

Evaluation of 4G Technology in Mobile Phone Network in Bangladesh



Inspiring Excellence

Master of Business Administration

Internship Report

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Letter of Transmittal

April 24, 2019

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Subject: **Submission of Internship Report**

Sir,

It is an immense pleasure to present you my research report on “**Evaluation of 4G Technology in Mobile Phone Network in Bangladesh**” which is a partial requirement for the completion of MBA Program.

I have completed my internship program at LM Ericsson Bangladesh Ltd. for a period of 12 weeks. The main objective of this report was to know the effect of 4G technology in mobile phone network in business perspective and to evaluate mobile phone users’ feedback. This paper also includes the usage of 4G network in different mobile phone operators and to know user feedback after implementing the new technology that has been introduced in Bangladesh.

Despite the time constraints and less available information, I have tried my level best to complete the research paper successfully. I hope you will be lenient in your assessment focusing more on my efforts than its resourcefulness.

Yours faithfully,

Sabrina Jannath

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Acknowledgement

I would like to express my gratitude and appreciation to all those who helped me to facilitate the completion of this report.

A special thanks to my internship supervisor Dr. Salehuddin Ahmed, Department of Master of Business Administration, BRAC University for his inspiring suggestions and encouragement, which helped me to realize this report. His guidance and encouragement have been a great contribution in completing this report.

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Executive Summary

Mobile telecom industry has flourished immensely since its introduction in Bangladesh. Besides voice and text, people are presently using data and content base services. The country has already entered the 4G era in February 2018. Bangladesh government is aiming to make “Digital Bangladesh” and telecom sector is playing a vital role in this.

At this moment, there are four telecom operator companies with four brands in Bangladesh serving total 158.438 million subscribers. Those brands are: Grameen Phone (GP), Robi, Banglalink, and Teletalk. Also, there are few widespread network providers working to setup strong network over the country. Among them Ericsson is one of the renowned network service provider company in Bangladesh serving since 1996.

A survey was conducted to evaluate the 4G technology’s widespread usage in mobile phone network in Bangladesh. 4G is aiming to provide mobile voice, video and data services by promoting low cost deployment and service models through internet friendly architectures and protocols. It’s been observed that there is a growing interest of network operators across the world to migrate their existing 2G/3G networks to 4G technologies to enhance the user experience and service. However, although 4G technology will give a new dimension to the Mobile and Internet industry in Bangladesh, but it’s worthwhile to understand whether deploying 4G technology in Bangladesh is viable or not for mobile operators. Keeping that in mind, in this report the focus is given on operators benefit, end user means customers’ feedback and how Ericsson is contributing for 4G deployment in Bangladesh.

Chapter 1 Introduction

1.1 Introduction of 4G

4G technology signifies an evolutionary step in advancement of mobile technology era. 4G was first standardized in 2012. It is the fourth generation of mobile telecommunications technology. 4G has many advantages such as improved spectral efficiency, enormous increase in speed than 3G, and the capability to address capacity issues through the dynamic addition of new spectrum bands. It also promises attractive long-term financial benefits to service providers. 4G based network has fundamentally changed operator business models making them more data-centric. It is also enabling operators to create new revenue streams and repositioning voice and text services, which are being undermined by OTT providers.

With 4G, the fourth generation of mobile telephony, the users can reach mobile broadband speed up to ten times higher than of Turbo-3G, or 80 Mbit/s in optimal conditions. 4G is based on the LTE technology (Long Term Evolution), an international standard and a complete IP based technology for data transmission.

4G availability is being expanded day by day over the world at a steady pace. Till 2018 it has been seen that 88 countries have 4G coverage. 5 countries South Korea, Japan, Norway, Hong Kong and USA have the highest 4G coverage and it's over 90% coverage. Soon 4G will be dominating in the mobile technology and surpassing half of the global mobile connection in 2019. By 2023 it will reach 60% all over the world.

4G technologies offer users a wider range of advanced services while achieving greater network capacity through -

- Large file transfer
- Improved spectral efficiency
- Videoconferencing, tele-presence
- Higher bandwidth (data speeds)
- Low latency, lower idle-to-active times (improved network responsiveness)

- Backwards compatibility and future-proofing
- Easier integration and improved cost-efficiency through IP network
- Enhancements to security and Quality of Service differentiation

LTE was created as an upgrade to the 3G standards. The cellular industry recognized its major benefits and virtually every mobile carrier has embraced it as the next generation. All cellular operators are now on the path to implement LTE. While 3GPP still defines LTE as a 3.9G technology, all the current LTE networks are marketed as 4G. The real 4G as designated by 3GPP is LTE-A.

TeliaSonera was the first operator in the world who launched 4G commercially in 2009 in the city center of Stockholm and Oslo. A year later, 4G was launched in Finland. In 2014 TeliaSonera offered 4G services in 10 countries.

1.2 Frequency Spectrum of 4G

4G supports different frequencies and flexible in supporting different carrier width. It can also be reframed in 2G/3G spectrum. 1800 MHz and 2100 MHz band are mostly used for 4G coverage. This is because the 1800MHz band provides better coverage and many operators can reuse the GSM 1800 spectrum they already own. This, in turn, has resulted in the widest range of devices being available in this frequency.

Other bands like 700MHz, 850MHz, 900MHz, 2300MHz and 26MHz are also being used for 4G coverage all over the world.

1.3 Evaluation of 4G

The main technological development that distinguished the First-Generation mobile phones from the earlier telecommunication technologies was the use of multiple cell sites and the ability to transfer calls from one site to the next as the user travelled between cells during a conversation. The first commercially automated cellular network (the 1G generations) was launched in Japan by NTT in 1979. In 1G, Narrow band analogue wireless network is used; with this we can have the voice calls.

In the 1990s, the 'second generation' (2G) mobile phone systems emerged, primarily using the GSM standard. The second generation introduced a new variant to communication as SMS text messaging became possible, initially on GSM networks and eventually on all digital networks. Later “2.5G” i.e. GPRS (General Packet Radio Service) with a data rate of 56 Kbit/s to 115 Kbit/s was introduced in the year of 2000 and 2.75G i.e. EDGE (Enhanced Data Rates for GSM Evolution) with a data rate of 384kbit/s speed was introduced in the year of 2003 in order to enable services such as Wireless Application Protocol (WAP) access, Multimedia Messaging Service (MMS), and for Internet communication services i.e. email and World Wide Web(www) access.

As the use of 2G phones became more widespread and people began to use mobile phones in their daily lives, it became clear that demand for data services (such as access to the internet) was growing. So, the industry began to work on the next generation of technology known as 3G.

The main technological difference that distinguishes 3G technology from 2G technology is the use of packet switching rather than circuit switching for data transmission. The high connection speeds of 3G technology enabled a transformation in the industry: for the first time, media streaming of radio and even television content to 3G handsets became possible. In the mid-2000s an evolution of 3G technology began to be implemented namely High-Speed Downlink Packet Access (HSDPA).





1G	2G	3G	4G
			
1st Generation Wireless network	2nd Generation Wireless network	3rd Generation Wireless network	4th Generation Wireless network
<ul style="list-style-type: none"> • Basic voice service • Analog-based protocols 	<ul style="list-style-type: none"> • Designed for voice • Improved coverage and capacity • First digital standards (GSM, CDMA) 	<ul style="list-style-type: none"> • Designed for voice with some data consideration (multimedia, text, internet) • First mobile broadband 	<ul style="list-style-type: none"> • Designed primarily for data • IP-based protocols (LTE) • true mobile broadband
The Speed			
2.4 kbps	64 kbps	2000 kbps	100,000 kbps

Figure 1: Evaluation of Technology

Consequently, the industry began looking to data-optimized 4th-generation technologies, with the promise speed improvements up to 10-fold over existing 3G technologies. It is basically the

extension in the 3G technology with more bandwidth and service offers in the 3G. The expectation for the 4G technology is basically the high-quality audio & video streaming over end to end Internet Protocol.

One of the main ways in which 4G differed technologically from 3G was in its elimination of circuit switching, instead employing an all-IP network. Thus, 4G ushered in a treatment of voice calls just like any other type of streaming audio media, utilizing packet switching over internet.

1.4 Objective

There are a broad objective and four specific objectives of this report.

Broad Objective: Broad objective is to evaluate 4G technology in mobile phone network in Bangladesh.

Specific Objective: Specific objectives of this project are to –

- Evaluate business effect after introducing 4G technology among different operators
- Understand effect of 4G network among the customer in Bangladesh
- Assess contribution of Ericsson in 4G technology in Bangladesh & compare with other competitors in Bangladesh
- Identify ways for Ericsson to expand business in Bangladesh

1.5 Rationale

This internship report will help Ericsson Bangladesh to evaluate its contribution in telecom sector especially in 4G mobile network of Bangladesh. It will also help the company to make future strategies. This internship report will support researchers or students too who want to research on this company or telecom sector.

1.6 Scope

The scope of this report is limited to the mobile telecom operators and service providers of telecom industry in Bangladesh. No other companies outside the sector are considered.

1.7 Limitations

Various limitations were faced during the preparation of this report. But full effort was given to overcome these limitations. Some of those are:

Access to information was not always possible as many of them were confidential.

It was hard for me to get the financial data or user count from operator as I'm working in a service provider company. So, communication with related people was seldom.

Participants of the interviews were selected by judgmental sampling and survey respondents were selected by convenience sampling. Though online survey was conducted, face to face survey was completed only in Dhaka city. Thus, the research may not be a true representative one of the actual scenarios.

Lack of experience in preparing questionnaire and performing survey caused problems in data collection and analyses. Some respondents were not opened to answer important questions.

Chapter 2 Methodology

There are two different methodologies for approaching a problem-

a) Qualitative Methods

b) Quantitative methods

The most important difference between them is how we use numbers and statistics. Often, one can combine quantitative and qualitative methods in the same research.

We have practiced the qualitative research technique in form of personal interviews with mobile phone users, operator staffs of Robi, GP, Banglalink and Ericsson management team. Internet survey & personal survey have been done for data collection for quantitative analysis.

2.1 Data Collection and Sources

For data collection primary and secondary sources were used.

Primary Data: Personal interviews, internet survey, personal survey.

Secondary Data: Journal Articles, annual reports, books, newspapers, related websites.

2.2 Personal Interview

Personal interviews were conducted in two phases. First phase was before preparing the questionnaire where mobile phone users/operator personnel were interviewed. This helped to prepare the survey questionnaire design.

In the second phase of personal interview, employees of Ericsson and telecom experts were interviewed. These interviews supported to provide strategies and recommendations to improve the brand perception of Ericsson and to improve 4G network. Interviewees were selected based on convenience and judgment of the interviewer.

2.3 Survey

Personal surveys were conducted face to face with prepared questionnaire. Online survey was conducted through Google docs. Questionnaire includes different types of questions such as: multiple choice questions, dichotomous questions, open ended questions, scales, ordering questions etc. First a draft of questionnaire was presented to 10 people for pretesting and then final version were prepared with necessary modifications. Survey respondents were selected based on convenience and judgment of the surveyor.

2.4 Data Analysis Technique

Data analysis was done from the survey questions result. Results are given in the Report Analysis and Findings chapter.

Chapter 3 Mobile Market in Bangladesh

3.1 4G in Bangladesh

The mobile telecom industry in Bangladesh is growing rapidly and is making a significant contribution to economic development and employment generation. Before 1990, telecommunication in Bangladesh was limited to wired telephone only. Very few people were able to avail that facility. With the development of technology, telecom sector has advanced a lot. In consequence, just before the beginning of the 90's Bangladesh was introduced with mobile telephony. Since then the mobile telecom sector has improved immensely. In the past, people used mobile phones only for voice communication or text messages. The scenario changed rapidly as different services emerged. Besides voice and text people are presently using data and content-based services. In Bangladesh majority of the internet users use smart phones to get access in internet.

Bangladesh has entered the 4G era in February 2018. Bangladesh government is aiming for building “Digital Bangladesh” and telecom sector is playing a vital role in this. All the existing four telecom operator companies have got 4G license. At this moment, four telecom operator companies are serving total 158.438 million Bangladeshi mobile subscribers. Also 86.268 million subscriber uses mobile internet. These operators are: Grameen Phone (GP), Robi, Banglalink, and Teletalk.

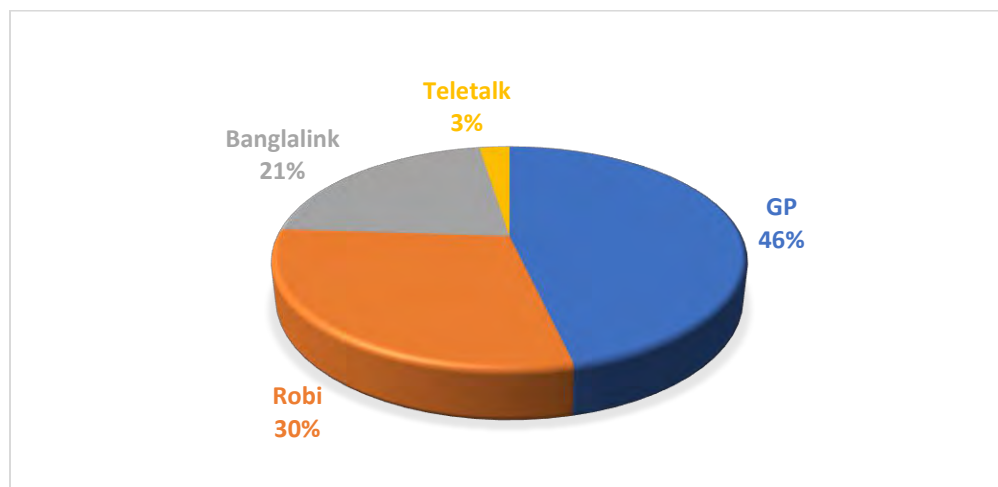


Figure 2: Subscriber of Mobile operators in Bangladesh

3.2 Mobile Operators in Bangladesh

3.2.1 Grameenphone

Grameenphone is one of the leading telecommunications operators of Bangladesh. It is a part of Telenor Group which owns network in 13 countries and has operations in 29 countries. Grameenphone started its journey with the Village Phone program: a pioneering initiative to empower rural women of Bangladesh. The name Grameenphone translates to “Rural phone”. Starting its operations on March 26, 1997, the Independence Day of Bangladesh. Grameenphone was the first operator to introduce GSM Technology in this country. Grameenphone pioneered the breakthrough initiative of mobile to mobile telephony and became the first operator to cover 99% of the country’s people with network.

Since its inception Grameenphone has built the largest cellular network in the country. Presently, nearly 99 percent of the country's population is within the coverage area of the Grameenphone network.

Grameenphone has always been a pioneer in introducing new products and services in the local telecom market. Grameenphone was also the first telecommunication operator in Bangladesh to introduce the prepaid service in September 1999. It established the first 24-hour Call Center, introduced value-added services such as VMS, SMS, fax and data transmission services, international roaming service, WAP, SMS-based push-pull services, EDGE, personal ring back tone and many other products and services. In October 2013 the company launched 3G services commercially. The entire Grameenphone network is 3G/EDGE/GPRS enabled, allowing access to high-speed Internet and data services from anywhere within the coverage area. Today, Grameenphone is the leading and largest telecommunications service provider in Bangladesh with 73.470 million subscribers as of February 2019.

3.2.2 Robi

Robi, the most dynamic and rapidly-growing telecommunications operator in Bangladesh. Now a days it is developing services to meet increasing customer needs - ranging from voice and high-speed Internet services to tailor-made telecommunications solutions. It commenced operation in 1997 as Telekom Malaysia International (Bangladesh) with the brand name ‘Aktel’. In 2010 the

company was rebranded to ‘Robi’ and the company changed its name to Robi Axiata Limited. Robi is a joint venture company between Axiata Group Berhad of Malaysia and NTT DoCoMo Inc. of Japan.

Robi was the first operator to introduce GPRS and 3.5G services in the country. It is the first company to launch 4.5G service in all the 64 districts of the country. In fact, this landmark milestone was achieved on the first day of the commercial launch of the service by Robi on 20 February 2018. By the end of 2018, Robi created the largest 4.5G network of the country with nearly 7,400 sites covering 99 per cent of the thanas of the country.

Robi also proudly claims to have the widest international roaming coverage with 398 operators across 182 countries with widest 4G roaming footprint in 29 countries with 40 operators.

On 16 November 2016 Robi Axiata Limited (Robi) started its commercial operation following the merger with Airtel Bangladesh. As of now, this is the biggest ever merger of the country and first ever merger in the mobile telecom sector of Bangladesh.

Robi’s customer centric solution includes value added services (VAS), quality customer care, digital network security and flexible tariffs. Robi is committed to provide best data and voice quality and will continue to ensure that its customers are able to enjoy the best experience through leading edge technology and innovative products and services.

3.2.3 Teletalk

Teletalk Bangladesh Limited was incorporated as a public limited company under Companies Act, 1994 and obtained Certificate of Commencement of Business on 26 December 2004. It started business as the solitary state sponsored mobile telephone company in Bangladesh. Before that on 1 September 2004, Teletalk obtained the Cellular Mobile Phone Operator License from Bangladesh Telecom Regulatory Commission (“BTRC”) for a duration of 15 years. Primarily the license was allotted in the name of BTTB, and afterwards upon application, BTRC changed the name of the operator as Teletalk Bangladesh Limited.

Teletalk is operating within the GSM 900 and GSM 1800 bands as per slots distributed by BTRC. Teletalk started its commercial operation on 31 March 2005 with huge expectation of people.

Teletalk was authorized to launch 3G service on commercially experimental basis and 3G technology was introduced in Bangladesh on 14 October 2012. Teletalk enjoyed this facility solely for one year before giving license to other operators. In August 15, 2018, Teletalk launched 4G service at several areas in Dhaka city.

3.2.4 Banglalink

Sheba Telecom (Pvt.) Ltd. was granted license in 1989 and after 15 years they got GSM license in November 1996 to extend its business to cellular mobile, radio telephone services. It launched operation in the last quarter of 1997 as a Bangladesh-Malaysia joint venture.

In September 2004, Orascom Telecom Holdings purchased 100% of the shares of Sheba Telecom Pvt. and changed its name as Orascom Telecom Bangladesh Limited, matching its parent company name.

In July 2013, following the 2011 ownership restructuring in the parent company, the company name changed for the second time to Banglalink Digital Communications Ltd. Since Banglalink's launch, its impact was felt immediately: overnight mobile telephony became an affordable option for customers across a wide range of market segments. Banglalink overtook Aktel in less than two years to become the second largest operator in Bangladesh with more than 7.1 million customers. Banglalink currently has 32.022 million subscribers as of February 2019, which represents a market share of 21%. Banglalink's growth over the preceding years have been fueled with innovative products and services targeting different market segments, aggressive improvement of network quality and dedicated customer care, creating an extensive distribution network across the country, and establishing a strong brand that emotionally connected customers with Banglalink.

Chapter 4 Company Overview

4.1 Ericsson

Ericsson is a Swedish multinational networking and telecommunication company situated in Stockholm, Sweden. Communication is a basic need for human. It's been more than 140 years, Ericsson's technology and people have changed the world which transformed lives, industries and society. In the year 1876, a 30-year-old mechanic Lars Magnus Ericsson laid the foundation for one of the world's leading telecommunication companies with his former work colleague Carl Johan Andersson.

Among the all service providers all over the world, Ericsson is one of the leading service providers of Information and Communication Technology (ICT) with about 40% of the world's mobile traffic carried through its networks.

4.2 Purpose & Strategy

Technology is the heart of Ericsson's business. With technologies and services, Ericsson is pioneering new ways to connect systems, cities, and societies in ways we never thought possible. Ericsson's engineering culture of competence, winning, and collaboration will ensure that will lead the industry going forward.

4.3 Core values

Respect, professionalism and perseverance are the core values of the foundation of Ericsson's culture. It guide its employees in their daily work and how they relate to people and how they do business.

4.4 Code of Business Ethics

Ericsson's aim is to work with responsibility, accountability and transparency to help to build the Networked Society.

It contains rules for all individuals performing work for Ericsson, under the staff management of Ericsson, whether as an employee of Ericsson or of a subcontractor, or as a private contractor.

The Ericsson Code of Business Ethics is periodically reviewed and acknowledged by all employees. It is translated into more than 30 languages certifying that it is accessible to all employees of Ericsson.

4.5 Company Facts and Figures

- Operations in no. of Countries: 110 Countries
- Financial facts

Net Sales (Q4 2018)	SEK 63.8 billion
Operating Income (Q4 2018)	SEK -1.9 billion
Net Sales (Full year 2018)	SEK 210.8 billion
Operating Income (Full year 2018)	SEK 1.2 billion

Source: Ericsson Annual Report 2018

- Number of employees worldwide

South East Asia, Oceania and India	23,959
North East Asia	12,788
North America	9,727
Europe and Latin America	44,621
Middle East and Africa	4,264
Total	95,359

4.6 Business Area & Market Area

Ericsson's portfolio is to enable the telecom industry and other sectors to do better business by increasing the efficiency and creating new opportunities. The business areas develop and maintain product and service offerings as well as secure delivery capacity. The four business areas are Ericsson's portfolio-

- Networks
- Digital Business
- Managed Service
- Technologies and New Business

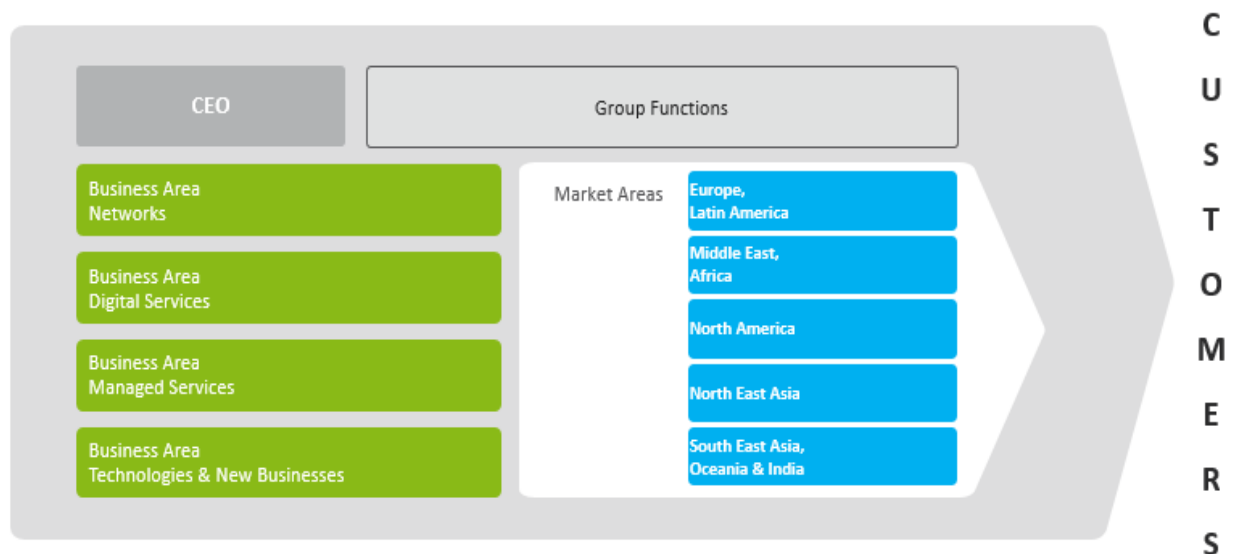


Figure 3: Ericsson Organization Overview

Ericsson's business is divided into five market areas. Each market area reports to the CEO and President. The market areas develop and maintain customer relationships, maximize sales and profitable business through an efficient regional operation with profit and loss responsibility.

Market areas Are-

- Europe, Latin America
- Middle East, Africa

- North America
- North East Asia
- South East Asia, Oceania & India

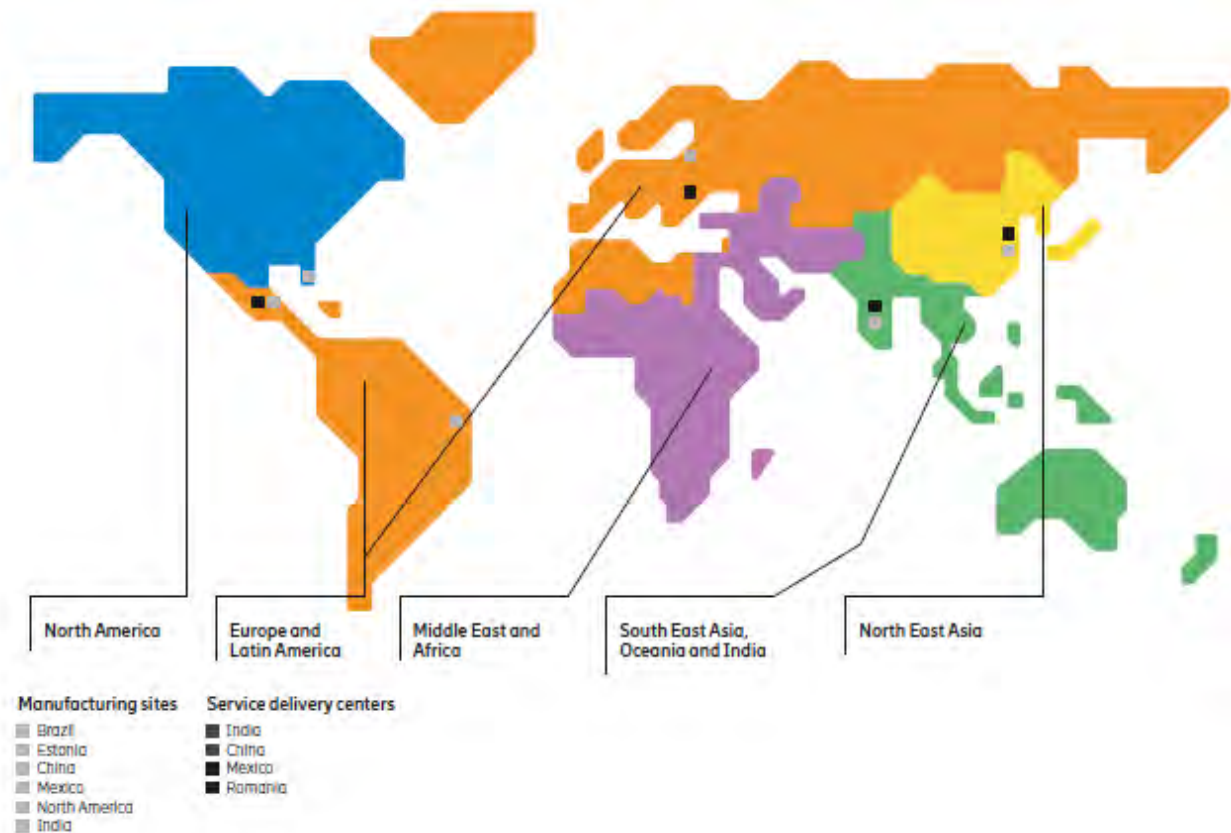


Figure 4: Ericsson Market Areas (Globally)

4.7 Group Functions

The group functions support the President and CEO in the governance of the group. They are responsible for developing and deploying strategies and policies, directives, group-wide processes and tools for their respective functional areas. They also drive change programs for their respective functional areas, develop and provide global expertise. The group functions are-

- Marketing & Communications
- Finance & Common Functions

- Human Resources
- Legal Affairs
- Technology & Emerging Business
- Sustainability & Public Affairs

4.8 Functional Areas of Ericsson

Functional areas manage functional competences and efficiency, develop career model, deploy functional strategies, and maintain process, methods and tools. Functional areas are responsible for delivering on project basis or in a whole. Functional areas are-

- Sales
- Commercial Management
- Presales & Support Sales
- Service Delivery
- Marketing
- Product Management
- Product Development
- Technology & Research
- Sourcing
- Sustainability & Corporate responsibility
- Supply & Logistics
- Real Estate
- Security
- Human Resource
- Finance
- Legal
- IT

4.9 Ericsson in Bangladesh

In 1996 Ericsson started its journey in Bangladesh. At the beginning of its operation it used to provide telephone equipment to Bangladesh Telephone board. The establishment of mobile communication in Bangladesh gave Ericsson its own prospect. Earlier times Ericsson supplied its transmission equipment and packet core for telecom industries in Bangladesh. Later in 1997 Grameen Phone (GP) became its first customer to deploy Ericsson's equipment and solutions to build the core network. Now it's been 22 years and now Ericsson is one of the foremost service providers who has business with Robi, GP, and Banglalink mostly.

4.10 Organization Structure in Bangladesh

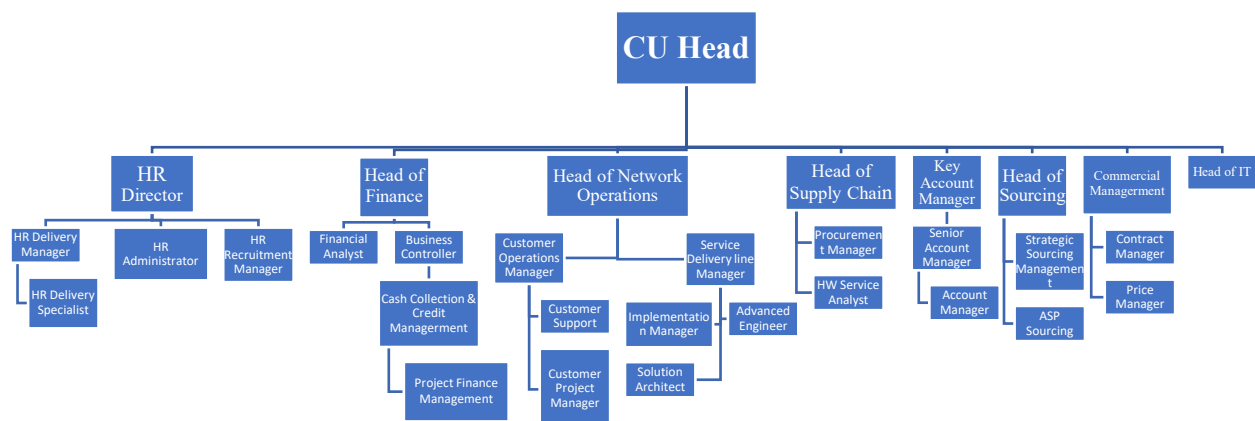


Figure 5: Organogram of Ericsson

4.11 Customers of Ericsson Bangladesh

Presently Ericsson has business with Robi (Axiata Group) and Grameen Phone (GP) (Telenor Group) in Bangladesh. Most of our business is in Robi network. Earlier in 1998 GP started its journey with introducing Ericsson RAN (Radio Access Network).

4.11.1 Robi

In Robi's network, Ericsson zone is mainly Dhaka Division, Cumilla Division and Chittagong Division along with Cox's Bazar. 60% of Robi's network is covered by Ericsson's equipment provided with services.

Ericsson started 4G deployment project for Robi network from August 2017. The project named "Robi LTE RAN". Robi possess 17.4 MHz 1800 spectrum and plans to refarm 10 MHz for LTE and rest part for GSM. Out of 6300 existing sites (2G/3G), 3,753 has been planned for LTE in consequent phases.



Figure 6: Ericsson Zone of Robi

4.11.2 Grameen Phone (GP)

In Grameenphone Ericsson has only Chattogram zone to provide network. GP has 2000 sites under Ericsson's equipped network. In 2018 Ericsson deployed LTE to 500 sites, project named 'GP Blue Speed'. Ericsson covers 20% of GP's network in Bangladesh.

Other operators Teletalk and Banglalink doesn't have product oriented service with Ericsson. But Ericsson has Digital Services (DGS) billing and charging services with Banglalink.



Figure 7: Ericsson Zone of GP

Chapter 5 Report Analysis & Findings

To analyze the report, total 24 queries have been asked to respondents and 125 people have responded. The purpose was to make the sample of the survey diversified in regards of gender, age and occupation. To complete the survey personal interview has been set on internet. The results acquired from the survey and their analysis are given in details in this chapter.

5.1 Gender

The first question on the survey was to find out whether the respondents were male or female. According to the result analysis, out of 125 respondents 83 were male, which was about 66.4% of the total respondents of this question. On the other hand, 42 were female which was 33.6% of the total respondents .

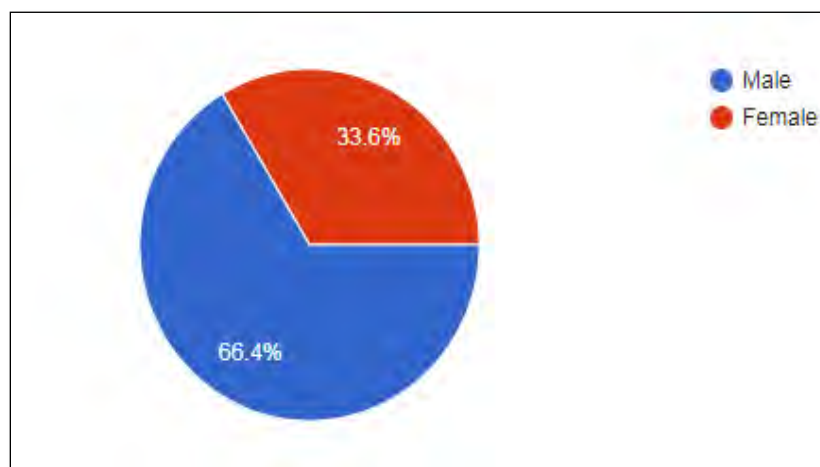


Figure 8: Gender Ratio

5.2 Age

The second question was related to the respondents' age which is important to understand the taste of different age group of people for market analysis. In Bangladesh majority is youth generation. As a result, in this survey the greatest number of respondents were young too. Among 125 respondents 84 said they aged between 18 years to 30 years. These age range respondents were 67.2% of the total number of respondents for this question. The second major group had their age

between 30 years to 45 years with the exact number of 36 which was 28.8% of the respondents. Among the other age groups 2 were below 18 years and between ages 45 years to 60 years. Only 1 respondent was above 60 years.

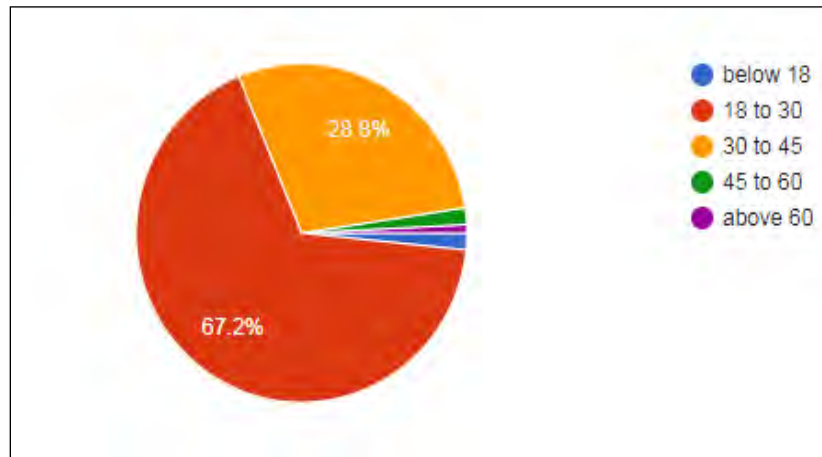


Figure 9: Age distribution

5.3 Occupation

Third question was related to the profession of the respondents. From the analysis I found that majority of them were service holders. To be exact 91 people out of 125 respondents were service holders which was 72.8%. Among all 19.2% student also took the survey. Also, self-employed, business man and other profession's persons attended the survey.

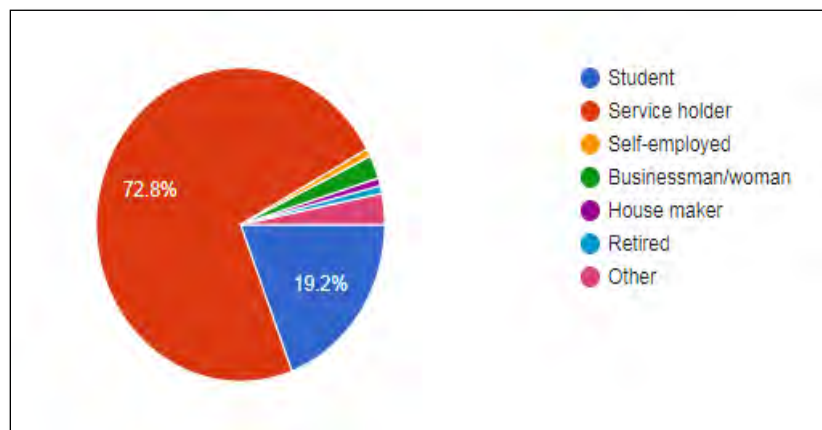


Figure 10: Occupation

5.4 Types of Mobile Phone Usage

Here we asked the respondents what type of mobile phone they use. Is it a feature phone or smart phone? The response to this question was very crucial for my study. By seeing the response we can understand whether people has the handset which is ready to support 4G frequencies. Many people in Bangladesh still use featured phones. Some uses both. All 125 respondents answered the question. Out of them 121 people said they use smart phone which was 96.8% of the total respondents. On the other hand, only 2 people said that they used feature phones.

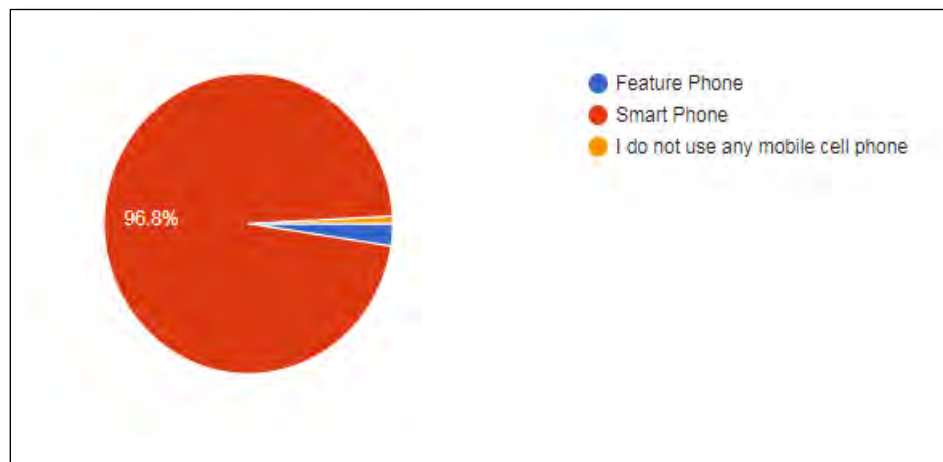


Figure 11: Type of mobile phones usage

The use of feature phone is declining day by day. It is because of different features of smart phones: starting from taking photographs to doing official works on it. Also, the use of internet and social media is affecting the trend at a high speed too. Nowadays lower economy classes are also using smart phones as it has become a way of entertainment.

5.5 Latest Mobile Technology Awareness

This question was related to latest mobile telecom technology people they are using. Among 125 respondents 119 replied that the latest technology is 4G in Bangladesh, which is correct. The percentage was 95.2%. Though 3G has been deployed all over the country, but 4G is also being deployed in the same pace.

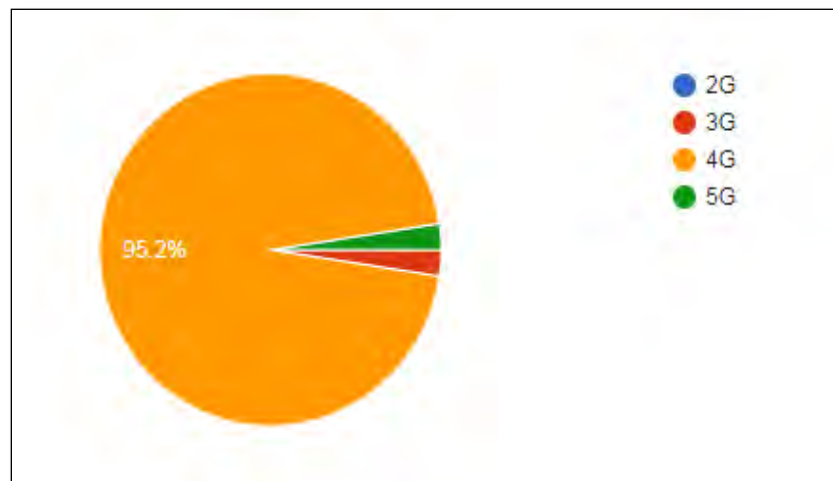


Figure 12: Awareness of latest mobile telecom technology

5.6 4G Technology Usage

4G has been launched in Bangladesh in 2018. Operators have deployed the 4G technology almost in every district in Bangladesh. In this question we asked respondents about which technology do they use.

104 respondents said they use 4G technology and other 21 respondents use 3G technology. The percentage of using 4G were 83.2% and 16.8% were 3G users.

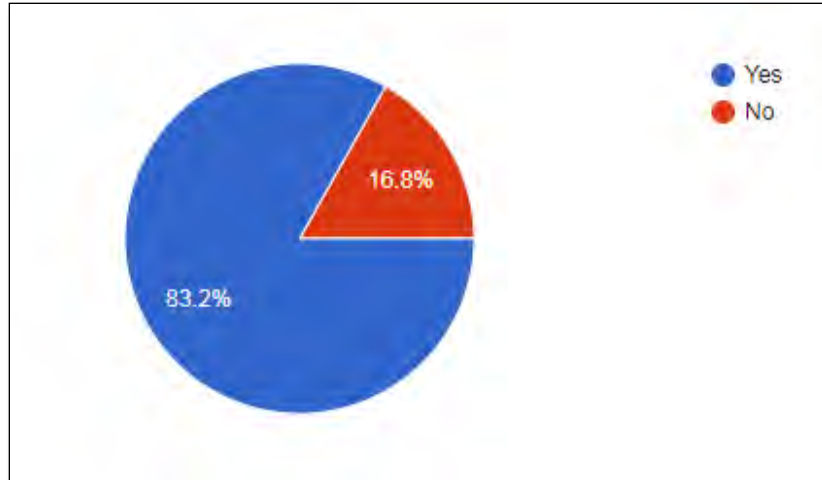


Figure 13: 4G technology usage

5.7 Users of Different Mobile Operators

In this question, we can see the reflect of mobile operators' respondents are using. From the chart we see that, maximum people use Robi network which is 66 people, then 55 people were under GP network, 18 people were using Banglalink and 13 people were using Teletalk. The survey report also shows that few people were using two or more operator's connection.

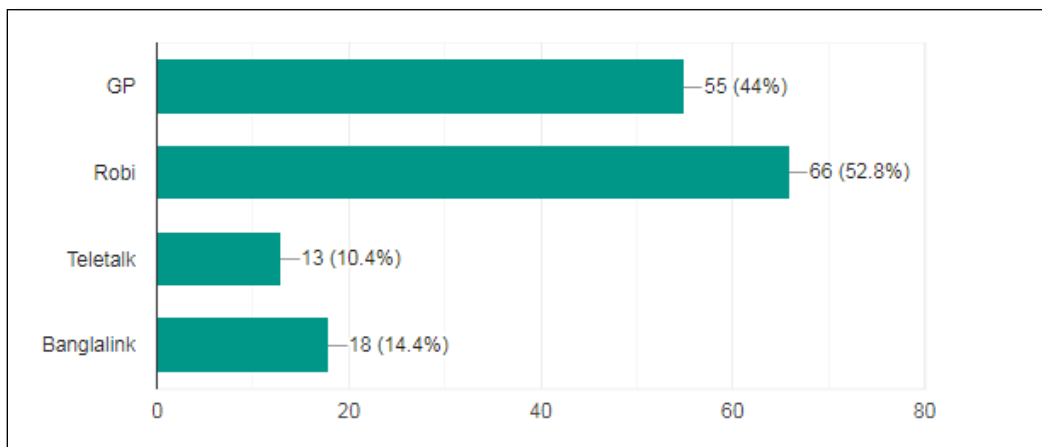


Figure 14: Users of different Mobile Operators

5.8 Ericsson's Brand Value

Here we asked people if they know about Ericsson; among 125 respondents 110 responded that they heard about the company. Which was 92.4%. Few responded that they did not know about the organization. This is may be because of Ericsson's low advertisement in Bangladesh compared to other competitors.

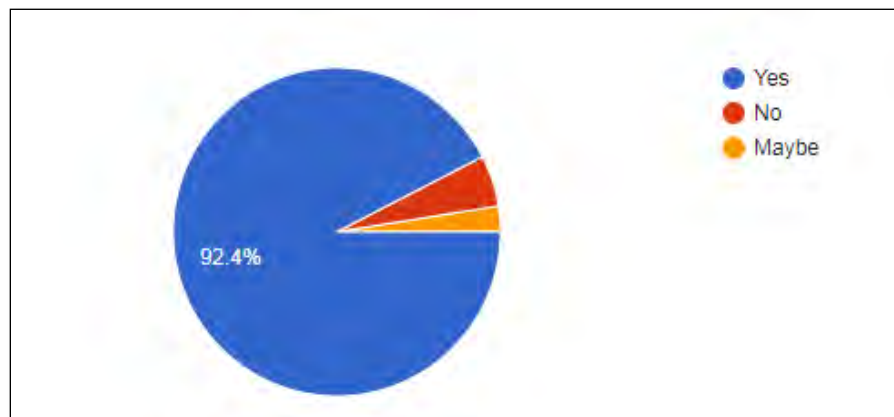


Figure 15: Ericsson's Brand Value

5.9 Thoughts about Ericsson

When the respondents were asked, do they know what Ericsson does? In the survey question we put three options. They were: "Network service provider", "Mobile phone brand" and "Don't have any idea" about the brand. Among 125 respondents 101, which was 84.9% responded that Ericsson is a network service provide. Ericsson mainly provides network solutions to operators along with the products.

There were an equal percentage where people said that it is a mobile phone brand, and some do not know what Ericsson does. It is obvious that when we ask general people about Ericsson they answer that isn't it "Sony Ericsson" the mobile phone brand? Ericsson had previously launched few mobile phones. Ericsson's very first mobile phone was designed in 1956. Ericsson launched some mobile handsets joint venture with Sony.

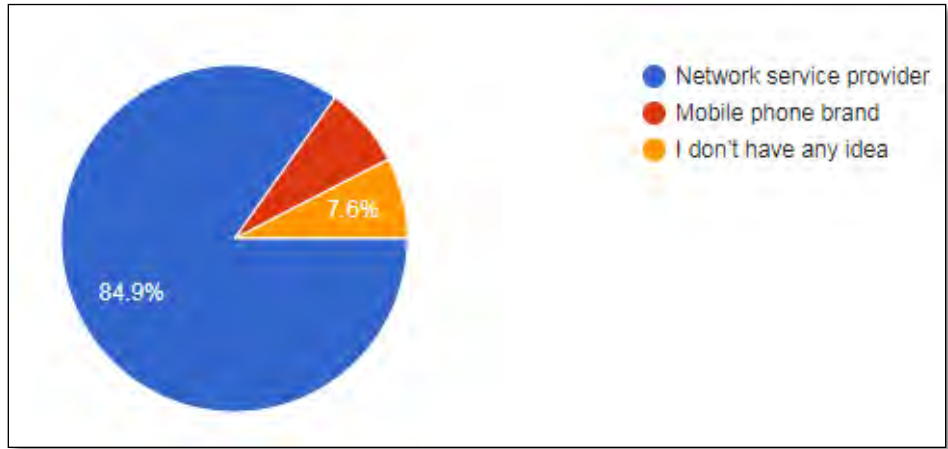


Figure 16: Thoughts about Ericsson

5.10 Call Preference

Here we asked the respondents what type of call they usually prefer. Among 125 respondents 58 said they usually did 2G voice call which was 49.2% and 56 people said they usually did mobile data call through WhatsApp or Viber etc. which was 46.6%. By the blessing of technology people are adapting themselves into internet which increases data usage now. In Bangladesh, rural people are now using smart phones and data calls which it much cheaper than 2G voice call.

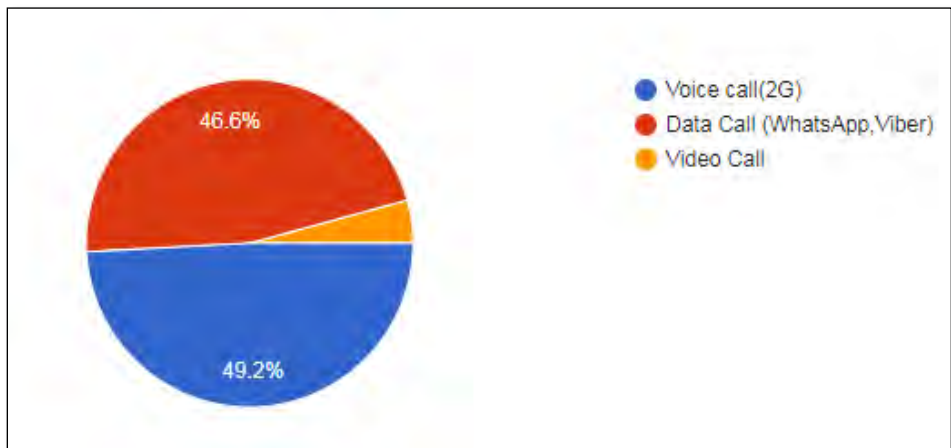


Figure 17: Call Preference

5.11 Quality of Data Call

This question was related to the data call quality. In survey question 55% responded that it was better than 2G voice call which was 66 people among 125 people. Due to the rapid speed of internet, some people now prefer data voice calls. 32 people responded that data voice call quality was equal as 2G voice call which was 26.1%. 22 people replied that the data call quality was worse than the 2G voice call.

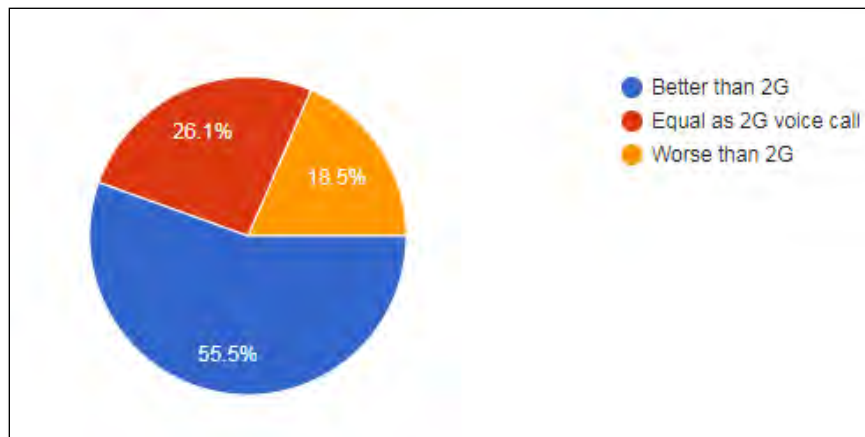


Figure 18: Data call quality

5.12 Use of Apps for Video Calling

Here we asked people did they usually use apps for video calling purpose. Among 125 respondents 117 responded that “Yes”. Which was 98.3%. Now a day’s people uses Messenger, Viber and WhatsApp for video calling. This is because the internet speed is high and people initiates a video call for overseas calling.

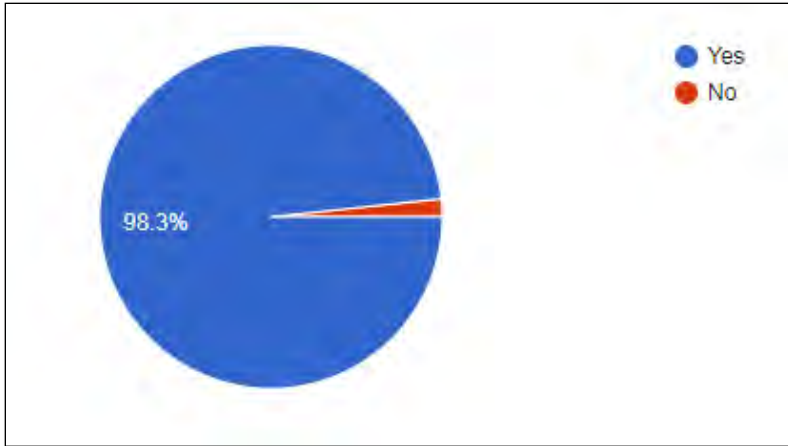


Figure 19: Use of Apps for Video calling

5.13 Video Clarity

In this question we asked the respondents whether the video clarity getting better in data calling apps. From survey analysis I found that 119 people attended this question. 88 people agreed that yes video calling picture clarity is was getting better after 4G deployment. The percentage was near about 74 %. 22 persons commented neutrality. They think that video clarity was same as before which is was 18.5%.

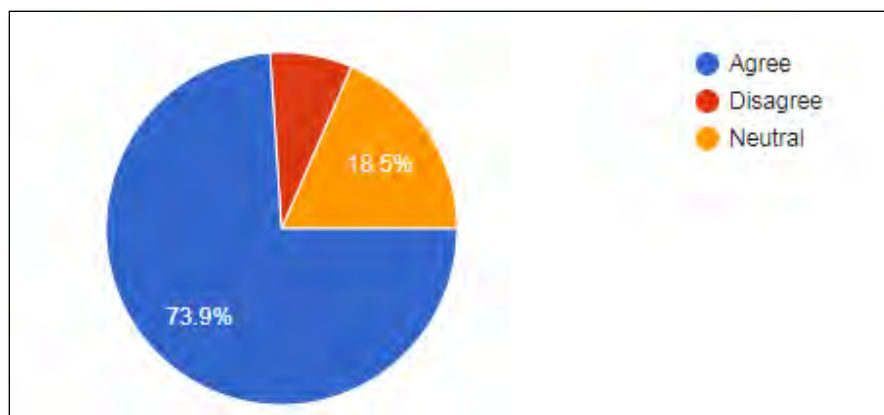


Figure 20: Video Clarity in Data Video Calling

5.14 Video Streaming Service

In this question we wanted to see the usage of video streaming apps. Among 125 respondents 112 responded that they used video streaming apps which was 94.9%. Now a day's video streaming rate is very high. People watches online movie, shows, sports through apps, YouTube etc.

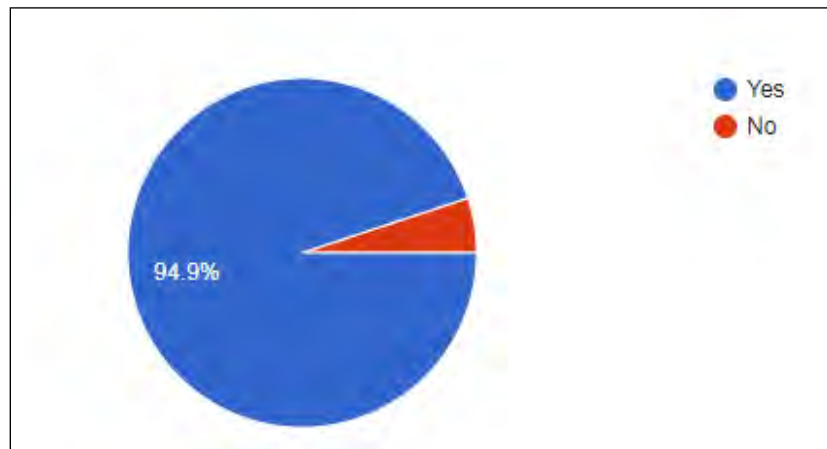


Figure 21: Video Streaming Service

5.15 Faster Speed

Here we asked respondents about uploading and downloading contents in internet using 4G network. Among 125 people, 98 responded that speed was faster in 4G. Also, video clarity and picture quality after uploading in social media has increased due to high speed internet.

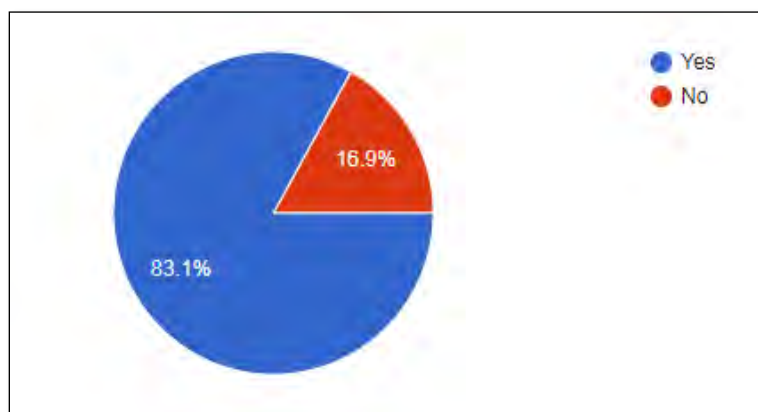


Figure 22: Speed in content loading in social media

From the survey we saw that 98.3% people used Facebook and among 125 people 109 people said that picture uploading had become faster for using 4G network. We also enquired people about the satisfaction of using 4G. 58% people said that in 4G, internet speed was good.

5.16 Profitability after 4G deployment

In survey queries some questions was directly to the employee of operator companies. Among 125 respondents 61 persons were employee in different operators. Those questions helped to get the real scenario of my internship paper.

We asked operators whether the business was in profit after deploying 4G. Operators replied that in Ericsson zone subscribers had increased vastly. 50 out of 61 respondents said that subscriber had increased after deploying 4G in Ericsson zone. 83.1% agreed that profitability in 4G increased rather than 3G service.

Among 61 operator's employee respondents, 41 persons said that in Ericsson zone 4G speed was "Better" than other competitors, 15 persons replied it's "Equivalent" to other competitors service.

Chapter 6 Conclusion

6.1 Research Observation

4G deployment brought a revolutionary change in Bangladesh. As a developing country, telecom sector has created a great change in the economy of Bangladesh. Within four years of 3G deployment, Bangladesh government gave permission to adapt the 4G technology to create Bangladesh into “Digital Bangladesh”.

Here are some research observation below-

- a) After the implementation of 4G, mobile operators got huge benefit on data usage mostly. Almost all the operators have implemented 4G more than 50% in their existing network. To be specific Robi has 71% 4G coverage in 64 districts. In GP 54.6% under 4G coverage of its existing network. GP got 21% more revenue in 2018 than 2017 in mobile data usage. In Teletalk 12% of total network is under 4G. Hence, mobile operators should work on full 4G network availability in Bangladesh.
- b) In survey research we asked respondents few questions regarding the speed of the internet, streaming services speed, picture uploading speed in social media etc. The feedback from the respondents were positive. More than 80% replied that the internet speed is now faster than 3G. People are also happy with the video clarity and streaming services as the 4G technology ensures higher bandwidth and high-quality video in 4G technology.
- c) In Bangladesh, presently there are few network service provider companies which serve operators like GP, Robi, Banglalink & Teletalk. In our survey interviews we asked operators’ employees about Ericsson’s highlighting areas. Some key points regarding Ericsson’s improvement are:
 - More customer centric approach to build close business relationship
 - Ericsson should strengthen their marketing sector to promote the brand
 - Ericsson should provide Core network solutions to operators to make demand into the market. More exposure is needed like other vendors (Huawei, ZTE, Nokia) into the market. And should introduce new business solutions to improve its image into the market
 - Ericsson should introduce more compatible and user-friendly equipment for monitoring services of network

6.2 Recommendation

Although the findings of my report show positive outcome for 4G implementation in Bangladesh but there are some limitations in my study. During the internship project, we discussed with the employees of Ericsson of different ranks of several departments. Such as Operation Manager, Project Manager, Customer service Manager, Key account Manager, Solution architects etc. My recommendations are-

- 4G deployment should not be limited to urban areas only. Mobile operators should start deploying 4G service to rural and remote areas & confirm 100% network coverage in any part of the country
- Mobile phone operators should execute frequent market visits along with the service provider companies to understand the network stability in remote areas
- Mobile operators should promote 4G as Mobile broadband as an alternative of Fixed Broadband.
- To understand more about customers, market survey need to be conducted in all the major cities in Bangladesh and later the market survey should be extended to rural and sub-urban areas for nationwide coverage
- Ericsson management should be more customer centric which will help the company to develop close business relation.
- Ericsson should concentrate more on product pricing and service price offering to operators comparing to other competitors. Ericsson should develop in house product solutions so that foreign expert cost doesn't need to bear for countries like Bangladesh
- Ericsson's leadership teams should work on sales and marketing of products and solutions. This can help Ericsson to get more profit and can compete in the competitive market
- Being a project oriented organization, Ericsson only does business with private company operators. To get highlighted in vendor market Ericsson should do business with government telecom sector and state-owned sectors
- Presently Ericsson has Value Added Service (VAS) with Banglalink only. They can offer it to other operators to develop the business more

Appendix

Survey Questionnaire

Gender: Male Female

Age: a) below 18 b) 18 to 30 c) 30 to 45 d) 45 to 60 e) above 60

Occupation:

a) Student b) Service holder c) Self-employed d) Businessman/woman
e) House maker f) Retired g) other: _____

What kind of mobile cell phone do you use?

a) Feature Phone b) Smart Phone c) I do not use any mobile cell phone

Do you know what the latest mobile telecom technology in Bangladesh is?

a) 2G b) 3G c) 4G d) 5G

Do you use 4G technology?

a) Yes b) No

Which mobile operator brand(s) are you using now?

GP b) Robi c) Teletalk d) Banglalink e) Airtel

Have you heard the name of LM Ericsson Bangladesh Ltd.?

a) Yes b) No c) Maybe

What does Ericsson do?

Network service provider b) Mobile phone brand c) I don't have any idea

Which one do you use mostly?

a) Voice call (2G) b) Data Call (WhatsApp,Viber) c) Video Call

How's the quality of data call?

a) Better than 2G b) Equal as 2G voice call c) Worse than 2G

Do you use Viber, Imo, WhatsApp, and Messenger for video calling?

a) Yes b) No

Do you agree that video clarity is getting better in these data video calling apps?

a) Agree b) Disagree c) Neutral

Do you use streaming (YouTube, Netflix) services?

a) Yes b) No

Do you face buffering while seeing videos online?

a) Yes b) No

Do you use Facebook?

a) Yes b) No

Do you think picture uploading in social media is getting faster than earlier?

a) Yes b) No

Do you download big data?

a) Yes b) No

Do you think downloading content is faster in 4G?

a) Yes b) No

Are you satisfied with 4G service of your operator?

a) Yes b) No

Answer question (21 – 26) if you are an operator (Robi, GP, Banglalink) employee:

After deployment of 4G, did number of subscribers increase in Ericsson zone?

- a) Yes
- b) No

Is 4G more profitable than 3G/2G?

- a) Yes
- b) No

How is data speed in Ericsson zone than another competitor's zone?

- a) Good
- b) Equivalent
- c) Less

What is the situation of customer complaining in Ericsson Zone comparing to competitor's zone?

- a) More
- b) Less
- c) equal

Which service provider do you prefer?

- a) Huawei
- b) Ericsson
- c) ZTE
- d) Other

If not Ericsson, please mention some reasons-

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Reference

- 1) <https://www.gsmainelligence.com/research/?file=b9a6e6202ee1d5f787cfebb95d3639c5&download>
- 2) <https://www.teliacompany.com/en/about-the-company/history/first-in-the-world-with-4g/>
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