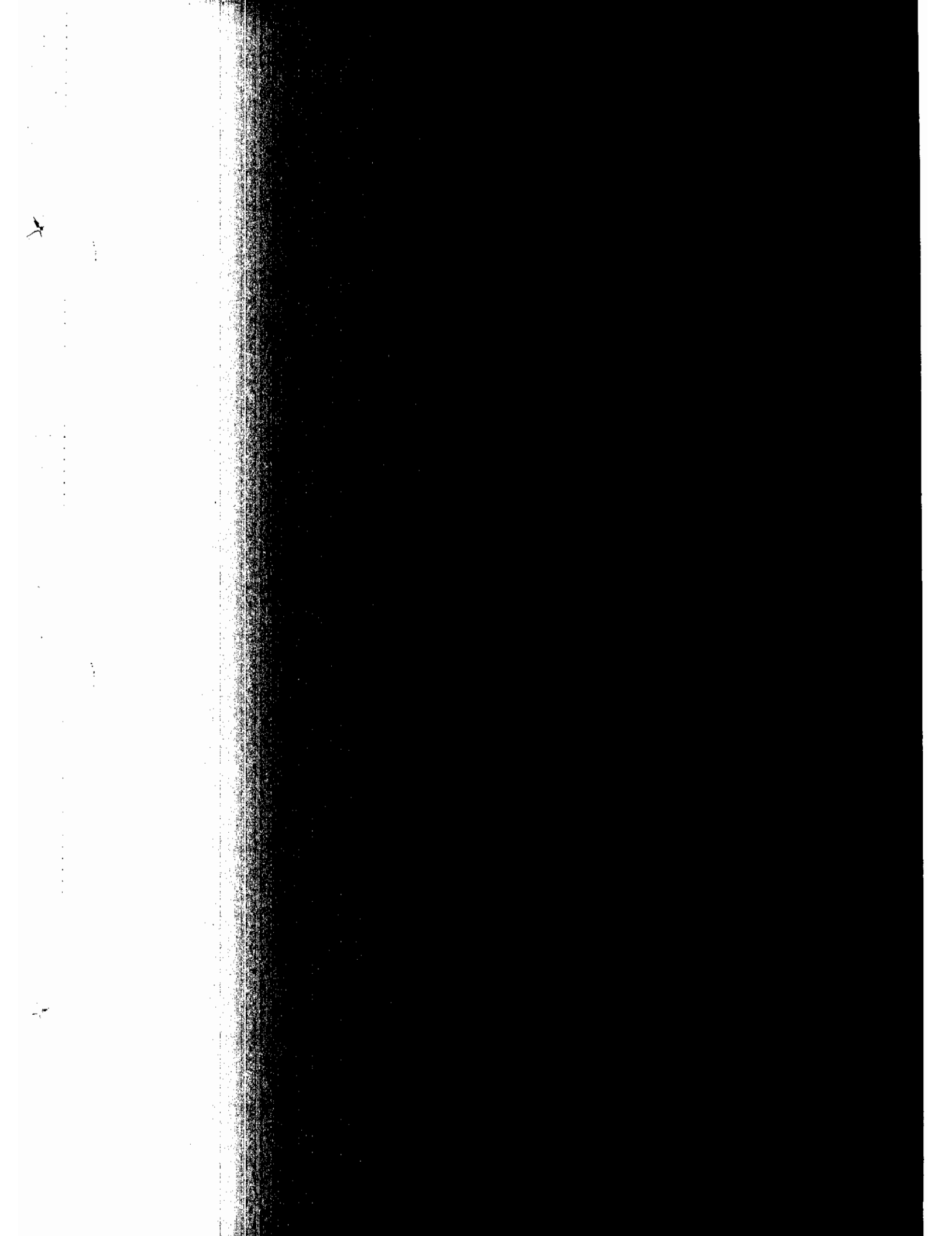
Keeping in view the detailed discussions, suggestions, and observations of the participants the Authority has decided as follows:

- The cellular mobile operators shall provide onward routing facility to fixed line networks at free of cost for the first two months from the date of implementation of Mobile Number Portability.
- Subsequently, the onward routing charges for fixed to mobile calls shall be Rs.0.30 per minute to be paid by the originating fixed line operator to the mobile operator providing onward routing facility. This arrangement shall be initially applicable up to December 2007 and may be reviewed if circumstances so warrant.

The fixed-line and cellular mobile operators shall also incorporate the above arrangement in their interconnect agreements and the same shall be submitted to the Authority in accordance with provision of Pakistan Telecom Rules, 2000[85].

(Mobile companies in High Court are challenging the Directive)

[85] Directive issued by Pakistan Telecommunication Authority, Islamabad. Dated 2-11-2006



CHAPTER IV LEGAL ISSUES IN MNP

A. INTRODUCTION

The MNP is in progress and it is thought and believed it will be in full operation in 2007 as PTA has issued revised deadline for the implementation of MNP in Pakistan i.e. before the end of year 2007. It is quite evident and understandable that the implantation of such a sophisticated and state of the art system requires appropriate legal changes to cater for the needs and requirements of the subscribers and consumers. In this regard PTA has already issued Mobile Number Portability Regulations, 2005 which provide the fundamental technical and legal details of the system. These regulations not only provide the administrative structure, which is necessary to adequately implement the MNP in Pakistan, but also provide necessary legal framework for the parties involved therein.

It is now very obvious to understand that the primary objective to implement this system in Pakistan is to introduce and provide adequate competition in the mobile market with equal opportunities to all subscribers. The Authority and the CMTOs, inter alia, base this objective, on many important decisions. These decisions are guided by the legal provisions, which have been implemented by the Authority. It is also known to us that there is no MNP related obligation given under the Telecom Act, 1996. The Telecom Rules, 2000 also does not specify any legal framework related to MNP. The only relevant legal instrument, which remains enforced, is the Mobile Number Portability Regulations, 2005 (hereinafter referred to as the Regulations). It is very important to understand that

the MNP implementation and its successful operation in Pakistan involves many legal issues which are related to Quality of Service, Billing, Consumer Protection, Coverage & Roll-out, Tariff and Transparency and last but not the least interconnection.

Before discussing each one of these issues in detail it seems appropriate to explain the general structure of the regulations with necessary details regarding important issues.

B. OVERVIEW OF THE MNP REGULATIONS

The part II of the Regulations obligates all the operators to implement and make this facility available to subscribers. The operator, however, shall perform porting if[86]:

- There is no financial or other contractual liability on subscribers relating to a contract or subscription unless otherwise agreed upon between the Donor and Recipient Operators;
- Complete information required by the Recipient Operator has been provided by the subscriber;
- There is no justifiable technical reason, which prevents porting;
- The subscriber has submitted a written application on prescribed form in duplicate to Recipient Operator or its Agent for availing MNP; and

[86] Mobile Number portability Regulation, 2005.

- Recipient Operator has intimated Donor Operator of the aforesaid application submitted by the subscriber, which shall also be considered as termination notice by the subscriber to the Donor Operators.

In case the Donor Operator refuses or does not allow its subscriber to port without any valid reason, the number requested to be ported shall be considered withdrawn from the said Donor Operator from the date and time the Donor Operator refuses or does not allow the porting and the said number shall be ported in accordance with these regulations without any compensation to Donor Operator whatsoever the case it may be.

To ensure smooth implementation of MNP and a well functioning number portability environment the Regulations also provide general conditions for the operators[87]:

- A Donor operator shall not prevent a porting from being completed that has already commenced by using rejection codes; and
- Legally binding agreements between an Operator and a subscriber shall be respected and followed in letter and spirit.

Moreover, the operational procedures and interfaces between operators shall be decided at commercially agreed upon terms and in case of disagreement, by the Authority. The numbers that can be ported include, without exception, all numbers for which a written agreement exists between a subscriber and an operator. All subsequent portability shall be handled in the same manner as the first time. The current operator shall become Donor

[87]Mobile Number portability Regulation, 2005.

Operator and new Operator becomes Recipient Operator. If, for any reason, a subscriber wants to end his relationship with his current operator, the current operator shall handle this as a termination in its telecommunication system and shall reset the status of the number in question to be called quarantine period. At the expiration of quarantine period the number shall revert to original range holder for recycling purpose.

A subscriber desirous of getting his number ported, but subject to discharging his contractual obligations with the donor or recipient operator shall have a right to own number in his name. He may ask donor operator through a designated recipient operator to port his active number to the telecommunication system of the recipient operator, Furthermore he is at liberty to choose services and payment package with Recipient Operator before or after Porting, which are being provided by Recipient Operator to its subscribers; provision of caller line identification or any other supplementary service without interruption after Porting as was being provided to him by Donor Operator, subject to right of anonymity of the caller; and get mobile communication services from Recipient Operator on non-discriminatory basis as are being provided by Recipient Operator to its subscribers.

The Regulations, in order to have a transparent and non-discriminatory environment for ported numbers explain the duties and responsibilities of the operators. According to the details given therein all operators will not only be responsible for administration of ported numbers and maintain an updated database in their respective systems but will also provide updated information to Central Database for all numbers on their respective

networks. The operators shall also co-operate with each other in terms of exchange of necessary information regarding their subscribers who avail MNP services[88].

All operators shall allow the inspection of their system by the officials in any premises where such system is installed. They will also maintain usage record including where possible calling and called numbers. A common set of procedures and timeframes will be followed, for each and every Operator to enable MNP between any two Operators while the Central Database is in use. The Central Database shall enable any and all authorized national and international Telecommunications Operators to obtain the appropriate routing details for any mobile subscriber numbers to complete a dialed call on correct network without in any manner engaging the network of the Donor Operator unless mutually agreed upon terms. It will be a central repository for all released subscriber numbers, with the primary purpose being the management of subscriber numbers which are in the process of being ported or have been ported.

The Regulations make it obligatory on all the operators to provide MNP service at the implementation date, which will be determined by the Authority. At this time the tentative deadline given by the Authority is 31 March 2007. The Regulations further empower the Authority to supervise the process of MNP and issue guidelines on technical, management and operational matters from time to time, which shall be followed by the operators.

[88] Mobile Number portability Regulation, 2005.

For effective implementation of MNP system certain processes must be in place to ensure a successful, effective and efficient porting operation. These processes will include rules on how, when and frequency of update, together with appropriate authentication for port completion – both at an IT and a network level.

The development of processes, procedures and protocols can take a significant amount of time and effort. As the timescale for full implementation of the policy is relatively short the PTA has considered various sets of procedures and protocols which could be adopted and, where necessary adapted to suit the Pakistan market. Naturally any final decision would need to be linked to the solution that will be purchased and to the requirements of each CMTO, therefore the fine details will only be available at the time.

As a guide, the following high-level aspect should be considered:

The following table (4.1) shows a high-level process overview of a successful request to port a subscriber number.[89]

Donor	Subscriber	Recipient	CDBA – IT	CDBA -NW
	Requests port from recipient and signs port request Document.	Recipient prepares porting documentation		
		Validates subscriber details from CDBA	CDBA IT database is checked for subscriber number, current operator, subscriber name	
Donor receives request for porting and checks validity of subscriber		Transmits Port request to Donor		
Acknowledges Port Request		Recipient receives acknowledgement		

[89] Mobile Number Portability Regulation, 2005.

		from Donor		
Donor receives copy of subscriber port request		Signed port request Document faxed to donor		
		Lodges Porting Details including Routing, Data/Time with CDBA	CDBA IT database is update with new routing	
			Details, subscriber account details, date & time of planned port	
	subscriber receives new SIM from recipient and is informed of procedure for installing new SIM plus date & time	Issue subscriber with new SIM		
Data fills switches with ported subscriber details and de-actives on date/time		Data fills switches with ported subscriber details and actives on date/time		
			Actives port at Data/Time specified and passes new routing to Network Database	Update routing details are updated on network database
		Receives confirmation that routing details have been updated	Informs recipient that routing DB now update	Confirms to CDBA that new details have been updated
Receives confirmation that subscribes is now officially on recipient network		Informs Donor that port activation has occurred on date/time		
	Following procedures given when SIM received, subscriber inserts new SIM in handset and turns handset on receives SMS welcoming the user to recipients network	Sends SMS to subscriber to informs them that their number is now officially on recipient Switches		

C. LEGAL ISSUES IN POST MNP REGIME

Some of the main Legal Issues regarding Post MNP regime can be categories under the following heads.

1.CONSUMER PROTECTION IN MNP

(a) Complaint System

There is no doubt that the whole exercise of thinking and implementation of MNP is primarily focused on improvement in and betterment of telecom system so that the consumers get the best in the given circumstances. These objectives can, however, diminish if any one of the operators or all the operators try to avoid the implementation on the basis of one pretext or the other. This situation seems to have arisen when we see that the time frames, which have been given by the Authority, have elapsed repeatedly due to non-preparation of one of the operators. Still some of the operators allege that it is due to the *mala fide* intention of the operator rather than the genuine difficulties being faced by it that it is delaying the implementation of the MNP. In these circumstances, the consumers who are the primary focused in the best case scenario can turn out to be the least focused. To avoid any or all such situations it is necessary that the operators be convinced that the policies being enforced by the Authority are equally in their favour as they are in the favour of consumers. If this is the case, then the operators will be working hand in hand with the Authority in implementing the system in its true letter and spirit.

Having considered all the potential problems the Government has not only expressed its intention, through the provision of the Act, of protecting consumer interest but has translated these important things into legislative instruments through regulations.

Feeling the potential problems, which might arise due to the *mala fide* intention of the operators, the Authority has stated that all Operators shall provide mobile telecommunication services for ported and non-ported subscribers on non-discriminatory basis. The purpose of this statement, which is a legal obligation on the operator, is very obvious that in case any discrimination is found the Authority will be entitled to take legal action against the licensee.

The Regulation 19 mandates that all the Operators shall establish an efficient and easy-to-use system to promptly receive process and respond to complaints, claims or suggestions by Operators or their customers[90]. They shall also make all reasonable efforts to resolve complaints or disputes without delay and without recourse to the Authority. Moreover, if a complaint is filed with the Authority in connection with any dispute among the Operators regarding any matter, which is the subject of this Regulation, the Authority may settle the dispute in accordance with the procedure laid down in the Interconnection Dispute Resolution Regulations, 2004[91].

This regulation is very comprehensive as it not only covers the consumer related complaints but also states that the operators can also file complaints against other

[90] Mobile Number portability Regulation, 2005
[91] Interconnection Dispute Resolution Regulations,2004.

operators. With regard to consumer related complaint the clause although reasonably covers the issue by making it obligatory on the all the operator to establish the complaint system, however, no time line is given by these regulations to address the complaint. It also does not state specifically what if unreasonably longer time is taken in addressing the complaint or if the complaint is not addressed at all. In these situations, a consumer has the option to resort to Pakistan Telecommunication Authority (Functions and Powers) Regulations, 2004. These regulations provide a detailed mechanism with some flexible time lines to address different complaints. It would have better to provide strict time lines in the MNP regulations for addressing the complaints as this would have bound them to follow the time line and communicate the decision to the consumers. However, in the existing circumstances the operators who would have *mala fide* intention will linger on the complaint. With regard to the complaint between the operators, we will discuss the relevant issues while dealing with the relationships of operators.

Without prejudice to the right of appeal and revision established in Section 7 of the Act, the decision of the Authority shall be binding on the Operators with regard to any dispute arising among Operators regarding MNP Process[92].

(b) Code of Practice

No system can be adequate and proper in its true sense until and unless all the market players are following some code of practice. Feeling this as an integral part of good practices, the Authority has required in Regulation 20 that all the Operators shall, prior to the implementation date of MNP, publish a code of practices approved by the Authority.

[92] Pakistan Telecommunication (Re-organization) Act,1996

The code of practice shall include, at a minimum, provisions covering protection of privacy of information, maintenance of confidentiality of subscribers' information, save as required by the provisions under Section 54 of the Act, and commitment by the Operators in respect of standard and quality of services.[93]

The code of practice is one of the many important legal issues, which are requirement of modern legal framework. These regulations however, should have enlisted detailed items, which would be covered by the operators through these codes of practices. For instance the code should also compulsorily cover the resolution of complaints between operator and the consumers along with time lines. A safeguard in this regard can however be seen in the form of approval by the Authority before its adoption by the operator.

(c) Privacy of data.

The privacy of data is another important issue, which has direct linkage with the privacy of any consumer. The Regulation 21 of the Regulations provide that the Operators shall not monitor or disclose the contents of any usage transaction contained within Central Databases under its control except to the extent necessary for the purpose of maintaining or repairing any part of the Central Database or except as required by the Act, the Rules and Regulations. Moreover, the Operators shall take all reasonable measures to safeguard the databases from unauthorized interception or unauthorized access[94].

[93] Pakistan Telecommunication (Re-organization) Act, 1996.
[94] Mobile Number portability Regulation, 2005.

Although the Regulations has done a commendable job by incorporating this provision, has not done enough good by not giving enough details relating to those necessary reasonable steps which are inevitable to safeguard unauthorized interception and access.

(d) Quality of Service

The quality of service (hereinafter called as QoS) is another important legal issue involved in the post MNP regime. The MNP regulations do not explain the QoS standards, which need to be followed by the operators. Regulation 20 while dealing with code of practice has referenced this issue by stating that the operator shall provide therein the commitment in respect of standard and QoS. No further details have been provided by the regulations.[95]

It is well known that there are two types of QoS. The first dealing with technical standards regarding QoS and the second regarding non-technical standards. Both these types of standards are directly relevant for discussion here. The reason for not discussing these issues in the MNP regulations is probably based on the fact that these issues have been addressed in the license conditions. **Appendix 3 of the cellular mobile licence deals with the QoS standards. For the purpose of reference these standards are given in Table (4.2) below:** [96]

[95] Mobile Number portability Regulation, 2005.
[96] PTA Technical Department.

- The Licensee shall take reasonable and prudent measures to ensure that the Licensed System and Licensed Services are available and operate properly at all times.

- Any fault in any component of the Licensed System or Licensed Service shall be repaired as early as possible.

- During each calendar month, Licensee shall meet or exceed the following quality of service standards (except for causes attributable to another Operator or a service provider that provides telecommunications services outside Pakistan):

Indicators	**Minimum target**		**Remarks**
	Short term (3 years)	**Long term (3 years on)**	
Service Provisioning			
Service Activation Time			
Post-Paid	3hrs	1hr.	
Pre-paid	1hr.	30 min.	
Service Quality			
Network Down-time (Average	< 2% in any	< 1% over	This relates to the percentage of

across all sites)	1 calendar month < 1% over a 1 rolling year period	a 1 month period	time network is operating. The objective is to ensure maximum operability of network to the consumers.
Grade of Service (end to end blocking)	<= 4% in busy hour	<= 2% in busy hour	
Community Isolation / Cell-Site Down Time (Average Across All Sites)	Not longer than 48 hours	Not longer than 24 hours	
Call Connection Time	<= 7	<= 5	
Call Completion Ratio	>96%	>98%	
Advanced Service Interruption Notice	>=1 day	>=3 days	This notice is normally given when planned system enhancements, updates or upgrades are to be performed.
Call Quality	MOS Score > 3	MOS Score > 3	This is derived fro a scale of 1-5, where 1 stands for poor quality and 5 for excellent. Voice quality is determined through Mean Opinion Score methodology as recommended by ITU-T in recommendation number P.800.
Indicators	**Bench Mark**		**Remarks**
	Short term (3 years)	**Long term (3 years on)**	
Customer's Complaints			
Customer Complaints/100 subscribers / Month			
Complaints Regarding Billing	<=2 %	<=1 %	
Complaints Regarding Service Provisioning	<=4 %	<=2 %	
Complaint Turn Around Time			
%age of Billing Complaints Resolved Within 24 hrs.	90 %	95 %	
Within 48 hrs.	98 %	100 %	
Within 7 days.	100%	100%	

%age of Complaints (Regarding Network Operability) Resolved Within 24 hrs.	92 %	95 %	
Within 48 hrs.	95 %	100 %	
Billing Service			
Billing Complaints	0.2 per 100 bills issued	0.2 per 100 bills issued	Applies to complaints which are valid
Reconnection Time After Clearing Arrears	30min.	15min.	The time it takes in minutes to reconnect the service once the customer has made the due payment directly to the operator offices.
Operator Service			
Operator Assistance Response. Within 20 sec 30 sec 90 sec	 >=70% >=80% >=98%	 >=80% >=90% >=99%	There should be a queuing system for all operator-attended calls i.e., no call should receive a busy signal; rather each call is queued and maximum calls (as shown in the given benchmark) should be answered within 30 seconds.
Customer Complaint Response Time Within 20 sec 30 sec 90 sec	 >=70% >=80% >=98%	 >=80% >=90% >=99%	
Calls to Emergency Numbers Handled Within 30 Seconds	>98%	100%	
Directory Assistance			
Updated Directory Assistance	Provisioning of redirect mechanism to PTCL directory	Provisioning of updated directory assistance	Cellular operators are currently not providing directory assistance to their subscribers. As cellular operators have a relatively smaller network, the provisioning of directory service is not proposed for them in the short term. However we propose that all the cellular operators should provide redirect service mechanism for accessing PTCL directory assistance to their subscribers. In the long-term period, they are required to provide their own directory assistance service
Network Management &			

Security		
Voice Security during Connection	Yes	
Personal Information Security	Yes	
Provisioning of Centralized Customer Complaint Database	Yes	
Provisioning of Computerized Directory Access System	Yes	
Probability of Fraud on User's Account	No	Operator should demonstrate to PTA that fraud controlled procedures are in place.

Table (4.2)

(e) Security Issues

The security issues in the telecommunication sector are not a new phenomenon. The governments have been very careful about the security concerns as although it is beneficial for the general public however it is equally vulnerable to be used by the terrorists and other undesired people. Probably this is the reason that this sector has been opened and liberalized lastly through out the world. The Regulator is though not directly responsible for all these things yet he is the focal institution to coordinate and execute the actions required from time to time by the security agencies.

Having considered all these aspects the Authority has made it compulsory that the Operators shall maintain usage records including where available, called and calling numbers, date, duration, time and called number cell, with regards to usage made on its central databases for a rolling twelve months for scrutiny by or as directed by the Authority or required by any law enforcement or intelligence agency.

In this regard the Donor Operator has been allowed to collect costs, as determined by the Operators upon mutually agreed terms, incurred on number porting process from Recipient Operator upon successful completion of a ported number.

2. REGULATORY ISSUES IN MNP

The regulatory issues are the important issues in post MNP regime. No regulator can over look these issues at the cost of development. The same situation is here where the Authority has covered different aspects of these issues in the Regulations.[97]

The Regulations have stated that the Authority shall supervise the process of MNP and may issue guidelines on technical, management and operational matters from time to time, which shall be followed by the Operators. Moreover, the responsibility of fixing the porting tariff has also been put on the Authority. The Authority shall ensure that all Operators provide MNP to their pre-paid and post-paid subscribers on non-discriminatory basis.

According to Regulation 13 all Operators shall include MNP clauses in their revised or new interconnect agreements and shall comply with all reasonable requests for establishment of modification of interconnect agreements in order to implement MNP which include:

- Exchanging Porting request related to mobile number portability for a specific subscriber;

[97] [97] Mobile Number portability Regulation, 2005.

- Use of Central Database; and
- Annual fee, fixed by the Authority from time to time, for an active or the Operator from whom the subscriber is receiving service for relevant time and not original range holder for the said number shall pay in-active number.

Furthermore, all Operators shall compile and submit information regarding ported subscribers to or from its network to the Authority on quarterly basis, which shall include failure rate of porting process, average duration of Porting process, and additional call setup delay time on average calculated by calling ported subscribers. The Authority has also obligated all Operators as well as PTCL, NTC, SCO, and other FLL/WLL/LDI service providers to upgrade their network in terms of hardware and software to support MNP as per the ITU-T recommendations and other standardization bureaus to provide all telecommunication services to ported subscribers[98].

Furthermore, the Authority has also obligated all operators to negotiate and develop certain methodology in terms of network codes for authorization for access to Central Database and subscriber number routing information prior to implementation time schedule for MNP. The Operators shall also negotiate with each other to develop and maintain a technically viable Central Database on mutually agreed terms. The operators shall allow official inspection of any premises by an authorized representative of the Authority at any time and shall furnish to the representative such information as may be required by him or the Authority.

[98] Mobile Number portability Regulation, 2005.

(a) INTER RELATION-SHIP OF OPERATORS

The inter-relationship of operators is the backbone of telecommunications system. There is no doubt that it cannot work and be beneficial to the public generally if operators run their system in the standalone mode. Due to this operators in any country execute interconnection agreements. These agreements on the one hand determine rights and obligations between the operators and on the other hand connect the two system to run concurrently and pass the traffic generated from one operator to the other and vice versa. The connection of two telecommunications system is not easy and simple. Apart of the technical and administrative details, which need to be worked out, it carries many legal complications, which the provisions of the agreement determine. Among the legal complications the major complications include: tariff issue, billing issues, working relationship in different situations, right and obligations of parties in different circumstances, interconnection methodologies, points of interconnections, sharing and recovery of costs, and last but not the least the settlement of disputes provisions[99].

These legal complications are equally viable and present when it comes to the development and operation of MNP network. The situation in the case of MNP, however, get further complication by the fact that all the technologies which are available for running mobile network are required to joint together with a seamless solution, all the mobile operators are required to sit together and chalk out the plans to develop, operationalise and administer the whole network system. The story does not end here, as the operators also have to work as a follow up to the work at the Central Database on

[99] Mobile Number portability Regulation, 2005.

their own network. The technical details are although satisfactory done, the transfer of ownership of mobile number along with responsibility of right application of tariff with regard to specific number followed by generation of correct are the big challenges as the successful and error free working on these fronts can help the operator retain the maximum number of customers. In the light of above given legal issues, the Regulations which are duly approved by the Authority try to provide answers to the questions.

(b) Operators Obligations

Regulation 7 of the Regulations provides obligations of all operators. These obligations are given below[100]:

- to ensure that only one Porting request may be lodged at any onetime; Provided that any attempt to submit further requests for same number to same or another Recipient Operator shall be lodged and all subsequent requests, pending first request, shall be rejected under intimation to subscriber with reasons of rejection.
- in case there is any unavoidable delay, including delay caused by a bulk Porting request, in Porting process, the concerned Operator shall immediately inform other Operator of nature of delay and expected execution time;
- all Porting requests shall be processed in order of receipt;

[100] Mobile Number portability Regulation, 2005.

- the 'No service' period, when the service is being disconnected from a Donor Operator and activated with a Recipient Operator shall not exceed a period to be mutually agreed by all Operators, however this period shall not exceed one working day; Provided that Donor Operator shall log time of such disconnection and Recipient Operator shall log time of activation and this log data shall be made available by both operators to the Authority;
- after activation Recipient Operator shall complete MNP Process by lodging a MNP completion message in the Central Database which would activate modification of subscriber number routing details immediately;
- both Donor Operator and Recipient Operator are bound to perform deactivation and activation with minimum inconvenience to the subscriber; and
- a number that is not-in-service may be reactivated on payment of reactivation charges for same subscriber only within the Quarantine Period.

(c) Obligations of Donor Operator

The MNP system cannot work if the operators do not exercise their rights or fulfill their obligations. We will discuss the rights and obligations of the parties one by one. The obligations of the donor operator, on the first place, are given below[101]:

[101] Mobile Number portability Regulation, 2005.

- A Donor Operator shall only accept Number Portability for subscribers, whose contract does not have a restrictive covenant and has cleared all his dues.
- Once a subscriber has applied for Porting, the Donor Operator before Porting out the subscriber shall not restrict or cease current quality and level of service to the subscriber during MNP completion process.
- For the purpose of completing Porting process, the following shall be the methods of communication between Recipient Operator and Donor Operator:
- Electronic Means— in the first instance communication between Recipient Operator and Donor Operator shall be via agreed Electronic Means; and
- Manual Means— should it not be possible to use Electronic Means for whatever reason, the Manual Process may be used.
- Both Donor and Recipient Operator may co-ordinate with each other and the subscriber to fix and, if necessary, to change Porting date and time.
- If the applicant is not a registered subscriber or legitimate user of the number, the Recipient Operator and the Donor Operator shall not accept a written application for Porting. If the Porting process has been completed, in such case inadvertently, it shall be reversed immediately on acquisition of knowledge.
- Donor Operator shall provide detail of subscriber for provision of Mobile Number Portability to Recipient Operator during porting process, if requested.

(d) Rights of Donor Operator

The rights of the donor operator are discussed as follows[102]:

- Donor Operator may refuse a subscriber Mobile Number Portability for following reasons:
  - ✓ Contracted services of the subscriber have been terminated due to arrears or violations of laws, regulations, code of practices or service contracts or any other valid reason existed prior to the Porting request;
  - ✓ Subscriber has not cleared his current outstanding dues unless amount charged is in dispute; and
  - ✓ Subscriber has voluntarily signed a Contract with Donor Operator for a certain period of time, which has not elapsed.
- The Donor Operator has right, but not the obligation, to contact the subscriber to solve any outstanding issues regarding numbers being ported but may not use this period to convince or entice the subscriber to remain with the Donor.
- Donor Operator may withhold Porting request till the subscriber discharges all his current financial obligations and clears all known dues till the time of Porting.

[102] Mobile Number portability Regulation, 2005.

(e) Obligations of Recipient Operator

The obligations of recipient operator are as under[103]:

- The Recipient Operator shall keep and maintain record of application forms as referred to in sub regulation (2) of Regulation 3 for at least six months, for inquiry by concerned Donor Operator or examination by the Authority.
- The Recipient Operator shall co-ordinate with ported subscriber to arrange for reasonable date and time of proposed Porting of his number.
- The Recipient Operator shall inform Donor Operator by electronic means and to Central Database of requesting subscriber's name, existing number and date and time of proposed Porting of his number at least seventy two (72) hours in advance of proposed Porting date and time, and ensure that a signed copy of the application form has been sent to the Donor Operator in advance; Provided that the non-receipt of signed copy is no ground to prevent the Porting from taking place.
- If any difficulty is encountered in the Porting process, Recipient Operator shall coordinate with the Donor Operator to resolve the problems and keep the subscriber informed:
- Provided that prior to successful completion of the Porting process, Donor Operator shall maintain original telecommunications services for subscribers thereof until the scheduled 'cease of service' has been completed.

[103] Mobile Number portability Regulation, 2005.

- Recipient Operator and Donor Operator shall, with no permission to postpone or advance the process, undertake to port the requesting subscribers according to agreed date and time.
- If subscriber cancels a Porting at any time before completion of the process, Recipient or Donor Operator shall inform the other Operator accordingly.
- Recipient Operator shall ensure that porting order is executed at the agreed execution date and time;
- Provided that Donor Operator has the right to disconnect the service to the subscriber after the agreed execution date and time, if Recipient Operator has not communicated the former, the reasons regarding any delay in execution date and time of the porting process.
- Recipient Operator cannot charge the subscriber till the time his Number is ported and activated on his Telecommunication system.
- Recipient Operator shall not prepare or offer any special package or services to Porting subscriber meant only for ported subscribers.

(f) Rights of the Recipient Operator

The Regulations finally discuss the rights of the Recipient Operator. The recipient operator is entitled to seek necessary information for the subscriber from Donor Operator before or after porting. In this regard the recipient operator may access the Central Database in order to acquire updated information for subscribers as and when required.

Moreover, the Recipient Operator may verify the subscriber relationship, against number with Donor Operator, to prevent fraud[104].

[104] Mobile Number portability Regulation, 2005.

CHAPTER V

CONCLUSION AND RECOMMENDATIONS:

The MNP is expected to play a major role in the development of telecom sector in the country. It is rightly thought to provide a wide range of telecom services to consumers, as every one will be at liberty to choose the network from which it is going to get the services. It, on the one hand, will provide competitive services to consumers, on the other hand it will give tough time to operators to maintain their customers.

The telecom sector in Pakistan has seen tremendous growth in this decade. After three years of de-regulation and liberalization, the number of operators has grown from one fixed line operator and four cellular mobile operators to more than ten LDI operators, more than hundred LL operators and six cellular mobile operators, drastic changes have occurred in the sector. These changes have not only changed the business dynamics but have changed the mode of doing business.

After lapse of such a short span the people have seen visible change in different segments of the networks. Now all the operators provide services in more than 300 cities. The coverage level and better network quality is available to people. The billing system of the companies have also improved due to expanded franchise network and improved soft wares. The operators have introduced Thirty second and five second billings. These and

many other service options have come into existence due to de-regulated and liberalized environment.

The implementation of MNP is going to be another milestone in the telecom development. No other country in the region has been able to introduce this service and Pakistan will be first one to have achieved this difficult task. While achieving this great task gives a sign of satisfaction to the Government of Pakistan it is equally pleasing for the telecom business managers.

As you know that MNP obligation has been put by the Government of Pakistan on the cellular mobile operators through its cellular mobile policy dated January 28, 2004 and no other legislative instrument either from the Act or the Rules have mentioned this obligation. In such situations, it is important for the Government to keep on going with its reforms agenda and implement such regulatory frameworks, which are not only industry friendly but also according to their demand.

In the previous chapter we have discussed many legal issues, which have arisen or might arise in the light of given regulatory structure. The need to redress all the existing or potential issues cannot be over emphasized as these can have enormous effects on the overall success or failure of the MNP system.

Among the many issues, from the policy perspective, the most important issues are related to the regulator. In the regulatory issues, there are two phases: the first is

regarding the pre-implementation phases and the second is regarding the post implementation phase. The Authority has successfully taken the lead by initiating the process of implementation, which not only includes convincing the operators to undertake the task but also to invest heavy amounts of money in it. The second phase of implementation requires that the system should run smoothly and efficiently so that consumers can really get the fruits of this gigantic task. The smooth running of the system demands three things: (i) MNP system in its true letter and spirit; (ii) clear and efficient regulatory framework by the Authority; and (iii) efficiently settling the billing and accounting disputes between the licencess by following the law and regulations.

With regard to the first issue the Authority has up till now supervised the whole system of MNP implementation which has resulted in minimizing the differences between the licencess. This has also helped in putting pressures on those operators who were not willing to implement the system and were part of process to create hurdles on each and every step. To handle such situations the Authority issued directions from time to time. The Authority also gave policy decisions on many occasions where it was required. It is only due to the timely decisions by the Authority and directions from time to time that the system is expected to launch in March 2007.

The Authority has also issued MNP regulations, which provide adequate regulatory framework for the licencess to follow. It is, however, interesting to note that the Authority has neither any function to implement MNP nor any power to do so. It is following all such things because the Government of Pakistan has put this obligation on

the cellular mobile operators. In the absence of any provision in the Telecom Act, 1996, and Telecom Rules, 2000 the MNP regulations by the Authority can be legally questioned. Under the Act, the rule making power lies with the Govt. It would have been better to introduce MNP Rules instead of regulations as it would have been consistent with the policy and secondly the licencess would have taken more care while implementing the system.

With regard to third issue, it is expected based on the complexity of the issue that the licensee will generate many disputes regard billing and accounts settlements. These issues will not only lead to failure of the MNP system but also would disturb the normal working of the operators. The relevant regulations in such situations would be Interconnection Dispute Resolution Regulations, 2004. These regulation, however, provide a lengthy and complicated framework as they deal with all sets of disputes which might arise between the licencess. In the current environment it is recommended that these regulations be revised and a special chapters dealing with MNP disputes may be introduced in it.

Apart from the above given suggestion, it is important to understand that the responsibilities of the Authority have increased manifold. The post de-regulation environment requires that the Authority should not only be vigilant about what's happening in the market and what types of regulations are required but it should also be efficient enough to response to new situations. This demands effective and sustainable legal framework. It is pathetic to see that the Govt. has taken minimalist approach while

introducing amendments in the Act and has not taken care of tremendous developments that have taken place during the last decade. This, if nothing else, leads to non-efficient and non-sustainable legal system. To put it more simply, the whole legal system becomes vulnerable. The non-introduction of many important amendments especially in the *quasi-judicial* process of the Authority has trickle down effect on the regulations, which cannot be enforced due to the absence of blanket provision in the law.

Moreover, the telecom sector at this juncture also needs consistent approach in the regulations. The Authority has many regulations the number, currently, goes to more than twenty. Many of these regulations are not only redundant but also conflict with the other regulations. This not only leads to confusion but also creates acute problems in properly implementing the law between the licencess. The current environment of the telecom sector is not similar to one in the late nineties. In the recent times, the regulatory approach should not only be minimalist but also need based and according to the requirements of the industry. Furthermore, the provisions of the Act, the Rules and the Regulations should be consistent and not in conflict with each other. The regulations should be made only on those issues, which in clear cut powers and jurisdictions of the Authority. The grey areas are recommended to be touched by the Authority in any circumstances. Hence it is further and finally recommended that the Authority and the Govt may enforce a long-term sustainable legal framework.

With regard to the consumers, it has been pointed out that the complaint system prescribed by the Authority is not sufficient to cater for the needs of the potential

consumer problems. The regulations do not specify the necessary time lines for disposing off the complaint. Although the Authority is going to have maintained a supervisory check on the licencess it will be a big problem for the consumers who intend to shift their network but due to the delaying tactics by the licencess may leave this process in the middle. It is also not clear that at what time the consumer can come to the Authority for redressal and what amount of the compensation the Authority will grant to the consumer for not getting the relief from the licensee.

Although the Authority has put the obligation of the licensee to give code of practice, however, it is apprehended that if adequate measures are not taken by the Authority the complaint redressal systems of the licencess will be different from each other. This will further add to the problems of the consumers. In the circumstances, the Authority should take further measures to elaborate the system in detail. The Authority may in this regard take all the licencess into confidence.

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