



ANALYSIS OF CUSTOMERS USING GLOBAL SYSTEM FOR MOBILE COMMUNICATIONS (GSM)

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ABSTRACT:

The Global System for Mobile Communications (GSM) has become an integral part of modern telecommunications, serving billions of customers worldwide. This study presents an analysis of customers utilizing GSM technology, focusing on key aspects such as user demographics, usage patterns, and the impact of GSM on society. The research employs a multidisciplinary approach, integrating data from various sources, including network operators, government agencies, and consumer surveys.

The analysis begins with an overview of the evolution of GSM technology, highlighting its growth and adaptation to changing consumer needs. Subsequently, the study delves into user demographics, exploring factors such as age, gender, income, and geographical location that influence GSM adoption. This demographic analysis provides valuable insights into the reach and accessibility of GSM services, helping stakeholders tailor their offerings to diverse customer segments.

Usage patterns are a crucial aspect of this analysis. By examining the types of services accessed, frequency of usage, and the duration of calls, the study uncovers trends in customer behavior. This information is vital for network operators and policymakers, aiding in the optimization of network infrastructure and the formulation of effective pricing strategies.

Furthermore, the study assesses the socioeconomic impact of GSM technology on both urban and rural communities. It investigates how access to mobile communications has influenced economic development, education, healthcare, and social connectivity. This analysis sheds light on the role GSM plays in bridging the digital divide and promoting inclusive growth.

The study also considers the challenges and opportunities associated with the continued expansion of GSM networks. Issues such as network congestion, security concerns, and the emergence of 5G technology are discussed, offering recommendations for sustainable growth and improved service quality.

In conclusion, this analysis provides a comprehensive overview of customers using Global System for Mobile Communications. By examining demographics, usage patterns, and socioeconomic impacts, it offers valuable insights for network operators, policymakers, and researchers. The findings underscore the significance of GSM technology in shaping the modern world and its potential for further transformative effects in the future.

LITERATURE REVIEW:

MARKETING RESEARCH:

Marketing research is defined as the “Systematic design, collection, analysis, and reporting of data and findings relevant to a specific marketing situation facing the company. Marketing Research is now about a US\$16.5 billion industry globally, according to ESOMAR, the World Association of Opinion and Market Research Professionals.

A company can hire the services of a marketing research firm or conduct research in creative and affordable ways such as:

- Engaging professors or students to design and conduct studies. Many large companies hire summer trainees from management institutions for cost-effective market research year after year. Awarding live projects to MBA students as part of their course work is also a common practice.
- Monitoring published information and actions systematically. This may be done by examining news papers, web sites, and industry reports and by visiting competitive outlets.

Effective marketing research involves six steps. They are:

- Step 1: Define the problem and the research objectives.
- Step 2: Develop the research plan.
- Step 3: Collect the Information.
- Step 4: Analyze the Information.
- Step 5: Present the Findings.
- Step 6: Make the Decision.

MOBILE INDUSTRY IN INDIA:

India's 21.59 million-line telephone network is the largest in Asia, 3rd largest among emerging economies (after China and Republic of Korea) and the 12th largest in the world. India's telecom network comprises of 27,753 telephone exchanges, with a total equipped capacity of 272.17 Lakh lines and 226.3 Lakh working telephones. The Long Distance Transmission Network has nearly 1,70,000 route kilometers of terrestrial Microwave Radio Relay & Co-axial cables and about 171,000 route kilometers of Optical Fiber Cables. Fully automatic International Subscriber Dialing (ISD) service is available to almost all the countries. The total number of stations connected to

National Subscriber Dialing (NSD) is over 18,000 and this is increasing fast. Yet the present tele-density is very low at about 2.2 per hundred persons, offering a vast scope for growth. In the field of International communications, tremendous progress was made by the use of Satellite Communication and submarine links. It is therefore not surprising that India has one of the fastest growing telecommunication systems in the world with system size (total connections) growing at an average of more than 20 percent over the last 4 years.

The voice and non-voice telecom services include data transmission, facsimile, mobile radio, radio paging, V-SAT and leased line services to cater to variety of needs, both residential and business. A dedicated Packet Switched Public Data Network (I-NET) with international access for computer communication services is also available. ISDN service has already been introduced in the major cities. Other services like Intelligent Network (IN), Frame Relay (FR) and Asynchronous Transfer Mode (ATM) for wide band multimedia applications will be introduced in the near future.

In the field of international communications, India's overseas service carrier Videsh Sanchar Nigam Ltd. (VSNL) has made tremendous progress by using extensive infrastructure of satellite earth stations, state-of-the-art digital gateways, Optical Fiber Multi Media submarine Cables and Multi Media Data Switches. Fully automatic international subscriber dialing (ISD) service is provided to almost all the countries in the world. In future, VSNL is positioning itself to provide bandwidth on demand, Global Virtual Private Networks, ISDN, B-ISDN, VSATs, Mini-M and hand held Personal Communications.

The telecommunications initiative in the country is led by Ministry of Communications through the Department of Telecommunication & Department Telecom Services and its undertakings for provision of basic telephone services, national and international long distance communications, manufacture of complete range of telecom equipment, research and development, and consultancy services. The Telecom Commission performs the Executive and Policy making functions. The Telecom Regulatory Authority of India performs the functions of an independent regulatory body.

SERVICES OFFERED

- Telephone Services
- NSD/ISD Services
- Computerized Trunk Services
- Pay Phones
- National & International Leased Lines Circuits

- Telex
- Telegraph Services (Manual & Automatic)
- X-25 based Packet Switched Data Network (INET)
- Gateway Packet Switched Data Services (GPSS)
- Gateway Electronic Data Interchange Service (GEDIS)
- Gateway E-Mail and Store & Forward FAX Service (GEMS-400)
- Concert Packet Service (CPS)
- Satellite-based Remote Area Business Message Network
- Electronic Mail
- Voice Mail
- Audio-Text
- Radio Paging
- Cellular Mobile Telephone
- Public Mobile Radio Trunked Service
- Video-Tex
- Video Conferencing
- V-SAT
- Internet
- ISDN
- INMARSAT Mobile Service
- INMARSAT Data Service
- Home Country Direct Service
- Intelligent Network (IN) Services



CELLULAR AND PAGING SERVICES

Cellular and paging services though not a very old means of communication in India has very rapidly caught the imagination of the people. The revolution that started with pagers soon gave way to Mobile phones. Pagers being one way and with limited application have almost disappeared, as mobiles became the favorite. With more

and more innovative offers like prepaid cards from telecom service operators, the mobile culture is growing. With more players entering the market, the competition has grown stronger, catering to the demands of consumers. VODAFONE, Airtel, Idea and Reliance are doing very well and are always coming up with new schemes and plans. SMS is a raging favorite among both the young and the old. A shift towards mobile telephony is apparent from the fact that the share of cellular connections in new connections is

Steadily going up and had reached 63% in December 2020.

Cell phones now come cheaper and so does the monthly bill. As a result one can still hear some grudges from service providers as they claim lack of use of enough airtime to make it a profitable business.

Today, India has 22 private companies providing cellular services in 18 telecom circles and 4 metro cities (Delhi, Mumbai, Chennai and Calcutta). Ever since their introduction, cellular services have shown a fair growth with the subscriber base crossing the 1 million mark by the first quarter of 1999. India has adopted the Global System of Mobile Communication (GSM) for provision of cellular services. The cellular services in India operate in the frequency band 890-902.5 MHz / 935-947.5 MHz. In metro cities, each operator has been allocated a frequency spectrum of 6.2+6.2 MHz (except Chennai where 5.8+5.8 MHz spectrum has been allocated), while for other telecom circles a spectrum of 4.4 +4.4 MHz has been allocated.

CELLULAR MOBILE TELEPHONE SERVICE PROVIDERS

- Bharti Cellular Ltd
- Sterling Cellular Ltd
- BPL Mobile Communications Ltd
- VODAFONE Eison Max Telecom Ltd
- Modi Telstra Pvt. Ltd
- Usha Martin Telekom Ltd
- RPG Cellular Services Ltd
- Skycell Communications Pvt. Ltd
- Airtel Digilink India Ltd
- Fascal Ltd
- Hexacom India Ltd
- JT Mobiles Ltd

- Koshika Telecom Pvt. Ltd
- Tata Communications Pvt. Ltd
- Escotel Mobile Comm. Pvt. Ltd
- Bharti Telenet Ltd
- RPG Cellcom Ltd
- Modicom Network Pvt. Ltd
- Birla AT&T Comm. Ltd
- Reliance Telecom Ltd
- BPL Cellular Ltd
- Srinivas Cellcom Ltd

LETTERS AND TELEGRAMS

Letters have been written from ages and the Indian Postal service is one of the biggest and most experienced services. About 90% of the postal outlets are in rural India. On an average a post office covers an area of about 21 sq. km and a population of about 6,600 people. The Indian postal system currently provides 38 services which can be categorized as

- Communication: letters, postcards, newspapers
- Transportation: parcels, money orders etc.
- Other services: resource mobilization, postal life insurance

For providing postal services, the whole country has been divided into twenty-two postal circles. Each Circle is coterminous with a State except for some. Besides these twenty-two circles, there is another circle, called Base Circle, to cater to the postal communication needs of the Armed Forces.

Telecommunication infrastructure was established in India in 1856. They were telegraphic data communication links principally for government and military use. Telegrams being the fastest means of communication in areas where phone lines did not reach, led to its use by the common man. Even now phone lines do not connect many interior regions of India and the telegram is used to fill in the gap. However it is a fast disappearing means of communication, as connectivity in India both in terms of telephone lines and wireless communication has rapidly grown.

COURIER SERVICES

Time was when one had to wait for weeks together to see the other person receive important document. The common man had no access to fax machines nor was he aware of its utility. Then came along the speed post, which too took about a week to deliver. The start of private courier services however changed all that. Documents could now reach within the day or by the next day. Moreover they are more reliable as chances of misplacement are minimal. Today businesses as well as individuals are increasingly dependent on the courier service.

INTERNET

Once the Internet market space was opened up to private Internet Service Providers (ISPs) in 1998, the market has witnessed phenomenal growth. In certain states there has been a high percentage in penetration, but in others it has been slow due to low telecom penetration, low bandwidth and above all illiteracy. All tourist spots however are more or less connected to the net. Cyber cafes are as common a sight as telephone booths and connectivity in India has arrived for the common man. One need no longer invest in a computer, which is still a costly commodity. Though email and Internet browsing remain the favorite purposes e-commerce and e-business have put their foot in. Banks have now facilitated Internet banking. The Indian Railways offers a computerized reservation system which enables a person to book his tickets online and from anywhere. It also provides other services like railway timetables and ticket availability. Airlines bookings, Movie ticket bookings, hospital appointments and even consultations are widely available. Connectivity is fast spreading in all areas and the Internet is becoming more and more user friendly. Facilities in connectivity are easily available even though not a very high percentage of Indians use these facilities.

The good news is that with improvements in bandwidth and penetration of Internet through PCs as well as cable TV, the Internet user base in India will expand by leaps and bounds. The cable route in fact is being touted as a significant pathway for the proliferation of the Internet in India. India already boasts of 37 million cable connections (expected to jump to 100 million by 2008), which could additionally be converted into Internet connections. Thanks to the wireless application protocol (WAP), Internet is coming to India through mobile phones as well. Voice over IP, a dream so far for India, too is expected to be reality in the future.

HISTORY OF GSM:

During the early 1980s, analog cellular telephone systems were experiencing rapid growth in Europe, particularly in Scandinavia and the United Kingdom, but also in France and Germany. Each country developed its

own system, which was incompatible with everyone else's in equipment and operation. This was an undesirable situation, because not only was the mobile equipment limited to operation within national boundaries, which in a unified Europe were increasingly unimportant, but there was also a very limited market for each type of equipment, so economies of scale and the subsequent savings could not be realized.

The Europeans realized this early on, and in 1982 the Conference of European Posts and Telegraphs (CEPT) formed a study group called the Grouped Special Mobile (GSM) to study and develop a pan-European public land mobile system. The proposed system had to meet certain criteria:

- Good subjective speech quality
- Low terminal and service cost
- Support for international roaming
- Ability to support handheld terminals
- Support for range of new services and facilities
- Spectral efficiency
- ISDN compatibility

In 1989, GSM responsibility was transferred to the European Telecommunication Standards Institute (ETSI), and phase I of the GSM specifications were published in 1990. Commercial service was started in mid-1991, and by 1993 there were 36 GSM networks in 22 countries. Although standardized in Europe, GSM is not only a European standard. Over 200 GSM networks (including DCS1800 and PCS1900) are operational in 110 countries around the world. In the beginning of 1994, there were 1.3 million subscribers worldwide, which had grown to more than 55 million by October 1997. With North America making a delayed entry into the GSM field with a derivative of GSM called PCS1900, GSM systems exist on every continent, and the acronym GSM now aptly stands for Global System for Mobile communications.

The developers of GSM chose an unproven (at the time) digital system, as opposed to the then-standard analog cellular systems like AMPS in the United States and TACS in the United Kingdom. They had faith that advancements in compression algorithms and digital signal processors would allow the fulfillment of the original criteria and the continual improvement of the system in terms of quality and cost. The over 8000 pages of GSM recommendations try to allow flexibility and competitive innovation among suppliers, but provide enough standardization to guarantee proper interworking between the components of the system. This is done by providing functional and interface descriptions for each of the functional entities defined in the system.

RADIO INTERFACE

GSM is a cellular network, which means that mobile phones connect to it by searching for cells in the immediate vicinity. GSM networks operate in four different frequency ranges. Most GSM networks operate in the 900 MHz or 1800 MHz bands. Some countries in the Americas (including the United States and Canada) use the 850 MHz and 1900 MHz bands because the 900 and 1800 MHz frequency bands were already allocated.

The rarer 400 and 450 MHz frequency bands are assigned in some countries, notably Scandinavia, where these frequencies were previously used for first-generation systems.

In the 900 MHz band the uplink frequency band is 890-915 MHz, and the downlink frequency band is 935-960 MHz. This 25 MHz bandwidth is subdivided into 124 carrier frequency channels, each spaced 200 kHz apart. Time division multiplexing is used to allow eight full-rate or sixteen half-rate speech channels per radio frequency channel. There are eight radio timeslots (giving eight burst periods) grouped into what is called a TDMA frame. Half rate channels use alternate frames in the same timeslot. The channel data rate is 270.833 kbit/s, and the frame duration is 4.615 ms.

The transmission power in the handset is limited to a maximum of 2 watts in GSM850/900 and 1 watt in GSM1800/1900.

GSM has used a variety of voice codecs to squeeze 3.1kHz audio into between 6 and 13kbps. Originally, two codecs, named after the types of data channel they were allocated, were used, called "Full Rate" (13kbps) and "Half Rate" (6kbps). These used a system based upon linear predictive coding (LPC). In addition to being efficient with bitrates, these codecs also made it easier to identify more important parts of the audio, allowing the air interface layer to prioritize and better protect these parts of the signal.

GSM was further enhanced in 1997 with the GSM-EFR codec, a 12.2kbps codec that uses a full rate channel. Finally, with the development of UMTS, EFR was refactored into a variable-rate codec called AMR-Narrowband, which is high quality and robust against interference when used on full rate channels, and less robust but still relatively high quality when used in good radio conditions on half-rate channels.

There are four different cell sizes in a GSM network - macro, micro, pico and umbrella cells. The coverage area of each cell varies according to the implementation environment. Macro cells can be regarded as cells where the base station antenna is installed on a mast or a building above average roof top level. Micro cells are cells whose antenna height is under average roof top level; they are typically used in urban areas. Picocells are small cells whose diameter is a few dozen meters; they are mainly used indoors. Umbrella cells are used to cover shadowed regions of smaller cells and fill in gaps in coverage between those cells.

Cell horizontal radius varies depending on antenna height, antenna gain and propagation conditions from a couple of hundred meters to several tens of kilometers. The longest distance the GSM specification supports in practical use is 35 km or 22 miles. There are also several implementations of the concept of an extended cell, where the cell radius could be double or even more, depending on the antenna system, the type of terrain and the timing advance.

Indoor coverage is also supported by GSM and may be achieved by using an indoor picocell base station, or an indoor repeater with distributed indoor antennas fed through power splitters, to deliver the radio signals from an antenna outdoors to the separate indoor distributed antenna system. These are typically deployed when a lot of call capacity is needed indoors, for example in shopping centers or airports. However, this is not a prerequisite, since indoor coverage is also provided by in-building penetration of the radio signals from nearby cells.

The modulation used in GSM is Gaussian minimum shift keying (GMSK), a kind of continuous-phase frequency shift keying. In GMSK, the signal to be modulated onto the carrier is first smoothed with a Gaussian low-pass filter prior to being fed to a frequency modulator, which greatly reduces the interference to neighboring channels (adjacent channel interference).

A nearby GSM handset is usually the source of the "dit dit dit, dit dit dit, dit dit dit" signal that can be heard from time to time on home stereo systems, televisions, computers, and personal music devices. When these audio devices are in the near field of the GSM handset, the radio signal is strong enough that the solid state amplifiers in the audio chain function as a detector. The clicking noise itself represents the power bursts that carry the TDMA signal. These signals have been known to interfere with other electronic devices, such as car stereos and portable audio players. This is a form of RFI, and could be mitigated or eliminated by use of additional shielding and/or bypass capacitors in these audio devices, however, the increased cost of doing so is difficult for a designer to justify.

SUBSCRIBER IDENTITY MODULE:

One of the key features of GSM is the Subscriber Identity Module (SIM), commonly known as a SIM card. The SIM is a detachable smart card containing the user's subscription information and phonebook. This allows the user to retain his or her information after switching handsets. Alternatively, the user can also change operators while retaining the handset simply by changing the SIM. Some operators will block this by allowing the phone to use only a single SIM, or only a SIM issued by them; this practice is known as SIM locking, and is illegal in some countries.

In the United States, Canada, Europe and Australia, many operators lock the mobiles they sell. This is done because the price of the mobile phone is typically subsidized with revenue from subscriptions and operators want to try to avoid subsidizing competitor's mobiles. A subscriber can usually contact the provider to remove the lock for a

fee, utilize private services to remove the lock, or make use of ample software and websites available on the Internet to unlock the handset themselves. While most web sites offer the unlocking for a fee, some do it for free. The locking applies to the handset, identified by its International Mobile Equipment Identity (IMEI) number, not to the account (which is identified by the SIM card). It is always possible to switch to another (non-locked) handset if such other handset is available.

Some providers will unlock the phone for free if the customer has held an account for a certain period. Third party unlocking services exist that are often quicker and lower cost than that of the operator. In most countries removing the lock is legal. Cingular and T-Mobile provide free unlock services to their customers after 3 months of subscription.

In countries like India, Pakistan, Indonesia, Belgium, etc., all phones are sold unlocked. However, in Belgium, it is unlawful for operators there to offer any form of subsidy on the phone's price. This was also the case in Finland until April 1, 2006, when selling subsidized combinations of handsets and accounts became legal though operators have to unlock phone free of charge after a certain period (at most 24 months).

GSM SECURITY:

GSM was designed with a moderate level of security. The system was designed to authenticate the subscriber using shared-secret cryptography. Communications between the subscriber and the base station can be encrypted. The development of UMTS introduces an optional USIM, that uses a longer authentication key to give greater security, as well as mutually authenticating the network and the user - whereas GSM only authenticated the user to the network (and not vice versa). The security model therefore offers confidentiality and authentication, but limited authorization capabilities, and no non-repudiation.

GSM uses several cryptographic algorithms for security. The A5/1 and A5/2 stream ciphers are used for ensuring over-the-air voice privacy. A5/1 was developed first and is a stronger algorithm used within Europe and the United States; A5/2 is weaker and used in other countries. A large security advantage of GSM over earlier systems is that the Key, the crypto variable stored on the SIM card that is the key to any GSM ciphering algorithm, is never sent over the air interface. Serious weaknesses have been found in both algorithms, and it is possible to break A5/2 in real-time in a cipher text-only attack. The system supports multiple algorithms so operators may replace that cipher with a stronger one.

SERVICES PROVIDED BY GSM:

From the beginning, the planners of GSM wanted ISDN compatibility in terms of the services offered and the control signaling used. However, radio transmission limitations, in terms of bandwidth and cost, do not allow the standard ISDN B-channel bit rate of 64 kbps to be practically achieved.

Using the ITU-T definitions, telecommunication services can be divided into bearer services, teleservices, and supplementary services. The most basic teleservices supported by GSM is telephony. As with all other communications, speech is digitally encoded and transmitted through the GSM network as a digital stream. There is also an emergency service, where the nearest emergency-service provider is notified by dialing three digits (similar to 911).

A variety of data services is offered. GSM users can send and receive data, at rates up to 9600 bps, to users on POTS (Plain Old Telephone Service), ISDN, Packet Switched Public Data Networks, and Circuit Switched Public Data Networks using a variety of access methods and protocols, such as X.25 or X.32. Since GSM is a digital network, a modem is not required between the user and GSM network, although an audio modem is required inside the GSM network to interwork with POTS.

Other data services include Group 3 facsimile, as described in ITU-T recommendation T.30, which is supported by use of an appropriate fax adaptor. A unique feature of GSM, not found in older analog systems, is the Short Message Service (SMS). SMS is a bidirectional service for short alphanumeric (up to 160 bytes) messages. Messages are transported in a store-and-forward fashion. For point-to-point SMS, a message can be sent to another subscriber to the service, and an acknowledgement of receipt is provided to the sender. SMS can also be used in a cell-broadcast mode, for sending messages such as traffic updates or news updates. Messages can also be stored in the SIM card for later retrieval

Supplementary services are provided on top of teleservices or bearer services. In the current (Phase 1) specifications, they include several forms of call forward (such as call forwarding when the mobile subscriber is unreachable by the network), and call barring of outgoing or incoming calls, for example when roaming in another country. Many additional supplementary services will be provided in the Phase 2 specifications, such as caller identification, call waiting, multi-party conversations.

GSM SUBSCRIBER SERVICES:

There are two basic types of services offered through GSM: telephony (also referred to as teleservices) and data (also referred to as bearer services). Telephony services are mainly voice services that provide subscribers with the complete capability (including necessary terminal equipment) to communicate with other subscribers. Data services provide the capacity necessary to transmit appropriate data signals between two access points creating an interface to the network. In addition to normal telephony and emergency calling, the following subscriber services are supported by GSM:

- Dual-tone multifrequency (DTMF)- DTMF is a tone signaling scheme often used for various control purposes via the telephone network, such as remote control of an answering machine. GSM supports full-originating DTMF.

- Facsimile group III—GSM supports CCITT Group 3 facsimile. As standard fax machines are designed to be connected to a telephone using analog signals, a special fax converter connected to the exchange is used in the GSM system. This enables a GSM-connected fax to communicate with any analog fax in the network.
- Short message services—A convenient facility of the GSM network is the short message service. A message consisting of a maximum of 160 alphanumeric characters can be sent to or from a mobile station. This service can be viewed as an advanced form of alphanumeric paging with a number of advantages. If the subscriber's mobile unit is powered off or has left the coverage area, the message is stored and offered back to the subscriber when the mobile is powered on or has reentered the coverage area of the network. This function ensures that the message will be received.
- Cell broadcast—a variation of the short message service is the cell broadcast facility. A message of a maximum of 93 characters can be broadcast to all mobile subscribers in a certain geographic area. Typical applications include traffic congestion warnings and reports on accidents.
- Voice mail—this service is actually an answering machine within the network, which is controlled by the subscriber. Calls can be forwarded to the subscriber's voice-mail box and the subscriber checks for messages via a personal security code.
- Fax mail—with this service, the subscriber can receive fax messages at any fax machine. The messages are stored in a service center from which they can be retrieved by the subscriber via a personal security code to the desired fax number.

SUPPLEMENTARY SERVICES

GSM supports a comprehensive set of supplementary services that can complement and support both telephony and data services. Supplementary services are defined by GSM and are characterized as revenue-generating features. A partial listing of supplementary services follows.

- Call forwarding—this service gives the subscriber the ability to forward incoming calls to another number if the called mobile unit is not reachable, if it is busy, if there is no reply, or if call forwarding is allowed unconditionally.
- Barring of outgoing calls—this service makes it possible for a mobile subscriber to prevent all outgoing calls.
- Barring of incoming calls—this function allows the subscriber to prevent incoming calls. The following two conditions for incoming call barring exists: barring of all incoming calls and barring of incoming calls when roaming outside the home PLMN.
- Advice of charge (AoC)—The AoC service provides the mobile subscriber with an estimate of the call charges. There are two types of AoC information: one that provides the subscriber with an estimate of

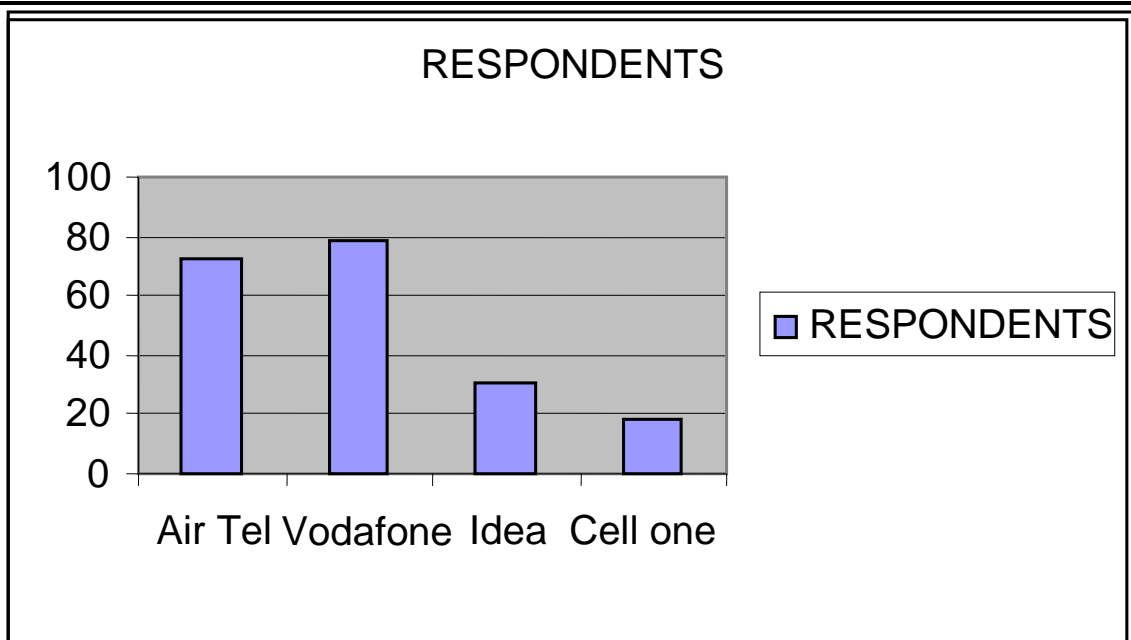
the bill and one that can be used for immediate charging purposes. AoC for data calls is provided on the basis of time measurements.

- Call hold—this service enables the subscriber to interrupt an ongoing call and then subsequently reestablish the call. The call hold service is only applicable to normal telephony.
- Call waiting—this service enables the mobile subscriber to be notified of an incoming call during a conversation. The subscriber can answer, reject, or ignore the incoming call. Call waiting is applicable to all GSM telecommunications services using a circuit-switched connection.
- Multiparty service—the multiparty service enables a mobile subscriber to establish a multiparty conversation—that is, a simultaneous conversation between three and six subscribers. This service is only applicable to normal telephony.
- Calling line identification presentation/restriction—These services supply the called party with the integrated services digital network (ISDN) number of the calling party. The restriction service enables the calling party to restrict the presentation. The restriction overrides the presentation.

Closed user groups (CUGs)—CUGs are generally comparable to a PBX. They are a group of subscribers who are capable of only calling themselves and certain numbers.

1. Which Service provider are you currently subscribing for your mobile?

CATEGORY	RESPONDENTS
Air Tel	72
Vodafone	79
Idea	31
Cell One	18

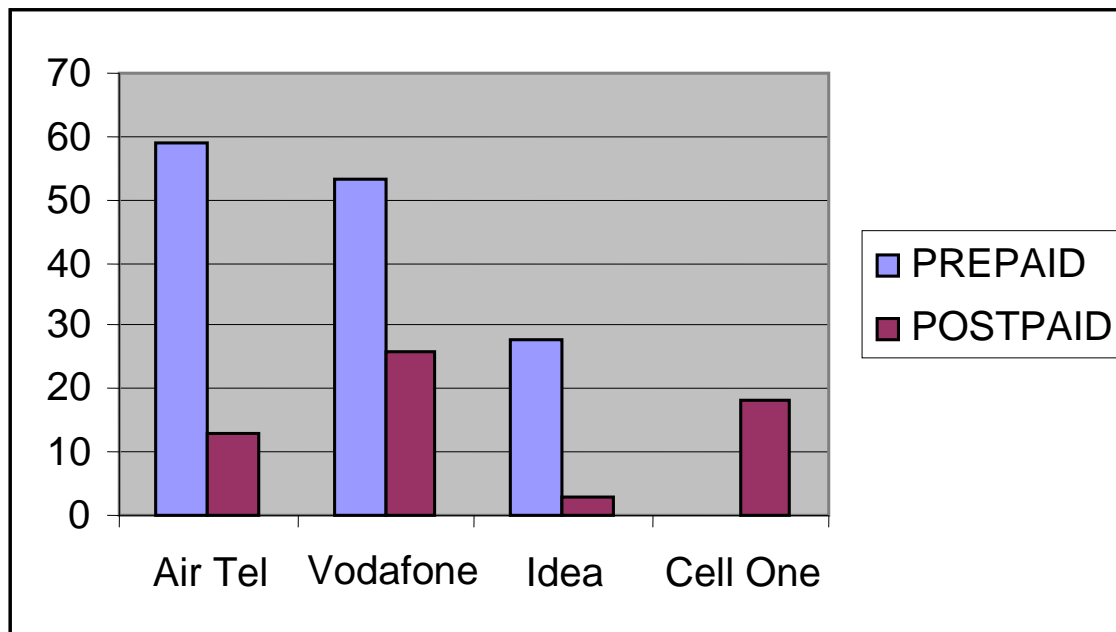


INTERPRETATION:

Out of 200 people who participated in survey it is found 72 are using Air Tel, 79 are using Vodafone, 31 are using Idea and 18 are using Cell One. The majority of the market share is captured by VODAFONE.

2. What is the service which you subscribed?

CATEGORY	PREPAID	POSTPAID
Air Tel	59	13
Vodafone	53	26
Idea	28	03
Cell One	00	18



INTERPRETATION:

Out of 72 respondents of Air Tel 53 members are prepaid subscribers and 19 are postpaid subscribers.

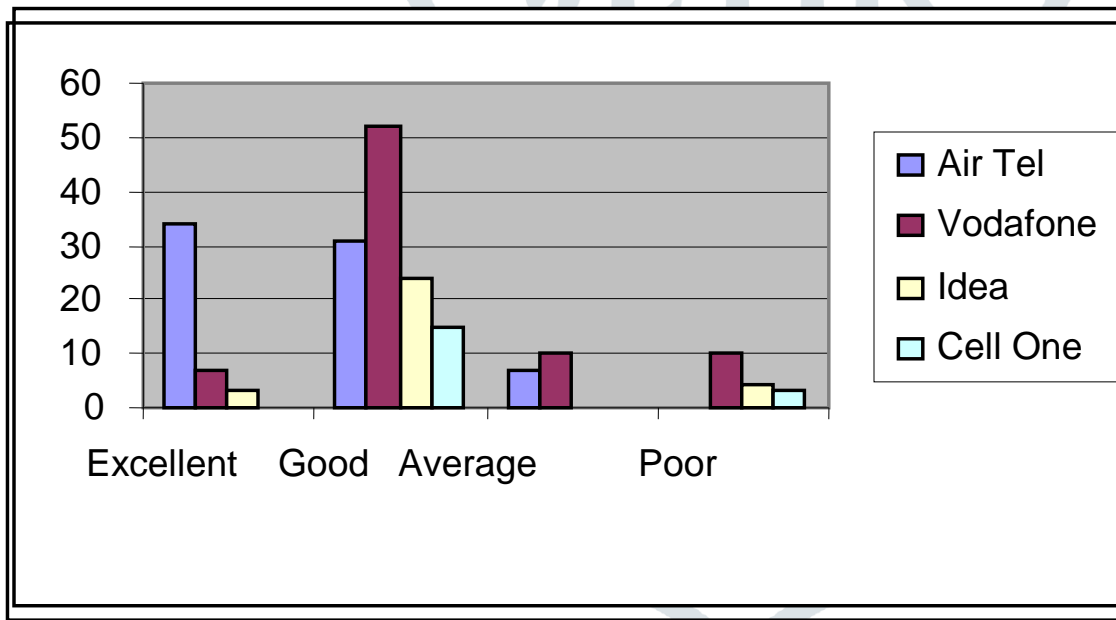
Out of 79 respondents of Vodafone 53 members are prepaid subscribers and 26 are postpaid subscribers.

Out of 31 respondents of Idea 28 members are Prepaid subscribers and 03 are Postpaid subscribers.

Out of 18 respondents of Cell One 0 members are Prepaid subscribers and 18 are Postpaid subscribers.

3. How do you find the services of your provider?

Category	Excellent	Good	Average	Poor
Air Tel	34	31	07	00
Vodafone	07	52	10	10
Idea	03	24	00	04
Cell One	00	15	00	03

**INTERPRETATION:**

Out of 72 respondents of Air Tel 34 members said that the service offered by Air Tel are Excellent, 31 members said the services is Good and 07 members said the service is Average.

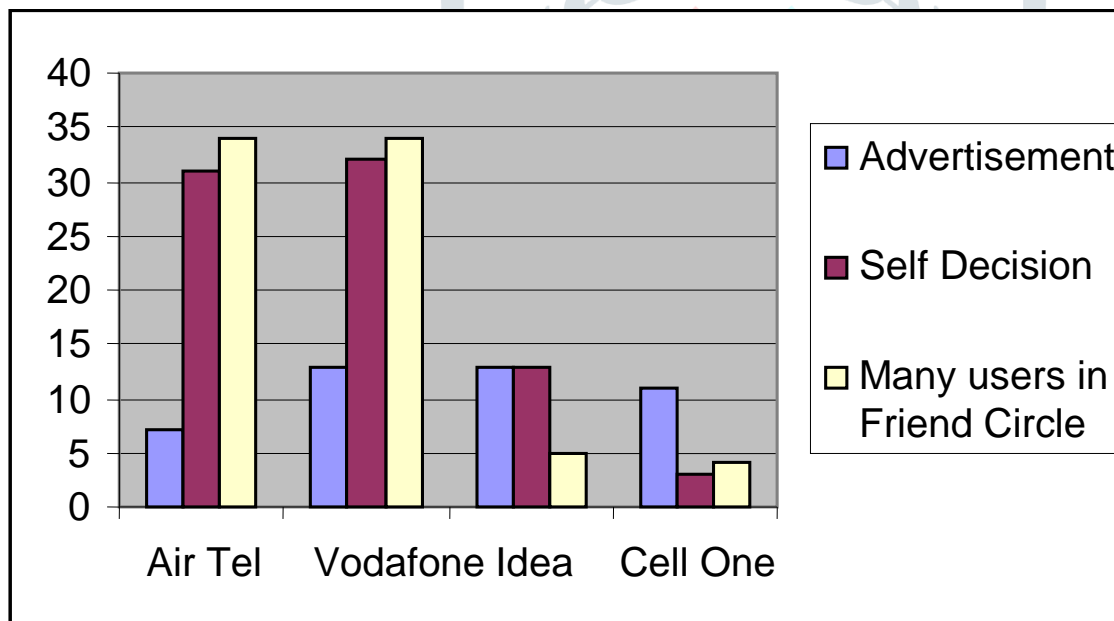
Out of 79 respondents of Vodafone 07 members said that the service offered by Vodafone is Excellent, 52 members said the services is Good, 10 members said the service is Average and 10 members said the service is Poor.

Out of 31 respondents of Idea 03 members said that the service offered by Idea is Excellent, 24 members said the service is Good, 00 members said the service is Average and 04 members said the service is Poor.

Out of 18 respondents of Cell One 00 members said that the service offered by Cell One is Excellent, 15 members said the service is Good, 00 members said the service is Average and 03 members said the service Poor.

4. Why did you opt for this service provider?

Category	Advertisement	Self Decision	Many users in Friend Circle
Air Tel	07	31	34
Vodafone	13	32	34
Idea	13	13	05
Cell One	11	03	04



INTERPRETATION:

Out of 72 respondents of Air Tel 07 members opt for Air Tel by seeing an advertisement, 31 members on their self decision and 34 members are using because of many users in their friend circle.

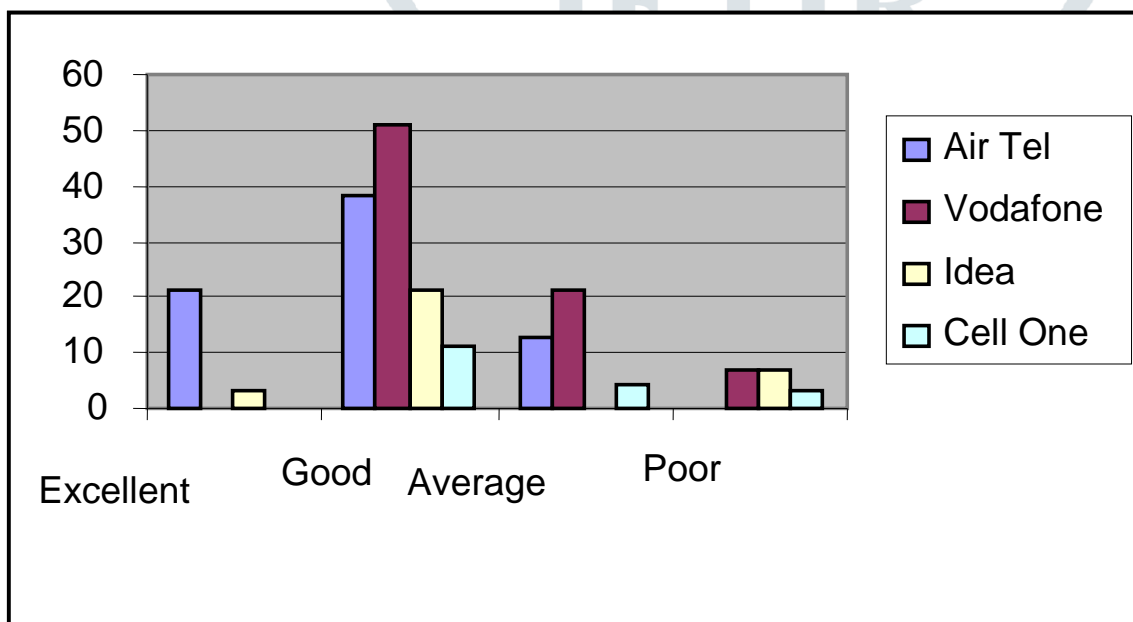
Out of 79 respondents of Vodafone 13 members opt for Vodafone by seeing an advertisement, 32 members on their self decision and 34 members are using because of many users in their friend circle.

Out of 31 respondents of Idea 13 members opt for Idea by seeing an advertisement, 13 members on their self decision and 05 members are using because of many users in their friend circle.

Out of 18 respondents of Cell One 11 members opt for Cell One by seeing an advertisement , 03 members on their self decision and 04members are using because of many users in their friend circle.

5. How do you find the packages offered by the service provider?

Category	Excellent	Good	Average	Poor
Air Tel	21	38	13	0
Vodafone	0	51	21	07
Idea	03	21	0	07
Cell One	0	11	04	03



INTERPRETATION:

Out of 72 respondents of Air Tel 21 members said that the packages offered by Air Tel is Excellent, 38 members said the packages are Good, 13 members said the packages are Average and 00 members said the packages are Poor.

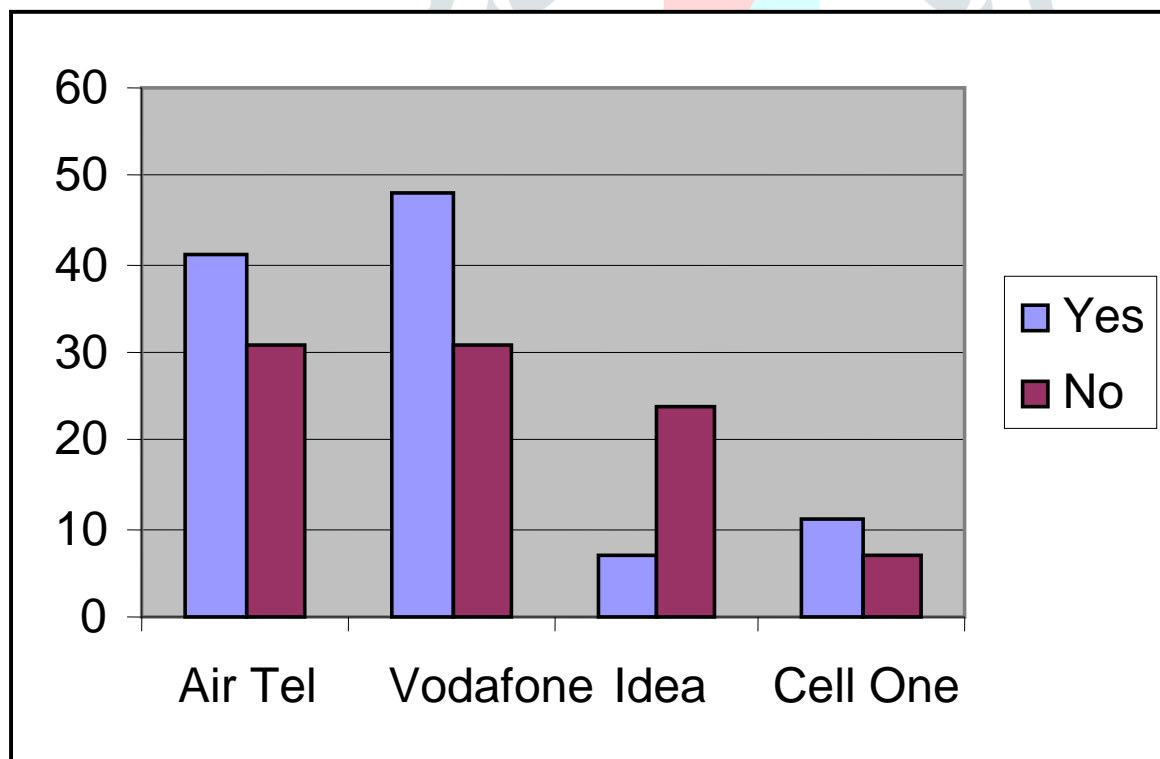
Out of 79 respondents of Vodafone 00 members said that the packages offered by Vodafone is Excellent, 51 members said the packages are Good, 21 members said the packages are Average and 07 members said the packages are Poor.

Out of 31 respondents of Idea 03 members said that the packages offered by Idea is Excellent, 21 members said the packages are Good, 00 members said the packages are Average and 07 members said the packages are Poor.

Out of 18 respondents of Cell One 00 members said that the packages offered by Cell One is Excellent, 11 members said the packages are Good, 04 members said the packages are Average and 03 members said the packages are Poor.

6. Do you try new packages offered?

Category	Yes	No
Air Tel	41	31
Vodafone	48	31
Idea	07	24
Cell One	11	07



INTERPRETATION:

Out of 72 respondents of Air Tel 41 members said that they will try the new packages offered by Air Tel and 31 members said that they don't try.

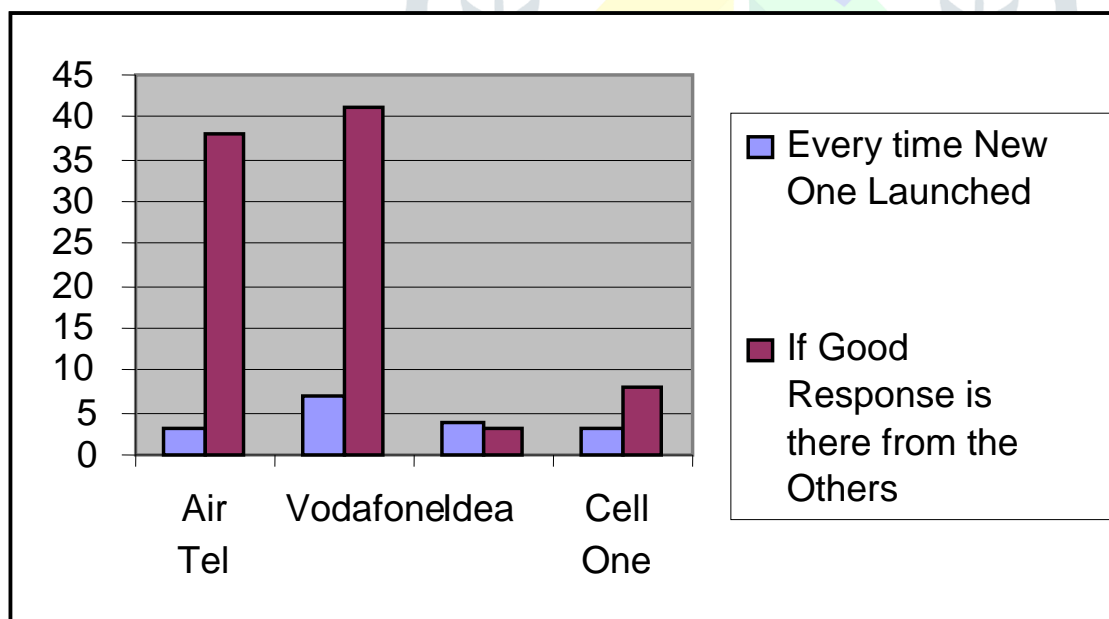
Out of 79 respondents of Vodafone 48 members said that they will try the new packages offered by Vodafone and 31 members said that they don't try.

Out of 31 respondents of Idea 07 members said that they will try the new packages offered by Idea and 24 members said that they don't try.

Out of 18 respondents of Cell One 11 members said that they will try the new packages offered by Cell One and 07 members said that they don't try.

7. If yes for (6), how frequently you try the packages?

Category	Every time New One Launched	If Good Response is there from the Others
Air Tel	03	38
Vodafone	07	41
Idea	04	03
Cell One	03	08



INTERPRETATION:

Out of 41 respondents of Air Tel who said will try 03 members said that they will try every time new package is launched, 38 members said that they will try if good response is their from the people who used it.

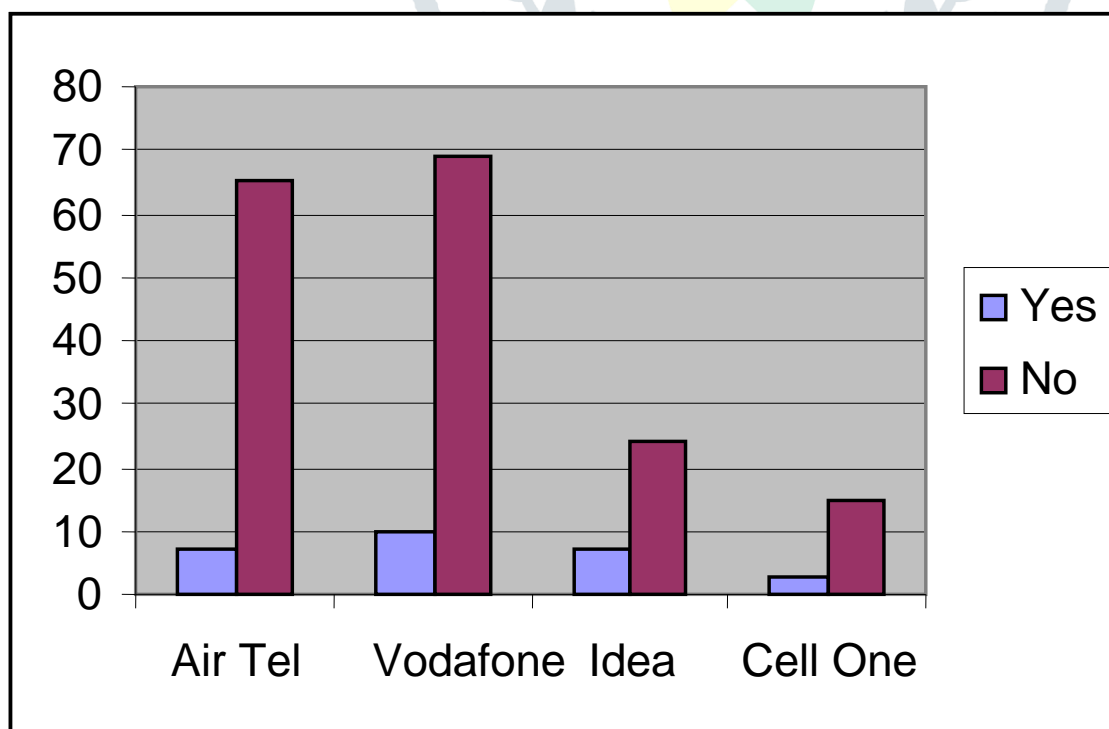
Out of 48 respondents of Vodafone who said will try 07 members said that they will try every time new package is launched, 41 members said that they will try if good response is their from the people who used it.

Out of 07 respondents of Idea who said will try 04 members said that they will try every time new package is launched, 03 members said that they will try if good response is their from the people who used it.

Out of 11 respondents of Cell One who said will try 03 members said that they will try every time new package is launched, 08 members said that they will try if good response is their from the people who used it.

8. Do you use any other service provider's service parallel with current provider?

Category	Yes	No
Air Tel	07	65
Vodafone	10	69
Idea	07	24
Cell One	03	15



INTERPRETATION:

Out of 72 respondents of Air Tel 07 members are using other service providers parallel to the current service provider and 65 members they don't use any other service.

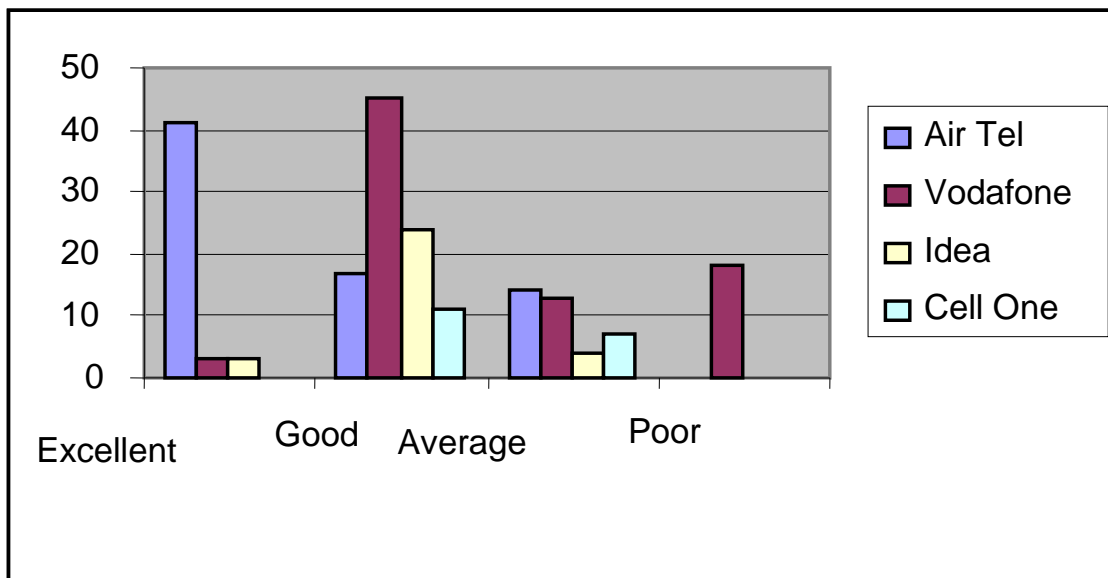
Out of 79 respondents of Vodafone 10 members are using other service providers parallel to the current service provider and 69 members they don't use any other service.

Out of 31 respondents of Idea 07 members are using other service providers parallel to the current service provider and 24 members they don't use any other service.

Out of 18 respondents of Cell One 03 members are using other service providers parallel to the current service provider and 15 members they don't use any other service.

9. How do you find the network of your service provider?

Category	Excellent	Good	Average	Poor
Air Tel	41	17	14	0
Vodafone	03	45	13	18
Idea	03	24	04	0
Cell One	0	11	07	0



INTERPRETATION:

Out of 72 respondents of Air Tel 41 members said that the Net Work of Air Tel is Excellent, 17 members said the Net Work is Good, 14 members said the Net Work is Average and 00 members said the Net Work is Poor.

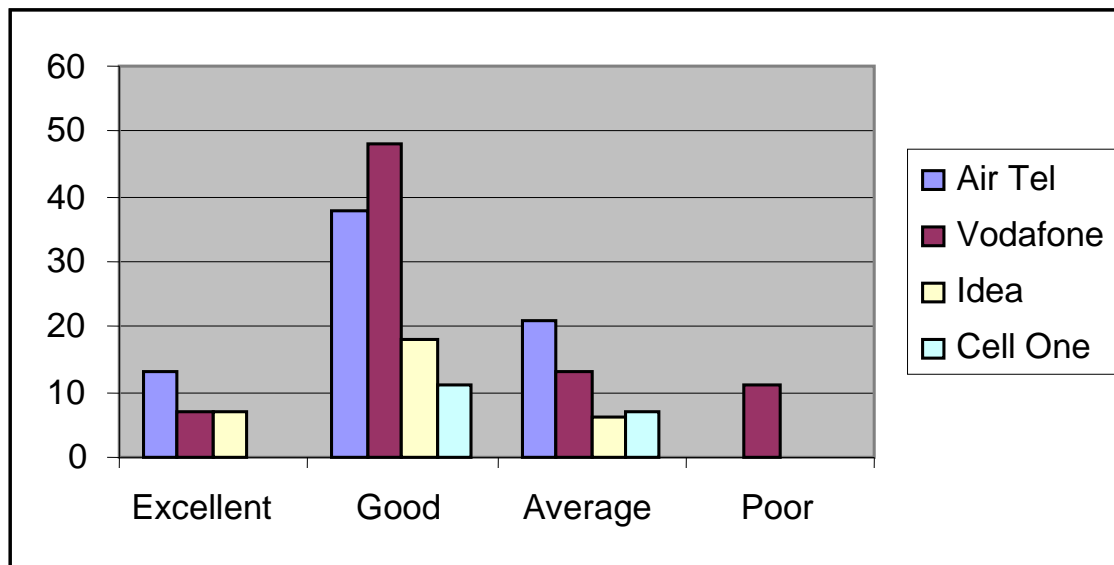
Out of 79 respondents of Vodafone 03 members said that the Net Work of Vodafone is Excellent, 45 members said the Net Work is Good, 13 members said the Net Work is Average and 18 members said the Net Work is Poor.

Out of 31 respondents of Idea 03 members said that the Net Work of Idea is Excellent, 24 members said the Net Work is Good, 04 members said the Net Work is Average and 00 members said the Net Work is Poor.

Out of 18 respondents of Cell One 00 members said that the Net Work of Cell One is Excellent, 11 members said the Net Work is Good, 07 members said the Net Work is Average and 00 members said the Net Work is Poor.

10. How is the customer care service of your service provider?

Category	Excellent	Good	Average	Poor
Air Tel	13	38	21	0
Vodafone	07	48	13	11
Idea	07	18	06	0
Cell One	0	11	07	0



INTERPRETATION:

Out of 72 respondents of Air Tel 13 members said that the Customer Care of Air Tel is Excellent, 38 members said the Customer Care is Good, 21 members said the Customer Care is Average and 00 members said the Customer Care is Poor.

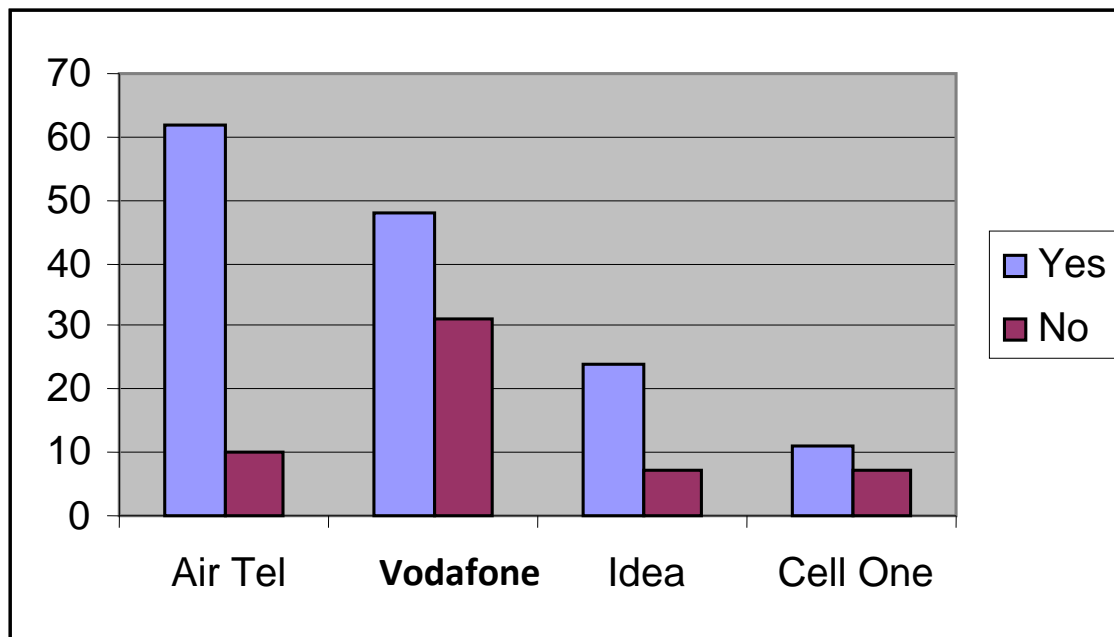
Out of 79 respondents of Vodafone 07 members said that the Customer Care of Vodafone is Excellent, 48 members said the Customer Care is Good, 13 members said the Customer Care is Average and 11 members said the Customer Care is Poor.

Out of 31 respondents of Idea 07 members said that the Customer Care of Idea is Excellent, 18 members said the Customer Care is Good, 06 members said the Customer Care is Average and 00 members said the Customer Care is Poor.

Out of 18 respondents of Cell One 00 members said that the Customer Care of Cell One is Excellent, 11 members said the Customer Care is Good, 07 members said the Customer Care is Average and 00 members said the Customer Care is Poor.

11. Do you advice people to opt for service you are using?

Category	Yes	No
Air Tel	62	10
Vodafone	48	31
Idea	24	07
Cell One	11	07



INTERPRETATION:

Out of 72 respondents of Air Tel 62 members said that they will advice people to opt for the service they are using.

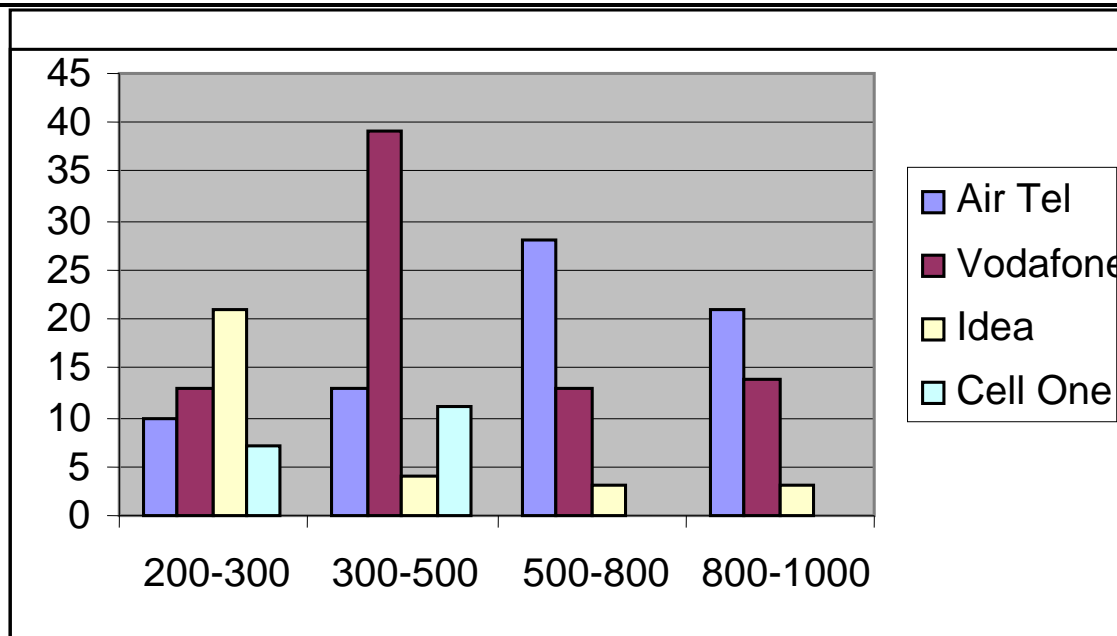
Out of 79 respondents of Vodafone 48 members said that they will advice people to opt for the service they are using.

Out of 31 respondents of Idea 24 members said that they will advice people to opt for the service they are using.

Out of 18 respondents of Cell One 11 members said that they will advice people to opt for the service they are using.

12. How much do you spend every month for your mobile?

Category	200-300	300-500	500-800	800-1000
Air Tel	10	13	28	21
Vodafone	13	39	13	14
Idea	21	04	03	03
Cell One	07	11	0	0



INTERPRETATION:

Out of 72 respondents of Air Tel 10 members are spending between 200-300, 13 members are spending between 300-500, 28 members are spending between 500-800 and 21 members are spending between 800-1000.

Out of 79 respondents of Vodafone 13 members are spending between 200-300, 39 members are spending between 300-500, 13 members are spending between 500-800 and 14 members are spending between 800-1000.

Out of 31 respondents of Idea 21 members are spending between 200-300, 04 members are spending between 300-500, 03 members are spending between 500-800 and 03 members are spending between 800-1000.

Out of 18 respondents of Cell One 07 members are spending between 200-300, 11 members are spending between 300-500, 00 members are spending between 500-800 and 00 members are spending between 800-1000.

METHODOLOGY OF STUDY:

- Data is collected from the primary and secondary sources.
- Primary Source:
 - A well structured questionnaire is prepared to know the respondents opinion.
- Secondary Source:
 - Different web sites, company reports, research company's reports (McKinsey, PWC, etc...).

CONCLUSION

- Out of 200 respondents who participated in the study 72 are using Air Tel, 79 are using Vodafone, 31 are using Idea and 18 are using Cell one.

- The main criteria of selecting the service provider is the network and the friend circle if many uses in their friend circle people are going to that service provider. Especially the students where the study is conducted they are opting for a particular service provider because many uses in their friend circle.
- The packages are playing vital role in choosing a particular service. In this area packages offered by Vodafone are comparatively better than the other service providers that's the reason market share of Vodafone is more than the others. The network of Vodafone is poor in rural areas they have to improve the network if they want to increase their subscriber base. The customer care of Vodafone is good.
- The network and packages of Air Tel is good so, it occupies the second place in the market share of student community. The majority subscribers of Air Tel are business people the packages and services are more beneficial to them. If Air Tel wants to increase their subscriber base they have to give more attracting packages. The customer care of Air Tel is good.
- Idea occupies third place in the market share of student community. The network and packages are average. The customer care of Idea is poor.
- Cell one occupies fourth place in the market share of student community.
- The network of Cell one is excellent in every part of India but the packages and the customer care of Cell one is very poor.

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