

A study On Customer Acceptance of 4G - WiMAX Service Of Bsnl in Ernakulam Business Area, Kerala.

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Abstract: Communication is necessitated as a need for the present era. It makes the common life more meaningful and faster. Apart from voice communication, data communication is more to be addressed now a days. An ideal data communication service assures high data transfer rate, uninterrupted connectivity, affordable tariff and good service support. In this study “ A study on Customer acceptance of 4G - WiMAX service (WiMAX-Worldwide Interoperability for Microwave Access) of BSNL in Ernakulam business area, Kerala, India.”, the researcher analyses the Customer acceptance of latest 4G based WiMAX data service of BSNL -a renowned telecom service provider of allover India. Data are collected from 152 respondents in Ernakulam District, Kerala. and their acceptance is analyzed using statistical tools like percentage analysis, Chi-square test, T-test and F-test with respect to various Technical factors of WiMAX service and Personal factors of customers.

Keywords: WiMAX, Customer Acceptance, 4G, Bsnl

INTRODUCTION

Bharath Sanchar Nigam Limited (BSNL) is India's leading Telecommunication Company formerly known as Department of Telecommunications, changed to company status in October 2000. Presently BSNL is 7th largest telecom company in the world. This company provides a wide range of telecom services and products like Basic Land Line, GSM Mobile, Broadband, CDMA mobile, IN Services, MPLS, VPN, VSAT, VoIP Services etc. BSNL provides Quality communication network even to remote rural villages all over India, and now focusing on advanced data networks through new voice and data services using 3G, 4G, and LTE technologies. Presently BSNL has 45 million Basic Phones, 4 million CDMA connections, 25 Million mobile connections. Apart from other service providers BSNL uniquely deployed all service to nearly 5.5 lack villages with most transparent billing and tariff plans. Nearly 2.5 million internet customers are using BSNL services. With a need of stable and fast data transfer mechanism, BSNL launched 4G supporting WiMAX broadband service, both in fixed and mobile dimensions. As a recent mile stone BSNL has set up a world class multi gigabit, multi-protocol convergent IP infrastructure that provides convergent service like voice, data and video through the same backbone and broad band access network.

WiMAX SERVICES : WiMAX is a stable broadband technology implemented by BSNL first time all over India using 4G technology - a new born communication data solution, both voice and data communication are integrated in this 4g technology. WiMAX uses 4G technology and it provides fixed as well as mobile high speed internet facility.

BSNL ensures superior data transfer performance through WiMAX systems. BSNL uses world's latest wireless technology for this service. Due to mobile access emergency hospital services also benefited by using WiMAX services like telemedicine, fire prevention etc. In connection with European research project WEIRD (WiMAX Extension for remote and Isolated Research Data Network) uses WiMAX service for their research applications for emergency services.

LITERATURE REVIEW

European based WEIRD uses WiMAX service for research design (An empirical evaluation by Pedro Neves NGMST 2007 IEEE). User acceptance by examining potential relationship between factors(User acceptance of long-term evolution LTE services by Eunil Park and Ki Joon kim 2012). Leading network service providers have adopted 4G ,LTE, WiMAX as future

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generation data technologies (Dahlman et al. 2001; TeliaSonera Sweden 2009, Vodafone in Germany 2010, SK Telecom in South Korea 2011. WiMAX is another area which BSNL Company plans to foray in this year (Annual report 2010: BSNL)

TECHNOLOGY ACCEPTANCE THEORIES

As explained by Esmat Abdulmajid Wahdain and Mohamad Nazir Ahmad Following are the most important used technology acceptance theories and models.

The Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975)

The Theory of Planned Behavior (TPB) (Ajzen, 1991)

The Diffusion of Innovations Theory (DOI) (Rogers, 1962)

The Unified Theory of Acceptance and Use of Technology (UTAUT) proposed by Venkatesh and others in 2003

The Technology Acceptance Model (TAM) (Davis, 1989) is one of most influential information systems' theories. It was theorized for the aim of modeling the information systems' acceptance by potential users, that is to predict IS/IT acceptance and diagnose any design problems before the systems are actually used.

Since Various theoretical models are available to analyze consumers' acceptance for new technologies. Considering major acceptance models, Technology Acceptance Model (TAM) is more suitable for this type of technology acceptance problems. The TAM focus on user's adoption of new technologies based on perceived usefulness (PU) and perceived ease of use (PEU).

The primary aim is to search suitable variables affect the performance of technology acceptance (Mehrabian & Russell, 1974) into the Technology Acceptance Model (Davis, 1989), the widely acceptance model used for accessing technology performance. This unified theoretical framework, called the Consumer Acceptance of Technology (CAT), is considered as more powerful in identifying consumer adoption of new technology. Songpol Kulviwat and Anand Kumar explains The adoption intention construct was not included in the study by Childers et al. (2001) and perceived usefulness was not explicitly examined by Dabholkar and Bagozzi's (2002). More recently, Bruner and Kumar (2005) incorporated a measure of fun along with all of the original TAM components.

SIGNIFICANCE OF STUDY

BSNL was a pioneer in telecommunication not only in Kerala but also all over India. Due some specific reasons now the company is lacking among its competitors. BSNL as telecom service provider, provides primarily voice and data services and corresponding value added services. Regarding voice communication both in land line and mobile sector still BSNL hold the majority of the market share. In case of Data communication in land line sector BSNL holds a major share and mobile sector it is lagging behind its competitors. Data communication in land line BSNL uses ADSL technology a best adoption for this type of services. Unfortunately all this ADSL network run on underground copper cables that has a highly prone to error/damage because of infrastructure development, quality of material used and somewhat poor maintenance. Due excessive fault in copper cables this technology facing steep decline even though it's a good option for landline data communication. Only at this juncture BSNL implemented a data communication technology working in wireless basis using a high data capacity based very advanced, 4G LTE. Now a days this 4G-LTE is very popular in mobile based data communications. From the researcher's observation the major technical or operating parameters influencing the acceptance of WiMAX services are:

1. Data transfer rate
2. Network Readiness (uninterrupted connectivity)
3. Tariff
4. Introduction of new plan
5. Coverage issues
6. Service support

Major Personal Parameters influencing the acceptance of WiMAX services are:

1. Gender
2. Age
3. Occupational status

Researcher analyzing to identify the customer acceptance this service with respect to various operating/technical parameters and personal parameters, as a substitute for the error prone wired ADSL technology.

OBJECTIVES OF THE STUDY

1. To grade the Customer acceptance of new WiMAX broad band service with respect to each Technical Parameters

2. To determine whether there is any significant difference between the level of acceptance of Technical variables in between steam lined urban area and hill side rural area

3. To study the significance of Personal Parameters in the Customer acceptance of new WiMAX broad band service

METHODOLOGY

This Study is based on both primary and secondary data. Primary data are collected from Wimax customers. For the purpose of study field surveys are conducted in SSA (secondary switching area) of Ernakulam in Kerala State in 2014, 152 BSNL customers are selected of which 86 from Ernakulam Division(urban area) and 66 from Perumbavoor Division(rural area) as both of the divisions are the most populated areas in Ernakulam District. Questionnaires were prepared with questions based on relevant technical factors like Data Transfer Rate, Network Readiness, Tariff, New plans, Coverage, Service Support, and Personal Factors like Gender, Age and Occupation status. A descriptive type of research design is adopted, with convenience sampling technique. Percentage analysis, T test, F test and Chi-square test are the statistical tools used for analysis of the collected data. The study was conducted in a short span of time. Time and costs are the factors limiting the study to a sample of 152 respondents.

ACCEPTANCE OF Wi MAX SERVICE WITH RESPECT TO VARIOUS TECHNICAL FACTORS

In order to grade the **WiMAX Service** acceptance, an analysis has been made with respect to various technical factors like Data Transfer Rate, Network Readiness, Tariff, New plans, Coverage, Service Support. Questions based on these areas are framed in five point scale ranging from score 5 for extreme positive (Strongly agree) and 1 for extreme negative (Strongly disagree) opinion. To measure the acceptance level of customers the questions are grouped and sum of the scores of each technical factors are calculated on the basis of which acceptance score in percentage is obtained.

Table 1

Technical Factors	No of statements	Maximum score	Avg Score obtained	% Score
Data transfer rate (SPEED)	4	20	15.09	83.38
Coverage issues	5	25	10.4	41.29
Tariff rate	7	35	19.4	53.71
New Plans	1	5	3.22	64.60
Network readiness	5	25	20.04	81.04
Service support	6	30	23.93	73.63
Total	28	140	91.33	62.88

Source: Survey Data

Table 1 shows average scores obtained for different technical factors that affect the acceptance of **WiMAX Service**. The maximum score obtained is 83.38% and minimum score is 41.29% for coverage issues. In the case of data transfer rate, network readiness and service support the score showing good level of acceptance. Primarily in the case of coverage issues the acceptance level is very less. Regarding the new plans introduction and tariff shows above average acceptance level.

Using percentage analysis the average acceptance of the service with respect to various technical factors is 68.88%, tariff rate, new plans and coverage issues are showing below average percentage levels and hence the hypothesis can be accepted.

6.2. ACCEPTANCE OF WiMAX SERVICE OF TWO POPULATED DIVISIONS ERNAKULAM (urban area) AND PERUMBAVOOR (rural area)

Hypothesis:H1: There is significant difference in level of acceptance of **WiMAX Service** in Two major Divisions Ernakulam(streamlined urban area) and Perumbavoor(rural hill side areas) regarding the technical factors.

Table 2

Opinion	Ernakulam	Perumbavoor	Total
Strongly accepted	31.27	23.15	59.48
Accepted	39.12	72.73	136.69
Moderately accepted	1.16	0.00	1.16
Not accepted	1.51	1.32	2.83
Strongly not accepted	0	0	0.00
Total	100	100	200
Calculated chi-square 7.44 Df= 3 with LOS 5% table value is 7.85			

Source: Survey Data

To test the hypothesis the division wise percentage acceptance score shown in Table 2, Ernakulam Division 31.27% of the consumers are strongly accepted and 63.95% is accepting **WiMAX Service**. In Perumbavoor Division 23.15% customers are strongly accepted and 72.73% are in accepted status. Since the calculated chi square value (7.44) is less than the table value (7.85) for 5% level of significance, this shows that there is no significant difference in level of acceptance of **WiMAX Service** in two major Divisions Ernakulam (urban) and Perumbavoor (rural) regarding the technical factors.

6.3 ACCEPTANCE OF WiMAX SERVICES WITH RESPECT TO PERSONAL FACTORS.

Acceptance of WiMAX Services may be affected by personal factors like Gender, Age and Occupation status of the consumers. Following tables show a comparative analysis of acceptance level with personal factors.

6.3.1 GENDER WISE ACCEPTANCE OF WiMAX Services

H2: There is significant difference between the level of acceptance of **WiMAX Services** Ernakulam with respect to personal factor Gender .

Table 3

Gender	Score	No of respondent	Mean	SD	T -value
Male	15289	114	131.72	14.13	.562
Female	4812	36	132.31	11.90	

Source: Survey Data

Table 3 shows Gender wise acceptance of **WiMAX Services**. As per the table the Mean acceptance score level of Males is 131.72with SD 14.13and Females is 132.31with SD of 11.90. As the calculated t value (.562) is less than the table value for 5% significant level. So the conclusion is that there is no significant difference in the man acceptance level of Female and Male consumers.

6.3.2 AGE WISE ACCEPTANCE OF WiMAX SERVICES

H3: There is significant difference between the level of acceptance of **WiMAX Services** in Ernakulam SSA with respect to personal factor Age.

Table 4

Age	Score	No of respondent	Mean	SD	F-value
Below 30	7590	55	131.21	11.16	14.9
30-40	11902	77	136.93	13.32	
Above 40	2439	18	133.19	16.56	

Source: Survey data

Table 4 shows Age wise acceptance of **WiMAX Services**. As per the table the Mean acceptance score level of consumers below 30 years of age, Mean is 131.21 with SD 11.16, between 30-40 age limit is 136.93 with SD 13.32; for those above 40 years of age the Mean is 133.19 with SD 16.56. As the calculated F value (14.9) is less than the table value (18.513) with degrees of freedom (2, 1) and level of significance 5%. So it is concluded that there is no significant difference on the acceptance level considering the Age of the consumers.

6.3.3 OCCUPATION WISE ACCEPTANCE OF **WiMAX SERVICES**

H4: There is significant difference between the level of acceptance of **WiMAX Services** in Ernakulam SSA with respect to personal factor occupation status

Table 5

Occupation	Score	No of respondent	Mean	SD	F value
Business	14320	106	133.5	13.07	2.333434
Professionals	3500	24	141.23	13.33	
Home users	1359	10	134.89	12.67	
Students	1468	10	149.18	11.74	

Table 5 shows occupation wise acceptance of **WiMAX services**. Using for business purpose the Mean is 133.5 with SD 13.07, for professionals Mean is 141.23 with SD of 13.33, for Home users the Mean is 134.89 with SD 12.67 and for Students Mean is 149.18 with SD of 11.74. As the calculated F value (2.3) is less than the table value (10.12) for 5% LOS and DOF(3,1). So the conclusion is that there is no significant difference on the acceptance level considering the Occupation status of customers.

7. FINDINGS

1. From the analysis data transfer speed and network readiness ensures a good level of acceptance .
2. Regarding the service platform customers are satisfied up to a limited extent.
3. Regarding present tariff plan and Service Support customers response is not satisfactory.
4. Even though coverage issues persist, data transfer rate and network readiness leads to the acceptance of this service.
5. With respect to analysis in two major populated towns Ernakulam and Perumbavoor , study not found any significant difference in acceptance of this service.

6. In the case of gender wise analysis , study explains there is no such gender variables controls the level of acceptance.
7. Regarding age based analysis no significant control in the level of acceptance is shown in the study
8. Occupational wise analysis also found no positive relationship of Customer acceptance to occupational status.
9. From the study majority of respondents using BSNL 4G WiMAX service for business applications, home users and student category are using less.

8. CONCLUSIONS

WiMAX as a high speed 4G data connectivity service has a unique existence only in BSNL, grabbing Customer and holding Customer with full filling all their demands is essential for the growth of the company. Customer satisfaction and acceptance of the product and services given by the company is also important. As earlier Customer are strongly supporting BSNL, expansion plans for making wide coverage of WiMAX service is essential for wider acceptance of value added services is very important.

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