Consultation Paper No. 02/2010

Telecom Regulatory Authority of India

Consultation Paper
on
Efficient Utilization of Numbering Resources

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Preface

Telecommunications sector has been undergoing a transformation triggered by emergence of new network architectures and services. Advancement in telecommunications technology has brought about possibilities of new revenue streams for operators and better, faster and cheaper services for the consumer. It is becoming increasingly possible to deliver any service on any device, anytime, anywhere. To achieve this ubiquity, an often-overlooked resource, the number resource, is used to uniquely identify and differentiate among the end users.

Management of numbering resources is governed by the National Numbering Plan. Though these plans are designed for long term, they may require careful and judicious reviews to constantly meet the country's requirements. Availability of numbering resources for telecommunications services is finite and scarce, limited in quantity by the plan design and technological constraints.

Substantial revision of the numbering plan is complex, time consuming and expensive. It therefore makes sense to use the resources optimally in a managed and controlled manner. The mean time between major modifications would depend on how the space is allocated to different services and how the number assignment is made among service providers. A major review of numbering plan was carried out in the year 1993. With the introduction of a large number of new telecommunication services and opening up of the entire telecom sector for private participation, it was felt necessary to rationalize and review this Plan to make it flexible so that it could cater to the numbering needs for about next 30 years in respect of the existing and likely new services. The National Numbering Plan (NNP) 2003 was formulated for a projected forecast of 50% tele-density by the year 2030. During the last few years there has been a very rapid growth all around and particularly in the field of cellular mobile services. Resultantly, we again find ourselves in a situation where we need to need to review utilization of the numbering plan and take decisions on certain related issues for sustainable growth of telecommunication services. Hence this consultation paper.

The purpose of this consultation paper is to analyze the changes that affect the national numbering plan and to identify the ways in which numbering arrangement and allocation policy might be managed for more efficient utilization.

Written comments on the issues raised in this consultation paper are invited from the stakeholders. The stakeholders may furnish the same to Principal Advisor(I&FN), TRAI by 19th February 2010. Counter-comments may be sent by 5th March 2010. The comments and counter-comments may preferably be sent by email at dafn@trai.gov.in or in case of any difficulty these may be sent at trai.gov@gmail.com. The fax numbers of TRAI is 011-23220209. Comments and counter-comments will be posted on TRAI's website on receipt.

Dr JS Sarma

Chairman, TRAI

Chapter 1

Introduction to National Numbering Plan

1.0 Importance of numbering plan

The numbering plan is one of the important 'fundamental plans' along with Switching, Routing, Transmission, Charging and Synchronization Plans that govern the functioning of telecommunications networks. Though these plans are designed for long term, they may require careful and judicious reviews to constantly meet the country's requirements as the telecommunication networks grow and technological developments take place. Availability of numbering resources for telecommunications services, akin to spectrum for wireless services, is finite and scarce and depends on the way the numbering plan is constructed. The mean time between major modifications would depend on how the space is allocated to different services and how the number assignment is done among service providers. A plan may require revision due to unprecedented growth in the number of subscribers or introduction of new services. Substantial revision of the numbering plan is a complex, time consuming and expensive exercise. It therefore makes sense to use the resources sensibly in a managed and controlled manner.

1.1 Functions of numbers

Telephone numbers are necessary to identify and use basic and value added services through switched telephone networks. In wireline networks, a telephone number generally identifies the called-party station. There may be telephone numbers that switch calls to servers for content based services or there may be short codes that give access to special services. Some telephone numbers may identify the type of service dialed, such as, Intelligent network services based toll-free or free-phone dialed using 1-800- prefix. In wireless networks, a telephone number indicates the wireless network termination point, although further database access by the wireless carrier is necessary to determine the location of the called station. Beyond indicating termination points, telephone numbers also contain information about the service provider, routing of calls across the network from origin to destination and charging of calls.

1.2 Objectives of the numbering plan

The purpose of the Numbering Plan is to ensure a structured approach to the allocation of numbers that is in accordance with best international practices. Its primary function is to define the numbering space and its evolution for various existing and prospective services. It must ensure that the range of numbers so defined allows for introduction of a wide range of services and caters to the expansion efficiently during the planned period and premature exhaust is avoided. The plan therefore defines the general principles to be applied in management of the numbering resources, and the processes and procedures to be applied. It should contain guidelines for the allocation, assignment and management of numbers. It has to make sure that available resources are efficiently managed and their allocation among the service providers is need-based, fair and equitable and promotes competition and innovation. Any modification should allow for minimal disruption to existing numbers and longer term stability that minimizes the need for further changes.

A numbering plan must consider the genuine needs of various stakeholders. Modification in a numbering plan could mean substantial changes in the network and significant network costs and for this reasons the service providers want the numbering resources to be carefully managed. If changes are done often then the subscribers have to change their dialing habits and also reprogram their mobile phones and phone books. The planners have to remember that wrong or incomplete dialing hold up network resources building up congestion and loss of paying traffic. Uniform dialing pattern across the country, across service providers and meaningful numbers that give some information about the location of a called party and the likely cost of a call are subscriber friendly. Business subscribers do not like changes in the numbers as telephone numbers are advertised and printed on stationary and forms which makes changes expensive for them.

1.3 Scope of the numbering plan

As has been said above the National Numbering Plan provides a set of rules and guidelines for the use and assignment of numbers to telephone services delivered over the Public Networks. The Plan also describes the allocation of numbers to international services, trunk service, emergency services and special services such as voice mail and Intelligent Network (IN) services. The structure of the national number generally conforms to the relevant International Telecommunication Union Standard Sector (ITU) Recommendations. The primary concern of the numbering plan is to give a uniquely identifiable number to every subscriber irrespective of the network he is connected to. The numbering plan could follow a closed numbering system where the number of digits to be dialed remains same or it could be open numbering system where the number of digits to be dialled for local and national calls is different. The numbering plan refers to NSNs, where the first N is the national code and SN is the subscriber number. Where local dialing is permitted then just the SN is dialled for connection to another user in the same local area. A single SN, say 2345678, may be assigned to a different customer in each different local area. This kind of plan is known as an open numbering plan. The alternative, a closed numbering plan, exists where there is only a single dialing procedure for all national calls, as for example in Denmark and Norway, where all 8 digits are dialled for all calls and no trunk prefix is needed. In the Indian context Short Distance Charging Area (SDCA) based numbering scheme is used for the fixed line network where 6 to 8 digits are required to be dialed for local call from fixed line to fixed line but 10 digits need to be dialed for national long distance calls. The national numbering plan would also describe how international calls should be dialed. The national numbering plan could have geographical numbering scheme or non-geographical numbers like for fixed numbers and mobile numbers respectively or a mix of the two. The plan should also allow for carrier access code for national long distance and international long distance operators if the need so arises. The numbering plan should have service access codes for services like Intelligent Network services, voice mail services or any other service that may be given in future. Provision has to be made for separate codes for Home Country Direct, international toll free, premium rate, mobile satellite services etc. also required to be mentioned in the National Numbering Plan. It is an important function of the numbering plan to mandate common numbers for emergency services like fire brigade, police etc. for all the telecom service providers.

1.4 Revisions of National Numbering Plan

1.4.1 National Fundamental Plan (1993)

A major review of numbering plan was done in 1993. This plan was formulated at a time when there was no competition in the basic telecommunication services, the competition in cellular mobile services had just started, paging services were in a stage of infancy and Internet services were not available in the country. It could cater to the needs of existing and new services for another few years. During this period either the Government or its public sector undertakings were mainly providing the telecom services. Management of the number allocation was, therefore, not complex.

1.4.2 National Numbering Plan (2003)

With the introduction of a large number of new telecommunication services and opening up of the entire telecom sector for private participation, it was felt necessary to rationalize and review the existing National Numbering Plan to make it flexible so that it could cater to the numbering needs for about next 30 years in respect of the existing and likely new services. Keeping this in view, National Numbering Plan 2003 (NNP 2003) was formulated for a projected forecast of 50% tele-density by the year 2030. This structure made numbering space available for 750 million telephone connections in the country comprising the anticipated number of 300 million basic and 450 million cellular mobile connections.

It was hoped that NNP 2003 will be able to meet the challenges of multi-operator, multi-service environment and will be flexible enough to allow for scalability for next 30 years without any change in its basic structure. It was designed to meet challenges of the changing telecom environment by reserving numbering capacity to meet undefined future needs. The National Numbering Plan 2003 and its subsequent amendments are available on the Department of Telecommunications' website i.e. www.dot.gov.in.

1.5 Reasons to revisit NNP 2003

National Numbering Plan (NNP) 2003 was designed to take care of the numbering requirements for about 30 years timeframe. The situation has changed rapidly since 2003. While the fixed line connections showed a decline, the mobile segment exhibited unprecedented growth. The anticipated 450 million connections by 2030 had already been achieved in 2009 and it is expected that the 1 billion mark would be crossed before the end of 2014. In view of the fact that some of the assumptions made in drawing up the NNP 2003 are no longer applicable, the plan falls short of meeting the developments and needs to be reviewed.

1.6 The need for regulatory intervention

One of the functions of the authority is to take measures to facilitate competition and promote efficiency in the operation of telecommunications services so as to facilitate growth in such services. The regulator needs to set the rules governing other competitive issues with numbering implications. Intelligent Network Services, selection of long distance operators through calling cards, equal access and operator portability would have numbering implications, access to Emergency numbers. The incumbent operators would fiercely safeguard their possession of large blocks of numbers and are unlikely to share numbering resources fairly with new competitors even though the utilization may be low. When deciding technology and timing of services the regulator need to envision potential capacity shortages and suggest changes in the scheme architecture.

If a major modification is being examined the regulator needs to consider views of all the stakeholders and act in the interest of the consumers. It has to be kept in mind that the proposed changes should not put a set of service providers to disadvantage from the competitive view point. From the consumers' point of view the numbering scheme should be easy to understand and use. It should be consistent across service areas, have significance and give charging information. Users would prefer to keep their own number when moving locally or when changing local operator without moving premises.

1.7 Issues for review

The purpose of this consultation paper is to analyze the issues like long term suitability of numbering plan, efficient utilization of the numbers, allocation and pricing of the numbers. These issues are discussed in Chapters 2 and 3.

Chapter 2

Measures for effectively utilizing number resource

2.1 Long term suitability of the Numbering Plan

2.1.1 Capacity in the existing numbering scheme

For a 10 digit numbering scheme leaving out level ‘0’ and ‘1’, which are used for special purposes, a theoretical numbering capacity of 8 billion numbers exists. However, local fixed line numbers and/or STD codes of various SDCAs for fixed network begin with ‘2’, ‘3’, ‘4’, ‘5’, ‘6’, ‘7’ and ‘8’ thus rendering about 6 billion number unusable for mobile network. In a way we can say these are used for just about 38 million fixed connections. Keeping in view declining fixed line connections and adequate availability of numbering resources discussion here would focus on numbering resources for mobile services.

With only level ‘9’ for mobile and a 10 digit numbering system a maximum capacity of 1000 million numbers are available. Some sub-levels of level 8 have also been used and approximately a capacity of 500 million is available in this level. Thus a total capacity of 1500 million numbers exists in levels ‘9’ and ‘8’. Though there is no technical reason why all 1500 million numbers cannot be used for working connections but because of the reasons of granularity of allocation for each Mobile Switching Center(MSC), numbers blocked in the distribution chain, administrative processing time for allocation of new blocks of numbers and other inefficiencies of the system utilization cannot reach 100%. For these reasons DOT allocates new blocks of number to service providers after the service providers demonstrate 60% utilization of the already allocated numbers. Therefore the present capacity of 1500 million number resources with DOT would be exhausted after 900 million connections have been given and after that there will no new numbers left for allocation unless more levels/sublevels are freed for mobile network use.

2.1.2 Possible Solutions to the problem

Currently we have about 550 million connections. Assuming an average expansion rate of 12 million connections per month for next 5 years, additional 720 million numbers would be required. Thus the total requirement till December 2014 would be 1270 million numbers. This would require resources of about 2000 million numbers. The Numbering Plan Administrator has allocating numbers from level ‘9’ and recently it has started using free sub-levels of level ‘8’. These two levels together would give would give about 1500 million numbers. The following solutions are proposed to get around the problem of shortfall of numbers.

2.1.2.1 Retaining 10 digit scheme with additional levels/sub-levels:

For each new level made available for mobile system 1000 million number can be allotted and for each new sub-level 100 million or lesser numbers become available.

To maintain 10 digit numbering scheme and also not disturbing the Subscriber Trunk Dialling(STD) codes already allocated, free sublevels of ‘7’ and ‘8’ can be used. These should together give about 800 million numbers. If Level ‘7’, that has been allotted to some new operators for fixed line but not used till now, can be withdrawn and the operators accommodated in existing levels then the numbers available in 7 and 8 levels would go up to 1000 million. This would make a combined total of 2000 million numbers in levels ‘7’, ‘8’ and ‘9’. This should suffice for 5 years i.e. upto the year 2014.

For longer term i.e. beyond 2014 it is possible to keep 10 digit scheme by vacating one level out of ‘7’ or ‘8’ completely by shifting STD codes and local numbers to other levels. Level ‘8’ is easier to vacate as it is not used for fixed line subscriber numbers and only STD codes would need to be shifted to other levels. This would affect the STD codes of Karnataka, Maharashtra (Panji) and Andhra Pradesh. If level ‘7’ is vacated, the sublevels that have recently been allocated to some new service providers for fixed network but have not been used need to be withdrawn and STD codes in this level also need to be shifted. Shifting the existing STD codes from this level would affect the states of MP, Maharashtra, Rajasthan and Gujarat. In any case levels '9', '8' and part level '7' will give 2500 million numbers.

2.1.2.2 Retaining 10 digit scheme with making access of mobile by dialing '0' from fixed line

Presently mobile phones are accessed from a fixed line phone, within a service area, without dialling '0'. This puts the limitation that any digit which has been used as a first digit for fixed network cannot be used for the mobile numbers. By making it necessary to access mobile numbers in a service area also by dialling '0' all the free sublevels in levels '2' to '6' can also be used for mobile numbers. This would provide a capacity of around 3 billions mobile numbers which would be sufficient to take care of the growth for 10 years. Implementing this should not be a difficult proposition as the subscribers already need to use '0' for calling adjacent SDCAs and also for mobile numbers in other service areas.

2.1.2.3 Integrated service area based scheme

In this scheme the STD codes would be merged with the numbers to form a 10 digit number for fixed phones. After this any number can be given to fixed or mobile phone. This way a large part of the numbering capacity will not have to be reserved for relatively small number of fixed connections. This scheme offers a long term solution and may be more acceptable to all service providers. However, this requires change in the architecture and data bases of the fixed network. Once integrated service area scheme has been implemented, it would also not require to dial access code "0" for Inter service area calls. As any number allocated to fixed line can also be allocated to mobile and vice versa, this method would enable implementation of Number portability between fixed line and mobile networks.

2.1.2.4 Switching over from 10 digit to 11 digit scheme

Switching from 10 to 11 digits with first digit fixed as 9 would give a total capacity of 10 billion numbers. With the current policy of allotment after 60% utilization this would suffice till India has 6 billion connections. This could mean liberal allocation to service providers and administrative ease.

The following problems are anticipated with change the mobile number from 10 digits to 11 digits:

(i) This would require modification in all fixed and mobile system software and number storage involving cost.

(ii) Caller Line Identification (CLI) will not be displayed properly in case of R2 MF signaling because of variable number scheme. This could be a security concern.

(iii) The billing database needs to be changed

(iv) Inconvenience to the consumers in the form of (a) dialing extra digit, (b) updating whole phone memory. This could lead to more dialing errors, infructuous traffic and loss of revenue.

2.2 International Experience on number of digits

The following Table provides number of digits used in Fixed and Mobile numbers in various countries:

S. No.	**Country**	**Number of Digits**		**No. of Connections (2008)**	
		Fixed Networks	**Mobile Networks**	**Fixed (000s)**	**Mobile (000s)**
1	**Australia**	10 Digits (2 Digit Area Code+ 8 Digit)	10 Digit('04'+8 Digit)	9370	22120
2	**Brazil**	10 Digits (2 Digit Area Code + 8 Digit (Starting First digit 2 to 5))	10 Digits (2 Digit Area Code + 8 Digit (Starting First digit 6 to 9))	41141	150641
3	**Canada**	10 Digits including 3 digit Area Code	10 Digits including 3 digit Area Code	18250	22092

S. No.	Country	Number of Digits		No. of Connections (2008)	
		Fixed Networks	Mobile Networks	Fixed (000s)	Mobile (000s)
4	**China**	7 to 8 Digit including 3 digit area code	11 Digits (In the format 1xx- xxxx- xxxx) 3 Digit for Mobile Phone Service Provider ID + 4 Digit Regional Code + 4 Digit Subscriber Number)	340800	634000
5	**Egypt**	9 Digits including 1 or 2 digit Area Code	9 Digits including 2 digit Operator Prefix	11936	41272
6	**France**	8 Digit including area Code	9 Digit (No Area Code)	35000	57972
7	**Germany**	No standard lengths for either area codes or subscribers' numbers. Area Code varies from 2 to 5 digits and total digits varies from 4 to 13 Digits. Newly assigned numbers are of 10 or 11 digits.	No standard lengths for either area codes or subscribers' numbers. Area Code varies from 2 to 5 digits and total digits varies from 4 to 13 Digits. Newly assigned numbers are of 10 or 11 digits.	51400	105523
8	**Indonesia**	7 to 8 Digit (With Area Code)	10 to 11 Digit for Post Paid and 11 to 12 digit for Pre Paid (including 3 digit Mobile Operator Prefix)	30378	140578
9	**Italy**	Generally 9 or 10 digits (Area Code + Exchange Code + Number)Begins with "4".	Always 10 Digits (Except very old TIM numbers which are 9 digits long - very rare)Begins with "3".	21246	90341
10	**Japan**	9 digits including the area code of 1 to 5 digit	10 digits (No Area Code)	48427	110395
11	**Korea (South Korea)**	9 to 10 Digit including 1 or 2 Digit Area Code	9 to 10 Digit including 1 or 2 Digit Operator Code	21325	45607
12	**Malaysia**	1 to 2 digit Area Code + 6 to 8 digit Subscriber Number	mobile phone code of 2 to 3 digits + seven-digit subscriber number	4292	27713
13	**Mexico**	10 digits including 2 to 3 digit area code	10 digits including 2 to 3 digit area code. For Dialling Mobile from outside Mexico "1" must be added before area code.	20668	75305
14	**New-Zealand**	1 digit area code+ 7 digit phone number	"02" + 7 to 9 digits (Usually 8 Digits)	1750	4620

S. No.	Country	Number of Digits		No. of Connections (2008)	
		Fixed Networks	Mobile Networks	Fixed (000s)	Mobile (000s)
15	**Nigeria**	1 to 3 digit area code + 7 digit	3 to 4 Digit Operator Code + 6 to 7 Digit Subscriber Number.	1308	62988
16	**Pakistan**	2 to 5 digit area Code + 4 to 8 without area code	3 digit specific Mobile Phone Code assigned to a mobile telephone operator+ 7 digit Mobile Number	4416	88019
17	**Philippines**	1 to 2 digit area code + 7 digit phone number	3 Digit area codes always start with the number "9" + 7 digit subscriber Number	4076	68117
18	**Russia**	3 digit area code + 7 digit subscriber Number	3 digit area code + 7 digit subscriber Number	44897	199522
19	**South Africa**	10 Digits including 3 Digit Area Code	10 Digits including 3 Digit Operator specific prefix	4425	45000
20	**Turkey**	3 Digit Area Code+ 7 Digit	3 Digit cell company id no. + 7 Digit	17502	65824
21	**UK**	Mostly 10, 9 for some areas (Including 2 to 5 Digit area Code)	10 Digits	33209	77360
22	**USA**	Mostly 10 digit including 3 digit area code	Mostly 10 digit including 3 digit area code	154655	270500

Chapter 3
Allocation criteria and Pricing of Numbers

3.1 Allocation criteria for numbers

3.1.1 For fixed line services

The service providers have been given pre-defined levels that decide the amount of numbering resources they have. The levels allocated to different service providers is as shown below:

1. BSNL/ MTNL – Complete Level 2
2. Reliance Communications – Complete Level 3
3. Bharti Airtel – Completed Level 4
4. Shyam/ HFCL – Sublevels of Level 5
5. Tata Teleservices – Complete Level 6
6. M/s. Datacom – Sublevels of Level 7

For 2, 3 digit SDCA code exchanges, a block of 1,00,000 numbers and for 4 digit SDCA code exchanges a block of 10,000 numbers are allocated at a time. The service providers are also allowed to use these allocated numbers in more than one circle. Additional numbers are allocated to requesting service providers after they demonstrate 80% utilization of already allocated numbers. In this system the total capacity for a service provider having a complete level, for a typical service area, say AP, the total capacity would be around 40 million numbers.

3.1.2 For mobile services

Level 9 and some sublevels of 8 have been allocated to mobile services. As per the existing criteria followed by the Numbering Plan Administrator mobile service providers are initially allocated 1 million numbers in a service area and additional numbers are allocated as and when requested by service providers, after demonstrating 60% utilization. There is no charge for allocating numbers. M/s. BSNL has been allotted complete Level '94' for their mobile services. M/s. Reliance Communications Ltd. and M/s. Tata Teleservices Ltd. were initially allotted some sub-levels of ‘93’ and ‘92’ respectively for migration from limited mobility to full mobility in CDMA network. Later complete ‘93’ level has been allotted to M/s. Reliance Communications Ltd. and ‘92’ level to M/s. Tata Teleservices Ltd. Each sublevel like 93 has a capacity of 100 million numbers.

Presently, the following mechanism is adopted by DoT to allot new number blocks to mobile service providers. Each service provider has to request DoT, in the prescribed proforma (given vide DOT circular no 842-582/2005-VAS/12 dated 29th August 2005), demonstrating 60% of utilization of allotted numbers in a given service area. The following details are called for from the requesting service provider for allotting new blocks.

Table 1: Details of Cellular Mobile Telephone Services (CMTS) subscribers

Sl.No.	**Type of subscribers**	**No. of Subscribers**
1.	Total IMSI/s in HLR **(A)**	
2.	Less: (**B**=a+b+c+d+e)	
a.	Test/Service Cards	
b.	Employees (includes cards given to Business Associates)	
c.	Stock in Hand/in Distribution Channels (Active Card)	
d.	Subscriber Retention Period Expired	
e.	Service Suspended pending disconnections	
3.	Subscriber Base (**A-B**)	

IMSI: International Mobile Subscriber Identifier
HLR : Home Location Register

Once the service providers demonstrate that the total subscriber base (Sl. 3 in Table above) in a given service area exceed 60% of the existing allocated numbers, new block of numbers are allotted to the service providers.

3.2 Efficient utilization of the numbers:

It has been observed that in many of the service areas the utilization of numbers by the service providers is well below 60%. Despite low usage some of the service providers request for more levels in some of the service areas. It can also be construed that the numbering resources have not been efficiently utilized as the numbering space meant for 1000 millions subscribers was almost exhausted even before reaching 500 million subscribers and new Mobile Switching Center (MSC) codes have been allocated in the sublevels of ‘8’.

It is now to be discussed whether any change is required in the allocation criterion given the unprecedented growth in mobile sector and declining fixed line subscriber base.

3.3 Annual Numbering Return

3.3.1 It is important to devise mechanisms to have a good monitoring system for effective utilization of numbering issues. One possibility is that all service providers making use of numbering resources may be required to submit an annual detailed “Numbering Return” to the Numbering Plan Administrator. The Numbering Plan Administrator may carry out the numbering audit of usage of numbers by service providers based on these returns. The following additional information could be included in the Numbering Return:

- Number resources allocated to the licencee
- Total number used
- Numbers for internal use (Test/Service Cards, Employees(including cards given to Business associates)
- Numbers under quarantine (disconnected numbers)
- Numbers suspended pending disconnections
- In case of Mobile Service Providers, Number of SIMs in distribution network with retailers and distributor networks and in hand.
- Details of numbers set aside for planned growth, customer orders or other usage, with explanations
- A three year forecast of demand within significant ranges
- Utilization of short codes and Intelligent Network (IN) SCP codes
- Details of numbers ported inward and outward
- Any other information requested by the Numbering Plan Administrator.

3.3.2 Consequent to the consultation if it is decided that a numbering return is required then the Numbering Plan Administrator may specify a standard format that will be amenable to qualitative and quantitative analysis. In the feed back on the research paper, some of the stakeholders felt that the information provided at the time of additional allocation is sufficient and a new return would be duplication of efforts and a three year forecast as required in the suggested return would not be possible within significant range. This issue is however open for comments.

3.4 Pricing of numbers:

3.4.1 At present the service providers do not pay for the numbering resources allocated to them. It has been observed from some websites and paper reports that most of the service providers charge their subscribers for allocating preferred numbers or ‘vanity numbers’. Some service providers even resort to auction of numbers for higher revenue. It has been seen that most regulators in Europe put a modest charge on the numbers. Charging for the numbers allocated to operators may also be used as a tool to encourage efficient use of numbering resources. It was felt that charging for the numbers allocated to operators may be used as a tool to encourage efficient use of numbering resources and would also be in line with practices followed internationally regarding charging of numbers. It is observed that most regulators in Europe put a modest charge on numbers. In Australia, the “rights of use” of numbers have been defined and are not seen in conflict with the numbers as a whole remaining a national resource. The annual charge for an ordinary phone number in Australia is around AUS $1. Ofcom in its consultation paper during 2006 proposed to introduce charges of up to 10 pence per number per year after 2007. This is based on rough calculations of the “cost” of a number (based on the cost of the 1995 National Code Change and the number of numbers it created), but at the same time is subject to adjustment to ensure it achieves the primary aims of disciplining the use of numbers without cramping growth.

3.4.2 The Hong Kong regulatory authority, OFTA, consulted stakeholders in 2008 for proposed annual fee of $3 for each telecommunications number allocated to unified carrier licensee, whether or not the number has been assigned to end users. The service providers actually hold many more numbers than the number of customers. OFTA had assessed that in the absence of proper measures to enhance the efficient use of numbers, 8-digit telecommunications numbers may be exhausted within 7 years, i.e. by 2015. Recognizing that the telephone numbers are a finite resource and use of longer digits have significant adverse impact on the community and therefore in order to prolong the life span of the 8 digit numbering plan OFTA adopted economic and administrative measures by imposing an annual fee of $3 for each telecommunications number. In this regard relevant Para 3 of Part 6 of "Telecommunications (Carrier Licences)(Amendment) Regulation 2008" is reproduced below:

"3. A fee of $3 shall be payable on the issue of a unified carrier license and on each anniversary of the issue of the license while the license remains in force, for each subscriber number allocated to the licensee that is not ported out from the licenses network or assigned , as authorized by the Authority, to another licensee (who has made payment of the license fee for such number under its license) and for each subscriber number allocated to another licensee that is ported into the licensees network. For the purposes of this section, a subscriber number is a number in the numbering plan within numbering blocks allocated by the Authority to a licensee, which number may be assigned by the licensee to its customer for use of a telecommunication service."

3.4.3 It may be useful to put a small charge for numbers even though a portion of the number sale process of service providers is paid as percentage on Adjusted Gross Revenue (AGR). It is apparent that numbers are an extremely valuable public resource. After the analysis of the international practices and the present state of utilization of numbers, it is felt that charging a reasonable amount for each number allocated would encourage the service providers for a more efficient utilization of numbers.

3.4.4 The stringent criteria laid down for allocation of numbering resources alone may not justify the free allocation of numbers. The numbering space belongs to the government. The service providers are given usage rights over the assigned number ranges during the tenancy of the licence. Though service providers may argue that they are not marketable commodity yet it cannot be denied that most service providers charge for numbers that may have higher demand.

3.4.5 The following different forms of charging are possible

- A one-time charge per number
- A one-time charge per block of numbers
- An annual charge per number held
- An annual charge per block of numbers held
- An annual charge per *active* number held

3.4.6 The following Table gives approaches adopted for charge numbers in various countries:

Table 3: Approaches adopted to charge numbers across various countries

Sr. No.	Name of Country	Whether Pricing of Numbering Resources exists	Method adopted	Existing Charge
1	**Australia**	Yes	Application Charge, Annual numbering charge and also Auction for smart numbers	• Application charge is approx $14 per number. • Total Annual Numbering Charge of $60 million from numbers held by providers. The base number charge for 2009 was $ 0.8097682824 (for a ten digit number). • In Auction number has a reserve price, generally $500. Patterned numbers attract a higher price up to $40,000.
2	**Belgium**	Yes	Annual Charge	Annual Charge For Ordinary Phone Number in euro cents: 1.34
3	**Canada**	No	N/A	N/A
4	**Denmark**	Yes	Annual Charge	Annual Charge For Ordinary Phone Number in euro cents: 25.71
5	**Finland**	Yes	Annual Charge	Annual Charge For Ordinary Phone Number in euro cents: 34

6	**France**	Yes	Annual Charge, Charges based on admin cost	Value of Base unit "a", not exceeding 0.023 euros, set by Budget • For every assigned 10 digit number, an amount equal to "a"; • For every assigned 6 digit number, an amount equal to 2 000 000a; • For every assigned 4 digit number, in an amount equal to 2 000 000a; • For every assigned 1 digit number, in an amount equal to 20 000 000a.
7	**Germany**	Yes	Allocation Charge, Charges based on Admin cost and allocative efficiency	Fee is depending on the kind of number.
8	**Greece**	Yes	Annual Charge	Annual Charge For Ordinary Phone Number in euro cents: 2.5
9	**Hong Kong**	Yes	Annual Charge	annual fee of $3 for each number
10	**Hungary**	Yes	Annual Charge	Annual Charge For Ordinary Phone Number in euro cents: 27
11	**Italy**	Yes	Annual Charge	1.1 Euro Cent per ordinary phone number
12	**Netherlands**	Yes	Annual Charge	Annual Charge For Ordinary Phone Number in euro cents: 0.16
13	**New-Zealand**	No	N/A	N/A
14	**Pakistan**	Yes	Annual Charge	• 6 digit (or higher) digit number @ Rs. 0.50 per number /financial year. • Short Codes etc. @ Rs. 5000 per number/financial year.
15	**UK**	No	N/A	N/A
16	**USA**	No	N/A	N/A

Chapter 4

Questions for Consultations

Q1. Do you believe that 10 digit numbering scheme should be continued? If yes, then what method(s) do you suggest to make adequate resources available for next five years i.e. up to December 2014 and beyond?

Q2. Comment on the advantages and disadvantages of accessing intra service mobile from the fixed line by dialing ‘0’ for generating more number resource for mobile services?

Q3. Do you believe that the only solution to the number resource problem is to migrate to an 11 digit numbering scheme for mobile and retaining 10 digits numbering scheme for fixed line? What kind of problems do you foresee in having a mixed numbering scheme?

Q4. If your preference is 11 digit numbering scheme for mobile services then what comment on the advantages and disadvantages of such a scheme.

Q5. Comment on advantages and disadvantages of migrating to integrated service area based scheme for fixed and mobile. If this scheme is adopted what should be the time frame for migration?

Q6. Do the present criteria for allocation of the numbers ensure efficient utilization of numbering resources or would you suggest some other criteria?

Q7. With reference to para 3.3.1, comment on the need to file a numbering return to the numbering plan administrator for monitoring and ensuring efficient utilization of the numbers?

Q8. Give your views on pricing of numbering resources? If pricing is implemented, what should be the method adopted for such pricing.

Q9. If pricing is implemented should it be for all resources held by the service providers or only for future allocations?

Stakeholders may please feel free to raise any other relevant issue and add their comments thereon.

List of Acronyms

Acronym	Expansion
ACMA	Australian Communications and Media Authority
AGR	Adjusted Gross Revenue
CDMA	Code Division Multiple Access
CLI	Caller Line Identification
CMTS	Cellular Mobile Telephone Services
DOT	Department of Telecommunications
HLR	Home Location Register
IMSI	International Mobile Subscriber Identifier
IN	Intelligent Network
ITU	International Telecommunication Union
MSC	Mobile Switching Center
NNP	National Numbering Plan
NSN	National Significant Number
OFCOM	Office of Communications, UK
OFTA	Office of the Telecommunications Authority, Hong Kong
SCP	Service Control Point
SDCA	Short Distance Charging Area
SIM	Subscriber Identity Module
STD	Subscriber Trunk Dialing