



A COMPARATIVE STUDY ON 2G & 3G MOBILE NETWORK PREFERENCE BY THE STUDENTS WITH REFERENCE IN THANJAVUR

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INTRODUCTION

In the world of cell phones, 2G signifies Second-Generation wireless digital telephone technology. Fully digital 2G networks replaced analog, which originated in the 1980s. 2G networks saw their first commercial light of day on the GSM standard. GSM stands for Global System for Mobile communications. 2G on GSM standards were first used in commercial practice in 1991 by Radiolinja, which was a Finnish GSM operator founded on the month of September of 19th, 1988. Radiolinja is now part of Elisa, which was known in the 1990s as the Helsinki Telephone Company. In addition to the GSM protocol, 2G also utilizes various other digital protocols including CDMA, TDMA, iDEN and PDC. GSM is mainly based on TDMA. Second Generation High Temperature Superconducting (2G-HTS) tape consists of multi-layers such substrate, buffer layer, superconducting layer and reinforced lamination tapes. 2G HTS tape is a candidate of good materials for current lead of superconducting magnet system owing to its low thermal conductivity.

However, joint resistance between 2G HTS tapes and terminal block can be a major problem because of high electrical resistivity of substrate, buffer layer and reinforced lamination tapes of 2G HTS. So specially considering joint resistance between 2G tapes and terminal block, 2G HTS current lead for 400 A was designed and fabricated. This current lead was consisting of two terminal blocks, a support bar or tube, protection tube and six 2G HTS tapes. Its total length was 300 mm and body diameter 18.3 mm. At liquid nitrogen temperature (77 K) critical current (I_c) of this HTS current lead was 600 A, about 1.5 times the operating current 400 A. Conductive heat loss of 2G HTS current lead between 60 K and 7 K was 50 mW.

The main differentiator to previous mobile telephone systems, retroactively dubbed 1G, is that the radio signals that 1G networks use are analog, while 2G networks are digital.

Standard of 2G

2G technologies can be divided into TDMA-based standard and CDMA-based standard depending on the type of multiplexing used. The main 2G standards are:

- GSM (TDMA-based), originally from Europe but used worldwide
- iDEN (TDMA-based), proprietary network used in the United States and in Canada
- IS-136 aka D-AMPS, (TDMA-based, commonly referred as simply TDMA in the US), used in the Americas
- IS-95 aka CDMA One, (CDMA-based, commonly referred as simply CDMA in the US), used in the Americas and parts of Asia
- PDC (TDMA-based), used exclusively in Japan
- 2G services are frequently referred as Personal Communications Service or PCS in the US.

2.5G services, which enable high-speed data transfer over upgraded existing 2G networks, are widely deployed worldwide. Next-generation 3G, designed to allow the transmission of very large quantities of data, is also becoming increasingly popular. Work on 4G has already started although its scope is not clear yet. Higher data speeds enable new services for subscribers, such as picture messaging and video telephony.

Though 2G has been superseded by newer technologies such as 2.5G, 2.75G, 3G and 4G; however, 2G networks are still used in many parts of the world.

Capacities of 2G

Using digital signals between the handsets and the towers increases system capacity of 2G in two key ways:

- Digital voice data can be compressed and multiplexed much more effectively than analog voice encodings through the use of various CODECs, allowing more calls to be packed into the same amount of radio bandwidth.
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Benefits of 2G

There are three primary benefits of 2G networks over their predecessors were given in point wise below:

- 2G phone conversations were digitally encrypted
- 2G systems were significantly more efficient on the spectrum allowing for far greater mobile phone penetration levels and
- 2G introduced data services for mobile starting with SMS (Short Message Services) text messages.

Advantages of 2G

Digital systems of 2G were embraced by consumers for several reasons. There are some advantages of 2G given down:

- The lower powered radio signals require less battery power, so phones last much longer between charges, and batteries can be smaller.
- The digital voice encoding allowed digital error checking which could increase sound quality by reducing static and lowering the noise floor.
- The lower power emissions helped address health concerns.
- Going all-digital allowed for the introduction of digital data services, such as SMS and email.

A key digital advantage not often mentioned is that digital cellular calls are much harder to eavesdrop on by use of radio scanners. While the security algorithms used have proved to not be as secure as initially advertised, 2G phones are immensely more private than 1G phones, which have no protection whatsoever against eavesdropping.

Disadvantages of 2G

The downsides of 2G systems, not often well publicized, are:

- In less populous areas, the weaker digital signal will not be sufficient to reach a cell tower.
- Analogue has a smooth decay curve, digital a jagged step one. This can be both an advantage and a disadvantage. Under good conditions, digital will sound much better. Under slightly worse conditions, analogue will have annoying static, while digital has occasional dropouts. As conditions worsen, though, digital will start to completely fail, by dropping calls or being unintelligible, while analogue just slowly gets worse and worse, generally holding a call longer and allowing at least a few words to get through.
- Despite the coverage maps provided by major phone companies, as of 2006 digital coverage in many areas is spotty at best.
- With analogue systems it was possible to have two or more "cloned" handsets that had the same phone number. This was widely abused for fraudulent purposes. It was, however, of great advantage in many legitimate situations. One could have a backup handset in case of damage or loss, a permanently installed handset in a car or remote workshop, and so on. With digital systems, this is no longer possible.
- While digital calls tend to be free of static and background noise, the lossy compression used by the CODECs takes a toll; the range of sound that they convey is reduced. You'll hear less of the tonality of someone's voice talking on a digital cell phone, but you will hear it more clearly.

3G

International Mobile Telecommunications-2000 (IMT-2000), better known as 3G (or 3-G) or Third-Generation technology. The official 3G mobile network is the systems and services based on the ITU family of standards under the International Mobile Telecommunications programme, 'IMT-2000'. 3G is a wireless industry term for a collection of international standards and technologies aimed at increasing efficiency and improving the performance of mobile wireless networks. Further, it is usually used in the context of cell phones. This 3G wireless services provide the ability to transfer both voice data (a telephone call) and non-voice data (such as downloading information, exchanging email, and instant messaging) and offer enhancements to current applications, including greater data speeds, increased capacity for voice and data and the advent of packet data networks versus today's switched networks.

The first country which introduced 3G on a large commercial scale was Japan and was launched by NTT DoCoMo in Japan branded FOMA, in the month of 1st October, 2001. In 2005 about 40% of subscribers use 3G networks only, and 2G is on the way out in Japan. It is expected that during 2006 the transition from 2G to 3G will be largely completed in Japan, and upgrades to the next 3.5G stage with 3 Mbit/s data rates is underway.



Next generation i.e., 3G wireless networks are not IEEE 802.11 networks. IEEE 802.11 networks are short range, primarily internet access, networks while 3G wireless networks are the evolution of wide area cellular telephone networks which hope to incorporate high-speed internet access and video telephony to these networks. It is estimated that there are about 60 3G networks in 25 countries around the world. In Asia, Europe and the USA, telecommunication companies use WCDMA (Wideband Code-Division Multiple Access) technology with the support of around 100 terminal designs to operate 3G mobile networks.

In 2001, NTT DoCoMo - one of the giant telecommunication companies in Japan - was the first ever telecommunication company to launch a commercial WCDMA network. The introduction of 3G services within Europe began in early 2003.

Standard of 3G

International Telecommunications Unit (ITU): IMT-2000 consists of five radio interfaces

- W-CDMA
- CDMA2000
- TD-CDMA / TD-SCDMA
- UWC-136
- DECT+

Capacities of 3G

- The most significant features offered by third generation (3G) mobile technologies are the momentous capacity and broadband capabilities to support greater numbers of voice and data customers - especially in urban centers - plus higher data rates at lower incremental cost than 2G.
- By using the radio spectrum in bands identified which is provided by the ITU for Third Generation IMT-2000 mobile services, it subsequently licensed to operators, 3G uses 5 MHz channel carrier width to deliver significantly higher data rates and increased capacity compared with 2G networks.
- The 5 MHz channel carrier provides optimum use of radio resources for operators who have been granted large, contiguous blocks of spectrum. On the other hand, it also helps to reduce the cost 3G networks while having the capable of providing extremely high-speed data transmission to users.
- Besides that, it also allows the transmitting 384kbps for mobile systems and 2Mbps for stationary systems. 3G users are expected to have greater capacity and improved spectrum efficiency which allows them to access the global roaming between different 3G services.

Advantages of 3G

The advantages of 3G are as under:

- Overcrowding is relieved in existing systems with radio spectrum
- Bandwidth, security and reliability are more
- Provides interoperability among service providers
- Availability of fixed and variable rates
- Support to devices with backward compatibility with existing networks.
- Always online devices – 3G uses IP (Internet Protocol) connectivity which is packet based
- Rich multimedia services are available

Disadvantages of 3G

Even though 3G has successfully been introduced to mobile users, there are some issues that happened to be debated by the 3G providers and users.

- The high input fees for the 3G service licenses;
- The great differences in the licensing terms;
- The current high debt of many telecommunication companies, making it more of a challenge to build the necessary infrastructure for 3G;
- Member State support to the financially troubled operators;
- Health aspects of the effects of electromagnetic waves;
- 3G phones are expensive and bulky;
- 2G mobile users still have not been convinced to use the 3G wireless service;
- Lack of coverage because it is still new service;
- High prices of 3G mobile services in some countries.

Compare 2G & 3G

Basis of Differences	2G	3G
Cost	The licence fee to be paid for 2G service is much cheaper than 3G service. Moreover, the network construction and maintenance of 2G is less cheap as compared to 3G networks. Also from the student's point of view, the expenditure for 2G services is affordable for the students if they can use of the various applications of 2G.	The licence fee to be paid for 3G service is much higher than 2G service. Moreover, the network construction and maintenance of 3G is much costlier as compared to 2G networks. Also from the student's point of view, the expenditure for 3G services will be excessively high if they make use of the various applications of 3G.
Data Transmission	The mobile users find a lesser amount of download speeds, lesser access to the data and applications in 2G services as compared to 3G service.	They find much faster download speeds, faster access to the data and applications in 3G services in comparison to 2G service.
Function	The main function of 2G services is the transmission of information via voice signals.	The main function of 3G services is data transfer via video conferencing, MMS, etc.
Features	The features like mobile TV, video transfers and GPS systems are not available with 2G services.	The features like mobile TV, video transfers and GPS systems are the additional features of 3G services.
Frequencies	It uses a broad range of frequencies in both upper and lower bands, under which the transmission depends on conditions such as weather.	A drawback of 3G is that it is simply not available in certain regions.
Implication	There is no such high level of security in 2G service as compared to 3G service.	3G service offers a high level of security, i.e., it permits validation measures when communicating with other devices.
Availability of speed	The downloading and uploading speeds available in 2G services are up to 236 Kbps.	The downloading and uploading speeds are up to 21 Mbps and 5.7 Mbps respectively in it.
Video Calls	Video calls can't be made through 2G services.	Video calls can be made with the help of 3G services.
Transmission of Text messages and photos	Transmission of text messages and photos is available in 2G services but they have data limit and the speed of data transmission is very slow.	Transmission of text messages and photos is available in 3G services with high speed.

Key Players Of 2G & 3G Service Providers In India

The key players of cellular service provider in India:-

AIRTEL	VODAFONE
AIRCEL	BSNL
TATA DOCOMO	IDEA
RELIANCE	MTS

OBJECTIVES OF THIS STUDY

The research objective of this study is as follows:-

To collect the information that the students have adequate knowledge about the features of 2G and 3G services.

- To find out if there is any knowledge about the difference between 2G and 3G services' features among students.

- To find out the popular service providers of 2G and 3G services among students.
- To find out the students' satisfaction level of the services of 2G and 3G in using via different devices viz. Mobile and Dongle.
- To find out the preference of uses between 2G or 3G mobile services' among students.
- To identify the purpose for using 2G and 3G services of mobile among students.

METHODOLOGY AND PLAN OF THE STUDY

Scope of the Study

Despite of the fact, that learning is all pervasive in all our lives, thus psychologist do not agree on how learning takes place in our live. But learning is a human activity and is as natural as breathing.

The scope of my study restricts itself to the analysis of students' preferences and perceptions of different features of 2G and 3G services.

Data Sources

The primary data is collected with the help of pre-tested structured and unstructured questionnaire from, various respondents. But Data obtained is found suitable and complete and is used for further analysis. Secondary data and information have been collected from internet, newspaper, existing literature, magazines etc. Sometimes personal interview has been conducted among the students

ANALYSIS AND INTERPRETATION OF THE DATA

Table 1: Distribution of Respondents Based On Mean Score & Standard Deviation of Comparative Statement 2G & 3G

S.No.	Comparative Statement	Mean	Std. Deviation
1	Types Of Mobile Phones	1.40	0.495
2	Types Of Services	1.76	0.431
3	Types Of Networks	1.42	0.499
4	Current Service Provider	1.98	1.505
5	Monthly Expenditure	1.76	0.744
6	Factors Responsible For Present Telecom Company	1.74	1.006
7	Feel About This Present Service Provider Network	1.84	0.842
8	Connectivity And Network Coverage	1.38	0.490
9	Opinion Of The Students about the Service Provider	2.48	1.129
10	Reasons For Switch Over	1.66	0.823
11	Reasons For Continuing The Present Telecom Company	2.20	1.178

Source: Data generated from the respondents.

Based on mean score the Opinion of the Students about the Service Provider (2.48) is the most important factor follows the (2.20) reasons for continuing the present telecom company the most important factors followed by current service provider (1.98) Feel About This Person Service Provider Network (1.84) Monthly Expenditure and also Types Of Services same level used (1.76) Factors Responsible For Person Telecom Company (1.74) Reasons For Switch Over (1.66) Types Of Networks (1.42) Types Of Mobile Phones (1.40) finally, network coverage's can be used (1.38).

Table 2: T Test for Significant Difference between Male and Female With Respect To 2G and 3G Services

Hypothesis 1: **t test for significant difference between Male and Female with respect to 2G and 3G Services**

t test for significant difference between Male and Female with respect to 3G and 2G services

Factors of 3G and 2G services	Gender				t value	P value
	Male		Female			
	Mean	SD	Mean	SD		
3G speed/2G speed	11.09	2.57	11.32	2.21	1.058	0.290
Plan details	13.42	3.65	13.83	3.51	1.306	0.192
3G and 2G coverage	18.09	4.13	19.49	3.72	4.038	<0.001**
Costly	42.48	8.82	45.45	8.25	3.967	<0.001**
Attention paid by the customer care	10.33	2.99	11.24	2.47	3.703	<0.001**



2G & 3G services availability of network	17.18	3.95	18.54	3.76	4.040	<0.001**
Ethics of 2G & 3G service provider	90.60	20.86	99.04	20.62	4.685	<0.001**
Frequent disturbances in Data	40.27	9.56	43.72	9.55	4.166	<0.001**
Response from the 2G& 3G telecom company	19.58	6.18	19.16	6.56	0.773	0.440
Poor customer handling	32.89	6.46	33.92	6.05	1.894	0.059

Note:

1. ** Denotes significant at 1% level

** Since P value is less than 0.01, the null hypothesis is rejected at 1 percent level of significance with respect to 2G & 3G coverage , Costly Attention paid by the customer care , 2G & 3G services availability of network , Ethics of 3G service provider , Frequent disturbances in Data .

Hence concluded that there is significant difference between Male and Female with respect to 2G & 3G coverage , Costly , Attention paid by the customer care , 2G & 3G services availability of network , Ethics of 2G & 3G service provider , Frequent disturbances in Data .There is no significance difference between Male and Female with respect to Response from the 3G telecom company, Poor customer handling, and 2G & 3G speed and plan details. Since P value is greater than 0.05. Hence the Null hypothesis is accepted at 5% level with respect to Response from the 3G Telecom Company, Poor customer handling, 2G & 3G speed and plan details.

CONCLUSIONS

In today's economical competition, whenever we talk of growth & development of a nation then hardly there can be no possibility of ignorance of Tele communication service sector. Now-a-days it being a lifeline for us, gives a great contribution where we could get connect with our large world.

The importance or significance of 2G and 3G services of mobile is an essential part of human being. The proverb statement "NECESSITY IS THE MOTHER OF INVENTION" is an equal proof of telecommunication service sector.

In today's globalizing economy competition has become more and more difficult for different products, services and offerings. Thus, this study focuses on 2G and 3G services' of mobile and its implication among the students.

The aim of this study is to find out the knowledge, satisfaction level, popularity of the 2G and 3G services' of mobile among the students of

It was found during the survey that maximum students have better knowledge about the 2G and 3G services of mobile. They are also cognizant about the differences of 2G and 3G services' features. But most of the students are preferred 2G services of mobile due to reasonable price, better network coverage etc. as compared to 3G. Both 2G and 3G services of mobile allow for easy use of data services. While 3G speeds are faster.

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