

# **COMPARATIVE STUDY OF TELECOM SERVICES IN NEPAL**

(A case study of Nepal Telecom, Ncell and UTL)

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## **RECOMMENDATION**

This is to certify that the Thesis

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**Entitled:**

**Comparative Study of Telecom Services in Nepal**

(A case study of Nepal Telecom, Ncell and UTL)

Has been prepared as approved by this Department in prescribed format of the Faculty of Management. This Thesis is forwarded for examination.

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**(A case study of Nepal Telecom, Ncell and UTL)**

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## DECLARATION

I, hereby, declare that the work reported in this thesis entitled “ **Comparative Study of Telecom Services in Nepal- A case study of Nepal telecom, Ncell and UTL** ” submitted to the Office of the Dean, Faculty of Management, Tribhuvan University, is my original work done in the form of partial fulfillment of the requirement for the master Degree in Business studies (MBS) under the supervision of Shree Bhadra Neupane and Er. Shankar Nath Adhikari of Shanker Dev Campus.

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## ABBREVIATIONS

3G	: Third Generation
Administn.	: Administration
ADSL	: Asynchronous Digital Subscriber Line
AFS	: Advanced Free phone Service
AM	: Amplitude Modulation
AN	: Access Network
ANP	: Access Network Planning
Approx.	: approximately
B.S.	: Bikram Sambat
BRD	: Birganj Regional Directorate
BSNL	: Bhartiya Sanchar Nigam Ltd.
BTRC	: Bangladesh Telecom Regulatory Commission
Cap	: Capacity
CB	: Central Battery
CBIS	: Computer Based Information System
CDMA	: Code Division Multiple Access
CIT	: Citizen Investment Trust
Congestn	: Congestion
Co.	: Company
D.O.T.	: Department of Telecommunication
D.P.	: Drop Point
DEL	: Distributed Exchange Line
Dept.	: department
DFD	: Data Flow Diagram
DMD	: Deputy Managing Director
Dom.	: Domestic
E-mail	: Electronic mail
ERD	: Eastern Regional Directorate
F.Y.	: Fiscal Year
Govt.	: Government
GPRS	: General Packet Radio Service



GSM	: Global System for Mobile communication
HCD	: Home Country Direct dialing
HF	: High Frequency
HRD	: Human Resource Department
IN	: Intelligent Network
Info	: Information
INGO	: International NGO
Internat	: International
IS	: Information System
ISD	: International Subscriber Trunk Dialing
ISDN	: Integrated Subscriber Digital Network
ISP	: Internet Service Provider
ITU	: International Telecommunication Union
IVR	: Interactive Voice Response
JICA	: Japan International Cooperation Agency
MARTS	: Multiple Access Radio Telephone System
MCC	: Maintenance Control Centre
MD	: Managing Director
MDF	: Main Distribution Frame
Mgmt.	: Management
MI	: Management Information
MIS	: Management Information System
MoF	: Ministry of Finance
MoIC	: Ministry of Information and Communication
MoL&J	: Ministry of Law and Justice
Msg	: Message
N/W	: Network
Nat	: National
NDCL	: Nepal Doorsanchar Company Limited
NGN	: Next Generation Network
NGO	: Non Government Office
NPR	: Nepalese Rupees
NT	: Nepal Telecom
NTA	: Nepal Telecom Authority

OS	: Operating System
OYT	: Own Your Telephone
P.P.	: Primary Pair
PCC	: Prepaid Calling Card
PCL	: PSTN Credit Limit
PDSN	: Public Digital Switching Network
PSTN	: Public Switching Telephone Network
S.P.	: Secondary Pair
SD	: Service Division
STD	: Subscriber Trunk Dialing
Std.	: Standard
Subscr	: Subscriber
TRAI	: Telecommunications Regulation Authority of India
TTC	: Telecom Training Centre
UHF	: Ultra High Frequency
UK	: United Kingdom
USD	: United States Dollar
VAS	: Value Added Service
VAT	: Value Added Tax
VDC	: Village Development Committee
VHF	: Very High Frequency
VSAT	: Very Small Aperture Terminal
WLL	: Wireless Local Loop

# Chapter I Introduction

## 1.1 Background

### 1.1.1 Telecommunications Service

Telecommunications, also called telecommunication, is the exchange of information over significant distances by electronic means. It is also defined as "the transmission, between or among points specified by the user, of information of the user's choosing, without change in the form or content of the information as sent and received.

For purposes of regulation by the Federal Communications Commission under the U.S. Communications Act of 1934 and Telecommunications Act of 1996, the definition of **telecommunications service** is "the offering of telecommunications for a fee directly to the public, or to such classes of users as to be effectively available directly to the public, regardless of the facilities used.

Telecommunication services have proved to be very important for the mankind. It has helped to make the earth closer and safer. It has vital role in raising the economy of the society and the country as a whole by saving time and money in getting information and instructions thereby helping in increasing production and finding out market for the industries. It has vital role in the sector of health and education of the society; especially telemedicine and e\_learning, recent developments, have highlighted the importance of telecommunication services in the health and education sectors! Telecommunication services helps at all phases of disasters. It can help to find jobs or to consult experts required. Telecommunication infrastructures, in fact, support people to achieve in each and every field of their work and lives.

It has been found that there is a direct relation between development and telecommunication services.

History of telecommunication started with the discovery of telephone by Graham Bell in 1876. The old analogous communications systems have been converted to digital systems with enhanced quality of service and increased capacity. There are various types of telecommunications services: voice, data and video. Again, they may be served through wireline or wireless technology. Fixed telephone can be served by PSTN exchange through wireline or VHF/ UHF/ MARTS, VSAT systems. Mobile

telecommunication is accomplished using cellular technology using GSM, CDMA and other systems. Data and video are the recent high demand telecommunications services.

The number of Fixed telephones per 100 inhabitants (average of years 2005-10) in poor countries of Africa is very less (29 ) whereas that of comparatively richer and developing Arab countries, Asia & Pacific countries, developed American and European countries are more 65, 58, 105 and 153 respectively.

### **1.1.2 Telecom Services in Nepal**

Nepal is a landlocked country occupying an area of 147,181 square kilometers. Approximately 83 % of the country is rugged terrain and only about 17% of its area is flat land. Since it is very difficult and costly to build transportation infrastructures due to the difficult terrain, telecommunications services are of utmost importance for Nepal to serve the rural population in majority.

After the restoration of multi –party democracy in 1990, Government of Nepal adopted a liberalization policy in communications sector by the formulation of National Communication Policy 1992 under which Government decided to privatize the telecommunications service sector. The telecommunications Act, 2053 (1997), Telecommunications Regulations, 2054 (1997), Long Term Vision of Communication Sector , 2002 and Telecommunication Policy, 2004 are the main legal and policy framework of telecommunication services in Nepal. Nepal Telecommunications Authority (NTA), separate regulatory body of Nepal in telecom sector has been constituted in March 1998 (2054) under the Telecom Act in order to make telecom service available throughout the country in a competitive manner and regulate the sector.

#### **Telecom Service Providers**

At present, the incumbent operator, Nepal Doorsanchar Company Limited (NDCL) is operating local, domestic, long distance, international telephony, cellular mobile and internet service including ADSL in Nepal. Besides NDCL, NTA has issued one more full mobility cellular mobile license to Ncell and two more licenses for Basic Telecom to STM and Smart Telecom Ltd. Till Ashadh 2068, NTA has issued 293 licenses under different types of telecom services mentioned in the table 1.1:

**Table:1.1 License issued by NTA (Existing as of 2011, July)**

<b>S.No.</b>	<b>Name of the Services</b>	<b>Number of the licensee</b>
1.	Basic Telecommunications	3
2.	Cellular Mobile	2
3.	Network Service Provider	9
4.	VSAT User	100
5.	Internet (With E-mail)	48
6.	GMPCS	3
7.	Rural Telecom	2
8.	Limited Mobility	108
9.	International Trunk Telephone	3
10.	Rural VSAT User	9
11.	Rural Internet Service Provider	6
<b>Total</b>		<b>293</b>

### **1.1.3 Case Studies of NT, Ncell and UTL Companies**

#### **1.1.3.1 Profile of Nepal Telecom**

Nepal Doorsanchar Company Limited (Nepal Telecom) was registered on 2060-10-22 under company act 2053 and the notice to this effect published in Nepal Gazette dated 26<sup>th</sup> Chaitra 2060, after dissolving then Nepal Telecommunications Corporation (NTC). However, the company name was officially effective from 1<sup>st</sup> Baisakh 2061 (13<sup>th</sup> April 2004) and the general public knows it by the name of NEPAL TELECOM as its registered trademark. Its share structure is composed of 8% public share and 92% government share.

## **Milestones of Nepal Telecom**

<b>Year</b>	<b>Milestone Details</b>
2004	NEPAL TELECOM (Transformation from Corporation to Nepal Doorsanchar Company Limited)
2004	Pre-paid Calling Card Service (IN Services)
2005	Soft launch of CDMA
2007	GPRS, 3G and CRBT Services introduced in GSM Mobile
2008	Broadband ADSL Service launched
2009	Postpaid CDMA Mobile Service started
2010	EVDO Service started
2010	Telecom Service to all VDCs
2011	Launch of SIP PPP (Permanent Prepaid Phone) service

## **Services Offered by NT**

PSTN (Public Switched Telephone Network):

Local Calls, Domestic Telex, Local Leased Lines, National Trunk Calls, International Trunk Calls, Operator-Assisted Int'l Telephone, Internet Service, Packet Switching Data Communication, Activating/ Deactivating Phone Locks, Call Forwarding, Call Waiting, Do Not Disturb, Conference call, Line Hunting, Abbreviated Numbering, ISDN (Integrated Services Digital Network), etc.

GSM Mobile Service: Post-paid, Pre-paid, GPRS, 3G, USSD, International roaming, Outbound SMS, FNF Calls, CRBT, Mobile VMS, etc.

CDMA Mobile Service: C-phone (Post-paid, Pre-paid), Sky Phone (Post-paid, Pre-paid), SKY Data, EVDO, CDMA VMS, Packet Data Service, Call Forwarding, Call Waiting, Do Not Disturb, Conference call, Mobile Access Hunting, Password Call Acceptance, Selective Call Acceptance, Subscriber Pin Intercept, Subscriber PIN Accept, Call Transfer etc.

Intelligent Network Services: PCC Easy Call Service, PCL (PSTN Credit Limit), HCD (Home Country Direct), AFS (Advanced Free phone Service), IVR (Interactive Voice Response), Notice board Service, etc.

### **1.1.3.2 Profile of Ncell**

Ncell Pvt. Ltd (known as Spice Nepal Private Limited earlier) was established in 2004 as the first private operator of mobile communication services in the GSM standard in Nepal. The services were commercially launched under the Mero Mobile brand on September 17, 2005. Since March 12, 2010 it has been operating under the Ncell brand. 'N' stands for Nepal.

Ncell has been part of TeliaSonera, a leading European telecommunication company since October 2008. Supported by TeliaSonera, Ncell has continued expanding coverage, enhancing quality and bringing new, efficient and easy-to-use services. Ncell has won the Most Innovative Mobile Operator & Best Consumer Pull Award in the year 2006 in a ceremony organized by Voice and Data, India's leading information and communication magazine in Colombo, Sri Lanka. The winners were chosen amongst the best mobile operators in South Asian countries (SAARC) for their contributions in cellular mobile phone development, innovative products and services.

Ncell also won the Best Consumer Pull Award for two consecutive years (2006 & 2007). The award ceremony was organized by Voice and Data a leading Indian magazine related to information and communication in Kathmandu, Nepal.

Mr. Pasi Koistinen is the CEO and Mr. Aigars Benders is the CTO of Ncell.

#### **Services Offered by Ncell**

A company that started its service with basic services like Voice call & SMS service at the launching phase under the cellular mobile license, has one by one, introduced services like BlackBerry, 3G, Ncell Connect-browsing internet through a data card, EDGE/GPRS, Call Waiting, Call Forwarding, Conference Call, Voice Mail, Missed Calls Notification, SMS to e-mail, e-mail to SMS, USSD, Mobile Internet (GPRS/EGDE), Multimedia Messaging Services (MMS), Personalized Ring Back Tones (PRBT) and different types of Value added Services.

Ncell has tied up with an array of operators in more than 75 countries, including 225 operators around the world at present and gradually extending roaming partners day by day for the convenience of its subscribers.

### **1.1.3.3 Profile of UTL**

United Telecom Limited (UTL) is a consortium of four companies who have come together in a joint venture, to explore various telecom opportunities in Nepal. Out of four partners, three are the major telecom players in India and the fourth one is a local partner, i.e., Nepalese company.

The equity participation in UTL is:

Mahanagar Telephone Nigam Limited (MTNL)	26.68%
Telecommunications Consultants India Limited (TCIL)	26.66%
Tata Communications Limited (TCL)	26.66%
Nepal Ventures Private Limited (NVPL)	20%

#### **Structure of UTL Board**

The Board of Directors of company consists of four members comprising of one nominee each of MTNL, TCIL, TCL (formerly VSNL) and NVPL. The following are the directors of the company:

Representative, Nepal Ventures pvt. Ltd, NVPL

Representative, Advisor- Telecom, Tata Group

Representative, Chairman and Managing Director, TCIL

Representative, Chairman and Managing Director, MTNL

#### **Services Offered by UTL**

Voice Service, SMS, Voice SMS, Missed Call Alert, CRBT, Internet through USIM, Internet Lease Line, Conference Bridge, Caller ID, DND, Mobile Access Hunting, Call Transfer, SPINA Service, SPINI Service, Call Waiting, etc.

Till now 47 cities of more than 36 districts under 5 zones have been covered by its services.

#### **Milestones of UTL**

- J 2003 Operation of service within UTL N/W in March
- J 2004 International Gateway Switch in operation on April 19
- J 2006 Limited Mobility Service w.e.f. March 24
- J 2006 CAC (Carrier Access Code) implemented on march 20
- J 2008 Launching of CDMA RUIM cards (U-SIM)
- J 2008 Launching of VAS like IN, SMS, CRBT High speed internet



## **1.2 Focus of Study**

The Nepal Government, in the policy and program for Fiscal Year 2068-69, has announced the slogan of “Broadband in every Village and Phone on Demand in every City”. World Bank study indicates that there is 1.38 % increase in GDP for every 10% increase in broadband penetration.

The focus of study is to picturize the status of telecom services in Nepal with case study of the services provided in the eastern and central development region by the telephone operators NDCL, Ncell and UTL.

## **1.3 Statement of the Problem**

It is required to study the overall status of telecom services in Nepal along with comparative study of contribution to telecom services by NDCL, Ncell and UTL, the three leading telecom operators in Nepal. There are many problems in this sector:

- i. There is problem of availability of the telecom services in remote rural area- both for basic voice telephony as well as for data/ internet.
- ii. The quality of the telecom services is not up to the international standard.
- iii. There is inter- operator connection problem.
- iv. There is problem in infrastructure sharing among operators thereby raising cost of services as well as affecting environment.
- v. There is difficulty in getting frequency band to new operators as well as for operating new services.

## **1.4 Objectives of the Study**

The main objectives of the study are as follows:

1. To analyze the existing PSTN line distribution information system of Nepal Telecom.
2. To analyze the existing Mobile line distribution of Nepal Telecom.
3. To analyze the existing Mobile line distribution of Ncell.
4. To analyze the existing WLL/ CDMA fixed line provided by UTL.
5. To compare the tariff rates of different services of the three companies.
6. To compare the quality of services offered by the three companies.
7. To compare the subscriber base of the three companies.

## **1.5 Significance of the Study**

1. This study serves as a partial requirement for the completion of the master's degree as specified by the Tribhuvan University, Nepal.
2. This study can be fruitful for the concerned organization because it intends to provide various information, feedback and conclusions and to suggest suitable recommendations to the organization.
3. It will be helpful for general readers, researchers, NTA and the government.
4. It is appropriate for library use also.
5. It assists in future study, as it becomes a pilot project.

## **1.6 Limitations of the Study**

Every researcher wants to have every facts and proof for the study. However, this is not possible in the lack of authority. Some of the major limitations of the study are listed below:

1. It was not possible to get all required statistical data from Ncell as they do not allow to meet officers in their corporate office. Only Customer relation/ Sales representatives could be accessed who were not allowed to provide any statistical data. However, they were very supportive to explain about the available services and the processes. It was also difficult to get Statistical Data from UTL; however they helped to collect some data and referred to NTA's reports.
2. This report is based on primary data collection and their authenticity depends on the answer provided by the staff of the companies visited.
3. There were no sufficient secondary data available to detect more information about the company.
4. This study is based on general views and limited interviews.
5. Cost constraints also play a major role in this fieldwork study. The study needed to pay visit to corporate and field offices of the three telecom operators in Kathmandu as well as in few places of Eastern and Central Development Region of the country-Birganj, Biratnagar, Damak and Ilam to name a few.
6. This research is based mainly on head offices of Nepal Telecom, Ncell and UTL, Eastern regional directorate office of Nepal Telecom in Biratnagar, Birganj regional directorate office of Nepal Telecom in Birganj, Regional offices of Ncell and UTL in the eastern region of Nepal.

7. Time constraints are one of the major factors of limitation of the field study. Field visit included many places of many districts of Central and Eastern Development Regions of Nepal such as Biratnagar, Itahari, Birtamode, Damak, Ilam, Phidim, Taplejung, Okhaldhunga, Khotang, Rajbiraj, Siraha, Gaighat, Lahan, Janakpur, Bardibas, Birganj, Kalaiya, Gaur, Hetauda, Bharatpur etc. Travelling to these places needs appreciable time in the much disturbed transportation situation of Nepal and poor transportation facility (gravel/soil roads and fewer vehicles) in the rural districts of the country.
8. Retrieving information from the service users by interview and questionnaire takes ample time. The student is allocated a limited time to research and submit the report.

This report deals with the normal PSTN line distribution information system of the fixed line of NT only. The distribution procedure varies a little in cases of VHF, MARTS in which transmission section is also involved in NT; however, these are almost obsolete now. In case of VSAT lines Satellite Services Directorate of NT distributes these lines directly from Kathmandu or via rural telecom or transmission section.

## **1.7 Organization of the Study**

The aim of this thesis is to evaluate the telecom service available in Nepal. For this, the services of the three major telecom companies of the country, namely, Nepal Telecom, Ncell and UTL have been studied and compared with that of the neighbouring countries. The study has been divided into 5 chapters.

### **Chapter I: Introduction**

The first chapter introduces about the thesis with simple background, focus of study, statement of the problems, objective of study, significance of the study, limitations of the study and the organization of the study arranged sequentially.

### **Chapter:II Review of Literature**

The second chapter contains the reviews of related literatures from books and journals. Besides, theses and available study reports written by research fellows and experts have also been reviewed. Similarly, Government Policies prevalent in

the country and in the leading country USA have also been reviewed. Similarly, technical terminologies that came across the study have also been listed.

### **Chapter III: Research Methodology**

This chapter presents the methodology followed in the study. This deals with the research design, sources of data and analytical tools and technologies used in the study.

### **Chapter IV: Presentation and Analysis of Data**

The fourth chapter 'Presentation and Analysis of Data' presents the relevant data and analyzes them to fulfil the objective of the thesis. Here, growth trend, tariff trend and quality of telecom services in Nepal have been compared with that of the neighbouring countries. The procedure details of distribution of the services in different companies in Nepal have also been outlined and depicted with the help of flowchart, DFDs and ERD.

### **Chapter V: Summary, Conclusion and Recommendation**

This chapter describes the thesis in nutshell and draws out the conclusion and recommends to the related stakeholders- government, service regulatory agency and the operating companies- in order to improve the telecom service in the country.

Lastly, Bibliography and Appendices have also been attached for reference purpose.

## **Chapter II      Review of Literature**

### **2.1      Conceptual Review**

This is the method of collecting data where there has already been some previous research or study so as to provide information to its readers or researchers who are working to gather information about the similar subject. If there has been any kind of research done in previous years then the data and information gathered from such a source is termed review of previous study. Unfortunately, not much research work has been done on this topic, however, few available and some conceptual perspectives have been reviewed. For this different thesis submitted by students of master level and Ph.D. level, research study published by various institutions, presentations made by authorized government representatives to different international organizations have been reviewed.

#### **2.1.1      Concept of Information System**

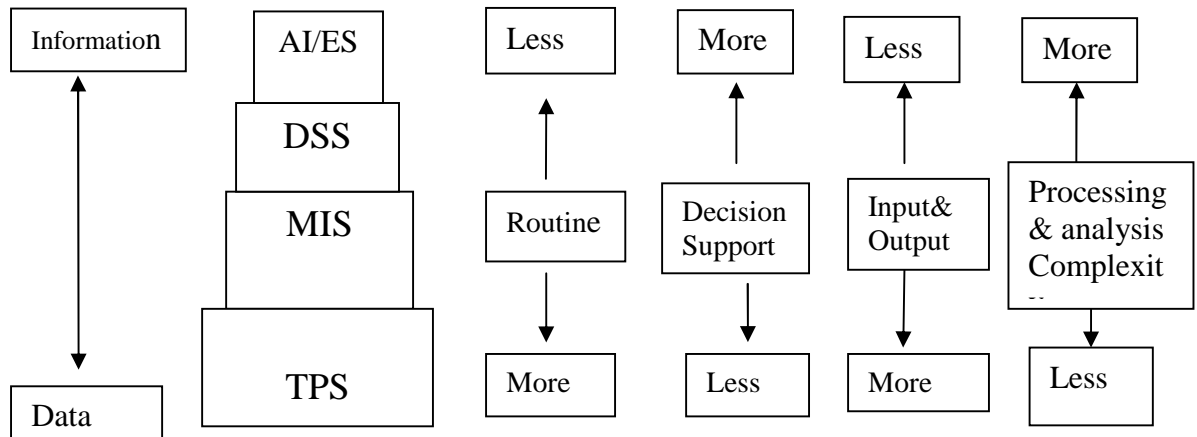
Information is of utmost importance for success in any field of life and same is true for successful operation of any organization. Information can be defined as the data which can be organized and presented so that the decision maker may take necessary action.

Interrelated components that collect, process, store and disseminate information to support decision making, control, analysis and visualization in an organization is the information system in organization. The basic system components are input, output, feedback, environment, interface and boundary. The boundary defines the system scope of an organization. Interface is the media for interaction between system and environment.

#### **2.1.2      Hierarchy of Information System**

Management Information System (MIS), Decision Support System (DSS), Executive Information System (EIS), Expert System (ES), Artificial Intelligent (AI) System are all examples of development of information system. The natures of these information systems are picturized in the Figure 2.1 .

**Figure:2.1 Hierarchy of Information System**



(Source: [www.mhhe.com/Whitten](http://www.mhhe.com/Whitten))

Transaction Processing System (TPS) is a type of information system that collects, stores, modifies and retrieves the data transactions of an enterprise. Operational level staff during their routine job perform so many transactions generating a lot of data for processing. It is of little use to make decisions and is more of input/output nature.

MIS is used in tactical level. It is a system which handles the databases, provides computing facilities to end users and gives a variety of decision making tools to the users. The supervisors as well as planners use this often for relevant information to make decisions.

Decision Support System (DSS) is an extendible system capable of supporting ad hoc data analysis and decision modeling, oriented toward future planning, and used at irregular, unplanned intervals. The processing and analysis complexity is more and is more informative.

In artificial intelligence, an expert system is a computer system that emulates the decision-making ability of a human expert. These are designed to solve complex problems by reasoning about knowledge. The processing and analysis complexity is much more and is used rarely by the top management.

## **2.1.3 Introduction to MIS**

### **2.1.3.1 Concept**

As the organization grows up in size the volume of information becomes bigger and bigger. At the same time it gets difficult and more difficult to supervise the works of the branches. The planning of the goods and services, implementation of the projects and maintenance of the machines and services all become quite a tedious task. In order to manage these things more effectively it is necessary to have good management of information. This is where the “MIS” comes into picture.

Management Information Systems are of vital importance for all kinds of organizations. All managerial functions are performed through decision making; for taking rational decisions management information is essential and is procured through the Management Information Systems (MIS) set up by the organization. The term Management Information System is composed of three elements viz., Management, Information and System.

Management is the process of getting things done through and with people. It includes Planning, Organizing, Staffing, Directing and Controlling. Information is data that is processed in a form which helps the management to take decisions. A System is a set of elements joined together to achieve a common objective(s). A business organization is the system where the divisions, departments, function units are the subsystems.

Management information system is a system having a combination of persons, machines, procedures and data-base, as its elements, which gather data from the intra and extra sources of an organization: and after processing these data, supply management information to the managers in an organization, to support the decision-making process of the management.

Robert B. Anthony described three levels of business activities carried out in operating an organization: Operational control (Operating Management), Management Control (Middle Management), and Strategic Planning (Top Management).

The first level, strategic planning processes determines what markets or businesses the company should be in at present or plan to be in the near future.

The next level, management control, includes processes or functions that facilitate the management of those processes delegated to the operational control level. An example of a management control process is production scheduling, where a system is established to schedule products through the various fabrication and assembly points within a factory. The feedback from the production scheduling process enables management to control the operation.

The bottom level, operational control indicates processes performed to control the basic product or services produced by the company. It is concerned with individual tasks or transactions such as procurement or raw material as per prescribed quantity and quality, selling of products to specific customers. In a bank operational control activities includes physical sorting, recording, and posting of cheques.

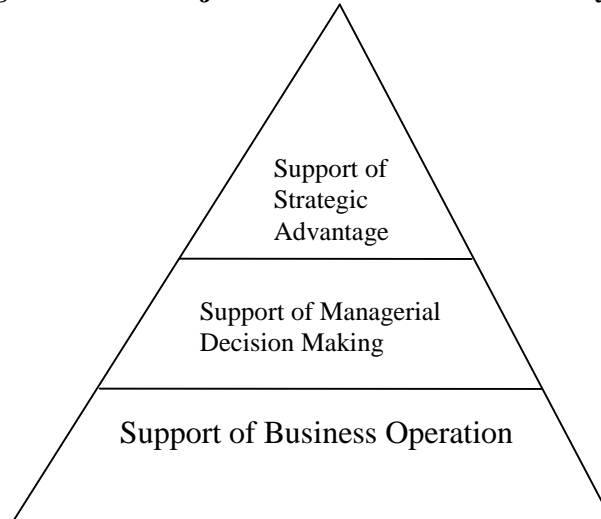
Executive decision-making today in any field is very complex. Both strategic and tactical decisions rely on information that is timely and accurate and therefore, the use of information procuring systems has become essential in every significant management activity. The rapid development of MIS and of its technology itself, its convergence and integration, birth of new concepts like information resource management, or the extension of the role of information professional within the organization are the new trend setters. Decision Support System, for example, presents an impressive picture of senior decision makers having up to date information at their fingertips in high quality graphic form and are able to borrow into detail to any level they require.

Thus, information is a vital ingredient for the operations and management of any organization. The scope of a formal information system in an organization is limited by the data that can be obtained; the cost of obtaining, processing and storing the data; the cost of retrieval and distribution; the value of the information to the user and the capability of the humans to accept and act on the information. CBIS is designed to both reduce the costs and increase the capabilities of organizational information processing and increase organizational effectiveness.

The major roles of MIS can be depicted in figure 2.2 as follows:



**Figure:2.2 Major Roles of Information System**



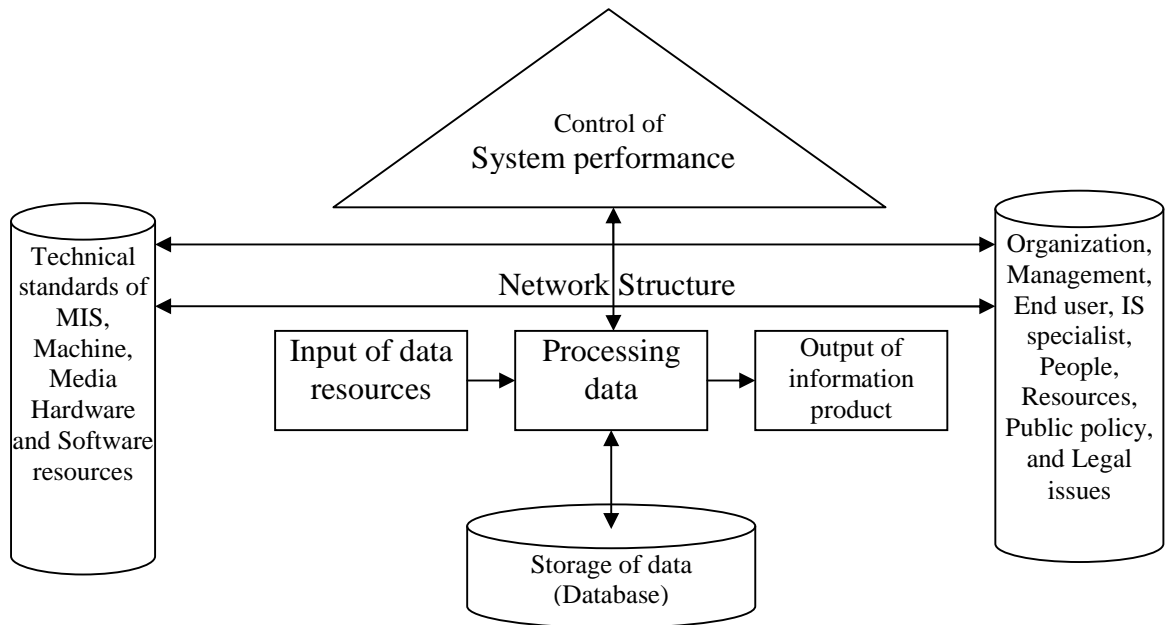
### **2.1.3.2 Architectural Framework of MIS**

The figure 2.3 illustrates a self explanatory organizational system model that express a fundamental architectural framework for the major components and activities of information system. In an organization data resources are transferred by information processing activities into a variety of information products for end users. Information processing consists of input, processing, output, storage and control activities.

People, hardware, software, data and networks are the five basic resources for MIS. People resource includes end users/ clients and IS specialists/ system analyst, programmer, computer operators. Hardware resources include all the physical devices and materials used in information processing. Software resources include programs to direct and control computer hardware and procedures to use the software packages. Data resources include database which hold organizational data and knowledge base that hold various forms of knowledge like facts, rules and case examples, and other such external data.

The system gathers data from the internal and external sources of an organization process it and supplies the information output to assist managers in the process of decision making. Here, the word “system” implies that MIS follows a system approach, which means a holistic approach and is based on the concept of synergy, where the output is greater than the sum of its parts.

**Figure:2.3 Architectural Framework of Managmnt Info System**



*(Source: Adhikary; 2007:26)*

Thus, it clearly indicates that MIS is not a single system rather than it is an integrated system where parts fit into an overall design.

MIS can be defined as the systematic or organized way of providing informational support to the managerial functions of an organization. The system utilizes computer hardware, software, manual procedures, and models for analysis, planning control and decision-making and a database. In other words, "MIS is an automated system which presents information both internal and external to the business that aids in making a specific set of routine decisions". The few aspects of the above definition that warrant closer scrutiny are:

1. MIS is an organized or planned effort and not the result of some sporadic attempts.
2. Integrated and meaningful information is the output of the system.
3. The primary function of MIS is to provide information.
4. MIS is a facilitating or supporting system to aid managerial functions and not merely help operational tasks, that is, the MIS provides information that assists managers at different levels in the organization.

5. MIS is formed from a number of components, including hardware, software, manual procedures, models and a database.
6. MIS is a system of users and machines, the users are as important to the system as the machines.

Different classes of users of MIS will use it differently. Clerical users primarily provide input and data control. First line supervisors use it for operational control and detailed exception reporting. Management uses it for special reports and analysis, often employing a staff specialist to manipulate decision models and perform analysis.

MIS is a system to support the decision making function in the organization. The difference lies in defining the elements of the MIS. However, in today's world, the MIS is a computerized business processing system-generating information for the people in the organization to meet the information needs for decision making to achieve the corporate objectives of the organization. MIS helps in optimizing the use of scarce resources, through their improved utilization, and by supporting intelligent decision making a co-ordination without wasteful delays. Information management involves the communication of intelligent or knowledge. It appraises and notifies surprises and stimulates, reduces uncertainty, reveals additional alternatives and helps eliminate irrelevant or poor ones, and influences individual and stimulates them to action. In any organization, information should give early warning and portend the future. Therefore, it is essential that those in the professional lines should be aware of MIS and be included to its effective utilization.

In the conclusion, we can say that MIS is a system using formalized procedures to provide management at all levels in all functions with appropriate information, based on data from both internal and external sources, to enable them to make timely and effective decisions for planning, directing, and controlling the activities for which they are responsible. The actual process will involve the collection, organization, distribution and storage of organization wide information for managerial analysis and control.

## **2.1.4 Government Policy for Telecommunications Sector**

Strategies and policies followed by the government affects the services directly. The policies can be such that operators may find easy to enter into business or it can be otherwise- the operators may not find secured and may not enter into business. If there are more operators there is competition in the business and the people may get the services of more quality at cheaper rates. Right of all the people (rural as well as urban) to communication services should be kept in mind while formulating policies. The strategy and working policies for telecommunication services formulated by the Government of Nepal in B.S. 2060 (A.D. 2004) and mission and strategies of FCC of USA are put below to know the government provisions for telecommunications sector:

### **2.1.4.1 Telecommunication Policy of Nepal, 2060 (2004)**

#### **1. Necessity of Telecommunication Policy**

The Government has accepted the telecommunication service as the basic prerequisite of the development. In order to promote private sector's participation in the telecommunication sector, the telecommunication policy, 2056 (1999 A.D.) has created favorable environment to some extent. The government has made commitment to maintain full competition by keeping the telecommunication sector open since 2004 A.D. through this policy.

The telecommunication sector is more significant comparison with the other infrastructures in the context of difficult geographical structure of Nepal. The technological development rapidly taking place on the telecommunication sector and dynamic change also taking place in its structure has opened up new opportunities in this sector. It would be possible that the Nepalese people may be benefited from the gradual depreciation universally taken place in the tariff of the telecommunication service. In this context, the necessity of timely and dynamic policy is realized to utilize the additional possibilities and opportunities to be appeared in the telecommunication sector in future for the prosperity and welfare of Nepalese peoples by utilizing the achievements gained in telecommunication sector to the maximum extent and the telecommunication policy, 2060 (2004 A.D.) has, therefore, hereby been

formulated for substitution of the telecommunication policy, 2056 (1999 A.D.).

## **2. Objectives**

The main objective of the telecommunication policy is to create favorable environment in order to make the telecommunication service reliable and accessible to all people at the reasonable cost throughout the kingdom in collaboration with the private sector et.al in order to support the social and economic development of the country. The following objectives have been determined in order to give support for accomplishment of this paramount objective.

- 2.1 In order to bring the access of general public of rural and urban areas of the kingdom to the telecommunication service, arrangement shall be made in a manner that the telecommunication service shall be available within the shouting distance in the inhabited areas.
- 2.2 The telecommunication service shall be made available to meet the demand in the urban areas of the kingdom. Arrangement shall be made in a manner that the corporate telecommunication service shall be available to the business areas.
- 2.3 Opportunity shall be provided to the consumers of the urban areas to choose service from various providers. Arrangement of opportunity to choose service accordingly shall be gradually extended in the rural areas also.
- 2.4 Arrangement shall be made for getting opportunity to use appropriate information and communication technology for poverty alleviation and development of the rural areas.

## **3. Strategy**

### **3.1 Universal Access to the Telecommunication Service:**

The telecommunication service shall be extended in a manner that there shall be universal access to the service. The telecommunication service shall be made available to the consumers through the shared telephone. Emphasis shall be given to extend telephone as fixed, mobile, etc. The satellite system may also be applied for extension of service. Other services pertaining to

information and communication shall be made available through the Community Centre.

### 3.2 Universal Service Obligation:

The telecommunication service provider shall be required to provide service to any consumer of the urban areas immediately after ordering therefor.

### 3.3 Development of Corporate Service:

Arrangement shall be made in a manner that the leased line, data and other similar corporate service shall be available to the government bodies and private business sector in the urban area through more than one service provider.

### 3.4 Liberalization of the Telecommunication Sector:

The telecommunication sector is kept open for the service providers. However, the number of service providers may be limited by virtue of radio spectrum. While providing directory service, the service provider shall be required to provide such service covering all customers consuming the service.

### 3.5 Open Licensing Regime to be Applied:

The open licensing regime system shall be applied for providing opportunity to all service providers to enter into the telecommunication sector. Transparent methods shall be applied upon granting such license. Moreover, an environment for healthy competition shall be created.

### 3.6 Private Sector's Participation to Be Encouraged:

The private sector's participation shall be encouraged for the telecommunication sector. Foreign investment shall be attracted. Arrangement shall make to regularly inform private sector about the particular of reform taken place in the telecommunication sector and about the opportunity available in this sector also.

### 3.7 To Enter into Information Society:

Arrangement of the necessary prerequisites such as extension of telecommunication service and Cyber Law shall be made and Nepal shall be got to effectively enter into the information society.

### 3.8 Appropriate Information and Communication Technology for the Users of the Rural Area:

Appropriate information and communication technology shall be made available as per the capacity and need of the users of the rural areas. In this

connection, the information and communication technology based on radio, television and telephone that do not require special training and literacy shall be made available in collaboration with the private sector et.al. The service of information and communication technology shall be made available to the rural users through the small service providers.

### 3.9 Commercialization of the Nepal Telecommunication Corporation:

In connection with commercialization of the Nepal Telecommunication Corporation, the Corporation shall be converted into a company and the ownership of the Government of Nepal shall be gradually decreased. In order to meet the increasing competition, various reform programmes shall be conducted to make the company competent.

### 3.10 Economic Efficiency of the Telecommunication Sector:

Emphasis shall be given to increase economic efficiency of the telecommunication sector by creating an environment that promotes healthy competition among the telecommunication service providers.

Based on the above strategies working policies have been worked out.

*(Source: MOIC:2003)*

## **2.1.4.2 Mission and strategy of FCC of USA**

The aim of USA regarding provision of telecommunication services to the people of the country can be seen from its mission and strategies which is put below:

As specified in section one of the Communications Act and as amended by the Telecommunications Act of 1996 (amendment to 47 U.S.C. §151) it is the FCC's mission to "make available so far as possible, to all the people of the United States, without discrimination on the basis of race, color, religion, national origin, or sex, rapid, efficient, Nation-wide, and world-wide wire and radio communication services with adequate facilities at reasonable charges." The Act furthermore provides that the FCC was created "for the purpose of the national defense" and "for the purpose of promoting safety of life and property through the use of wire and radio communications."

Consistent with the objectives of the Act as well as the 1993 Government Performance and Results Act (GPRA), the FCC has identified six goals in its 2006-2011 Strategic Plan. These are:

- J **Broadband:** "All Americans should have affordable access to robust and reliable broadband products and services. Regulatory policies must promote technological neutrality, competition, investment, and innovation to ensure that broadband service providers have sufficient incentives to develop and offer such products and services."
- J **Competition:** "Competition in the provision of communication services, both domestically and overseas, supports the Nation's economy. The competitive framework for communications services should foster innovation and offer consumers reliable, meaningful choice in affordable services."
- J **Spectrum:** "Efficient and effective use of non-federal spectrum domestically and internationally promotes the growth and rapid development of innovative and efficient communication technologies and services."
- J **Media:** "The Nation's media regulations must promote competition and diversity and facilitate the transition to digital modes of delivery."
- J **Public Safety and Homeland Security:** "Communications during emergencies and crisis must be available for public safety, health, defense, and emergency personnel, as well as all consumers in need. The Nation's critical communications infrastructure must be reliable, interoperable, redundant, and rapidly restorable."
- J **Modernize the FCC:** "The Commission shall strive to be highly productive, adaptive, and innovative organization that maximizes the benefits to stakeholders, staff, and management from effective systems, processes, resources, and organizational culture."

The FCC is organized into seven Bureaus and eleven Staff Offices, described in the following sections.

## Bureaus

'The Bureaus' include processing applications for licenses and other filings, analyzing complaints, conducting investigations, developing and implementing regulations, and participating in hearings.



- J The **Consumer & Governmental Affairs** (CGB) develops and implements the FCC's consumer policies, including disability access. CGB serves as the public face of the FCC through outreach and education, as well as through their Consumer Center, which is responsible for responding to consumer inquiries and complaints. CGB also maintains collaborative partnerships with state, local, and tribal governments in such areas as emergency preparedness and implementation of new technologies.
- J The **Enforcement Bureau** (EB) is responsible for enforcement of provisions of the Communications Act 1934, FCC rules, FCC orders, and terms and conditions of station authorizations. Major areas of enforcement that are handled by the Enforcement Bureau are consumer protection, local competition, public safety, and homeland security.
- J The **International Bureau** (IB) develops international policies in telecommunications, such as coordination of frequency allocation and orbital assignments so as to minimize cases of international electromagnetic interference involving U.S. licensees. The International Bureau also oversees FCC compliance with the international Radio Regulations and other international agreements.
- J The **Media Bureau** (MB) develops, recommends and administers the policy and licensing programs relating to electronic media, including cable television, broadcast television and radio in the United States and its territories. The Media Bureau also handles post-licensing matters regarding direct broadcast satellite service.
- J The **Wireless Telecommunications Services** (WCS) such as Advanced Wireless Services (AWS) and fixed, mobile, and broadcast services on the 700 MHz Band.
- J The **Wire line Competition Bureau** (WCB) develops policy concerning wire line telecommunications. The Wire line Competition Bureau's main objective is to promote growth and economical investments in wire line technology infrastructure, development, markets, and services.
- J The **Public Safety and Homeland Security Bureau** was launched in 2006.

## Offices

The FCC's Offices provide support services to the Bureaus. Though the Bureaus and Offices have their individual functions, they regularly work together on FCC issues.

- J The **Office of Administrative Law Judges** (OALJ) is responsible for conducting hearings ordered by the Commission.
- J The **Office of Communications Business Opportunities** (OCBO) promotes telecommunications business opportunities for small, minority-owned, and women-owned businesses.
- J The **Office of Engineering and Technology** (OET) advises the Commission concerning engineering matters like frequency allocation and spectrum usage.
- J The **Office of General Counsel** serves as the chief legal advisor to the Commission.
- J The **Office of the Inspector General** (OIG) recommends policies to prevent fraud in agency operations.
- J The **Office of Legislative Affairs** (OLA) is the FCC's liaison to the United States Congress, providing lawmakers with information about FCC regulations.
- J The **Office of the Managing Director** (OMD) is responsible for the administration and management of the FCC, including the agency's budget, personnel, security, contracts, and publications.
- J The **Office of Media Relations** (OMR) is responsible for the dissemination of Commission announcements, orders, proceedings, and other information per media requests. OMR manages the FCC Daily Digest, website, and Audio Visual Center.
- J The **Office of the Secretary** (OSEC) oversees the receipt and distribution of documents filed by the public through electronic and paper filing systems and the FCC Library collection.
- J The **Office of Strategic Planning & Policy Analysis** (OSP) identifies policy objectives for the agency.
- J The **Office of Workplace Diversity** (OWD) develops policy to provide a full and fair opportunity for all employees.

## 2.2 Review of Technical Terminologies

**Teledensity:** Number of telephone for every 100 inhabitant.

**Percent of fixed telephone lines in urban areas:** This percentage is obtained by dividing the number of fixed telephone lines in urban areas by the total number of fixed telephone lines in the country.

**Percent of fixed telephone lines in rural areas:** This percentage is obtained by dividing the number of fixed telephone lines in rural areas by the total number of fixed telephone lines in the country.

**Mobile cellular telephone subscriptions (post-paid+ prepaid):** Refers to the subscriptions to a public mobile telephone system and provide access to Public Switched Telephone Network (PSTN) using cellular technology, including number of pre-paid SIM cards activate during the past three months. This include both analogue and digital cellular systems (IMT2000 (third Generation, 3G) and 4G subscriptions, but exclude mobile broadband subscriptions via data cards or USB modems. Subscription to public mobile data services, private trunked mobile radio, telepoint or radio paging, and telemetry service should also be excluded. This should include all mobile cellular subscription that offers voice communications.

**VoIP Subscriptions:** Number of voice over internet Protocol (VoIP) fixed line subscriptions. Refers to fixed telephone line VoIP subscriptions that have generated in –or outbound traffic within the past three months. This include VoIP subscriptions through fixed wireless, DSL, cable, and other fixed internet platform that provide fixed telephony using internet protocol, but excludes software-based VoIP applications (example:VoIP using Skype, hotmail, or yahoo).

**Waiting list for fixed lines:** Un-met applications for connection to the Public Switched Telephone Network (PSTN) due to a lack of technical facilities (equipment, lines, etc.). The waitlist should reflect the total number reported by all PSTN service providers in the country.

**Faults per 100 fixed Lines:** The total number of reported faults to fixed telephone lines for the year. Faults, which are not the direct responsibility of the public

telecommunications operator, should be excluded. This is calculated by dividing the total number of reported telephone faults for the year by the total number of fixed lines in operation and multiplied by 100. The number of faults per 100 fixed lines per year should reflect the total reported by all PSTN service providers in the country.

**Percent of fixed telephone faults cleared by next working day:** Percentage of PSTN faults reported that have been corrected by the end of the next working day (i.e. not including non-working days, e.g., weekends, holidays). The percentage of fixed telephone faults cleared by next working day should reflect the total number across all PSTN service providers in the country.

**Availability:** Probability that a device will perform a required function without failure under defined conditions for a defined period of time. BTS downtime is an indicator of the network availability.

**Network Accessibility:** % age of calls made by subscribers and successful within operator's network. Call set up success rate is an indicator of this parameter.

**Service Retainability:** The ability of a service to be kept once it was accessed under given conditions for a requested period of time. Call drop rate and good quality of voice service are the indicators.

**Call Drop Rate (CDR):** This indicator measures the network ability to retain call conversation when it has established or set up. A value of 7% of CDR means that, out of every 100 calls established or set up, 7 will drop before any of the calling parties voluntarily terminate the set up call. It is calculated using the expression:

$$\text{CDR} = \frac{\text{No. of dropped call}}{\text{Total no. of call attempts}} = (1 - \text{call complete probability}) * 100\%$$

**Call Completion Ratio (Call Completion Success Rate, CCSR):** It can be derived either from network statistics or from drive test statistics. It is a good parameter for evaluating the network accessibility and retainability as perceived by the customers. It is derived using the following expression:

$$\text{CCSR} = \frac{\text{Total no.of completed calls}}{\text{Total no. of call attempts}}$$

**Paging Response (Call Set up Success Rate, CSSR):** This indicator measures the ease in which calls are established or set up. The higher the value of CSSR, the easier it is to set up a call. For instance, a CSSR of 71% means that out of every 100 call attempts, only 71 are successful while the remaining 29 are unsuccessful. The indicator is calculated using the expression:

CSSR = No. of Unblocked Call attempts/ Total no. of call attempts = (1 – Blocking Probability)\*100%

**Traffic Channel Congestion Rate (TCHR):** This congestion is the first level of congestion experienced by the customer. It measures the relative ease by which the customer seizes a traffic channel to set up a call after a signaling seizure has been successful. The higher this value, the higher difficulty it is in making a call.

## 2.3 Review of Journals, Articles and Report

### Articles from Journals about Telecommunications services:

Economic Commission for Europe (1987) published a report on “The Telecommunication Industry – Growth and Structural Change” discussing about the different aspects of telecommunications services as below:

Socio-economic impact of telecommunication:

The macro-economic effects of investments in telecommunications are, as pointed out in the ITU/ OECD study “Telecommunications for Development”, very difficult to estimate. It is, however, “sensed intuitively that telecommunications are much more important than generally suspected, and have major multiplier effects on development”.

Relationship between economic development and the level of supply of telecommunications services:

In several studies, calculations are presented of the strong correlation between the overall level of development in countries, expressed for instance in GDP per capita, and the level of supply of telecommunications services, expressed for instance in the telephone density. Although this does not imply a direct or perfect causal relationship between usage of telecommunications and economic development, there is still a strong partial interdependence. Before demand for telecommunications shows a substantial increase, a certain economic level must have been attained. On the other hand, some basic telecommunication facilities are imperative for further economic development.

The relationship between main stations per 100 inhabitants (variable q) and GDP per capita (variable x), as of 1978, plotted for 69 countries was obtained as

$${}^{10}\log q = a + b {}^{10}\log x$$

$${}^{10}\log q = -3.726 + 1.357 {}^{10}\log x$$

which indicates that the telephone density increases faster than GDP per capita.

Multiplier effects of telecommunications and their contribution to the gross domestic product: It has been estimated that, in the European Economic Community in 1981, telecommunications contributed some 2 % to the GDP (during that same year, investment in telecommunications corresponded to about 0.7 % of the GDP). By the year 2000, this contribution was expected to attain 7 %. The multiplier effect of telecommunications is estimated to be in the order of 1.5 in the community, that is, an investment of 1 million ECUs in telecommunications brings about a total increase in economic activity of 1.5 million ECUs.

ITU Telecom World 2011 held in Geneva (24 – 27 Oct. 2011) emphasized on the role of broadband as critical modern infrastructure driving economic growth, trade and productivity.

Nisar, Sarkar and Wu (2011) published an article on “*Performance Studies of VoIP over Ethernet LANs*” in International Journal of the Computer, where they have put Voice over Internet Protocol (VoIP) as a rapidly growing technology that enables transport of voice over data networks such as Ethernet Local Area Networks (LANs). This growth is due to the integration of voice and data traffic over the existing networking infrastructure, low cost, and improved network management offered by the technology. Various VoIP communication software products are already available on the internet: Skype, Google Talk, and Windows Live Messenger. All of them can provide good quality, cheap, and even free phone calls. The major factors that affect VoIP quality are delay, jitter and packet loss.

Dr. Hessa Al-Jaber, secretary general, ict Qatar, put his remarks in “The Connect Arab Summit” held in Doha on 5 -7 March 2012, as he had one aim: to bring together collective ideas, resources and resolve to effectively connect individuals, neighbourhoods, cities and nations in the Arabic region.

The summit set the target as “no one should be denied access to any form of digital communication, and everyone should be a part of the connected web regionally and globally by 2015 A.D.

His Highness the Emir of Qatar, addressing the summit, said that connectivity had become essential for people to participate in the knowledge economy – and he believed that it was becoming a fundamental human right.

In the summit cyber security was taken seriously. Recognizing the importance of protecting users, especially children and young people, against the risks posed by illegal use of ICT and the dangers of the internet, the summit agreed to improve pan-Arab co-operation in addressing the growing threat posed by cyber attacks and cyber crime. The summit set a target deadline of 5 years for all Arab countries to establish national legal frameworks for cyber security harmonized at the regional level, and to develop national cyber security strategies aligned with international cooperation principles, including critical information infrastructure protection (CIIP).

*(Source: ITU NEWS No.2, Special edition, 2012 March)*

During the Connect Arab Summit, the status of Mobile Cellular Subscriptions, Fixed (Wired) Broadband Subscriptions and Active Mobile Broadband Subscriptions in terms of penetration rates by region (2011) were presented as in table 2.1:

**Table:2.1: Penetration Rates of Mobile and Broadband Services Regionwise**

S.N.	Region	Cellular Mobile (%)	Fixed Broadband (%)	Mobile Broadband (%)
1	Africa	53	0.2	3.8
2	Asia- Pacific	73.9	6.2	10.7
3	Americas	103.3	15.5	30.5
4	World	86.7	8.5	17.0
5	Arab states	96.7	2.2	13.3
6	Europe	119.5	25.8	54.1
7	Commonwealth of Independent States	143.0	9.6	14.9

Navas-Sabater, Dymond and Juntunen (2002), in their research paper entitled “*Telecommunications and Information Services for the Poor: Toward a Strategy for Universal Access*” has remarked that access to information and communications technologies has become crucial to a sustainable agenda of economic development and poverty reduction, and yet access remains concentrated in a few regions and population groups, with the contours of this new ‘digital divide’ closely following and supplementing existing income and economic divides. However, technological innovations, economic pressures, and regulatory reforms are making access to information and communications technologies more affordable and providing opportunities to close the digital divide.

Rich people have more access to information and communications services than the poor people because of their affordability. Urban areas have more access to information and communications services than rural areas because companies do not like to go to rural places due to high infrastructure cost and low profit.

World Bank had provided technical assistance to Nepal to create rural development fund and initial investment into the fund. Strategy was to introduce competition by licensing 4 new providers in separate regions with a rural focus. The project would finance the subsidy portion associated with one region initially.

**Proposed Strategic Directions:**

S.N.	Strategic Directions	Policy/ investment options
1	Policy reform	<ul style="list-style-type: none"> <li>- Competition, regulation, privatization</li> <li>- Universal access funds, incl for advanced ICTs</li> </ul>
2	Mobilization of Investment	<ul style="list-style-type: none"> <li>- Investment in rural telecentre operator</li> <li>- Seed financing of universal access funds</li> <li>- Grants &amp; micro-loans for SME development</li> </ul>



## 2.4 Review of Thesis

Joshi (2000) had conducted a research study on “*Management Information System in Nepalese Banks: A case study of Rashtriya Banijya Bank*”. It is focused on the fact that MIS, in present days, has proved to be a dominant factor for the development of any organization. This has attempted to provide an effective information collection system and recommend some area where the bank should address with the help of available information.

The objective of her study is to highlight the MIS in Nepalese banks. The specific objectives are:

- ) To highlight the financial system in Nepal
- ) To highlight the banking system in Nepal
- ) To highlight the MIS in Nepalese banks
- ) To highlight the importance of data and information
- ) To provide a useful system of collecting data and information

Research methodology followed by her is mainly based on the secondary sources of information and data. The information needed has been obtained from the Rashtriya Banijya bank under case study. The study is descriptive and a exploratory research design. Interviews and discussions have been conducted to strengthen the research.

The researcher has following recommendations:

- ✓ The overall situation of the bank can be uplifted though effective information system and effective monitoring unit. The chief executive must have effective management or strategic information and coordination monitoring system.

Poudyal Sharma (2006) had conducted a research study entitled “*MIS in Nepal Telecom*” which states that NTC is one of the growing service industries using information and communication technologies rapidly in its all service sectors in proper way. The information system of NTC is computerized but there is lack of effective use of microcomputer in each and every organizational functions and departments; it is used for the purpose of word-processing, accounting and statistical analysis. Due to complex and big organizational pyramid, nowadays, NTC has faced

different problems due to management complexities, direct competition with national and international market and modern industrial and technological revolutions.

The study has following objectives:

- ) To analyze about system analysis, system design, data flow, networking as well as information collection and flow through MIS.
- ) To examine the existing information and communication technologies system of NTC
- ) To analyze the users of MIS for overall NTC performance
- ) To examine the flow of information to coordinate and communicate different divisions and units
- ) To find out drawbacks of existing information system and to design the best suited information system on the basis of findings.

Further, the researcher wishes to discuss the demand and distribution status of basic telecom service and use of application of MIS in NTC. The researcher mentions to use relevant statistical, accounting, mathematical and financial tool e.g., mean, correlation, regression line, percentage, ratio analysis etc in analysis and interpretation.

The researcher has used descriptive research method to obtain a complete and accurate description of the situation. The study is based mainly on secondary data that comes from MIS report of NTC.

The researcher has tried to focus on study of the personnel department of NTC. Besides this, the researcher has studied about the registration process, coordinating services and administration process.

The researcher has following recommendations:

- ✓ NTC should concentrate on data collection from the various sources to analyze and conclude the future strategy.
- ✓ It is necessary to build IS application to support the telecom manager in making decision to keep a different index, norms and ratios within the acceptable limits.

- ✓ The IS should identify the training needs of the organization and offer help in designing training courses for the employees to improve their knowledge about Telecom World.
- ✓ The customer of Telecom expects the service to be delivered in a smooth, problem-free, efficient and timely manner. So, it is necessary to set internal standard in terms of accuracy, responsiveness and timeliness. The system and resources provided to achieve these standards need monitoring and MIS will provide a feedback on this standard so they can be regulated and controlled.

Tanguturi and Harmantzis (2008) studied on current state of the telecommunications networks in India and China in their topic “*ICT Infrastructure in two Asian giants: A comparative study of China and India*”.

The researchers objective was to find out the reasons for stark difference between India and China with regard to telecommunications services whether it is due to affordability, availability of ICT Infrastructure or lack of awareness or knowledge for adoption of a technology in the two giant countries.

The researchers have used descriptive research method to obtain a complete and accurate description of the situation. The study is based mainly on secondary data that comes from reports of TRAI (Telecom Regulatory Authority of India), UNCTAD (United Nations Conference on Trade and Development), ITU (International Telecommunication Union), UNDP (United Nations Development Program), Education and Research network of China and India etc.

The researchers have concluded that China’s self-dependence on home-grown hardware, superior infrastructure, and availability of higher regional and international bandwidth, makes the country more attractive for FDI as opposed to India. Furthermore, China’s higher per capita income coupled with superior access to infrastructure, help in driving telephone (fixed and mobile) and broadband penetration levels.

The researchers have suggestion that in order for India to reach the same levels, it needs to push its manufacturing base to offset its dependence on importing hardware: increase network coverage and user acceptability, which in turn, will help creating

jobs. Apart from investing in telecommunications, large investments are needed in the power sector as well as road development, which indirectly impact the level of foreign investment and attractiveness.

Chitrakar (2008), in her thesis on “*An Evaluation of Privatization in Nepal – with special Reference to manufacturing Enterprises*” had following objectives:

1. To assess the policies, procedures and mode of privatization pursued in Nepal.
2. To examine the impact of privatization on selected enterprises.
3. To compare the performance of the organization before and after privatization.
4. To identify strategies, weaknesses and problems in privatization in Nepal.
5. To recommend policies, procedures and approaches of privatization to make it more effective.

The research methodology used was exploratory and detailed survey.

Her conclusion is that the privatization process must be continued keeping in mind and trying the previous experiences and strategizing to overcome hindrances faced by stakeholders.

Her recommendations are:

1. Privatization needs proper regulation. Often the regulated firm capture regulatory agencies and thereby they control the regulation they face.
2. There must be sequential framing of time for launching the privatization program. Unnecessary time consumption and lengthy process may affect the enterprises.
3. Out of different modalities – ‘assets and business sale’, ‘share sale’, ‘lease’, ‘management contract’, the most preferred one is the sale of shares.
4. There is need for amendment in Privatization Act and Labour Act.
5. Public enterprises could do better if they are run and managed by professionally qualified personnel without any political interference.
6. Privatization should not be carried out on an adhoc basis without detailed feasibility study its worthiness. Successful implementation and continuity of the process is essential.

Adhikary (2009), in his thesis on “*Commitment and Performance in Public and Private Sector Organisation in Nepal*” had following objectives:

1. To study whether the commitment- performance relationship stands differently to differential demographic factors of the employees.
2. To study whether the commitment- performance relationship stands differently to differential works and organizational factors of employees.
3. To study whether the performance subjectively felt by the employees match with the objective indicators specific to the organization.
4. To study whether the commitment- performance relationship varies by employees and organizational level variations.

Commitment is composite of three components comprising affective commitment denoting a desire to hold the relationship, continuance commitment denoting a desire to hold the continuity of the services, and normative commitment denoting a desire to hold the sense of duty performance is viewed as composite of several indicators of which the study has included 4 employers specific indicators (business growth, financial results, productivity and corporate social performance) and 2 employees specific indicators (employees responsiveness, and advancement and well being).

The study has revealed the following facts:

1. The performance would vary by time specific categories such as age, organizational tenure and positional tenure.
2. The commitment performance relationship is seen to be composite of two components (affective and normative commitments) affecting organizational performance positively and significantly than commitment as a composite of three components.
3. The junior professionals stand out as contributing more and within them when they mature in age and tenure.
4. Female employees are more responsive.
5. Among four variations considered at employees level, degree of job satisfaction is found to influence the commitment performance relationship.
6. Among the four variations at organizational level, market orientation and total quality management is found to make differences in commitment-performance relationship.

Given that the commitment of the employees lead to the organizational performance, commitment can be said as predictor of organizational growth, profitability and social responsibility, and a contributor to employee responsiveness and advancement. In this regard, employment contract towards a specific goal or action, reorientation of commitment performance relationship from organizational standpoint to the objectivity standpoint is important in the changing environment.

Popoola, Megbowon and Adeloje (2009) in their thesis on “*Performance Evaluation and Improvement on Quality of Service of Global System for Mobile Communications in Nigeria*” had the objective to evaluate the performance and QOS of GSM cellular system in Nigeria.

The research methodology used structured questionnaire. They used four assessment parameters (network accessibility, service retainability, connection quality and network coverage). The parameters were applied on four GSM networks in Nigeria using customers’ complaint method.

Network Accessibility: Four operators were studied – Celtel, MTN, Glo and M-Tel. Percentage calculation was done on Mean Opinion Score (MOS).

The researchers recommendations were:

1. The GSM network accessilbility and retainability were unsatisfactory. The operators have to increase the number of BTSs to increase coverage and resource.
2. The regulatory body, NCC, should inspect the GSM network in the country regularly. This would aid the GSM operators in improving their network. By this network accessibility in the country would improve while high congested networks currently experienced should be reduced.

## **Research Gap**

Joshi's research study on "Management Information System in Nepalese Bank": A case study of R ashtriya Baniija Bank" in the year 2000 has attempted to provide an effective information collection system and recommended some area where the bank should address with the help of available data and information. Her research work has not compared MIS of RBB with the status of MIS with that present in other banks. This research work has considered other companies of the same nature and thus gives a comparative figure that provides more impetus for improvement of the system.

Poudyal Sharma (2006) in his thesis on "MIS in Nepal Telecom" has missed to analyze about the demand and distribution of telecom services as he stated, although he has mentioned about the direct competition in this service sector nationally and in international market. This research endeavors to picturize the demand and distribution of the telecom services by the major three Telecom Service Providers, namely, NTC, Ncell and UTL. Besides, it has attempted to evaluate the quality of services provided by the 3 operators.

Popoola, Megbowon and Adeloje (2009) in their thesis entitled "Performance Evaluation and Improvement on Quality of Service of Global System for Mobile Communications in Nigeria" had used structured questionnaire method and old data of the previous researchers whereas this research work has tried to collect the recent secondary data by itself besides collecting the primary data by the use of random stratified structured questionnaire method. This research has not only considered the GSM mobile communication service but it has also considered other types of telecommunications services (fixed telephone and data services) available in the country. This research work has also compared the tariff aspect.

The researcher could not find any previous research work attempted on this particular topic in Nepal, in fact, hence there was no base available and the research work had to be done from zero point.

## Chapter III Research Methodology

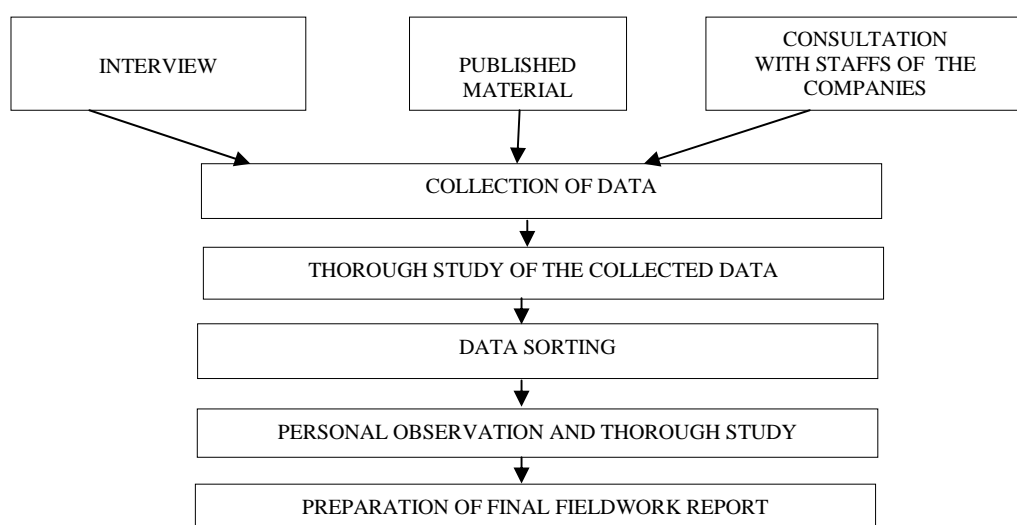
This study is based on operational research methodology. The application of methodology is, in fact, the eye and the ear of the study. It helps to analyze the data in finding the cause and effects of relationships to see how the organization is performing its activities.

### 3.1 Research design

#### 3.1.1 Research Design Methodology

The Field study research design has been followed in the project. The first step in fieldwork is to design the framework of the research. The task begins with the collection of necessary data and information concerning the study. The data and information collected must be studied carefully and presented systematically and should be analyzed to meet the objectives of the fieldwork. The research design phased for this fieldwork is shown in the figure 3.1 hereunder:

**Figure:3. 1 Research Design Applied for Methodology**





As per the above diagram, first of all the necessary data related with Nepal Telecom, Ncell and UTL companies were gathered. For the collection of data, central offices of the three companies located in Kathmandu, eastern regional directorate and few branch offices of Nepal Telecom and offices/ contact points of Ncell and UTL companies located in the eastern development region and Birganj regional directorate of NT with telecom service business in Janakpur and Narayani zone of Nepal were visited. Collection of data consists of compiling of data in necessary quantity. Analysis of the data helps and assists the study of the project. The data collected was thoroughly studied. After that, necessary data were sorted and analyzed in a systematic manner. Personal interviews and observations were also conducted as per the requirement in various places of 5 zones (Narayani, Janakpur, Sagarmatha, Koshi and Mechi) of the country. Thus, after the collection of primary and secondary data, the final fieldwork report was prepared.

### **3.1.2 Fieldwork Procedure**

For the preparation of this fieldwork report, the researcher has followed certain steps. The overall fieldwork procedure has been divided into five phases:

#### **a) Conception Phase**

The researcher selected Nepal Telecom, Ncell and UTL telecom companies for the project as required for the case study. Firstly, the researcher decided to study about the existing line distribution information system, QOS and tariff of the three companies under study. Next step was to find out the gap in the existing line distribution information systems and QOS of the companies.

#### **b) Definition Phase**

In the definition phase, the researcher made the description of the problems of the fieldwork topic. After that, the aim of the fieldwork topic was listed out.

#### **c) Planning Phase**

Planning is the very important phase. In this phase, the methodology to gather information was developed, reference books were collected and the overall work schedule was prepared.

#### **d) Implementation Phase**

The researcher visited the three organizations for conducting the study. The appointment was taken to meet the chief executives of Nepal Telecom. It was not

possible to meet the executives of the other two companies – Ncell and UTL; it was learnt that they did not allow the students for research study. The researcher met the MIS officer of Nepal Telecom and collected published materials like Annual reports, MIS reports, newsletters etc. Similarly the researcher met the sales representatives/officers of Ncell to collect service brochures and application form sample- they were eager to explain about the available services for sale. Similarly, the researcher also visited UTL deputy managers and finance executive to collect annual reports and to discuss about their services and procedures followed in distribution, operation and maintenance of their offered services. The researcher made a detailed study of the existing services and information systems of the above three companies. The researcher also conducted several interviews with the concerned personnel/ service users for the collection of data regarding their services. The collected data were analyzed and necessary data were sorted. Finally, the fieldwork report was prepared in electronic form.

#### **e) Termination Phase**

The final report was edited, printed and banded with a copy of collected information. Then the report was submitted to the college.

### **3.2 Sources of Data**

Data is the foundation of all fieldwork projects. The research design for this fieldwork was based mostly on the exploratory design method. Thus, the sources of data collection were both based on primary and secondary sources. For the already existing data, the information was derived from the secondary source and for the data that was looked for the first time, information was derived from the primary source. Keeping in the view of explorative nature of the study, primary source is the main source of information and data.

#### **Primary Data**

Primary data are the original data gathered for the research project in hand. During the fieldwork, the primary data was obtained by conducting structured interviews with the concerned person, personal observation and also by conducting personal interviews.

#### **Secondary Data**

Secondary sources of data refer to the readymade data that is already published by the concerned organization or data that has been compiled by others for some other

purpose. Secondary data sources were the brochures, annual reports, published reports and statements, published official documents, etc. of the concerned companies – NT, Ncell and UTL.

### **3.2.1 Data Collection Method**

As already mentioned, both primary and secondary sources of data were collected for the fieldwork. The method of data collection followed are as hereunder:

#### **3.2.1.1 Primary Source**

The data collection methods used for primary sources mainly were structured interviews and personal observation.

##### **Structured Interviews**

Structured interviews with the concerned authorities were conducted. At first, a structured list of question to be asked during the interviews was formulated. Then they were prioritized according to the importance of the question. The views expressed by the sample service users are put in Chapter IV.

The questionnaire is relatively quick to collect information. Potentially information can be collected from a large portion of group. However, questionnaires are standardized so it is not possible to explain any point in the question that participants might misinterpret. Open-ended questions can generate large amounts of data that can take a long time to process and analyze. Respondents may answer superficially especially if the questionnaire takes a long time to complete. The participants may be biased or may answer vaguely that may be difficult to analyze. The format of the questionnaire is attached as Annex-11.

(Source: <http://www.icbl.hw.ac.uk>)

##### **Personal Observation**

During the exploratory phase, the researcher also had spent quite a considerable time with Nepal Telecom. For the observation, the researcher made conversation to know the response of concerned employees of Nepal Telecom, Ncell and UTL during the work. The service quality of each company was also observed personally making calls at different locations of different area.

### 3.2.1.2 Secondary Source

The secondary sources of data were the brochures, annual reports, published official documents, and published reports /statements and company websites (www.ntc.net.np, www.ncell.com.np, www.utlnepal.com). Annual report is neither publicly distributed by Ncell nor made available for research/ thesis purpose. Brochure was not available from UTL. They provided the application form to receive a telephone connection which details the personal data required from the subscriber. Annual report was collected with great difficulty from UTL. NTA website (www.nta.org) was also the important source of data for the above company. Data collected from the secondary sources were completely internal.

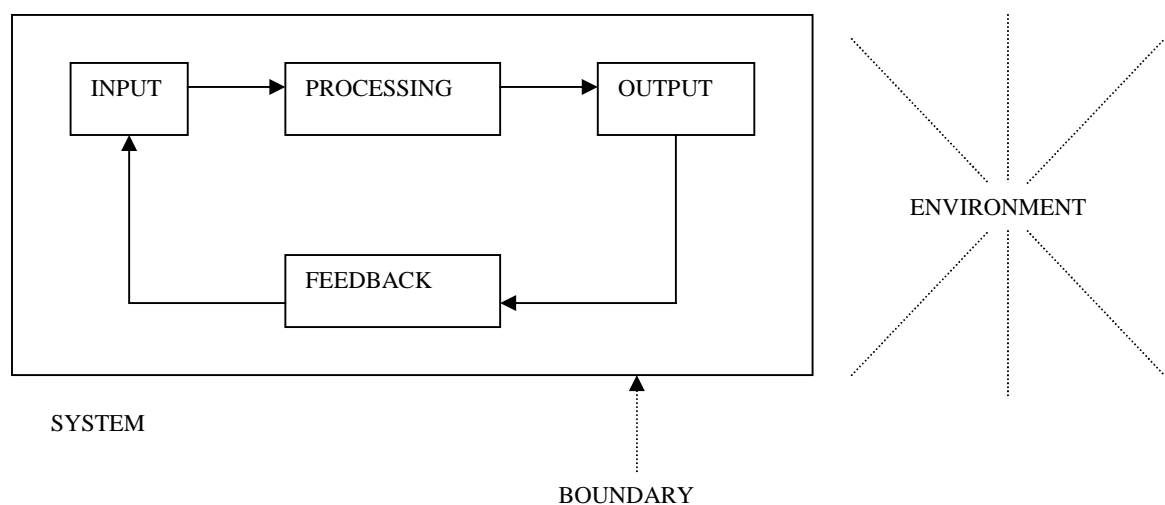
Libraries of Shanker Dev Campus and Tribhuwan University were the sources for books, journals, dissertations and theses. Various other websites were visited which are enlisted in the references.

## 3.3 Analytical Tools and Technology

### 3.3.1 General System Models

This study is carried out with the general model. The business organization is a man made system that has a dynamic interplay with its environment, competitors, government and so on. Furthermore, the business organization is a system of interrelated part working in conjunction with each other in order to accomplish the specified objectives. The researcher has identified the Line Distribution centre as a system. The figure 3.2 shows the general system model.

**Figure:3.2 General System Model Of Line Distribution Centre**



The researcher has followed three steps for preparing data:

### **Preparation Effort**

The researcher has taken Line Distribution centre as a system under study. PSTN Land Line distribution is accomplished with coordination of sales section, outside plant section, switching section, MDF section, MCC section and revenue section in NT. Mobile Line distribution is accomplished with sales section and revenue cash counter in NT.

Ncell sells only Mobile Lines. The customer has to go to the sales and cash counters to buy the mobile line service.

UTL sells WLL Fixed Line and USIM Mobile Line for which the subscriber has to visit the sales counter for application form processing and has to pay the required charges on the cash counter of UTL.

The quality of the services provided by the three companies were personally observed and questionnaires were prepared for the public inquiry about their perception regarding the quality of the services offered by the companies.

### **Definition Effort**

System analysis is done observing the existing line distribution system. The researcher also found out the deficiencies and need of the existing line distribution information system of the different companies. At the same time quality of the service provided by the three companies (NT, Ncell, and UTL) were also observed and compared.


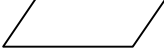

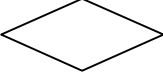


### **Solution Effort**

The researcher outlined recommendation to make the existing systems more effective. A detailed observation was done to give the recommendation about making easy subscription and to maintain high grade of service to the subscribers.

## **3.3.2 Flowchart**

Flowchart depicts the logical flow of the process. It is a pictorial representation of the program or an algorithm. It indicates the various steps involved in designing a system. A flowchart consists of a set of 'flowchart symbols' connected by arrows. Each symbol contains information about what must be done at that point & the arrow shows the 'flow of execution' of the algorithm i.e. they show the order in which the instructions must be executed. The purpose of using flowcharts is to graphically

represent the logical flow of data in the system and defining major phases of processing along with the various media to be used. Some of the notations/ symbols used for flowchart are following:

<u>Objects</u>	<u>Symbols</u>
Start / Stop	
Input / Output	
Process	
Decision	
Connector	
Flow of data	

### 3.3.3 Data Flow Diagram

During the course of analysis, the researcher had to gather enough information. The researcher used DFD to record all the information gathered.

Graphical representation of a system's data and how the processes transform the data is known as Data Flow Diagram (or DFD). Unlike, flowcharts, DFDs do not give detailed descriptions of modules but graphically describe a system's data and how the data interact with the system.

DFDs are constructed using four major components: external entities, data stores, process and data flows.

DFD is a graphical tool used to describe and analyze the movement of data through a system- manual or automated- including the process, stores of data through a system. The DFD shows the inputs and outputs clearly. The DFD has the basic elements namely source, data store and destination.

DFD of a system is presented by using context level and system level. The researcher has used Gane/Sarson approach to represent the logical flow of the data, which are mentioned as follows:

## DFD object symbols

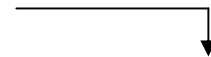
### Objects

### symbols

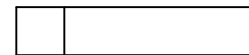
External Entity



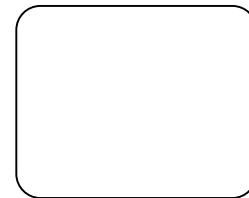
Data Flow



Data Store



Process



A brief description of the above components is given as follows:

### **(i) External Entities**

External entities represent the source of data as input to the system. They are also the destination of system data. External entities can be called data stores outside the system. These are represented by squares.

### **(ii) Data Stores**

Data stores represent stores of data within the system. Examples: computer files or databases. An open-ended box represents a data/store – data at rest or a temporary repository of data.

### **(iii) Process**

Process represents activities in which data is manipulated by being stored or retrieved or transferred in some way. In other words we can say that process transforms the input data into output data. A rounded rectangle stands for a process that converts data into information.

### **(iv) Data Flows**

Data flows represent the movement of data from one component to the other. An arrow identifies data flow – data in motion. It is a pipeline through which information

flows. Data flows are generally shown as one-way only. Data Flows between external entities are shown as dotted lines.

### **3.3.4 Entity Relationship Diagram**

An ERD is a data modeling technique that creates a graphical representation of the entities, and the relationships between entities, within an information system. There are 3 main components of an ERD:

The entity – a person, object, place or event for which data is collected. Entity is represented by a rectangle and labeled with a singular noun. For a business information system entity could be customer, customer's address etc.

The relationship is the interaction between the entities. It is represented by a diamond shape, or more, simply, by the line connecting the entities. Verbs are used to label the relationships.

The cardinality defines the relationship between the entities in terms of members. The three main cardinal relationships are: one to one expressed as 1:1., one – to – many expressed as 1: M and many – to – many, expressed as M:N.

### **3.3.5 Table, Figures, Graph and Chart**

Table is the presentation technique of data in a way to visualize and process it easily. Figures are diagrams, pictorial view of a subject. Graph is the pictorial presentation of data which is easy to understand and is helpful to draw conclusions instantly.

Table, figures, graphs and charts are convenient ways to clearly show the data.



## **Chapter IV      Presentation and Analysis of Data**

### **4.1      Conceptual Review:**

Telecommunications network is one of the most important infrastructure for development. For a mountainous (83%) country Nepal where road construction is very costly telecommunication can be used to support health and education sector by telemedicine and distant education. Telecommunication can help to people living in any part of country by providing all kinds of information. To know how far Nepal has achieved in the telecom sector internal data of the operating companies have been gathered and compared with the achievement of other countries of the world, especially neighbouring countries: India, Bangladesh, Sri Lanka and Pakistan.

While analyzing the status of telecom services teledensity, quality of service and tariff rates have been considered.

### **4.2      Status of Telecom Service in Neighbouring Countries**

A comparative study of Telephone line bases, their performances in different countries would be relevant while inferring about the status of telecom services of own country. Few such example studies are put hereunder.

#### **4.2.1      Status of Telecommunications Service in Bangladesh**

In Bangladesh, liberalization of the mobile phone sector led to large increases in the accessibility of telecommunications to consumers due to low tariff costs. Bangladesh Telecommunication Regulatory Commission (BTRC) has been able to fix call charges for all cellular phone operators and has been able to bring all the companies under a uniform regulatory framework.

The growth trend of telecom from 2004 to 2008 , the details of the licenses issued in different sector of telecom services and average tariff rate of mobile telephone from 2001 to 2008 were retrieved from the website of the telecom regulatory agency of Bangladesh which are put in table 4.1 and 4.2.

**Table:4.1 Summary of licenses issued till June 2008 in Bangladesh**

S.N.	Category	No. of Licenses
1	Cellular Mobile Telecom Operator (Private)	5
2	Cellular Mobile Telecom Operator (Public)	1
3	PSTN Operator License (Rural)	1
4	National PSTN Operator License	7
5	VSAT – Provider	20
6	VSAT-Provider with HUB	6
7	Internet Service Provider (ISP)	159
8	Pre-Paid Card Service Operator License	2
9	Network Service Provider License	1
10	International Gateway (IGW) License	4
11	Call Centre Licenses (CC-170, HCC-57 & HCCSP-45)	272
	Grand Total	562

Item	2008	2006	2004
Population (million)	140.40	138.80	135.20
Mobile Phones (million)	43.70	21.88	4.15
Fixed Lines (PSTN) (million)	1.28	1.0	0.9
Total Telecom Users (million)	44.98	22.88	5.05
Teledensity (%)	32.04	16.48	3.74

(Source:www. btrc.gov.bd)

**Table:4.2: Average Tariff of Mobile Telephone Service in Bangladesh**

S.N.	Month – Year	Average Tariff (BDT/minute)	S.N.	Month – Year	Average Tariff (BDT/minute)
1	Dec – 2001	11.37	5	Jan – 2007	2.09
2	Jan – 2004	4.31	6	Jul – 2007	1.7
3	Oct – 2005	3.55	7	Dec -2007	0.97
4	Dec – 2006	2.43	8	June – 2008	0.88

From the table 4.2 the tariff rate can be seen going down each year.

## 4.2.2 Status of Telecommunication Service in Sri Lanka

Growth trend of fixed telephone from 1990 to 2011 and the current licensee were retrieved from the website of regulatory agency of Sri Lanka which are put as table 4.3 & 4.4 and Chart 4.1.

**Table:4.3 Statistical Overview of the Telecom Sector as (2011, June)**

Number of System Licenses	64
Total number of Fixed phones	3,599,250
Teledensity (Fixed Phones per 100 inhabitants)	17.1
Teledensity (Fixed) in Colombo District-2009 Dec	38.5
Total Switching Capacity of Fixed Operators	4,200,000
Number of Cellular Mobile Subscribers	18,176,030
Mobile Subscription per 100 people	86.5
Internet & Email Subscribers-fixed	323,000
Mobile Broadband Subscribers	367,764
Number of Public Pay Phone Booths	6986

### Performance of Fixed Access Telephone Operators

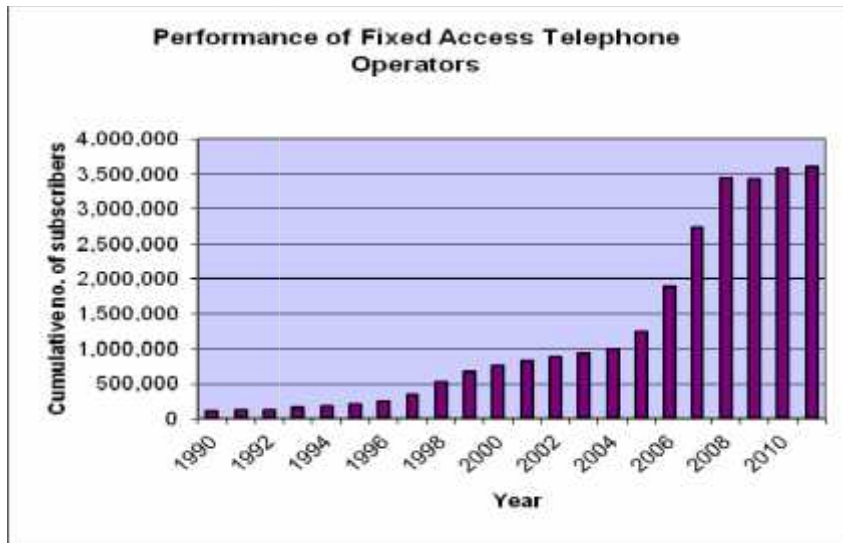
**Table:4.4 Growth Trend/ Performance of Fixed Access Teleph in Sri Lanka**

Year	Cumulative	Year	Cumulative	Year	Cumulative
1990	121,388	1998	523,529	2005	1,243,994
1991	125,834	1999	669,113	2006	1,884,076
1992	135,504	2000	767,411	2007	2,742,059
1993	157,774	2001	827,195	2008	3,446,411
1994	180,724	2002	883,108	2009	3,435,958
1995	204,350	2003	939,013	2010	3,578,463
1996	255,049	2004	991,239	Jun' 11	3,599,250
1997	341,622				

The chart 4.1 shows there is steep growth from 2005 onwards in Sri Lanka.

(Source: [www.trc.gov.lk](http://www.trc.gov.lk))

**Chart:4.1 Growth Trend of Fixed Access Telephone in Sri Lanka**



#### 4.2.3 Status of Telecommunication Service in Pakistan

There are 7 providers of mobile phone services: Mobilink (Pakistan Mobile Comm. Ltd.), Ufone (Pakistan Telecom Co. Ltd/ Etisalat), Telenor, Warid Telecom, ZONG (Paktel/ China Mobile Pakistan), SCO(Special Communication Organization) and Instaphone. Similarly, there are 7 providers of Land Line/ DSL/ Broadband/ Triple Play/ WiMAX/ WLL/ EV-DO: PTCL, Wateen, Worldcall, Nayatel, wi-tribe, Qubee and NTC (National Telecom Corporation).

Growth trend of telecom services(Fixed, Mobile lines and Broadband data) of 8 -10 years was retrieved which can be seen to be increasing appreciably faster as put in the tables 4.5, 4.6, 4.7, 4.8 and 4.9.

**Table:4.5 Growth Trend of Subscrbr (Fixed+Mobile+WLL) in Pakistan**

Fiscal Years	Total Teledensity(%)	Fiscal Years	Total Teledensity(%)	Fiscal Years	Total Teledensity (%)
2002 - 03	4.31	2005 - 06	26.26	2008 - 09	62.0
2003 - 04	6.25	2006 - 07	44.06	2009 - 10	64.1
2004 - 05	11.89	2007- 08	58.90	2010 - 11	68.4

**Table:4.6 Annual Cellular Mobile Line in Pakistan**

Fiscal Years	Total Subscribers	Mobile Teledensity (%)	Fiscal Years	Total Subscribers	Mobile Teledensity (%)
2003-04	5,022,908	3.29	2007-08	88,019,812	54.6
2004-05	12,771,203	8.3	2008-09	94,342,030	58.2
2005-06	34,506,557	22.21	2009-10	99,185,844	60.4
2006-07	63,159,857	39.94	2010-11	108,894,518	64.8

**Table:4.7 Annual Fixed Local Line Subscribers in Pakistan**

Years	Total Subscribers	Fixed LL Teledensity(%)	Years	Total Subscribers	Fixed LL Teledensity (%)
2003-04	4,501,171	3	2007-08	4,416,417	2.7
2004-05	5,277,531	3.43	2008-09	3,533,275	2.2
2005-06	5,240,012	3.37	2009-10	3,417,802	2.16
2006-07	4,806,206	3.04	2010-11	3,016,852	1.9

**Table:4.8 Annual Wireless Local Loop Subscribers**

Years	Total Subscribers	WLL Teledensity (%)	Years	Total Subscribers	WLL Teledensity (%)
2004-05	264,828	0.17	2008-09	2,616,268	1.6
2005-06	1,025,328	0.66	2009-10	2,659,824	1.6
2006-07	1,702,098	1.08	2010-11	2,704,873	1.7
2007-08	2,239,613	1.4			

**Table:4.9 Broadband Subscribers in Pakistan**

Years	Total Subscriber	Years	Total Subscriber
2005-06	26,611	2008-09	413,809
2006-07	45,153	2009-10	900,648
2007-08	168,082	2010-11	1,491,491

(Source: [www.pta.gov.pk](http://www.pta.gov.pk))

#### 4.2.4 Status of Telecom Services in India

There are 960.9 million telephone lines out of which 929.37 million telephones are mobile and 31.53 million lines are landline. Overall telephone density is 79.28% as

of May 31, 2012 out of which 76.68% is contributed by mobile phone and 2.6% is contributed by landline telephone service. Major telecom operators are: BSNL, Airtel, Idea, Reliance, Tata DoCoMo, Aircel, Tata Indicom, Vodafone, MTNL and Loop Mobile.

*(Source:www.trai.gov.in)*

### **4.3 Milestones of Telecommunication Service in Nepal**

The progress in telecom sector was very slow from 1913 to 1982 that is, until the Panchayat system of government was not reformed. Progress of telecom sector increased with progress in democratization and privatization in the country.

<b>Year</b>	<b>Milestone Details</b>
1913	Establishment of first telephone lines in Kathmandu
1914	Establishment of first Open wire Trunk Link from KTM to Raxaul
1950	Establishment of Telegram Service and CB teleph exchg in KTM
1955	Distribution of telephone line to general public
1964	Beginning of International Telecommunications Service using HF radio to India and Pakistan
1974	Microwave transmission links establishment for internal trunk
1982	Establishment of Standard "B" Type Earth Station for internat circuits
1983	Establishment of digital Telephone Exchange
1996	Conversion of all Transmission link to Digital transmission link
1996	Independent Int. Gateway Exchange and VSAT teleph. service
1999	Launching of GSM Mobile service
2004	Pre-paid Calling Card Service (IN Services)
2005	Soft launch of CDMA
2007	GPRS, 3G and CRBT Services introduced in GSM Mobile
2008	Broadband ADSL Service launched
2010	EVDO Service started in CDMA mobile
2010	Telecom Service to all VDCs

#### 4.4 Present Telecom Network Status of the Country

- ) Nepal has made significant progress in the growth and development of the national public switched telecommunications network (PSTN) in the last decade, particularly during Fifth Phase Telecom Project (1992-97).
- ) With the introduction of private telecom operators Ncell and UTL and others besides the public company Nepal Telecom, the number of distributed lines increased sharply from approx. 65,000 lines in 1992 to over 7,60,386 (PSTN + WLL). Number of Post-paid and Pre-paid Mobile Subscribers reached 1,49,630 and 49,71,888 respectively till July 15, 2011.
- ) There are fixed and mobile telecom services in all the 75 districts of Nepal.
- ) There are a total of 6406 International telephone circuits including Microwave circuits in operation by NT. Ncell and UTL also have international gateways operating international trunk circuits. UTL has installed a total of 657 International Telephone circuits and 4012 national trunk circuits.
- ) There are 839,317 fixed telephone lines availed by the people (till Ashadh 2068 BS) based on wire line and wireless technologies in Nepal.
- ) Similarly, there are 11,602,814 mobile telephone lines in operation based on GSM and CDMA technologies.
- ) Similarly there are 721,518 telephone lines in operation based on LMS (Land Mobile Service/ Technology with Least Mean Square Algorithm to cancel echo in channels) and GMPCS technologies.
- ) Thus, there are altogether 13,163,649 number of telephone lines distributed for voice telephone services. Thus, by Ashadh 2068, overall tele-density has reached 46.05 per 100 inhabitants in Nepal.
- ) Currently there are 3 operators in land line (PSTN) telephone sector, namely, NDCL, STM and Smart, out of which NDCL is the dominant having 99.06 % of PSTN market share.
- ) There are 3 operators providing fixed location type of basic telephone using WLL technology, namely, NDCL, UTL and NSTPL, out of which NDCL is seen to be the dominant having 68.20 % of the total WLL line current users.

The above facts and figures are shown by table 4.10 and 4.11.

(Source: NTA:MIS 2011, July)

**Table:4.10 Voice Telephony Services (as of 2011, July)**

Services Operators	Fixed		Mobile		Others		Total
	PSTN	WLL	GSM	CDMA	LMS	GMPCS	
<b>NDCL</b>	603,291	157,095	5,121,518	862,072	-	-	<b>6,743,976</b>
<b>UTL</b>	-	70,741	-	-	502,888	-	<b>573,629</b>
<b>SNPL</b>	-	-	5,619,224	-	-	-	<b>5,619,224</b>
<b>STM</b>	5,090	-	-	-	155	-	<b>5,245</b>
<b>NSTPL</b>	2,502	-	-	-	88,933	-	<b>91,435</b>
<b>Smart</b>	598	-	-	-	127,800	-	<b>128,398</b>
<b>(GMPCS)</b>	-	-	-	-	-	1,742	<b>1,742</b>
<b>Total</b>	<b>608,979</b>	<b>230,338</b>	<b>10,740,742</b>	<b>862,072</b>	<b>694,151</b>	<b>1,742</b>	
	<b>839,317</b>		<b>11,602,814</b>		<b>721,518</b>		<b>13,163,649</b>
Tele-Density							
<b>Services</b>				<b>Penetration Rate %</b>			
Fixed				2.93			
Mobile				40.59			
Others (LMS, GMPCS)				2.52			
<b>Total</b>				<b>46.05</b>			

*Note: Projected population for 2010 is 28,584,975 (Source : cbs.gov.np)*

**Table:4.11 Data/Internet Services**

Services	Subscribers				Total
	NDCL	UTL	SNPL	ISPs	
Dialup (PSTN +ISDN)	5,745	-	-	14,610	<b>20,355</b>
Wireless Modem, Optical Fibre Ethernet	-	-	-	22,288	<b>22,288</b>
Cable Modem, Cable etc.	-	-	-	15,629	<b>15,629</b>
ADSL	68,343	-	-	-	<b>68,343</b>
GPRS	956,617	-	1,874,078	-	<b>2,830,695</b>
CDMA 1X	103,171	51,377	-	-	<b>154,548</b>
<b>Total</b>	<b>1,133,876</b>	<b>51,377</b>	<b>1,874,078</b>	<b>52,527</b>	<b>3,111,858</b>
<b>Internet Penetration Rate %</b>			<b>10.89</b>		

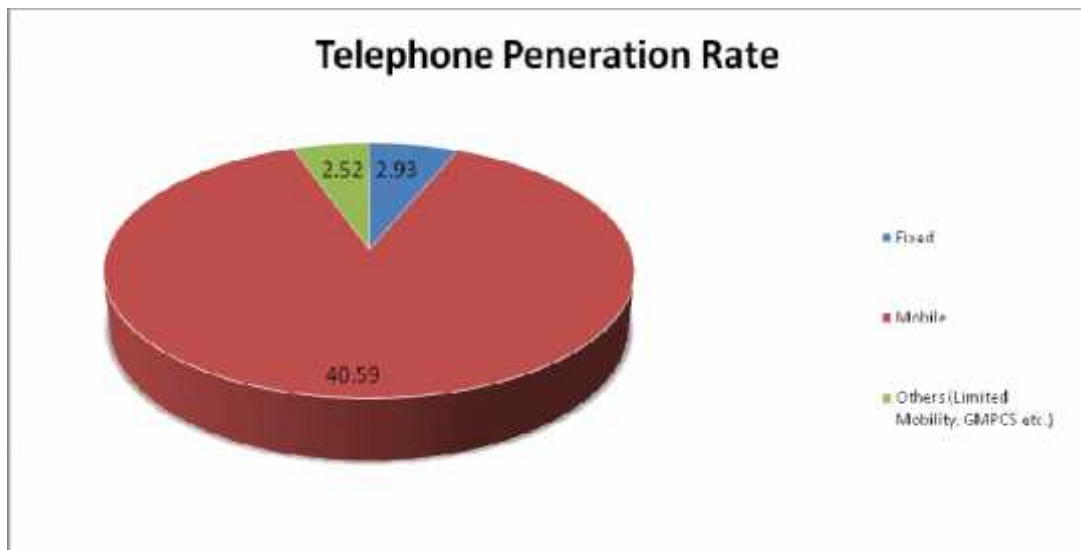


There were altogether 31,11,858 data/ internet users by the end of Ashadh 2068 in Nepal through different technologies – Dial up, Wireless modem, Optical Fibre Ethernet, Cable modem, ADSL, GPRS and CDMA 1X. Thus, the internet penetration rate had reached 10.89 % and are shown in table 4.11.

Overall tele-density has reached 46.05 % by Ashadh 2068 in Nepal. The telephone penetration rates for fixed, mobile and others (Limited Mobility, GMPCS, LMS etc) in the country are shown in Chart 4.2.

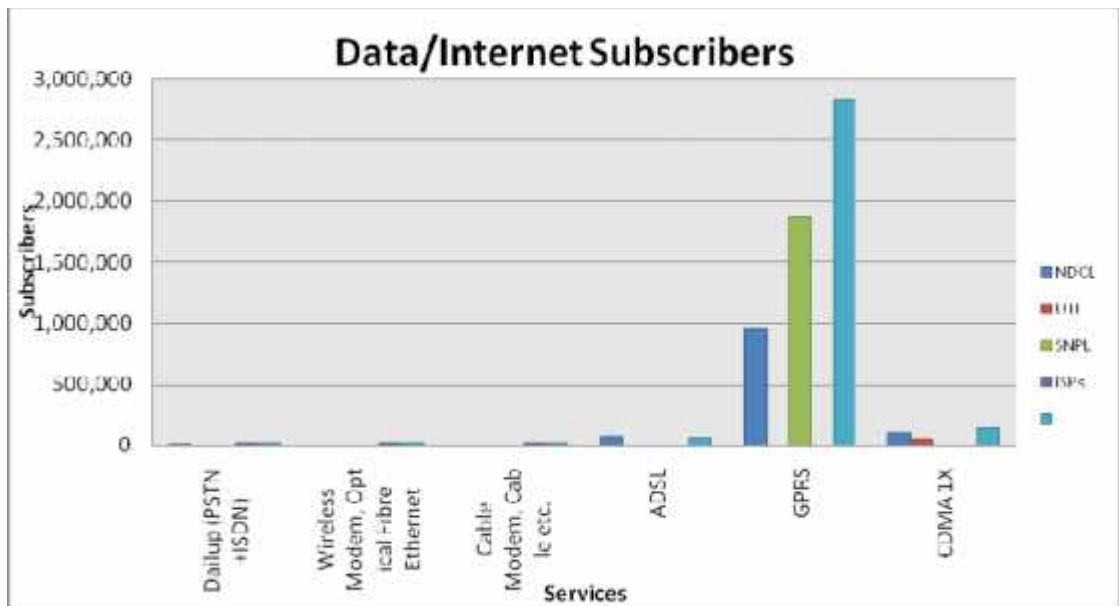
(Source: NTA:MIS 2011, July)

**Chart:4.2 Penetration Rate of Fixed, Mobile and other Teleph in Nepal**

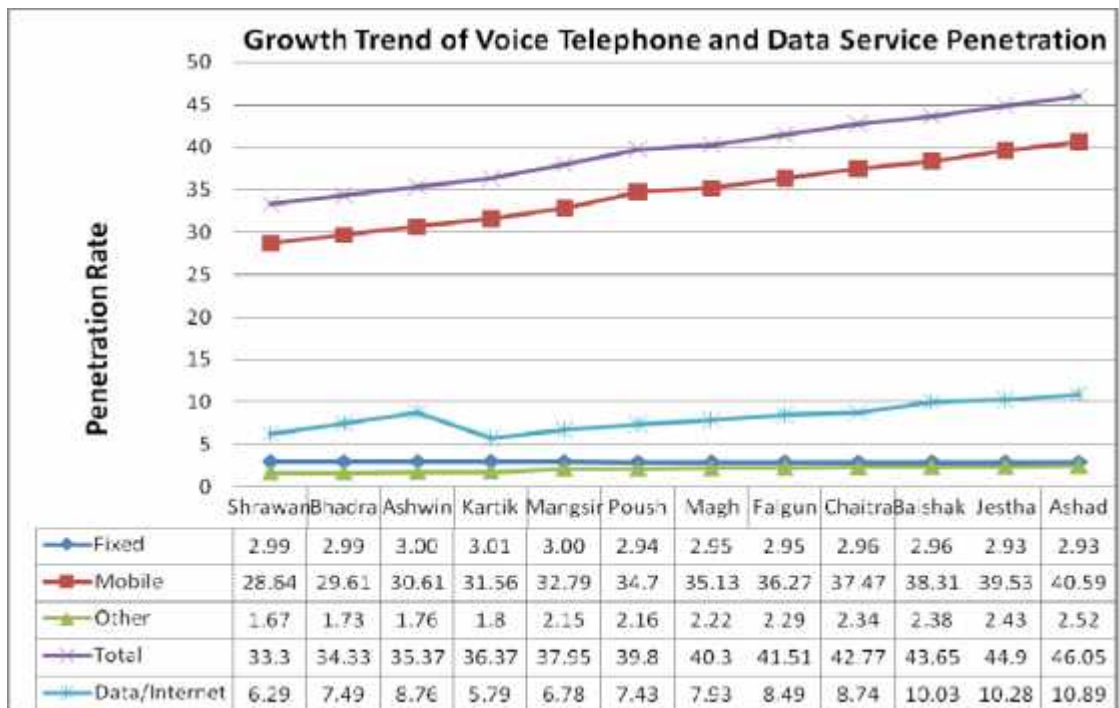


NDCL provides data/internet services using four technologies, Dial-up (PSTN/ISDN), ADSL, GPRS and CDMA 1X. Ncell (SNPL) provides data/internet service through GPRS, EDGE and 3G technologies. UTL serves its data/ internet services through CDMA 1X technology. Other ISPs (Internet Service providers) provide through Dial-up, wireless, Optical Link and Cable modems. There are 26 ISPs currently in operation in the country out of which Mercantile Communications Pvt Ltd, World Link Communications Pvt Ltd, Via net Communications Pvt Ltd and Subisu Cable net Pvt Ltd are the major ones having subscriber base more than 1000. The subscribers using data/ internet service technology-wise can be seen from the Chart 4.3.

**Chart:4.3 Technology-wise Data/ Internet Subscribers in Nepal**



**Graph:4.1 Growth Trend of Voice and Data Service Penetration in Nepal**



The growth trend of landline, mobile and data/internet services in fiscal year 2067/68 has been recorded month wise and put in graph 4.1 as follows. From the graph it is clear that landline has no growth- fixed line teledensity dropped from 2.99% to 2.93. Mobile service has attracted more to the customer- mobile teledensity increased from 28.64 % to 40.59% . Similarly data service also increased from 6.29% to 10.89%.

## 4.5 Analysis of the Existing system of Nepal Telecom

### 4.5.1 Organization Structure of Nepal Telecom

Board Of Directors
Chairman, secretary, MoIC
Member, Managing Director
Member, Joint secretary, MoF
Member, Jt. Sec., MoL&J&Constituent
Member, Joint secretary, MoIC
Member, Shareholder Group
Member, Union Representative
Company Secretary, DMD, NT

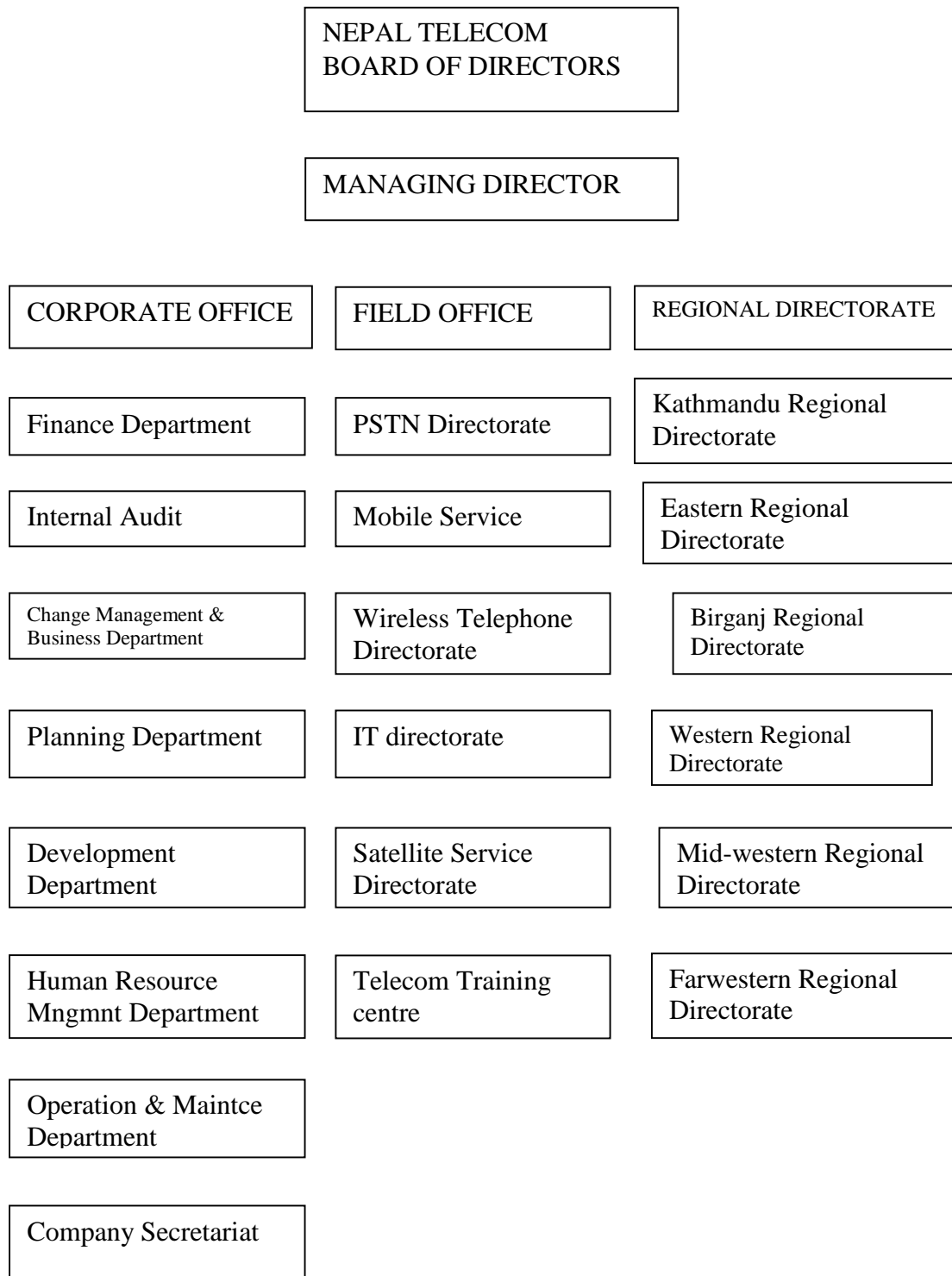
A team of board of directors heads the organization. The Board is comprised of a chairman, six members and one company secretary. The board decides about the major policies of the company.

The managing director, included in the board of directors as a member, looks after the entire management and day-to-day operation of the company assisted by 7 deputy managing directors(level 11), 10 regional directors (level 10&11).

There are 7 corporate level offices which supervises, supports and controls all the other offices. There are 6 field level offices and 6 regional directorates. Each type of service has separate field office for its planning, implementation and operation& maintenance. So, there is PSTN Directorate for PSTN (fixed) lines, Mobile Service Directorate for GSM mobile lines, Wireless Telephone Directorate for CDMA lines, IT Directorate for internet and data services, Satellite Service Directorate for telephone service using satellite to rural places and for international trunk call service. Telecom Training Centre for conducting trainings related to telecom services. Regional Directorates are established in order to distribute the services of the company to the public in easy and efficient way, to maintain the quality of service by correcting the faults in the services as first line maintenance and to collect the revenue from the subscribers.

The organization structure of Nepal Telecom is shown in chart 4.4.

**Chart:4.4 Organization Chart of Nepal Telecom**



## **4.5.2 Facts of Nepal Telecom**

### **4.5.2.1 Objectives**

#### **Past Objectives**

1. To provide basic telephone voice service to the Nepali citizen throughout the country.
2. To support the government administration in maintaining peace, security and law & order all over the country.
3. To connect the country with outer world.
4. To assist in live broadcasting of functions of public importance on request of particular institution or the government.

#### **Present Objectives**

In addition to above objectives following objectives are included:

1. To provide local, national as well as international telecommunication services under regulation of NTA, the regulating body of the government of Nepal.
2. To provide high quality data services, e-mail and internet services to the customers.
3. To continually maintain and upgrade reliable and quality telecommunication services for maximum customer satisfaction.
4. To provide interconnection facilities at NT's local network as well as national trunk network and access to the international gateway to the other operators to make their services more effective ultimately serving people.
5. To maintain its market leader position in the domestic as well as international telecommunication services.
6. To enhance the development of tourism industry.

#### **Future Objectives**

1. To enhance the economy of the country by cutting expenses as well as reducing time needed to perform various functions in all sectors of life – agriculture, health, education and others. Helping to conduct information centre, telemedicine and distance education etc.
2. To provide broadband data services- video, data and voice service with one telephone line. i.e., TV, Computer and telephone services via the same line.
3. To provide one integrated bill for all services provided by NT.

4. To set up Data Centre for cloud computing to store data of the subscriber safely.
5. To provide additional value added services like number portability so that number may not be changed when changing the office/ operator of the subscriber.
6. To develop alternate routes for connection of NT with all the countries of the world to make its services more reliable.
7. To see a telephone line in the hand of every citizen.

#### 4.5.2.2 Services Offered by Nepal Telecom

**Table 4.12 List of Services offered by NT**

S.N.	Name of services	Quantity
1	PSTN Telephone line	603291
2	GSM Mobile Telephone Subscriber	5121518
	a) Post-paid Mobile Telephone Subscriber	149630
	b) Pre-paid Mobile Telephone Subscriber	4971888
3	CDMA lines	1019167
	a) C-Phone Post-paid	34396
	b) C-Phone Pre-paid	122699
	c) Sky Phone Post-paid	42786
	d) Sky Phone Pre-paid	819286
4	PCC & HCD(Capacity 500,000)	197974
5	AFS Subscriber (Capacity 4000)	188
6	PCL Subscriber (Capacity 50000)	11931
7	VMS Mail Box (PSTN)	4577
8	Total Internet Subscriber	1133876
	a) CDMA PDSN Data Internet	101693
	b) GPRS Internet (GSM Post-paid)	956617
	c) Dial-up Internet Subscriber ( PSTN+ISDN)	5745
	d) ADSL Subscriber	68343
9	Rural Telephones	
	a) VHF Telephone	88
	b) VSAT Telephone (C-Band, Ku-Band)	412

(Source: Nepal Telecom: MIS 2011, July)

### **4.5.2.3 Projects**

In the process to achieve its objectives it has launched following projects:

1. Alternate Transmission Route: Establishment of alternate transmission routes for backbone network using OPGW with coordination of NEA to increase reliability of the telecommunication services.
2. NGN: 105 K PSTN lines with NGN technology.
3. IPTV Service: 50 K lines for KTM valley and 125 K lines for Outside KTM Valley.
4. WiMax Service: 200 K lines to serve all VDCs.
5. CRTB: Convergent Real Time Billing to provide one bill for different services provided by the company.
6. ERP: Enterprise Resource Management for management of all the resources of the company- Finance, Revenue, Store, Manpower.
7. NOC: Network Operation Centre to manage the maintenance of all the networks efficiently with centralized supervision and control of all the network systems of the company.

### **4.5.3 Hierarchy of management**

Level of management means the arranged managerial position in an organization as well as it is the system of dividing the authority and responsibility among the various managerial positions. It is concerned with the classification of superior subordinate relationship in an organization. The level of management depends upon the size and nature of the organization.

In Nepal Telecom, the hierarchy of management is divided into four levels.

Top level management

Middle level management

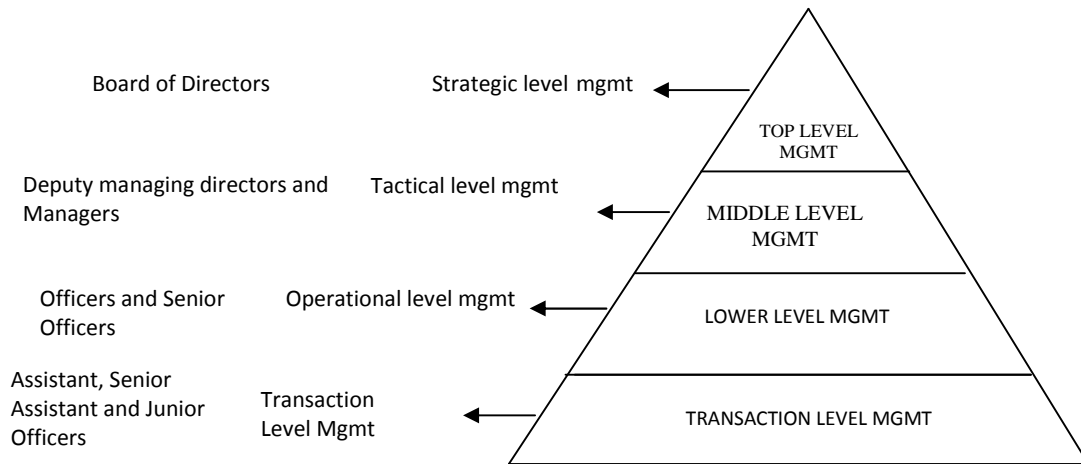
Lower level management

Transaction level management

All levels of management are inter-related with each other and are equally important for the smooth operation of management. Even a small mistake of one level can affect the whole management process.

The following figure 4.1 shows the hierarchy of management of Nepal Telecom.

**Figure 4.1 Hierarchy of Management**



### **Top level management**

Top-level management of Nepal Telecom consists of seven members of board of directors including chairman and one secretary additional. These people are the governing bodies of the organization and they exercise all authorities bestowed on by the telecommunication act for conducting the business smoothly, effectively and efficiently. The top level management of Nepal Telecom has the highest authority and is responsible for the success and failure of Nepal Telecom programs.

### **Middle level management**

Middle level management in Nepal Telecom consists of all the directors and managers of various corporate level offices, field level service directorates and regional directorates. They are level 10 and level 11 employee of the company. This level of management is concerned with the task of implementing the plans and policies prepared by the top-level management. Middle level management is fully responsible for all the activities of lower level management and transaction level management. They act as coordinators between policy makers and the floor level staff. They are responsible for implementation, monitoring the progress and quality of the activities being performed in their offices/ sections. They solve the problems faced by the lower level management while performing their duties. Most of the time they follow the rules made to run different wings of the organization and at times give own judgments also (consulting the authorities in strategic level if necessary). They provide important



information to the top level management in decision making process. Thus, this level bridges the gap between top-level management and lower level management.

#### **Lower level management**

Lower level management is also known as supervisory level management or operational level management. This level carries out the regular works of the organization. Lower level management of Nepal Telecom includes the senior officers of level 8 and 9 . This level of management is responsible for the implementation and control of the operational plans developed by strategic and tactical level management. This level also controls and handles the activities of transaction level management.

#### **Transaction level management**

Transaction level management is the bottom level of the hierarchy of management in Nepal Telecom. Transaction level management of Nepal Telecom includes assistants, senior assistants and junior officers who are of level 1 up to 7. They are responsible to perform day-to-day activities. They are responsible for execution of the different activities performed by the organization – installation of equipments in different systems (PSTN, GSM, CDMA, Internet, Rural VSAT and others), distribution of different services (fixed and mobile telephone lines, leased data lines, IN services etc.), bill processing, revenue collection, maintenance of equipments, telephone lines and various services, giving feedback about the performances of different systems and services, survey and collection of demands of the services offered by the organization.

### **4.5.4 Hierarchy of decision-making**

In Nepal Telecom, the hierarchy of decision-making is divided into three levels.

Strategic level management

Tactical level management

Operational level management

#### **Tactical level management**

The tactical level management consists of all the directors and managers of the organization. Decisions taken by tactical level management is based on the policy and agreement procedure of the organization that is repetitive and rational in nature. Decisions thus made may be programmed or non-programmed and depends upon the need of the organization. The concerned managers take decisions and thus, the need

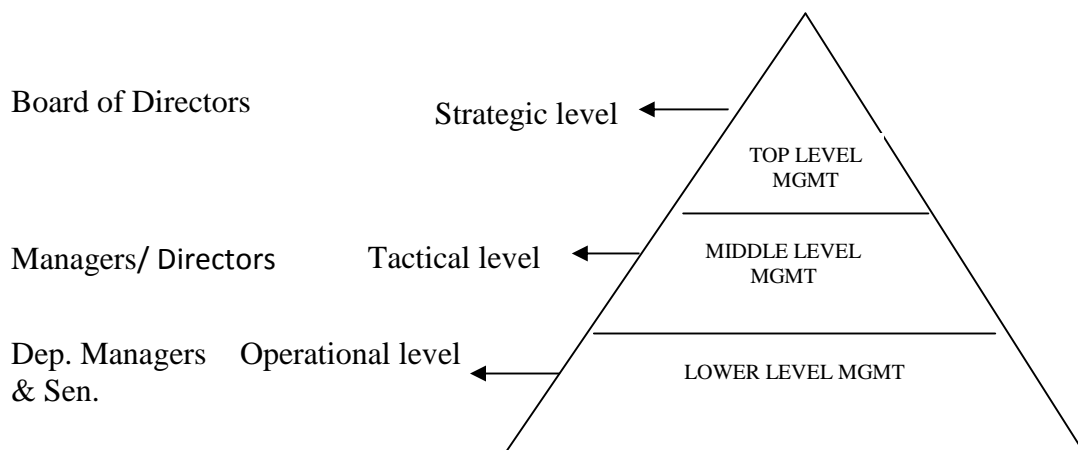
of information in this level is internal and structured information is high. In Nepal Telecom, middle level management assists in allocating and controlling the use of organization's resources. Some of the decisions include different technical system planning, implementation procedure decision, quality control, human resource planning for planning, implementation and operation, project implementation schedule determination, budgetary control, revenue monitoring, determination of tariffs of the services, profit sharing with other operators etc.

**Operational level management**

In Nepal Telecom, operational level management consists of deputy managers and senior officers. Decisions in this level are made according to the plans and policies formulated by the strategic and tactical levels. The personnel in this level of management usually make short-term decisions like daily or monthly. Some decisions made in this level are fault localization team allocation, project implementation team selection based on available expertise, preventive and corrective system maintenance scheduling, revenue collection control, procurement of miscellaneous accessories etc. The need of information in this level is totally internal and is programmed.

The hierarchy of decision making in Nepal Telecom is shown in figure 4.2:

**Figure:4.2 Hierarchy of Decision Making**



## 4.5.5 Growth Trend of Nepal Telecom

**Table:4.13 Growth Trend of Nepal Telecom**

Human Resource	2005/06	2006/07	2007/08	2008/09	2009/10
Approved post	6095	6984	7030	7088	7094
Working Manpower	5717	5699	5592	5876	5826
Technical	2005/06	2006/07	2007/08	2008/09	2009/10
Installed teleph exchng	225	231	236	243	256
Districts with exchg	72	72	72	73	75
Installed teleph lines	602252	656070	684942	726980	749205
Distrib. teleph lines	485997	509873	532391	562162	583542
Internat trunk circuits	3140	3423	4568	4841	5206
GSM Mobile Subscrs	622737	909483	1717230	3009962	3960293
CDMA Subscribers	23579	161155	480016	721318	920257
Overall Teleph. Distribn	1152478	1580511	2729637	4293442	5464092
Teleph penetration (Overall)	4.4	5.99	10.12	15.58	19.40
<b>Financial</b>	<b>2005/06</b>	<b>2006/07</b>	<b>2007/08</b>	<b>2008/09</b>	<b>2009/10</b>
Total Inc.(Million Rs.)	11058.9	14751.6	17889.3	22257.7	27221.1
PBT (Million Rs.)	6843.7	7983.3	10871.4	13634.0	14441.1
PAT(Million Rs.)	4936.6	5652.7	7942.9	10178.0	10775.2
NPR (%)	44.64	38.32	44.4	45.72	39.58
Total Capital Employed	23686.0	27985.9	35343.9	46280.6	52504.6
Ret. On Capital Employed, %	22.17	21.88	25.12	29.94	21.82
EBITDA Margin (%)	73.07	63.78	69.53	67.85	71.83

*(Source: Nepal Telecom: Annual Report 2010)*

Going through the data of table 4.13 it can easily be seen that number of exchange offices has increased from 225 to 256 in just four years. The number of PSTN lines has increased from 602252 to 749205. The number of mobile subscribers have increased from 622737 to 3960293 during the same period. Similarly CDMA subscribers have also increased from 23579 to 920257. Operating revenue has been on increase. Net profit ratio has been fluctuating between 38 % and 46 % which indicate towards its successful operation and healthy condition of the only public company with 90% government share.

## **4.5.6 Distribution System**

Distribution system of any commodity/ service is very sensitive and important part for any organization. The distribution system should be short, efficient, less time consuming and transparent as much as possible.

In order to meet the demand of telephone and related services throughout the country, NT has established 285 exchange offices. In order to discharge the distribution functions effectively and efficiently, the organization has divided whole of the national market in 6 regions and has established regional directorates at the main business centres of the regions. There are 5 regional directorates in 5 development zones of the country and one regional directorate is dedicated to meet the huge telephone demand of the Kathmandu valley.

NT offers varieties of telecom services like land line telephone, GSM mobile telephone, CDMA wireless fixed and mobile telephones, VHF, VSAT telephones, data lease line, internet and IN services like PCC, PCL, AFS, HCD, SIP etc. The distribution systems of GSM and CDMA wireless mobile phones are simple and so are the distribution systems of internet and various value added IN services because detail site survey and specific installation processes at the customer's location are not required for them but the distribution system of PSTN land line is rather complex due to the above detail survey and installation processes involved in it. Here I have attempted to analyze the distribution system of PSTN line and have tried to investigate the lags/ gaps to be covered up to make the system faster and more efficient so that the customers can get more satisfaction aiding to improvement of the telecom service.

### **4.5.6.1 Objectives of PSTN Line Distribution system**

1. To maintain the line inventory and distribution.
2. To distribute the telephone line in shortest time and properly.
3. To generate various reports for the higher authorities to control and support such as number of telephones issued under different category – normal, priority or OYT.
4. To collect charges for telephone installation and pass the collection statement to the Revenue department.
5. To ensure proper billing of the telephone lines by coding.

#### **4.5.6.2 PSTN line distribution System in Nepal Telecom**

The study covers the overall information system used in PSTN line distribution system. The study entails the detailed description of the different documents including application form, survey order, service agreement, Subscriber Identification & Signature Verification and installation order forms and the entire line distribution process. Forms are attached as annex-2,3,4,5 and 6.

The study covers all the processes covering how it is handled, the flow of information and its management according to the integrated system approaches.

The line distribution system in Nepal Telecom is quite sophisticated. Almost all of the major offices (capacity greater than 5000) in the valley are working with computers with SD system software. The offices outside of the valley use computers for MCC but they do not have SD system implemented yet.

Provision of necessary guide lines and control is done by the regional directorates according to the policies received from the operation and maintenance department located in the corporate office.

#### **General status of PSTN Line Distribution**

There are approximately 350,000 customers waiting for telephone connections. Nepal Telecom has not been able to provide a telephone for them. The reasons are many:

NT has been transformed to company since 2060 B.S. Magh 22, 9 years back and still majority of the board members are from the concerned ministries who think in traditional way. To fulfill the demand huge procurement of the resources is necessary which demands for big budgets; the board members from the ministries consider a lot of things parallelly and full budget sanction is not possible. This situation was even worse in the government's corporation period and hence, the big backlog. The customers have been waiting even for more than 5 years in certain parts of the country. However, there are places where the telephone is on demand. Here we discuss about the general procedure for providing a telephone connection.

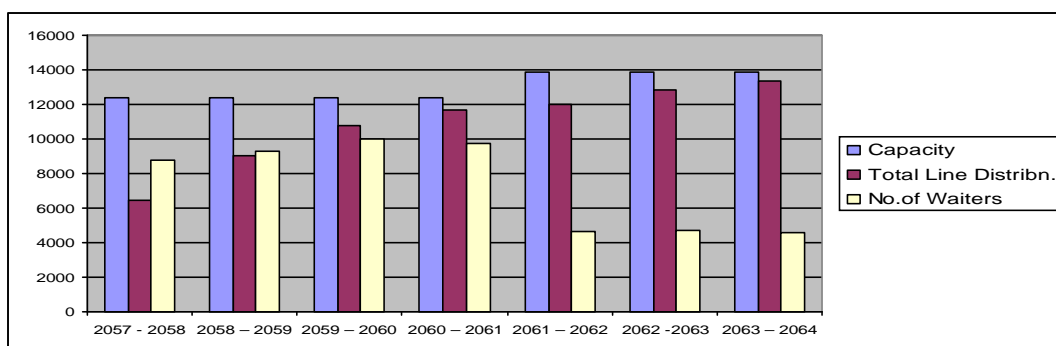
#### **PSTN Line Distribution Trend in EDR and CDR**

Line distribution system of NT outside the valley was targeted and for this Biratnagar and Birganj were selected according to the directive of the supervisor. The capacity, distribution and waiters are shown in table 4.14 & 4.15 and presented in graphs as chart 4.5& 4.6.

**Table:4.14 Record of PSTN line Cap, Distribn and Waiters in Birganj**

S. N.	Fiscal Year	Capacity	Total Line Distribn.	Line Distributed in the F.Y.	No.of Waiters	Spare Line	Remarks
1	2057 -2058	12400	6453		8760	5947	N/W insuffic.
2	2058 –2059	12400	9063	2610	9279	3337	
3	2059 –2060	12400	10799	1736	9992	1601	
4	2060 –2061	12400	11651	0852	9763	749	
5	2061 –2062	13900	11992	341	4644	1908	N/W insuffic.
6	2062 -2063	13900	12830	838	4693	1070	
7	2063 –2064	13900	13366	536	4569	534	
8	2064 -2065	14908	13163	till Chaitra		281 lines returned	
9	2065-2066	13904	12964	86		207 lines returned	
10	2066-2067	13904	12871	191		214 lines returned	
11	2067-2068	13904	12771	264		100 lines returned	

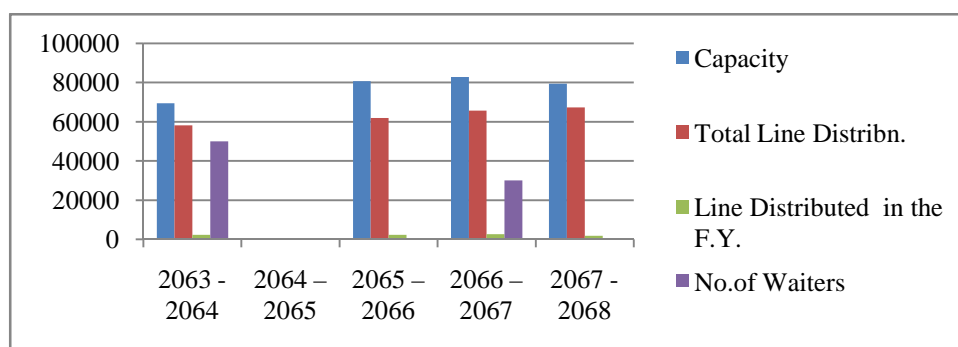
**Chart:4.5 Capacity, Distribution and Waiters in NT office, Birganj**



**Table:4.15 Record of Line capacity, Distribution and Waiters in BRD**

S.N.	Fiscal Year	Capacity	Total Line Distribn.	Line Distributed in the F.Y.	No.of Waiters
1	2063 – 2064	69480	58190	<b>2300</b>	50000
2	2064 – 2065				
3	2065 – 2066	80796	62000	2288	
4	2066 -2067	82808	65620	2538	30000
5	2067 – 2068	79452	67344	1724	300

**Chart:4.6 PSTN Data of BRD as a whole**



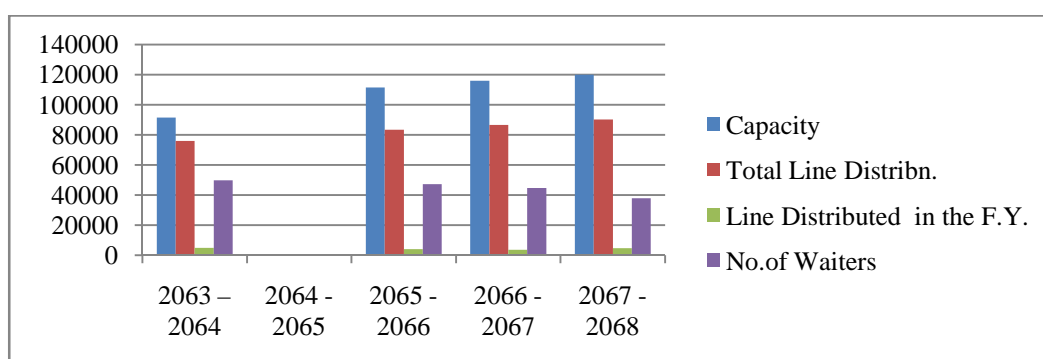
Waiters of PSTN have diminished and service is on demand by F.Y.067/68. Also public have got cheaper alternative telecommunication service – mobile telephony!

**Table:4.16: Record of Line capacity, Distribution and Waiters in ERD**

S.N.	Fiscal Year	Capacity	Total Line Distribn.	Line Distributed in the F.Y.	No. of Waiters
1	2063 –2064	91444	75882	5000	49791
2	2064 - 2065				
3	2065 - 2066	111522	83298	4000	47246
4	2066 - 2067	115964	86643	3612	44699
5	2067 - 2068	119992	90150	4686	37940

From table 4.16 and chart 4.7 it is seen that there are enough waiters in eastern region for PSTN line in spite of introduction of mobile line. It may be either due to people’s faith on the quality of service of land line in ERD or the waiting list need to be confirmed through public notice.

**Chart:4.7: PSTN Data of ERD as a whole**



### **Information to be supplied in the application form for PSTN land line**

1. Name of the applicant
2. Names of the applicant's father and grand father
3. Addresses (permanent, temporary and address where line installation is required)
4. Citizenship number
5. Type of connection (permanent, temporary, casual -Charges differ for each type)
6. Type of line required: (Normal land line, VHF line, MARTS line, VSAT line)
7. Class of line ( Normal, Priority, OYT line – charges differ class wise)
8. Acceptance for publication in the telephone directory: Yes or No
9. Number of existing telephone(s) if any and the number(s)
10. Road map of the location where telephone line connection is sought.
11. Nearby telephone number where telephone connection is sought.
12. Acceptance of the rules and regulations of the company.

### **Fees and Charges scheme**

Registration fee:	NRs.	50/-
Line installation charge:	NRs.	900/-
Deposit money:	NRs.	1000/-
Ownership charge:	NRs.	1500/-
Line transfer charge:	NRs.	500/-
Drop wire charge:	NRs.	10/ meter

### **Criteria for Priority Line**

Followings get priority in issue of line:

Govt. office, NGO, INGO, Recognized School or College, Recognized professional organization, Diplomatic offices, Senior Govt. officers, Doctors, Engineers, Chartered accountants, Lawyers, Journalists on recommendation of their respective organizations, Head masters, Lecturers and Professors on recommendation of their respective organization, Contractors and others prioritized by the board of the company.

### **Procedural Steps for distribution of PSTN line**

1. The regional directorate or the concerned branch telecom office notifies to the customers in waiting list regarding distribution of telephone line with required



documents wherever network and resources are available. The office, generally, require the following documents:

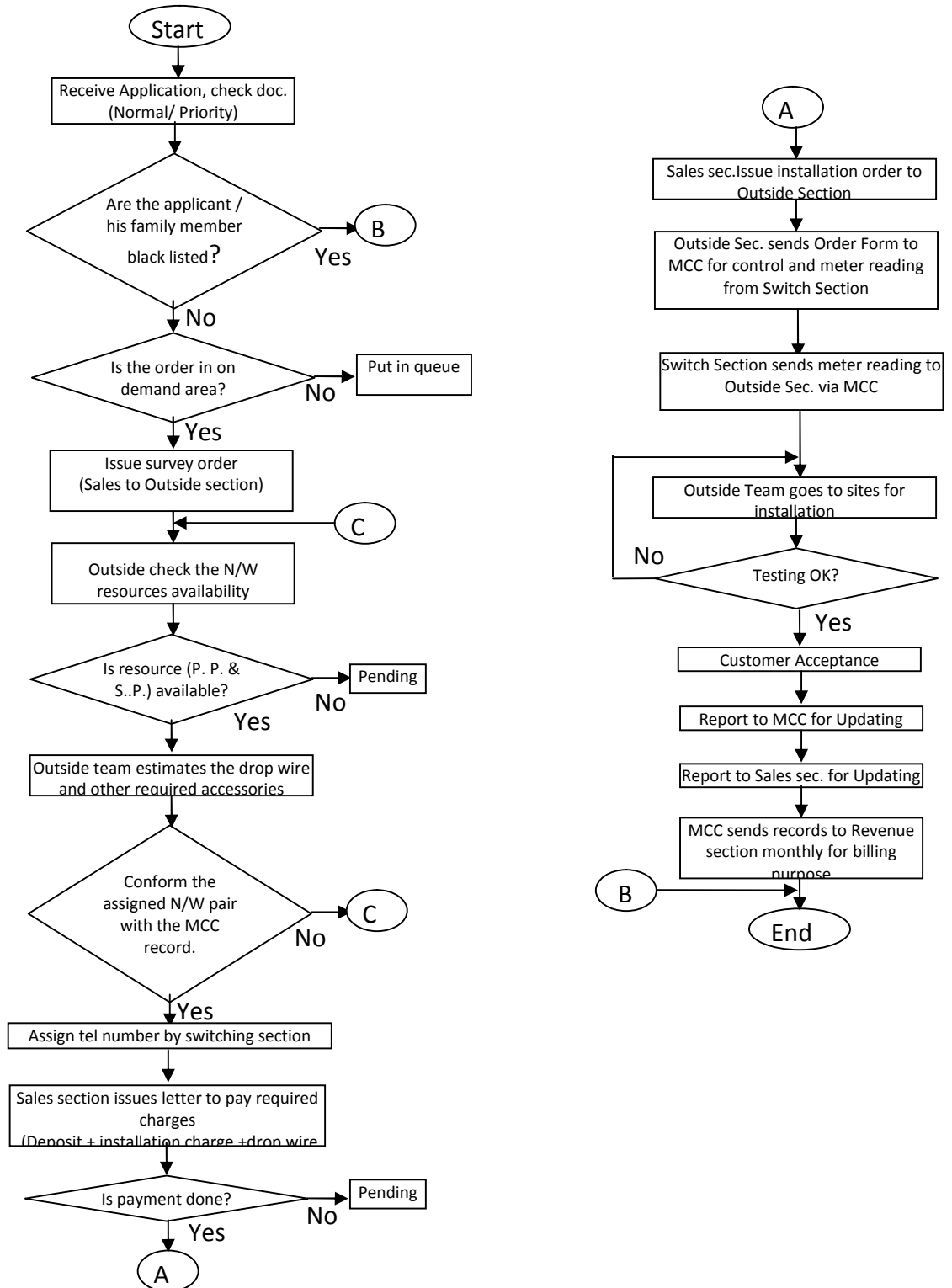
- a) Nepali citizenship for Nepali customer and Identification document and recommendation letter issued by the relevant embassy for foreigners.
  - b) Passport size photo.
  - c) Registration/ license of the business/ industry, VAT registration certificate and Tax clearance certificate in case of priority telephone for the entrepreneurs.
  - d) Recommendation letter of the recognized professional organizations if the customer wants telephone on that basis in priority.
2. The applicant contacts the sales section of the office along with the required documents. The sales section checks out for the sufficiency and validity of the documents. It also verifies if the applicant is black listed or not. If there is back dues due to discontinuity of bill payment on any line already issued to the applicant or his family members then he has to clear out the dues.
  3. If the customer is eligible to have a connection then the sales section prepares a Survey order in a prescribed format (Annex -3) and produce before the office – in – charge. The office-in-charge confirms out the documents, eligibility and issue order for survey to the outside cable network section.
  4. The outside section-in-charge deposes for Survey & Estimation work to a line installation technical team which gets a good network pair and required material estimate for line connection.
  5. The M.C.C. section checks these data and enters them in the network database. In case it finds any mismatch (like the pair(s) mentioned has already been reserved for someone else, may be to a bad payer or to a new connection in process), it may return to check for other pair. The M.C.C. section forwards this form to the switching section for allotment of an O.K. telephone number.
  6. The switching section allots good telephone switching equipment and sends its number to the sales section for further processing.
  7. The sales section calculates for the installation, deposit and subscription charges and notifies to the client/ customer for payment within a certain time limit.
  8. The client/ customer payment of the installation and other charges notified by the sales section on the Revenue counter and produces the receipt bill to the sales section.

9. The sales section prepares the legal agreement (format attached as Annex-4) to be signed by the customer and the office-in-charge. The agreement contains the details of the rules and regulations to be observed and followed by the customer. At the same time it also gets completed a Subscriber's Identification and Signature Verification Card by the subscriber (Annex-5).
10. The sales section prepares the Line Installation Order form (Annex-6) and produces before the office-in-charge for check if the proper amount of charge has been paid or not and issue installation order to the outside section.
11. The outside section-in-charge deputs a technical team for installation of the line at the premises of the customer.
12. The technical team gets the initial meter reading of the telephone number (sometimes it may not start from zero for several reasons like test number or returned/seized number) from the switching section.
13. The technical team requests the MDF technician to jumper the outside pair to the switching side pair located on the MDF to connect the switching equipment with the telephone set to be installed at the customer's premises via the outside cable network.
14. The technical team installs the line according to the survey report, gets the installation quality acceptance of the customer and reports to MCC for record update.
15. The MCC files the survey and installation order forms, prepares installation summary report and sends to the sales and revenue section for record keeping and service coding required to generate monthly bill of the telephone number. The summary report contains following details about the line installed:

- Name and address
- Installation date
- Cabinet, DP and DP pair number
- Meter reading of the tel. no.
- Installation team identification

The above procedural steps in course of line distribution can be shown in the form of flow chart 4.8 as follows:

**Chart:4.8 Flowchart of PSTN Line Distribution Process in NT**

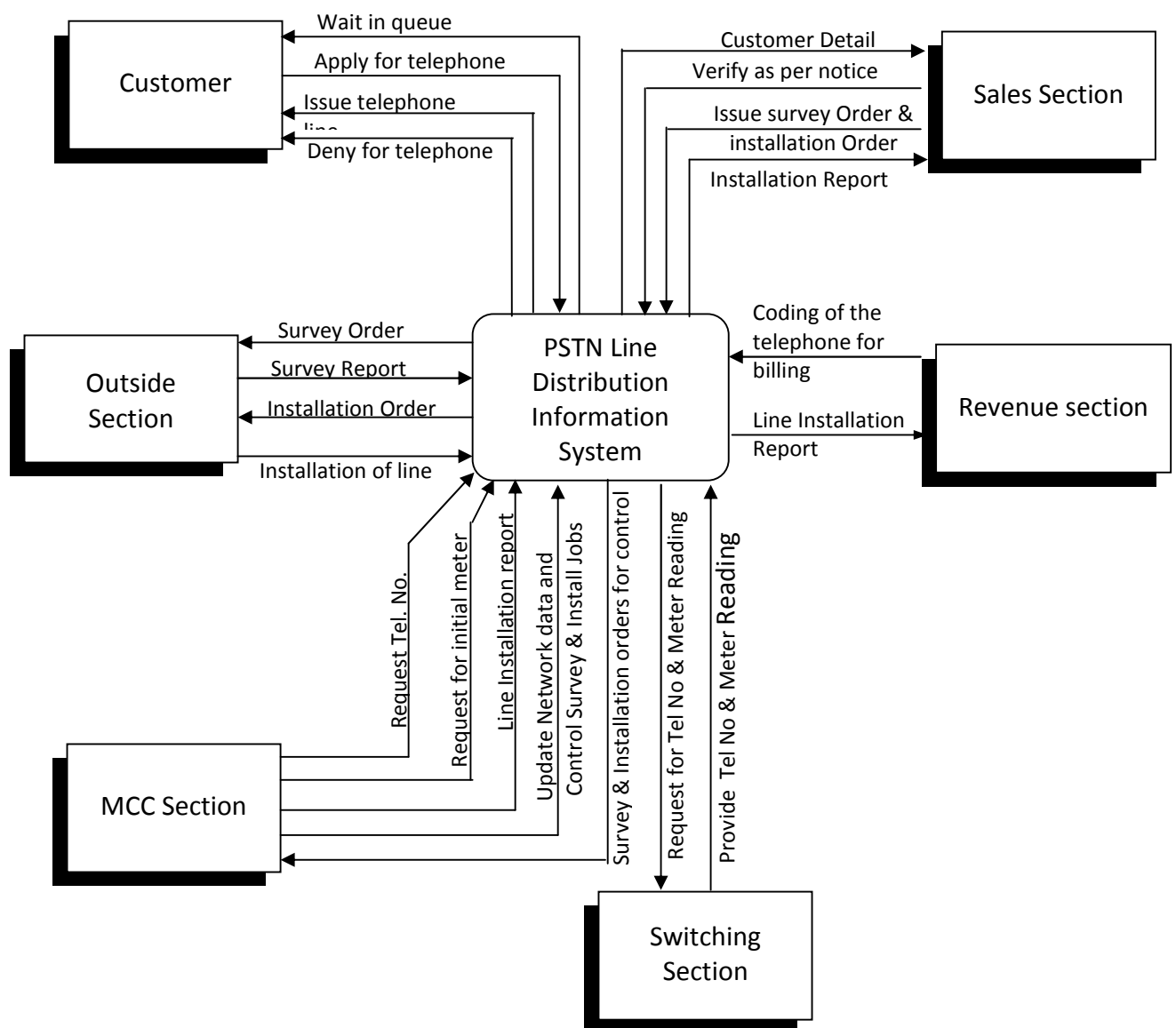


## DFD of PSTN Line Distribution Information System

### Context Level DFD of PSTN Line Distribution information system

Context level DFD gives the bird's eye view over the system. In the land line distribn system of Nepal Telecom, there are basically six external entities: Customer, Sales Section, Outside Plant Section, MCC Section, Switching Section and Revenue Section. (Chart 4.9) Each entity plays a major role in the process of line distribution.

**Chart:4.9 Context Level DFD of PSTN Line Distribn Info System of NT**



**Customers** are the most important element for the company. The company earns bread and butter out of them. They are the ones who come to subscribe the telephone services and thus are the revenue generators of NT.

**Sales section** of NT offices notifies the waiters for line installation in the area when it has network resources ready. They receive the customers and check out the documents produced before the office. The sales officer fills up survey and installation order forms in the name of the subscriber and forwards via the office-in-charge to outside plant section for survey and installation. Sales section calculates the charge to be paid against issue of the line. It makes legal agreement with the customer in order to bind with responsibility for the line- regarding bill payment and misuse thereof.

**Outside Plant section** supervises the cable network. It looks after the resources of MDF, cabinets and D.Ps. It is responsible for installation and maintenance of PSTN lines. The section-in-charge supervises the works of survey, installation and maintenance teams. It can be compared with our limbs whose works are seen and by which the organization gets much of external environment information and demand details. Their working style may attract or distract the customers.

**MCC section** controls and monitors the various activities performed by the technical teams involved in surveying, installation, maintenance of lines. It calculates the time taken to perform the jobs for evaluation purpose. It manages the database of the networks. The database contains following network data:

1. Records of the cabinets – primary/ secondary pair capacities with OK/FLT status.
2. Records of D.Ps.- capacity (10/20 pair), used and vacant secondary pairs with status.
3. Names and addresses of the subscribers to whom the PP and SP have been allotted.
4. The team responsible for survey, installation and maintenance and time taken to do the jobs.
5. Fault repair details including time of clearing the faults with type of faults.

**Switching section** is responsible for the operation and maintenance of line equipments. It observes the charging /meter of the lines. It issues the line facilities like STD, ISD, Locking codes and other value added services. The section is very sensitive and complex in operation. It may be compared with our heart and brain as it

is responsible for all the processes involved in setting up our telephone calls and completing it as successful calls.

**Revenue section** codes the telephone lines according to different categories- residential, business, official, privileged service and non-service, privileged journalist etc. It collects the bill amounts through its counters, monitors the revenue and follows up the bad debtors, if any. It is so important for a company's good economic health.

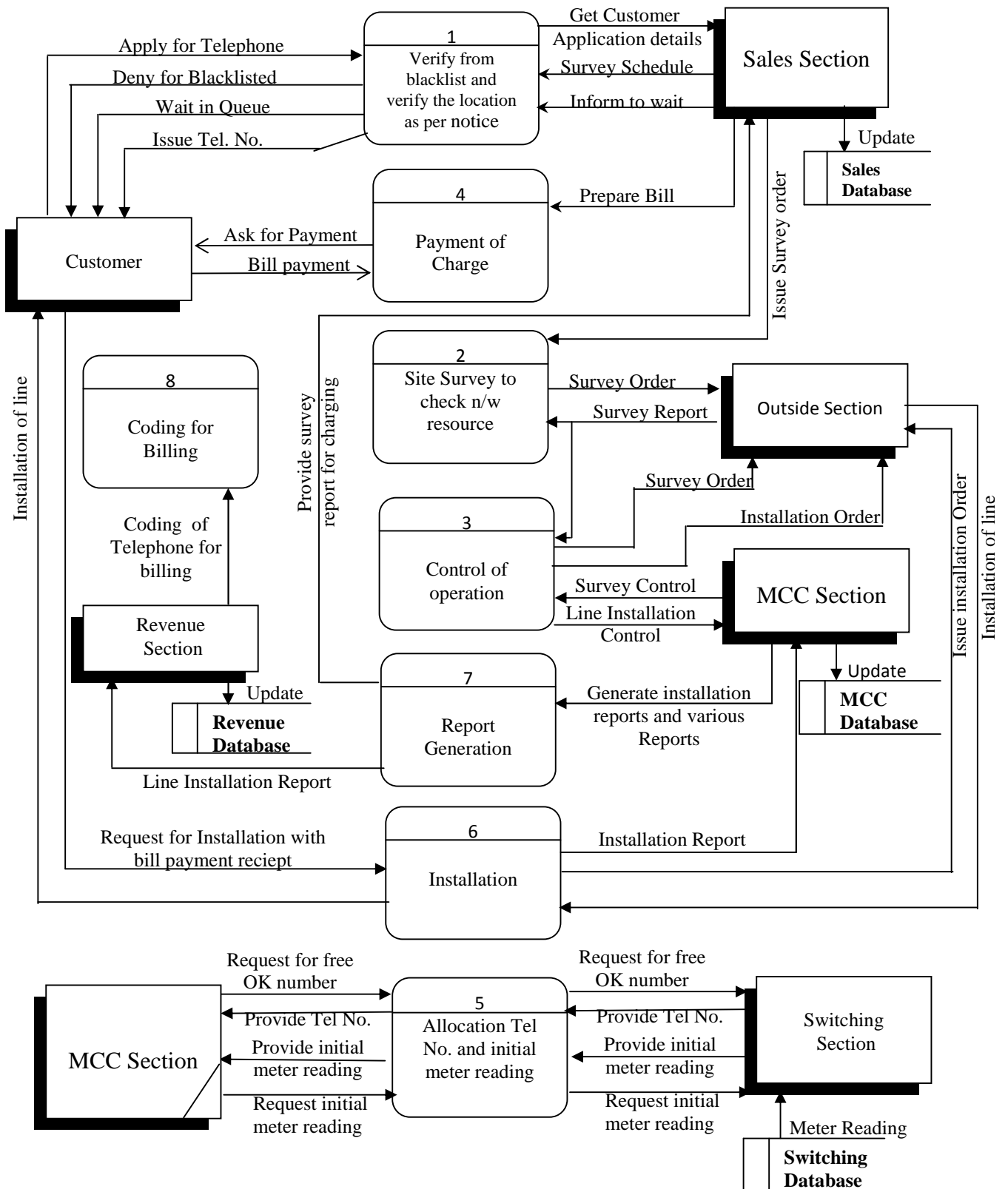
### **System level DFD of Line Distribution information system**

System level DFD clearly defines the processes of PSTN land line distribution and the relation of the external entities with the main processor.

Customers requests for telephone line and provides location detail and personal information to the sales section. If the applicant produces the necessary documents and there is nothing against him (her) and resources is available, it initiates for the line distribution otherwise puts him (her) in queue or deny giving reasons. It also prepare bill for payment of charge process. The office-in-charge coordinates with all other sections responsible for resource information. Customers may also cancel their intention of getting line at any moment. Site survey and installation of line in the customer's premises – these two processes are performed by the outside section which receives survey and installation order forms from sales section. It performs its functions in close coordination with MCC and MDF sections. Processes like controls of operations like survey and installation processes, generation of reports for management as well as preparation of summary line installation report for billing purpose for revenue section are done by MCC. It also coordinates with switching section for free telephone number and initial line meter reading. MCC maintains a huge database comprising of all the network resources, line operation locations, and the user's detail. Revenue section completes the coding for billing process based on the data supplied by MCC and other papers supplied by the customers, if any. It also maintains a database for the revenue collection records. Allocation of telephone number and Reading of Initial Meter Reading are performed by switching section.

The system level diagram is shown as chart 4.10.

**Chart:4.10 System Level DFD of Line Distribn Info System of NT**

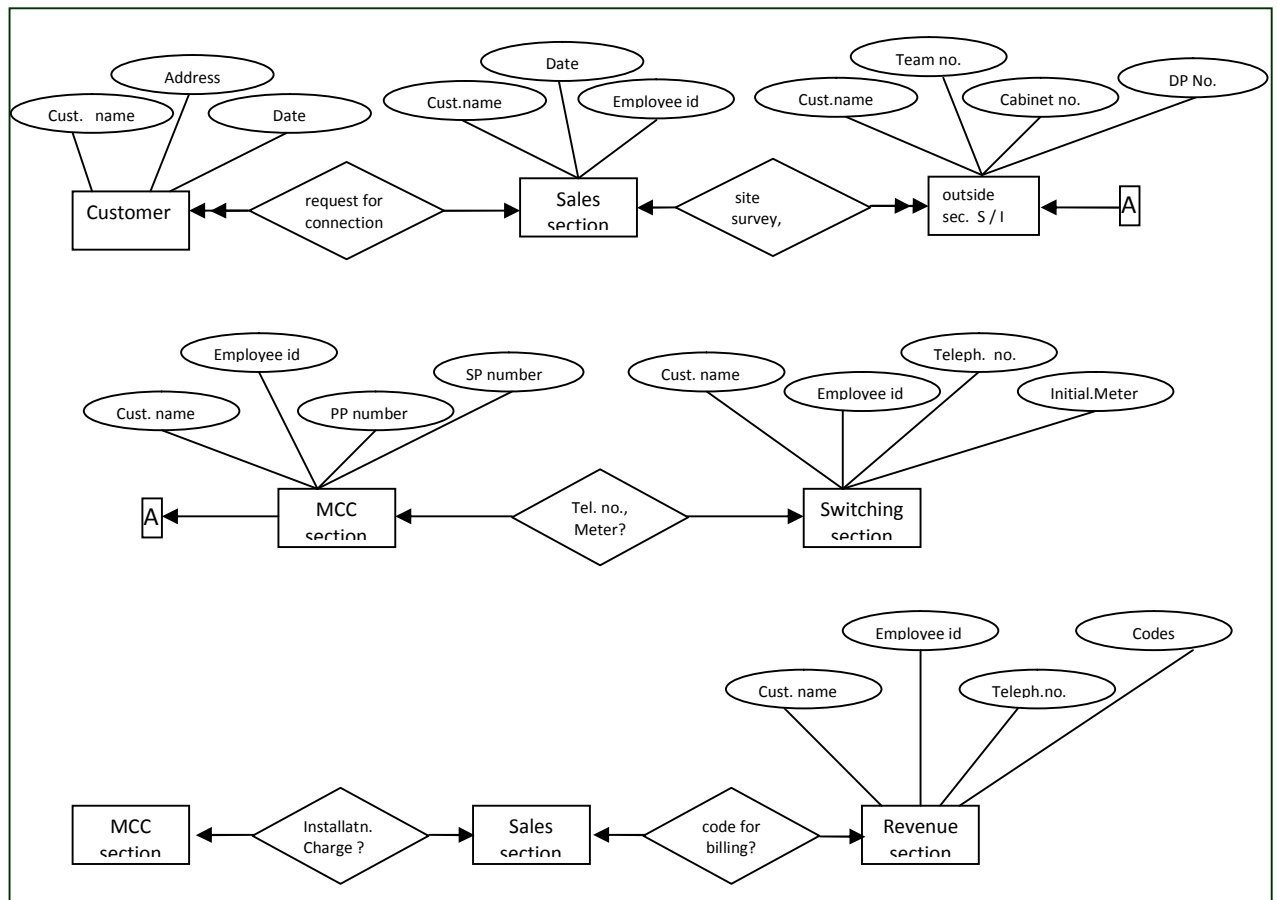


## Entity Relationship Diagram (ERD)

### Data Dictionary System

The relationship between different entities have been shown in the preceding ERD diagram chart 4.11. The diagram depicts the relationships between different entities involved in the PSTN telephone distribution system.

**Chart 4.11 ERD of Entities involved in PSTN Line Distribn of NT**



From the chart 4.11 it is clear that *relation between customer and sales section is many: 1 relation* (so many customers contact one sales section) and so is the relation between sales section and different teams of outside section. Relationship between outside section and MCC section, switching and MCC and sales and revenue sections are 1:1.



**Table:4.17 Data Dictionary**

Entity: Customer

S.N.	ATTRIBUTE	TYPE
1	Customer name	TEXT
2	Address	TEXT
3	Date	NUM

Entity: Sales section

S.N.	ATTRIBUTE	TYPE
1	Customer name	TEXT
2	Employee Id	NUM
3	Date	NUM

Entity: Outside section

S.N.	ATTRIBUTE	TYPE
1	Customer name	TEXT
2	Team number	NUM
3	Cabinet number	NUM
4	D.P. number	NUM

Entity: MCC section

S.N.	ATTRIBUTE	TYPE
1	Customer name	TEXT
2	Employee Id	NUM
3	PP number	NUM
4	SP number	NUM

Entity: Switching section

S.N.	ATTRIBUTE	TYPE
1	Customer name	TEXT
2	Employee Id	NUM
3	Telephone number	NUM
4	Initial Meter	NUM

Entity: Revenue section

S.N.	ATTRIBUTE	TYPE
1	Customer name	TEXT
2	Employee Id	NUM
3	Telephone number	NUM
4	Code	Lookup Wizard

The types of different data are also shown in the table of data dictionary table 4.17. The attribute 'Code' of the Revenue section entity is to differentiate various types of telephone lines like normal, VHF, MARTS, VSAT, Privileged press etc to implement different types of billing. *Primary Key is the Customer name.* The attributes and their types of the entities are also given in table 4.17.

#### 4.5.6.3 Objectives of Mobile Line (GSM/ CDMA) Distribution

1. To distribute mobile line to every hands of the people for fast development of the country and increase safety while also on move.
2. To distribute the telephone line in shortest time and properly without giving much trouble to the customers.
3. To maintain the line inventory and generate various reports to produce before the higher authorities for control and support.
4. To collect charges for telephone and pass the collection statement to the Revenue department.

The distribution of mobile line in NT is similar to that of Ncell and UTL with a slight difference that line is approved by the office-in-charge forwarded by the sales section. Capacity and distribution of GSM and CDMA lines are shown in table 4.18.

**Table:4.18 Record of GSM & CDMA Line Cap & Distribn in ERD**

S. N.	Fiscal Year	Capacity	Total Line Distribn. GSM	GSM Line Distributed in the F.Y.	Total Line capacity CDMA	Total Line Distribn. CDMA	CDMA Line Distributed in the F.Y.
1	2066 - 2067	10,00,000	6,16,862	2,08,923	3,00,000	2,17,034	73,425
2	2067 - 2068	11,95,703	7,71,584	1,51,551	3,00,000	2,36,309	39,430

#### 4.5.7 Tariff Plan of NDCL

**Table:4.19: Local Call Tariff of NT**

S.N.		Rs./minute	Rs./minute	S.N.		Rs./minute
	NT to NT	06am-10pm	10pm-6am			24 Hrs
1	Post paid GSM	1.00	0.55	5	NT to UTL	2.6
2	PSTN	1.00		6	NT to Ncell	2.5
3	Prepaid GSM	1.50	0.55	7	NT to STM	3.6
4	Prepaid CDMA	1.80	0.75	8	NT to SmartTel	3.6

Table 4.19 shows the tariff rates of local calls made within and to other operators.

**Table:4.20 Domestic Long Distance Calls Tariff of NT**

S.N.	Type of call	08:00 – 18:00	18:00 – 22:00 & 06:00-8:00	22:00 – 06:00
		Rs./Minute	Rs./ Minute	Rs./ Minute
1	Call made from one district to another within one Zone	1	1	1
2	National Zonal Calls (Sun – Fri)	2	1.5	1
3	National Zonal Calls (Sat)	1	1	1

**Table:4.21 International Call Tariff (access code “00”) of NT**

S.N.	Countries	Rs./minute
1	India, Pakistan, Bangladesh, Sri Lanka	12
2	Bhutan	15
3	Maldives	40
4	Afghanistan	24
5	Somalia, Falkland Island, Cuba, N.Korea, papua new Guinea, Soloman Island, East Timor	80
6	Rest of the world except countries above mentioned	30

Table 4.20 &4.21 shows the tariff rates of STD and ISD calls of Nepal Telecom.

## **4.6 Analysis of Existing System of Ncell**

### **4.6.1 Technology and Features of Ncell**

Ncell is using HSDPA technology for internet/data service through 3G capable of 3.6 Mbit per second online. It has planned to use HSPA add-on-technology to extend the speed further. Also it has plan to start LTE which can provide internet access up to 100 Mbit speed. The CEO has written in his blog on Aug 15, 2011 that average data download speed is 1.1 Mbit.

#### **New Features/ Innovations**

Ncell has introduced NGN technology claiming to have updated technology. It has introduced BlackBerry facility. BlackBerry is leading wireless enterprise solution

offered by Research In Motion Ltd (RIM) that keeps professionals connected to people and information while on the go. It provides wireless access to many applications including e\_mail, corporate data, phone, SMS, web, organizer features and multimedia features. It requires the use of special BlackBerry handset.

### **Quality Improvement Measures**

Ncell claims that 90 % of its rural BTS sites have diesel generator as power back up to make service more reliable. It has plan to implement power stabilizer, new type of batteries (short recharge cycle) and replace DG by solar where place allows.

### **Services available:**

#### **Ncell Connect**

Ncell Connect is a flexible internet service from Ncell using Data Card and Ncell data SIM to access internet. Data Card is inserted in the USB port.

There are three packages available for this service- 500 MB package at Rs. 399 (80 paisa per MB), 1000 MB package at Rs.699 (70 paisa per MB) and 5000 MB package at Rs. 1999 (40 paisa per MB). Without subscribing it costs Rs. 2 per MB.

#### **Short Messaging Service (SMS)**

Short text messages up to 160 characters can be exchanged with Ncell subscribers as well as subscribers of other mobile operators within and outside Nepal. Charges for sending SMS from Ncell to Ncell is Rs. 1.00 per message and from Ncell to other network is Rs. 1.27 per message exclusive of taxes.

#### **Mobile Internet**

Depending upon the mobile device model capabilities internet connection can be had via different protocols (WAP, GPRS, EDGE). There is provision of surfing the net, checking emails, using the handset as modem to connect wireless internet to one's personal computer, MMS, chatting and downloading different applications. Charges for Data traffic is Rs. 0.006 per kb (upload and download) at charging interval of 10 kb (exclusive of taxes).

#### **Multimedia Messaging Service (MMS)**

Messages including images, audio and video clips can be sent in addition to text to share captured moments and experiences instantly. Charge for sending MMS from Ncell to Ncell is Rs. 3.00 per msg exclusive of taxes.

### **Personal Ring Back Tone (PRBT)**

PRBT service enables the person who calls one to listen to popular tunes instead of the regular tones. It can also be sent as gift to anyone. Monthly charges for this service is Rs. 10 and tone downloading charge is Rs. 10 per tone.

### **Voice Mail**

It is a service , which answers ones calls automatically and allow callers to leave messages when one is unable to answer the calls or when ones mobile phone is switched off. The mobile phone alerts the owner of the message received. The voice messages can be listened using PSTN phone with tone dialing. There is activation charge of Rs. 88.50 and for listening to the messages charges are Rs. 1.99 per minute for prepaid and Rs. 1.60 per minute for postpaid (exclusive of taxes).

### **SMS-to-Email**

SMS-to-Email service relays SMS as emails and the message is delivered to the recipient's email address. One can also receive emails sent to ones number as SMS. Charges for this SMS-to-Email service for Pre-paid includes a monthly fee of Rs. 30 and Rs.1.00 per message and that for Post-paid monthly fee is exempted and Rs. 5.00 per message is charged.

### **Call Waiting**

This service notifies one of another incoming call during a conversation and allows you to keep the first caller on hold and answer the second call. This service is free.

### **International Roaming (Prepaid)**

This service enables one to carry one's cell phone with Ncell number while travelling abroad. Ncell prepaid subscribers can activate/ deactivate roaming service via USSD. This service includes SMS interworking, balance information and balance refill. Calls to Ncell centre are charged by roaming partners as international calls to Nepal.

### **Call Forwarding or Call Divert**

This service enables one to divert all one's incoming calls to any other mobile number or to a landline number of one's office or residence when one is busy, out of reach, mobile switched off or when talking on other line. Charges are according to calling rate.

### **Missed Call Notification**

It is a service which enables one not to miss a single call even when one's phone is switched off or when one is out of network coverage. The mobile owner receives detailed SMS of all the missed calls when the mobile is switched on or when s/he

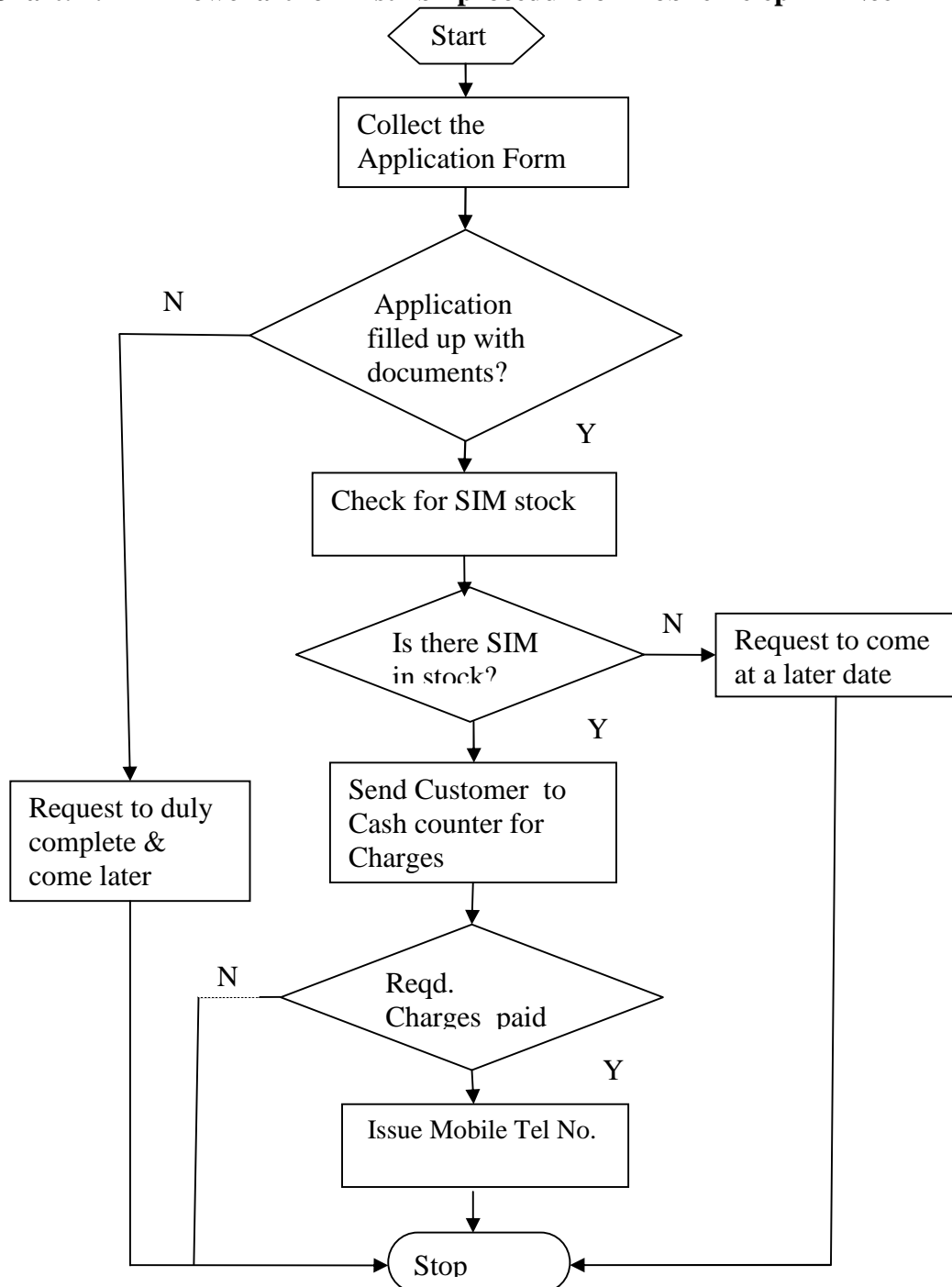
enters the network coverage area. Charge for Missed Call Notification is Rs. 2.49 including VAT per week.

## 4.6.2 Mobile Line Distribution System of Ncell

It is explained with the help of self explanatory charts 4.12, 4.13, 4.14 and 4.15.

### 4.6.2.1 Flowchart for Mobile Line Distribn Information System in Ncell

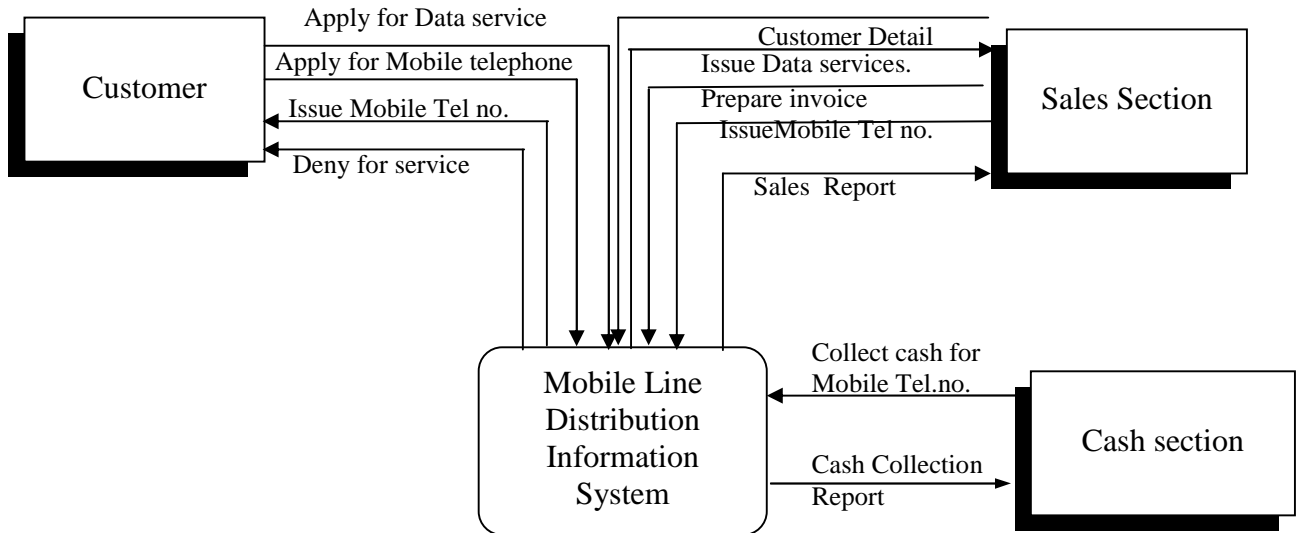
**Chart: 4.12 Flowchart for Distribn procedure of Mobile Teleph in Ncell**



#### 4.6.2.2 DFD of Mobile telephone Distribn Info System in Ncell

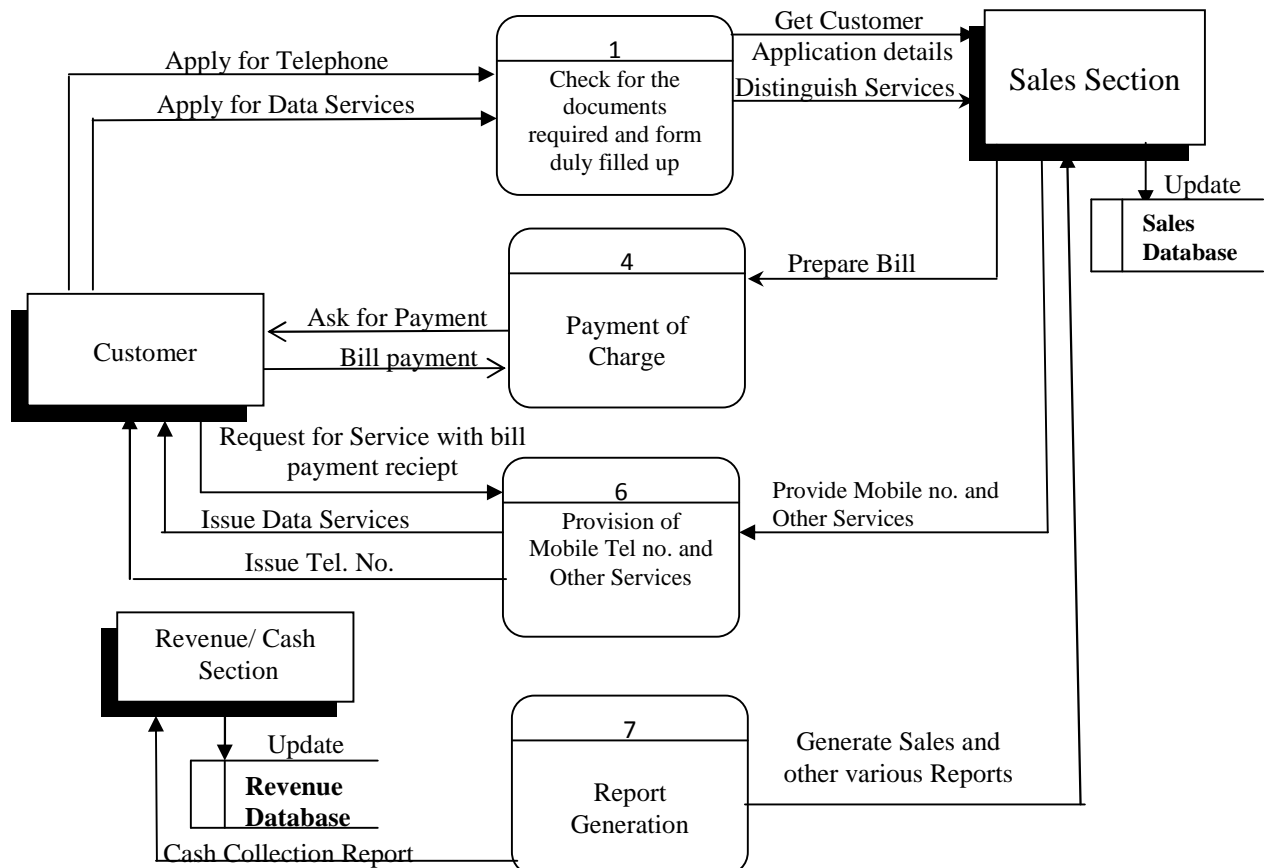
##### Context Level DFD

**Chart:4.13: Context Level DFD for Mobile Distributn Info System in Ncell**



##### System Level DFD

**Chart:4.14: System Level DFD of Line Distribn Info System in Ncell**



Ncell provides mobile lines based on GSM technology. The customer is required to approach the sales counter of Ncell with any identification alongwith passport size photo and fee within business hour. Nowadays, a copy of citizenship certificate or passport has been made compulsory according to the instruction of NTA.

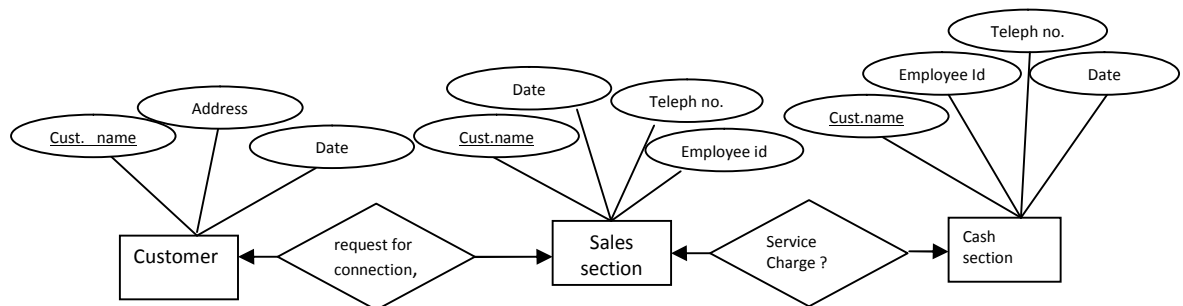
The sales counter produces an application form before the customer to be duly filled up which contains the information about the customer and /or user (name, address, occupation, etc). The form is verified by the sales officer and SIM is issued within minutes.

A sample of application form is attached as Annex-9A and 9B.

The detail distribution procedure depicting the different processes and the involved entities have been shown in the following flowchart, DFDs and ERD.

#### 4.6.2.3 Entity Relationship Diagram (ERD) for Ncell

**Chart:4.15 ERD of Entities involved in GSM Line Distribn of Ncell**



#### Data Dictionary System

The relationship between different entities have been shown in the ERD diagram chart 4.15. The diagram depicts the relationships between different entities involved in the Mobile telephone distribution system in Ncell. From the diagram it is clear that *relation between customer and sales section is many: 1 relation* (so many customers contact one sales section) and so is the relation between customer and revenue section(counter). The types of different data are also shown in the table of data dictionary below. *Primary Key is the Customer name*. The attributes and their types of the entities are given in table 4.22.



**Table:4.22 Data Dictionary**

Entity: Customer

S.N.	ATTRIBUTE	TYPE
1	Customer name	TEXT
2	Address	TEXT
3	Date	NUM

Entity: Sales Section

S.N.	ATTRIBUTE	TYPE
1	Customer name	TEXT
2	Employee Id	NUM
3	Date	NUM
4	Telephone no.	NUM

Entity: Cash Section

S.N.	ATTRIBUTE	TYPE
1	Customer name	TEXT
2	Employee Id	NUM
3	Date	NUM
4	Telephone No.	NUM

**4.6.3 Tariff of Ncell****4.6.3.1 Tariff for voice call**

Tariff rates of local, STD and ISD calls charged by Ncell are shown in tables 4.23, 4.24 and 4.25.

**Table:4.23 Local and STD Tariff in Ncell (Ramro Tariffs)**

S.N.	Type of all	Rate in Rs.
1	Ncell to 3 Favourite numbers	0.99/ minute +VAT
2	Ncell to Ncell	1.99/ minute +VAT
3	Ncell to NTC GSM/CDMA mobile	2.53/ minute +VAT
4	Ncell to other network fixed lines (NTC PSTN, NTC CDMA fixed, UTL CDMA fixed)	2.13/ minute +VAT
5	Ncell to other n/w within different districts of same zone	2.79/ minute +VAT
6	Ncell to other network within different zones	2.81/ minute +VAT
7	Ncell to LMS local charge	2.33/ minute +VAT
8	Ncell to LMS in different charging area	2.83/ minute +VAT

**Table:4.24 International Roaming Operators CAMEL**

S.N.	Country	Operator	Local OG call (Rs.)	Callback to Nepal (Rs.)	I/C call (Rs.)	SMS (Rs.)
1	India	Airtel (Delhi, AP, UP west)	134	271	240	55
2	Sri Lanka	Dialog Telekom Ltd	46	256	81	33

**Table:4.25: Prepaid International Tariffs in Ncell**

S.N.	Name of Countries	Rate in Rs.
1	USA, Canada	1.99/ minute
2	India	2.99/ minute
3	Bahrain, Bangladesh, China, Hongkong, Malaysia, S.Arabia, Singapore, S.Korea, Thailand	6/ minute
4	Australia, Bhutan, Japan, Kuwait, Lebanon, Pakistan, Qatar, Sri lanka,UAE, UK	15/ minute
5	Selected premium destinations for Australia and UK	48/ minute

**Night Tariff :** 10 pm to 6 am: Rs. 0.70/ minute

#### 4.6.3.2 Packages and Prices of Internet & Data Services of Ncell

**Table:4.26: Packages and Prices of Internet & Data Services of Ncell**

	Small	Medium	Large		
Package	500 MB	1000 MB	5000 MB	10000 MB	20000 MB
Price	Rs. 399	Rs. 699	Rs. 1999	Rs. 2999	Rs. 3999
Price per MB	Rs. 0.80	Rs. 0.70	Rs. 0.40	Rs. 0.30	Rs. 0.20

Note: Without Subscribing browsing charge is Rs. 2 per MB. All charges are exclusive of taxes.

The data SIM costs Rs. 99 (incl. tax) including Rs. 50 balance to start with. There is free data card offer worth Rs. 2258 at the purchase of 10 GB Ncell connect data package with validity of 30 days.

**MMS:** Ncell to Ncell Rs.3.00

**Prepaid Data Services Tariff:**

S.N.		Rate per MSG
1	Ncell to Ncell	Rs. 1 +VAT
2	Ncell to other NW	Rs. 1.27 + VAT
3	International	Rs. 10 + VAT

**SMS 2 Email**

Monthly Charge      Rs.30 + VAT      SMS to Email      Rs. 1

**Table:4.27 Normal Data Packages**

S.N.	MB	Price (Rs.)+VAT	S.N.	MB	Price (Rs.)+VAT
1	25	119	4	250	599
2	50	199	5	500	999
3	100	299	6	1000	1899
			7	5000	8999

**BlackBerry:**

BlackBerry Internet Service (BIS Unlimited):      Rs.999 per month

BlackBerry Enterprise Server (BES Unlimited):      Rs.1499 per month

**Ncell Special Scheme : Pro Plans**

Premium: Includes 700 min Local calls/ 700 Nat. SMS/ 70 MB data:Rs.999/ month

Plus: Includes 300 min Local calls/ 300 National SMS/ 30 MB data:Rs.499/ month

Classic: Local calls Rs. 1.2 (to Ncell) Rs.1.5 (to Others), Local SMS Rs.1 within Nepal: Rs.300/ month

All the Pro Plan charges are inclusive of all taxes.

**Table:4.28 Unlimited Closed User Group**

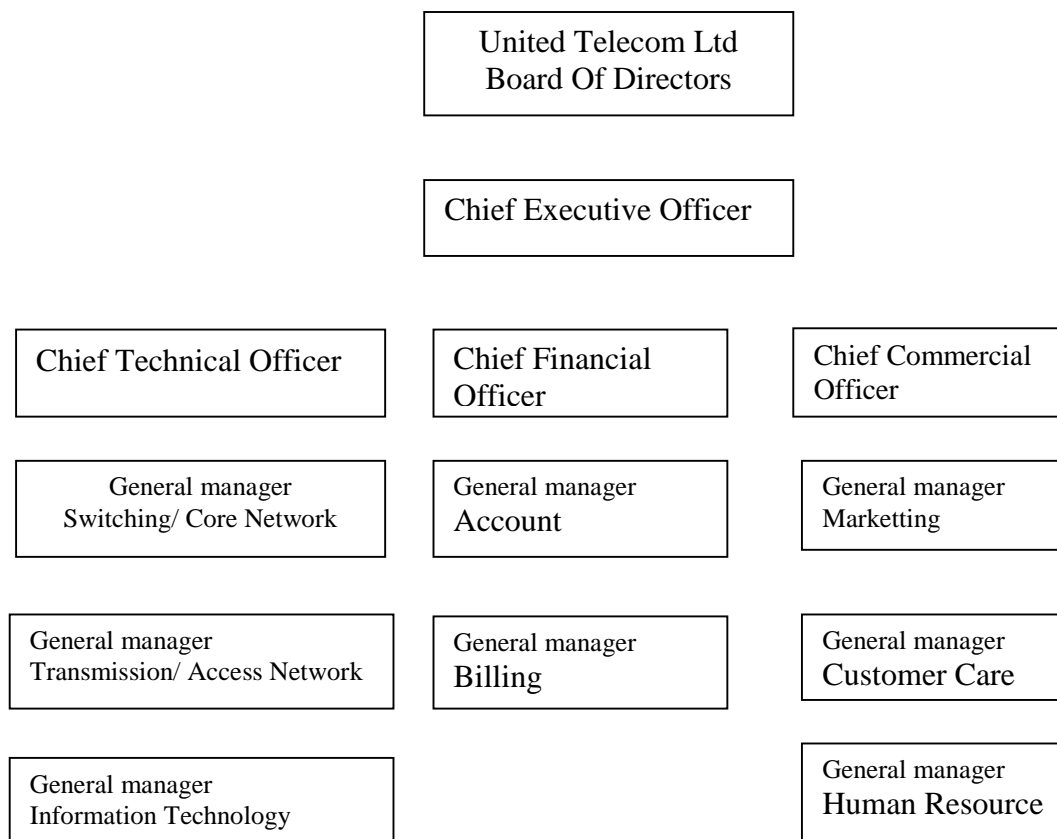
Rs./Per Line/ month+Tax	No. of Lines	Remarks
199	3 – 24	For frequently used numbers within an organization or friend circle this service may prove to be cheaper.
149	25 – 50	
119	51 – 100	
<i>(Source: www.ncell.com.np)</i>		

## 4.7 Analysis of Existing System of UTL

### 4.7.1 Organization Structure of UTL

The organization structure is shown in the chart 4.16:

**Chart:4.16 Organization Chart of UTL**



A team of board of directors heads the organization. The Board is comprised of a chairman and three members. The board decides about the major policies of the company. The chief executive officer looks after the entire management and day-to-day operation of the company assisted by 7 general managers besides one chief financial officer and one chief commercial officer.

The general manager of switching/core network looks after MSC, IN, Gateway, CRTB etc. The general manager of transmission/access network looks after the BSC, BTS, MW and Optical links. The general manager of IT takes care of ISP, Internet (CDMA1X) (154 kbps), Broadband (upto 10 mbps) and Leaseline services. The general manager of human resource takes care of management of manpower which involves new recruitment, transfer, promotion, punishment and rewarding etc. The

general manager of marketing is responsible for business promotion, launching of new services etc. The general manager of customer care deals with the sale of services and products and their post sales services. The chief financial officer operates and controls the budget as well as controls the collection of revenue.

#### 4.7.2 Growth Trend of UTL

**Table:4.29 Growth Trend of UTL**

<b>Human Resource</b>	<b>2004/05</b>	<b>2005/06</b>	<b>2006/07</b>	<b>2007/08</b>	<b>2008/09</b>
Working Manpower				78+250	
Manpower per 1000 line				2.8	
<b>Technical</b>	<b>2004/05</b>	<b>2005/06</b>	<b>2006/07</b>	<b>2007/08</b>	<b>2008/09</b>
Districts Covered	3	3	5	14	14
Cities Covered	3	3	5	16	
Distributed Teleph Lines	27500	66500	91940	116972	163636
<b>Financial</b>	<b>2004/05</b>	<b>2005/06</b>	<b>2006/07</b>	<b>2007/08</b>	<b>2008/09</b>
Total Income (Mill. Rs.)	82.37	163.3	543.4	590.94	643.8
Total Cost (Mill. Rs.)	280.3	413.7	401.7	414.45	386.36
PBT (Million Rs.)	(430.38)	(4.89)	16.89	4.36	(18.3)
Net Profit (Mill. Rs.)	(430.38)	(4.89)	16.89	4.36	(18.3)
EBITDA Margin (Mill. Rs.)	(3.58)	54			
No. of Shares (in Million)				272	13.6
<b>Traffic Handled</b>					
Local (Million minutes)	186	324	406	412	
DLD(Million minutes)	18	27	48.27	62.6	
ILD(Million minutes)	5.42	11	46.6	70.1	
License Fee	65.79	77.37	55.27	42.93	31.1

The table 4.29 shows the progress of UTL is very slow and is running in loss.

#### 4.7.3 Products Offered with Fees and Charges Scheme in UTL

Products in sale/ service:

- A. Fixed wireless terminal connection
- B. CDMA RUIIM cards (USIM)

**A. CDMA Fixed Wireless Terminal Connection:**

- ) Cost of Connection: **Rs. 3650**
- ) UTL-UTL Talk Value: **Rs. 200/-** per month for a period of **18 months**
- ) UTL-Other Network Talk Value: **Rs. 50/-**
- ) Validity of Connection: 19 Months
- ) Warranty for set is 3 Month

**B. Two types of USIM are available: 1. Voice USIM      2. Data USIM**

**1. Voice SIM**

- ) Cost of Connection for Voice SIM is Rs. 267 inclusive of VAT.
- ) Free UTL-UTL talk value will be Rs. 1,200(Rs.100\*12 Month).
- ) Initial Talk Value for Other Network will be Rs. 5.
- ) Free UTL-UTL SMS will be 600(50\*12 Month).
- ) Data Service is not available in the voice SIM.

**2. Data SIM**

Four different types of Data Plan are available for USIM Data Subscriber.

Different plans available are:

- ) Unlimited 24 hour surfing for 1 month
- ) Unlimited 24 hour surfing for 1 year
- ) Unlimited night surfing (8 pm to 8 am) for 1 month
- ) Unlimited night surfing (8pm to 8am) for 1 year

**1. Unlimited 24 hour surfing for 1 month**

- ) Cost of Connection is Rs 848.
- ) 1 month internet free.
- ) Activation charge for each month is Rs 565 (Rs 500 + 13% VAT)

**2. Unlimited 24 hour surfing for 1 Year**

- ) Cost of Connection is Rs 5933
- ) 1 year internet free
- ) Activation charge for each year is Rs 5650 (Rs 5000 + 13% VAT)

**3. Unlimited night surfing (8 pm to 8 am) for 1 month**

- ) Cost of Connection is Rs 622
- ) 1 month internet free
- ) Activation charge for each month is Rs 339 (Rs 300 + 13% VAT)

#### **4 . Unlimited night surfing (8 pm to 8 am) for 1 year**

- ) Cost of Connection is Rs 3673
- ) 1 year internet free
- ) Activation charge for each year is Rs 3390 (Rs 3000 + 13% VAT)

#### **NOTE:**

Once initial free internet period is over, one can recharge with ordinary UTL's recharge card available in any UTL's outlet so that his/her balance becomes equivalent to the activation charge. Once one is connected to the internet after recharge, His/her balance will get deducted by the activation amount and S/He will get the uninterrupted internet service for the next cycle.

### **4.7.4 Line Distribution System in UTL**

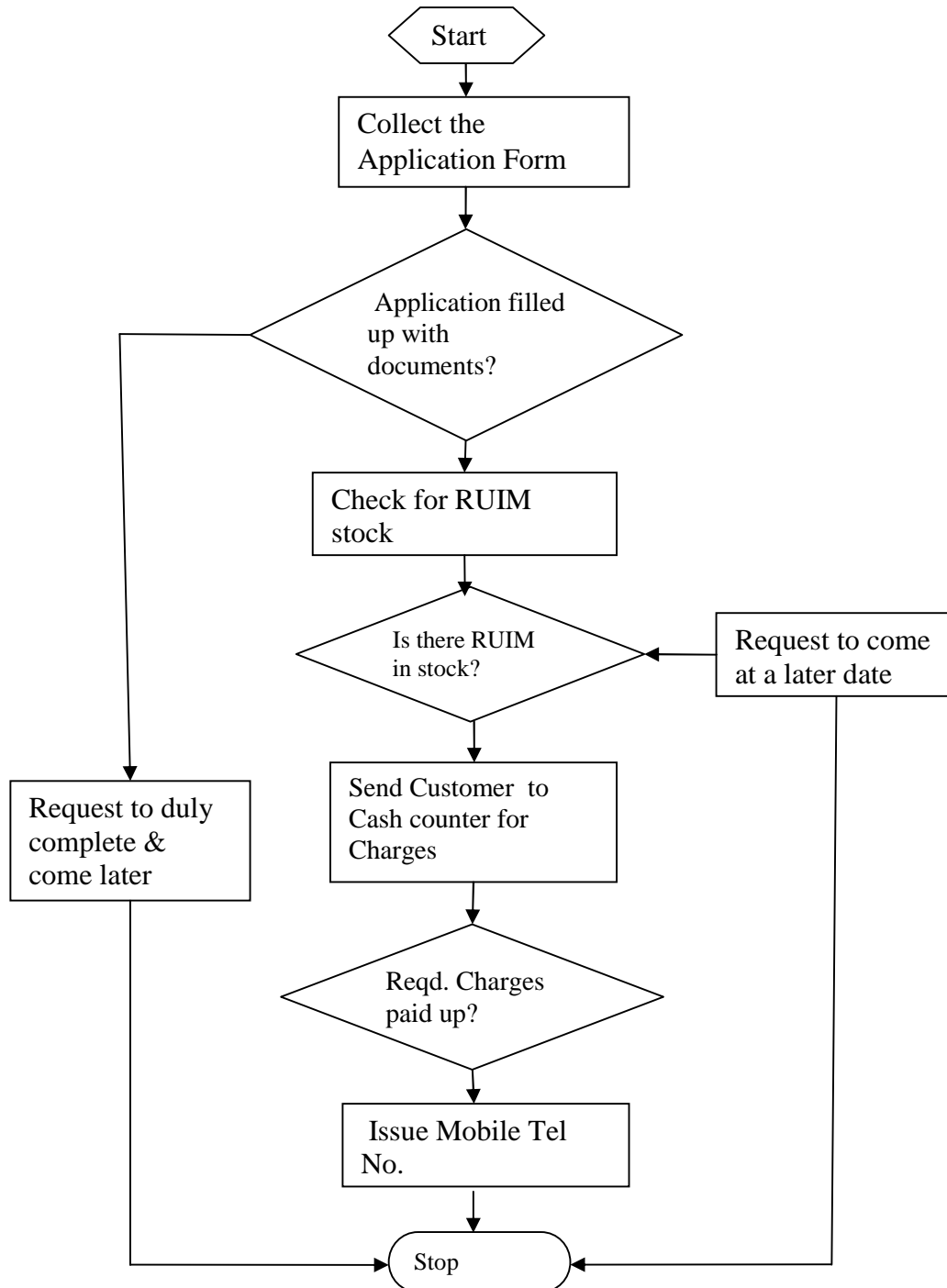
#### **4.7.4.1 Procedural Steps for WLL Line Distribution in UTL**

The distribution procedure is shown in charts 4.17, 4.18, 4.19 and 4.20. The procedural steps can be summarized in following points:

1. The customer care centre asks the customer to fill up an application form (annex-10). The customer needs to submit, generally, the following documents alongwith the application form:
  - a) A copy of citizenship for Nepali customer or a copy of passport for a foreign customer or copies of license and income tax registration certificate for organizations, government and non government offices.
  - b) Passport size photo of the customer.
2. The applicant contacts the sales section of the office along with the required documents. The sales section checks out for the sufficiency and validity of the documents. It also verifies if the applicant is black listed or not. If there is back dues due to discontinuity of bill payment on any line already issued to the applicant or his family members then he has to clear out the dues.
3. The sales section calculates for the installation, deposit and subscription charges and notifies to the client/ customer for payment within a certain time limit on the cash counter.
4. The customer needs to pay the fees/ charges as required by the company.

#### 4.7.4.2 Flowchart of WLL Line Distribution System in UTL

Chart:4.17 Flowchart for Distribution of Mobile RUIM in UTL



5. The sales section prepares the Line Installation Order form and produces before the office-in-charge for check if the proper amount of charge has been paid or not and issue installation order to the line installation section.

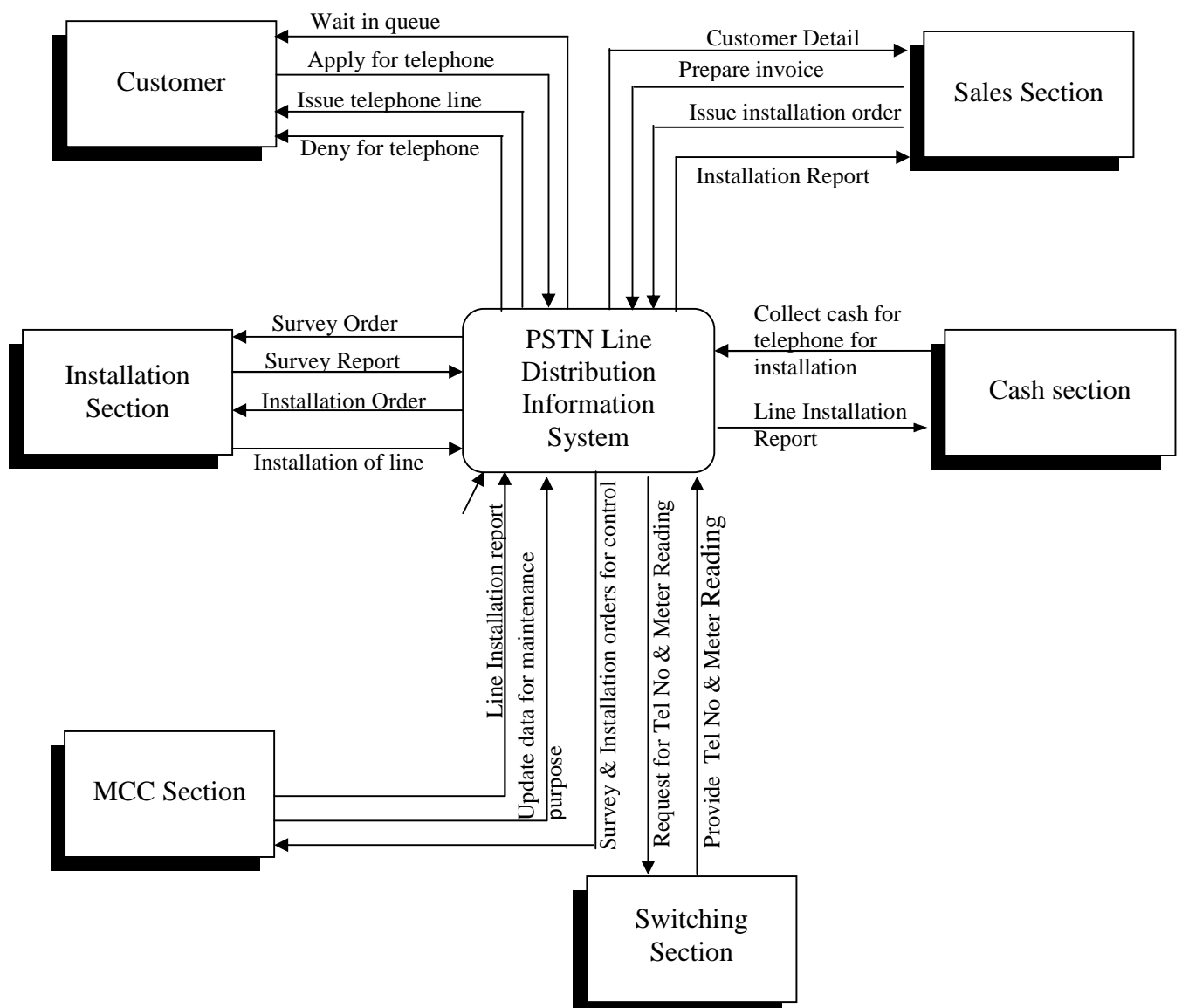


6. The customer contacts the installation section of the office.
7. The technical team of installation section collects the required set and other installation materials and gets the initial meter reading of the telephone number (sometimes it may not start from zero for several reasons like test number or returned/seized number) from the switching section.
8. The installation section prepares installation summary report and sends to the sales section for record keeping.

#### 4.7.4.3 DFD of Line Distribution System in UTL

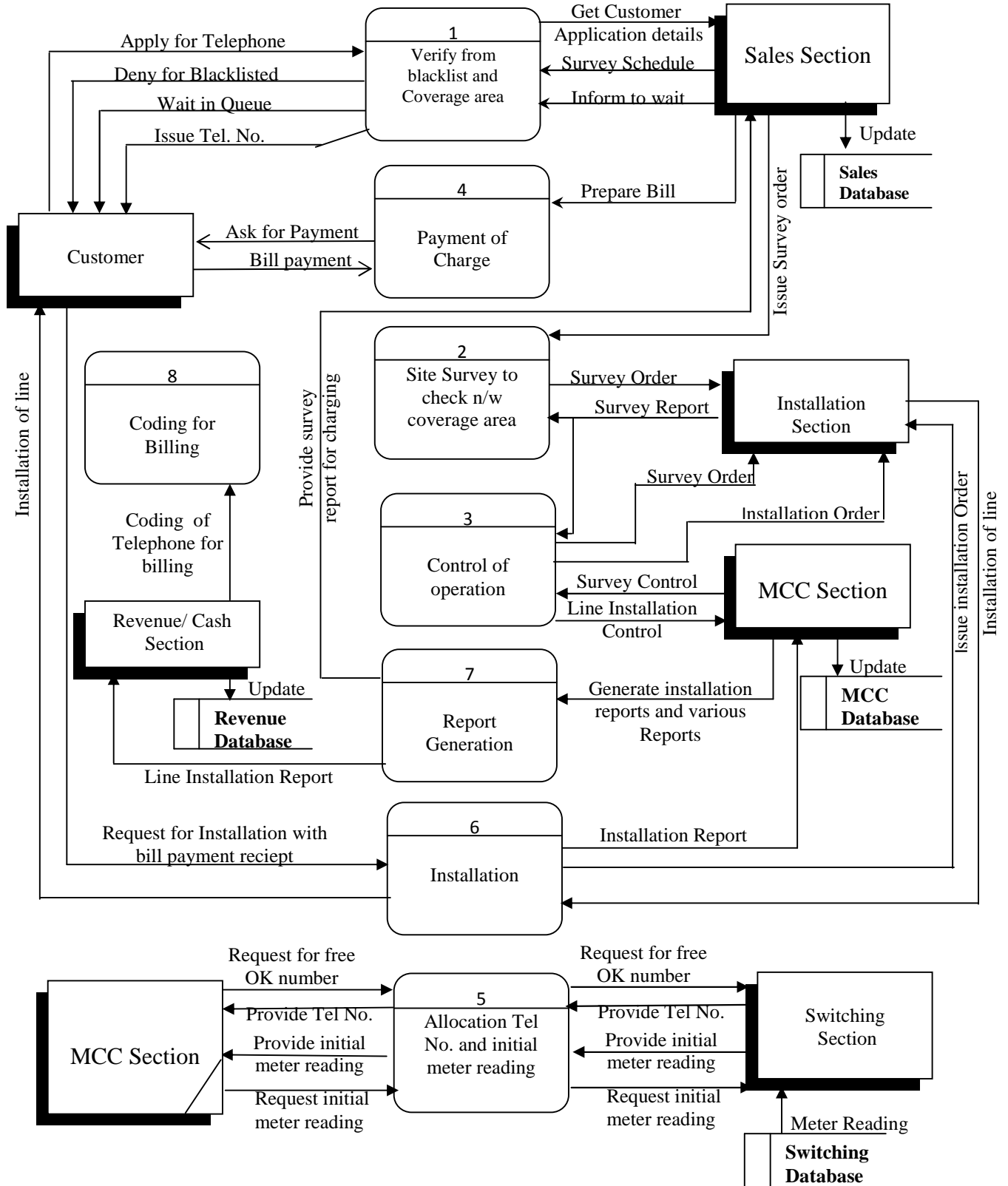
##### Context Level DFD in UTL

**Chart:4.18 Context Level DFD of Line Distribution System in UTL**



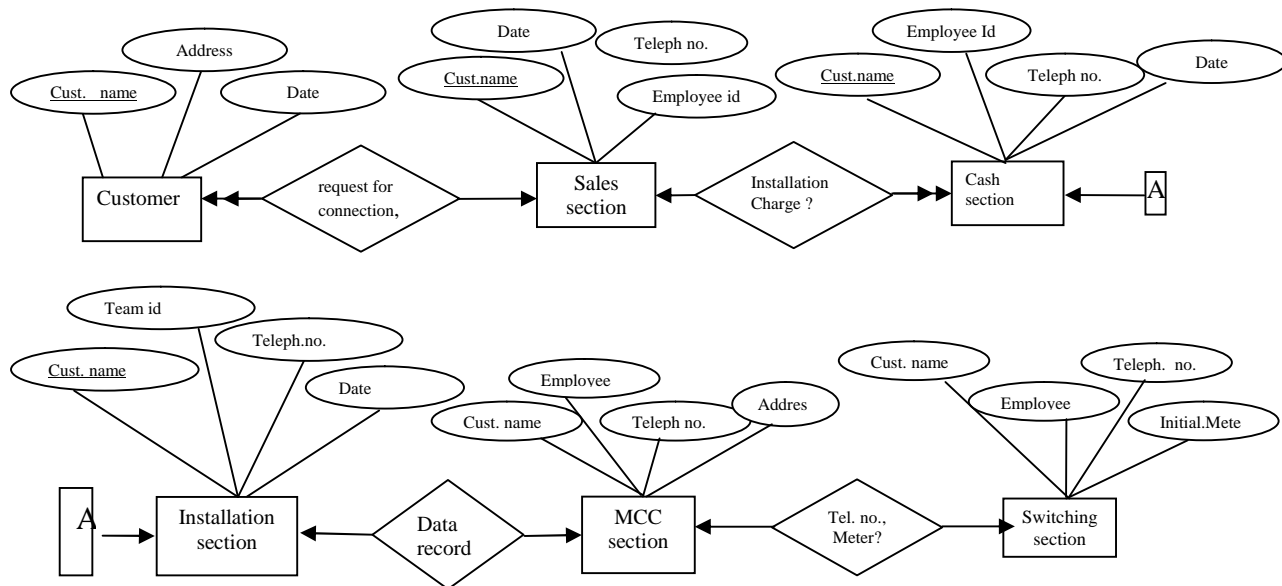
# System Level DFD in UTL

Chart:4.19 System Level DFD of Line Distribn Info System in UTL



#### 4.7.4.4 Entity Relationship Diagram (ERD) in UTL

Chart:4.20 ERD of Entities involved in CDMA Fixed Line Distribn of UTL



#### Data Dictionary System

The relationship between different entities have been shown in the ERD chart 4.20. The diagram depicts the relationships between different entities involved in the WLL telephone distribution system. From the diagram it is clear that *relation between customer and sales section is many: 1 relation* (so many customers contact one sales section) and so is the relation between customer and revenue section(counter). The relationship between sales section and technical section is 1:1. *Primary Key is the Customer name*. The various entities with attributes and types of data are shown in the table 4.30.

Table:4.30 Data Dictionary

Entity: Customer

S.N.	ATTRIBUTE	TYPE
1	Customer name	TEXT
2	Address	TEXT
3	Date	NUM

Entity: Sales Section

S.N.	ATTRIBUTE	TYPE
1	Customer name	TEXT
2	Employee Id	NUM
3	Date	NUM
4	Coding	NUM

Entity: Cash Section

S.N.	ATTRIBUTE	TYPE
1	Customer name	TEXT
2	Employee Id	NUM
3	Date	NUM
4	Telephone No.	NUM

Entity: Installation Section

S.N.	ATTRIBUTE	TYPE
1	Customer name	TEXT
2	Team Id	NUM
3	Date	NUM
4	Telephone No.	NUM

Entity: MCC section

S.N.	ATTRIBUTE	TYPE
1	Customer name	TEXT
2	Employee identity	NUM
3	Telephone number	NUM
4	Address of Teleph	NUM

Entity: Switching Section

S.N.	ATTRIBUTE	TYPE
1	Customer name	TEXT
2	Employee Id	NUM
3	Telephone number	NUM
4	Initial Meter	NUM

#### 4.7.5 Tariff Plans of UTL:

**Table:4.31 Domestic Tariff for HHT Prepaid/ Postpaid/ FWT Prepaid/ FWT**

S.N.	Call Type	Rate/ Pulse
1	UTL-UTL(any where in Nepal)	0.99
2	UTL to Other Networks (NDCL, Ncell, STM, Smart Tel) anywhere in Nepal	1.5

Tariff rates for local call within the lines of UTL and to lines of other operators are cheaper as shown in table 4.31. Tariff for ISD calls are shown in table 4.32. From the table it is seen that the tariff depends on the types of resources/ links; calling via '1220' code is cheaper than that of calling via '00' code. The tariff also varies according to time: busy hour or slack hour. The rates of UTL are cheaper in comparison to that of NT.

(Source:www.utlnepal.com)

**Table:4.32 ISD Tariff of UTL**

Time Slab	08:00-18:00		18:00-22:00, 6:00-8:00		22:00-6:00		Rate/Pulse
Countries	Rate/Min	Pulse	Rate/Min	Pulse	Rate/Min	Pulse	
With Dialling Code 1220							
USA, Canada, China, Singapore, HongKong	2.59	0	2.59	0	2.59	0	2.59
Thailand, Malaysia, S.Korea, Bangladesh & Macau	4	60	4	60	4	60	4
Bahrain	6	60	6	60	6	60	6
Taiwan & Pakistan	8	60	8	60	8	60	8
Sri Lanka, Japan, Russia, Kuwait	10	60	10	60	10	60	10
Saudi Arabia& Qatar	12	60	12	60	12	60	12
With dialling Code 00							
India	6	10	6	10	6	10	1
China	7	8.57	7	8.57	7	8.57	1
USA, Canada, Malaysia, Singapore & Hongkong	8	7.5	8	7.5	8	7.5	1
SAARC except India	15	4	15	4	15	4	1
Rest of the World	15	4	15	4	15	4	1

## 4.8 Comparison of Quality of Service

### 4.8.1 QOS Offered by the Companies in India

Comparative Performance of Telecom Service Providers in Delhi Service Area, Key Quality of Service Parameters for Quarter Ending September 2011 as recorded according to Telecom Regulatory Authority of India, Mahanagar Doorsanchar Bhavan for mobile and fixed land lines are shown in tables 4.33 - 4.37 and charts 4.21-4.25.

**Table:4.33 QOS of Cellular Mobile Telephone Service in India**

Name of Service Provider	QoS Parameters (Benchmark)				
	Base Stations Accumulated downtime: Non availability of network in a month in % (=2%)	Accessibility: % of calls made by subscribers and successful within operator's network (=95%)	Connection Maintenance (Retainability) Call Drop Rate %age of established calls getting disconnected due to network problems (=2%)	% age of call with good voice quality (=95 %)	Resolution of billing/ charging complaints resolved within 4 weeks (100% within 4 weeks)
Aircel	0.15	98.03	0.91	97.22	100.00
Bharti Airtel	0.01	99.86	0.64	99.00	100.00
Etisalat	0.01	97.99	1.52	96.02	100.00
Idea	0.11	99.63	0.85	98.09	100.00
MTNL	0.43	97.36	1.68	97.86	100.00
MTNL-CDMA	1.63	98.78	1.69	98.87	100.00

**Table:4.34 QOS Basic Telephone Service (Wire line) in India**

Name of the service provider	QoS Parameters (Benchmark)			
	Fault incidence: No of faults per 100 subscribers per month (=5)	Fault Repair: % of fault repair within one day of booking (=90%)	Mean Time to Repair: the average time taken to repair a fault. (=8 Hrs)	Resolution of billing/ charging complnts: % of billing resolved within 4 weeks (100% within 4 weeks)
Bharti Airtel	2.14	96.05	5.77	89.32
MTNL	6.06	81.05	7.10	92.08
RCOM	0.33	100.00	2.22	100.00
TTSL	0.23	85.81	15.07	100.00

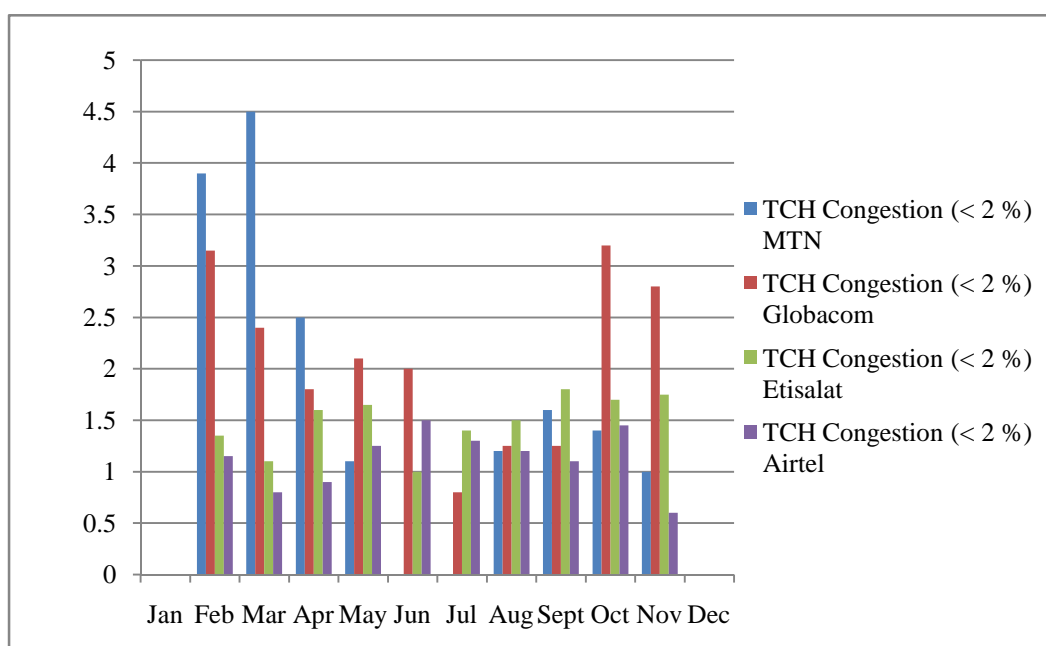
- ) \*The audited data pertains to the audit period July'11 to Sept'11
- ) (Issued in Public Interest by TRAI)

## Key Performance Indicators Comparison of GSM in India

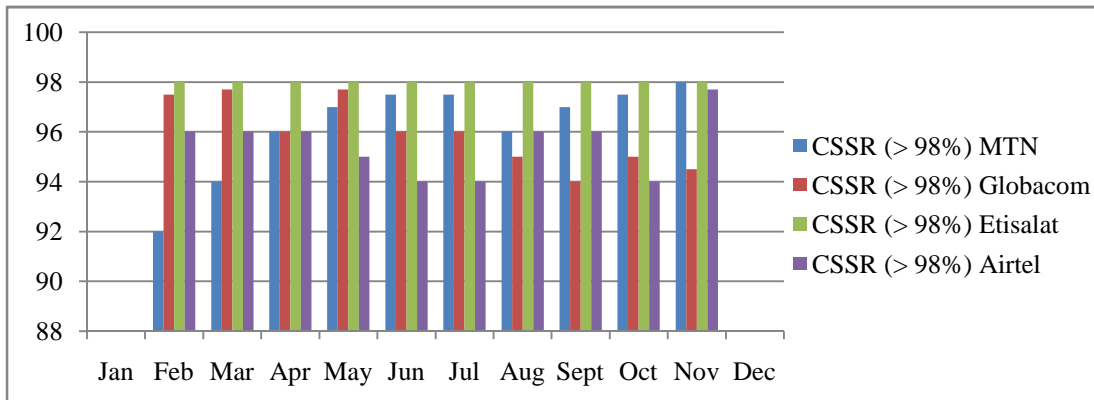
**Table:4.35 KPI Comparison of MTN, Globacom, Etisalat and Airtel, India**

Month	CSSR (> 98%)				TCH Congestion (< 2 %)			
	MTN	Globacom	Etisalat	Airtel	MTN	Globacom	Etisalat	Airtel
Jan								
Feb	92	97.5	98	96	3.9	3.15	1.35	1.15
Mar	94	97.7	98	96	4.5	2.4	1.1	0.8
Apr	96	96	98	96	2.5	1.8	1.6	0.9
May	97	97.7	98	95	1.1	2.1	1.65	1.25
Jun	97.5	96	98	94		2	1	1.5
Jul	97.5	96	98	94		0.8	1.4	1.3
Aug	96	95	98	96	1.2	1.25	1.5	1.2
Sept	97	94	98	96	1.6	1.25	1.8	1.1
Oct	97.5	95	98	94	1.4	3.2	1.7	1.45
Nov	98	94.5	98	97.7	1	2.8	1.75	0.6
Dec								

**Chart:4.21 Performance of TCH Congestn of MTN, Globacom, Etisalat and Airtel**



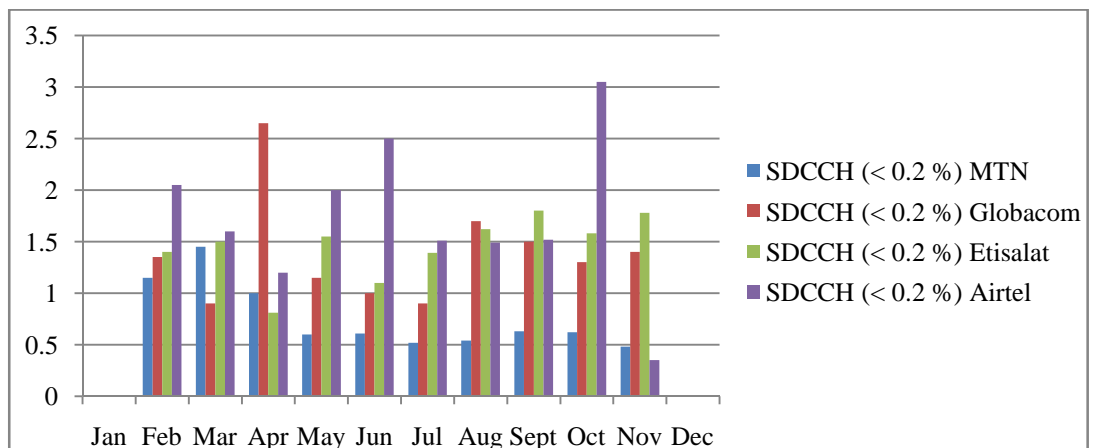
**Chart:4.22: Performance of CSSR of MTN, Globacom, Etisalat and Airtel**



**Table:4.36 KPI of MTN, Globacom, Etisalat and Airtel co.s of India**

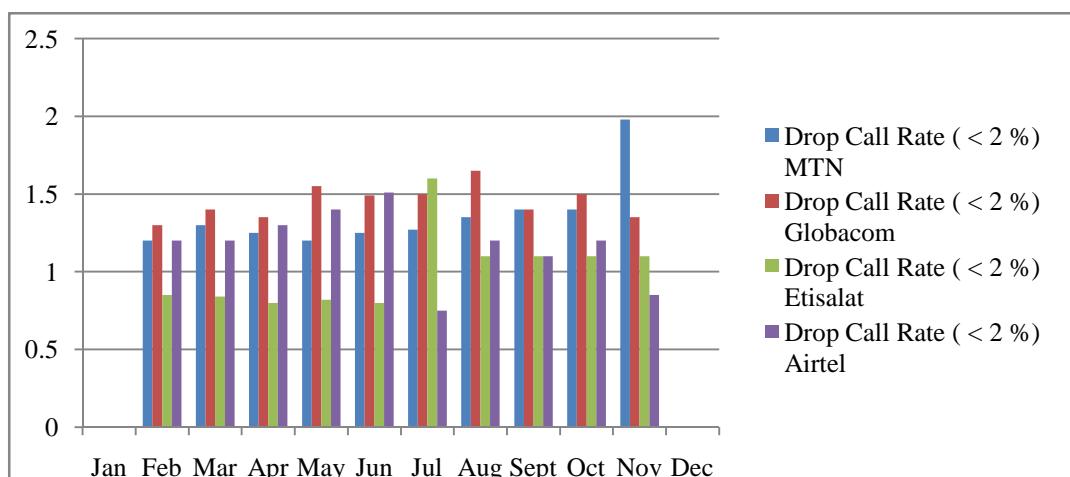
Month	SDCCH (< 0.2 %)				Drop Call Rate (< 2 %)			
	MTN	Globacom	Etisalat	Airtel	MTN	Globacom	Etisalat	Airtel
Feb	1.15	1.35	1.4	2.05	1.2	1.3	0.85	1.2
Mar	1.45	0.9	1.5	1.6	1.3	1.4	0.84	1.2
Apr	1	2.65	0.81	1.2	1.25	1.35	0.8	1.3
Jun	0.61	1	1.1	2.5	1.25	1.49	0.8	1.51
Jul	0.52	0.9	1.39	1.51	1.27	1.5	1.6	0.75
Aug	0.54	1.7	1.62	1.49	1.35	1.65	1.1	1.2
Sept	0.63	1.5	1.8	1.52	1.4	1.4	1.1	1.1
Oct	0.62	1.3	1.58	3.05	1.4	1.5	1.1	1.2
Nov	0.48	1.4	1.78	0.35	1.98	1.35	1.1	0.85

**Chart:4.23: Performance of SDCCH of MTN, Globacom, Etisalat and Airtel**





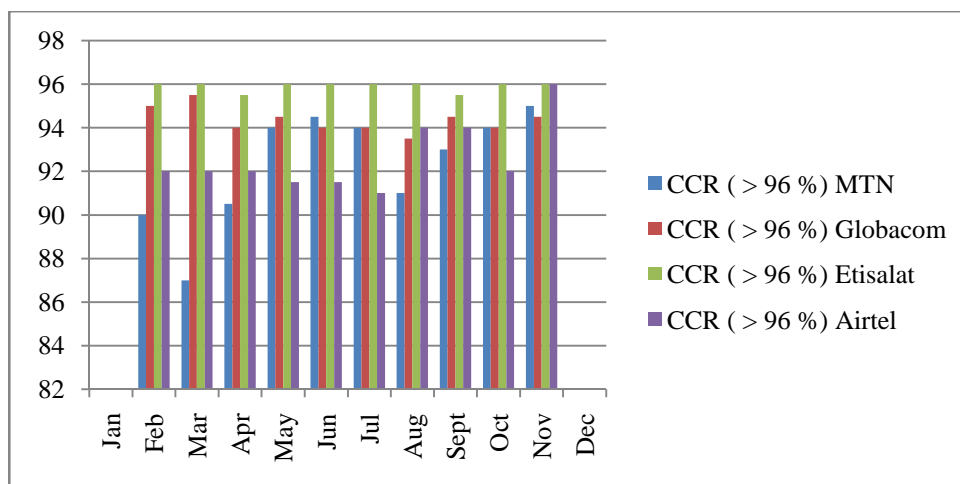
**Chart:4.24 Performance of CDR of MTN, Globacom, Etisalat and Airtel**



**Table:4.37 KPI of MTN, Globacom, Etisalat and Airtel co.s of India**

Month	CCR (> 96 %)				Month	CCR (> 96 %)			
	MTN	Globacom	Etisalat	Airtel		MTN	Globacom	Etisalat	Airtel
Feb	90	95	96	92	Jul	94	94	96	91
Mar	87	95.5	96	92	Aug	91	93.5	96	94
Apr	90.5	94	95.5	92	Sept	93	94.5	95.5	94
May	94	94.5	96	91.5	Oct	94	94	96	92
Jun	94.5	94	96	91.5	Nov	95	94.5	96	96

**Chart:4.25 Performance of CCR of MTN, Globacom, Etisalat and Airtel**



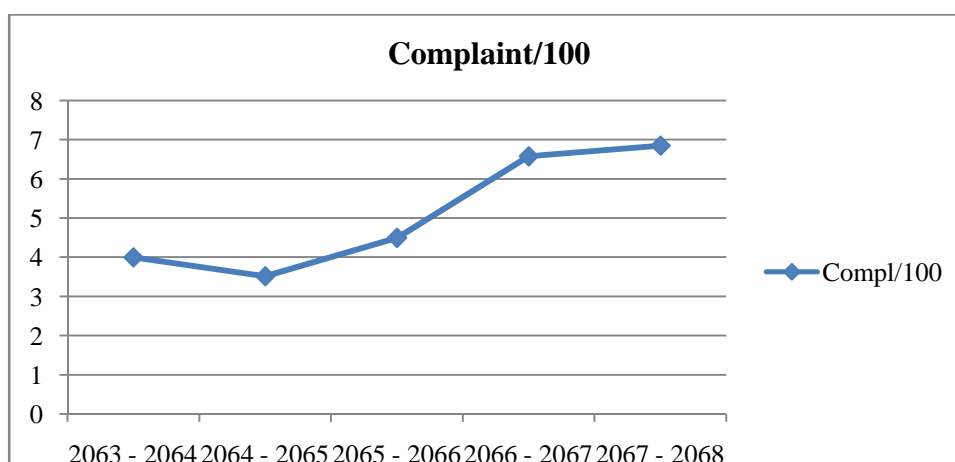
## 4.8.2 Quality of Fixed Line Service in Nepal

Fixed line is provided by two technology – PSTN (wireline) and WLL (wireless). 72.56% of fixed line is served by PSTN system. The quality of service of PSTN line is measured by the fault complain per hundred subscriber. Nepal Telecom is the dominant provider of PSTN fixed line with 99.06% market share. Accounting the WLL technology fixed line NT has 90.06% share in fixed line. Standard for fault per hundred subscriber has been fixed at 8 lines per hundred subscriber by NT. The fault rate in ERD and BRD can be seen to be within standard from the tables 4.38 & 4.39. However, the fault rate/ complaint rate is on increase that indicates that quality of service is on decreasing trend. Fault rate in the Birganj region has exceeded the limit! Due to decrease in quality of service PSTN lines were being returned back from F.Y.2064 upto F.Y.2067. The decrease in PSTN quality is thought to be due to network getting old and escaping tendency of technicians. The data for quality of service of PSTN in eastern and central region of Nepal can also shown by graph 4.2 & 4.3. Data was not available for F.Y. 2064/65 which has distorted the actual picture.

**Table:4.38 Fault Rate of PSTN Lines under ERD**

F.Y	Compl/100	F.Y	Compl/100
2063 – 2064	4	2066 – 2067	6.58
2064 – 2065	3.52	2067 – 2068	6.85
2065 – 2066	4.50		

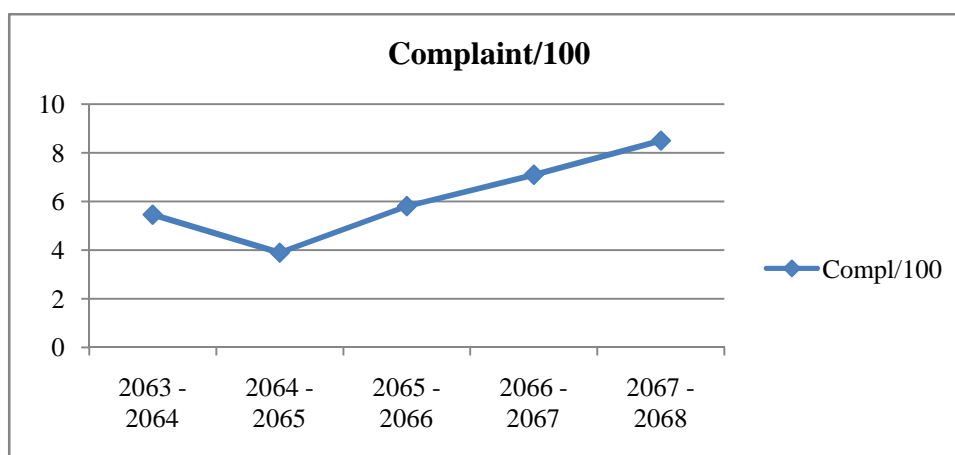
**Graph:4.2 Fault Rate of PSTN Lines under Eastern Reg Directorate**



**Table:4.39 Fault Rate of PSTN Lines under Birganj Reg Directorate**

F.Y	Compl/100	F.Y	Compl/100
2063 – 2064	5.46	2066 – 2067	7.10
2064 – 2065	3.90	2067 – 2068	8.50
2065 – 2066	5.81		

**Graph:4.3 Fault Rate of PSTN Lines under Birganj Reg Directorate**



Compared with the performance of other operators in the neighbouring countries (table 4.34) it is seen that Nepal is quite behind in QOS of wire line (land line). The fault rates of Bharti Airtel, MTNL, RCOM and TTSL were seen to be 2.14, 6.06, .33 and .23 respectively where as that of NT (table 4.38 & 4.39) were seen between 3.5 and 8.5. Similarly the percentage of faults repaired within 24 hrs were found to be between 81 and 100 where as that of NT between 10 and 25% only!

### **4.8.3 Quality of Mobile Service in Nepal**

The mobile service is provided using two technology in Nepal – GSM and CDMA. The quality of GSM as well as CDMA mobile service can be evaluated in terms call drop rate, paging response, call completion ratio and answer seizure ratio.

#### **4.8.3.1 Quality of GSM mobile Service**

There are two operators using GSM technology for mobile service – NT and Ncell.

## Quality of NT mobile Service

The call drop rate should not exceed 5%- the lower the better. The call drop rate were seen to be below 2 in ERD that are within limit. Paging response are seen between 70% and 75% which were also more than the standard of 60% and this parameter was also met. Call completion ratio should be more than 50% for acceptable performance; the call completion ratio were found to be between 70 and 79 meeting the standard. ASR should be greater than 15% . ASR was 14.22 in F.Y. 2066-67 which was not acceptable but it was found to have met the standard in the F.Y.2067/68 (Table 4.40).

**Table:4.40 KPI Indicator of GSM Mobile Service in ERD**

F.Y.	Call Drop Rate( <5%)	Paging Response (>60%)	Call Completion Ratio (>50%)	ASR (>15%)
2066 – 2067	1.83	70.16	70.6	14.22
2067 – 2068	0.95	75.4	78.83	15.26

The QOS of GSM service of NDCL in BRD region was also seen to have met the standard according to the KPI report taken from Hetauda BSC of NT (Table 4.41).

**Table:4.41 KPI Indicator of GSM Service in Birganj Reg Directorate**  
[iBSC10 CDR KPI Weekly Report (Busy Hour: 18:00 to 19:00)]


	IBSC MEID	SDCCH in service rate (%)	SDCCH in congesti on rate (%)	TCH in service rate (%)	Hand over success rate(%)	TCH assign failure rate (%)	Call setup success rate	SD Assign Success Rate	TCH total traffic number (erl)
24-Jan-12	iBSC10(5)	85.54%	3.44%	80.10%	92.84%	2.10%	82.33%	96.28%	6398.785
25-Jan-12	iBSC10(5)	84.06%	3.89%	78.97%	92.53%	1.67%	82.95%	95.46%	6269.375
26-Jan-12	iBSC10(5)	89.52%	0.62%	84.25%	92.69%	1.84%	89.17%	96.22%	6292.588
27-Jan-12	iBSC10(5)	88.52%	0.93%	4.16%	91.13%	2.20%	87.85%	96.91%	6364.696
28-Jan-12	iBSC10(5)	86.35%	1.72%	82.69%	89.36%	2.37%	84.24%	96.81%	6254.793
29-Jan-12	iBSC10(5)	89.06%	0.85%	85.11%	91.92%	2.12%	87.30%	95.99%	6500.531
30-Jan-12	iBSC10(5)	88.98%	1.81%	84.97%	92.50%	1.99%	87.10%	96.68%	6165.68
31-Jan-12	iBSC10(5)	88.32%	2.60%	83.76%	91.64%	1.93%	83.01%	96.47%	6210.058

## Quality of Ncell GSM mobile Service

The table 4.42 & 4.43 give general views of certain parameters out of which TCH congestion rate, Handover success rate, Network availability, Drop out, Call set up rate reflects the quality of service of mobile line. The QOS of Ncell is seen OK.


**Table:4.42 General View of GSM Service of Ncell**

GENERAL VIEW			
Parameters	August		July
<b>Subscribers</b>			
Active (VLR)	3,377,595	▲	3,225,838
Registered (VLR)	4,455,261	▲	4,393,954
<i>(Average of whole day of 31<sup>st</sup> of August)</i>			
BSS Network Traffic, Erl (Daily Average)	944,988.69	▲	904,378.22
TCH Congestion Rate %, (Monthly NBH)	2.17	▼	2.81
Handover Success Rate %, (Monthly NBH)	97.18	▲	97.18
Network Availability, % (Daily Average)	97.78	▲	97.48
Call Attempts (Daily Average)	84,086,038	▲	81,871,474
Drop per Erlang, NBH (Monthly NBH)	0.41	▼	0.51
Average Conversation Time(sec), NBH (Monthly NBH)	28	▼	161



**Table:4.43 General View of GSM Service of Ncell**

GENERAL VIEW			
PERFORMANCE SUMMARY-NETWORK			
RNC	August		July
CS Traffic (E) (Monthly Sum)	843,982.67	▲	795,781.95
Total PS DL Payload (MB) (Monthly Sum)	11,848,988.42	▲	10,546,203.75
PS UL Payload (MB) (Monthly Sum)	3,150,667.82	▲	2,815,019.95
HSDPA payload (VB) (Monthly Sum)	11,183,697.82	▲	10,091,828.41
HSDPA Data Rate (Kba) (Monthly NBH)	1101.4	▲	1041.71
Rate of CS Call Drop (%) (Monthly NBH)	0.17	▼	0.18
Rate of PS Call Drop (%) (Monthly NBH)	0.35	▼	0.58
Rate of PS-HSDPA Call Drop (%)	NA		NA
Rate of successful CS RAB establishment (%) (Monthly NBH)	99.79	▲	98.42
Rate of successful PS RAB establishment (%) (Monthly NBH)	99.34	▲	98.98
Rate of successful PS RAB establishment (HSDPA) (%) (Monthly NBH)	99.89	▲	99.39
Rate of successful RRC connection establishment (%) (Monthly NBH)	NA		99.74
Blocking Rate of RAB (%) (Monthly NBH)	0.48	▼	0.64



NA changed due to 2G/3G upgrade. No Rate of successful RRC connection establishment (%) (Monthly NBH)

## Performance of 2 G Network of Ncell

Availability of 2G service of Ncell in the month of August 2011 has been recorded as in graph 4.4. The graph indicates that 2G performance of Ncell is OK.

**Graph:4.4 2G Network Availability of Ncell**

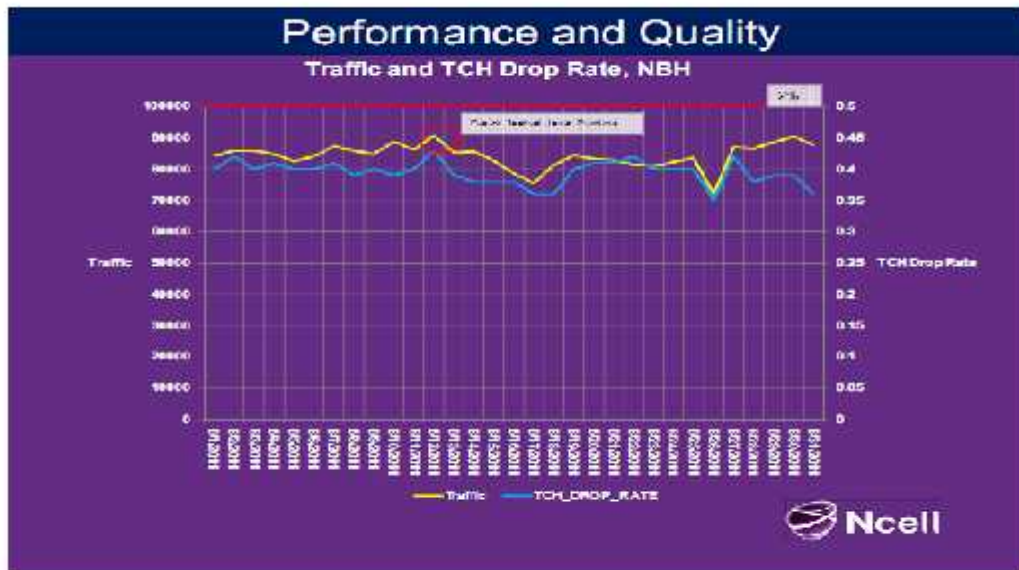


The standard for availability has been fixed between 93% and 99%. On 2 days network availability was seen to be 96%. Thus the network availability for 2G service can be taken as OK. Lower values (marked in red circles) were due to transmission and MUX card problems.

## Performance of GSM mobile service of Ncell

Traffic and TCH drop rate indirectly indicates the performance of the service. When the signal strength is low or there is hardware problem due to failure of cards or there is bad connection (loss of signal/ high error rate) the traffic channel is released and the call is dropped and consequently the traffic is also dropped. Maximum TCH drop rate is fixed at 2% and maximum traffic is fixed at 10,000 Erlang in Ncell. The graph 4.5 shows the TCH drop rate in Ncell and is within standard of 2%.

**Graph:4.5 Traffic and TCH Drop Rate in Ncell**



**Data Service of Ncell**

Performance of GSM Mobile Data Service of Ncell in the month of August of 2011 AD has been produced in graph 4.6 . Speed recorded during the month varied from about 1055 kbps to 1135 kbps. Data service has become very essential part of our requirement. Speed made available may be taken to be OK.

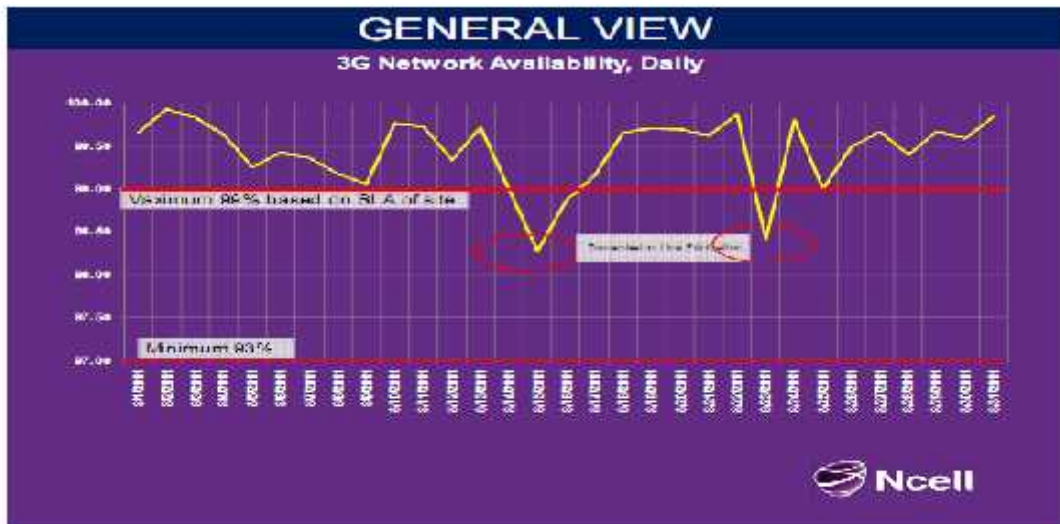
**Graph:4.6 Performance and Quality of Data Service**



## Performance of 3G Service of Ncell

Availability of any service is important for its performance and quality. Availability of 3G service of Ncell in the month of August 2011 has been recorded and shown in graph 4.7. On 2 days network availability was seen below 99%. Thus the network availability for 3G service can be taken as OK.

**Graph:4.7: 3G Network Availability of Ncell**



**Graph:4.8: 3G Performance and Quality of Ncell**



The graph 4.8 shows that the call drop rate is below the std 2% and Call set up success rate is above 98%(std) value for 3G service which are OK.



No MIS publication seen Ncell. MIS is so helpful for the employees at all levels to perform as well as evaluate their works. Mismatches, deficiencies in the different resources can be found out easily and in time.

## Comparison of GSM Mobile Service of Operators in Nepal

Mobile telecommunications service based on GSM technology is being operated by NT and Ncell. The quality parameters (Key Performance Indicators,KPIs) of the GSM mobile service of both the companies were compared and are put in the table 4.30. This shows that quality of service of Ncell is better than that of NT.

**Table:4.44 Comparison of QOS between Ncell and NT**

Call Set up Success Rate (>98%)		Handover Success Rate		Call Drop Rate (<5 %)		TCH Congestion Rate (<2%)	
Ncell	NT	Ncell	NT	Ncell	NT	Ncell	NT
99.42	85.64	97.18	91.75	0.58	0.95	2.17	2.05

Comparing the performance of mobile service with that in India (table 4.33, tables 4.35, 4.36 & 4.37 and graphs 4.21- 4.25) it is found that call set up success rate of MTN, Globacom, Etisalat and Airtel companies in India lies between 95.5% and 98%. NT doesn't compete in this parameter and has to improve. Similarly, call drop rate in the above Indian operators lies in between 1.011% and 1.727%. Ncell and NT both have less than 1% call drop rate and can be said to be better. Similarly, TCH congestion rate of above Indian operators ranges from 1.125 to 2.075 and NT and Ncell have this rate more than 2% as seen from table 4.44 which is NOK.

Comparing the performance of mobile service with that of Celtel, MTN, Glo and M-Tel companies of Nigeria it is seen that their CSSR are 57.3%, 85.9%, 94.1% and 89.9% respectively. Similarly, their CDR are 64%, 67%, 64% and 71% respectively. Likewise, their CCSR are 36%, 33%, 36% and 29% respectively. Looking over these figures, QOS of mobile service can be taken as better in Nepal.

*(Source:www.jiti.net)*

### 4.8.3.2 Quality of CDMA service

NT and UTL provide mobile service based on CDMA technology. The quality of CDMA service can also be evaluated in terms call drop rate, paging response, call completion ratio and answer seizure ratio and the standards are same as for GSM. The CDMA service of NT has met the standard and the quality of service is OK. The relevant data can be seen in table 4.45.

Data for quality of service could not be obtained from UTL. It can be judged from feedback of the informants contacted that is mentioned under field survey result.

**Table:4.45 Quality of CDMA mobile Service in ERD of NDCL**

F.Y.	Call Drop Rate (<5%)	Paging Response (>60%)	Call Completion Ratio (>50%)	ASR (>15%)
2066 – 2067	2.08	90.43	73.94	22.39
2067 – 2068	2.17	91.5	79.3	24.74

## 4.9 Comparison of Tariff Rates

### 4.9.1 Tariff Rates in Other SAARC countries

#### Tariff Rates in Sri Lanka

**Table:4.46 Typical Tariff Rates in Sri Lanka**

Company	Scheme	Call Type	Rate (Home)		Rate(Office)	
			Active Hr	Leisure Hr	Upto 3 <sup>rd</sup> min.	Beyond 3 <sup>rd</sup> min.
Sri Lanka Telecom	Voice only	SLT to SLT	1.90	1.00	1.90	1.00
		SLT to Other	2.90	2.00	2.90	2.00
	Voice+BB Internet or TV	SLT to SLT	1.70	1.00	1.70	1.00
		SLT to Other	2.70	2.00	2.70	2.00
	Voice+BB internet + TV	SLT to SLT	1.50	1.00	1.50	1.00
		SLT to Other	2.50	2.00	2.50	2.00

## Tariff Rates in India

**Table:4.47 Typical Tariff Rates in India**

Vodafone	Type of Service	Charges	Type of Service	Charges
India	Local OG	1.00	Satellite Calls	550
	STD OG	1.50	USA, SE Asia, UK	6.4
	SMS(National/ International)	1.5/3.45	China, Russia, S.Africa, Egypt	10
	Incoming	1.00	OG Vodafone to Vodafone	0.015
	To Landlines	0.02		

The table 4.47 shows there is great variation in tariff rates of STD and ISD calls via satellite where as Local calls are very cheap in India.

### Tariff Regulation in Pakistan

Pakistan Telcommunication Authority (PTA) has set a cap of PKR500 and PKR750 respectively for new wireline connection charges in rural and urban areas respectively, with monthly line rental at maximum of PKR199. The PTA has also capped calling rates, with calls to on-net and off-net fixed line numbers to be set at PKR1 per minute and PKR2 per three minutes respectively. Lon-distance calls have to be charged no more than PKR1 per minute (on-net) or PKR2 per minute (off-net). Fixed to mobile calls have to be charged at no more than PKR2.50 for both local and long-distance calls.

### Tariff Regulation in Bangladesh

In Bangladesh, liberalization of the mobile phone sector led to large increases in the accessibility of telecommunications to consumers due to low tariff costs. Bangladesh Telecommunication Regulatory Commission (BTRC) has been able to fix call charges for all cellular phone operators and has been able to bring all the companies under a uniform regulatory framework. Average tariff rate year wise can be seen in Table 4.1 (Article 4.2.1). The tariff rate is clearly seen to be decreasing year after year.

## 4.9.2 Comparison of Tariff in Nepal

### 4.9.2.1 Comparison of Local and Domestic Call Tariff

**Table:4.48: Comparison of Local and Domestic Call Tariff**

Company		Rate (Rs./min)		Rate Rs./min)
UTL	UTL – UTL	0.99	UTL- Other NW	1.5
NT	NT – NT (PSTN, Postpaid)	1.00	NT GSM Prepaid – Ncell	2.5
	NT – NT(GSM Prepaid)	1.50	NT GSM/CDMA Prepaid – UTL	2.6
	NT – Prepaid CDMA	1.80	NT GSM/CDMA Prepaid – STM	3.6
			NT GSM/CDMA Prepaid –SmartTel	3.6
Ncell	Ncell – Ncell	1.99	Ncell - NTC GSM/CDMA	2.53
			Ncell - other nw fixed lines local	2.13
			Ncell- other nw within diff. zone	2.81
			Ncell - LMS in diff. charging area	2.83

Looking over the tariff table 4.48 for local and domestic calls, Ncell is seen comparatively costlier although it has not been criticized seriously yet by the people. Rates of National/ STD and International ISD calls have gone down tremendously compared to the past times when there was no competition and no VOIP telephone service. However, comparing among NT, Ncell and UTL, UTL is seen to be selling service at cheaper price although UTL is not able to compete in the market. NT's ISD service rate is costlier than that of Ncell's although for some destinations Ncell's rate is higher. Whatever may be, overall telephone call rates are cheaper in Nepal.

### 4.9.2.2 Comparison of Data Packages' Tariffs

**Table:4.49: Comparison of Data Package among NT, Ncell and UTL**

S.N.	Package	NT	Ncell	UTL
1	500 MB		Rs. 399	
2	1000 MB		Rs. 699	
3	3000 MB	Rs. 660		
4	5000 MB	Rs. 660	Rs. 1999	

The data service of NT is seen cheaper as compared to that of Ncell from table 4.49. In fact, quality of service does matter most.

#### 4.9.2.3 Comparison of International call (Premium Rate)

**Table:4.50 Comparison of ISD Call Rates among NT, Ncell and UTL**

S.N.	Country	Rate in Rs. Per minute		
		NT	Ncell	UTL
1	USA	8	1.99	2.59
2	Canada	8	1.99	2.59
3	India	6	2.99	2.59
4	China	8	6	2.59
5	Singapore	8	6	2.59
6	Hongkong	8	6	2.59
7	Thailand	12	6	4
8	Malaysia	8	6	4
9	S.Korea	12	6	4
10	Bangladesh		6	4
11	Bahrain	12	6	6
12	Pakistan		15	8
13	Sri Lanka		15	10
14	Japan	12	15	10
15	Kuwait	12	15	10
16	Saudi Arabia	12	6	12
17	Qatar(New)	12	15	12
18	UAE	12	15	

The premium tariff rates for international calls of UTL are cheaper than that of Ncell and NT. The NT's rate are costlier as seen from the table 4.50.

#### 4.9.2.4 Comparison of International Call (Normal Rate)

**Table:4.51 Comparison of International Call Tariff**

S.N.	Country	Rate in Rs. Per minute		
		NT	Ncell	UTL
1	USA	30		8
2	Canada	30		8
3	India	12		6
4	China	30		7
5	Singapore	30		8
6	Hongkong	30		8
8	Malaysia	30		8
10	Bangladesh	12		15
11	Pakistan	12		15
12	Sri Lanka	12		15
13	Japan			15
14	Bhutan	15		
15	Maldives	40		
16	Afghanistan	24		

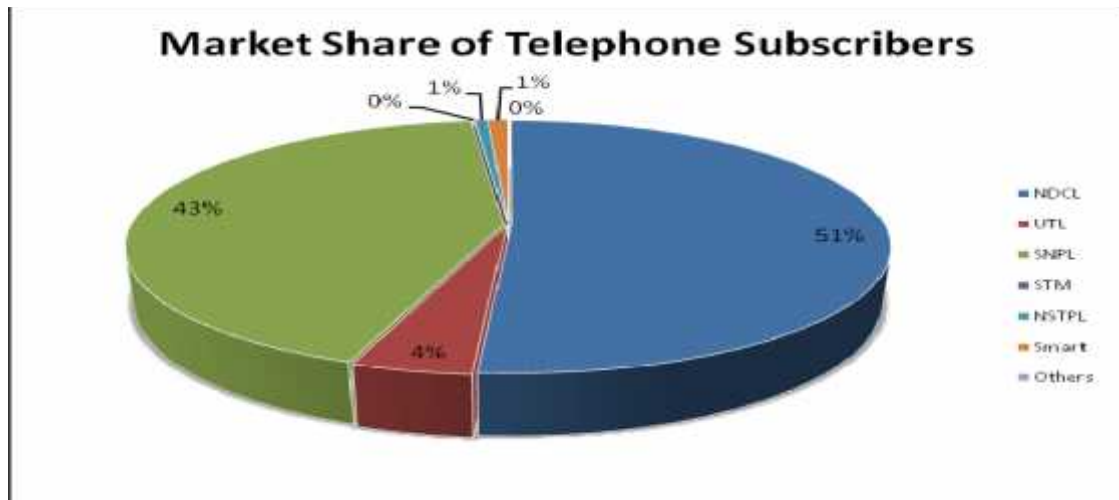
The table 4.51 shows the normal tariff rate for international calls of UTL are cheaper than that of NT. Data for Ncell was not available.

#### 4.10 Comparison of Subscriber Base of NT, Ncell and UTL

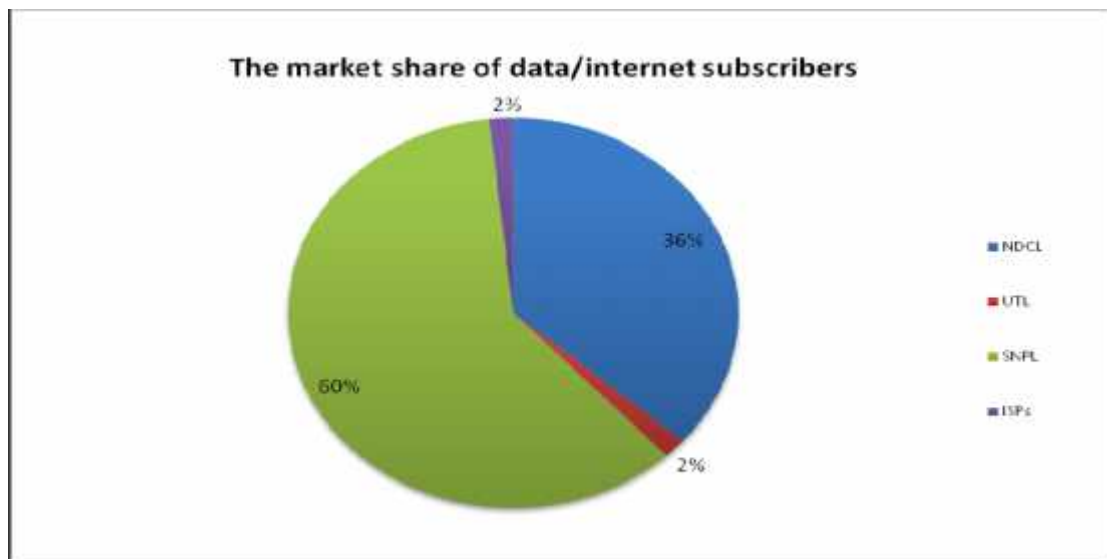
Position of different telecom service providers based on the number of their telephone subscribers (market share) irrespective of the technology type can be seen from the chart 4.26.

Similarly market share of the data/internet business in the country of the major operators – NDCL, UTL, Ncell (SNPL) and ISPs (all 26 combined) can be visualized by Chart 4.27.

**Chart:4.26 Market Share of Teleph Subscr of Various Operators in Nepal**



**Chart:4.27 Market Share of Data/ Internet Subscribers in Nepal**



From the charts 4.26 & 4.27 it is seen that Nepal Telecom is number 1 in voice communication service (51% market share) whereas No.2 in data service (36% market share). Similarly, Ncell is No.1 service provider in data communication service (60% market share) whereas No.2 in voice telephony (43% market share). UTL is far behind the other two operators with only 4% share in voice and 2% in data service.

## **4.11 Study Results of Status of Telecom Service in the Country**

### **4.11.1 Study Results from Secondary Data Analysis**

#### **Fixed Telephone Service**

The number of Fixed telephones per 100 inhabitants (average of years 2005-10) in poor countries of Africa is very less (1.5 ) whereas that of comparatively richer and developing Arab countries, Asia & Pacific countries, developed American and European countries are more 9.7,15.15, 30 and 43 respectively. The number fixed of telephones per 100 inhabitants in Nepal was 2.93 in July,2011.This fixed teledensity for India, Bangladesh, Pakistan and Sri Lanka are 2.87, .61, 1.97 and 17.15 respectively (2010 ITU data). The demand of fixed telephone has decreased and the existing data is not unsatisfactory for Nepal.

Number of faults per 100 subscribers was from 2.14 to 6.06 (in July 2011) and 81 to 100% faulty lines were maintained within one day in India. In Nepal, number of faults per 100 subscriber is about 8 and only 20 to 25 % lines are maintained within one day which indicates how poor is the QOS of PSTN lines here.

#### **Mobile Telephone Service**

The number of Mobile telephones per 100 inhabitants (average of years 2005-10) in poor countries of Africa is very less (27.4 ) whereas that of comparatively richer Arab countries, Asia & Pacific countries, developed American and European countries are more 55.2,42.8, 75 and 109.8 respectively. The number of Mobile telephones per 100 inhabitants in Nepal is 40.59. The mobile teledensity for India, Bangladesh, Pakistan and Sri Lanka are 61.4, 46.2, 57.14 and 83.22 respectively (2010 ITU data). The demand of mobile telephone is very high every where. The demand of mobile telephone in Nepal has also not been met. Call set up success rate and Traffic Channel congestion rates do not meet the standard. QOS has to be improved.

#### **Data/ Internet Service**

Usage of internet service is less in poor and developing countries and more in rich and developed countries. In developed and developing countries internet user was



71.6% and 21.1% respectively. In Asia and Pacific countries there are 21.9% internet users (ITU data 2010). In Nepal there are 10.89% internet users.

*(Source: NTA MIS 2011, July)*

The data figures depicting the above facts is attached as Annex 1: Key Global Indicator for World Telecommunication Service Sector.

### **Telecom Sector in General**

Further it is also revealed from the data in Annex- 1 that mobile telephone line is getting more and more popular and the fixed telephone line is facing decreasing trend.

Tariff rate of telephone service is on continuous decrease all over the world.

Development of telecom infrastructure directly affects development of the country and is reflected in GDP. According to a study in Bangladesh an increase of 10 mobile phones per 100 people boosts GDP growth by 0.6 %. A 1 % increase in the number of internet users increases total exports by 4.3 %. Telecom sector contributes approximately 1.46 % of national GDP and its significant proportion is contributed by mobile sector.

The population of Bangladesh is 140.4 million and there are 562 licensee out of which 6 are for mobile telephone, 8 for PSTN telephone and 159 internet and data services. India, about 20 times bigger than Nepal in area, has 11 cellular mobile operators and 4 Fixed telephone operators. Sri Lanka has 64 system licensees. Nepal a smaller country with population of 28.6 million has 293 licensee out of which 3 are for basic telecom service and 2 for cellular mobile and 48 for internet & e\_mail service. This indicates that there is need to increase QOS and not the number of operators now.

#### **4.11.2 Study Results from Primary Data Analysis**

Stratified Random Sampling method was used. Here the population is systematically segmented under various strata prior to the selection of samples at random. It was done to get correct picture by collecting data from rural as well as urban population areas.

Codified and Uncodified both types of Structured questionnaire were used in the field survey to collect data. Altogether 175 persons were requested to respond to the questionnaire regarding their views on the quality of services of the various companies in Nepal. The questionnaire used in the survey is attached as Annex-11.

Sample Size: 175

**Table:4.52 Telephone used Proportion by the Respondent Subscribers**

S.N.	Service Type	NT	Ncell	UTL
1	PSTN	97		
2	GSM Mobile	283	118	
3	CDMA Mobile	16		2
4	WLL			1
	Total Services Used from	396	118	3

The above data for ‘Telephone used proportion’ shows that people have used more services (396 points) from NT than that of Ncell (118 points) where as people have rarely used UTL services. Secondly, the data also indicates that GSM mobile is more prevalent than PSTN and CDMA mobile services. In fact, availability of PSTN service is limited to densely populated area and hence less users. Almost all users of PSTN service are also users of GSM and/or CDMA services.

**Table:4.53 QoS of diff. Co.s as Judged by the Respondent Subscrs**

S.N.	Service Type	OK	POK	NOK
1	NT PSTN	63	2	5
2	NT GSM	90	2	4
3	NT CDMA	10		
4	Ncell GSM	61		
5	UTL CDMA	3		
6	UTL WLL	1		

The above data for ‘Quality of Service’ shows that 63 out of 97 NT PSTN users, that is, 65% users have graded the NT PSTN service as of good quality.

Similarly, 32% (90 out of 283) users of GSM mobile were in favour of NT where as 51.69% (61 out of 118) were in favour of Ncell. Similarly, 62.5% (10 out of 16) of CDMA users had appraised the CDMA service of NT.

**Table:4.54 Network Status of the Co.s as Judged by the Respondent Subscrs**

S.N.	Service Type	OK	POK	NOK
1	NT PSTN	61		
2	NT GSM	88	3	10
3	NT CDMA	9		
4	Ncell GSM	85		3
5	UTL CDMA	4	1	4
6	UTL WLL	1		

The data for 'Network status' reveals that 63% (61 out of 97) users evaluate the network quality of PSTN network of NT to be high. Similarly 72% users accept the network quality of GSM network of Ncell to be OK whereas 31% (88 out of 283 points) users only accept the network quality of GSM of NT to be OK. The quality of CDMA network of NT is appraised as OK by 56% of the users. The quality of performance and network both of UTL are appraised as good but the availability of UTL services is very much limited so it cannot be treated as real.

**Table:4.55 Satisfaction from the Service of Co.s expressed by Respondents**

S.N.	Service Type	OK
1	NT PSTN	80
2	NT GSM	106
3	NT CDMA	32
4	Ncell GSM	54
5	UTL CDMA	2
6	UTL WLL	1

The data for 'Satisfaction' reveals that 82.47% users are satisfied with PSTN service of NT. 37.46% of users expressed satisfaction with NT GSM service whereas 45.76% of users expressed satisfaction with Ncell GSM service.

However, 42% (218 out of 517) users express overall satisfaction and belief on NT whereas 10.44% (54 out of 517) users only express overall satisfaction and belief on Ncell. Less number of user of UTL may also be treated as company with less goodwill of customers!

### Interconnection:

According to the World Trade Organization (WTO), interconnection refers to “linking with suppliers providing public telecommunications transport networks or services in order to allow the users of one supplier to communicate with users of another supplier, where specific commitments are undertaken.”

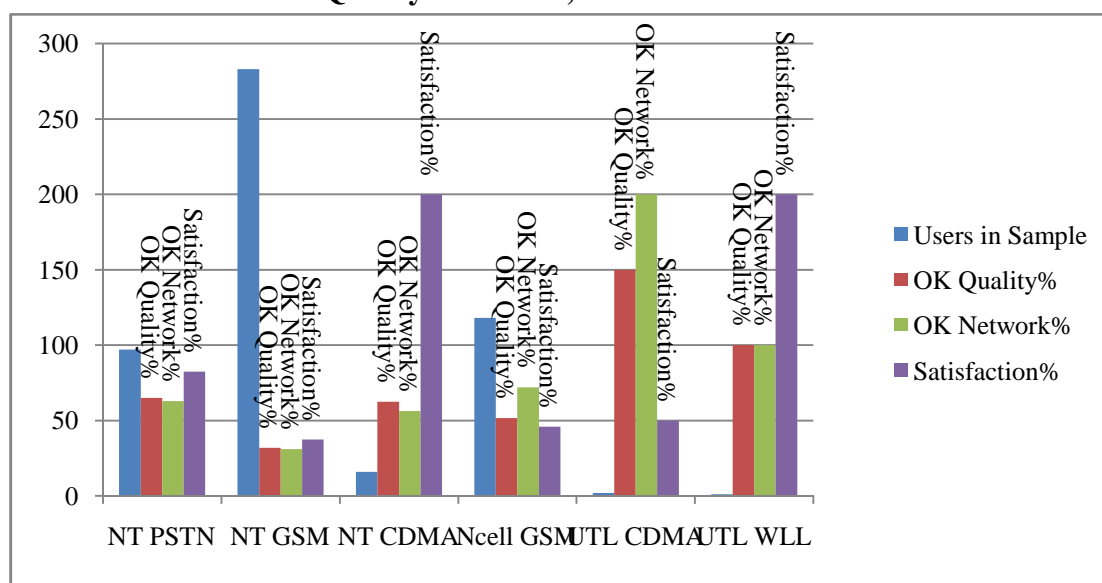
From the feedback of field survey it was learnt that the inter-operator connection is a big problem - almost all informants have mentioned that they face problem in making calls to people with line of another operator; that is the interconnection problem is not addressed seriously by the operators.

The above mentioned figures can be seen in the table 4.56 and graph 4.28.

**Table:4.56 Service Quality, Network Quality and Satisfaction in %**

S.N.	Service Type	Users in Sample	OK Quality%	OK Network%	Satisfaction%
1	NT PSTN	97	64.95	62.89	82.47
2	NT GSM	283	31.80	31.10	37.46
3	NT CDMA	16	62.50	56.25	200.00
4	Ncell GSM	118	51.69	72.03	45.76
5	UTL CDMA	2	150.00	200.00	50.00
6	UTL WLL	1	100.00	100.00	200.00

**Chart:4.28 Quality of Service, Network and Satisfaction in %**



## **Chapter V      Summary, Conclusion and Recommendation**

### **5.1 Summary**

The telecommunications services have proved to be very important for the mankind. The whole world has become like a village - informations from one end of the world can be transmitted and/ or received to/ by people living at the other end of the world instantly ! The telecommunications services have supported every sector – health, education, business, security and many many others. The telecommunications infrastructure has become the human right at present. From the data of ITU (Key Global Indicators for the World Telecommunications Service Sector) it is learnt that developed countries have high number of telephone lines than that of developing countries. By July 2011, Nepal had density of fixed and mobile telephone 2.93 and 40.59 respectively against the Asia & Pacific data of about 14 and 73.9 respectively (ITU:2010 ). Similarly, internet data penetration rate of Nepal is 10.89 against 21.9 (ITU:2010) of Asia and the Pacific. The world average for fixed line, mobile line and internet are 17.3, 76.2 and 30.1 (ITU:2010). Today is the world of mobile communication and broadband data services for the fast and competitive life of the people!

The Field Research Design method has been followed for this thesis work. The primary data has been collected from structured questionnaire according to stratified random sampling method. Secondary data has been collected from annual reports, MIS reports, brochures made available by the service operators, NTA, internet and other sources. Personal observation was also done to make opinion about the quality of services and behavior of the service providers.

The Govt. of Nepal has treated telecom services as the basic pre-requisite for the development and telecommunication Policy 2056 (1999 AD) has created competitive environment to make the services cost effective, reliable and accessible to all people of the country. NTA (established in 1998 AD) has issued 293 licenses under different types of telecom services. Out of that 15 operators are noticeably active. NDCL

serves almost all types of telecom services – fixed and mobile telephone with voice, data and video facilities. It uses PSTN system for fixed telephone and data, GSM and CDMA systems for mobile telephonic voice, data and video services. To introduce new services and make the services user friendly it uses IN system. NDCL has been working as a public company since 2003 AD. Ncell has been serving since 2005 AD. For 3 years it served under the trade name ‘Mero Mobile’ and since 2008 under the trade name ‘Ncell’. It serves mobile phone service using GSM technology. It serves voice, data and video services. It has won the most innovative mobile operator and best consumer pull award among the SAARC countries in 2006 organised by voice and data magazine in Sri Lanka. UTL has been serving since 2003. It serves fixed and mobile phones with voice and data facilities using CDMA technology.

The analysis of the data indicates that the demand of good quality telecommunications services of the customer has not been met. Customers face problem in getting a land line or mobile phone connection, especially in rural area. The quality of mobile phone service is still questionable. Ncell and UTL have to do a lot for carpet coverage. NT, which has introduced mobile service 12 years back, has also not achieved carpet coverage yet. The quality of mobile service of NT faces many technical problems. However, it has maintained the standard fixed and is proved to be satisfactory looking on the subscriber base and satisfaction rating by the service users. Ncell has become leader in mobile service – both quantitatively and qualitatively but users are not satisfied with its billing. UTL’s market share is only 4% whereas that of NDCL (NT) and SNPL (Ncell) is 51% and 43% respectively as of July, 2011.

Ncell is seen comparatively costlier in local and domestic call rates. Rates of National/ STD and International ISD calls have gone down tremendously compared to the past times when there was no competition and voice over internet (VOIP) service. However, comparing among NT, Ncell and UTL, UTL is seen to be selling service at cheaper price although UTL is not able to compete in the market. NT’s ISD service rate is costlier than that of Ncell’s although for some destinations Ncell’s rate is higher. Whatever may be, overall telephone call rates are cheaper in Nepal. The data service of NT is seen cheaper as compared to that of Ncell.

The inter-operator connection is a big problem in the country and the interconnection problem need be addressed seriously by the operators.

65% users have graded the NT PSTN service as of good quality. 32% users have evaluated the GSM mobile service of NT as of good quality whereas 51.69% have evaluated Ncell's GSM service as of good quality. Similarly, 62.5% of CDMA users had appraised the CDMA service of NT. 63% users evaluate the network quality of PSTN network of NT to be high. Similarly 72% users accept the network quality of GSM network of Ncell to be OK whereas 31% users only accept the network quality of GSM of NT to be OK. The quality of CDMA network of NT is appraised as OK by 56% of the users. The quality of performance and network both of UTL are appraised as good but the availability of UTL services is very much limited so it cannot be treated as real. 82.47% users expressed satisfaction with PSTN service of NT. 37.46% of users expressed satisfaction with NT GSM service whereas 45.76% of users expressed satisfaction with Ncell GSM service.

However, 42% users express overall satisfaction and belief on NT whereas 10.44% users only express overall satisfaction and belief on Ncell. Less number of user of UTL may also be treated as company with less goodwill of customers!

The price/rates of telecommunications services has gone down and it can be accepted as affordable. In fact, prices of the telecom services have gone down globally due to price cut in electronic goods. (e.g. In Bangladesh prices have gone down from BDT 11.37 in 2001 to BDT 0.88 in 2008.)

Telecom service providers and internet service providers are required to pay 2% of their total annual revenue to the Rural Telecom Development Fund but NTA has not been able to use the fund to increase the access of telecom services to the rural parts of the country. So far, till jan'2012' Rs.4.25 billion is accumulated in the fund.

ADSL, Lease Line with ADSL, SIP phone, 3G IP CDMA, VSAT, Voice & data service in rural area via VSAT Link - all are available in Nepal but the new services like 3G, EVDO, SIP and Broadband services are limited to urban area only.

Extreme politicization and non-stability of the government has also affected adversely to the development of telecom sector.

Due to mismanagement of rare resource of frequency spectrum, NTA is in shortage of frequency spectrum for allotment to new entrants in this sector.

NTA has directed all the three operators NT, Ncell and UTL to improve their network coverage and QOS along highways at the earliest.

*(Source: The Kathmandu Post, Oct.17,2011)*

## **5.2 Conclusion**

Nepal is lagging behind in telecommunications infrastructure as compared to other countries of the Asia and the Pacific region and the world as a whole. The telecommunications services should be available to the rural parts of the country as well for balanced progress of the country. Privatization Act and Labour Act require to be amended. Proper regulation by the regulating authority is necessary. Coordination between different companies for optimum utilization of resources is optional. Long procedures/ formalities should be made short but the customer should be made responsible to minimize the misuse of the telecom services. Services must be prompt and the process should be fully automated. Major portion of rural areas of the country are not covered, so operators should expand their network coverages. There should be post sales customer care service in each company to support the customer to resolve technical problems in using the services. There should be enough exercise in selection of the technology. A research and development department should be established to care for technical as well as non technical problems in telecom sector. Also, there should be an information database.

## **5.3 Recommendation**

After study of the above facts, improvements on different stakeholders was felt necessary in order to enhance the status of telecommunications services in Nepal, and hence, recommendations have been worked out for different stakeholders as follows:



**Recommendation on to the government:**

1. Public enterprises could do better if they are run and managed by professionally qualified personnel without any political interference. NDCL is a public company with very good image but it is suffering from political interference. So make the company politically free.
2. Privatization is the need of the time so it is better to privatize NDCL fully immediately by selling the shares (most preferred model). Unnecessary time consumption and lengthy process is affecting the company.
3. There is need for amendment in Privatization Act and Labour Act.
4. Strengthen the regulatory body by delegating more rights in distribution of frequencies and in controlling the service operators.
5. Provide more subsidies/ financial support to operators for providing services in the rural area.
6. Research and development works pays in long term although it requires huge investment. One operator may not like to invest in this. So the Govt should establish one.
7. A central database is required for the use of all.

**Recommendations to the Regulatory body, Nepal Telecommunication Authority:**

1. The regulation should be fair. The regulatory body should analyze the demand and/or suggestions of the operators and compare with provision in other countries also and then should decide.
2. NTA should evaluate the performance of the operators from time to time (once in a year) independently and instruct the operators accordingly to improve the service and extend all the telecommunications services to the rural parts of the country as well.
3. NTA should exploit the RTDF capital to extend the services to the remote areas by giving subsidy to the operators to extend all the telecommunications services in the rural areas.
4. Frequency spectrum is a very important and scarce resource which should be allotted carefully taking care of new entrants.

5. There are sufficient number of operators for competition as compared to other countries and struggle for frequency allocation is being seen in public media. It is necessary to focus on improving QOS now and not on increasing number of operators.

### **Recommendations to the Operators:**

1. Customer has to reach too many tables in the process of installation of a PSTN land line. Nepal Telecom should implement one window system for all its services through well managed, comfortable customer care centre.
2. Customer has to reach to the office at least 5 times – for application, contact at the time of notice, survey, payment and installation. This can be reduced to 2 to 3 times- for application, survey (optional, because the customer has to provide his address as well as the route map to reach the site he or she wants to have a connection) and Payment of the installation charges.
3. Nepal Telecom may decrease one process of network data verification by MCC because it is confirmed on the site itself by the technical team.
4. Nepal Telecom should expand its PSTN network more in rural areas also.
5. Nepal Telecom should increase the number of GSM BTS to increase its GSM network coverage and traffic channel resources.
6. Nepal Telecom needs upgradation of CDMA network and increase the number of BTS as well.
7. Nepal Telecom should replace old Pentium 2 or 3 version computers by faster Pentium IV or V computers.
8. Nepal Telecom is using maximum numbers of Dot Matrix computers. These printers are slow, noisy and have low printing quality. Nepal Telecom should replace those printers by non-impact printers like Laser printer which is fast and which has a good printing quality.
9. Ncell and UTL should increase the number of customer support centres throughout the country.
10. Ncell should increase the number of BTS to increase network coverage and traffic channel resources.
11. Ncell should audit its billing system to improve its image.

12. UTL should increase its network coverage by increasing number of BTSs and upgrade its system.
13. UTL should expand its infrastructure either on its own or by hiring on lease from other operators.
14. UTL should do more homework before deciding about charging; reduction in charges only cannot help in attracting customers – coverage, features and quality matters much!
15. Every company should manage to receive the bill from any place in the country.
16. Every company should manage to receive the bill amount from all banks so that customer may not bear the trouble of coming long way to the office.
17. Operators should start e-payment system.
18. Every operators should emphasize on promptness in actions.
19. Each operator should provide full in-house support to train the customer on the use of E-mail and internet services.
20. Each operator should make information flow easy, clear, accurate and timely so that it can help in decision-making process by integrating each and every sections/ units of the office using office automation. Ncell and UTL both do not publish MIS, it is a useful tool.
21. Each operator should pay proper attention to inter-operator connection.
22. Operators should share infrastructure for cost minimization and fair environment.

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Annex-1: Key Global Telecom Indicators for the World Telecommunication Service Sector

	<b>(millions)</b>						<b>Per 100 inhabitants</b>					
	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
<b>Fixed telephone lines</b>												
Developed	570	565	546	521	511	506*	46.9	46.3	44.6	42.4	41.5	40.9*
Developing	689	715	726	719	704	691*	13.0	13.3	13.3	13.0	12.5	12.1*
World	1'259	1'280	1'271	1'240	1'215	1'197*	19.3	19.4	19.0	18.3	17.7	17.3*
<b>Mobile cellular subscriptions</b>												
Developed	1'001	1'139	1'250	1'342	1'409	1'436*	82.3	93.4	102.0	109.2	114.3	116.1*
Developing	1'216	1'617	2'104	2'670	3'243	3'846*	22.9	30.0	38.5	48.2	57.7	67.6*
World	2'217	2'756	3'354	4'012	4'652	5'282*	33.9	41.7	50.1	59.3	67.9	76.2*
<b>Mobile broadband subscriptions</b>												
Developed	57	132	253	352	505	631*	4.6	10.8	20.7	28.7	41.0	51.1*
Developing	16	27	54	105	198	309*	0.3	0.5	1.0	1.9	3.5	5.4*
World	73	159	307	458	703	940*	1.1	2.4	4.6	6.8	10.3	13.6*
<b>Estimated Internet users</b>												
Developed	620	654	720	762	821	885*	51.0	53.6	58.8	62.0	66.6	71.6*
Developing	416	505	673	850	1'037	1'199*	7.8	9.4	12.3	15.3	18.5	21.1*
World	1'036	1'159	1'393	1'611	1'858	2'084*	15.9	17.5	20.8	23.8	27.1	30.1*
<b>Fixed broadband subscriptions</b>												
Developed	145	187	224	253	273	304*	11.9	15.3	18.3	20.6	22.2	24.6*
Developing	71	96	127	160	197	251*	1.3	1.8	2.3	2.9	3.5	4.4*
World	216	283	351	413	471	555*	3.3	4.3	5.2	6.1	6.9	8.0*

The developed/developing country classifications are based on the UN M49 (<http://www.itu.int/ITU-D/ict/definitions/regions/index.html>)

	<b>(millions)</b>						<b>Per 100 inhabitants</b>					
<b>Fixed telephone lines</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
Africa	10	11	11	11	12	13*	1.4	1.5	1.5	1.5	1.5	1.6*
Arab States	30	31	33	35	34	33*	9.3	9.5	9.9	10.2	9.8	9.4*
Asia & Pacific	575	596	596	580	561	549*	15.5	15.9	15.8	15.2	14.5	14.0*
CIS	64	69	72	73	73	74*	23.0	24.9	25.8	26.3	26.4	26.6*
Europe	273	273	265	261	255	249*	45.2	45.0	43.5	42.6	41.4	40.3*
The Americas	291	284	278	264	263	262*	32.8	31.7	30.7	28.9	28.5	28.1*
<b>Mobile cellular subscriptions</b>												
Africa	88	130	174	246	295	333*	12.3	17.8	23.3	32.1	37.6	41.4*
Arab States	85	126	174	209	255	282*	26.6	38.7	52.1	61.3	73.3	79.4*
Asia & Pacific	834	1'071	1'377	1'743	2'159	2'649*	22.5	28.6	36.4	45.6	55.8	67.8*
CIS	166	227	267	313	356	364*	59.7	81.9	96.4	113.0	128.6	131.5*
Europe	550	610	677	721	729	741*	91.0	100.5	111.1	117.7	118.5	120.0*
The Americas	469	564	656	750	826	880*	52.9	63.0	72.4	81.9	89.3	94.1*
<b>Mobile broadband subscriptions</b>												
Africa	-	1	2	7	23	29*	-	0.1	0.3	1.0	3.0	3.6*
Arab States	-	1	3	11	21	34*	0.1	0.2	0.8	3.3	6.2	9.7*
Asia & Pacific	44	87	129	170	221	278*	1.2	2.3	3.4	4.5	5.7	7.1*
CIS	-	-	2	5	54	72*	-	-	0.7	1.8	19.5	25.9*
Europe	24	55	108	158	217	286*	3.9	9.0	17.8	25.9	35.3	46.3*
The Americas	4	13	56	94	152	226*	0.4	1.4	6.2	10.3	16.4	24.2*
<b>Estimated Internet users</b>												
Africa	16	22	27	45	69	77*	2.2	3.0	3.6	5.9	8.8	9.6*
Arab States	26	35	46	58	71	88*	8.0	10.6	13.8	16.9	20.5	24.9*

Asia & Pacific	251	399	513	636	755	857*	9.5	10.7	13.6	16.6	19.5	21.9*
CIS	30	36	51	70	99	127*	10.7	12.9	18.4	25.2	35.7	46.0*
Europe	277	300	333	361	380	401*	45.9	49.4	54.7	59.0	61.8	65.0*
The Americas	322	351	406	424	466	514*	36.3	39.2	44.8	46.3	50.4	55.0*
<b>Fixed broadband subscriptions</b>												
Africa	-	-	1	1	1	1*	-	0.1	0.1	0.1	0.1	0.2*
Arab States	1	2	3	4	6	8*	0.3	0.5	0.9	1.2	1.7	2.3*
Asia & Pacific	80	103	126	150	180	223*	2.2	2.7	3.3	3.9	4.7	5.7*
CIS	2	4	6	12	17	24*	0.6	1.3	2.3	4.5	6.1	8.7*
Europe	66	89	111	126	137	148*	10.8	14.6	18.3	20.6	22.2	23.9*
The Americas	63	81	99	114	125	145*	7.2	9.1	10.9	12.4	13.5	15.5*

Regions in this table are based on the ITU BDT Regions (<http://www.itu.int/ITU-D/ict/definitions/regions/index.html>)

Note: Rounded values. \* Estimates.

Source: © INTERNATIONAL TELECOMMUNICATION UNION, 2010.

Updated on 21 October 2010.

*Annex -2: Application Form of NT*



(ख) सेवाको विवरण

- |                      |                      |   |
|----------------------|----------------------|---|
| (१) नाम:-            | <input type="text"/> | टेलिफोन / टेलिक्स / फ्याक्स / अन्य          |
| (२) अवधि:-           | <input type="text"/> | गटके / अस्थायी / स्थायी                     |
| (३) किसिम:-          | <input type="text"/> | साधारण / बि.एच.एफ. / माईस / ग्रामिण         |
| (४) सेटको किसिम:-    | <input type="text"/> | साधारण / आई.सि.एफ. / बाहिरी कन्ट्रोल / अन्य |
| (५) सुविधाको किसिम:- | <input type="text"/> | साधारण / टुइल / होम सिस्टरीड / अन्य         |
| (६) निवेदनको किसिम:- | <input type="text"/> | साधारण प्रतिका सूचि / ओ.वाइ.टी. / अन्य      |

- मैले जा म समेत संलग्न उद्योग कम्पनी वा फर्मको टेलिफोन / टेलिक्स आदि महशुल नतिरी काटिएको छ / छैन:
- पस निवेदन अनुसार सेवा प्राप्त गरिसकेकोछ म परा संस्थानको नीति नियम पालना गर्नेछु र सेवा बागलको महशुल रकम तोकिएको समयभित्र बुझाउने छु अन्यथा नियमानुसार गरे मञ्जुर छ।
- उपरोक्त विवरणहरू ठीक छ, फरक भएमा बुरसञ्चार सेवावाट बञ्चित गरिएमा मेरो मञ्जुरी छ।

.....  
निवेदकको दस्तखत

तन्धी विवरण:-

- तागिरकताको प्रमाण-पत्रको प्रतिलिपि
- 
- 
- 

(एकभन्दा बढी सेवाको लागि छुट्टा छुट्टै फर्म अनूपर्नेछ र सेवा सम्बन्धी अर्तहरू ४ नं. पानामा छ।)

क्रमशः

**निवेदकले उपलब्ध गराउनु पर्ने थप विवरणहरू:-**

1. सेवा उपलब्ध गराउनु पर्ने घरको नजिकको टेलिफोन भए टे.न.
2. उल्लेखित घरको नजिकको टेलिफोन भए घरबाट अन्वानी दूरी (मिटरमा)

सेवा उपलब्ध गराउनु पर्ने घर कम्पाउण्डसम्म पुग्ने बाटोको तस्ता:-

**उत्तर**



**दक्षिण**

(टेलिफोन भएको नजिकको घर तस्सामा उल्लेख गर्नुहोला !!)

निवेदकको दस्तखत

(कार्यालयले अनुमर्ने)

1. निवेदन दस्तुर रु ..... बुझाएको मिति ..... र.नं ..... : सही .....
2. जडान सूचना प्रकाशित अवधि ..... देखि .....
3. सम्पर्क मिति ..... इष्टिमेट स.नं ..... मिति .....
4. जडान स.अ.नं ..... मिति ..... टे.नं .....

प्रमाणित गर्नेको नाम

मिति .....

सहीछाप: .....

## सेवा सम्बन्धी शर्तहरू

- यो निवेदन फाराममा उल्लेख हुनुपर्ने सबै महत्वपूर्ण स्पष्ट रूपमा बर्णन गर्नुपर्नेछ । फाराम भर्दा कुनै कुरा नबुझिएमा टेलिकमको सेन्स शाखाको सहयोग लिन सकिनेछ ।
- फाराम साथ टेलिकमले तोकेको निवेदन बस्तुर बुझाउनु पर्नेछ ।
- निवेदनमा माग भएको सेवा संस्थानको वितरण प्रक्रिया एवं अमता अनुरूप प्रतीक्षा सूचि तयार गरी सो अनुरूप वितरण गरिनेछ ।
- वितरण हुने समयमा माग भएको सेवा वितरणको लागि सम्बन्धित निवेदकलाई पत्रबाट वा सञ्चार माध्यमबाट सूचित गरिनेछ । सो अनुसार निर्धारित समयमा सम्पर्क राख्न नआउने ग्राहकको निवेदन प्रतीक्षा सूचिबाट हटाइनेछ ।
- निवेदनमा उल्लेखित जडान ठेगाना तथा सेवा विवरण परिवर्तन गर्नु परेमा जडानको सूचना प्रकाशित नभएसम्म टेलिकमद्वारा निर्धारित बस्तुर निरी परिवर्तन गर्न सकिनेछ । तर जडान सूचना प्रकाशित भईसकेपछि ठेगाना र सेवा विवरण परिवर्तन गरिने छैन ।
- निवेदकको मृत्यु भएको अवस्थामा सबभन्दा टेलिकको दफ्तरवालाको नाममा निवेदन नामसारी गरी जडान गर्न सकिनेछ ।
- वितरण समयमा लागू रहेको टेलिकमद्वारा निर्धारित जडान बस्तुर तथा धरौटी रकम बाबतला लागू बाध सेवा जडान गरिनेछ ।
- टेलिकमद्वारा तोकेको स्थान र समयमा सेवा बापतको महशुल नियमित रूपमा बुझाउनु पर्नेछ ।
- उपलब्ध सेवा सम्बन्धी सम्पूर्ण जिम्मेवारी सम्बन्धित ग्राहकको हुनेछ । निर्धारित समयमा सेवा उपलब्ध नभुलाउने ग्राहकलाई अन्य कुनै दूरसञ्चार सेवा उपलब्ध गरिने छैन । महशुल बापत बाँकी रहेको रकम सरकारी बाँकी सरह कानूनी कारवाही गरी असुल उपर गरिनेछ ।
- सेवा उपलब्ध भएपछि सेवा सम्बन्धी टेलिकमको प्रचलित सबै नीति नियमहरू ग्राहकले पालना गर्नुपर्नेछ । अन्यथा टेलिकमले जुनसुकै समयमा पनि सेवा फिर्ता लिब सक्नेछ ।
- रीत नगुको तथा आवश्यक विवरण संलग्न नभएको निवेदन मान्य हुने छैन ।
- नवीकरण गर्दा निवेदकको पुरानो बरखासहससभ्ये एकमात्र पुरानो कता नं. र मितिलाई नयाँ प्रतीक्षा सूचीमा कायम गरिनेछ ।



Annex 3: Survey Order Form

श्री नेपाल दूरसंचार संस्थान

ट.डि. १२०  
स. अ. १

सर्वेक्षण फारम		सं. _____	कार्यही
नयाँ लाईन जडान गर्ने/सार्ने/परिवर्तन गर्ने		मिति: _____	
टेलिफोन/टेलेक्स/वीचड लाइन नं. _____		एन.टी.डी. कोड _____	
नाम _____			
(नेपालीमा): _____		फहिलको टेलिफोन/टेलेक्स नं. _____	
(अंग्रेजीमा): _____			
ठेगाना _____			डे
(नेपालीमा): _____			ब्व
(अंग्रेजीमा): _____			
(क)	सहारी 1 0	अरवाइ/महिना 2	पटक दिन 3
(ख)	लावासी 1	राष्ट्रिय स्थान 2	पत्रकारी 3
	सर्जित 4	प्रसा 5	
	ब्यान्ड ब्रोक 6	पोस्टाएल 7	टेलिस्ट 8
		सर्विड 9	गन्ना विवरण 10
(ग)	उपकरण/विवरण		
घरौटी रकम रु _____		परिलेको कोड _____	
मिति _____		हालको कोड _____	
जडान महशुल रु _____	रमित नं. _____		
रन्ज महशुल रु _____			
जग्गा रु _____			
मिति :-		लाईन जडान मिति _____	
मिटर सिङ्गिङ्ग		फिकेको मिति :-	शिक्षित
मिति :-		अधिकृत (जडान):	
अधिकृत (एस.सी.डी.)			
(क)	रूपवापर जडान गर्न चाहिने लगत इस्टिमेट :	जडान बेरहेको	स्टीमेट
	१. पाल	गोटा	
	२. रूपवापर	मिटर	
	३. रूपवापर कलना (एक्सर)	गोटा	
	४. रूपवापर बाकट (डि.पी.सा राख्ने)	गोटा	
	५. इन्टरमिडियम रूपवापर क्याम्ब	गोटा	
	६. रूपवापर कनेक्टर	गोटा	
	७. आई कोस्ट (प्राहजको मिलावा राख्ने)	गोटा	
	८. वाइडब्रिड	गोटा	
	९. टर्मिनल टु ब्लक	गोटा	
	१०. इण्डोर वायर (या अन्य सामान)	गोटा	
	११. मिटर		
(ख)	क्याबिनेटबाट एस.डी.एफ.डी.पी. वेयरको विधार्थको लागि एस.सी.टी.मा सम्पर्क राख्ने, वेयर उपलब्ध नभएका कलस भाङ्गमा फिर्ता गर्ने।		
	व्या नं. _____	वि.पि.न.नं. _____	
	एस.डि.एफ. (प्रा.) वेयर नं. _____	डि.पि.वेयर नं.नं. 0 0	
(ग)	उपरोक्त बमोजिमको वेयरहरूकोच क्याबिनेटमा जम्पारिङ्ग गर्ने।		
(घ)	एस.डि.एफ.मा सम्पर्क राखी निम्न बमोजिम विवरण गर्ने		
	इन्टरलेक् ए.पि. 0 ए/वा 0 0	वि.पा. 0 0	मेगाओम्स
	लूप रेजिस्टेन्स 0 0 0 0	ओम्स	श्री.एस.लव. 800 हर्ज
			0 0 डि.वि.
(ङ)	रूपवापर रुटको हाइड्रम बलाउनु (पछाडी पढी)		
	मिति: _____		टोली प्रमुख
	ए हकआइ पत्र क/ख पठाएको :		
	मिति: _____		इस्तावत

कीफियत :- आहकहरूले पत्र बुझी यस संस्थानमा रकमा पुक्तानी भईसकेपछि नठान टिमलाई जडान फारम (स.अ. 2) र सर्वेक्षण फारम (स.अ. 1) दिई पठाउने। फारम गर्दा अंग्रेजी अङ्क मात्र प्रयोग गर्ने।

- ३) हुरी, जतास, चक्काजाम, भीगोलिक विकटता जस्ता विशेष परिस्थिति बाहेक अन्य कारणले ग्राहकहरूको विगिएका लाइन ७२ घण्टा भित्रमा समेत गरिनेछ र सो समयभित्र समेत गर्न तत्किएमा ग्राहकलाई मर्मत गर्न नसकिएकी अवधि भर ग्राहकले तिनु पर्ने न्युनतम मासिक महशुल रकमलाई आधार लिई सो रकमलाई प्रति दिनमा पत्त आउने शुल्क अनुसार दामासाहीले हुने रकम टेलिकमले छुट दिनेछ । तर टेलिकमको मर्मत शाखा (टि.वे. १९८) मा सूचना नगरी लामो समयसम्म लाइन बन्द भएमा नेपाल टेलिकम जवाफदेही हुनेछैन ।
  - ४) प्राविधिक कारण परि टेलिकमले टेलिफोनको नम्बर परिवर्तन गर्नुपर्ने भएमा कम्तीमा १५ दिन टेलिकमले ग्राहकलाई अग्रिम रूपमा सूचना दिई नम्बर परिवर्तन गर्न सक्नेछ ।
- घ) टेलिफोन महशुल सम्बन्धमा :
- १) ग्राहकले बुझाउनु पर्ने कर/दस्तुर थपि ५ को सरकारले समय समयमा तोके अनुसार हुनेछ ।
  - २) टेलिकमले टेलिफोन सेवाको बिल सामान्यतया मासिक रूपमा ग्राहकलाई उपलब्ध गराउनेछ ।
  - ३) टेलिफोन सेवा वापतको महशुल ग्राहकले समयमा नै बुझाउनु पर्नेछ ।
  - ४) तोकिएको समयभित्र महशुल नबुझाएमा टेलिकमको नीति नियम अनुसार टेलिकमले विलम्ब शुल्क लगाउने जम्नेछ ।
  - ५) विलम्ब शुल्कको अन्तिम म्यादाभित्र पनि रकम नबुझाएमा ग्राहकको टेलिफोन सेवा टेलिकमले बन्द गरी ग्राहकको नाम कालो सूचीमा चढाउन सक्नेछ र प्रचलित कानून बमोजिम यस्तो ब्रोकी रकम टेलिकमले निजको घर घरानाबाट समेत असुल उपर गर्न सक्नेछ ।
  - ६) ग्राहकको घर घरानाबाट बाँकी रकम असुल उपर गर्नु अगावै ग्राहकले सम्पूर्ण रकम बुझाएमा पुनः जडान शुल्क वापत तोकिएको रकम लिई ग्राहकको नाम कालो सूचीबाट हटाई अवशुद्ध सेवाहरू टेलिकमले गर्न सक्नेछ ।
  - ७) टेलिफोन महशुल असुल गर्दा घर घरानाको प्रयोजनको लागि टेलिफोन ग्राहक वा निजको एकाधनको रूपै पनि सम्पतिबाट महशुल असुल उपर गर्न सकिने छ ।
  - ८) संगठित संस्थाको सिफारिसमा जडान गरिएको टेलिफोनको महशुल जडान गरिएको ब्यक्तिले सूचना नगरेमा सिफारिस गर्ने संगठित संस्थाले उक्त ब्रोकी महशुल तिनु पर्ने बरी सम्झौता गर्न सकिनेछ । यसरी सम्झौता गरिएकोमा संगठित संस्थाले दायित्व ब्यहोर्नु पर्नेछ ।
  - ९) कुनै पनि टेलिफोन उपकरण गरिरहेको मालिक/कम्पनी लिक्विडिशन भएको अवस्थामा टेलिफोनको महशुल लिक्विडिशन सम्बन्धी कानून एवं सम्बन्धित ऐन बमोजिम असुल उपर गर्न सकिनेछ ।
  - १०) ग्राहकको मृत्यु भएको अवस्थामा बुझाउन बाँकी रकम जपुताली खाने हबदार समेतबाट असुल उपर गरिनेछ ।
  - ११) ग्राहकले तिनु पर्ने बाँकी महशुल लगायत अन्य रकमको सम्बन्धमा प्रचलित नेपाल कानूनमा जृतसुर्क कुरा लेखिएको भएता पनि यस सम्झौतामा लेखिए जति यमै बमोजिम हुनेछ ।
  - १२) लगातार ७ दिन वा सो भन्दा कम अवधिमा ग्राहकले राखेको धरौटी रकम भन्दा बढी रकम वा १ महिना भित्रमा धरौटीको बोजुर भन्दा बढी रकम बराबरको सेवा प्रयोग गरेमा टेलिकमले ग्राहकको नाम High Billing Subscriber (HBS) को सूचिमा चढाउनेछ ।
  - १३) (HBS) सूचिमा परेको ग्राहकको टेलिफोन मर्मत तभार सम्बन्धमा टेलिकमले विशेष प्राथमिकता दिनेछ र व्यवस्थापनले यस्तो ग्राहकसँग थप धरौटी पनि माग्ने सक्नेछ ।
  - १४) (HBS) सूचिका ग्राहकले थप धरौटी रकम फिर्ता भएमा टेलिकमले रफा (घ) १२ को अवस्था नरहेमा उक्त थप धरौटी रकम १५ दिन भित्र फिर्ता दिनु पर्नेछ ।
- ङ) विवाद र उजुरी सम्बन्धमा :
- ग्राहकले टेलिफोनको महशुल एवं सेवा सम्बन्धमा कुनै निखित सिकायत गरेमा तोकिएको समितिले छानविन गर्नेछ

र छानबिन समितिको निर्णय द्वै पक्ष (ग्राहक र टेलिकमलाई) मान्य हुनेछ। उक्त निर्णय उपर वित्त नबुझेमा टेलिकम नियमावली २०१४ बमोजिम नेपाल टेलिकम समक्ष उजुरी गर्न सक्नेछ।

च) लाइन सञ्चालन तथा विविध :

- १) जुनसुकै प्रयोजनको लागि लिएको टेलिफोन लाइन पनि टेलिकम भन्, नियम, नीति एवं अन्य व्यवस्थाको प्रतिकूल हुने गरी गैर कानूनी तथा अनाधिकृत प्रयोग भएको पाइएमा टेलिकमले धरोटी जफत तथा टेलिफोन लाइन बन्द गरी त्यस्तो ग्राहकको नाम कालो सूचीमा चढाउन सक्नेछ।
- २) टेलिफोन लाइनको प्रयोग ठिकसँग भए नभएको बारेमा टेलिकमले गठन गरेको निरिक्षण टोलीले ग्राहकको घर कम्पाउण्डमा तत्काल लिखित सूचना दिई आकस्मिक निरिक्षण समेत गर्न सक्नेछ। यसरी निरिक्षणमा आउने टेलिकमको कर्मचारीलाई टेलिफोन लाइनको निरिक्षण गर्ने कार्यमा ग्राहकले विना कुनै अनुरोध जुनसुकै बेलामा पनि निरिक्षण गर्न दिनु पर्नेछ।  
यसरी ग्राहकको घर कम्पाउण्डमा प्रवेश गर्दा कुनै हाली नोकसानो भएमा टेलिकमले उचित र मर्यादित क्षतिपति निर्धारण गरी १२ दिन भित्र ग्राहकलाई उपलब्ध गराउनेछ। क्षतिपति उचित र मर्यादित तथा क्षतिपूर्तिको सूचना पाएको मितिले १२ दिन भित्र नेपाल टेलिकममा निवेदन गर्न पाउनेछ।
- ३) कालो सूचीमा परेका ग्राहकको नाममा रहेको अधिराज्यको कुनै पनि स्थानमा टेलिकमले उपलब्ध गराएको सबै किसिमको टेलिकम सेवाहरू अवरुद्ध गर्न सक्नेछ र कालो सूचीमा परेका व्यक्तिलाई भविष्यमा टेलिकमले कुनै पनि किसिमको टेलिकम सेवा उपलब्ध नगराउन सक्नेछ तर कालो सूचीमा राखिने प्रक्रिया सम्बन्धी सम्पूर्ण व्याहारा टेलिकमले तयार गरी सार्वजनिक सूचना प्रकाशित गर्नेछ। कालो सूचीको प्रक्रिया सार्वजनिक नगरी पक्ष खप्ताको प्रयोग गरिने छैन।
- ४) कुनै पनि ग्राहकले लिएको टेलिफोन नोसुनैले बर्होस्नै प्रयोग गरेको भएतापनि सो टेलिफोनको सम्पूर्ण जिम्मेवारी त्यस्तो ग्राहकले नै वहन गर्नु पर्नेछ।
- ५) टेलिफोनमा उपलब्ध मूल्योदय सुविधाहरू (Value added services) निर्धारण फाराम भरि तथा तोकिएको बन्क बृद्धाई ग्राहकले माग गरेको खण्डमा प्राविधिक दृष्टिकोणले सम्भव भएसम्म टेलिकमले ग्राहकलाई उपलब्ध गराउने छ। तर यस्ता सुविधाहरू उपलब्ध गराउँदा ग्राहकको घर कम्पाउण्डमा कुनै उपकरण थप लाग्ने भएमा सोको व्यवस्था ग्राहक स्वयंले गर्नु पर्नेछ।
- ६) ग्राहकले लोकल टेलिफोन सेवाको अलावा STD, ISD सेवा तथा Operator को सहयोगमा टंक बुकिङ सेवा लिन चाहिँमा निर्धारित फाराम भरी तथा आवश्यक धरोटी नपुग भएको अवस्थामा तपुग धरोटी रकम जम्मा गरी उक्त सेवा लिन सक्नेछ र सेवा आवश्यक नभएमा निर्धारित फाराम भरी यस्तो सेवा बन्द गराउन पनि सक्नेछ र यस्तो अवस्थापना सेवा बन्द गराएको मितिले १५ दिन भित्र थप धरोटी राखेको भए उक्त रकम टेलिकमले फिर्ता दिनु पर्नेछ।
- ७) ग्राहकले आफ्नो आवश्यकता अनुसार लोकल टेलिफोन सेवा लगायत सम्पूर्ण सेवाहरू वा निजको टेलिफोनमा उपलब्ध सेवाहरूमध्ये कुनै सेवाहरू निर्धारित ड्राइवको फाराम भरी बन्द गर्नको लागि निवेदन गरेमा टेलिकमले ग्राहकको माग बमोजिमका सेवाहरू बन्द गर्नेछ। यसरी लाइन बन्द गर्दा सम्पको समयमा ग्राहकले प्रयोग गरेको सेवाको महशुल न्यूनतम मासिक महशुलभन्दा बढी भएमा बिल बमोजिम र न्यूनतम मासिक महशुल भन्दा कम सेवा प्रयोग गरेको भए पनि सेवा बन्दको निवेदन गरेको महिनाको न्यूनतम मासिक महशुल तिर्नु पर्नेछ।
- ८) टेलिकमले ग्राहकसँग लिनु विनु पर्ने सबै रकम फछुवाई गरी टेलिकम सेवा दिन बन्द गरेमा वा ग्राहकले पनि टेलिकमसँग लिनविनुपर्ने सबै रकम फछुवाई गरी टेलिफोन सेवा फिर्ता गरेमा यी सर्भोता स्वतः निष्क्य हुनेछ।
- ९) ग्राहकलाई टेलिफोन सेवाको आवश्यकता नभएमा टेलिकमलाई निवेदन दिई टेलिफोन लाइन टेलिकममा नै फिर्ता गर्न पनि सक्नेछ। सो टेलिफोन सेवा वापत ग्राहकले बुझाउनु पर्ने बक्यौता बाँकी नभए यसरी फिर्ता हुन आएको टेलिफोन जहान गर्दा राखेका धरोटी रकम टेलिकमले ग्राहकलाई १५ दिनभित्र फिर्ता गर्नेछ।

- १०) टेलिफोन सेवासँग सम्बन्धित टेलिकमको विद्यमान नीति नियम, प्रस्ताव नीति नियममा भविष्यमा हुने परिवर्तन र भविष्यमा नयाँ हुने नीति नियम समेत सूचना प्रकाशित गरेपछि ग्राहक तथा टेलिकम दुवैको लागि मान्य हुनेछ ।
- ११) यो सम्झौताको अवधि ग्राहकले टेलिफोन सेवा प्रयोग गरेसम्म वा अन्य ग्राहकको नाममा नामसारी नभएसम्म कायम रहनेछ ।
- १२) टेलिकम कुनै निकायमा परिवर्तन आएमा वा यक्षकी स्वाभिव्यता परिवर्तन आएमा यो सम्झौता स्वतः परिवर्तित रूपमा कायम रहेको मानिनेछ ।
- १३) यस अघि ग्राहकले भए गरेका सम्झौता यही सम्झौता इमान्तिम भए गरेको मानिनेछ । यो सम्झौता लागू भएपछि यस अघिका सम्पूर्ण सम्झौताहरू स्वतः खारेज भएको मानिनेछ ।

ग्राहकलाई समीकरण गर्ने प्रयोजनको लागि मात्र

कुनै एक मात्र

- (१) व्यावसायिक
- (२) सावकारी
- (३) अन्य

टेलिकमको सफाकार

व्यवहार :

मिति :

कार्यालय :

नाम :

पद :

नाम :

पतेन :

हस्ताक्षर :

मिति :

ग्राहक

व्यवहार :

मिति :

पतेन :

नाम :

पद :

(इतिहासगत ग्राहकको प्रतिनिधि भएमा मात्र)

नाम :


पतेन :

हस्ताक्षर :

मिति :



Annex 6: Installation Form




**नेपाल टेलिकम**  
नेपाल दूरसंचार कम्पनी लि०  
दूरसंचार कार्यालय,

द. डि. पत्र७  
स. अ. २

<b>जडान फारम</b>		नं.	
नयाँ साईन बडान गर्ने / साईन / परिवर्तन गर्ने		मिति	
टेलिफोन/टेलेफोन/पोस्ट/फाइभ नं.	<input type="text"/>	एच.टी.डी. कोड	<input type="text"/>
नाम	बिपानीमा	पहिलो टेलिफोन नं.	<input type="text"/>
	(अंग्रेजीमा)		
संस्थान	(नेपालीमा)		
	(अंग्रेजीमा)		
(क) स्थानी	1 0 0	अस्थाप/प्राप्ति	2
		पटक बिन	3
(ख) अचलता	1	व्यापारिक संस्था	2
		सरकारी	3
		वर्गित	4
		रैल	5
		व्यापारिक	6
		सिवांगक	7
		टेलिफोन	8
		नीज	9
		अन्य विवरण	0
(ग) उपकरण विवरण			
धरोटी रकम रु.	रु. नं.	मलिनको अंक	<input type="text"/>
सङ्कलन मसुदा रु.	रु. नं.	कुलको अंक	<input type="text"/>
सा. मसुदा रु.	रु. नं.		
सी. मसुदा रु.	रु. नं.		
कलर भाँडे. डि. रु.	रु. नं.		
टेलिफोन अंक रु.	रु. नं.		
जम्मा			
प्रतिनिधित्वको दस्तावेज	मिति	अधिकृत	
(क) उपकरण विवरण ( ) ( )		र मेटल नं.	
(ख) उपकरण र उपकरण बडान गर्ने (अ. अ.) मातृक प्रयोग प्रयुक्त सामान्यतयाको परिभाषा गर्नु			
(ग) एम. डि. यु.क. वा सम्पर्क राखी उपकरण रेजि. एम. डि. एच. सम्म परिक्षण गर्ने।			
(घ) टोक नष्ट भिडर रिडिग किने मिटर	( ) टोक ( ) वेडीक	मिटर रिडिग	<input type="text"/>
मिति		टोली प्रमुख	
(ङ) निरीक्षकको प्रतिवेदन ( ) टोक ( ) वेडीक			
मिति		निरीक्षण	
पाठकको निरीक्षण			
उपकरण तथा उपकरण बडान गर्ने जडान संतोषजनक क्षमता भएको छ र मासिक महसुल तिर्ने शर्त तयत प्राप्त भएको र उ. हामी नेपाल टेलिकमको ताल मेशको र सविधमा लागू हुने विनियमावलीको पालना गर्ने छुंछौं।			
मिति		इस्तवत	
पाठकको मास्टर कार्ड तयार भएको।			
मिति		एच. टी. डी.	
पाठकको साईन रेकर्ड।			
मिति		रे. ल.	

Annex- 7: Prepaid Mobile Application Form



# नेपाल टेलिकम

(नेपाल टूरिस्टन्स कार्पोरेशन लिमिटेड)

## काठमाडौं क्षेत्रीय निर्देशनालय

प्रयोगकर्ताको  
सामग्रीको साईटको  
फोटो

(कुनैमा फोटोमा  
स्टिच नगर्नुहोस्)

कार्यालय प्रयोजनको लागि	
दस्ता नं.	
मिति	

**पि-पेड मोबाइल टेलिफोनको आवेदन फारम**

1. ग्राहकको नाम, यत्र :-  
Customer's Name (in BLOCK Letter) :-
2. ग्राहकको ठेगाना (Customer's Address) :-  
(क) सवारी : जिल्ला :-  या वि.सं. : नगरपालिका :-   
(क्यान्डिडाट अनुसार)  
वाट नं. :-  मार्केट/टोलको नाम :-  घर नं. :-   
(ख) हाम्रो बसोबास गरिरहेको :- जिल्ला :-  या वि.सं. : नगरपालिका :-   
(क्यान्डिडाट अनुसार बन्दा घरको सवारी नाम)  
वाट नं. :-  मार्केट/टोलको नाम :-  घर नं. :-
3. संघ/संस्थाको नाममा जडान भएमा  
(क) प्यान नम्बर :-  (ख) सम्पर्क टेलिफोन नं. :-
4. ग्राहकको पेशा :-  ५. लिंग :  पुरुष  महिला
- (क) कार्यालय/अध्ययनरत संस्थाको नाम :-
- (ख) कार्यालय/अध्ययनरत संस्थाको ठेगाना :-
6. ग्राहकको बाबु/पतिको नाम :-
7. ग्राहकको बान्नेको नाम :-
8. ग्राहकको सम्पर्क टेलिफोन नं. :-  ९. ई-मेल :-
10. ग्राहकको परिचय :- नागरिकता नं. (सवारी कार्यालयको लागि) जिल्ला  
पासपोर्ट नं. (सवारी कार्यालयको लागि) सम्पत्ती/घरको दस्ता नं.  
(सम्पर्क नम्बरमा आरक्षित नसकिने १०९९ अतिरिक्तको लागि आरक्षित नम्बरहरूको लागि विपरीत प्रमाणपत्रको संख्या उल्लेख गर्नुपर्नेछ।)  
(संघ-संस्थाको हकमा हाम्रो प्रमाणपत्रको नम्बर उल्लेख गर्नु पर्नेछ।)

(क) नाम उल्लेखित व्यक्तिलाई छिक् लागेको हो, भन्दा उद्देश्यमा सामान्य ब्यक्तिगत ब्यक्ति हुन सक्दैन।  
(ख) नेपाल टेलिकमको इन्टरनेट तथा मोबाइलमा कसैको रूपमा हुने पास्वर्ड, आई पासवर्ड, विवरणमा फाट्नु गरीनु।  
(ग) सेरो साधनमा हाम्रो आएको मोबाइल टेलिफोनबाट अरु कसैले प्रयोग गरेर हुने दुरुपयोग वा अनिर्दिष्ट कार्य गर्नुमा सम्बन्धित कानूनको अन्तर्गत कडा कार्रवाही गरिनेछ।  
(घ) अनधिकृत रूपमा वा सल बिगरित सेवा उपभोग गर्नेको कार्रवाही दरसम्बन्धित रूपमा २०६३ को दफा २३मा अनुसार सेवा बन्द गरेमा गर्नु सक्नुपर्ने छ।  
(ङ) मोबाइल टेलिफोन इस्तेमालमा तत्काल बन्द गर्नको लागि नेपाल टेलिकममा निर्दिष्ट नम्बर दिनु।  
(च) व्यक्तिको रूपमा नेपाली नागरिकताको प्रमाणित प्रतिनिधी, विदेशीको हकमा पासपोर्टको प्रमाणित प्रतिनिधी तथा संघ-संस्थाको हकमा हाम्रो प्रमाणपत्रको प्रमाणित प्रतिनिधी यस आवेदन फारम साथ सम्बन्धित गर्नुपर्नेछ।


<u>ग्राहकको दस्ताखत</u>	<u>संघ/संस्थाको नाममा जडान भएमा</u>	<u>प्रयोगकर्ताको आईडा छाप</u>				
नेपालीभा :	संघ/संस्था प्रमुखको दस्ताखत	<table border="1" style="width: 100%; height: 60px;"> <tr> <td style="width: 50%;"></td> <td style="width: 50%;"></td> </tr> <tr> <td style="text-align: center;">दायाँ</td> <td style="text-align: center;">बायाँ</td> </tr> </table>			दायाँ	बायाँ
दायाँ	बायाँ					
अंग्रेजीभा :	नाम :					
मिति : २०६६ / /	पद :					

**कार्यालय प्रयोजनको लागि मात्र**

<u>यसु गर्नेको</u>		
दस्ताखत :	नाम :	पद :
		ग्राहक सेवा केन्द्र प्रमुखको दस्ताखत

SIM Card Serial Number:  Mobile No.


Annex-8: CDMA Telephone Registration Form



**SKY  
PHONE**

**नेपाल टेलिकम**  
नेपाल दूरसंचार कम्पनी लिमिटेड  
**CDMA टेलिफोन दर्ता फारम**

..... कार्यालय



**PHONE**

प्रयोगकर्ताको  
समावेष्टी साईजको फोटो  
(सम्पत्तः फोटोमा रिटर्न गर्नुहोला)

१. CDMA टेलिफोनको प्रकार:  MOBILE  FIXED  SKY DATA

२. महतम भुक्तानीको प्रकार:  PREPAID  POSTPAID

३. Mobile Directory Number: [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] (MDN)

४. ग्राहकको नाम, घर: \_\_\_\_\_  
Customer's Name: (in BLOCK Letters) [ ]

५. ग्राहकको ठेगाना (Customer Address) जिल्ला: \_\_\_\_\_ गा.वि.स./नगरपालिका: \_\_\_\_\_  
 क) स्यादी बार्ड नं.: \_\_\_\_\_ गाउँ/टोलको नाम: \_\_\_\_\_ घर नं.: \_\_\_\_\_  
 ख) हाल कसोबल गरी रहेको जिल्ला: \_\_\_\_\_ गा.वि.स./नगरपालिका: \_\_\_\_\_  
 (स्थायी ठेगाना भन्दा फरक भएमा) बार्ड नं.: \_\_\_\_\_ गाउँ/टोलको नाम: \_\_\_\_\_ घर नं.: \_\_\_\_\_

६. डाहाको/प्रयोगकर्ताको परिचय: नागरिकता नं.: \_\_\_\_\_ Passaport No.: \_\_\_\_\_ (Foreigners Only)  
(Other Nationals submit a Passaport photo in the Certificate Number issued by The Indian Embassy)  
 विवरण भएको जिल्ला: \_\_\_\_\_ Nationality: \_\_\_\_\_

७. ग्राहकको/प्रयोगकर्ताको पेशा: \_\_\_\_\_ ल. विट्टु:  पुरुष  महिला

८. ग्राहकको/प्रयोगकर्ताको सम्पर्क टेलिफोन नं.: \_\_\_\_\_ E-mail: \_\_\_\_\_

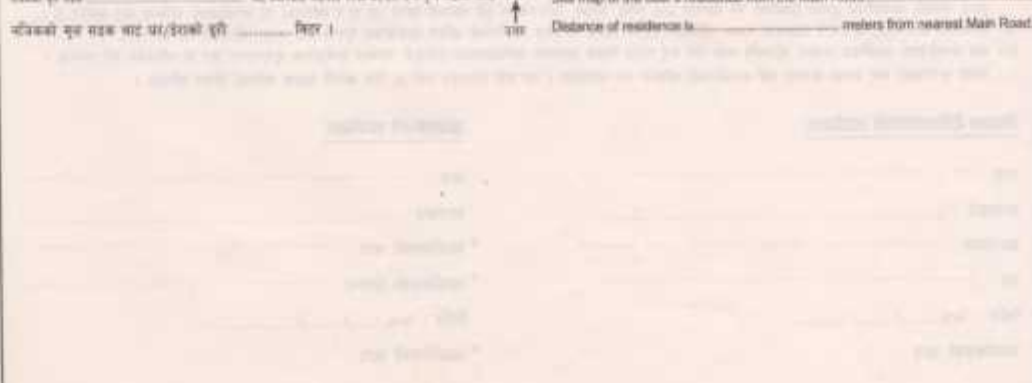
९. ग्राहकको/प्रयोगकर्ताको चातेको नाम: \_\_\_\_\_

१०. ग्राहकको/प्रयोगकर्ताको चाबुको/पतिको नाम: \_\_\_\_\_

११. सघ/सम्स्थाको नाममा जहान भएमा  
 (क) कार्यालय/कार्यलयसहित संस्थाको नाम: \_\_\_\_\_  
 (ख) कार्यालय/कार्यलयसहित संस्थाको ठेगाना: \_\_\_\_\_  
 (ग) सघ/संस्था प्रमुख वा प्रोपराईटरको नाम: \_\_\_\_\_  
 (घ) प्यान नम्बर: \_\_\_\_\_  
 (ङ) सम्पर्क टेलिफोन नं.: \_\_\_\_\_

संकेत नुमाँडा \_\_\_\_\_ वा प्रयोगकर्ताको/प्रयोगकर्ताको नाम \_\_\_\_\_ N  
 नजिकको मुख्य सडकबाट घर/ठेगानाको दूरी \_\_\_\_\_ मिटर । Distance of residence is \_\_\_\_\_ meters from nearest Main Road.

Site map of the user's residence from the Main Road.



बाधित अनलेखित प्यारीस ठीक गर्नु हो, कृपया टाउनेमा कसपुन बर्भोजिम सहैला बुझाउला ।

ग्राहक/प्रयोगकर्ताको/प्रयोगकर्ताको नेपालीमा \_\_\_\_\_ Signature in English \_\_\_\_\_ दिने: २०८ / /







## Ncell Subscription Form for Individual Subscriber(backpage)

**REQUIRED DOCUMENTS ALONG WITH THE APPLICATION FORM**

1. A photocopy of Nepal Citizenship Card/Passport/Driving License/ID Card (If employed in Government office) – any one document mentioned above.
2. Applicant must bring the original copy of the document attached with the subscription form for verification.
3. For minors, a document to prove or support identification and a photocopy of the citizenship of minor's father/mother or guardian is required along with a valid signature taken in presence of an authorized personnel.
4. For foreign citizens, a photocopy of passport and duly endorsed valid visa is required.
5. A passport size photograph with both ears clearly visible is needed and the applicant should sign on it.
6. Applicant must declare names of his/her three immediate previous generations, permanent and temporary addresses.
7. In case of fraud or ambiguous declaration of the address or other details, Ncell Private Limited reserves the right to refuse the mobile service and if the service is already provided then the service will be discontinued any time without prior notice.
8. All rights related to rendering of the mobile service to an individual or a company will be solely reserved by Spice Nepal Private Limited and the applicants are not allowed to create any duplicate whatsoever.
9. Applicant must strictly use the mobile service which is endorsed in his/her name. If the mobile service is used by a person other than the applicant/subscriber, in such a case, prior permission must be obtained from Ncell Private Limited. After providing the reasons, name of user, family name, address, business/ service and name of his/her three previous generations must be provided. The subscribers will be liable for any unauthorized use of the service.

**Signature of Applicant**

\_\_\_\_\_

**Signature of Authorized Personnel**

\_\_\_\_\_

**Stamp of Authorized Personnel**

\_\_\_\_\_





Annex-11: Questionnaire for Status of Telecommunications Services

दूरसंचार सेवाको स्तर मूल्यांकन संबधी प्रश्नावलि:

- १ नाम: \_\_\_\_\_  
२ उमेर: \_\_\_\_\_ लिङ्ग: \_\_\_\_\_ पेशा: \_\_\_\_\_  
३ ठेगाना: \_\_\_\_\_ गा.वि.स. र न.पा. \_\_\_\_\_ जिल्ला: \_\_\_\_\_  
४ कति वटा टेलिफोन घरमा छ ? कुन कुन कंपनीको छ? \_\_\_\_\_

५ के-कुन कंपनीको टेलिफोन क-कसले प्रयोग गर्छ? \_\_\_\_\_

६ के- कति अवधिदेखि उक्त फोनहरु प्रयोगमा छ? \_\_\_\_\_

७ फोनलाइन(हरु) प्राप्त गर्न के- कति समय लागेको वियो: \_\_\_\_\_

८ कलको गु-णस्तर कस्तो हुन्छ? \_\_\_\_\_

९ डायल टोन रहन्छ वा रहदैन? कति विग्रन्छ? \_\_\_\_\_

१० लाइन बनाउन कति समय लाग्ने गर्छ साधारैतया? \_\_\_\_\_

११ STD/ISD कल कति सजिलोसग लाग्छ? ... एक पटकमा दइ पटकमा  
तीन प्रयासमा धेरै प्रयास गर्नुपर्छ? \_\_\_\_\_

१२ टेलिफोन विल भरपर्दो लाग्छ? कति पटक घटी वा बढी विल आएका छ? \_\_\_\_\_

१३ मोबाइलफोनको नेटवर्क त्स्त लाग्छ? कसको कस्तो नेटवर्क लाग्छ?

NT.....

Ncell.....

UTL.....

(२४ घटा रहन्छ, राति हन्छ? आदि)

१४ मोबाइलफोनको कुरा कति स्पष्ट हुन्छ? आवाज कटने,  
एकतर्फी आवाज, सनसनाहट आदि

Questionnaire for Status of Telecommunications Services

१५ मोबाइलको नेटवर्कको BTS बिग्रेमा बन्न कति समय लाग्छ? २४/ ४८/ ७२  
घंटा वा सोभन्दा बढी

NT.....

Ncell.....

UTL.....

१६ मोबाइलबाट इन्टरनेट (GPRS/3G) कस्तो चल्छ? (गति र Fluency)

१७ एउटा कम्पनीको फोनबाट अर्को कम्पनीको फोनमा कल गर्दा सजिलोसग लाग्छ  
लाग्दैन?

१८ थप सुविधाहरु लिन कति समय लगाउँछ?

१९ मोबाइल बाट कति सेकेण्ड वा मिनटमा कल जोडिन्छ?

२० कुरा गरी रहँदा कल कति फेल हुन्छ? (Call Drop)

२१ कुन कम्पनीको सेवा भरपर्दो लाग्छ? किन ?

२२ कुन कम्पनीमा तपाईंको विश्वास र आस्था बढी छ?

२३ कुन कम्पनीको सेवाबाट तपाईं सबैभन्दा बढी सन्तुष्ट हुनुहुन्छ?

धन्यवाद

*Annex-12: Telecommunications and Information services for the Poor*

Navas-Sabater, Dymond and Juntunen (2002), in their research paper (World Bank Discussion paper number 432) entitled “Telecommunications and Information Services for the Poor: Toward a Strategy for Universal Access” has remarked that access to information and communications technologies has become crucial to a sustainable agenda of economic development and poverty reduction, and yet access remains concentrated in a few regions and population groups, with the contours of this new ‘digital divide’ closely following and supplementing existing income and economic divides. However, technological innovations, economic pressures, and regulatory reforms are making access to information and communications technologies more affordable and providing opportunities to close the digital divide.

Two issues need to be addressed when designing strategies to promote universal access to information and communications services: 1. Market efficiency gap and  
2. Access gap.

The market efficiency gap can be closed with a well-known set of policy and regulatory measures such as introduction of competition in all service segments and geographic areas. The access gap is very challenging as it is hard to reach isolated poor customers in uneconomic areas. Government need to employ a mix of several possible approaches including specific universal access policies and public investment subsidy schemes.

The researchers have analyzed access problems and put them as:

A. There are two dimensions of access problem:

- i. Rich and Poor, and
- ii. Urban and Rural/ Remote areas

Rich people have more access to information and communications services than the poor people because of their affordability. Urban areas have more access to information and communications services than rural areas because companies do not like to go to rural places due to high infrastructure cost and low profit.

B. Basic Access Indicators:

- i. Teledensity : Rural areas have very low teledensity.
- ii. Residential Penetration: Low in rural/ remote areas due to lack of infrastructure.



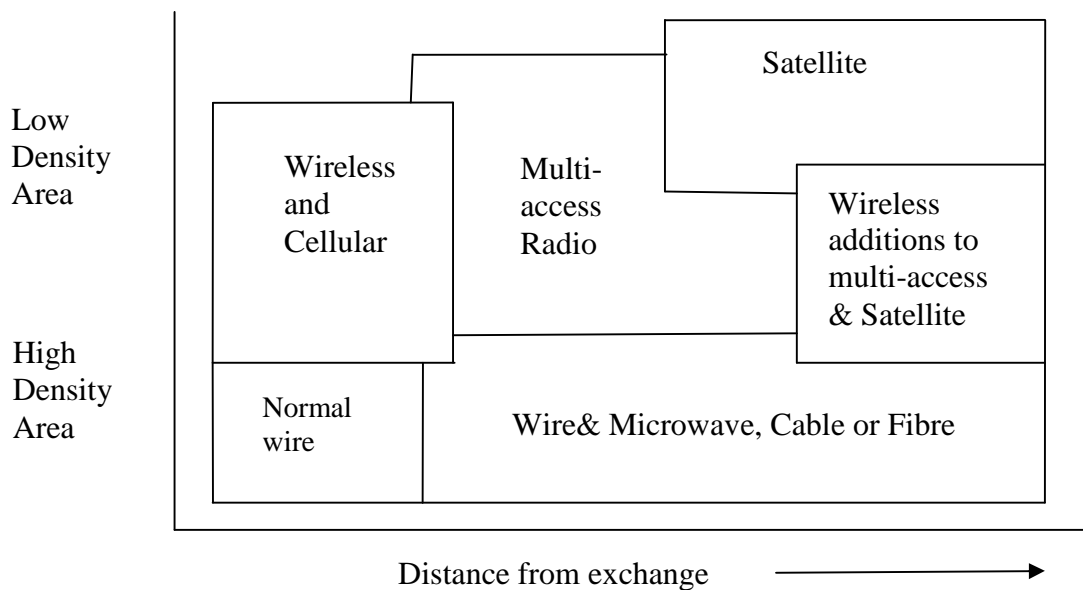
- iii. **Affordability:** Countries, regions, households and individuals of all income levels spend somewhere between 1% and 3% (avg. 2%) of their income on telecommunications. Some of the poorest countries of the world spend less (low income countries average 1.25).
- C. **Urban – Rural Gap:** Assuming conservatively that 80% of all the telephone lines outside the largest city indeed serve other smaller urban areas, as opposed to villages and rural locations, the scale of the problem can be estimated. Disparities between 20:1 and 60:1 are common.

Technology and Market Solutions for the Access Gaps:

1. **Wireless and Satellite Technologies:** Cellular, WLL, VSAT etc.
2. **Declining Costs:** Low cost wireless solutions, ranging from multi-access radio to cellular to fixed wireless are now available for rural areas.

The technological feasibilities for different types of locations have been worked out as shown in the figure below:

Figure:2-4: Typical Market Niches For Various Technologies



World Bank had provided technical assistance to Nepal to create rural development fund and initial investment into the fund. Strategy was to introduce competition by licensing 4 new providers in separate regions with a rural focus. The project would finance the subsidy portion associated with one region initially.

**Proposed Strategic Directions:**

S.N.	Strategic Directions	Policy/ investment options
1	Policy reform	<ul style="list-style-type: none"><li>- Competition, regulation, privatization</li><li>- Universal access funds, incl for advanced ICTs</li></ul>
2	Mobilization of Investment	<ul style="list-style-type: none"><li>- Investment in rural telecentre operator</li><li>- Seed financing of universal access funds</li><li>- Grants &amp; micro-loans for SME development</li></ul>
3	Institutional development	<ul style="list-style-type: none"><li>- Organisational planning and capacity building for regulatory agencies</li><li>- Modernization of Govt agencies, e-govt initiatives</li></ul>
4	Pilot Projects and knowledge	<ul style="list-style-type: none"><li>- Pilots to innovate policy and technology for universal access</li><li>- Local content creation and dissemination</li></ul>