CHAPTER 1
INTRODUCTION

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"HALT COMMUNICATION AND LIFE COMES TO A STAND STILL"

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INTRODUCTION

1.1 INTRODUCTION:

With the kind of infrastructure available these days the world has become a global village. With the introduction of globalization every minute there is advancement in infrastructural facilities. Infrastructure reflects the basic backbone of any economic system. It is the capital which has been invested in the economy, which is peripheral to economic activity and also facilitates the smooth functioning and promotes the social wellbeing of the community.

Three forces – Telecommunication, Information and Globalization are restructuring every aspect of business and society. A fundamental difference between the developed nation and developing nation is related to the quality of economic and social infrastructure. Infrastructure development requires massive resources which the government of a developing nation finds hard to mobilize.[1] Hence private sector participation becomes crucial. India has also entered the race. According to Telecom Review 1997, the Finance Minister P. Chidambaram has granted in the Union Budget a series of duty reductions. According to industry analysts, the newly conferred infrastructure status to the telecom sector provides industry benefits such as tax breaks and amortization of license fees, coupled with recent cuts in duty, and will trigger investment flow into the telecom sector.[9]

1.11) Tele-communication History: Global and Indian

Global history: For 110 years the company that Alexander Graham Bell set up has lived on the cutting edge of electronic technology. Many of its inventions have transformed human life.

The invention of the telephone by Graham Bell was a revolution in communication and has contributed immensely towards its expansion.

On February 14, 1876 Elisha Gray lost his race to invent the telephone. Alexander Graham Bell put in a patent application just hours before Gray filed his. Gray however had already left his mark on telephony when in 1869 he and Enos N. Barton formed Gray and Barton, a small manufacturing firm based in Cleveland, Ohio. Three years later it was renamed The Western Electric Manufacturing Company; by 1880 it was the largest electrical manufacturing company in the United States.

Indian history: Pre-Independence And Post-Independence Era

(i) Pre-Independence Era: Telecommunication services were introduced in India soon after the invention of telegraphy and the telephone. The first telegraph line was opened in 1851 between Kolkata and Diamond Harbour. The British in India, realized the advantages of industry and invested time and capital to expand the telegraph industry. In 1884, telegraph messages were sent from Agra to Kolkata. From 1900, telegraph and telephone service started serving the Indian Railways. The first automatic exchange started at Simla in 1913-14 with a capacity of 700 lines.[6]

At the time of independence in 1947, India had 321 telephone exchanges with the capacity of 1,00,000 lines, 86,000 working connections, 426 long distance voice circuits, 338 long distance public call offices and 3,324 public telegraph offices.

(ii) Post-Independence Era: After independence Tele communication services was considered the privilege of the rich. The invention of cellular phones by Hartin Cooper in 1973, has marked the beginning of a new era in wireless technology. After Motorola staked its claim to being the first by introducing its first cellular phones in 1975, along with other cell phone companies it has brought a revolutionary change in size, features, technologies, etc. In India, this sector was

accorded importance on the recommendation of Sam Pitroda around 1984-85. Indian planners realized the importance of communication to infrastructure for economic development and this lead to the expansion of telecommunication facilities.

In 1985, telecom manufacturing was liberalized. After the adoption of policies liberalization of the Indian economy, many changes occurred in the business environment.[14] With the introduction of the new telecom policy in 1994, telecommunication sector was transformed from a state owned monopoly into an increasingly competitive industry. The private operators started offering basic and value added telecommunication services including:

Cellular Communication (Cellular phone)

Radio trunking

Electronic Mail

Paging and other value added services in many parts of the country.[7] In August, 1995, Kolkata became the first metropolis to have a cellular network.

The telecom scenario has changed radically in India as well as the world. In India Development report 1997, Telecommunication was considered to be an extremely important factor in India's economic development. And even investment in this sector increased greatly. The opening up of the market led to impressive growth in business as the private sector continued to spread all over the country; new licenses were acquired, and funds were raised from both the domestic and the international market. New services were launched in the basic, cellular and WLL sectors. The cellular sector of the telecommunication industry recorded a boom with the entry of a fourth operator in each circle. In this sector, policies were framed and implemented which yielded about CDMA+ GSM 61.01mn and BASIC 45.91 mn customers by July, 2005.[20]

The telecom sector has witnessed a remarkable growth since it was accorded the status of an infrastructure industry.

1.12) Major Policy Initiatives in Telecom Sector:

The Telecom Regulatory Authority of India has taken many initiatives in the telecom policy for the fast growth of this sector. To catch up with teledensity of other countries, there is a need to maintain vigorous pro-competitive efforts in terms of public policy, rapidly shift to new technologies, encourage the entry of new players, and drive prices down through competition. The initiatives undertaken in the telecom sector recently addressing some of these issues are:

- Broadband Policy announced on October 14, 2004
- Indoor use of low power equipments in 2.4 GHz band de-licensed from August 2004
- In April 2004, license fee for UAS, reduced by 2%, is in the range of 6-10% while that for CMTs is in the range of 8-12%
- Performance Bank Guarantee in respect of NLDS license reduced in June 2004 from Rs. 100 crore to Rs. 40 crore for each phase
- License for Infrastructure Provider II reduced in June 2004 from 15% to 6% of the AGR
- ISPs permitted to use underground copper cable for establishing their own last mile linkages
- In Budget 2004-05
  - Benefits under Section 80 IA provided for companies starting after May 31, 2005
  - Customs duty exemptions provided on mobile switching centres for Unified Access Service Providers, optical fibre cable and raw materials required for optical fibre
- Bank Guarantee for IP-II category reduced in March 2004 from Rs. 100 crore to Rs. 5 crore
- The operation of automated spectrum management system has commenced

- National Internet Exchanges set up during September 2003 – February 2004
- Guidelines issued for intra-circle mergers of licenses in January 2004
- After the introduction of Unified Access Service regime, all the Basic Service licenses have migrated to UASL.[10]

1.13) Telecom Services: Telecom services are the types/kind of services provided by telecom operators .They include WLL, basic services and cellular services. Now a days these telecom services are used in various sectors therefore increasing their applications.

i) Types: The telecom services provided by operators include WLL, basic services and Cellular services.

WLL: Limited mobility means providing mobile service within one single charging area. In a single charging area the limited mobility subscriber can roam any where and make or receive calls.

BASIC SERVICES: This is a service provided using a Fixed Wireline Terminal and a telephone instrument. The Fixed Wireline Terminal (FWT) will be wall mounted and provided with an indoor type or outdoor type antenna depending on the location of the premises keeping in view the strength of the radio signal to be transmitted and received. The antenna is connected to a wall set. A conventional telephone instrument is connected to the wall set through a short telephone cable.

CELLULAR SERVICES: Cellular refers to a communications system, especially the Advanced Mobile Phone Services (AMPS) that divides geographic divisions called cells. The purpose of this division is to make the most use out of a limited number of transmission frequencies. Each connection, or conversation, requires its own dedicated frequencies, and the total number of available frequencies is about

1,000. To support more than 1000 simultaneous conversations, the cellular system allocates a set number of frequencies for each call. Two cells can use the same frequency for different conversations so long as the cells are not adjacent to each other. For digital communication, several competing cellular systems are available including GSM and CDMA.

ii) Application of Telecom: Today telecom services are used in many sectors. The growth of the telecom sector can be tracked as it is used for many purposes in each sector, as follows:

Railways / Airports	Availability, bookings and status
DGFT (Directorate General of Foreign Trade)	Reduce processing time to a few hours for registrations
Customs	Computerize and make available all export / import declarations
Central Excise	Process and view Service Tax returns etc.
Postal Services	Direct e-credit of Monthly Income Scheme returns into the investors accounts.
Passport	⇨ Availability, information, screening (at some locations) available over image transfer ⇨ Status information to individuals
Income Tax, Land registration, health Card etc.	

1.14) Overview of the Indian Cellular Industry:

The Indian Telecom Services sector is one of the fastest growing sectors in the world. Cellular services began in 1995 where GSM was the mandated standard for all cellular operators. This Government decision proved beneficial for India as GSM has been established as the dominant standard. The cellular industry has fast moved from a class service to a mass service for the common man – fuelled by continuously falling tariffs and increased coverage. Today, India's more

than 100 million strong telephone network is one of the largest in the world. In terms of number of phones, we are the fifth largest network after China, USA, Japan and Germany. During the first year of the new Government, i.e. May, 2004 onwards, an all time record growth was achieved by adding about 2.36 crore phones. The number of phones provided in the country up to 1995 was only about 2.2 crore since the introduction of phones in India and adding nearly 2 million connections every month i.e. about 70,000 persons are provided phones each day. Initially the network grew at an annual rate of 21.6 per cent, but for the last two years the growth rate has been over 40 per cent, the highest ever reported the world over. The growth can be judged from the fact that in 1947, when India attained independence, it had less than 80,000 telephone connections and could add only two million connections in the next 34 years, and now the sector adds about 20 lakh connections every month, almost what the sector added in the first 34 years of independence.

In 1947, the teledensity (telephone penetration per 100 persons) was 0.02, which has now increased from 7.15 on April 30, 2004 to 9.13 on April 13, 2005 compared to China 55 and more than 100 in the USA, Japan and Germany. While teledensity has risen sharply in recent years, India continue to lag behind countries like Brazil and China, where teledensity is higher than 42.

Even small countries like Indonesia and Sri Lanka have more teledensity than India. The average teledensity the world over is connections by four times. To reach the world average, India requires a similar pace of growth for another decade. The total number of mobile shares in India was 50.8 million with Global System for Mobile communications (GSM) sector alone accounting for over 48 million connections. At present the number of mobile phones has overtaken the number of fixed phones.

The share of the private sector has also increased to more than 45 per cent of the total number of subscribers. The cellular user base registered a 68 per cent growth to touch the 48 million mark, while fixed lines touched 44 million at the end of 2004. And the total telecom subscriber base, comprising fixed line as well as cellular users, recorded a growth of 31.42 per cent to touch 92.72 million at the end of 2004. And the total telecom subscriber base, comprising fixed as well as mobile users, recorded a growth of 31.42 per cent to touch 92.76 million at the end of 2004. The gross telecom user base stood at 70.58 million at the end of 2003. Telecom growth statistics in India can be seen from Table 1 and Table 2.

Table 1: Telecom Growth Statistics in India.[17]

	Month & Year		
Particulars)	Jan., 2005	Feb., 2005	Mar., 2005
Total subscribers	94.92 mn	97.03 mn	98.08 mn
Tele-density (per 100 persons)	8.80	9.0	9.08
Fixed Line	45.15 mn	45.54 mn	45.90 mn
Additions during the month	0.39 mn	0.39 mn	0.36 mn
Mobile	49.77 mn	51.49 mn	52.17 mn
Total additions during the month	1.77 mn	1.67 mn	0.73 mn
GSM additions	1.27 mn	1.13 mn	1.24 mn
CDMA additions	0.5 mn	0.54 mn	0.52 mn

(Source : Telecom Regulatory Authority of India)

Table 2: Growth of Telephony in India.[13]

Particulars years	1948	1951	1961	1971	1981	1991	1997	1999	2000	2001	2002	2003	2004	Apr. 05
Total Telephones (in Million)	0.08	0.1	0.33	0.98	2 15	5.07	4.88	22.81	28.53	36.29	44.96	54.62	76 54	100.27
Teledensity (per 100 persons)	0.02	0.03	0.08	0 18	0.31	0.6	1.57	2 33	2.86	3.53	4 29	5.11	7 08	9.13
Fixed lines (in million)	0.08	0.1	0 33	0 98	2.15	5.07	14.54	21.61	26.66	32 71	38 53	41 93	50.39	58.81
Cellular Mobile (in million)	---	---	---	---	---	---	0.34	1 2	1 88	3 58	6.43	12.69	26.15	41.46

(Source · Ministry of Communication and Information Technology, Government of India)

As of August 2005, there were nearly 50 million GSM subscribers which constitute 80% of the total cellular subscribers. The months of July and August witnessed record growth in GSM subscribers – an addition of about 2 million. About 75% of the new mobile subscribers in India choose GSM.Total private GSM investments are over Rs. 50,000 crores.

Moreover, the non voice market for total subscribers tele density and mobile operators have also registered tremendous growth in 2005. The annual turnover of the telecom industry is more than Rs. 51,600 crore. The telecom operators contribute about Rs. 6000 to Rs. 6500 crore per annum to the central exchequer through licence fees. USO levy, and spectrum charges, dividends, etc., of BSNL alone contribute about Rs. 2500 crore per annum. Besides, the sector also contributes through service charges, corporate tax and other fiscal levies. The telecom services are clearly the growth drivers for other sectors of the economy.

According to the working group of the Tenth Five Year Plan, the telecom sector requires an investment of Rs. 1,60,000 crore during the plan period, despite having Foreign Direct Investment (FDI) of Rs. 99508 crore. The economical model followed by India after independence relied much on import substitution and selective foreign capital inflow, both through portfolio investment and the FDI route. This scenario changed radically with the liberalization measures post 1999; both portfolio and FDI were not only allowed but also actively encouraged. The Foreign Investment Promotion Board (FIPB) was also created to approve FDI proposals speedily in most sectors particularly infrastructure.

Popularly Used Value Added Services: Today various value added services are used by subscribers. All the cellular operators have this area in focus. Cellular operators work on market expansion strategies. Value added services enhance usage and therefore increases

revenues. These are the value added services popularly used by operators:

Airtel:

Live portal with games, music, cricket, stocks, news, easy charge facility, logos, a range of voice activated services, games, missed call alerts, Airtel Live, Hello Tunes, etc.

Hutch:

Online Yahoo & MSN Messenger, Java based games, missed call alerts, logos, games, news, stocks, range of voice activated services, Caller Tunes, etc.

Idea:

Daily horoscopes, cellular jockey to send musical greeting cards, voice activated services, music, logos, news, stocks, movies, cricket, games, jokes, Dialer Tones, etc.

BPL:

Ring tones, logos, picture messages, send a song, mobile gaming, etc.

Spice:

Ring tones, logos, picture messages, SMS Chat, mobile gaming, etc.

Aircel:

Ring tones, logos, picture messages, games, music, etc.

Factors for High Mobile Potential: There has been phenomenal growth in the mobile industry in the last few years. As per Telecom Regulatory Authority of India (TRAI), India has high potential for growth in the sector. These are the factors for potential growth:

High GDP growth rate: The GDP is growing consistently. It has the fastest growth amongst major democracies in last 10 years (Average growth of 5.5% in the nineties). According to Goldman Sachs, India could emerge as the third largest economy in the next 50 years.

Rising Income Levels: The income level is increasing. Per capita income has risen by 4% in the nineties. India is the 4th largest economy in terms of purchasing power parity (PPP).

Increased Urbanization: With increased development of infrastructure, rural India will become increasingly mainstreamed.

High Forex Reserves: Forex reserves are increasing, putting India in a better position.

Booming Knowledge Sector: The levels of education are rising rapidly. Easy access to information has enhanced knowledge.

The New FDI Policy: According to the new policy, foreign direct investment up to 74 per cent is permitted, subject to licensing and security requirements for internet services, infrastructure providers and radio paging services. The Centre cleared the hike for the ceiling of composite FDI in the telecom sector to 74 per cent from the earlier cap of 49 per cent, but imposed stern conditions to address security concerns. Further, the 74 per cent foreign investment can be made directly or indirectly in the operating company or through a holding company. The company would be required to disclose the status of such foreign holding and certify that the foreign investment was within the ceiling of 74 per cent on a half yearly basis. Table 3 shows the actual inflow of FDI in the telecom sector from 1993 to March 2004.

Table 3: Year wise FDI inflow in Telecom in India.[17]

Year	FDI inflow (mn)
1993	20.60
1994	140.20
1995	2067.40
1996	7648.30
1997	12451.90
1998	17756.40
1999	2126.70
2000	2885.80
2001	39709.00
2002	10815.00
2003	3014.00
2004	2664.60
Total	101299.90

(Source : Telecom Regulatory Authority of India)

Trends of FDI Inflows and Exports: Since liberalisation in 1991, exports from developing countries are associated with FDI and the global market. Table 4 reveals the major receipts of FDI in the developing countries including India, and the competition India faces in attracting FDI.

Table 4: FDI Inflows and Exports in 2002.[18]

Country	FDI	% share in world	Exports	% share in world
Developing Economies	162.15	24.9	2428.44	37.8
China	52.70	8.1	325.59	5.1
Hong Kong	13.72	2.1	200.09	3.1
Singapore	7.66	1.2	125.18	2.0
India	3.45	0.5	49.31	0.8
Malaysia	3.20	0.5	93.27	1.5
Korea	1.97	0.3	162.47	2.5
Philippines	1.11	0.2	36.50	0.00
Thailand	1.07	0.2	68.77	1.1
Sri Lanka	0.24	0.0	4.70	0.1
Indonesia	-1.52	-0.2	58.12	0.9
World	651.19	---	6417.20	---

(Sources : World Investment Report, 2003)

Future Vision: It has been visualized that by 2007, India will have 250 million telephones and the teledensity will be about 22 per cent. Of these phones, around 180 – 200 million phones are estimated to be mobile phones and the public sector operators would contribute about 50 per cent. The operators would cover about 5000 cities and towns within the next few months. Thus, wireless phones would play an important role in achieving the plan objective of telephone on demand. By the end of 2007, the telecom network will have reached the entire country and all the villages will be connected by telephone. Further, 3G technology would enhance voice capacity, higher data speeds, etc., which in turn would facilitate e-initiatives of the Government such as e-governance, e-health and e-education. With increased competition, it is expected that the tariff rates will fall further benefiting the consumers at large.

The Indian telecom service sector is one of the fastest growing sectors in the world. All these measures are intended to expand telecom services in the country at a faster pace, to reduce the digital divide, to build a reliable manufacturing base to meet the equipment demand and to employ the latest technologies which, in the final analysis, would benefit the consumers.

The FDI inflows into India vitally depend on adequate infrastructure facilities, a better FDI policy framework, labour law reforms and better management of fiscal deficit. India has to take certain steps to come any where near the top FDI hosts like China, USA, Japan and Germany.[15]

1.15) Innovation Capability of Indian Telecommunication Sector:

India is considered an emerging technological giant; it Spends about 1 per cent of its GDP on R&D and has a growing number of us patents issued to its indigenous inventors. India is an acknowledged powerhouse in embedded software, business software in general, chip

designs and in pharmaceuticals. See Table 5 for technological strengths of India.

Table 5: Technological Strengths of India.[4]

Indicator	India	
Strengths	Embedded software	
	Drugs	
	Business software	
	Chip design	
US Patents	1993	2003
	30	354
R&D spending	1 per cent of GDP	
Science and Engineering graduates	316 thousand	

Source: Engardio (2004)

India is one of the largest telecommunications equipment markets in the world. It is necessary to focus on the sectoral system of the innovation framework for understanding the differential outcomes in innovation capability building achieved by the industry in India. Divergent strategies were pursued for developing domestic innovation capabilities. India followed a very rigid policy for indigenous development of domestic technologies by establishing a stand alone public laboratory that developed state of the art switching technologies. The public laboratory was not given any strategic direction, even though it was technologically speaking, very competent. Consequently, the country, despite possessing good quality human resources was unable to keep pace with changes on the technology frontier and the equipment industry is now essentially dominated by affiliates of MNCs.

The growth rates in the number of telecommunication lines (both fixed and mobile) have been growing quite significantly, tele-densities have been steadily improving and the ratio of mobile to fixed communications has crossed unity in the country. The distribution of

telecommunication services in the country has been reformed, restricted and in some cases, privatized. In addition to the distribution of telecommunication services, it has a sizeable telecommunication equipment manufacturing industry. Although the laboratory was technologically competent, it lacked strategic direction. Not much emphasis was placed on in house R&D centres within its telecom manufacturing enterprises.

The Indian industry, although much older, has been less agile in taking advantage of the challenges. The telecommunications industry is a good example of how, while having cheap factor endowments is necessary for a country to establish its presence in the international market, the ability to move up the innovation ladder is a sufficient condition for that to occur.

India because of the sheer size, have one of the largest telecommunications networks in the world. Broad features of the Telecommunication sector in India can be seen in Table 6.

Table 6: Broad Features of the Telecommunications Sector in India (c2003).[3 & 11]

	India
Density of fixed telephones per 100 population	3.9
Density of mobile telephones per 100 population	2.6
Density of internet users per 100 population	0.4
Density of broadband connections per 100 population	0.019
Charges for 20 hours of internet users per month (US$)	9.00

Source: Department of Telecommunications (2002 – 03), International Telecommunications Union (2003).

The telecommunication sector in India is known according to the following factors: relative size of the telecommunications services market, privatisation and structure of the services market, the extent and direction of the digital divide, and overall telecom development as judged through the scores obtained in the digital access index.

Relative Size of Telecommunications Services Market: The number of telecom connections (both fixed and mobile) has been growing in the country (Table 7). Keeping with the international trend, the ratio of mobile to fixed telephones has crossed unity in 2004.

Table 7: Growth of Telecommunications Services Sector in India, Growth of Telecommunications Services Sector in India.[3 & 17]

	India (Number of Subscribers in Millions)		
	Fixed	Mobile	Ratio of Mobile to Fixed
1990	2.15		
1991	5.07		
1992	5.81		
1993	6.8		
1994	8.03		
1995	9.8		
1996	11.98		
1997	14.54	0.34	0.02
1998	17.8	0.88	0.05
1999	21.59	1.20	0.06
2000	26.51	1.88	0.07
2001	32.44	3.58	0.11
2002	41.48	13.00	0.31
2003	42.58	33.58	0.79
2004	45.00	50.00	1.11

Source: Economic Research Unit (2002), Telecom Regulatory Authority of India (2005)

In terms of revenue: The Indian market for telecom services has grown steadily from 6.3 in 1998 to 8.8 in 2003 (Table 8).This means that India has a large domestic market for telecommunication equipment and this market is also growing very fast.

Table 8: Growth of Telecoms Revenues in India, 1997-2003 (Value in billions US$).[19]

Year	India
1998	6.3
1999	6.5
2000	7.1
2001	7.6
2002	8.2
2003	8.8

Source: World Markets Research Centre (2005).

Privatisation and Structure of Services Market: The distribution of both the fixed and mobile services in the country are deregulated and opened to private competition although the state owned incumbents, BSNL, have not been privatised. A direct comparison is difficult. Also the state of competition is different in fixed and mobile communications. In India, the market is divided into different operating circles (which roughly correspond to a state within the country's federal establishment) and in each circle there is the state incumbent and a select number of private service providers. The extent of competition between the state incumbent and the private providers is very intense in the case of mobile communication services while it is much less in the case of fixed line services. India has an independent regulator in the Telecom Regulatory Authority of India (TRAI). In India, the equipment vendors deal with one dominant buyer in the case of fixed telephony equipment and with a large number of mobile service providers for mobile communication equipment.

Extent and Direction of Digital Divide: This is defined in terms of the broad rural-urban divide in the access to telecom services. The number of telecom subscribers has increased and the divide has narrowed (Table 9). The Department of Telecommunication (DoT, 02-03) has

also issued guidelines for implementing the Universal Service Obligations for access to telecom in rural areas.

Table 9: Extent of the Digital Divide in India.[3, 17 & 2]

Year	India
1996	13.33
1997	16.00
1998	14.50
1999	13.80
2000	11.71
2002	10.17
2003	9.53

Source: Economic Research Unit (2002), Telecom Regulatory Authority of India (2005), Department of Telecommunications (2002-03)

Overall Telecom Development: Measurement in terms of the Digital Access Index (DAI) was introduced for the first time by the International Telecommunications Union (2003). The DAI is an inclusive index that measures the overall ability of individuals in a country to access and use telecommunication and ICTs in general. It is composed of five parts; infrastructure, affordability, knowledge, quality and usage. A single index value is computed for each of the five DAI categories and the values range from 0 to 1, the closer it is to 1 the better it is. Of the 178 countries for which the DAI is computed, India ranks at 119. However, with the increase in teledensity (which enters the calculation of the infrastructure variable) and improvements in both quality and affordability, it is expected to better its score.

Innovation Capability: This is defined as the ability to conceptualise, design, manufacture and sell internationally competitive telecom equipment and also at the same time keep pace with changes on the technology frontier of is equipment. There is no one single indicator that can adequately capture this dimension. Different types of

indicators are: traditional indicators, competitiveness in exports, capability in hardware design and capability in telecom software.

Traditional Indicators: In India R&D investments in the sector have remained stagnant. India has begun to appreciate the need for and importance of patenting its innovations.

Competitiveness of Exports: The ability to continuously sell products designed and manufactured locally in international markets, where they have to face fierce competition from other manufacturers, can be regarded as a reasonably good indicator of a country's ability to innovate in a particular technology. There are a variety of indicators to measure export competitiveness, but revealed comparative advantages (RCA) – which is a quantity based export measure is the one that is commonly used.

Table 10: Competitiveness of Telecom Exports, 1992 – 2003.[12]

Year	India
1992	4.02
1993	4.65
1994	4.58
1995	4.26
1996	5.04
1997	4.88
1998	4.46
1999	4.37
2000	3.78
2001	5.70
2002	7.01
2003	8.35

Source: Computed from UN Comtrade Statistics (Mani Sunil 2005)

Capability in Hardware Design: Telecom system equipment may be roughly divided into three categories, switching, transmission and terminal equipment. During the initial period, India relied on foreign

sources of technology for all the three kinds of telecom hardware and especially for the first two. There is significant innovation capability in two kinds of hardware. The first is small and large electronic digital switching systems innovations (C-DOT) and the second is in wireless local loops (WLL) and access technology known as CorDECT.

Capability in Telecoms Software: India's software exports have registered spectacular performance during the 1990s. But much of the software exports from India are of low technology. But over time, the enterprises involved in this effort have attempted to rise up the value chain. An important dimension of India's capability in the telecom software industry is the fact that a number of MNC telecom companies have established their software development centres in India. Of late some of them have closed down their own R&D centres in India, but have outsourced their telecom R&D to Indian software companies.

Conclusions: India has one of the largest domestic markets for telecommunication equipment in the world. India has pursued divergent strategies towards acquiring and maintaining innovation capability in the telecommunication equipment industry. India has a much longer manufacturing and research history in this industry. However, its sectoral system of innovation is very weak. Although India has managed to build considerable innovation capability in conventional circuit switches, the main component of its sectoral system, the laboratory, was not given the strategic direction to build capability in mobile communication. A number of private sector manufacturers have developed a reasonable innovation capability in telecommunication software and this has spawned a telecom software industry in the country. This industry has managed to win a number of R&D outsourcing contracts. The government now invites FDI in telecommunication equipment and therefore the industry is now in the process of being transformed from one dominated by domestic technology to one dominated by foreign technology and foreign manufacturers.[12]

1.16) Telecom Fraud

Telecom fraud is the use of telecommunication products and / or services, without paying for their use. The losses, if unchecked, will significantly increase the operating costs of telecom companies. Telecommunication fraud is a multibillion dollar business worldwide.

Fraud in telecom networks eats into the bottom line of operators. The availability of information on hacking and the ease with which several illegal actions can be performed, allows even amateurs to invade and abuse the network, its resources, as well as customers' accounts. The cutting edge methods employed by fraudsters call for continuous improvements on the solutions deployed to check fraud.

With Next Generation Networks (NGN) steadily making their entry into the mainstream, telecom fraud is heading towards an explosive situation. NGNs are fertile ground technological fraud and criminal activity. This is not to say that small scale fraud is not perpetrated by numerous everyday users around the world.

Ways to reduce fraud: Fighting fraud in telecom networks is a difficult task. First operators must have recognize fraud; unless it is acknowledged, it can never be fought. The second step is to develop a corporate strategy against fraud. The third step is to implement a Fraud Management System (FMS). It is also very critical to understand the specifics of the market and the behavioural patterns of the fraudsters within the network before the solution is selected. The important aspects of fraud management are how fast carriers can detect suspicious activities in their network and what areas are covered by FMS.

The advance of information and communication technologies brings many challenges to the telecom industry. Companies are now beginning to realise that fraud if unchecked, can lead to the loss of not

only professional credibility but also of revenues. Fraud Management is emerging as an integral function of any telecom organisation.

1.17) 3G by 2006: Innovation and Benefits for India

3G is an International Tele-communication Union (ITU) specification for the third generation mobile communications technology that was created for high speed transfer of data and multimedia content, such as video, downloads and interactive games. 3G will work over wireless air interfaces such as GSM, TDMA, and CDMA. The new EDGE service was developed specifically to meet the bandwidth needs of 3G.

Unleashing the potential of 3G requires substantial investments, and, eventually, the rebuilding of network infrastructure. 2.5G and 3G can exist side by side and support the same types of services. This means that operators can maximise returns from their 2.5G investments and gradually migrate to a full 3G infrastructure. It is expected that in rural areas, 2.5G may be a long term solution while 3G is rapidly rolled out in densely populated areas. Any service that requires multi megabyte data byte rates is only possible on 3G infrastructure. To start with, 3G adoption will be greater in urban areas as the bandwidth intensive applications such as news clips, live stock exchange information and video downloads will be in greater demand there.

The average revenue per user (ARPU) for mobile service providers is expected to double with the coming up of new services in the 3G domain. ARPUs of private GSM operators have dropped by 17 percent in 2003-04 from Rs. 523 per subscriber in the first quarter to Rs. 432 in the last. Pundits say that 3G can help service providers double their ARPU.[20]

In Licensing: While India is expected to follow the European and Japanese markets where 3G has been widely adopted, the key issue will be licensing. Licensing 3G in India will become possible by late 2005. It is expected that once 3G licensing is introduced, it will take 12-

18 months to implement 3G networks. Globally, operators such as NTT DoCoMo in Japan and Hutchison in the UK have deployed 3G services. While consumers will benefit from high speed mobile connectivity, 3G is expected to give a fillip to the operators' falling ARPU thanks to the decreasing cost of voice tariffs. Globally, there are already 20 million customers who have migrated to 3G handsets (the figure was around six million last June) from GSM (Global System for Mobile, or 2G).

Industry experts are of the view that around 10 per cent of the existing 40 million mobile subscribers in India (as of February 2005, according to COAI) will move to 3G once it is introduced. It is likely that voice will be an important application for 3G for quite some time. 3G and 2.5G services are expected to complement each other with 3G being used in densely populated areas and 2.5G in rural pockets.

MTNL is the first GSM based cellular service provider to take a decisive step towards migrating to 3G. Private GSM operators such as Bharti, Hutch and Idea have expressed their willingness to move into the 3G domain and have already applied for radio frequency spectrum. To meet the demand for handsets and showcase its range, LG Electronics India has launched a variety of 3G handsets.

While the Telecom Regulatory Authority of India grapples with the issue of spectrum allocation on the 1900 MHz band, the government is considering whether to allow direct migration for existing operators to 3G services or to conduct a fresh auction of spectrum. So 3G still awaits the government's decision.

3G technology gives service providers the ability to stream audio visual content and offer faster downloads of Java applications. This technology also leads to increased network capacity and high bandwidth for voice calls, data and multimedia services. The migration towards a richer set of IMS (IP Multimedia Subsystem) based services

could eventually lower cost per subscriber on the infrastructure side.3G will enable the convergence of voice, data and video in a single infrastructure. It will also enable the convergence of wireless and wireline services onto one access agnostic set of service offerings that are available anywhere, any time, and over any access network.

3G by 2006; Benefits for India:

- 3G has a 4-5 times higher voice capacity than existing 2G services. It is an ideal means to deliver low cost voice telephony to Indian consumers.
- 3G has hi-speed data capabilities. It will fulfil the content rich mobility experience for urban Indians.
- 3G will help enhance India's competitiveness in the ITES / BPO segment.
- 3G will also enable the Government to achieve its broadband objectives.

3G up gradation for GSM is 3GSM (WCDMA). 78% of the GSM market share will form an ideal base for this. The mobile phone is fast becoming the dominant technology for voice communication. The mobile phone is becoming less and less of a narrowband device as it evolves through 2G to 2.5G to 2.75G to 3G.

India's Evolution to Next Generation Technologies by 2010:

- Technology will evolve to digital switching and transmission, VoIP and advanced Broadband by 2010.
- To ensure rapid evolution of technology, there is a need to light up India's extensive optical fiber network.
- 6, 70,000 km of optical fiber has been laid out in the interior areas by service providers including BSNL.
- Optical fiber network together with wireless technologies such as 3G can be effectively used to provide high quality

telecom coverage to rural areas and thus bridge the Digital Divide.

The Indian operators are showing a lot of interest in 3G. There is no doubt that 3G is a spectrum efficient technology and has taken off globally after the initial hiccups. The 3G networks are not only good for data downloads, but also for voice services. Applications like tele-medicine, e-education and e-governance can be developed on 3G networks. Deploying 3G can also enable broadband services in new areas. In India, spectrum is an issue in 3G deployment though there is a lot of momentum in the market. Operators are also busy with their 2.5G networks. But even after all this, judging by the trials and pilots, they would arrive on time. The next tender from MTNL would include 3G. The plans and positioning of the operators would determine the demand for 3G services. Actual deployment is still some time away. Initial deployments would happen in pockets and not as blanket coverage. While it is not clear what we can expect after 3G, one thing is certain-cellular networks will get faster and telcos are hoping that users will start using the features they plan to offer on 3G networks.

1.18) Telecom Outsourcing:

The potential of the telecom outsourcing market was highlighted when Bharti Tele Ventures signed a 10 year deal with IBM worth $750 million (Rs. 3,400 crore). While outsourcing activity is on the rise across many sectors in the country, the telecom segment is perhaps, the most lucrative. By 2007, this number is expected to climb to 100 million. Add 45 million fixed lines and you have a market that cannot be ignored.

Benefits of Outsourcing: Although outsourcing by telcos of their IT and IT related services to India is still a relatively new practice, it is gaining momentum. A majority of Indian operators have begun to outsource parts of their business such as call centre operations, application based services, and content. Billing and payment solutions outsourcing is a good example of this trend. Another critical area gaining ground is

network management. Typically, network management comprises 50.55 per cent of the cost of a telco's operations. System integrators expect this space to be among the largest segments that could be outsourced to a third party.

With the proliferation of technology, telecom operators are looking at partners who can reduce costs and risk, move assets from their books reduce their headcount and enhance customer satisfaction. In the past, Indian telecom operators have outsourced customer care and billing solutions. The Bharti deal has shown that other areas, including information technology management, CRM initiatives, data centres, disaster recovery and even the IT help desk can be outsourced.

The outsourcing of selected activities to system integrators (SIs) is a natural evolution for companies that wish to manage their operations and technological complexity in an increasingly competitive market.

It is a gigantic and expensive task to manage an internal team to handle the network, train them and keep them updated on changing technologies at regular intervals and then retain them, says Sanjay Jotshi, director, Marketing and Channels, Nortel Networks India. The telecom market in India is cut-throat and operators feel the need to spend time on core issues, feels Subramanian V., Head, Integrated Management Solutions, Data Craft India.

Value play: As voice becomes a commodity, telecom operators are depending on value added services to improve their revenues. The ability to offer these services would depend upon the IT infrastructure of the operator.

The killer application would be to enable customers to personalize their environments based on requirements. But this would translate into more IT investments and management. Service providers not only need to improve existing services, but also offer content and other new

services in order to attract and retain customers and improve topline revenues by increasing average revenue per user (ARPU).In a competitive environment, it makes sense for telecom operators to consider outsourcing. It is only a matter of time before other telecom operators follow suit.

1.2 RATIONALE OF THE STUDY:

The researcher has undertaken the present study as this area has been neglected in the business as well as academic environment. The investigator interviewed concerned officers of all four operators to verify the fact and reviewed the related literature and found no systematic study in this field has been undertaken either in the form of articles and research papers or as doctoral study, though a number of small studies have been completed in the field of cellular telephony (Telecommunication) regarding various aspects like health issues, performance level of operators, entry of new technology, various value added services and churn management. But there is no study specifically related to the strategies and marketing organization structure of cellular operators. This study would be a step ahead in this direction.

The present study also highlights the Indian Government's new economic policy which has let to the formation of the National Policy, 1994 and 1999.

The Indian telecommunication sector has always been like a natural monopoly. The removal of monopoly and the adoption of the National Telecom Policy 1994 and 1999 has led to keen competition.

So to cope with the new environment and to maximize the market share, cellular operators made various changes in their marketing organization structure and strategies.

From these views as well as from reviews of related literature and research, an attempt has been made to study the marketing organization structure and strategies adopted by cellular operators in Gujarat.

1.21) Potential Areas for the Growth of Telecommunication Sector:

1.21(i) Technologies:

- Telemedicine: Enable people in rural areas to get in touch with specialized doctors. Remove language barriers through multi-lingual interfaces. Bridge lack of visual examination through video capability. Enable prescription service through document transfer.
- E-Education: Provide high bandwidth access for e-education courses. Provide Video Based and Computer Based Trainings (CBTs).
- E-Governance: Remove bureaucracy by providing instant viewing of land records etc. Provide government information like policies, forms, schemes. Centralized initiative, decentralized implementation.

Telecom will be the springboard for expansion of Broadband and IT.IT & Telecom will spread among the masses and spur entrepreneurship and economic growth. This will significantly strengthen India's presence in the global arena.

1.21(ii) Variety / Types of Services:

Value Added Services: An unfortunate situation of mobile telephony is that mobile operators resorted to using price competition instead of using non price factors. It resulted in the commoditization of mobile services. Once the trend of slashing prices has been set, prices can only move downwards. At best, efforts can be made to stabilize these. Any attempt to revise the prices upwards will only result in stiff

resistance from customers. Already India offers the cheapest mobile service in the world. So there are two challenges before mobile service operators:

i) To do away with commoditization of cellular services by initiating non price competition

ii) To increase Average Revenue Per User (ARPU) by exploring alternate revenue streams with better margins

Both the challenges can be met successfully by focusing on value added services. Value added services are the services offered in addition to the conventional voice call services offered by operators that are useful to customers and are available at a price. These include Short Messaging Service (SMS), Multimedia Messaging Service (MMS), and other data services like wall papers, ring tones, hello tones and games.

Introducing Innovative Services: The key to differentiate one's service is to offer unique services, which appeal to core needs and values like religious sentiments, curiosity about the future, education cum entertainment for children, etc. Mauj Telecom, a wireless content provider, launched its spiritual channel in May 2005, which enables mobile users to perform elaborate prayers. The company claims to having had 500 downloads on the first day of the launch. The option of offering online prayers at Tirupati Temple, via cell phone, has been in practice for sometime. Most mobile service providers have started offering services like astrology and predictions. In a country like India where monsoons determine the pace of economic growth, weather forecasting can be a useful and remunerative service. Spice Telecom, a mobile operator in Punjab, has been providing rates of agricultural output in different mandis (markets) so that the farmer may choose a mandi which is the nearest and fetches him the most remunerative price.

For children, Nazara Technologies, a Mumbai based content provider plans to develop games based on Archie comics. India Book House (IBH) has decided to create mobile content from its best selling Amar Chitra Katha and Tinkle. Initially, the mobile content will be in the form of wallpapers. Subsequently, the offer includes full fledged mobile comics that can be downloaded in instalments.

Converging Technologies and Gadgets: The options, reach and services, in mobile telephony have been hindered by limitations of technology, bandwidth and frequency. But the recent development and policy guidelines have indicated that these constraints are likely to go. It may result in a scenario where mobile phones, internet and electronic gadgets merge to give unified solutions to the users. The World premiere of the Bollywood movie, Koi Rok Sake To Roke on cell phones and accessing one's e-mail on mobile phones is just an indicator. Industry experts predict a future with unlimited and uninterrupted internet access, movies, online games, online booking / reservation of services, using the mobile phone. Air Deccan has already started the facility for reservation of its air tickets using the mobile phone with the help of IT solutions provider "Jigrahak". The next generation mobile phone will be a multipurpose hybrid machine. An active application of different services requires the collaboration of other content providers.

A gradual but steady shift of mobile service providers towards value added services will help in achieving a higher level of differentiation among service providers. It will also generate an alternative stream of revenue and dependence on voice call revenue will decrease. It will eventually end the rat race in mobile telephony because the worst thing in a rat race is: even if you win it, you are still a rat.[5]

1.21(iii) Changing Consumer's Perception of Quality of Services

A majority of the telephone users are very satisfied with the dynamic locking mechanism and other electronic exchange facilities. They are more confident of using STD / ISD services and the telephone bills are to their expectations.

The electronic exchanges and transmission mediums developed by optical fiber techniques maintain the overall quality of local / long distance communications at a high level of performance compared with the same services just some four or five years ago.

The use of extensive group dialling facility push button telephone instruments made the services more useful and helpful. But the services still have manual interference like trunk calls (180), fault repair service (198), directory enquiry services (197), and trunk information (183). They need to be improved according to the majority opinion, eventhough the overall quality of service in the majority opinion is satisfactory.

Outdoor services, fault repair services, customer center services, telephone billing unit services, directory enquiry services and on general items of any other nature.

Today, counters are being equipped with computers, which support the service with up to date information. Of course, more counters with more staff are needed. The accurate and updated information can be supplied to them to deal with the visiting customers in a better, service oriented manner. When suggestions are invited on the telephone billing unit, they offer the following suggestions :

The monthly billing and reduction of call rate instead of increase in call rate after a slab of bill amount, are very good suggestions. These were already taken up by the local administration with DOT headquarters to

have a change of policy decision, which is still pending. For dispatch of the bills, DOT depends on the postal department. Due to the latest techniques, more care is taken to ensure the accuracy of the bills, which may result in systems. As the details of the local call charges occupy a lot of pages, the actual necessity of local call details would not be justifiable for printing on the telephone bill.

Actually the integrated software linking commercial billing accounting and directory enquiry was just operational with the automatic updated information using LANs everywhere. This may take some more time to be 100% operational by which the problem of insufficient / not updated information can be solved. The number of lines required for this service can be increased depending on the service traffic, which is being monitored. The telephone directory work, which is in progress, will also have this updated information. Anyway, to improve the behavioural attitudes of the personnel, training classes have to be arranged.

1) More service orientedness is required than the expansion of the networks.
2) Put the telephone directory on the Internet.
3) Inspection of public telephones and their charging nature.
4) Attending the public complaints and taking them seriously.
5) Eliminating corrupt practices by the staff.
6) Giving new telephone connections on demand by laying more cables, etc.

1.21(iv) Policy Reformulations:

The early rounds of telecom reform were a disappointing experience. However, the latest round is well designed, driven as it is by an impartial telecom regulator and should set the stage for the sector accelerated development. While the future structure of the industry in terms of the number of players and the coverage and geographical focus of development depend on the ability of the public sector giants, DOT and MTNL, to restructure them, there is likely to be more competition and better rates for most telecom services.

There is little doubt that urban India will greatly benefit from a density of telephone, and other telecom linkages. More business will be done in urban India and more business means a higher growth rate for the country. But how important is higher telephone usage for rural India, where three fourth of the population lives? This is an important question because it cannot be assumed merely on the basis of long queues in the urban areas that higher usage will result from the availability of more rural lines. There is evidence from studies of the power sector that shows that the rural poor do not benefit from higher power connection rates (even if the power is subsidized) unless they can afford the light bulbs, electronic irons and mechanized equipment that can be used with the availability of power.

Even in the United States, attempts at rural electrification failed until 1950 because the rural population did not have the money to buy the durable goods that consume power. The success of American rural electrification only occurred after access was subsidized.

Unlike fertilizer, power and water, though, using a telephone does not require complementary inputs. Nor is power supply necessary. It is possible for a farmer to make a call once he has a line and a telephone, even in darkness. Urban dwellers in many Indian cities, large and small, have been doing this for decades. As any small urban trader will testify, a telephone line is often more valuable than having power. While a power blackout is a nuisance (and one that a gen-set can overcome), downed telephone lines threaten his livelihood. This allows us to evaluate the decisions made in the latest telecom reforms that continue the subsidies for rural users. We have argued that subsidies are necessary for rural development. However, given the absence of complementary infrastructure of greater importance, it is likely that the subsidies alone will not do much for spreading rural telephony.

The Indian telecom sector is the eighth largest network, with an annual growth rate of more than 22% for bask services and almost 100% for Internet and cellular services.

Network Expansion:

Most of the private mobile companies offered their services in top cities / towns. So to reach out to new consumers in rural and remote areas, the sharing of infrastructure must be encouraged by the government. It would, indeed be wasteful for every operator to duplicate costly infrastructure. Infrastructure sharing on fair, transparent and commercial terms will ensure that consumers in rural areas get choice of service, quality as well as affordability. While the nation achieves aggressive rollout and improved tele density, the operators get an attractive commercial proposition and an opportunity to expand the coverage and reach of their services.

Expansion of Distribution Network of Handset Vendors:

The biggest enabler of market expansion is the support of the handset vendors in both distribution and pricing. Markets like Gujarat and Punjab have expanded dramatically due to the expansion of the distribution network of the handset vendors. However, the same has not happened in all states. The Government has a role to play in this area. Currently, the service provider has to pay license fee on revenues from handset sales. It is bundled and sold with the service, which the service providers are reluctant to pay as it is an additional cost burden and they prefer independent promotion of service and handsets. If handsets can be removed from the purview of the service revenue definition by the government, the operators may be able to offer a low cost entry option to consumers.

Focus areas for telecommunication operators:

As per TRAI, two other associated aspects for market growth are availability of spectrum and availability of resources for network rollout and expansion. The government is currently looking into these two

areas. The 79% hike in FDI has to be cleared by the government to ensure continuous flow of investments to expand the reach of the mobile operators.

To realize full market potential and achieve the forecasts by December 2005, telecom operators have to work on a segmented approach and focus on the five key strategies given below:

Focus on "Active and Paying" Customers

As per the latest TRAI report, 75% of mobile owners use the pre-paid system and the rest are in the post-paid / contract segment. On an average, 30% of the pre-paid customers are in "grace and non-active" with all operators. This means, around 10 million customers are actually "not active" and not contributing any revenue to the mobile industry. In the post-paid category, "zero" usage billing customers (only rental paid) exist to the extent of 5% of the total base, thus adding limited revenue to operators. Currently, some of the leading mobile players have raised this issue seriously and are putting the pressure on the entire system to focus on adding quality customers. This obviously resulted in cautious acquisition in both post-paid and pre-paid, thus reflecting the real increase in the customer base, instead of the earlier trend of acquiring fleeting customers and adding to the grace customers' / zero usage billing base.

Focus on Collection, Bad Debt Control and Genuine Customers Acquisition

The time of unlimited usage and unlimited credit limits offered during the year 2003 by new entrants to the mobile industry is gone. The focus now is on collecting dues from customers and barring their connection, if they do not pay in time. Current controls imposed by all mobile operators have certainly reduced the acquisition rate by over 50%, which can be seen from the fact that against the earlier net addition of over 7 – 8 lakhs per month by CDMA operators, today only 2-3 lakh new customers are added by Reliance and Tata Indicom.

To tighten the channel partners who are involved in the acquisition, every operator today has a claw back arrangement, whereby the channel partners are debited for customers churned out within three months. In the same way, the retailers and pre-paid distributors are paid based on the recharged card, instead of on the basis of simple activation, which used to be the case earlier.

All these new initiatives and conditions by mobile companies have certainly ensured that artificial activation does not happen to inflate numbers, and that the channel partners get paid for genuine activations.

Focus on Tariff / Price instead of Market Expansion

The last market expansion strategy was the launch of the Rs. 501 scheme by Reliance, which enabled customers to go mobile for just Rs. 501. However, after this path breaking strategy, no mobile operator has launched any market expansion strategy. All the activities are focused on tariff changes, launch of value added services to enhance usage and revenue, increase or decrease of various charges / tariff, instead of working towards market expansion.

The next revolution in the mobile industry can happen only when the telecom companies work towards market expansion rather than price / tariff changes. However, in the pursuit to beat the competition, the focus of each operator is only on price / tariff changes instead of working collectively to acquire more new customers, who are confused due to the continuous changes and delays in entry. The biggest enabler of market expansion is the support of the handset vendors in both distribution and pricing. Markets like Gujarat and Punjab have expanded dramatically due to the expansion of the distribution network of the handset vendors. However, the same has not happened in all states.

To bring in the next revolution in mobile telephony, cellular operators need to bring out innovations in marketing strategies at regular intervals.

Mobile Penetration in Every Town and Village with a Population of over 5000

India has over 8,000 towns with a population of over 5000 and has the potential to sell a minimum of 1000 mobile connections within a couple of years of launch. However, currently only 1600 towns are covered under the mobile network by all service providers put together. This is where a great opportunity lies untapped and the first entrant is bound to gain substantially. The potential untapped is 6400 x Avg. 1000 connections * 6.4 million mobile connections in the next 15 months.

The Total Market Potential through Four Focus Segments: 32.3 million. However, only segmentation of markets cannot yield the necessary results. It needs to be backed by a strong handset strategy.

Make Mobile Phones Available and Affordable

The major impediment for growth in the industry is affordability and availability of handsets. Both mobile operators and handset vendors have to work together to address these issues and ensure that handsets are available wherever mobile services are offered so that customers have ready choice and it is easy to acquire a connection.

The service providers have to work out aggressive pricing / handset bundling options, which make mobile phones more affordable when compared to the current situation.

In addition to making mobiles affordable, handset vendors have to come up with second hand phone options at very low prices with guarantee, to make a large number of entry level customers go mobile. The "go mobile" price limit for these customers is Rs. 2000 and handset vendors have to work out suitable strategies to introduce handsets in

this price range to support the service providers in expanding the market.

The Indian car industry has started marketing pre owned cars and in the process has improved the sale of new cars substantially in the last two years. If pre owned mobiles along with connections are offered in the same way by mobile operators, instead of handset vendors, there will be a huge expansion in the market. It is expected that at least 50% of the existing mobile owners will return their old handsets and take a new set for better utilization and these mobiles can help bring in customers who expect "low entry cost" to go mobile. The mobile phone industry should adopt this strategy to that the overall mobile market expands exponentially.

However, it is not going to be easy and needs support in several areas:

1) To ensure that every youth has a mobile, service providers have to offer services like SMS / MMS at low cost / free and ensure that the total mobile bill for the youth does not cross Rs. 300 – 400 per month, which is the maximum this customer can afford from his / her pocket money.

2) In the same way, for executives / businessmen, to tap the full potential, it is essential that services like Closed User Group, National Closed User Groups, low STD / ISD rates, fixed cost for Network to Network calling etc., are offered so that they can grab the services and go mobile soon.

3) To ensure that every household has a mobile connection, it is essential that the utility of mobile phones is increased through better STD and ISD rates vis-à-vis landline, friends and family offers, special rates to landlines etc., with easy / low deposit schemes to acquire these facilities.

4) To ensure that the penetration targeted in towns and villages is achieved, service providers have to invest in network expansion

and reach out on priority, to exploit the untapped potential in these markets.

5) To expand the network to a large number of towns and villages by all the operators, network sharing should be allowed by BSNL and the government should allow 74% FDI in mobile companies for easy access to funds.

6) Finally, both service providers and handset vendors have to combine their strengths and address the issue of market expansion as a priority and launch aggressive programs to make mobile phones affordable and available to all.

India too can replicate the growth of China in the next two years and achieve over 100 million mobile customers by December 2005, and over 200 million by 2007, if the five focus strategies given above are followed, in addition to regular tactical programs. The need of the hour is a new revolution in mobile telephony and it is imperative that service providers work towards making it a reality.

1.21(v) Telecommunication Education Emphasized in India

As India takes a leap into the telecommunication boom, it also wants its people to have the latest technological know how to participate in a strong knowledge based economy. This transition can be brought about by means of skill oriented quality education that will help create opportunities for students and professionals. To help them utilize their potential and contribute to their utmost capacity for the development of their nation, many institutions in India now offer telecommunication programs. Since a number of major players in the country are investing in the upcoming telecommunication industry, it is time to prepare and train people for this new era.

I would like to mention the Aegis School of Telecommunication. (http: // www.aegisedu.org) the first truly international interdisciplinary telecommunication school in the entire Asia Pacific region. The institute

is set up in collaboration between Tonex Inc. a leading US based company in telecom training and the Indian Institute. The MPTM (Masters Program in Telecommunication Management) Program offered by this institute. This program in telecommunication is specifically designed to provide future telecommunication leaders who can manage telecommunication projects efficiently.

There is another program worth mentioning, which is part of telecommunication education. The Telecom Training Centre, renamed The Bharat Ratna Bhim Rao Ambedkar Institute of Telecom Training (B.R.B.R.A.I.T.T.) has its origin at Calcutta where it initially started functioning in the 1920s. B.R.B.R.A.I.T.T. has made a continuous effort to carter to the training needs of the Indian Telecommunications Department, other allied organizations and foreign participants.

1.3 STATEMENT OF THE PROBLEM:

"A study of marketing organization structure and strategies of cellular operators in Gujarat".

For clarification of the statement, terms used in the statement are defined as follows:

Marketing: As defined by Oxford University Press
Marketing is an exchange process that occurs between individuals, between an organization and individual or between organizations as they seek to satisfy their needs and wants.

Marketing Management: As defined by Stanton
Marketing is a total system of interacting business activities designed to plan, price, promote, and distribute want satisfying products and services to potential consumers.

Marketing Organizations: As defined by Nigel Piercy

Marketing text books have not caught upto how the changing corporate superstructures have affected the organization of marketing. The new structures have diffused and curtailed marketing management's autonomy.

Piercy and Evans have argued that analysis of the marketing information function is inseparable from organizational issues i.e. structure defines various dimensions like the capacity for information handling, the channel of communication and the barrier to information flow and to information system development.

Organization structure is the link between decision markers and marketing strategies developed to relate to the environment.

Organization: As defined by Stephen Robbins

"A consciously co-ordinated social unit composed of two or more people that functions on a relatively continuous basis to achieve a common goal or set of goals."

Organization Structure: As defined by Stephen Robbins

How job tasks are formally divided, grouped and co-ordinated.

Organization Structure: As defined by Pradip Khandwala

Organization structure is the formal or quasi formal network of reporting or controlling relationships in an organization and the powers and duties associated with each role in the networks.

Strategy: As defined by Alfred Chandler

Strategy is the determination of basic long term goals and objectives of an enterprise and adoption of course of action and allocation of resources necessary for carrying out these goals.

Marketing Strategies: As defined by Philip Kotler

Marketing strategies are a set of guidelines and policies used for effectively matching marketing programs (4 P's) with target market opportunities in order to achieve organizational objectives.

1.4 OBJECTIVES OF THE STUDY

1) To study the role of government in framing rules and objectives for cellular operators with reference to the liberty of business

2) To study market organization and strategy used by various cellular operators

3) To study product life cycle of the cellular phone vis-à-vis wire line telecommunication

4) To study the parallel market for cellular instruments

5) To study whether marketing strategy and frequent changes in it has an impact on unstable market share of cellular operators

6) To study the impact of differences in call rates from when it was introduced and now

7) To study the awareness of negative externalities

8) To study the effects on present users and market if additional operators enter the market

1.5 HYPOTHESIS

H1 Removal of monopoly in telecommunication sector and entry of private players has led to change in the market situation

H2 The changing market situation has led to changes in the strategies adopted by cellular operators

H3 Changes in the strategies adopted have led to changes in the marketing organization structure

H4 The strategies adopted by cellular operators are influenced by initial resource position of each operator

H5 Adoption of new telecom policy has improved India's competitiveness in the global market enabling Indian telecom companies to become truly global players and also has wide spread ramifications for the entire economy

H6 New telecom policy has led to emergence of keen competition, lowering of tariffs, consumer satisfaction, better services and sound infrastructure.

H7 The social cost of the advancements in technology has increased

1.6 METHODOLOGY

Methodology contains population of the study, sample of study, sources of data and their collection, methods of analysis and statistical techniques used in the study.

1.61 Population of the Study (Area of Study)

The population of study is Gujarat. It is based on various aspects like adequacy, feasibility and availability of data (Ahmedabad, Baroda and Surat).

1.62 Sample of Study (Size)

i) Organization: The present study refers to all the four cellular operators functioning in the state of Gujarat.

1) BSNL
2) Hutchison
3) Bharti Cellular
4) Idea Cellular

The investigator has selected all four cellular operators for the present study.

ii) Number of Users: Total number of users is 477 respondents
Users are selected randomly on the basis of area i.e.

Users: 1) 178 from Baroda
2) 191 from Ahmedabad
3) 108 from Surat

The technique used for the selection of the sample is random sampling. The main reason for selecting this technique is feasibility in terms of time and cost.

iii) Time period of study: The study attempts to cover a period of one decade from 1994 to 2004. The reason behind selecting this period is it is long enough to analyse the changes in business environment. New Telecom policy was implemented in 1994, dismantling monopoly of Indian Telecom sector.

The aim was to study the effect of the liberalization of the telecom sector on its development, the effects due to entry of private players on its efficiency and the steps taken to cope with these changes.

1.63 Methods of Analysis and Statistical Techniques used in the Present Study

Processing of Data: The cellular customers were interviewed through a pre-test structured questionnaire and personal interview. The edited questionnaires were coded for tabulation. SPSS package was used for tabulating data.

The approach adopted in this study was analytical and interpretative by nature and used Inter-operator comparison of cellular services.

Various statistical tools used in the analysis of data are parametric, non parametric test, measures of central tendency such as mean, median, mode, chi-square test, co-relation, Regression, Frequency, time series analysis, etc.

1.64 Sources of Data and their Collection

The research is primarily based on questionnaire analysis and data from various government websites.

The data is collected by both the methods

i) Primary data collection method

ii) Secondary data collection method

i) Primary Data:

For collection of primary data the questionnaire prepared keeps in mind the main objectives of the study and also aims to develop information which is not available from published sources. The questionnaire included both open ended and closed questions.

ii) Secondary Data:

The secondary data is collected from reliable and authentic sources, journals, periodicals, government publications and electronic media.

1.7 LIMITATIONS OF THE STUDY

The present study has been limited with respect to the following points:

i) The present study is limited to the study of marketing organization structure and strategies of cellular operators of Gujarat.

ii) The present study is limited to a period of one decade from 1994 to 2004, as only one decade has elapsed since privatization in 1994.

iii) The present study is limited by the size of the sample.

iv) The study was confined to major cities of Gujarat – Baroda, Ahmedabad and Surat.

v) The present study only examines cellular operators which is not enough to have an overview of the telecommunication sector (Basic, Services, WLL, Cellular Services).

vi) The limitations of threat of the secondary data sources employed in the research project do prevail.

vii) Responses given by the respondents are subject to their personal bias.

1.8 CHAPTERISATION SCHEME

This thesis comprises of six chapters.

Chapter 1 : Introductory chapter which includes introduction, rationale of the study, statement of the problem, objectives of the study, hypothesis of the study, methodology, limitations and chapterization.

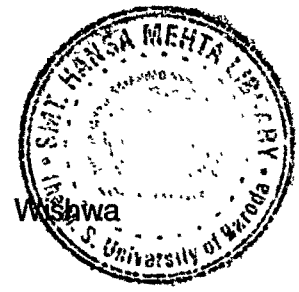
Chapter 2: Review of related literature and research.

Chapter 3: Research Design (Methodology)
It includes selection of sample size, population of study, methods of analysis and statistical techniques used in the study, sources of data and their collection.

Chapter 4: Organization Structures and Information
Indian Telecom reforms, TRAI, COAI, all four cellular operators viz., BSNL, Hutchison, Bharti Cellular, Idea Cellular.

Chapter 5: Analysis and Interpretation of Data
A SWOT Analysis is attempted.

Chapter 6: The last chapter concludes with findings, conclusion, and suggestion for further research.



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