Development of Telecommunication in India since Independence

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ABSTRACT

During British Raj, Rajdhani of East India Company was at Calcutta and then the capital got shifted to Delhi in 1911 by Lord Hardinge and gradually the power center was shifted to Delhi and continued to be capital of India and after independence, New Delhi became the capital of India. The control of telecom operations was gradually transferred from Public Works Department (PWD) to Director General Postal and Telegraph (DGP&T), from DGP&T to Department of Telecommunication (DOT), from DOT to Department of Telecom Services (DTS) and finally landed in Bharat Sanchar Nigam Limited (BSNL). The head quarters of telecom operations during all these years of transition was New Delhi and for BSNL and Mahanagar Telephone Nigam Limited (MTNL) after their coming into existence also, still New Delhi continues to be the head quarters.

Keywords: Rajdhani, East India Company, PWD, DGP&T, DOT, DTS, BSNL and MTNL

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1. INTRODUCTION

We live in an age of computer, electronics and communications. Nowadays, we could see an all-round development is going on in communications. Modern Science has revolutionized the system of communication. The word "communication" is derived from the Latin root 'communicare' which means "to make common to share, to transmit". Communication in a general sense is a chain of events to pass message to others. Communication is done by talking and writing. A nation's development depends highly on the development of communication system. In the ancient times, birds, horses were trained to carry written messages. Horse men carried information and handed it over at Choultries (rest houses). The discovery of electromagnetism led to the basic understanding of electronic communication. The various means of communication are the Posts, telegraphs, telephones, radio, television, internet programs and newspapers. They are the powerful means of communicating information and educating the people at large. The communication plays an important role in molding their thoughts and deeds.

Telecommunication is a system, which provides communications over a distance. For centuries bonfires have been used as a method of conveying a simple message, such as the Armada is coming (1588). The first mechanical telecommunication systems were the semaphore and heliography (which used flashes of sun light). But the forerunner

of the modern telecommunication age was the electric telegraphy. The earliest practicable instrument was invented by William Cooke and Charles Wheatstone in the U.K. in 1837 and used by railway companies, the first public line being laid between Paddington and Slough in 1843.

This paper is organized as follows: Section 2 provides a discussion on development and implementation of Telegraph service in India. Section 3 provides a discussion on development and implementation of Phonograph service in India. Section 4 provides a discussion on development and implementation of Telex service in India. Section 5 provides a detailed discussion about the development of Telephone Service in India. Section 6 provides a discussion on present scenario of Telecom Industry in India. Section 7 gives the conclusions.

2. TELEGRAPH SERVICE

The invention of telegraph introduced far-reaching changes the wires and cables of the telegraph. The word, "telegraph" is derived from the Greek word, "tele" means 'far' and "graphein" means 'to write'. Telegraph is an apparatus for sending messages over a distance by using a code. Now it denotes the electric telegraph in which the information is transmitted in a written or printed from. The telegraph offices help to send telegrams. Telegram is meant for urgent messages. It takes only a few hours to reach the destination. First Telegraph line between Kolkata and Diamond Harbour was opened for traffic in 1851[1]. Telegraph messages were sent from Agra to Kolkata in 1884. By 1900, telegraph and telephone had started serving Indian Railways.

Telegraphic communications are made through telegrams and phonograms. Telegrams are of two types- inland and foreign. Inland telegrams can be sent either as Ordinary telegrams or as Express Telegrams. Telegrams are written out in printed form available with the telegraph offices. To reduce the length of the message and maintain secrecy, many business firms use code telegrams. In a code, a single word may have the meaning of a whole sentence. Very similar to Code telegrams are Cipher telegrams which consist of groups of figures or of letters carrying secret meaning. Many businessmen require early reply to their queries. For this purpose, they can avail the facility offered by reply-paid-telegrams. In this system, the sender of a telegram deposits charges for reply by the addressee subject to the minimum charge for an 'ordinary' telegram. If telegrams are sent very frequently by a businessman's office, he can make arrangement with the post office to maintain a deposit for the telegrams for a stated period or give a letter of guarantee from an approved bank for that amount upon which telegrams are received by the telegraph office without pre-payment of charges[2]. For this service rendered, the telegraph office charges a nominal fee.

3. PHONOGRAPH SERVICE

Another useful service is that of phonogram. The sender, in this service, merely gives the telephone number of the addressee. The telegraph office communicates the message to the addressee over the phone and a written copy is sent subsequently by way of confirmation. The message itself can be delivered by the sender to the telegraph office on phone. It may be pointed out in passing that with the development of telephone facilities, the use of telegrams in business communications has reduced significantly. This is on account of the fact that transmitting messages over telephones is much more convenient than transmitting message by telegrams. Also, replies can be received and queries replied to almost immediately on the telephone whereas it takes some time to communicate replies via telegrams[1].

4. TELEX SERVICE

Telex service provides a direct communication link between subscribers by means of teleprinters. Subscribers to this service have a teleprinter installed in their office and are given a number (in the same way as telephone subscribers are given number). The sender (telex operator) just types the message on the teleprinter which is automatically printed at the recipient's office, even if there is no one there to receive it. On account of this reason, we may say that the telex service is a 'written telephone call between the typewriters'. The advantage of this system is that messages can be transmitted at any time of the day or night. Changes in stock exchange quotations, prices of different goods or other information sent through telex service in the night will remain typed in the teleprinter. When the recipient opens his office next morning, he will get the information ready[1]. This system is highly beneficial for firms having their offices in different cities or different countries.

In India, the national telex service was opened in 1963. With the commissioning of teleprinter, exchanges at important cities printed messages can the sent and received directly from one subscriber to another in any part of the country. Telex service was available between 157 cities on 31st March, 1982. Fully automatic telex subscriber dialing

through electronic telex exchanges at Bombay and New Delhi is available to 48 countries of the world. With the opening the Telecom sector to private investment and establishment of independent regulator, a new Public Sector Undertaking, Bharat Sanchar Nigam Limited (BSNL) was formed 1st October, 2000. It takes over all the service providing functions of the Department of Telecommunications all over the country. Initially, the exchanges were of manual type. Later, they were upgraded into automatic electro-mechanical type. Later, they were upgraded into automatic electro-mechanical type. A significant qualitative improvement has been brought about by including Digital Electronic Exchanges. India has one of the largest telecom networks in Asia comprising 35,023 telephone exchange (including BSNL and MTNL) on 31st March, 2002. The Mahanagar Telephone Nigam Limited (MTNL) came into existence on 1st April, 1986 as a company wholly-owned by the Government under the Department of Telecommunications[2].

5. TELEPHONE SERVICE

Telephone service was also introduced at first in Kolkata in 1881-1882. The term telephone is derived from the Greek word, "tele" far and "phone" sound. The invention of the telephone by Alexander Graham Bell, Scottish American Scientist was a revolution in communications and contributed much towards its expansion. Telex services are available to transmit message quickly by teleprinters. The first telephone exchange with automatic lines was installed at Simla in 1913 with a capacity of 700 lines. Now, E-mail and Internet play an important role in communication. Instant contact between people in any part of the world is made possible with the help of communication satellites[1]. The Indian Telephone Industries (ITI) limited, Bangalore was set up in 1948.

Recent decades have seen two significant changes in telecommunications. Telephones have been made much more efficient by the introduction of fiber optics, which can carry telephonic communications that have been digitized, so that many calls can travel over a single cable. Each analog signal is sampled 8,000 times per second, are compressed and sent in packet form second issue was a divestment by the Government of India. To ensure future growth, VSNL has a five year programme of investment of over Rs.7,050 crore in further infrastructure and other strategic initiatives[3].

Consequent to the liberalization of Broadcasting Policy by the Government, VSNL has provided satellite uplinking facility to a number of private operators, which include Sun TV, Surya TV, Eenadu, Asianet, Gemni TV, Vijay TV, etc. VSNL also provides Point-to-Point transmission facilities to Star TV and Zee TV. VSNL's major initiatives include more gateways at international traffic generating centres and greater facilities to provide information super highways and remain a carrier of carriers for India in the international telecom field. VSNL is a MoU Siging Government company and has bagged the ranking of 'excellent' for the last six years[4].

The Department of Telecommunications (DOT) has improved significantly since independence both in quality and quantity. At the time of independence, there were 321 exchanges and 86,000 telephones. By 1982, the number of telephone exchanges had risen to 8,521 and the number of telephones to 29.81 lakhs. This rapid expansion of the telephone facilities has enabled traders to place orders for goods or get quotations for them much more rapidly than by the traditional postal methods. Moreover, matters can be discussed and decisions arrived at in a few minutes telephone talk. The disadvantage is that there is no written record of the communication. Therefore it is imperative that decisions arrived at through telephone conversation are confirmed in writing as soon as possible[5].

A service which has benefited traders located in different cities immensely and has made the task of placing orders across cities very easy is the Inland Trunk Service and the Subscriber Trunk Dialing (STD) system. Four types of Trunk Calls- ordinary, urgent, priority and lightning are available. Urgent calls have a priority over ordinary calls while priority calls have a priority over urgent calls. Lightning calls are the best means to communicate immediately with persons in other cities. However, they are very expensive as their charges are as high as eight times the ordinary charges. The STD system was introduced for the first time between Kanpur and Lucknow in 1960. It is now in operation between a large number of cities. Telephone subscribers in Delhi, Bombay, Calcutta and Madras can now dial London and other cities in U.K., directly without the help of an operator. In addition to this facility, the normal international trunk service is also available. Fully automatic International Subscriber Dialing Service is now available. International Trunk Exchange, New Delhi has direct Satellite Circuits to a number of countries[6].

5.1 Bharat Sanchar Nigam Limited

The control of telecom operations was gradually transferred from Public Works Department (PWD) to Director General Postal and Telegraph (DGP&T), from DGP&T to Department of Telecommunication (DOT), from DTO to Department of Telecom Services (DTS) and finally landed in Bharat Sanchar Nigam Limited (BSNL). The head quarters of telecom operations during all these years of transition was New Delhi and for BSNL and Mahanagar Telephone Nigam Limited (MTNL) after their coming into existence also, still New Delhi continues to be the head quarters[7].

BSNL is a fully owned Government Public Sector Unit (PSU), offering wire line, wireless, data and long distance services on pan India basis except Mumbai and New Delhi, which come under MTNL jurisdiction. Each state in India is named as a Telecom Circle which is called, Primary Switching Area and one or more Revenue Districts of the state circle are grouped together to form a Telecom Secondary Switching Area.

The total number of executives working in BSNL all over the country is around 48,420 and there are around 2,497 executives working in Tamil Nadu Telecom Circle alone. Some under developed border telecom circles may have less strength of executives when compared to other telecom circles. Altogether there are 26 circles in India and Tamil Nadu Telecom Circle (consisting of Tamilnadu state and Puducherry, except Chennai Metropolitan area) has 17 SSAs. The various historical events of Indian Telephone systems are presented[8].

The future growth of Indian Telecom industry lies in Data Services. In such circumstances, BSNL is transforming its organization setup to cater to the needs of emerging technologies as well as consumer business requirements.

Also, BSNL, being a Government Organization, has many social obligations viz., to fulfill service in rural areas, service during natural calamities/disasters, emergency situations, elections, etc., The above services have to be maintained, even though it is economically unviable. For example, when cloud burst occurred in Leh area, all the communication facilities were destroyed by flash floods. Only BSNL deputed extra staff to the area and restored the communication link to defense and public operations in a record time. This was widely appreciated and acknowledged by Honorable Ministers also. Also, the maintenance of the Telegraph System is adversely affecting the performance of BSNL. Due to no growth rate of fixed lines, stiff competition in Mobile segment, removal of Government subsidies and Government compensation, USO fund obligations, License fee reimbursements, 3G spectrum charges, BSNL is incurring losses on these score[9].

Telecom is a strategic sector and a strong PSU in this sector is a must. Also, BSNL is fulfilling the country's strategic needs to provide a reliable network and telecommunication services to remote and other sensitive areas. BSNL is also fulfilling the social obligations of the Government in the Telecom field. Hence, the Government of India is planning to bear the cost of providing these strategic telecom needs in sensitive and strategic areas and to bring BSNL in the fore front of Telecom field by focusing.

5.2 Cellular and Paging Services

Cellular and paging services though not a very old means of communication in India has very rapidly caught the imagination of the people. The revolution that started with pagers soon gave way to Mobile phones. Pagers being one way and with limited application have almost disappeared, as mobiles became the favourite. With more and more innovative offers like prepaid cards from telecom service operators, the mobile culture is growing. With more players entering the market, the competition has grown stronger, catering to the demands of consumers. Hutch, Airtel, Idea and Reliance are doing very well and are always coming up with new schemes and plans. SMS is a raging favourite among both the young and the old. A shift towards mobile telephony is apparent from the fact that the share of cellular connections in new connections is steadily going up and had reached 63% in December 2002. Cell phones now come cheaper and so does the monthly bill. As a result one can still hear some grudges from service providers as they claim lack of use of enough airtime to make it a profitable business. Today, India has 22 private companies providing cellular services in 18 telecom circles and 4 metro cities (Delhi, Mumbai, Chennai and Calcutta). Ever since their introduction, cellular services have shown a fair growth with the subscriber base crossing the 1 million mark by the first quarter of 1999. India has adopted the Global System of Mobile Communication (GSM) for provision of cellular services[9]. The cellular services in India operate in the frequency band 890-902.5 MHz/ 935-947.5 MHz. In metro cities, each operator has been allocated a frequency spectrum of 6.2+6.2

MHz (except Chennai where 5.8+5.8 MHz spectrum has been allocated), while for other telecom circles a spectrum of 4.4+4.4 MHz has been allocated.

5.3 Expansion of Telephone Centres

The telecom services continued to make progress in the last decade of the 20th century. 241 new telephone exchanges were added and bringing the total to 15,332 exchanges. The switching capacity and direct exchange lines were increased by 3.26 lakh lines. The total of optical fiber system went up to 4432 route kilometres. The telephone facility to panchayat villages improved and about 61,330 gram panchayats have been connected[10].

The increase in telex switching capacity during 1991-92 was 2206 lines, 7.6 per cent higher than in 1990-91; 17795 telex connections were added, 16.7 percent less than in 1990-91; demand for telex connections were added, 16.7 per cent less than in 1990-91, demand for telex connections has declined because of increased use of FAX. During 1991-92, 91.29 lakh conductor kilometers (1Ckms) of cables were laid, 28.8 per cent more than in the 1990-91. Cables laid in four metro cities accounted for 25.5 per cent of the total. In the manufacture of telecom cables, private sector investment was allowed[10].

Telecommunication Training Centre (ALTTC) at Ghazibad and Bharat Ratna Bhim Rao Ambedkar Institute of Telecom Traning (BRBRAITT) at Jabalpur followed by 42 Telecom Training Centres at regional, state and district levels for imparting training to the personnel in technical, managerial, traffic, building science and finance branches of Telecom Services Trainees from foreign telecom administration and entities are also admitted to these centers.

6. PRESENT SCENARIO

In the fixed line arena, BSNL and MTNK are the incumbents in their respective areas of operation and continue to enjoy the dominant service provider status in the domain of fixed line services. For example BSNL controls 79% of fixed line share in the country. On the other hand, in the mobile telephony space, Airtel controls 21.4% subscriber base followed by Reliance with 20.3% BSNL with 18.6%, Hutch with 14.7% subscriber base as per June 2005 data. The telephone instruments do not actually carry the sound themselves, but rather produce it by means of electric impulses. Sound is transmitted by means of waves in the air. These air waves way be set up by one's voice the clapping of hands, or anything that causes a disturbance of the air. Different sounds have waves of different volume and frequency[11].

In today's fast moving, competitive business world, the telephone is one of the most commonly used means of oral communication. It is used to place and take orders, to exchange urgently needed information, to make appointments, to establish valuable business contacts and numerous other things. Modern business houses spend thousands of rupees a month to avail themselves of telephone services. But this is money well spent. Speed is the hallmark of the modern world. Speed in supplying information to a customer can gain a quick order. A prompt telephone call to a customer can reveal your interest in him and create goodwill. But the telephone service can sometimes prove a nuisance also. It is very important to use it with discretion.

In modern equipment the telephone land set is lifted to make a call switch contacts in the telephone set close to came circuit to be established between the telephone set and the central office equipment. The telephone ringer provides as audible ringing bell signal to a called parts or an incoming telephone call. The telephone lines from a ringing generator. The ringing voltage is between 85 and 105 voltage at a low frequency of between 20 and 66Hz[11].

Central officers or telephone exchange serve to connect telephones of one line to those of other lines. There are 1000 of these central exchanges throughout the country and abroad. To handle the many millions of telephones in use, almost all telephone exchanges in use today are of the automatic type. There may be a few rural communities that still use manual exchanges, but these are rapidly being replaced with the automatic type. Most telephone circuits in use today utilize one insulated wire. Some lines which utilize a 2 wire metallic talking circuit use a ground circuit for ringing.

When telephone lines run parallel to power line they often pick up, by magnetic induction an interfacing hum. To avoid this, the pairs of wire should occasionally be crossed into opposite's positions on the poles so that one wire will not be closest to the transmission line throughout its entire length. Telephone wires should never be left close enough to high voltage power lines so that there would be dangers of their coming in contact with each other.

7. CONCLUSIONS

Due to the inclusion of Privatization and Liberalization Policy by the Government of India, we could see a tremendous improvement in the field of telecommunication. Mobile phone and internet plays a vital role in communication. Once upon a time, the richest people had the telephone connection. Because of the revolution of wireless communication, nowadays almost everybody has their own mobile phone in India.

Now wireless communication provides new dimension of the services like mobile data, Wireless Fidelity (WIFI), Hifi Wireless Broadband Internet and Global Positioning System (GPS). FAX service is also replaced by e-mail. But the Department of Telecommunication is providing excellent landline telephone services against their competitors.

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