3G Users Perception of Service Quality: Indian Perspective

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Abstract

The aim of the research was to study the gap between the perceptions & the expectations of the users of 3G (third generation) wireless networks and its impact on the Indian Telecom Market by using the SERVQUAL framework. Depending upon the culture of India, demography and the heterogeneity of the people, various factors such as perceived cost of services and perceived cost of mobile phones (PC & PM), perceived usefulness (PU), speed of 3G service (S), social influence (SI), privacy and security (PS), perceived health risks (PHR) and vis-à-vis with the expectations are analyzed which has an effect on the Indian consumers decision not just to adopt 3G technology but also to continue using the same. This study will help the Service Providers to improvise their strategies and to target the apt market segment & to understand the customers' expectations and perceptions to increase the data base of satisfied customers.

Keywords: Perceptions, Expectations, SERVQUAL Framework

Introduction

3G stands for the 'third generation' of mobile technology. With a '3G' enabled handset and access to the 3G network one can encapsulate the whole world in a device. This technology can be used for video calling, accessing the internet, downloading infotainment content & all other services available on 2G but with a ameliorated edge. The 3G mobile devices augment the services already available and make life effortless.

3G networks do not use the same radio frequencies as 2G. Mobile operators use innovative network technologies and license new frequencies to achieve high-end data transmission rates. The private companies which participated in the 3G spectrum auction are Bharti Airtel, Aircel, Idea Cellular, Reliance Communication, Tata Teleservices and Vodafone Essar.

The State owned companies which participated in 3G auctions are BSNL and MTNL.

3G is a much swifter and an enhanced way of getting infotainment & news at our fingertips, so that one can make use of the best services like real-time video streaming, social networking and high speed downloads of files and images.

Messaging & Social Networking

3G provides the expediency of chatting in a real time environment, video calling & access to emails.

Social networking has become the nitty-gritty of the contemporary world. Day in & day out people want to be connected & 3G makes this come alive.

Audio & Video

3G provides video calling facility which helps in face-to-face interaction which was not possible in 2G technology. 3G enables download of news, sports, favorite TV shows instantaneously on the go. Downloading of music, songs is possible in a flash of a second.

Faster browsing and downloads

One can send & receive documents, files, images, audio & video content much speedier than GPRS/EDGE connection available on a 2G network.

Review of Literature

The history of cellular telephony started in AT & T's Bell Labs with the first commercial cellular network called the Nordic mobile telephone network. The Total Access Communication Systems (TACS) was developed by Motorola in the 1980's. These analog technology mobile systems are referred to as first generation or 1G.

The Europeans initiated the Global System for mobile communication. The United States introduced the CDMA & the TDMA technology and these digital systems are called as 2G. These systems had limited capacity and thus to overcome these limitations 2.5G came into existence.

The European telecommunication Standards Institute developed the GPRS (General Packet Radio Services) which is a wireless communication system (Ariel Pashtan, 2006).

Approximately, every tenth year, a new generation of cellular technology has emerged. 3G is the third generation mobile technology that has condensed the world in our hands. 3G emerged to fulfill the never ending needs of the present generation who expect everything to be very fast. 3G enables the use of real time applications such as Mobile Banking, E-Shopping, Live TV & downloading videos & audios at a much higher data rate.

Many studies have been conducted with respect to 3G and have taken a single/ limited aspects or dimensions to predict the adoption of 3G services (Ying-Feng Kuo, Shieh-Neng Yen,

2008; Mihail Cocosila, Ofir Turel, Norm Archer & Yufei Yuan, 2007).

3G at first was moderately slow to be adopted globally especially in India. (Amalesh Sharma, Sourav Bikash Borah, 2011). At present, India has the 2nd largest population in the world and has a booming telecom market. In order to increase the customer base in India, mobile service providers need to analyze their customers' needs & expectations so that they can have a well-defined target market. 70% of the Indian population lives in rural areas where technology has not yet penetrated as compared to the urban counterparts so the service providers can customize 3G services to serve this huge untapped market.

Service Providers have to concentrate more on the semi-urban & the rural areas and find out ways in which 3G can benefit people from these areas so that they can increase their customer base, profit margin and to also develop the Indian economy. As of now the Indian telecom market generates 2.1% of GDP. If the semi-urban & rural areas are benefitted from this move then the Telecom Industry will contribute a much higher revenue percentage. India is a country of diversity. With over 1.2 billion population the number of people who can be benefited with the usage of such innovative & contemporary technologies as 3G is enormous. In this study various factors are analyzed based on the perceptions & expectations of 3G users and this will help to understand the consumer behaviour.

This study can prove to be of great importance to the service providers to understand the topographical layout of Indian 3G users. These factors on which the adoption of 3G services in India is distributed can be studied on the basis of cost of 3G services, usefulness, health risks associated with 3G, security & privacy concerns,

speed of services, ease of use of 3G services, social/societal influence, cost of 3G mobiles, associated health risks, real time applications such as mobile banking, e-shopping, performance of the 3G mobile & the usage of GPS & GIS facilities. The study aims at capturing the perceptions & the expectations of the users with respect to these factors.

Scope of the Study

1. In this study various factors were analyzed based on the perceptions & expectations of 3G users and this will help to understand the consumer behaviour.

2. This study can be used to bridge up the gap in the 3G users' expectations and perceptions, if any.

3. Similar studies can be conducted in the rural and sub-urban areas so that the service providers can penetrate 3G technology to these areas as well.

Objectives

1. To understand the parameters that influences the consumers' decision towards the adoption of 3G technology.

2. To evaluate the users perception of the quality of the 3G services offered by the Indian telecom industry.

3. To compare the customer perception of the 3G services with their expectations offered by the service providers

Research Methodology

This study is analytical in nature and the data was collected using a structured questionnaire, which was developed by using the underlying principle of the SERVQUAL framework (Parasuraman et. al). The questionnaire consisted of 98 questions which were classified broadly under the factors mentioned below, which in turn has five dimensions of the SERVQUAL framework i.e. tangible, reliability, accessibility, responsiveness and the empathy dimensions.

The list of attributes was ranked using the five point Likert scale individually. Various factors were analyzed which influence 3G users. Fig.1 shows conceptual framework recommended by the authors to link between the parameters that influence consumers' decision to adopt 3G technology and further to continue the same.
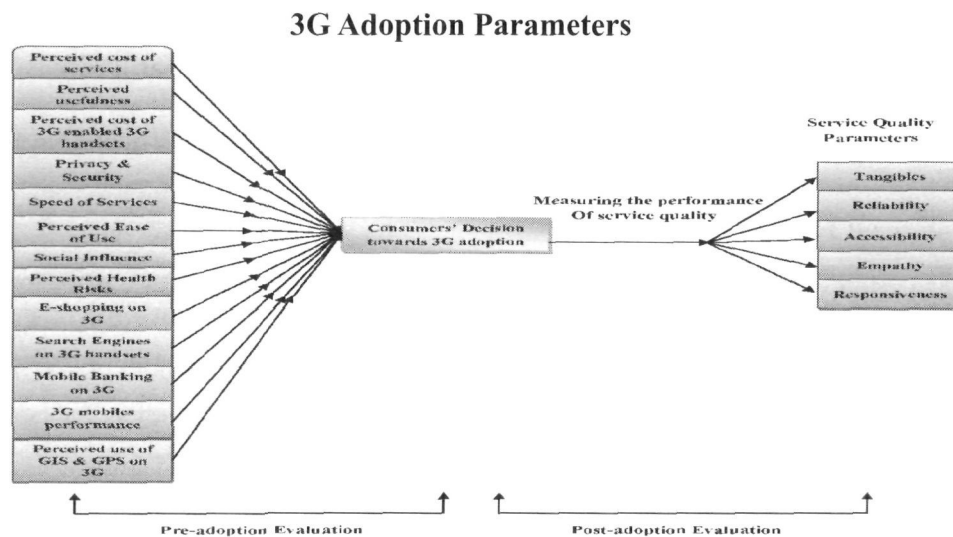
3G Adoption Parameters

Fig. 1: Research Framework

Reliability Dimension -

Perceived Cost of Services

India is a developing country where most of the people belong to the middle and lower-middle classes. The cost of services on a 3G mobile is high and is a matter of concern to the Indian population. Use of 3G involves variable cost in the usage such as service cost; download charges, video streaming charges etc...

People expect cost of the services that is being charged to them should be within an acceptable range and should be provided with accurate services.

Perceived Usefulness

Business and service related people use 3G for enhancing their operations, professionals and academicians use for the purpose related to their profession. The younger generation uses it for networking with people with all over the world like video calling facilities, email, social networking sites all can be accessed easily and at good speed.

3G handsets enables motion sensor games which gives a real-time experience while playing games and using other applications.

Movies, videos, live TV, streaming is swift in 3G network which adds to the entertainment package. 3G offers Wi-Fi facilities on mobile devices.

E-Shopping on 3G

In a world which is fast moving people & with new technologies coming up people can shop online through mobiles and can get items delivered at their doorsteps swiftly. 3G provides better security of the transactions carried out and there is a higher level of privacy which makes it more reliable.

Perceived use of GPS and GIS on 3G

GPS and GIS helps in locating or guiding the user to the desired destination. Since 3G uses higher frequency which provides a faster navigation system and consistent results all the time.

Tangibles Dimension -

Perceived cost of 3G enabled Mobiles

3G mobile phones are not affordable to all classes of people as they are exorbitant. Phones which were used to access 2G connection do not support 3G services and those that support the services are high-end expensive mobiles.

Perceived Ease of Use

Perceived ease of use is the degree to which a person or an individual will feel unsophisticated and simple to use 3G services & facilities.

Search Engines on 3G handsets

In 2G technology search engines do not display the results properly as the resolution of the mobile do not support the display screen very often. Thus the need for 3G enabled handsets comes in here, which offers higher picture quality, proper display of results as in any personal computer.

Assurance Dimension -

Privacy & Security Concerns

Data on any device or system can be accessed easily by hackers. Thus this is a major concern when we are sending important or confidential information on a 3G network. Security on a 3G network is another main issue where we have to protect the user's transaction and private information.

Social Influence

India is a country with strong family values and social factors plays a major role in the lives of all the people. Family decisions also have an impact on the decisions made by the user in adopting 3G technology. The media also plays a significant role in giving out information on 3G.

Mobile Banking on 3G

Mobiles are becoming the new transaction media for banks and their customers. According to top managers of banking sector the number of customers using internet banking is increasing day by day.

With the stupendous growth of Internet and online transactions, security is always a concern to the netizens for doing financial transactions. This layer of 3G networks ensures an additional security to all online banking transactions and one can be assured that their online transactions are more secure.

Responsiveness Dimension -

Speed of Services

In a world that is changing every minute, speed is a main concern. Every tick of the clock counts. People of today's generation want everything quick & at the flash of a second. 3G offers high speed services which has become a need for today's generation.

3G Mobiles Performance

3G mobile handsets come with high-end processors, operating system, and large memory space that enhance the performance of the device and facilities available on it, which is what the users demand or require.

Empathy Dimension -

Perceived Health Risks

3G though a boon has other effects on humans which can affect the health of an individual due to high levels of radiation from the cell phones. It can cause insomnia, oxidative stress. 3G users expect handsets which emit lower levels of radiations so that it won't affect their health.

Sampling

The main intent of this study is to examine the factors which influence the users of 3G mobile service and to measure the difference in their perception and expectations with respect to these factors.

The empirical data were collected using a questionnaire. 114 random samples of 3G enabled hand set users was selected from Gokula Educational Foundation (G.E.F). It is a Group of Institutions representing cosmopolitan people belonging to almost all the states of India. Data was also collected through references from the users (snow ball sampling). The questionnaires were distributed personally and also by using the social media networks like Facebook. An online version of the questionnaire was distributed using the link https://docs.google.com/spreadsheet/viewform ?formkey=dGVOM2hzQIM0WW9QMDVYV XlJWEc2VGc6MQ#gid=0

Out of the 114 responses 101 were usable, since 13 questionnaire received were partially filled and cannot be used for analysis. This shows 88.5% response rate. Thus the actual sample size was 101.

Results and Discussion

Variable Measurement

A total of 98 questions were used to measure the variables used in this study. All variables used a 5 point Likert scale where 1= Strongly Agree and 5= Strongly Disagree.

Sample Profile

The demographic profile of the respondents is shown in Table 1- Table 9, which includes gender, age group, marital status, education profile, income range per month, Occupation of respondents, mobile brands used by the respondents, service providers and mobile bill per month on an average.

Characteristics of the Sample

Table 1: Gender profile of Respondents

Male	81
Female	20
Total	**101**

Table 2: Age profile of Respondents

20 - 25	74
25 - 35	25
35 - 45	02
45 and above	00
Total	**101**

Table 3: Marital status of Respondents

Married	20
Unmarried	81
Total	**101**

Table 4: Education Profile of Respondents

Graduate	65
Post-Graduate	33
Others	03
Total	**101**

Table 5: Income Range/ Month on an average in Rs.

10000-20000	54
20000-30000	12
30000-40000	15
40000 & above	20
Total	**101**

Table 6: Occupation of Respondents

Student	68
Government employee	02
Entrepreneur	04
Private company employee	26
Others	01
Total	**101**

Table 7: Mobile Brands Used by Respondents

Samsung	40
Apple	12
Nokia	27
Sony Ericsson	10
Blackberry	02
Others	10
Total	**101**

Table 8: Service Providers

Airtel	54
BSNL	10
Idea/Spice	09
Aircel	07
Tata Docomo	21
Total	**101**

Table 9: Mobile bill charges / month on an average

Below 500	54
500-1000	40
1000-2000	06
2000 and above	01
Total	**101**

Demographic Profile Interpretations

There is a huge difference in the genders using 3G services. 80% of the total respondents were male users and just 20% were female. 73% of the users were in the age group of 20-25 which shows that 3G mobile services are mostly used by the Y-Generation i.e. the students form the major chunk of the 3G population which is shown in the graphs above 67% of the people who use 3G are students.

Service Quality Gaps

The questionnaire which was developed consisted of 2 sets of items each set had 49 questions each. The first set was used to measure the perceived levels of service quality (P). The same set of questions were reframed/ rephrased to inquire the users' expectations of the service quality (E). A multiple item questionnaire under each dimension was rated using a 5 point Likert scale. A gap analysis was conducted on each dimension of the SERVQUAL (Parasuraman et. al., 1988) taking averages of individual items in the multiple item scale under each dimension, by subtracting the expectations from the perceptions (P-E). The results are tabulated in Table 10.

Table 10: Comparison of Perceptions and Expectations of Respondents

Dimensions	Average Perception Score (P)	Average Expectation Score (E)	Difference (P - E)
Tangibles Dimension			
Perceived cost of mobile devices			
3G handsets are a real value for money	2.50495	2.009901	0.49505
3G handsets: A status symbol	2.554455	2.49505	0.059406
Higher versions of 3G handsets enhance the connectivity of the network	2.376238	2.049505	0.326733
Average value (Cost of mobile devices)	2.478548	2.184818	0.29373
Perceived ease of use			
3G handsets are easy to use with the menu driven application	2.257426	1.930693	0.326733
3G services are very easy to understand and use	2.316832	1.80198	0.514851
3G is very complicated to use	3.574257	1.80198	1.772277
Average value (Ease of use)	2.716172	1.844884	0.871288
Search Engines on 3G			
Search engines are comfortable to use on 3G devices	2.217822	1.950495	0.267327
Search engines result are displayed in very convenient manner	2.188119	1.920792	0.267327
Information acquired as easily as in a 2G network	2.455446	1.950495	0.50495
Average value for (Search engines on 3G)	2.287129	1.940594	0.346535

Reliability Dimension		
Perceived Usefulness		
3G services are useful for enhancing business	2.069307	1.990099	0.079208
3G services are very useful for students	2.306931	1.871287	0.435644
3G very useful in the service industry	2.009901	1.80198	0.207921
3G gives a real -time gaming experience	2.277228	1.960396	0.316832
3G offers a diverse set of entertainment applications not available on 2G	2.128713	1.920792	0.207921
Video conferencing - a boon to business executives	1.871287	2.059406	-0.18812
Huge amount of data can be transferred in a fraction of second	2.316832	2.108911	0.207921
Confidential data/documents of the company can be sent securely	2.633663	1.960396	0.673267
Average value for (Usefulness)	2.201733	1.959158	0.242575
Perceived Cost of Services		
3G service charges are affordable	3.346535	2.009901	1.336634
Ability of 3G to provide service accurately for the cost being charged	2.871287	1.80198	1.069307
3G services are a real value for money	2.970297	1.742574	1.227723
Average value for (Cost of services)	3.062706	1.851485	1.211221
e - Shopping in 3G		
Convenient to do e-shopping on a 3G device	2.29703	2.009901	0.287129
Easy to view all the merchandise on 3G device	2.277228	1.990099	0.287129
3G network loads the pages of e-shops quickly on the device	2.049505	1.910891	0.138614
Average value for (e- Shopping in 3G)	2.207921	1.970297	0.237624
Perceived use of GIS and GPS on 3G		
GPS very helpful to locate places	1.891089	1.821782	0.069307
GIS and GPS very helpful in remote locations to give information about a Place	2.079208	1.821782	0.257426
GIS and GPS services on a 3G device can be accessed easily anywhere	2.247525	1.861386	0.386139
Average Value for (Use of GIS and GPS on 3G)	2.072607	1.834983	0.237624
Responsiveness Dimension		
Speed of services		
3G provides service at a very high speed	2.237624	1.792079	0.445545

3G is very useful in video conferencing	1.930693	1.673267	0.257426
3G provides high speed downloads	1.980198	1.752475	0.227723
The network is never too busy to respond to requests	2.663366	1.70297	0.960396
Average Value for (Speed of services)	2.20297	1.730198	0.472772
Performance of 3G mobiles			
High picture quality on 3G	2.158416	1.831683	0.326733
Better OS enhances performance of 3G devices	2.089109	1.792079	0.29703
Improved audio and video on 3G	1.920792	1.613861	0.306931
Average Value for (Performance of 3G mobiles)	2.056106	1.745875	0.310231
Assurance Dimension			
Privacy and security concerns			
3G is safe and trustworthy to send confidential data	2.732673	1.762376	0.970297
Users identity is protected on 3G networks	2.693069	1.742574	0.950495
3G network is safe to do monetary transactions	2.574257	1.594059	0.980198
Average Value for (Privacy and security concerns)	2.666667	1.69967	0.966997
Social Influence			
Using 3G is a status symbol	2.752475	2.960396	0.20792
Peers influence the choice and usage of 3G handsets	2.544554	2.792079	0.24752
Family has a strong influence on adapting to 3G services	3.217822	2.762376	0.455446
3G handsets are visually appealing	2.366337	2.207921	0.158416
Average Value for (Social influence)	2.720297	2.680693	0.039604
Mobile banking on 3G			
Banking transaction very secure on 3G network	2.653465	1.821782	0.831683
Banking operations can be carried out effortlessly on 3G	2.445545	1.792079	0.653465
Transactions processed at high speeds	2.386139	1.762376	0.623762
Average Value for (Mobile banking on 3G)	2.49505	1.792079	0.702971
Empathy Dimension			
Perceived health risks			
You feel addicted to 3G	2.960396	3.118812	- 0.15842

You have lost sleep due to over usage of 3G	3.564356	2.60396	0.960396
There is a lot of stress when you are away from your mobile	3.386139	2.415842	0.970297
3G devices will harm you due to the high levels of electro - magnetic radiations	2.970297	2	0.970297
Average Value for (Health risks)	3.220297	2.534653	0.685644

Interpretation of the Gap Analysis

The demographic profile showed that most of the users fall into the age group of 20-25 years. In other words, the major chunks of the 3G users are the young generation. There are 3 possible outcomes of the above table:

- P-E > 0, this implies that the users are very satisfied with the level of service being provided.

- P-E = 0, this implies that the satisfactory levels are just being touched or reached.

- P-E < 0, this implies that the satisfaction levels are very low.

An average of perceptions' & the expectations' scores of each of the dimensions in the questionnaire is taken and the relevant difference is sought out in the Table 5. The differences show a positive or negative value.

The positive values show that the perceptions of the users are greater than the expectations & the expectations have been met. While the negative values show that the expectations of the users have not been met by the service providers.

Most of the values in the Table 5 are positive i.e. the service quality is satisfactory. However, there are 4 incidences in the Table 5 where the service quality values are negative. This implies that there is a gap in the service quality offered and the expectations of the users. Those parameters are video conferencing on 3G; 3G as a status symbol; peers having an influence on the users'

decision to adopt 3G & addiction towards 3G. Since most of the respondents were students, they have not found video conferencing to be very useful for them.

Social Influence was one of the parameters analyzed in the Assurance Dimension. Two of the statements under this parameter have got negative values. From this it can be interpreted that the Y-Gen does not think of 3G devices as a power or status symbol, the 2nd parameters shows that they think independently and do not depend on friends around them to take decisions for adopting a new technology.

t-Test Analysis

A paired sample t-test was conducted for all the dimensions to evaluate the significance of gap between expectations and perceptions and the results are shown in Table 11.

The paired t-test is only appropriate when there is just one observation for each combination of the nominal values. In this case it would be the perceptions of the users of 3G services and their expectations from the 3G service providers.

As the sample size is large, the t- value corresponds to probabilities for a standard normal distribution. The t values for all the 5 dimensions i.e. Tangibility, Reliability, Responsiveness, Assurance and the Empathy dimension are significantly low in very few cases. So all the values above 1.96 in the t - table are considered as satisfactory. Overall we can

say that there is no significant difference between customer expectations and perceptions of service quality of 3G services and that most of the expectations have been met by the service providers.

Table 11: t - test

Dimensions	t-values
Per ceived cost of services	10.27161
Perceived usefulness	2.723351
Perceived cost of mobile devices	3.102748
Privacy and security concerns	8.182328
Speed of services	4.404077
Perceived ease of use	10.74344
Social influence	0.42226
Perceived health risks	6.100175
e-Shopping in 3G	2.336751
Search engines on 3G	3.524908
Mobile banking on 3G	6.285318
Performance of 3G mobiles	3.091142
Perceived use of GIS and GPS on 3G	2.716467

Conclusion

This study has examined the gap that lies in between the expectations and the perceptions of the 3G users. The study also illustrated the application of the SERVQUAL instrument for measuring 3G mobiles and facilities' service quality. The overall scores on all the service quality dimensions i.e tangible, reliability, responsiveness, assurance and empathy shows that the expectations of most of the users are met by the 3G service providers. Furthermore, this study was also conducted in the Indian context. India is a fast growing developing nation whereby the users still maintain their traditional values while at the same time are also becoming more urban and technology savvy so this fosters the adoption of 3G technology and consumers' decision to continue the usage.

Limitations and Future Studies

The limitations of this present study are: First, the study was conducted in a cosmopolitan city of Bengaluru. This can be extended to the other cities in India to study the overall behavior of the 3G users and to bridge the gap in the users' expectations and the perceptions. Further study can be conducted by taking in new technology that has upgraded 3G services.

The second is that the sample size considered for the study is small with respect to the population size in a city like Bangaluru. Hence a larger sample size has to be taken in consideration to bring in more accuracy of the results.

This study can be used as a base for the upcoming 4G technology which is being used worldwide and is slowly entering India. 4G offers advanced technology and more bandwidth with improved services.

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