A STUDY ON THE PERCEPTION OF BSNL BROADBAND SERVICE USERS

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BONAFIDE CERTIFICATE

Certified that the Project report titled "**A Study on the Perception of BSNL Broadband Service Users**" is the bonafide work of **Miss.K.Muthamizharasi** who carried out the work under my supervision. Certified further that to the best of my knowledge the work reported herein does not form part of any other project report or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

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Connecting India

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ABSTRACT

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The Communication sector is amongst the fastest growing in the country. The scope of telecommunications includes any medium used to transmit or receive voice, data, or video signals and information. That means telephones, wireless/mobile phones, pagers, and broadcast or cable television. The predominant theme song of the telecommunication industry is broadband.

BSNL Broadband is the Broadband service of BSNL. BSNL launched DataOne broadband service in January 2005 which shall be extended to all villages of the country very shortly. The service is being provided on existing copper infrastructure on ADSL2 technology. The minimum speed offered to the customer is 256 Kbps.

The research works conducted so far are on the diffusion of Broadband in general. The various individual aspects of the Broadband that are important in consideration with the service in respect of the Broadband users are not thoroughly studied in the existing researches. As it becomes necessary to maintain the customer base in the competitive scenario, the perception of customers regarding BSNL Broadband Service is to be studied.

TRAI (Telecom Regulatory Authority of India) has listed the Top 10 Broadband service providers in India out of which BSNL ranks first with 2.32 million subscribers and 53.15% market share. Eventhough BSNL ranks first in Broadband, there

are competitors like Bharti Airtel, Hathway Cable, Tata Communications [Tata Indicom + Tata WiMax], You Telecom, Reliance Communications, Sify Broadband, Asianet Communications and HFCL Infotel. If proper care in all aspects of Broadband Service is not taken to maintain the customer base, it is difficult to maintain its position in this competitive scenario. The customer base can be maintained only by delivering the expectations of the customers. Against this background, it becomes essential to understand the customer perception regarding the various aspects of BSNL Broadband Service.

This project is of Descriptive type which analyses the existing facts with the quantitative data. It is of Survey type which includes designing Questionnaire for collection of data from target respondents, processing and analyzing and arriving at conclusions. The target respondents are the residential BSNL Broadband Service users of Coimbatore.

The sampling technique used is Proportionate Stratified Random Sampling and the sample size is 249 residential BSNL Broadband Service users in Coimbatore. The BSNL Broadband Service users of Coimbatore are stratified on the basis of the Telephone Exchange from where the broadband Service is provided. From the stratified population, samples for each stratum are chosen proportionate to the total sample of 249. From the proportionate samples, a sample is chosen on random basis.

A specially designed Questionnaire is prepared for the primary data collection from the residential BSNL Broadband Service users of Coimbatore. The data collected from the residential BSNL Broadband Service users of Coimbatore are processed using the package SPSS.

The demographic profile, subscription process, type of service availed, usage pattern and source and level of awareness regarding various features of BSNL Broadband service are identified. The influence of demographic variables on the level of satisfaction is studied. The gap between level of satisfaction and expectation of the users is highlighted. The switching behaviour of the users from and to BSNL is also analysed.

The perception of the users with respect to various features indicates that the users are satisfied with most of the features except complaint redressal and slow browsing speed of BSNL Broadband. The additional features like IPTV are to be introduced at an economical price to benefit and attract the users. It is important to solve the problems at the earlier stage so that BSNL can stay as the leader in Broadband Service provision in the competitive market.

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K. Muthamizharasi

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2. ADSL	-	Asymmetric Digital Subscriber Line
3. B2B	-	Business-to-Business
4. BSNL	-	Bharat Sanchar Nigam Limited
5. CATV	-	Cable Television originally Community Antenna Television
6. CDMA	-	Code Division Multiple Access
7. CMD	-	Chairman and Managing Director
8. DIAS	-	Direct Internet Access Systems
9. DSL	-	Digital Subscriber Line
10. DWDM	-	Dense Wavelength Division Multiplexing
11. EU	-	European Union
12. FCC	-	Federal Communications Commission
13. GIS	-	Geographic Information System or Geographical Information System
14. GSM	-	Global System for Mobile communications originally Groupe Spécial Mobile
15. HFCL	-	Himachal Futuristic Communications Limited
16. HSPA	-	High-speed Packet Access
17. ICT	-	Information and Communication Technology
18. IEEE	-	Institute of Electrical and Electronics Engineers
19. IN	-	Intelligent Network
20. IP	-	Internet Protocol
21. IPTV	-	Internet Protocol Television
22. ISDN	-	Integrated Services Digital Network
23. ISP	-	Internet Service Provider
24. IT	-	Information technology
25. IVRS	-	Interactive Voice Response System.
26. LEC	-	Local Exchange Company

27. LLU - Local Loop Unbundling
28. MPLS-VPN - Multiprotocol Label Switching - Virtual Private Network
29. MTNL - Mahanagar Telecom Nigam Limited
30. NPD - National Purchase Diary
31. OECD - Organization for Economic Cooperation and Development
32. PC - Personal Computer
33. PSU - Public Sector Undertakings
34. SBC - Southwestern Bell Corporation
35. SDH - Synchronous Digital Hierarchy
36. SMS - Short Message Service
37. SPSS - Statistical Package for Social Sciences
38. TNS/NFO's - Taylor Nelson Sofres plc/ National Family Opinion
39. TRAI - Telecom Regulatory Authority of India
40. U.S - United States
41. VCR - Video Cassette Recording
42. VoBB - Voice over Broadband
43. VoIP - Voice over Internet Protocol
44. VPN - Virtual Private Networks
45. VSAT - Very Small Aperture Terminal
46. Wi-Fi - Wireless Fidelity
47. WiMAX - Worldwide Interoperability for Microwave Access
48. W-LAN - Wireless Local Area Network

CHAPTER 1

INTRODUCTION

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INTRODUCTION

1.1 INTRODUCTION

1.1.1 Growth of communication sector

The Communication sector is amongst the fastest growing in the country. It works in all major markets around the world. Communication technology products and solutions are accepted globally. The first year of the new millennium has been a year of turbulence, tragedy, terrorism and slow-down in the world economy. The Indian Communication industry has weathered this storm well. It is indeed creditable that the industry and services in India has reasonably continued its robust growth in the year 2003-04. This sector has emerged as one of the fastest growing sectors in the economy.

1.1.2 History of communication in India

The postal, telegraph and telephone services were managed by the Posts and Telegraphs Department till 31st December, 1984. In January 1985, two separate Departments for the Posts and the Telecommunications were created. The accounts of the department, initially, were maintained by the Accountant General of the P&T. However, by April 1972, the telecommunications accounts were separated.

On October 1, 2000, the Department of Telecom Operations, Government of India, became a corporation and was christened Bharat Sanchar Nigam Limited (BSNL). Today, BSNL is the number one telecommunications company and the largest public sector undertaking in the country, with an authorised share capital of $3,600 million and net worth of $13.85 billion. It has a network of over 45 million lines covering 5,000 towns with over 35 million telephone connections. With the latest digital switching technology and an extensive transmission network, including synchronous digital hierarchy (SDH) systems up to 2.5 gbps, dense wavelength division multiplexing (DWDM) systems up to

80 gbps, web telephony, direct Internet access systems (DIAS), virtual private networks (VPN), broadband and more than 400,000 data customers, BSNL is geared to play a stellar role in the information revolution in the country. Its responsibilities include the improvement of the quality of telecom services, the expansion of the telecom network, the introduction of new telecom services in all villages and increasing customer confidence. BSNL has managed to shoulder these responsibilities deftly.

1.1.3 Scope of telecommunications

The scope of telecommunications includes any medium used to transmit or receive voice, data, or video signals and information. That means telephones, wireless/mobile phones, pagers, and broadcast or cable television. Its modem-equipped computers, digital subscriber lines (DSL) and cable modems to carry that traffic to the worldwide network of communications paths is termed as the Internet. The satellites and all the signals bounce between earth and space are also included. Fast invading the marketplace is wireless internet access from a mobile phone, a PC, or even the Palm Pilot, from and to anywhere. Each of these components of the telecommunications arena is useless without software application programming to enable, manage, and improve them.

1.1.4 Broadband

The predominant theme song of the telecommunication industry is broadband. To push through all the voice, data, and video signals today's and tomorrow's customers present to the various telecommunications networks, the pipes or paths over which it all travels must be big – very big. As Jason Myers, editorial director of Telephony magazine (August 28, 2000 issue) puts it, "Broadband defines the infrastructure that feeds, supports, runs, maintains, steers, tests, and powers your networks." The difference between broadband and narrow-band technology, is that the download speed of Broadband is greater than 256 kilobit-per-second but that of the narrow-band is 56 kilobit-per-second. Fiber optic backbone networks and related electronics controlling them are the key enablers of high-speed data delivery.

Broadband service providers plan to give their customers everything from video-on-demand to voice over Internet protocol (IP). The video-on-demand service allows a customer to download a movie any time, with the ability to stop, rewind, or fast forward it as if it were a tape in the VCR. Eventually, holding a conversation over the Internet will be commonplace.

Another tremendously attractive service facilitated by broadband networks is E-commerce (electronic commerce), also known as B2B (business-to-business). E-commerce is the business of inter-company transactions – electronic ordering, billing, and bill payment over the Internet. Online shopping is another growing form of this broadband innovation.

1.1.5 Broadband service providers in India

TRAI (Telecom regulatory authority of India) has published the Internet and Broadband subscriber numbers. At the end of June-2008, India had 11,160,000 million Dial-Up Internet subscribers and 4.38 million Broadband subscribers. The Top 10 Broadband service providers in India are listed as

- BSNL with 2.32 million subscribers and 53.15% market share
- MTNL with 0.59 million subscribers and 13.56% market share.(MTNL operates only in the lucrative circles of Delhi NCR and Mumbai)
- Bharti Airtel with 0.58 million subscribers with 13.25% market share
- Hathway Cable with 204K subscribers
- Tata Communications with pathetic 193K subscribers [Tata Indicom + Tata WiMax]
- You Telecom with 146K subscribers
- Reliance Communications with 85K subs
- Sify Broadband with 64K subs
- Asianet Communications with 43K subs
- HFCL Infotel with 19K

1.1.6 Service package

1.1.6.1 BSNL Broadband

BSNL Broadband is the Broadband service of BSNL. BSNL launched DataOne broadband service in January 2005 which shall be extended to all villages of the country very shortly. The service is being provided on existing copper infrastructure on ADSL2 technology. The minimum speed offered to the customer is 256 Kbps.

In addition to the High Speed Internet Service being provided through this technology, other services such as VPN, Multicasting, Video Conferencing, Video-on-Demand, Broadcast application etc will also be added shortly. The availability of broadband depends primarily on existing networks, which vary according to the legacy infrastructure.

1.1.6.2 IPTV

IPTV (Internet Protocol Television) is a system where a digital television service is delivered using Internet Protocol over a network infrastructure, which may include delivery by a broadband connection. A general definition of IPTV is television content that, instead of being delivered through traditional broadcast and cable formats, is received by the viewer through the technologies used for computer networks. For residential users, IPTV is often provided in conjunction with Video on Demand and may be bundled with Internet services such as Web access and VoIP.

1.1.6.3 3G Mobile telephony

3G stands for "third generation" mobile telephony protocol. 3G enables data to be sent in packets and provides among the highest mobile telephony data transfer speeds and capacity. It is also known as High-speed packet access (HSPA).

1.1.6.4 WiMAX

WiMAX (Worldwide Interoperability for Microwave Access) is a telecommunications technology that provides wireless transmission of data using a variety of transmission modes, from point-to-point links to portable internet access. The technology provides up to 75 Mb/s symmetric broadband speed without the need for cables. The technology is based on the IEEE 802.16 standard (also called Broadband Wireless Access). The name "WiMAX" was created by the WiMAX Forum, which was formed in June 2001 to promote conformity and interoperability of the standard. The forum describes WiMAX as "a standards-based technology enabling the delivery of last mile wireless broadband access as an alternative to cable and DSL".

1.1.6.5 Voice over Internet Protocol (VoIP)

Voice over Internet Protocol (VoIP) is a general term for a family of transmission technologies for delivery of voice communications over IP networks such as the Internet or other packet-switched networks. Other terms frequently used are IP telephony, Internet telephony, voice over broadband (VoBB), broadband telephony, and broadband phone.

1.2 RESEARCH BACKGROUND

Generally, Broadband describes high speed, high capacity data communication making use of DSL, Cable Modem, Ethernet, Fixed Wireless Access, Optical Fiber, W-LAN, VSAT etc. TRAI proposed definition for Broadband as 'Always-On' data connection that is able to support various interactive services including Internet access having the capacity of a minimum download speed of 256 Kbps to an individual subscriber from the Point of presence of the service provider.

BSNL launched broadband service in January 2005. The service is being provided on existing copper infrastructure on ADSL2 technology. BSNL's broadband service which is with a minimum speed of 256 Kbps would be 17.5 times faster than a dial-up connection and about eight times faster than ISDN (Integrated Services Digital Network) and DIAS (Direct Internet Access) The technology called ADSL (Asymmetric Digital Subscriber Line) will enable the subscriber to surf the net and have a phone conversation simultaneously.

Broadband will enhance applications in various fields such as tele-medicine, tele-education, Scientific research, tele agriculture etc. Such a service will serve as a bridge between the developing and the developed, between the urban and rural divide and let people interact across the globe digitally. With the advent of broadband and its faster always-on connections, the possibilities for the development of such services are growing dramatically, opening the path to interactive applications, especially online games, virtual reality and other and other high-quality digital services. The applications also includes consumer-oriented services such as Internet browsing, voice services (e.g. voice over broadband or Internet Protocol), entertainment and information supply. Specific public domain services are also examined, including e-government, e-education and e-medicine, as well as e-commerce and business uses.

The research works conducted so far are on the diffusion of Broadband in general. The various individual aspects of the Broadband that are important in consideration with the service in respect of the Broadband users are not thoroughly studied in the existing researches. As it becomes necessary to maintain the customer base in the competitive scenario, all the aspects of BSNL Broadband Service are to be studied. The strategies formulated after analyzing the gap between expectation and satisfaction of the broadband users will improve the position of BSNL in the competitive environment.

1.3 PROBLEM IDENTIFIED FOR THE STUDY

Bharat Sanchar Nigam Limited is World's 7th largest Telecommunications Company providing comprehensive range of telecom services in India such as Wireline, CDMA Mobile, GSM Mobile, Internet, Broadband, Carrier Service, MPLS-VPN, VSAT, VoIP Services, IN Services etc. BSNL Broadband is the Broadband service of BSNL. It has an objective to reach Broadband customers base of 20 million in India by 2010 as per Broadband Policy 2004. At the end of June-2008, India had 11,160,000 million Dial-Up Internet subscribers and 4.38 million Broadband subscribers. TRAI has listed the Top 10 Broadband service providers in India out of which BSNL ranks first with 2.32 million subscribers and 53.15% market share. BSNL had 31,200 broadband connections in Coimbatore and the broadband capacity will further be increased by 31,000 as said by Principal General Manager, BSNL, Coimbatore during August 2008.

Eventhough BSNL ranks first in Broadband, there are competitors like Bharti Airtel, Hathway Cable, Tata Communications [Tata Indicom + Tata WiMax], You Telecom, Reliance Communications, Sify Broadband, Asianet Communications and HFCL Infotel. In addition to this, Mobile Technology is growing in a rapid manner, and people are attracted towards Mobile Internet. If proper care in all aspects of Broadband Service is not taken to maintain the customer base, it is difficult to maintain its position in this competitive scenario. The customer base can be maintained only by delivering the expectations of the customers. Against this background, it becomes essential to understand the customer perception regarding the various aspects of BSNL Broadband Service. This is identified as the problem for the study

1.4 NEED FOR THE STUDY

Bharat Sanchar Nigam Limited launched its broad band services under the brand name DataOne through out the country in 2005. BSNL has an objective to reach Broadband customers base of 20 million in India by 2010 as per Broadband Policy 2004. Till then it is trying to attract more customers towards Broadband. Eventhough BSNL ranks first in Broadband as per TRAI which lists the Top 10 Broadband Service providers as on October 2008, there are various service providers for BSNL to compete with. Proactive Marketing strategy should be formulated to survive in this competitive market. Thus it becomes essential to know the expectation and satisfaction level of BSNL Broadband Service users to maintain its position in the listing.

BSNL in association with Smart Digivision, is offering Interactive Personalized Television and Video Services (IPTV) for BSNL customers through Broadband Connection. BSNL is planning to invest Rs 1,600 crore in infrastructure facilities that will support eight million broadband connections for the government as per the news from chairman and Managing Director, BSNL on January 2009. In addition, BSNL is planning to add 9 million connections by end of 2009 and planning 3 million customers every year. Currently, the broadband penetration in the country is less then 1 per cent, of which BSNL has around 60 per cent market share with 5.52 million connection base as per CMD, BSNL. It is also going to launch Nova Net PC, a new range of personal computer which the company revealed in association with Chennai-based Novatium Solution. To achieve the above mentioned targets of BSNL, it becomes essential to understand the position of BSNL Broadband Service in the minds of the people. In summary to maintain the existing customer base, attract the new customers, compete with other service providers and achieve the targets of BSNL, it is very much important to understand perception of BSNL Broadband Service users.

1.5 OBJECTIVES AND SCOPE

1.5.1 Objectives

- To identify the demographic profile of BSNL Broadband users
- To understand the subscription process, type of service availed and usage pattern of BSNL Broadband users
- To identify the sources and level of awareness of Broadband users regarding various features of BSNL Broadband Service
- To identify the gap between the expectation and satisfaction regarding various features of BSNL Broadband Service
- To analyse the switching behaviour of BSNL Broadband Service users
- To analyse the influence of demographic variables on the level of satisfaction of BSNL Broadband Service users
- To provide recommendations based on the findings

1.5.2 Scope

The project involves a general study which attempts to capture the BSNL Broadband Service users characteristics based on the inference drawn from the sample characteristics. The quantitative data using a well defined Questionnaire is collected and the findings are generalized to the entire BSNL Broadband Service users. The sample is taken from the BSNL Broadband residential users of Coimbatore. It covers all residential users of BSNL Broadband Service without any discrimination in age, occupation, income etc. Due to the time constraint the Sample size is limited to 249 and the population is limited to residential BSNL Broadband users of Coimbatore.

1.6 DELIVERABLES

The study will provide input regarding the,

- Demographic profile of BSNL Broadband users
- Subscription process, type of service availed and usage pattern of BSNL Broadband users
- Sources and Level of Awareness of the BSNL Broadband users
- Level of Importance attached to various Broadband Features of BSNL Broadband users

- Level of Satisfaction of the BSNL Broadband users
- Competitors to BSNL in Broadband Service
- Frequency of Complaints faced by the BSNL Broadband users
- Forecasting results for IPTV, 3G Wireless Broadband and Wimax wireless Broadband
- Problems faced by the BSNL Broadband users with BSNL service
- Additional features expected by the BSNL Broadband users
- The above input will enable BSNL to formulate strategies to retain and attract customers

CHAPTER 2

LITERATURE SURVEY

CHAPTER 2

LITERATURE SURVEY

This chapter deals with two sections viz, Review of literature and Research gap.

2.1 REVIEW OF LITERATURE

The objective of the study conducted by **John B. Horrigan, Chandler Stolp and Robert H. Wilson (2006)**[1] is to examine the impact of several spatial factors, including population size and economic structure, on the likelihood of broadband utilization, after controlling for a set of demographic characteristics. This study utilizes a unique data set of almost 9000 responses to a survey in the United States, generated by the Pew Internet and American Life Project (the Pew Project) in 2004. The findings of the study show that the place matters in utilization of broadband. Broadband use is correlated with type of city (i.e., county type), its population, and the telecommunications intensiveness of its economy, after controlling for various characteristics of individuals. The larger the population of the county and the larger the telecommunications-intensive sector, the higher are the odds of broadband utilization, holding other individual demographic characteristics constant.

Pedro Pereira and Tiago Ribeiro (2006)[2] in their study evaluated the impact on broadband access to the Internet of the structural separation of the telephone and the cable networks of the Portuguese telecommunications incumbent. The data used in this study consists of a rich micro panel. The information is based on monthly invoices, collected by Marktest for mainland Portugal from April 2003 to March 2004. The panel

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[1] John B. Horrigan, Chandler Stolp and Robert H. Wilson (2006) "Broadband Utilization in Space: Effects of Population and Economic Structure" *The Information Society* 22:341-254. ISSN: 0197-2243 print / 1087-6537 online DOI.1080/01972240600904290

[2] Pedro Pereira and Tiago Ribeiro (2006) "The Impact on Broadband Access to the Internet of the Dual Ownership of Telephone and Cable Networks" *NET Institute Working Paper* No. 06-10

consists of around 1, 200 households surveyed each month, and renewed periodically. Over the sample period, 1, 650 households were surveyed. In this study a panel of consumer level data and a discrete choice model is used to estimate the price elasticities of demand and the marginal costs of broadband access to the Internet. Based on these estimates, the effect on prices and social welfare of the structural separation is simulated. The result indicated that the increase in competition, caused by the structural separation, may lead to substantial price decreases, as well as to consumer welfare increases.

The study conducted by **Harald Gruber and Mario Denni (2005)**[3] addresses the determinants of diffusion of broadband infrastructure by looking at the U.S. Federal States. This study tries to identify in particular to what extent intra-platform and inter-platform competition contribute to accelerating the speed of diffusion. This study is an empirical investigation into the diffusion of access to broadband services in the U.S. The data is collected at the level of Federal State and allows for a panel analysis. The data is semi-annual with the period of observation running from June 1999 to June 2004. The evolution of broadband subscribers is based on a logistic model of technology diffusion. This study has investigated into the determinants of diffusion of broadband access, which is considered of prime importance for sustained long-term productivity growth. Particular emphasis was placed on disentangling the effect of intra-platform and inter-platform competition. Panel data analysis results indicate that both types of competition significantly affect the rate of diffusion, although with different effect. Intra-platform competition seems to have a positive impact only initially on the rate of diffusion but then dissipates. For the longer term, inter-platform has a much more important role in driving the rate of diffusion. The study takes account of the impact of other variables measuring competition in the telecommunications sector as well. The econometric results provide robust support for the hypothesis that inter-platform is more conducive for driving diffusion than intra-platform competition.

[3] Harald Gruber and Mario Denni (2005) "The diffusion of broadband telecommunications: the role of competition" *Working Paper Series*

Bronwyn Howell and Mark Obren (2003)[4] conducted research to identify diffusion patterns evident in the market for broadband internet connections. In the absence of supply-side constraints, the diffusion patterns are determined by the interaction of learning effects, vintage capital and information barriers, moderated by economic conditions and the emergence of demand for new internet applications. The data for the study is collected from a national population where a specific technology (xDSL), with negligible competition from other broadband technologies, diffused over an extended period from January 1999 to December 2001. This diffusion occurred in a geographically enclosed market (New Zealand) where there was near monopoly provision of local loop telephony and broadband services (provided by Telecom New Zealand). The analysis finds that diffusion of broadband technologies is best explained in their test market by substitution of dial-up Internet connections by broadband, conditioned by learning associated with Internet applications. Users in this market appear to strongly favour low-cost, low-risk dial-up connections for initial learning, leading to increased use of existing applications, an increased portfolio of applications or a greater understanding of the individual user's valuation of time. The findings also indicate that Broadband technologies on their own appear insufficiently more productive than dial-up technologies at the prices prevailing in their test market to justify large levels of adoption. Due to the absence of competing broadband technologies in the studied market, the findings are directly applicable to the understanding of other markets with competing internet technologies. The limitation in their data is that precluding separation between residential and business dial-up modem users might have prevented their ability to detect vintage capital effects in the business market, with users utilising ADSL to avoid time-based telephony charges.

The aim of the study conducted by **Walter Distaso, Paolo Lupi and Fabio M. Manenti (2004)**[5] is to analyze the role of competition in promoting broadband adoption. The study focuses on the effect of inter and intra platform competition on the diffusion of broadband access using a model of oligopoly competition between differentiated products. Their panel dataset was built by joining data and information coming from different

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[4] Bronwyn E. Howell and Mark P. Obren (2003) "Broadband Diffusion: Testing for Vintage Capital, Learning by Doing, Information Barriers and Network Effects" *Working Paper Series, New Zealand Institute for the Study of Competition & Regulation Working* Paper No. BH02/10

[5] Walter Distaso , Paolo Lupi and Fabio M. Manenti (2004) "Platform Competition and Broadband Uptake: Theory and Empirical Evidence from the European Union" *Working Paper Series*

sources concerning the three broad categories of users and infrastructures, prices and regulatory policies. In particular, all data related to the number of analogic and ISDN digital lines (as well as the number of DSL, CATV, broadband upgraded CATV, fiber optic and satellite lines) were taken from Telecom Markets, a telecom industry newsletter providing quarterly data and statistics detailing fixed-line subscribers and infrastructures broken down by technology. All data on input prices such as unbundling of the local loop, shared access, leased lines one-off and recurring fees, as well as data on the regulation of the rights of way, were taken from the annual reports on the implementation of the telecommunications regulatory package of the European Commission. The dataset contains information on all EU-15 countries except Greece. The data are available over 15 time periods and 14 countries resulting in a total of 158 observations. The implications of the model are tested using this data. The result emphasizes the role of stronger competition across technologies as the main driver to stimulate broadband adoption. The econometric evidence confirms the results of the theoretical model and indicates that while inter-platform competition drives broadband adoption, competition in the market for DSL services does not play a significant role. The results also confirm that lower unbundling prices stimulate broadband uptake.

The article by **Nikhilesh Dholakia and Nir Kshetri (2005)**[6] examines in depth the factors that could shape the patterns of diffusion of broadband telecommunications technologies in India and China. The factors influencing the diffusion of broadband in the two economies are divided into three groups such as demand and cost conditions, industry structure and competitive rivalry and export and transfer conditions. Demand and cost conditions include factors such as consumer preferences, income level, and input costs as well as government regulations, and prior national experience with previous generations of technology. Industry structure and competitive rivalry include the market openness for competition in broadband and traditional sectors. Transfer and export conditions include trade policy, the export orientation of industry, strategic regulation, and market size. The analysis indicates that many factors favor China in terms of the demand and cost conditions affecting the potential of broadband. These factors include higher income, higher propensity of Chinese consumers to adopt new technologies, higher investment in

[6] Nikhilesh Dholakia and Nir Kshetri (2005) "The Broadband Race: Comparing China and India" *Indian Telecom Industry: Trends and Cases, 2004, Accepted Paper Series*

telecom sector and a significant proportion of it going to the most modern technology, much higher mobile phone and cable penetration. On the other hand, India's position in the global IT map as a major provider of IT services is likely to trigger the demand for broadband. The competition levels in the broadband and traditional telecom sectors are roughly comparable in the two economies. India, however, fares slightly better in terms of opening up the telecom sector to competition. As a result, the broadband subscription costs are declining rapidly in both economies. Such cost declines are likely to further drive the demand for broadband technology. Although China fares better in terms of several dimensions of transfer and export conditions, India is taking several measures in recent years to improve the situation.

Mo Xiao and Peter F. Orazem (2006)[7] extended Bresnahan and Reiss's (1991) model of local oligopoly to allow firm entry and exit over time. In their study sunk costs are incorporated into an empirical framework estimating a discrete game of firm entry and exit. The primary data set is the Survey of High Speed Internet Providers, conducted every six months by the National Telecommunications and Information Administration since December 1999. In their framework, entrants have to incur sunk costs in order to enter a market. After becoming incumbents, they disregard these entry costs in deciding whether to continue operating or to exit. This framework is applied to study market structure and competitive conduct in local markets for high-speed Internet service from 1999 to 2003. The findings indicate that once the market has one to three firms, the next entrant has little effect on competitive conduct in the local broadband market. It is also found that entry costs vary with the order of entry, especially for early entrants. The findings highlight the importance of sunk costs in determining entry conditions and inferences about firm conduct.

The study conducted by **Jed Kolko (2007)**[8] examines the two justifications for public involvement in broadband diffusion. The first is that there remain areas underserved by traditional broadband providers, and second is that broadband adoption encourages online behaviors that are arguably socially desirable. The study uses data from Forrester's

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[7] Mo Xiao and Peter F. Orazem (2006), "Do Entry Conditions Vary over Time? Entry and Competition in the Broadband Market: 1999-2003" *Working Paper Series*

[8] Jed Kolko (2007) "Why Should Governments Support Broadband Adoption?" *Public Policy Institute of California Working Paper* No. 2007-0

Technographics surveys. These surveys are conducted by mail. The samples are selected from national market research panels to be representative of US households demographically and are weighted to correct for differences in response rates. Forrester has used TNS/NFO's market research panel since 2001 and used NPD's panel in earlier years. Forrester collects data in the 48 contiguous states and the District of Columbia, but not in Alaska or Hawaii. Using individual-level data from Forrester Research, the analysis finds significantly lower residential broadband adoption in lower-income and lower-density zip codes, controlling for individual characteristics. Further tests show that lower adoption in these areas is evidence of a persistent digital divide in availability. The analysis then assesses how broadband adoption changes individuals' usage of online activities. Broadband adoption increases individuals' frequency of researching health information online, but there is no evidence that broadband adoption increases usage of online job sites or online government services. Localities currently considering municipal wireless (Wi-Fi) initiatives should focus on digital divide justifications rather than expecting to raise usage of a wide range of online activities perceived to be socially desirable. But this study does not address how the evolution of online offerings and content will change the impact broadband has on online behaviors.

The objective of the study conducted by **Wei-Min Hu and James E. Prieger (2007)**[9] is to highlight the important drivers of broadband provision for policy makers. The study examines the supply of DSL broadband by the incumbent local exchange company (LEC) in five U.S. states in the earlier years of deployment. In October 1999, SBC and Ameritech merged. Both companies were dominant telecommunications service providers in different locations. Precise statistics at the company level on DSL deployment are closely held data. In addition to the DSL deployment list, the other data for the study come from five other sources such as a GIS database of ZIP+4 codes and locations, a GIS telecommunications wire center database, the FCC local competition database, and two Census data sources for household demographic and business information. The data are from the early years of broadband roll out in the area. Their empirical analysis shows that income, other demographics, and cost factors are important determinants of entry and availability, and thus, the supply side of the digital divide. After controlling for other

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[9] Wei-Min Hu† and James E. Prieger (2007) "The Timing of Broadband Provision: The Role of Competition and Demographics" *AEI-Brookings Joint Center Working Paper* No. 07-06

factors, the racial characteristics of the area do not affect DSL provision. Active competition in broadband from competitive LECs reduces deployment of DSL by the incumbent, but potential competition from competitive LECs has the opposite effect. Competition from cable companies also negatively influences the incumbent's decision to supply DSL.

The study conducted by **Hongju Liu, Pradeep Chintagunta, Ting Zhu (2008)**[10] provides a plausible demand-side explanation for a particular market outcome in the US broadband DSL market. The study focuses on consumers' demand on broadband exclusive and explores consumers' consumption of technology across product categories. It also focuses in both the inter-modal and intra-modal (independent ISPs vs. phone or cable companies) competition. In addition, the consumer panel data is used to identify the state dependence, consumer heterogeneity and complementarity/substitutability between categories. The panel data come from combining the Consumer Technographics benchmark surveys in 2004 – 2006 from Forrester Research. The data reflect market information from the years 2003-2005, i.e, prior to the change in regulation. The survey goes out to 60,000 households each year with some overlap in respondents each year. From these data it was able to obtain a panel of 2543 households who participate in each of the 3 years. The detailed information on household demographics and their subscription to cable television, local telephone and highspeed internet is also available. In addition, the characteristics of cable television from the Television and Cable Factbook 2006 by Warren Communications News are obtained. The findings include strong complementarities between broadband and the other two categories, after controlling for the effects of prices and preference correlations. There are two major reasons for consumers to purchase broadband services within a product bundle, namely the single-provider effect and the price discounts. The findings also show that the impact of the single-provider effect dominates the impact of price discounts.

The main aim of the study conducted by **Sangwon Lee and Justin Brown (2008)**[11] is to examine the effects of platform competition on broadband deployment.

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[10] Hongju Liu, Pradeep Chintagunta and Ting Zhu (2008) "Complementarities and the Demand for Home Broadband Internet Services" *Working Paper Series*

[11] Sangwon Lee and Justin Brown (2008) "The Diffusion of Fixed Broadband: An Empirical Analysis" *NET Institute Working Paper* No. 08-19

Platform competition occurs when different technologies (platforms) compete to provide similar or differentiated telecommunication services to end-users. This study examines the influential factors of fixed-broadband diffusion and whether there have been network effects in the diffusion of fixed broadband in OECD countries. In addition, the study assesses the effects of different types of LLU policies such as full unbundling, line sharing, and bit stream access as well as inter-modal competition. The study uses 1999-2006 OECD (Organization for Economic Cooperation and Development) data, the longest available panel to date. Employing the largest secondary data set, this study examines adoption factors of fixed broadband. The result suggests local loop unbundling (LLU) policy, platform competition between different broadband technologies and other diverse industry, ICT (Information and Communication Technology) and demographic factors influence fixed broadband diffusion. It is also found that different types of LLU policies and previous fixed broadband penetration are significant factors of fixed broadband deployment. The findings also suggest, countries fostering broadband deployment need to adopt LLU policy for broadband, but the costs and benefits of the different LLU policy types should be carefully considered. Interestingly, the result suggests high levels of platform competition are related to high levels of fixed-broadband penetration, but the effects of platform competition are not statistically significant in OECD countries. The effects of platform competition are strong in the initial deployment of fixed-broadband, but the effects of platform competition are decreasing when the broadband market size is sufficiently large or the broadband market is mature.

The study conducted by **James E. Prieger (2001)**[12] contributes a better understanding of where broadband Internet access is available. The data for the study come from three major sources: the FCC, Census, and a telecommunications wire center database. Using a comprehensive U.S. data set covering all forms of technology (chiefly DSL and cable modem), there is little evidence of redlining based on income or on black or Hispanic concentration. There is mixed evidence concerning redlining based on Native American or Asian concentration. Other findings includes that market size, education, Spanish language use, commuting distance, and Bell presence increase access probability and inner city or rural location decreases access probability.

[12] James E. Prieger (2003) "The Supply Side of the Digital Divide: Is There Redlining in the Broadband Internet Access Market?" *AEI-Brookings Joint Center Working Paper* No. 01-16

2.2 RESEARCH GAP

The research works conducted so far are on the diffusion of broadband in general. One of the studies highlighted the impact of the several spatial factors, including population size and economic structure, on the likelihood of broadband utilization holding other individual demographic characteristics constant. One of the results of the earlier studies indicated that the increase in competition, caused by the structural separation, might lead to substantial price decreases, as well as to consumer welfare increases. The contribution of intra-platform and inter-platform competition in accelerating the speed of broadband diffusion and the role of competition in promoting broadband adoption, identification of diffusion patterns evident in the market for broadband internet connections such as dial-up, broadband and the factors that shape the patterns of diffusion of broadband telecommunications technologies are examined in earlier studies.

The aspects such as the entry costs and importance of sunk costs, the underserved areas and online behaviour as a result of broadband adoption, the important drivers of broadband provision for policy makers, the consumers' demand on broadband exclusive and consumers' consumption of technology across product categories are dealt in the earlier studies.

The focuses of the studies conducted earlier are in general and not specific to an ISP (Internet Service Provider). The various individual aspects of the broadband that are important in consideration with the service in respect of the broadband users are not thoroughly studied in the existing researches. The influence of the demographic profile on the satisfaction of broadband users, the gap analysis between expectation and satisfaction of the broadband users are not studied elaborately. There is no sign of researches for forecasting the new arrivals such as IPTV (Internet Protocol Television), 3G Mobile and Wimax. The switching behaviour of the broadband users among ISPs is not examined. The level of awareness of broadband users, purpose of usage, difficulties faced by the broadband users and their satisfaction in solving their problems and additional features expected by the broadband users are not studied in the previous researches.

This research covers all the above mentioned points with respect to BSNL Broadband Service. It also highlights the recommendations to formulate strategies to improve the BSNL Broadband Service to maintain its customer base by satisfying them.

CHAPTER 3

METHODOLOGY

CHAPTER 3

METHODOLOGY

3.1 TYPE OF PROJECT

This project is of Descriptive type. Descriptive research describes data and characteristics about the population or phenomenon being studied. Descriptive research answers the questions who, what, where, when and how.

This project analyses the existing facts with the quantitative data. It is of Survey type which includes designing Questionnaire for collection of data from target respondents, processing and analyzing and arriving at conclusions.

3.2 TARGET RESPONDENTS

The target respondents are the residential BSNL Broadband Service users of Coimbatore.

3.3 ASSUMPTIONS, CONSTRAINTS AND LIMITATIONS

3.3.1 Assumptions

It is assumed that the demographic profile of BSNL Broadband Service users will have an impact on the level of satisfaction attached to various features of BSNL Broadband Service.

It is assumed that frequency of the nature of complaints and treatment of Broadband Service users during various instances will have an impact on the level of satisfaction of the users.

It is assumed that level of satisfaction will have an impact on the Switching behaviour of the BSNL Broadband Service users.

3.3.2 Constraints

All the customers may not be expressing what they actually feel. Time constraint is involved in deciding the sample size and the population area.

3.3.3 Limitation

Due to time constraint, the collection of data is limited to residential BSNL Broadband Service users of Coimbatore only.

3.4 SAMPLING METHOD

The sampling technique used is Proportionate Stratified Random Sampling. Proportionate Stratified Random Sampling is a stratified sampling procedure which selects numbers proportional to size of strata. The BSNL Broadband Service users of Coimbatore are stratified on the basis of the Telephone Exchange from where the broadband Service is provided. From the stratified population, samples for each stratum are chosen proportionate to the total sample of 249. From the proportionate samples, a sample is chosen on random basis. The sample size is calculated theoretically as per formula as 377. Due to the time limitation, the sample size is limited to 249.

3.5 DATA PROCESSING

3.5.1 Method and source of data collection

Primary data is collected from the residential BSNL Broadband Service users of Coimbatore. A specially designed Questionnaire is used for the data collection from the residential BSNL Broadband Service users of Coimbatore.

3.5.2 Data processing

The data collected from the residential BSNL Broadband Service users of Coimbatore are processed using the package SPSS (Statistical Package for Social Sciences).

3.6 TOOLS FOR ANALYSIS

The study used the following tools for analysis

- Percentage Analysis
- Mean Score
- Paired Samples T Test
- Chi-square

3.6.1 Mean score

The Mean score is the arithmetic mean of all the individual scores.

3.6.2 Paired samples T test

The Paired samples T test compares the means of two variables. It computes the difference between the two variables for each case, and tests to see if the average difference is significantly different from zero.

3.6.3 Chi-square test

A chi-square test (also chi-squared or $\chi 2$ test) is any statistical hypothesis test in which the test statistic has a chi-square distribution when the null hypothesis is true, or any in which the probability distribution of the test statistic (assuming the null hypothesis is true) can be made to approximate a chi-square distribution as closely as desired by making the sample size large enough.

CHAPTER 4

DATA ANALYSIS AND INTERPRETATION

CHAPTER 4

DATA ANALYSIS AND INTERPRETATION

4.1 DEMOGRAPHIC PROFILE

The following tables represent the demographic profile of the residential BSNL Broadband Service users.

4.1.1 Age wise distribution of respondents

Age Group	Number of Respondents	Percentage
Below 20 years	17	6.8
21-30 years	57	22.9
31-40 years	45	18.1
41-50 years	59	23.7
51-60 years	42	16.9
Above 60 years	29	11.6
Total	249	100.0

The above table shows that most (23.7%) of the respondents are in the age group 41-50 years, followed by 22.9% of the respondents in the age group 21-30 years, 18.1% of the respondents in the age group 31-40 years, 16.9% of the respondents in the age group 51-60 years, 11.6% of the respondents in the age group above 60 years and only 6.8% of the respondents in the age group below 20 years.

4.1.2 Occupation wise distribution of respondents

Occupation	Number of Respondents	Percentage
Business	49	19.7
Government	24	9.6
PSU	40	16.1
Private	35	14.1
Others	101	40.6
Total	249	100.0

It is inferred from the above table that 40.6% of the respondents are categorized as 'others' which includes retired employees, students and house wives.19.7 % of the respondents fall under Business category, 16.1 % of the respondents fall under PSU category, 14.1 % of the respondents fall under Private category and 9.6 % of the respondents fall under Government category.

4.1.3 Family monthly income wise distribution of respondents

Family Monthly Income	Number of Respondents	Percentage
Below Rs.10000	38	15.3
Rs.10001-20000	66	26.5
Rs.20001-30000	49	19.7
Rs.30001-40000	37	14.9
Rs.40001-50000	14	5.6
Above Rs.50000	18	7.2
No Response	27	10.8
Total	249	100.0

From the above table, it is understood that the family income of 26.5% of the respondents fall in the range of Rs.10001-20000, 19.7% of the respondents fall in the range of Rs.20001-30000, 15.3% of the respondents fall below Rs.10000, 14.9% of the respondents fall in the range of Rs.30001-40000, 7.2% of the respondents is above 50,000 and 5.6% of the respondents fall in the range of Rs.40001-50000. Out of 249 respondents, 27 respondents were not willing to disclose their family monthly income which is about 10.8% of the total respondents.

4.1.4 Distribution of respondents on the basis of earning members

Number of Earning Members	Number of Respondents	Percentage
One	120	48.2
Two	106	42.6
Three	18	7.2
Four	3	1.2
Above five	2	0.8
Total	249	100.0

The above table indicates that the number of earning members in 48.2% of the respondents' family is one, 42.6% of the respondents' family is two, 7.2% of the respondents' family is three, 1.2% of the respondents' family is four and 0.8% of the respondents' family is more than five.

4.2 SUBSCRIPTION PROCESS, TYPE OF SERVICE AVAILED AND USAGE PATTERN

4.2.1 Subscription process

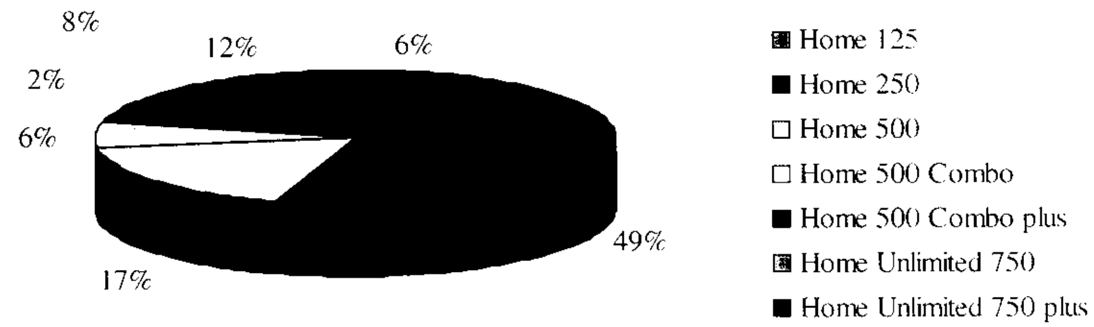
4.2.1.1 Broadband plan wise distribution of respondents

Broadband Plan	Number of Respondents	Percentage
Home 125	14	5.6
Home 250	123	49.4
Home 500	43	17.3
Home 500 Combo	16	6.4
Home 500 Combo plus	4	1.6
Home Unlimited 750	20	8.0
Home Unlimited 750 plus	29	11.6
Total	249	100.0

It is inferred from the above table that most (49.4%) of the respondents have opted Home 250 plan, 17.3 % of the respondents opted for Home 500 plan, 11.6 % of the respondents opted for Home Unlimited 750 plus plan, 8% of the respondents opted for Home Unlimited 750 plan, 6.4% of the respondents opted for Home 500 Combo plan, 5.6% of the respondents opted for Home 125 plan and very few (1.6%) of the respondents opted for Home 500 Combo plus plan.

The tabulated numerical data of the table 4.2.1.1 is presented in the following figure.

Broadband plan wise distribution of respondents



4.2.1.1 Broadband plan wise distribution of respondents

4.2.1.2 Distribution of respondents based on broadband plan change

Broadband Plan Change	Number of Respondents	Percentage
Yes	69	27.7
No	180	72.3
Total	249	100.0

From the above table it is understood that majority (72.3%) of the respondents have not changed their broadband plan and only 27.7 % of the respondents have changed their broadband plan.

4.2.1.3 Broadband plan change distribution

		From plan										TOTAL	
		Home 125		Home 250		Home 500		Home 500 Combo		Home Unlimited 750		No.	%
		No.	%	No.	%	No.	%	No.	%	No.	%		
To plan	Home 125			3	4.3							3	4.3
	Home 250	2	2.9			6	8.6			3	4.3	11	15.9
	Home 299					1	1.4					1	1.4
	Home 500	1	1.4	16	23.2							17	24.6
	Home 500 Combo			3	4.3	3	4.3			1	1.4	7	10.1
	Home Unlimited 1350									1	1.4	1	1.4
	Home Unlimited 750			23	33.3	3	4.3	3	4.3			29	42.0
TOTAL		3	4.3	45	65.2	13	18.8	3	4.3	5	7.2	69	100.0

It is understood from the above table that the following percentage of plan conversions have taken place out of 69 plan conversions. Most (33.3%) of the plan conversions are from Home 250 to Home Unlimited 750. 23.2% of the plan conversions are from Home 250 to Home 500. 8.6% of plan conversions are from plan Home 500 to Home 250. 4.3% of plan conversions are from plan Home 250 to Home 125, Home 250 to Home 500 Combo, Home 500 to Home 500 Combo, Home 500 to Home Unlimited 750, Home 500 Combo to Home Unlimited 750 and Home Unlimited 750 to Home 250. 2.9% of plan conversions are from plan Home 125 to Home 250. 1.4% of plan conversions are from plan Home 125 to Home 500, Home 500 to Home 299, Home Unlimited 750 to Home 500 Combo and Home Unlimited 750 to Home Unlimited 1350.

4.2.1.1 Reasons for plan change

The respondents stated that Home 500 combo plans are economical, facilitates free landline calls with no rental charges for landline, provides unlimited night usage and increased hours of usage during day time which resulted in plan change. The respondents changed over to unlimited 750 plans stated that unlimited usage is required by them, few of them mentioned heavy billing in previous plan as the reason for change over and only one stated the reason as R&D on software and other stated Online Trading as the reason for change over to unlimited plan. The respondents changed over to Home 500 plan felt the requirement of the night time free downloads, extra download limit during daytime and increased speed. The respondents changed to all "plus plans" stated the rent free connection as the reason for plan change. A few of the respondents felt the cost factor as the reason for the plan change. The respondents who have changed to Home 250 and Home 125 from higher plans stated that less usage is required by them. The respondents who have changed from lower plans to higher plans mentioned that more usage is requirement by them. One respondent stated increased speed as the reason for change over from Home unlimited 750 plus to Home unlimited 1350 plus.

4.2.1.4 Office approached

Office Approached	Number of Respondents	Percentage
Commercial Office	63	25.3
Customer Service Centre	91	36.5
Nearest telephone exchange	87	34.9
Others	8	3.2
Total	249	100.0

From the above table it is clear that 36.5% of the respondents approached Customer Service Centre, 34.9% of the respondents approached Nearest Telephone Exchange, 25.3% of the respondents approached Commercial Office and 3.2% of the respondents approached others.

4.2.1.5 Method of filing broadband application

Method of filing Broadband Application	Number of Respondents	Percentage
In person	218	87.6
Online	4	1.6
Through BSNL employees	25	10.0
Through post	2	0.8
Total	249	100.0

It is inferred from the table 4.2.1.5 that majority (87.6%) of the respondents filed the broadband application in person. 10% of the respondents filed through BSNL employees, 1.6% of the respondents filed online and only 0.8% of the respondents filed through post.

4.2.1.6 Waiting period to get the broadband connection

Waiting Period	Number of Respondents	Percentage
Less than 3 days	25	10.0
3-7 days	59	23.7
8-31 days	104	41.8
Above 31 days	61	24.5
Total	249	100.0

The above table indicates that most (41.8%) of respondents have waited from 8 to 31 days for getting the broadband connection. 24.5 % of the respondents have waited above 31 days and 23.7 % of the respondents have waited from 3 to 7 days for getting the broadband connection. Only 10 % of the respondents got the connection within 3 days.

4.2.2 Type of service availed

4.2.2.1 Type of modem

Type of Modem used	Number of Respondents	Percentage
Wired modem	203	81.5
Wireless modem	46	18.5
Total	249	100.0

From the above table it can be inferred that Majority (81.5%) of the respondents are using wired modem and only 18.5% of the respondents are using wireless modem.

4.2.2.2 Mode of purchase of modem

Mode of Purchase of Modem	Number of Respondents	Percentage
Purchased from BSNL	216	86.7
Monthly rental	8	3.2
Purchased outside	25	10.0
Total	249	100.0

It is inferred from the above table that Majority (86.7%) of the respondents purchased modem from BSNL. Only 10% of the respondents purchased outside and a very few (3.2%) respondents taken the modem for rental.

4.2.3 Usage pattern

4.2.3.1 Period of usage

Period of Usage	Number of Respondents	Percentage
Less than 1 year	70	28.1
1.1-2 years	74	29.7
2.1-3 years	52	20.9
3.1-4 years	21	8.4
4.1-5 years	20	8.0
Above 5 years	12	4.8
Total	249	100.0

It is understood from the above table that 29.7% of the respondents are using BSNL Broadband for the period 1.1 to 2 years followed by 28.1% of the respondents using it for less than 1 year, 20.9% of the respondents using it for the period 2.1 to 3 years, 8.4% of the respondents using it for the period 3.1 to 4 years, 8% of the respondents using it for the period 4.1 to 5 years and 4.8% of the respondents using it for more than 5 years.

4.2.3.2 Hours of usage per day

Hours of Usage per day	Number of Respondents	Percentage
Less than 1 hour	49	19.7
1.1-2 hours	84	33.7
2.1-3 hours	35	14.1
3.1-4 hours	25	10.0
4.1-5 hours	18	7.2
Above 5 hours	38	15.3
Total	249	100.0

It is inferred from the above table that 33.7% of the respondents are using BSNL Broadband for 1.1 to 2 hours per day on average, 19.7% of the respondents are using for less than 1 hour per day on average, 15.3% of the respondents are using above 5 hours per day on average, 14.1% of the respondents are using for 2.1 to 3 hours per day on average, 10% of the respondents are using for 3.1 to 4 hours per day on average and 7.2% of the respondents are using for 4.1 to 5 hours per day on average.

4.2.3.3 Family members using broadband

Family members using Broadband	Number of Responses	Percentage
Children	109	43.8
Friends and relatives	25	10.0
Parents	44	17.7
Self	203	81.5
Spouse	77	30.9
Others	13	5.2

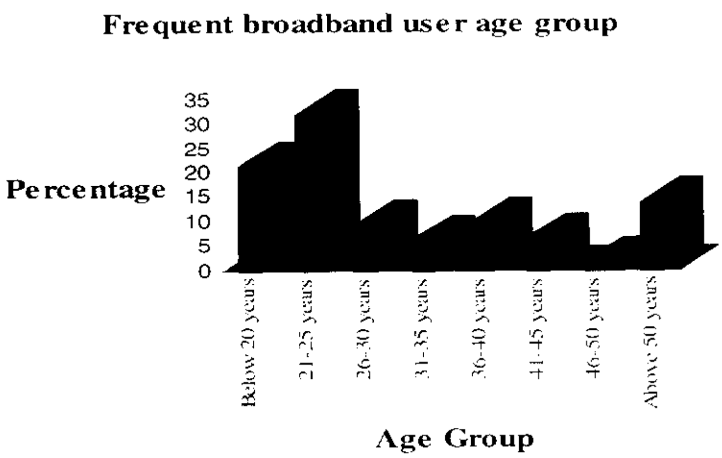
The above table shows that majority of the respondents are the users of the broadband as the 'self' category covers 81.5% of the users. The children occupy the next position by covering 43.8% of the users. The 'spouse' category covers 30.9% of users, the 'parents' category covers 17.7% of the users, the 'friends and relatives' category covers 10% of the users and the 'Others' category covers 5.2% of the users.

4.2.3.4 Frequent broadband user age group

Frequent Broadband user Age Group	Number of Respondents	Percentage
Below 20 years	53	21.3
21-25 years	80	32.1
26-30 years	23	9.2
31-35 years	15	6.0
36-40 years	24	9.6
41-45 years	16	6.4
46-50 years	4	1.6
Above 50 years	34	13.7
Total	249	100.0

It is inferred from the above table that the 32.1% of the respondents indicated the age group 21-25 years as the frequent user age group of their family followed by 21.3% of the respondents by age group below 20 years, 13.7% of the respondents by age group above 50 years, 9.6% of respondents the by age group 36-40 years, 9.2% of the respondents by age group 26-30 years, 6.4% of the respondents by age group 41-45 years, 6% of the respondents by age group 31-35 years and 1.6% of the respondents by age group 46-50 years.

The tabulated numerical data of the table 4.2.3.4 is presented in the following figure.



4.2.3.1 Frequent broadband user age group

4.2.3.5 Purpose

Purpose	Mean Score	Rank
Downloading Files	2.7415	2
Email	1.9123	1
Entertainment (Online Movies, Online Games etc)	4.5300	7
Net Chatting	3.7059	4
Online Banking	4.4659	6
Online Purchases	6.2222	13
Online Ticket Booking	4.5526	8
Online Trading	4.8269	10
Searching Information through web	3.0055	3
Video Conferencing	5.7174	12
Viewing Web Camera / IP Camera	5.2676	11
Voice Chatting	4.6061	9
VOIP (Voice over Internet Protocol)	6.3043	14
Others	3.9231	5

From the above table it is inferred that when considering the purpose of usage of broadband by the respondents Email ranks the first followed by Downloading Files, Searching Information through web, Net Chatting, Others, Online Banking, Entertainment (Online Movies, Online Games etc), Online Ticket Booking, Voice Chatting, Online Trading, Viewing Web Camera / IP Camera, Video Conferencing, Online Purchases and VOIP (Voice over Internet Protocol).

4.2.3.6 Trial usage before purchase

Trial Usage	Number of Respondents	Percentage
Yes	13	5.2
No	236	94.8
Total	249	100.0

It is inferred from the above table that majority (94.8%) of the respondents have not tried the free usage before purchasing the broadband connection. Only 5.2 % of the respondents have tried the free usage before purchasing the Broadband connection.

4.2.3.7 Discount for Government and PSU employees

Discount Availed	Number of Respondents	Percentage
Yes	41	16.5
No	57	22.9
Not applicable	151	60.6
Total	249	100.0

It can be seen from the above table that 16.5% of the respondents have availed the discount for government and PSU employees.

4.2.3.8 Method of complaint redressal

Method of Complaint Redressal	Number of Respondents	Percentage
In person	136	54.6
Through phone	94	37.8
No Response	19	7.6
Total	249	100.0

From the above table it is clear that majority (54.6%) of the respondents preferred the method of attending the broadband complaints in person. 37.8% of the respondents preferred the method of attending the broadband complaints through the telephone guidance. 7.6% of the respondents have mentioned that the method of compliant redressal preferred depends on the nature of the complaint faced.

4.2.3.9 Frequency of Complaints

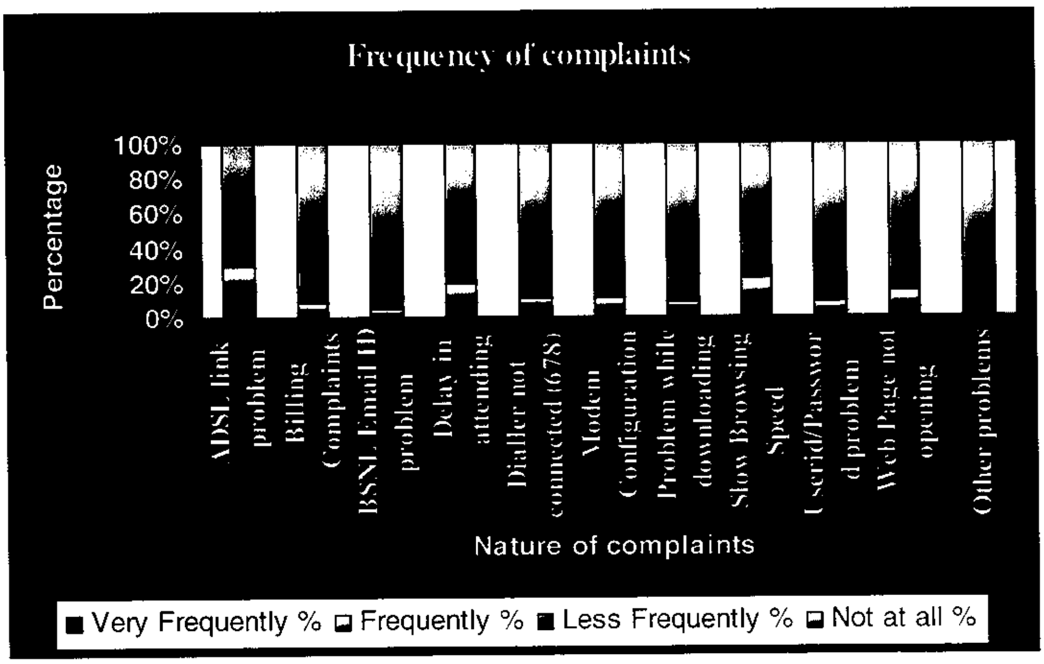
Nature of Complaint	Very Frequently		Frequently		Less Frequently		Not at all	
	No.	%	No.	%	No.	%	No.	%
ADSL link problem	39	15.7	34	13.7	74	29.7	102	41.0
Billing Complaints	7	2.8	15	6.0	45	18.1	182	73.1
BSNL Email ID problem	4	1.6	9	3.6	16	6.4	220	88.4
Delay in attending Complaints	23	9.2	27	10.8	60	24.1	139	55.8
Dialler not connected (678 error)	16	6.4	13	5.2	37	14.9	183	73.5
Modem Configuration problem	10	4.0	17	6.8	46	18.5	176	70.7
Problem while downloading data	13	5.2	9	3.6	36	14.5	191	76.7

Table 4.2.3.9 (continued)

Slow Browsing Speed	24	9.6	31	12.4	52	20.9	142	57.0
Userid/Password problem	5	2.0	17	6.8	30	12.0	197	79.1
Web Page not opening	13	5.2	25	10.0	52	20.9	159	63.9
Other problems	5	2.0	3	1.2	10	4.0	231	92.8

It is inferred from the above table that ADSL link problem is less frequently faced by 29.7% of the respondents followed by Slow Browsing Speed and Web Page not opening by 20.9% of the respondents, Delay in attending Complaints by 24.1% of the respondents and Billing complaints by 18.1% of the respondents. The ADSL link problem is very frequently faced by 15.7% of the respondents followed by Slow Browsing Speed by 9.6% of the respondents, Delay in attending Complaints by 9.2% of the respondents and Dialler not connected (678 error) by 6.4% of the respondents. The ADSL link problem is frequently faced by 13.7% of the respondents followed by Slow Browsing Speed by 12.4% of the respondents, Delay in attending Complaints by 10.8% of the respondents and Web Page not opening by 10% of the respondents.

The tabulated data of table 4.2.3.9 is presented in the following figure.



4.2.3.2 Frequency of complaints

The level of satisfaction in clearing complaints is captured on a 5 point scale. The perception regarding the level of satisfaction is calculated with measures 5 for very much satisfied, 4 for satisfied, 3 for neutral, 2 for dissatisfied and 1 for very much dissatisfied.

4.2.3.10 Level of Satisfaction in clearing complaints

Nature of Complaints	Mean Score	Rank
ADSL link problem	3.3878	4
Billing Complaints	3.1791	7
BSNL Email ID problem	3.6207	1
Delay in attending Complaints	2.8273	9
Dialer not connected (678 error)	3.1212	8
Modem Configuration problem	3.4658	3
Problem while downloading data	3.2069	6
Slow Browsing Speed	2.8038	10
Userid/Password problem	3.5192	2
Web Page not opening	3.2556	5
Other problems	2.5556	11

It is inferred from the above table that the respondents are satisfied in clearing complaint with BSNL Email ID problem followed by Userid/Password problem, Modem Configuration problem, ADSL link problem, Web Page not opening, Problem while downloading data, Billing Complaints, Dialler not connected (678 error), Delay in attending Complaints, Slow Browsing Speed and Other problems. It is also inferred that they are least satisfied with the other problems, slow Browsing Speed and delay in attending complaints.

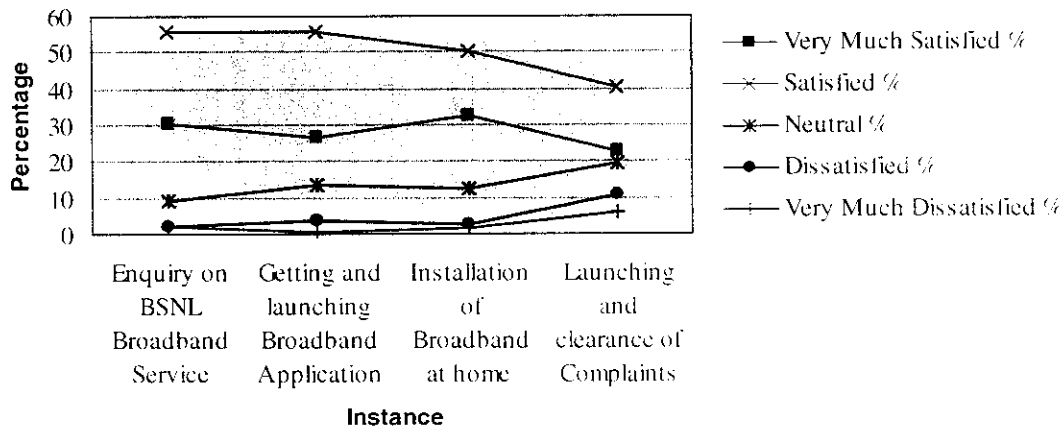
4.2.3.11 Level of satisfaction in customer interaction

Instance	Very Much Satisfied		Satisfied		Neutral		Dissatisfied		Very Much Dissatisfied	
	No.	%	No.	%	No.	%	No.	%	No.	%
Enquiry on BSNL Broadband Service	76	30.5	138	55.4	23	9.2	6	2.4	6	2.4
Getting and launching Broadband Application	67	26.9	138	55.4	34	13.7	9	3.6	1	0.4
Installation of Broadband at home	82	32.9	125	50.2	31	12.4	7	2.8	4	1.6
Launching and clearance of Complaints	57	22.9	101	40.6	49	19.7	27	10.8	15	6.0

From the table 4.2.3.11, it is clear that 55.4% of the respondents are satisfied with Enquiry on BSNL Broadband Service and Getting and launching Broadband Application. 32.9% of the respondents are very much satisfied with the Installation of Broadband at home and 30.5% of the respondents are very much satisfied with Enquiry on BSNL Broadband Service. 10.8% of the respondents are dissatisfied and 6% of the respondents are very much dissatisfied with Launching and clearance of Complaints.

The tabulated data of the table 4.2.3.11 is presented in the following figure.

Level of satisfaction in customer interaction



4.2.3.3 <u>Level of satisfaction in customer interaction</u>

4.2.3.12 User recommendation

Recommendation	Number of Respondents	Percentage
Yes	225	90.4
No	24	9.6
Total	249	100.0

From the above table it is understood that majority (90.4%) of the respondents recommend others to use BSNL Broadband Service. 9.6% of the respondents are not willing to recommend others to use BSNL Broadband Service.

4.3 AWARENESS

4.3.1 Sources

Sources	Mean Score	Rank
Through Advertisements	1.5149	1
Through BSNL Employees	2.1083	3
Through Friends and Relatives	1.8795	2
Others	3.4286	4

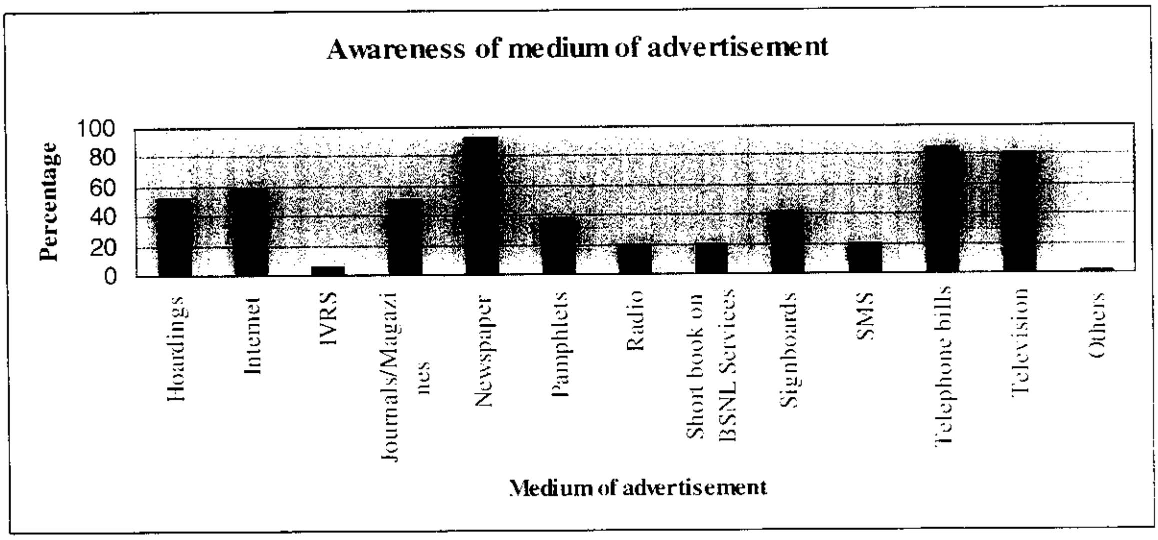
The above table clearly indicates that the respondents have rated Advertisement as the first source to know about BSNL broadband service followed by Friends and Relatives, BSNL Employees and Others.

4.3.2 Medium of Advertisement

Medium of Advertisement	Number of Respondents	Percentage
Hoardings	130	52.2
Internet	147	59.0
IVRS	14	5.6
Journals and Magazines	126	50.6
Newspaper	229	92.0
Pamphlets	94	37.8
Radio	50	20.1
Short book on BSNL Services	47	18.9
Signboards	105	42.2
SMS	49	19.7
Telephone bills	211	84.7
Television	202	81.1
Others	2	0.8

It is inferred from the above table that 92% of the respondents have noticed advertisements in Newspaper followed by 84.1% of the respondents in Telephone Bills, 81.1% of the respondents in Television, 59% of the respondents in Internet, 52.2% of the in Hoardings and 50.6% of the respondents in Journals and Magazines.

The tabulated data of the table 4.3.2 is presented in the following figure.



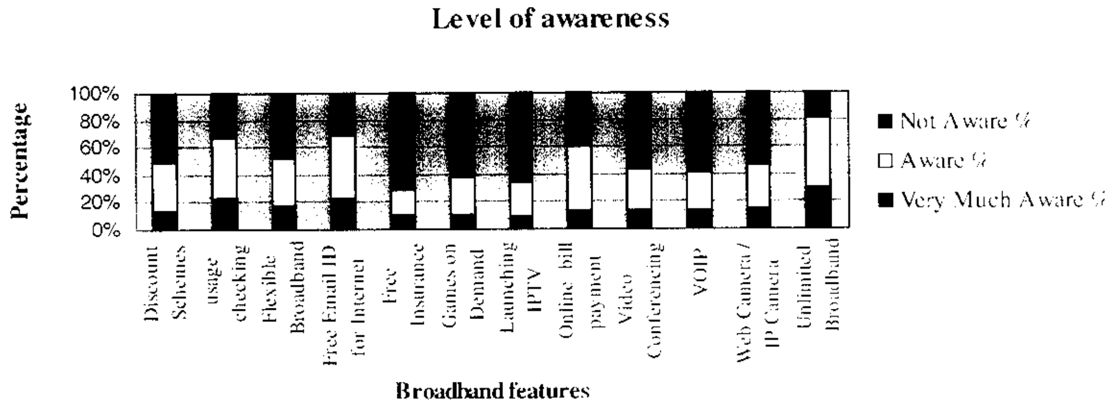
4.3.1 Awareness of medium of advertisement

4.3.3 Level of Awareness

Broadband Features	Very Much Aware		Aware		Not Aware	
	No.	%	No.	%	No.	%
Discount Schemes	34	13.7	90	36.1	125	50.2
Facility for checking usage in Broadband	58	23.3	109	43.8	82	32.9
Flexible Broadband Plan option	43	17.3	88	35.3	118	47.4
Free Email ID for Internet connection	57	22.9	113	45.4	79	31.7
Free Insurance Scheme	26	10.4	44	17.7	179	71.9
Games on Demand	28	11.2	66	26.5	155	62.2
Launching IPTV in near future	23	9.2	61	24.5	165	66.3
Online facilities for bill payment	33	13.3	117	47.0	99	39.8
Video Conferencing	33	13.3	75	30.1	141	56.6
VOIP (Voice Over Internet Protocol)	34	13.7	68	27.3	147	59.0
Web Camera / IP Camera	38	15.3	78	31.3	133	53.4
Unlimited Broadband Plan options	75	30.1	125	50.2	49	19.7

The above table indicates that 71.9% of the respondents are not aware of Free Insurance Scheme, 66.3% of the of the respondents are not aware of Launching IPTV in near future, 62.2% of the of the respondents are not aware of Games on Demand and 59% of the of the respondents are not aware VOIP (Voice Over Internet Protocol). It is inferred that 50.2% of the respondents are aware of Unlimited Broadband Plan options, 47% of the respondents are aware of Online facilities for bill payment, 45.4% of the respondents are aware of Free Email ID for Internet connection and 43.8% of the respondents are aware of Facility for checking usage in Broadband. It is also inferred that 30.1% of the respondents are very much aware of Unlimited Broadband Plan options, 22.9% of the respondents are very much aware of Free Email ID for Internet connection and 23.3% of the respondents are very much aware of Facility for checking usage in Broadband.

The tabulated data of the table 4.3.3 is presented in the following figure.



4.3.2 <u>Level of awareness</u>

4.3.4 <u>IPTV</u>

IPTV	Number of Respondents	Percentage
Yes	141	56.6
No	104	41.8
No Response	4	1.6
Total	249	100.0

The above table indicates that majority (56.6%) of the respondents wished to opt for IPTV through BSNL Broadband. 41.8% of the respondents are not willing to opt for IPTV through BSNL Broadband. 1.6 % of the respondents mentioned that after the introduction of the IPTV, clarity is to be verified and cost is to be considered for the decision.

4.3.5 Types of broadband

Type of Broadband	Number of Respondents	Percentage
BSNL Broadband Through landline	129	51.8
BSNL Mobile 3G Wireless Broadband	43	17.3
BSNL WiMax Wireless Broadband	59	23.7
Mobile 3G Wireless Broadband-Others	4	1.6
WiMax Wireless Broadband-Others	0	0.0
No Response	14	5.6
Total	249	100.0

It is inferred from the above table that majority (51.8%) of the respondents will opt BSNL Broadband through Landline, 23.7% of the respondents will opt BSNL Wi-Max Wireless Broadband, 17.3% will opt BSNL Mobile 3G Wireless Broadband, 1.6 % of the respondents will opt Mobile 3G Wireless Broadband by other operators if all the types of broadband are available and 5.6% of the respondents have mentioned that the decision will be made on the basis of cost comparison.

4.3.6 Additional features

Additional Features	Number of Respondents	Percentage
Yes	77	30.9
No	172	69.1
Total	249	100.0

It is understood from the above table that majority (69.1%) of the respondents do not require any additional features. 30.9% of the respondents require additional features. The respondents mentioned the following additional features as their requirement,

- Enhancement in Speed
- Online Broadband Plan changing option
- Online Complaint Redressal System
- Extension of the Night time unlimited usage for Broad plan Home 500, Home 500 Combo and Home 500 Combo plus plans
- IPTV with all channels and trial usage
- Introduction of Student Package in Broadband
- Provision of Identity card to each Telephone owners

- Easy access to check usage
- Monthly billing pattern instead of Bimonthly
- Reduction in BSNL Broadband Usage charges for Home users
- Clarity in video conferencing
- Special offers for limited time
- Additional features in par with the competitors and new technology
- Introduction of New unlimited plans with enhanced speed
- Improvement in Modem performance at low voltage times
- Facility from BSNL to hear songs through internet
- Immediate provision of new connection like other operators
- Immediate updation of usage and provision for checking usage during last few days of the month
- Availability of broadband in interior areas
- Availability of all BSNL services online
- Reduced Billing charges
- Wi-Max facility
- Additional Mail ID Space
- BSNL 3G wireless Broadband
- Unlimited night time usage for H250 plan
- Supply of basic VoIP end user modem
- Wireless Broadband
- Automatic speed display and usage details
- Wireless supporting of Modem over long distance
- For loyal customers of more than 5 years , wired modem can be replaced by wireless modem
- 20% discount scheme can be extended to self employed professionals
- Increased unlimited Home Plan speed from 256kpbs to 512 kpbs

4.4 PERCEPTION REGARDING BSNL BROADBAND SERVICE

The perception regarding BSNL broadband service is captured on a 5 point scale. The perception regarding the level of satisfaction is calculated with measures 5 for very much satisfied, 4 for satisfied, 3 for neutral, 2 for dissatisfied and 1 for very much dissatisfied. Similarly the perception regarding the level of importance is calculated with measures 5 for very much important, 4 for important, 3 for neutral, 2 for unimportant and 1 for very much unimportant.

4.4.1 Level of importance

Broadband Features	**Mean Score**	**Rank**
Broadband Charges	4.3775	3
Complaint Redressal	4.4297	2
Discount Schemes	3.9438	7
Facility for Usage Checking	3.9920	6
Free Email ID	3.5743	8
Games on Demand	2.9076	12
Speed of the Broadband Connection	4.4980	1
Video Conferencing	3.3494	10
VOIP (Voice Over Internet Protocol)	3.3253	11
Web Camera / IP Camera	3.4096	9
Transparent Billing	4.0884	4
Variety of Plan options	4.0643	5

It is inferred from the above table that the respondents considered the Speed of the Broadband Connection as the first important feature followed by Complaint Redressal, Broadband Charges, Transparent Billing, Variety of Plan options, Facility for Usage Checking, Discount Schemes, Free Email ID, Web Camera / IP Camera, Video Conferencing, VOIP (Voice Over Internet Protocol) and Games on Demand.

4.4.2 Level of satisfaction

Broadband Features	Mean Score	Rank
Broadband Charges	3.8153	2
Complaint Redressal	3.5221	6
Discount Schemes	3.4217	8
Facility for Usage Checking	3.5863	5
Free Email ID	3.4618	7
Games on Demand	3.1004	12
Speed of the Broadband Connection	3.7028	4
Video Conferencing	3.1807	11
VOIP (Voice Over Internet Protocol)	3.2329	10
Web Camera / IP Camera	3.2892	9
Transparent Billing	3.8353	1
Variety of Plan options	3.7952	3

The above table shows that the respondents are satisfied with Transparent Billing among all the Broadband features followed by Broadband Charges, Variety of Plan options, Speed of the Broadband Connection, Facility for Usage Checking, Complaint Redressal, Free Email ID, Discount Schemes, Web Camera / IP Camera, VOIP (Voice Over Internet Protocol), Video Conferencing and Games on Demand.

4.4.1 Level of importance Vs Level of satisfaction

In order to analyse the gap between the level of importance and level of satisfaction, it is hypothesized that there is no significant difference between the level of importance and the level of satisfaction with respect to the various Broadband Features.

H_o1: There is no significant difference between the level of importance and the level of satisfaction with respect to the various Broadband Features.

The following table 4.4.1.1 represents the t value, p value and result of the paired sample t test.

4.4.1.1 Level of importance Vs level of satisfaction

Broadband Features	T value	p value	Result
Broadband Charges	8.391	0.000	H_0 Rejected
Complaint Redressal	11.408	0.000	H_0 Rejected
Discount Schemes	7.808	0.000	H_0 Rejected
Facility for Usage Checking	6.617	0.000	H_0 Rejected
Free Email ID	1.717	0.087	H_0 Accepted
Games on Demand	-3.210	0.002	H_0 Rejected
Speed of the Broadband Connection	10.321	0.000	H_0 Rejected
Video Conferencing	3.002	0.003	H_0 Rejected
VOIP (Voice Over Internet Protocol)	1.756	0.080	H_0 Accepted
Web Camera / IP Camera	2.441	0.015	H_0 Rejected
Transparent Billing	4.779	0.000	H_0 Rejected
Variety of Plan options	5.478	0.000	H_0 Rejected

The above table indicates that there is a significant difference between the level of importance and the level of satisfaction with respect to the broadband features such as Broadband Charges, Complaint Redressal, Discount Schemes, Facility for Usage Checking, Games on Demand, Speed of the Broadband Connection, Video Conferencing, Web Camera / IP Camera, Transparent Billing and Variety of Plan options.

In all the other cases the null hypothesis is accepted showing that there is no significant difference between the level of importance and the level of satisfaction with respect to the identified broadband features.

4.5 SWITCHING BEHAVIOUR OF BSNL BROADBAND SERVICE USERS

4.5.1 Other broadband services considered

Other Broadband Services Considered	Mean Score	Rank
Bharti Airtel	1.2895	1
Hathway cable	2.4340	2
Reliance communications	2.5833	4
Sri RP telecom	4.2778	5
Tata communications	2.5167	3
Others	5.5128	6

From the table 4.5.1 it is clear that the respondents have considered other broadband services such as Bharti Airtel, Hathway cable, Tata communications, Reliance communications, Sri RP telecom and others.

4.5.2 Other broadband services owned

Other Broadband Services Owned	Number of Respondents	Percentage
Bharti Airtel	11	4.4
Hathway cable	1	0.4
Reliance communications	7	2.8
Sri RP telecom	0	0.0
Tata communications	2	0.8
Others	2	0.8
Not Applicable	226	90.8
Total	249	100.0

It is inferred from the above table that majority (90.8%) of the respondents have not owned any other broadband services in addition to BSNL broadband service. 4.4% of the respondents own Bharti Airtel in addition to BSNL broadband service followed by 2.8% of the respondents by Reliance Communications, 0.8% of the respondents by Tata Communications and Others and only 0.4% of the respondents by Hathway cable. No one of the respondents own Sri RP telecom in addition to BSNL broadband service.

4.5.3 Other broadband service before BSNL

Other Broadband Service before BSNL	Number of Respondents	Percentage
Yes	41	16.5
No	208	83.5
Total	249	100.0

From the above table it is clear that majority (83.5%) of the respondents have not used any other broadband service before BSNL. Only 16.5% of the respondents have used other broadband service before BSNL.

4.5.4 Broadband service provider before BSNL

Broadband Service Provider before BSNL	Number of Respondents	Percentage
Bharti Airtel	17	41.5
Hathway cable	3	7.3
Reliance communications	9	22.0
Sri R.P.telecom	4	9.8
Tata communications	6	14.6
Others	2	4.9
Total	41	100.0

It is noted from the above table that most (41.5%) of the respondents used Bharti Airtel before BSNL followed by 22% of the respondents by Reliance communications, 14.6% of the respondents by Tata communications, 9.8% of the respondents by Sri R.P.Telecom, 7.3% of the respondents by Hathway cable and 4.9% of the respondents by 'Others'.

4.5.5 Reason for changing from other service providers to BSNL

Reason	Mean Score	Rank
Billing complaints	1.9231	3
Delay in attending complaints	2.7500	6
Heavy charges	2.0000	4
Lack of connectivity	1.8182	2
Slow browsing speed	2.3077	5
Others	1.0000	1

The above table clearly indicates that the respondents have rated 'Other' reasons as most important followed by Lack of connectivity, Billing complaints, Heavy charges, Slow browsing speed and Delay in attending complaints.

4.5.6 Switching over from BSNL to other service providers

Switching over from BSNL	Number of Respondents	Percentage
Yes	17	6.8
No	232	93.2
Total	249	100.0

From the table 4.5.6 it is clear that majority (93.2%) of the respondents are not willing to switch over from BSNL to any other service provider. Only 6.8% of the respondents are willing to switch over from BSNL to other service provider.

4.5.7 Other service provider chosen to switch over from BSNL

Service Provider	Number of Respondents	Percentage
Bharti Airtel	8	47.1
Hathway cable	2	11.8
Reliance communications	5	29.4
Sri R.P.telecom	0	0.0
Tata communications	1	5.9
Others	1	5.9
Total	17	100.0

It is clearly noted from the above table that most (47.1%) of the respondents out of 17 respondents wish to switch over to Bharti Airtel from BSNL followed by 29.4% of the respondents to Reliance communications, 11.8% of the respondents to Hathway cable, 5.9 % of the respondents to Tata communications and 'Others'. No one wish to switch over to Sri R.P.Telecom.

4.5.8 Reason for changing from BSNL to other service providers

Reason	Mean Score	Rank
Billing Complaints	3.0000	5
BSNL Email ID problem	4.0000	6
Delay in attending complaints	1.8462	1
Heavy Charges	2.5714	4
Lack of Connectivity	2.0000	2
Slow Browsing Speed	2.0909	3
Others	4.0000	6

The above table clearly indicates that the respondents have rated Delay in attending complaints as the first reason to switch over from BSNL followed by Lack of connectivity, Slow browsing speed, Heavy charges, Billing complaints, BSNL Email ID problem and 'Others'.

4.6 INFLUENCE OF DEMOGRAPHIC VARIABLES ON THE LEVEL OF SATISFACTION

The demographic variables considered are Age, Occupation, Monthly Income and Number of Earning Members. In order to analyse the influence of the demographic variables on the level of satisfaction, it is hypothesized that the demographic variables have no significant influence on the level of satisfaction. The hypothesis is divided into four based on the demographic variables.

4.6.1 Influence of age on the level of satisfaction

$H_0$2: There is no significant influence of age on the level of satisfaction with respect to the various broadband features.

The following table represents the Chi-Square Value, p value and result of the Chi-Square test.

4.6.1.1 Influence of age on the level of satisfaction

Broadband Features	Chi-Square value	p value	Result
Broadband Charges	26.355	0.154	H_0 Accepted
Complaint Redressal	20.562	0.423	H_0 Accepted
Discount Schemes	36.475	0.014	H_0 Rejected
Facility for Usage Checking	27.749	0.115	H_0 Accepted
Free Email ID	33.656	0.029	H_0 Rejected
Games on Demand	24.954	0.203	H_0 Accepted
Speed of the Broadband Connection	20.578	0.422	H_0 Accepted
Video Conferencing	23.622	0.259	H_0 Accepted
VOIP (Voice Over Internet Protocol)	24.101	0.238	H_0 Accepted
Web Camera / IP Camera	21.774	0.353	H_0 Accepted
Transparent Billing	22.303	0.324	H_0 Accepted
Variety of Plan options	35.025	0.020	H_0 Rejected

The above table indicates that there is a significant influence of age on the level of satisfaction of broadband features such as Discount Schemes, Free Email ID and Variety of Plan options.

In all the other cases the hypothesis is accepted indicating that there is no significant influence of age on the level of satisfaction of the identified broadband features.

4.6.2 Influence of occupation on the level of satisfaction

$H_0 3$: There is no significant influence of occupation on the level of satisfaction with respect to the various broadband features.

The following table represents the Chi-Square Value, p value and result of the Chi-Square test.

4.6.2.1 Influence of occupation on the level of satisfaction

Broadband Features	Chi-Square value	p value	Result
Broadband Charges	11.606	0.771	H_0 Accepted
Complaint Redressal	13.849	0.610	H_0 Accepted
Discount Schemes	32.140	0.010	H_0 Rejected
Facility for Usage Checking	41.033	0.001	H_0 Rejected
Free Email ID	29.464	0.021	H_0 Rejected
Games on Demand	25.374	0.063	H_0 Accepted
Speed of the Broadband Connection	21.655	0.155	H_0 Accepted
Video Conferencing	13.847	0.610	H_0 Accepted
VOIP (Voice Over Internet Protocol)	15.771	0.469	H_0 Accepted
Web Camera / IP Camera	13.133	0.663	H_0 Accepted
Transparent Billing	17.398	0.360	H_0 Accepted
Variety of Plan options	18.852	0.276	H_0 Accepted

The above table indicates that there is a significant influence of occupation on the level of satisfaction of broadband features such as Discount Schemes, Facility for Usage Checking and Free Email ID.

In all the other cases the hypothesis is accepted indicating that there is no significant influence of occupation on the level of satisfaction of the identified broadband features.

4.6.3 Influence of family monthly income on the level of satisfaction

H_o4: There is no significant influence of family monthly income on the level of satisfaction with respect to the various broadband features.

The following table represents the Chi-Square Value, p value and result of the Chi-Square test.

4.6.3.1 Influence of family monthly income on the level of satisfaction

Broadband Features	Chi-Square value	p value	Result
Broadband Charges	16.273	0.700	H_o Accepted
Complaint Redressal	16.588	0.680	H_o Accepted
Discount Schemes	30.481	0.062	H_o Accepted
Facility for Usage Checking	13.739	0.843	H_o Accepted
Free Email ID	20.545	0.424	H_o Accepted
Games on Demand	21.769	0.353	H_o Accepted
Speed of the Broadband Connection	21.809	0.351	H_o Accepted
Video Conferencing	22.955	0.291	H_o Accepted
VOIP (Voice Over Internet Protocol)	27.952	0.111	H_o Accepted
Web Camera / IP Camera	15.167	0.767	H_o Accepted
Transparent Billing	23.895	0.247	H_o Accepted
Variety of Plan options	29.185	0.084	H_o Accepted

The above table indicates that there is no significant influence of family monthly income on the level of satisfaction of any of the broadband features.

4.6.4 Influence of number of earning members on the level of satisfaction

H_o5: There is no significant influence of number of earning members on the level of satisfaction with respect to the various broadband features.

The following table 4.6.4.1 represents the Chi-Square Value, p value and result of the Chi-Square test.

4.6.4.1 Influence of number of earning members on the level of satisfaction

Broadband Features	Chi-Square value	p value	Result
Broadband Charges	8.610	0.929	H_0 Accepted
Complaint Redressal	17.986	0.325	H_0 Accepted
Discount Schemes	12.464	0.712	H_0 Accepted
Facility for Usage Checking	20.913	0.182	H_0 Accepted
Free Email ID	23.932	0.091	H_0 Accepted
Games on Demand	26.063	0.053	H_0 Accepted
Speed of the Broadband Connection	21.088	0.175	H_0 Accepted
Video Conferencing	19.608	0.238	H_0 Accepted
VOIP (Voice Over Internet Protocol)	32.443	0.009	H_0 Rejected
Web Camera / IP Camera	21.016	0.178	H_0 Accepted
Transparent Billing	7.264	0.968	H_0 Accepted
Variety of Plan options	8.505	0.932	H_0 Accepted

The above table indicates that there is a significant influence of number of earning members on the level of satisfaction of VOIP (Voice Over Internet Protocol).

In all the other cases the hypothesis is accepted indicating that there is no significant influence of number of earning members on the level of satisfaction of the identified broadband features.

CHAPTER 5

CONCLUSIONS

CHAPTER 5

CONCLUSIONS

5.1 FINDINGS

5.1.1 Demographic profile

- It is observed that most (23.7%) of the respondents are in the age group 41-50 years.
- Most of the respondents (40.6%) belong to 'other' category which includes retired employees, students and housewives.
- The family monthly income of most (26.5%) of the respondents lies between Rs.10001-20000 and few (10.8%) respondents were not willing to disclose their family monthly income.
- Number of earning members in most (48.2%) of the families is one.

5.1.2 Subscription process, type of service availed and usage pattern

5.1.2.1 Subscription process

- Most (49.4%) of the respondents have opted for Home 250 Plan.
- Majority (72.3%) of the respondents have not changed their broadband plan.
- Most (33.3%) of the plan conversions are from Home 250 to Home Unlimited 750 and the reasons for plan change are the need for unlimited usage, free downloads and cost factors.
- Most (36.5%) of the respondents approached Customer Service Centre.
- Majority (87.6%) of the respondents filed the broadband application in person.
- Most (41.8%) of respondents have waited from 8 to 31 days for getting the broadband connection.

5.1.2.2 Type of service availed

- Majority (81.5%) of the respondents are using wired modem.
- Majority (86.7%) of the respondents purchased modem from BSNL.

5.1.2.3 Usage pattern

- Most (29.7%) of the respondents are using BSNL Broadband for the period 1.1 to 2 years.
- Most (33.7%) of the respondents are using BSNL Broadband for 1.1 to 2 hours per day on average.
- Majority (81.5%) of the responses indicate 'self' category as users of the broadband.
- Most (32.1%) of respondents indicated the age group 21-25 years as the frequent user age group of their family.
- When considering the purpose of usage of broadband by the respondents Email ranks the first followed by Downloading Files and Searching Information through web.
- Majority (94.8%) of the respondents have not tried the free usage before purchasing the broadband connection.
- Very few (16.5%) of the respondents have availed the discount for government and PSU employees.
- Majority (54.6%) of the respondents preferred the method of attending the complaints in person. Very few (7.6%) respondents have mentioned that the method of complaint redressal preferred depends on the nature of the complaint.
- Maximum respondents have not faced any complaints in broadband. Maximum occurrence of complaints is less frequent. Maximum complaint is with ADSL Link problem, delay in attending complaints and slow browsing speed.
- The respondents are not satisfied in redressal of the complaints such as the slow browsing speed, delay in attending complaints, dialer not connected 678 error and billing complaints.
- Majority (55.4%) of the respondents are satisfied with all the treatment before installation but very few (10.8%) are not much satisfied with treatment on clearing complaints.

- Majority (90.4%) of the respondents recommend others to use BSNL Broadband Service.

5.1.3 Awareness

- The respondents have rated advertisement as the first source to know about BSNL Broadband
- Most (92%) of the respondents have noticed advertisements in Newspaper followed by Telephone Bills, Television, Internet, and Journals and Magazines
- Majority (71.9%) of the respondents are not aware of Free Insurance Scheme followed by Launching IPTV in near future, Games on Demand, Video Conferencing, VOIP (Voice Over Internet Protocol) , Web Camera / IP Camera and Discount Schemes. Majority (50.2%) of the respondents are aware of Unlimited Broadband Plan options.
- Majority (56.6%) of the respondents wished to opt for IPTV through BSNL Broadband. Very few (1.6%) respondents mentioned that clarity verification and cost consideration are to be examined before making the decision.
- Majority (51.8%) of the respondents will opt for BSNL Broadband through Landline if different types of broadband options are available. Very few (5.6%) respondents have mentioned that the decision on the type of broadband option will be made on the basis of cost comparison.
- Majority (69.1%) of the respondents do not require any additional features. The respondents who required additional features require features such as enhancement in speed, online broadband plan changing option, online complaint redressal system, extension of the night time unlimited usage for broad plan Home 500, Home 500 combo and Home 500 combo plus plans, IPTV with all channels and trial usage, introduction of student package in broadband, provision of identity card to each telephone owners, easy access to check usage, monthly billing pattern instead of bimonthly, reduction in BSNL broadband usage charges for home users, clarity in video conferencing, special offers for limited time, additional features in par with the competitors and new technology, introduction of new unlimited plans with enhanced speed, improvement in modem performance at low voltage times, facility from BSNL to hear songs through internet, immediate provision of new connection like

other operators, immediate updation of usage and provision for checking usage during last few days of the month, availability of broadband in interior areas, availability of all BSNL services online, reduced billing charges, Wi-Max facility, additional mail id space, BSNL 3G wireless broadband, unlimited night time usage for H250 plan, supply of basic VOIP end user modem, wireless broadband, automatic speed display and usage details, wireless supporting of modem over long distance for loyal customers of more than 5 years, wired modem can be replaced by wireless modem, 20% discount scheme can be extended to self employed professionals and increased unlimited home plan speed from 256kpbs to 512kpbs.

5.1.4 Perception regarding BSNL broadband service

- The Speed of the Broadband Connection is considered as most important feature followed by Complaint Redressal and Broadband Charges. Games on Demand, VOIP (Voice Over Internet Protocol) and Video Conferencing are not considered as important.
- The respondents are satisfied with Transparent Billing among all the features of broadband followed by Broadband Charges and Variety of Plan options.
- There is a significant difference between the level of importance and the level of satisfaction with respect to the broadband features such as Broadband Charges, Complaint Redressal, Discount Schemes, Facility for Usage Checking, Games on Demand, Speed of the Broadband Connection, Video Conferencing, Web Camera / IP Camera, Transparent Billing and Variety of Plan options. There is no significant difference between the level of importance and the level of satisfaction with respect all other features.

5.1.5 Switching behaviour of BSNL broadband service users

- The respondents who have considered other Broadband Services before BSNL have rated Bharati Airtel as first followed by Hathway Cable.
- Majority (90.8%) of the respondents have not owned any other Broadband Services in addition to BSNL Broadband Service.
- Majority (83.5%) of the respondents have not used any other Broadband

Service before BSNL.

- Most (41.5%) of the respondents used Bharti Airtel before BSNL followed by Reliance communications.
- The respondents have rated other reasons such as poor service as first followed by Lack of Connectivity and Billing complaints as the reason for switching over from other Service Provider to BSNL.
- Majority (93.2%) of the respondents are not willing to switch over from BSNL to any other Service Provider.
- Most (47.1%) of the respondents out of 17 respondents wish to switch over from BSNL to Bharti Airtel followed by Reliance communications.
- The respondents have rated Delay in attending complaints as the first reason to switch over from BSNL followed by Lack of connectivity and Slow browsing speed.

5.1.6 Influence of demographic variables on the level of satisfaction

- There is a significant influence of Age on the level of satisfaction of Broadband Features such as Discount Schemes, Free Email ID and Variety of Plan options.
- There is a significant influence of Occupation on the level of satisfaction of Broadband Features such as Discount Schemes, Free Email ID and Facility for Usage Checking.
- There is a significant influence of Number of Earning Members on the level of satisfaction of VOIP (Voice Over Internet Protocol).
- In all other cases there is no influence of the demographic variables on the level of satisfaction of the identified Broadband Features.

5.2 SUGGESTIONS AND RECOMMENDATIONS

The findings regarding the demographic profile shows that the marketing strategy is to be formulated by BSNL to attract the people of age group 41-50 years, special discounts or offers can be given to retired employees and students and more economical broadband plans can be introduced as the family monthly income of most of the respondents lies between Rs.10001-20000 and the number of earning members in majority of the families is one to attract users towards BSNL broadband.

The findings regarding the subscription process indicates that Home 250 Plan can be made more attractive by increasing the download limit or reducing the cost as most of the respondents have opted for this plan. The free download limit in Home 500 Plans can be extended to attract more users. The Customer Service Centres are to be made more active to attract new users and also new Customer Service Centres can be opened wherever users are expected to increase. The waiting time for getting the Broadband connection can be reduced by proactive measures by finding the reason for such delay.

The findings regarding the type of service availed shows that the quality of the modem is to be maintained and it can be given at more economical price to attract other broadband service users.

The findings regarding the usage pattern indicates that as limited use of broadband is required by most of the respondents, the broadband plans can be modified to fit their needs. It also shows that the advertisements can be made more attractive for children, attractive features can be introduced to satisfy the age group 21-25 years as they are the frequent users of broadband , free email facility given by BSNL can be improved, advertisements on trial usage and discount schemes can be published, broadband compliant redressal team can be formed to attend the complaints in person and the team can be trained to take care of ADSL Link problem and delay in attending complaints and also the bandwidth can be increased to improve the browsing speed.

The findings regarding the awareness shows that the Broadband advertisements can be attractively given in Newspaper, Telephone Bills, Television, Internet, and Journals and Magazines and also the information on Free Insurance Scheme, Launching IPTV in near future, Games on Demand, Video Conferencing, VOIP (Voice Over Internet Protocol), Web Camera / IP Camera and Discount Schemes can be made easily available in easily approachable place, the Customer Service Centre. It also indicates that IPTV with trial usage can be introduced and as majority of the respondents do not require any additional features the existing features are to be maintained properly to make them stay with BSNL. The additional features as reported in the findings can be considered based on the performance of cost benefit analysis.

In order to reduce the level of importance Vs level of satisfaction gap the formation of broadband compliant redressal team, bandwidth improvement, introduction of economical plans and creation of awareness of the various broadband features can be used.

The findings regarding the switching behaviour of BSNL broadband service users shows that the users from other services can be given preferences to make them stay with BSNL and to attract customers of other service providers. It indicates that the service improvement and proper billing can attract more users as no standby arrangement for most of the users. It also highlights the importance of creation of awareness to check usage among users, avoidance of delay in attending complaints, lack of connectivity and slow browsing speed to prevent users from switching over to other Service Providers.

The findings regarding the influence of demographic variables on the level of satisfaction with respect to various broadband features indicates that as there is a significant influence of 'age and occupation on the level of satisfaction of broadband features such as discount schemes and free email ID', 'Occupation on the level of satisfaction of Facility for Usage Checking' and 'age on the level of satisfaction of variety of Plan options', these features can be planned accordingly to attract users of frequent user age group and occupation.

5.3 CONCLUSIONS

The two major factors responsible for the growth of telecommunications industry are the use of modern technology and market competition. The dominant technology is all about high-speed data delivery and oversized capacity of the transport media. Data products and services dominate what most telecommunications companies offer their users because that is what they demand.

Today's requirement is to transmit voice, data and video signals in the same pipeline for which broadband plays an important role because of its transmission speed of 256kbps and more. There are various competitors for providing broadband out of which BSNL ranks the first as per TRAI rating. Even then there are several problems faced by the users. If that is taken care of then the position of BSNL in broadband provision can be maintained as the leader in the broadband service provision.

The perception of the users with respect to various features indicates that the users are satisfied with most of the features except the complaint redressal which is to be taken care of. It is also noted that the dissatisfaction results from the slow browsing speed which is to be very well taken care of. If the above mentioned weaknesses are overcome then there will not be any difficulty in maintaining the existing users and attracting the new users.

The additional features like IPTV are to be introduced at an economical price to benefit and attract the users. On the whole it is understood that the customers are satisfied with BSNL but faces little difficulty. It is important to solve the problems at the earlier stage so that BSNL can stay as the leader in broadband service provision in the competitive market.

5.4 DIRECTIONS FOR FUTURE RESEARCH

- As IPTV is going to be launched by BSNL in near future, research on IPTV can be conducted.
- After the introduction of the Mobile 3G Wireless Broadband and Wi-Max Wireless Broadband, research on comparative study with Broadband through landline can be conducted. This research can be conducted within the same service provider or between different service providers.
- Comparative study on BSNL Broadband with the competitors can be conducted.

APPENDIX

APPENDIX 1

QUESTIONNAIRE

APPENDIX 1

QUESTIONNAIRE

1. **Name** :

2. **Address** :

Phone No : **Mobile No** :

Email :

3. **Age**

a)Below 20 years ☐ b) 21 to 30 years ☐ c) 31 to 40 years ☐

d) 41 to 50 years ☐ e) 51 to 60 years ☐ f) Above 60 years ☐

4. **Nature of Occupation**

a) Business ☐ b) Government (State/Central) ☐ c) PSU ☐

d) Private ☐ e) Others (Please specify) ☐ ____________________

5. **Monthly Income of your family**

a) Below Rs.10,000 ☐ b) Rs.10,001 to Rs.20,000 ☐

c) Rs.20,001 to Rs.30,000 ☐ d) Rs.30,001 to Rs.40,000 ☐

e) Rs.40,001 to Rs.50,000 ☐ f) Above Rs.50,000 ☐

6. **Number of earning members in your family**

a) 1 ☐ b) 2 ☐ c) 3 ☐ d) 4 ☐ e) above 5 ☐

7. Specify the duration for which you have been using BSNL Broadband connection.

a) Less than 1 year ☐ b) 1.1 to 2 years ☐ c) 2.1 to 3 years ☐

d) 3.1 to 4 years ☐ e) 4.1 to 5 years ☐ f) Above 5 years ☐

8. Specify the type of the Modem used for BSNL Broadband connection.

a) Wired Modem ☐ b) Wireless Modem ☐

9. Mention the Mode of purchase of the Modem.

a) Modem purchased from BSNL ☐

b) Modem for monthly rent from BSNL ☐

c) Self owned Modem purchased from outside ☐

10. Which BSNL Broadband Plan you currently opted for?

a) Home 125 ☐

b) Home 250 ☐

c) Home 500 ☐

d) Home 1000 ☐

e) Home 1800 ☐

f) Home 3300 ☐

g) Home 199 combo ☐

h) Home 299 combo ☐

i) Home 500 combo ☐

j) Home 500 combo plus ☐

k) Home flexi 350 ☐

l) Home Unlimited 750 ☐

m) Home Unlimited 750 plus ☐

n) Home Unlimited 1350 ☐

o) Home Unlimited 1350 plus ☐

p) BSNL Broadband Temporary Connection ☐

11. Have you ever changed your BSNL Broadband plan?

a) Yes ☐ b) No ☐

12. If 'Yes", from which plan to which plan and why?

From ______________________ to ______________________

Reason ____

13. How many hours on an average do you use Broadband a day?

a) Less than 1 hour ☐ b) 1.1 to 2 hours ☐ c) 2.1 to 3 hours ☐

d) 3.1 to 4 hours ☐ e) 4.1 to 5 hours ☐ f) Above 5 hours ☐

14. Rank from 1 to 4, the sources you came to know about BSNL Broadband.

(1 -> Most Important, 2-> Next Important and so on.)

Sources	Rank
a. Through Advertisements	
b. Through BSNL Employees	
c. Through Friends and Relatives	
d. Others (Please specify)__________	

15. Have you noticed Advertisements of BSNL Broadband Connection in the following media?

Medium of Advertisement	Yes	No
1. Hoardings		
2. Internet		
3. IVRS (Interactive Voice Response System)		
4. Journals and Magazines		
5. Newspaper		
6. Pamphlets		
7. Radio		
8. Short Book on BSNL Services		
9. Signboards		
10. SMS		
11. Telephone Bills		
12. Television		
13. Others (Please specify)__________		

16. Rank the other Broadband Services you considered before choosing the BSNL Broadband Service.

(1 -> Most Preferred, 2-> Next Preferred and so on.)

Sources	**Rank**
a. Bharti Airtel	
b. Hathway Cable	
c. Reliance Communications	
d. Sri R P Telecom	
e. Tata Communications	
f. Others (Please specify)________________	

17. What are the other Broadband Services you own in addition to BSNL? (check whichever appropriate)

a) Bharti Airtel ☐ b) Hathway Cable ☐

c) Reliance Communications ☐ d) Sri R P Telecom ☐

e) Tata Communications ☐ f) Others (Please specify) ☐ ________________

g) Not Applicable ☐

18. Have you used any other Service Providers' Broadband Connection before getting BSNL Broadband Connection?

a) Yes ☐ b) No ☐

19. If 'Yes', mention the Service Provider.

a) Bharti Airtel ☐ b) Hathway Cable ☐

c) Reliance Communications ☐ d) Sri R P Telecom ☐

e) Tata Communications ☐ f) Others (Please specify) ☐ ________________

g) Not Applicable ☐

20. Rank the reason for changing from the above mentioned Service Provider to BSNL.

(1 -> Most Important, 2-> Next Important and so on.)

Reason	Rank
a. Billing Complaints	
b. Delay in attending complaints	
c. Heavy Charges	
d. Lack of Connectivity	
e. Slow Browsing Speed	
f. Others (Please specify) ____________	

21. Where did you first approach for getting BSNL Broadband Connection?

a) Commercial Office ☐ b) Customer Service Centre ☐

c) Nearest Telephone Exchange ☐ d) Others (Please specify) ☐____________

22. How did you file your BSNL Broadband Application?

a) In person ☐ b) Online ☐

c) Through BSNL employees ☐ d) Through post ☐

23. How long have you waited for getting the BSNL Broadband connection since applied?

a) Less than 3 days ☐ b) 3 to 7 days ☐ c) 8 to 31 days ☐ d) Above 31 days ☐

24. Who is using BSNL Broadband connection in your house? (check whichever appropriate)

a) Children ☐ b) Friends and Relatives ☐ c) Parents ☐

d) Self ☐ e) Spouse ☐ f) Others (Please specify) ☐ ________

25. Which age group in your family do you think uses BSNL Broadband more frequently?

a) Below 20 years ☐ b) 21 to 25 years ☐ c) 26 to 30 years ☐ d) 31 to 35 years ☐

e) 36 to 40 years ☐ e) 41 to 45 years ☐ e) 46 to 50 years ☐ f) Above 50 years ☐

26. Rank the purpose for which you are using the BSNL Broadband Service.

(1 -> Most Important, 2-> Next Important and so on.)

Purpose	Rank
a. Downloading Files	
b. Email	
c. Entertainment (Online Movies, Online Games etc)	
d. Net Chatting	
e. Online Banking	
f. Online Purchases	
g. Online Ticket Booking	
h. Online Trading	
i. Searching Information through web	
j. Video Conferencing	
k. Viewing Web Camera / IP Camera	
l. Voice Chatting	
m. VOIP (Voice over Internet Protocol)	
n. Others (Please specify) ______________	

27. Have you tried the free usage before purchasing the BSNL Broadband Service?

a) Yes ☐ b) No ☐

28. If you are a Government (State/Central) or PSU employee, have you availed 20% discount on Broadband Service charges (usage and rental) for Government employees?

a) Yes ☐ b) No ☐ c) Not applicable ☐

29. Record your level of awareness for the following features of BSNL.

Features	Level of Awareness		
	Very Much Aware	Aware	Not Aware
1. Discount Schemes			
2. Facility for checking usage in Broadband			
3. Flexible Broadband Plan option			
4. Free Email ID for Internet connection			
5. Free Insurance Scheme			
6. Games on Demand			
7. Launching IPTV in near future			
8. Online facilities for bill payment			
9. Supporting features			
a. Video Conferencing			
b. VOIP (Voice Over Internet Protocol)			
c. Web Camera / IP Camera			
10. Unlimited Broadband Plan options			

30. Mention the level of importance and level of satisfaction attached to the following aspects of BSNL Broadband Connection (Check whichever appropriate).

(**VMI**-Very Much Important **I** –Important **N**-Neutral **UI**-UnImportant **VMU**-Very Much Unimportant

VMS-Very Much Satisfied **S** –Satisfied **N**-Neutral **DS**-Dissatisfied **VMD**-Very Much Dissatisfied)

Level of Importance					Feature	Level of Satisfaction				
VMI	I	N	UI	VMU		VMS	S	N	DS	VMD
					1. Broadband Charges					
					2. Complaint Redressal					
					3. Discount Schemes					
					4. Facility for Usage Checking					
					5. Free Email ID					
					6. Games on Demand					
					7. Speed of the Broadband Connection					
					8. Supporting features a. Video Conferencing					
					b. VOIP (Voice Over Internet Protocol)					
					c. Web Camera / IP Camera					
					9. Transparent Billing					
					10. Variety of Plan options					

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40. http://www.bsnl.co.in/service/dataone_tariff.htm
41. http://www.business-standard.com/india/news/bsnl-to-put-rs-1600-cr-in-broadband-nfrastructure/00/39/345079/
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57. http://www.michigan.gov/documents/hal_lm_1_Introduction_to_Broadband_77993_7.pdf
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59. http://www.savethechildren.org/corporate/partners/tns-nfo.html
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70. http://www.wellesley.edu/Psychology/Psych205/pairttest.html - Paired samples T test
71. http://www.westburnpublishers.com/marketing-dictionary/p/proportionate-stratified-(random)-sampling.aspx
72. www.tcil-india.com/new/new_site/white%20paper/TCIL%2010%20WiFi%20Technology.ppt

31. Which method of complaint redressal do you prefer?

a) Attending the complaint by BSNL staff at home in person ☐

b) Guidance through phone ☐

32. Record the frequency of the following nature of complaints faced by you and the level of satisfaction in clearing those complaints while using BSNL Broadband connection so far? (check whichever appropriate)

(**VF** - Very Frequently F –Frequently **LF**-Less Frequently **NA**-Not at all

VMS-Very Much Satisfied **S** –Satisfied **N**-Neutral **DS**-Dissatisfied **VMD**-Very Much Dissatisfied)

Frequency of Complaints				Nature of Complaint	Level of Satisfaction in clearing Complaints				
VF	F	LF	NA		VMS	S	N	DS	VMD
				1. ADSL link problem					
				2. Billing Complaints					
				3. BSNL Email ID problem					
				4. Delay in attending Complaints					
				5. Dialler not connected (678 error)					
				6. Modem Configuration problem					
				7. Problem while downloading data					
				8. Slow Browsing Speed					
				9. Userid/Password problem					
				10. Web Page not opening					
				11. Other problems (Please specify)					

33. BSNL is offering Interactive Personalized Television and Video Services (IPTV) for BSNL customers by using the existing Broadband Connection. You will be able to watch programmes via your home television according to your convenience from more than 140 channels. The new offering has services like movie library, `Video on Demand', "Education on Demand", "Games on Demand" and "Parental Controls" over the programmes.

Would you like to opt for IPTV through Broadband?

a) Yes ☐ b) No ☐

34. Which one will you choose, if you have an option to choose among the following types of Broadband?

a) BSNL Broadband through Landline ☐

b) BSNL Mobile (3G) Wireless Broadband ☐

c) BSNL WiMax Wireless Broadband ☐

d) Mobile (3G) Wireless Broadband from other operators ☐

e) WiMax Wireless Broadband from other operators ☐

35. How were you treated during the following instance of getting and using BSNL Broadband connection? (check whichever appropriate)

(**VMS**-Very Much Satisfied **S** –Satisfied **N**-Neutral **DS**-Dissatisfied **VMD**-Very Much Dissatisfied)

Instances	Level of Satisfaction				
	VMS	S	N	DS	VMD
1. Enquiry on BSNL Broadband Service					
2. Getting and launching Broadband Application					
3. Installation of Broadband at home					
4. Launching and clearance of Complaints					

36. Would you recommend others to use BSNL Broadband Service?

a) Yes ☐ b) No ☐

37. Would you like to switch over to Other Service Provider?

a) Yes ☐ b) No ☐

38. If 'Yes', mention the Service Provider you wish to switch over.

a) Bharti Airtel ☐ b) Hathway Cable ☐

c) Reliance Communications ☐ d) Sri R P Telecom ☐

e) Tata Communications ☐ f) Others (Please specify) ☐ ________________

g) Not Applicable ☐

39. Rank the reason for moving from BSNL to the above mentioned Service Provider.

(1 -> Most Important, 2-> Next Important and so on.)

Reason	Rank
a. Billing Complaints	
b. BSNL Email ID problem	
c. Delay in attending complaints	
d. Heavy Charges	
e. Lack of Connectivity	
f. Slow Browsing Speed	
g. Others (Please specify) ________	

40. Do you require any additional feature in BSNL Broadband?

a) Yes ☐ b) No ☐

41. If yes, specify details

____

Date :

Signature

APPENDIX 2

LIST OF BROADBAND USERS

APPENDIX 2

LIST OF BROADBAND USERS

A 2.1 Broadband users in Coimbatore as on 29-01-2009

Sl. No	Exchange	Home Users	Business Users	Total Users	Proportionate Sample Size for Total Sample Size of 250	Proportionate Sample Size Rounded off for Total Sample Size of 250
1	ANAIKATTI	13	4	17	0.159071998	0
2	ALANDURAI	35	10	45	0.428270765	0
3	ARASUR	46	54	100	0.562870148	1
4	BHARATHI COLONY	599	90	689	7.329548236	7
5	BHARATHIYAR UNIVERSITY	1202	44	1246	14.7080417	15
6	CHINNATHADAGAM	41	4	45	0.50168861	1
7	COIMBATORE CENTRAL	428	278	706	5.237139641	5
8	CHINNIYAMPALAYAM	152	42	194	1.859918751	2
9	CHINTHAMANIPUDUR	53	17	70	0.648524301	1
10	CHETTIPALAYAM	25	20	45	0.305907689	0
11	ALANDURAI DLC	5	1	6	0.061181538	0
12	DID EPABX	68	3	71	0.832068915	1
13	SAIBABA COLONY DLC	23	3	26	0.281435074	0
14	SULUR DLC	136	10	146	1.66413783	2
15	COIMBATORE E10B MAIN	39	20	59	0.477215995	0
16	ETTIMADAI	23	11	34	0.281435074	0
17	GANAPATHY	771	124	895	9.434193138	9
18	GANDHIMANAGAR	672	75	747	8.222798688	8
19	GANDHI PARK	563	84	647	6.889041163	7
20	KUMUTTIPATHY	2	2	4	0.024472615	0
21	KUNIAMUTHUR	359	48	407	4.392834418	4
22	KOVAIPUDUR	661	45	706	8.088199305	8
23	KURICHI	540	110	650	6.607606089	7

Table A 2.1 (continued)

24	KARUNYANAGAR	20	13	33	0.244726151	0
25	MADUKKARAI	147	32	179	1.798737213	2
26	MALUMICHAMPATTI	104	39	143	1.272575987	1
27	NARASIMA NAICKAN PALAYAM	255	69	324	3.120258431	3
28	NAVAKKARAI	31	33	64	0.379325535	0
29	DLC OTHAKKALMANDAPAM	0	6	6	0	0
30	ONDIPUDUR	370	43	413	4.527433802	5
31	PAPPAMPATTI	12	7	19	0.146835691	0
32	PERIYANAICKANPALAYAM	546	90	636	6.681023934	7
33	PODANUR	460	38	498	5.628701483	6
34	PEELAMEDU	1861	202	2063	22.77176839	23
35	P N PALAYAM	290	99	389	3.548529196	4
36	RACE COURSE	332	77	409	4.062454114	4
37	RAM NAGAR	456	171	627	5.579756253	6
38	RAMANATHAPURAM	1557	133	1690	19.05193089	19
39	R S PURAM	529	148	677	6.473006705	6
40	RAJA STREET - COIMBATORE	94	38	132	1.150212912	1
41	SAIBABA COLONY	2129	232	2361	26.05109882	26
42	SARKARSAMBAKULAM	76	30	106	0.929959375	1
43	SELVAPURAM	470	39	509	5.751064559	6
44	SANGANUR	289	78	367	3.536292888	4
46	SULUR	251	84	335	3.071313201	3
47	SARAVANAMPATTI	434	78	512	5.310557486	5
48	TATABAD I	518	98	616	6.338407322	6
49	THUDIYALUR	1145	131	1276	14.01057217	14
50	THODAMUTHUR	54	10	64	0.660760609	1
51	TATABAD II	447	59	506	5.469629485	5
52	TVS NAGAR	980	75	1055	11.99158142	12
53	UKKADAM	94	11	105	1.150212912	1
54	VELLINGIRI - ISHA YOGA CENTRE	19	3	22	0.232489844	0
55	VAZHUKKUPARAI	5	1	6	0.061181538	0
TOTAL		**20431**	**3266**	**23697**	**250**	**249**

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