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Research Utilizing the Global Mobile Network of Huawei Telecom to Examine and Project Deployment

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Abstract

This is why "This master's thesis aims to demonstrate the processes by which criteria are "born" as standards, including the identification, categorization, and implementation of these processes. The initiative is also motivated by a desire to make a useful contribution to business and industry by shedding light on the complexities of the standardisation process, in this case as it pertains to mobile communications. There will be significant advancements over the current 4G services in the next generation of mobile technology, including faster speeds, lower latency, more devices, and new capabilities like Machine to Machine communication, Device to Device communication (D2D), and Internet of Things architecture [17]. It is crucial for networking experts and developers to examine how the ITU establishes specifications that are then followed by telecommunications corporations because doing so will help them better understand the development of mobile communications and the various standards that have accompanied it. The fifth generation of wireless networks (5G) has already been deployed and tested in the wild. The improvements enable a stable connection 14 times better than current 4G, as shown by tests conducted by telecom carriers and manufacturers of 5G equipment [18]. Smartphone makers are starting to provide 5G-capable devices, and this trend will continue over the next several years. After all the hype around 5G and increased data transfer rates, it's time to examine how the new standard stacks up against older ones, as well as how various implementations and solutions compare to the IMT-2020 standard. There is also a shortage of data on how the main telecom firms participate in standard-setting and what sort of effect they have "advancement. Therefore, it is necessary to assess the level of development made by each company in the field of 5G [19].

Keyword: Networking Experts, Mobile Technology, IOT, Telecommunications

INTRODUCTION

This thesis "will examine the evolution of mobile telecommunications technologies, with a special emphasis on the upcoming 5G technology. This project's goal is to examine Huawei's strengths and weaknesses in the mobile network and handset industries [1]. The creation of the 5G standard, as well as Huawei's participation in the IMT-2020 standards, will be the focus of technological attention. The focus of the business will be on Huawei's operations in network markets, where they manage mobile networks for" mobile operators, as well as how they approach the smartphone market [2].

The evolution of "mobile communication technologies, as well as their classification by International Mobile Telecommunication (IMT) standards, will be discussed in this study, as well as how the world of handsets and mobile devices is moving toward faster, better, and more efficient communication – 5G [3]. Along with the" challenge specification, the reader will be given motivation for this endeavour.

LITERATURE REVIEW

Humans have "always strived towards smaller, smarter gadgets and better services, since Motorola invented the first mobile phone in 1973. Mobile communication technologies, which were originally designed for voice interactions, now provide much more. The first mobile service, launched in 1981, focused on mobile phone and voice communication. It was labelled a 1G mobile communication device [4]. The International Telecommunication Union (ITU) used G nomenclature, or so-called Generation, to classify development in various generations of mobile communication technologies and their associated features. It offers a simple, identifiable notion that is easy to comprehend by the general public and marketable by service providers. Furthermore, when characterizing the services provided by a particular generation, the term G proved" to be crucial [5].

Future generations "will be able to transport data through the network as a result of further progress. By adding GSM, the second generation (2G) enables roaming communication and even data transmission (SMS) (Global System for mobile). Initial data speeds were as high as 9.6kb/s. Third Generation (3G) was developed in response to the Internet Boom and focused on faster data transfers and lower latency (delay) [6]. The proliferation of data-hungry gadgets, such as smart phones, has hastened the development of wireless communication technology. According to Cisco's Visual Networking Index (VNI), traffic will quadruple between 2019 and 2020. The diverse multimedia material that is being carried via the network, such as high definition video, 3D video, and other real-time services, is another driver for the growth in data traffic, in addition to the expanding us- age of such devices. Mobile users were also interested in social networking, which resulted in new consumption patterns and a significant increase in data traffic. As a result, mobile data traffic surpassed worldwide voice traffic in 2009 [7]. Aside from the exponential rise of network traffic, the number of devices connected to the mobile communication infrastructure will be a future network difficulty. In the 2020s, machine-to-machine (M2M) connectivity will be commonplace. This type of communication necessitates an extremely short latency. Furthermore, not only are mobile devices improving their computational capabilities, but manufacturers are also transitioning from lower-generation

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(2G) to higher-generation (3G) networks (3G, 4G and now also 5G). That means that, in" the not-too-distant future, almost all, if not all, gadgets will rely on and consume data [8].

STATEMENT OF THE PROBLEM

Given that "4G meets the needs of the average user, why should we aim for a new standard and, eventually, a new generation of cellular network? As mentioned in, there are a few primary reasons to do so. When the International Telecommunication Union (ITU) established the 4G categories and development of the technology began, the major driving was mobile broadband and its use [9]. Additional contributory causes exacerbated the requirement for additional construction. 4G relied on high-cost gear and infrastructure. Frequency bands were licenced at a relatively high cost in several nations. As a result, more effective and better mobile communication is required. As we get closer to fifth generation (5G), greater attention is being paid to latency, dependability, throughput, data volume, and mobility. However, since mobile Internet traffic has continued to rise over the previous two years, the greater problem for 5G will be the continual" demand for increasing network capacity [10]. Here are the primary causes for the rise in mobile data usage, according to Rost et al:

- More "mobile devices connected to the" network.
- More "diverse and demanding services, also more bandwidth-hungry".
- Introducing "Device-to-device (D2D) type of" communication.
- Integration "of IoT and Machine to machine (M2M) type of communication".
- User "terminals used as a gateway to access other services – cloud, live TV" etc.
- Devices "that are using the spectrum are more complex and data hungry".

Because "the focus is on the service-based paradigm, mobile broadband has grown by 92 percent since 2006. This raises worries about the capacity limits of existing mobile network infrastructures, which will be surpassed shortly with current development. In today's networks, rigid and costly equipment is paired with a complicated and inflexible control plane [11]. As a result, the entire picture indicates that 4G will be unable to manage anticipated future demands, and that improving current networks would be difficult. The purpose of 5G is to overcome these constraints and deliver higher performance and capacity while being economically viable. Following that, the next generation should deliver an outstanding user experience with more coverage at a cheaper cost than previous generations. In Chapter 5, a possible approach for technical 5G implementation will be examined. As a result, 5G is one of the most efficient mobile networks available [12]. The" goal of comprehensive mobile communication integration in society is to achieve the following objectives:

- Unconstrained "Access to" information
- Data "transfer will be available for" everyone
- Providing "real time connection for different" devices
- Fully "mobile and connected" society
- Flexible "network that can maintain" itself
- Seamless "integration with all mobile" devices
- Better "use of the provided" bandwidth

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As a result, "5G will be free of the constraints that plagued earlier generations, allowing users to access the World Wide Wireless Web (WWW). The user will come first, making the next generation of mobile communication user-centric rather than service-centric like 4G. Many telecommunications firms have already created" functional prototypes and devices. Pre-commercial 5G deployments have already taken place [13]. But, when 5G replaces 4G, who will be the worldwide "leader in the 5G race, and how will the world of mobile communication be shaped? The responses to these questions will be used to "paint" a picture of the digital world, particularly the mobile" element.

Objective of the Study

- To "highlight firstly the development of the standards, then will reveal the current status of technology development that is compliant with the published 5G requirements and" classifications.

Research Questions

- Will they "come if we build it? 5G is expected to generate enormous revenues by tapping into a wide market for 5G services and equipment, as well as a slew of new employment. However, the reader will be given a" realistic appraisal of the new generation, with the goal of suggesting a future development route.

RESEARCH METHODOLOGY

The study "section of the dissertation focuses on both standardisation and the technological concepts utilised by organisations that adhere to these standards. The reader will learn about the standardisation process and how businesses contribute to the development of 5G technology, as well as how these technologies operate. This will serve as the foundation for the theoretical framework that will be included in this dissertation. Theoretical foundation and "State of the Art" chapters will provide a review of literature and standards. For data collection, the thesis will use a combination of descriptive, explanatory, and qualitative methodologies. The data will be utilised as a foundation for the subsequent analysis when it has been collected [20]. The study will not be based on a specific" framework, but rather on the methodology that has been discussed.

RESEARCH DESIGN

Fact-finding "and interpretation are the foundations of this research process. The mobile market prognosis in 2015 is an example of descriptive research. It is a satiation description. That strategy will benefit the thesis, and it will give a comprehensive grasp of existing mobile technology and future standards as a result. It will allow for the necessary comparison of different 5G implementations. Since of the nature of the dissertation, descriptive research is insufficient because it lacks suitable conclusion and analysis. Descriptive research will be utilised to prepare for" the following approach, which is explanatory research [21].

Explanatory "technique improves this thesis by focusing research investigations on the correlation of various events, or in our instance, various technologies and implementations. The study entails analysing a certain technology and gathering background information in order

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to explain its functioning principles and components. The concepts of 4G and 5G will be thoroughly explained in this dissertation. Infrastructure and mobile network functions will be described and analysed in detail. The reader will get adequate knowledge of the mobile network and several 5G implementations. The qualitative" method comes after the explanatory approach [22].

This "research approach relies heavily on qualitative data. It is a collection of non-quantitative data from many sorts of studies. Non-quantitative data, on the other hand, is data that cannot be quantified in numbers. We may use interviews and surveys as examples of qualitative data sources [23]. As explained in the research technique, there are" three fundamental principles in it:

- "Meaningfulness"
- "Data classification"
- "Conceptual analysis"

The "information gathered will be meaningful (Meaningfulness). The facts in this dissertation will be based on technological explanations. After that, it will be divided into parts and subsections. Different sorts of numbers will be accounted for and utilised since they give a more thorough perspective of the subject under investigation. As a result, technology will be presented in a complete manner [24]. A little amount" of quantitative data will be included in the thesis to provide relevant specifics for the investigation.

DATA ANALYSIS

The "A comparison of 4G and 5G networks will kick off the inquiry. After collecting relevant information through investigation, a solution will be proposed. A variety of 5G deployments and the roles played by major tech firms will be analysed. To do this, we'll look at how 5G adoption has expanded at different companies and how that's affected the industry as a whole. An exploratory qualitative inquiry will be helpful for this thesis "a similar sort of analysis to that which was just described**.**

CONCLUSION

Forecasts for "the mobile communication environment," including a glossary of terms, are presented in the first chapter of this thesis. In Chapter 3, the various organisations and people involved in the telecommunications standardisation process are introduced. The existing 4G (LTE) technology and the state of the future 5G were then examined in Chapter 4. Qualitative studies using primary and secondary sources will be discussed in Chapters 6 and 5, respectively. Thus, the 5G mobile landscape in its entirety is shown. 2. defined the approach to data analysis that would be taken. At the beginning of this chapter, we shall discuss the results of our analysis.

Therefore, this thesis demonstrates that there are several points of view about the creation, deployment, and use of 5G. A subset of experts think that 5G will be more cost-effective and provide more to customers. Others are sceptical and do not see a bright future for this technology. However, both main and secondary sources agree that Huawei is the dominant player in the industry and is making the most investments in 5G technology.

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LIMITATIONS OF THE STUDY

The "technologies will be examined at a greater level in this thesis. Knowledge of mobile data transmission and administration, on the other hand, will be required. It's important to remember that each tech company's 5G technologies are confidential, thus precise facts and methods of functioning aren't available. As a result, the examination will include 5G and general operating concepts [14, 15]. There will be no case studies because the thesis will be based on standards and literature. Several expert surveys will be done, however, in order to get as much information as possible regarding the current situation with 5G. Access to a more full description of the vendor's solution, as well as interviews with specialists in the telecommunications or radio industries, would have improved comprehension and contributed to a more thorough examination of the problem. The insertion of a case study would have supplied more insider information from the firm [16]. The framework utilised adds to the constraints. Using a variety of analytic frameworks would have resulted in more in-depth study. Finally, it should be remembered that 5G is still under development and, at the time of writing, is regarded a brand new technology. As a result, future" evaluations may reach different results.

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