UNIVERSIDAD TÉCNICA DEL NORTE

FACULTAD DE INGENIERÍA EN CIENCIAS APLICADAS

CARRERA DE INGENIERÍA ELECTRÓNICA Y REDES DE COMUNICACIÓN

Technical Report

PROYECT NAME: PLAN DE NEGOCIOS DE UN SISTEMA INALÁMBRICO CDMA 450 EN LA PARROQUIA DE BUENOS AIRES-CANTON URCUQUÍ PARA LA CORPORACIÓN NACIONAL DE TELECOMUNICACIONES**.**

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1. Introduction

This report is presented of explicit manner the processes were performed to develop the Business Plan of a Wireless System Cdma 450 in Buenos Aires town-Urcuqui City to National Corporation Telecommunications, which could see more detailed form the steps realize in the thesis with the same name.

2. Abstract

In this document indicate the processes follow in the preparation of the thesis project, which consists of 5 chapters are indicated. Each describes the processes used in the course of the preparation of the thesis, in which the business plan of the wireless system, for which it's realized a socio-economic study in sectors to intervene, also it's made a demographic study in which analyzed the right places in which will be the relay to network design Cdma 450.

Starting from: determining the necessity for a telecommunications system, to provide services telephony and internet communities in La Merced de Buenos Aires town, for which it's realized interviews to the people to can realize a socio-economic analysis, content structure to define the project scope for design besides using Mobile Radio software to realize testing to the operation of the wireless link.

With consideration of the process, cost analysis to evaluate the cost benefit of the project further with this analysis will determine how beneficial it is for society, because currently the objective of the CNTEP, And the National Government is to provide telecommunications services to all sectors especially the farthest for a good life.

For this reason the development of the proposed project will provide important contributions to design wireless networks that provide voice services and data inaccessible places further regulatory technical standards and must have a wireless network that can support the application is denoted would provide a description of the necessary equipment and more efficient to be used to a future implementation.

It was realized an analysis of the repeater between Beauty and Buenos Aires town to develop a microwave link between these two points, you should have a bandwidth of 5 GHz required by CNT EP, to this took Chispo coordinates (elevation mountain located in Buenos Aires) in which the repeater to provide service to Buenos Aires town surroundings will be located, because it's doesn't have line of sight between the two points was reached to determine is necessary to locate a repeated more in Buenos Aires mountain, thus having good coverage for what the link is Beauty - Cerro Buenos Aires - Chispo, providing better coverage all communities.

It was effected a study to identify coverage where the cells, tower height, for which it took into account potential users and the services required, further will be located detailed the required equipment.

It was included a diagram of detailed engineering, where the links and descriptions of E1s that used the BTS be illustrated, also took into account the energy and climate with which the fourth generation.

To continue describing the following chapters of research and development to this proposed project.

3. Work body

3.1. Chapter I: Basic Concepts of the Technology CDMA

In this chapter it was realized a study of the CDMA technology (Code division multiple access), so indicate the advantages, disadvantages and applications of the same making a comparison with other technologies, further compared to other wireless technologies to this manner know what is the range to national and global levels of such technology.

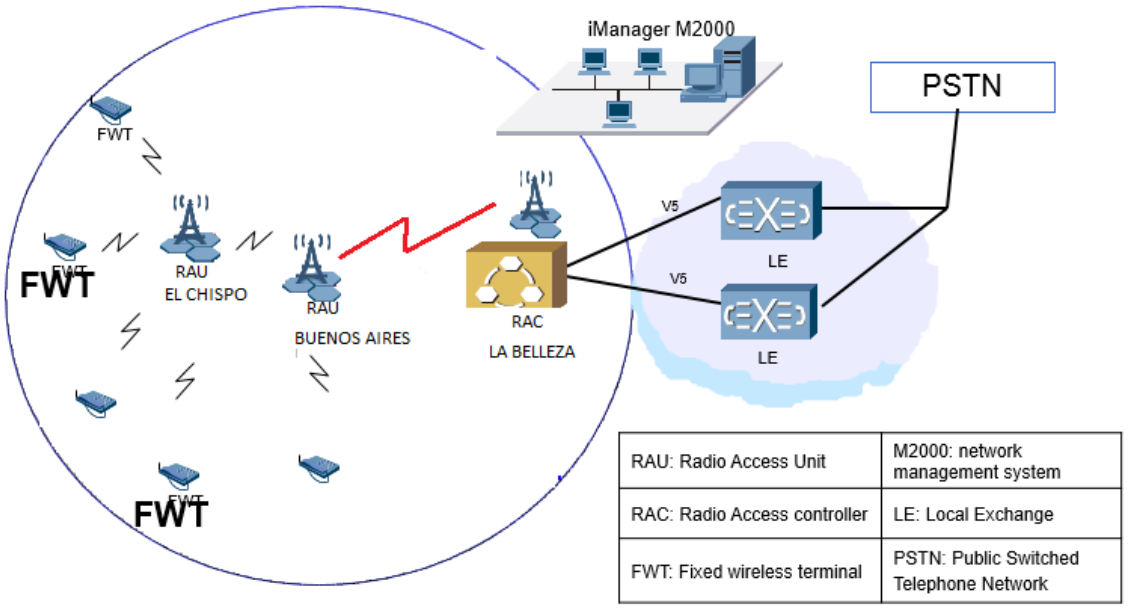
3.2. Chapter II: Demographic Situation Analysis and Design Requirements

It was indicated the demand and service needs, current techniques and geographic characteristics of application area for the location of the relay and calculations of the link, for the development of this chapter will also present field surveys directed at residents of the was performed communities in Merced de Buenos Aires town, in this way came to know what people need and what is their ability to pay, having satisfactory answers.

3.3. Chapter III: System Design

En este capítulo se realizó el diseño WLL (lazo local inalámbrico) implementado con el sistema CDMA en el que constara la arquitectura de la red además la selección y descripción de los equipos requeridos para el diseño, todo el diseño se basó en cálculos matemáticos para radio enlaces tomando en cuenta los puntos en los que se pondrán las repetidoras, mediante los datos obtenidos se puede saber si matemáticamente el diseño es factible y con una excelente cobertura, todo esto se comparó con la simulación y en ambos casos se tiene un buen resultado.

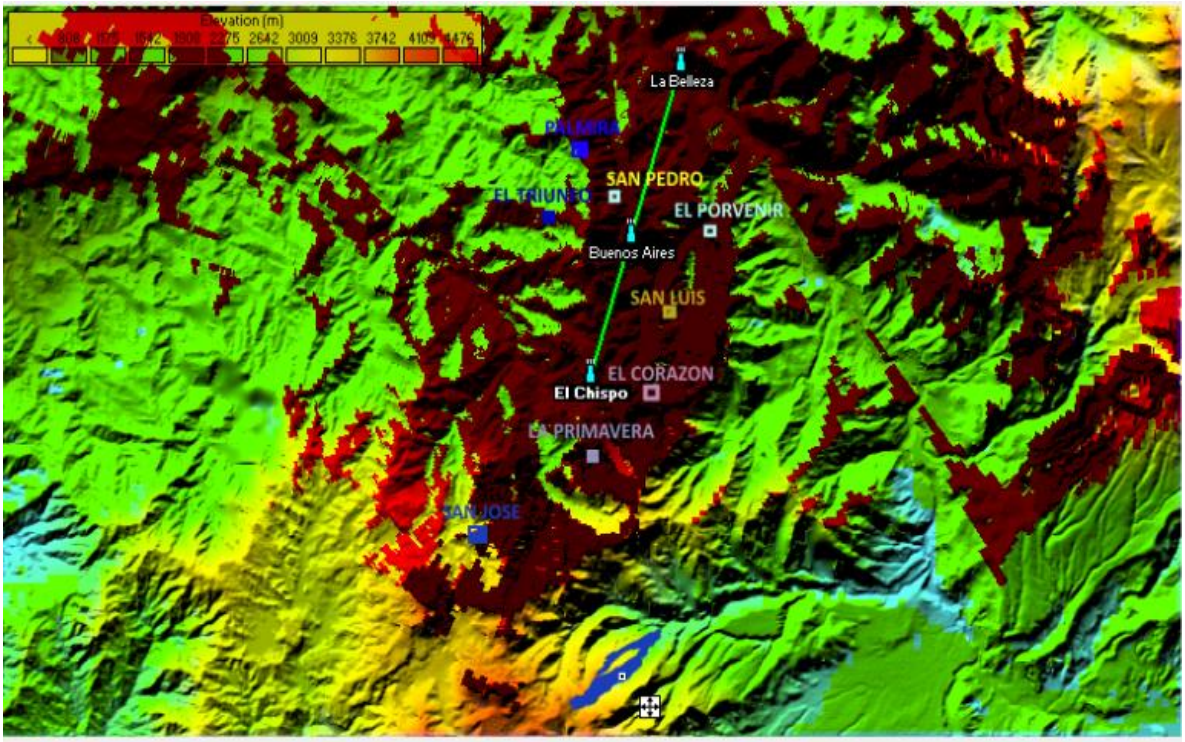
In this chapter it was realized WLL design (Wireless Local Loop) implemented with the CDMA system in which consist the network architecture also the selection and description of the equipment required for the design, all design was based on mathematical calculations performed for radio links taking into account the points at which the relay will be made by the data obtained can tell if mathematically feasible design and excellent coverage, all this was compared with the simulation and in both cases there is a good result.



RAU: Radio Access Unit	M2000: network management system
RAC: Radio Access controller	LE: Local Exchange
FWT: Fixed wireless terminal	PSTN: Public Switched Telephone Network

3.4 Chapter IV: Testing Design

Once completed the system design by calculation simulation is made using the radius Mobile software to verify the performance of the link to provide quality coverage also the interpretation of the simulation of the link and the coverage the same.



3.5. Chapter V: Cost Analysis

It will indicate he reference budget of the teams indicated in this case Huawei company, further costs related to project development for the engineering, then a detailed cost analysis for the implementation of the project and the feasibility study, coming from this way to see if the project is economically feasible or not, which concluded that is social benefit, realizing of this manner the analysis performing cost-benefit.

4. Conclusions

- The design of a rural network, apart from the own aspects of engineering, also contains an aspect of sensitivity and social responsibility which should be reflected in the pursuit of development of people, feelings that have been around since the conception of this project and will remain as part of the commitment with the society.

- It conclude that to achieve, provide better coverage in rural areas such as communities of Buenos Aires town the best choice is CDMA 450 because the radius of coverage is wide, in the air and indoors, occupying less settlements cells.

- CDMA 450 technology in Ecuador is the best option to take because it is a mix of CDMA 2000 in the 450 MHZ frequency less exploited n the wireless range inside the country.

- It's conclude that future customers waiting and want to provide to short term telephony services to this way have as communicate with their families and even when happen disasters by bad weather or health.

5. Recommendations

- It is recommended that when designing a network its wireless or vice versa realize a careful study of what is possible user needs in this way can provide a quality service gained of this manner more confidence in the market.
- It's necessary that the geographic study area would perform before radio link through software to this manner verify physically if the places that may be located based stations are easily accessible or whether to take enabling measures of roads.
- It's recommended the installation of the equipment inside the station to be distributed efficiently to maximize space, further to in a future be possible increase the service.
- Create a culture of belonging of the service and infrastructure installed in the area to prevent acts of vandalism which in recent years has been the CNTEP, in the copper network, because users should be aware they are the unique beneficiaries, generating a sense of conservation and care of the entire population to the equipment.

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