

THE ADVANTAGES OF USING 5G IN LIVE RADIO AND TV BROADCASTING AT THE MINISTRY OF INFORMATION AFFAIRS IN BAHRAIN

Fatima Saleh Al Dhaen^{1*}

¹*University of Bradford PHD Candidate University of Bradford, Bradford West Yorkshire BD9 4JL, United Kingdom*

***Corresponding Author:-**

Abstract:-

This article focuses on the impact of new technology, such as 5G deployment which will be realised soon and how to utilize from it in the local television broadcasting industry in Bahrain. This article will give an idea for exploiting new technology for producers and executive management in local Bahrain television station. Everyone needs to know his or her role and how to embrace new technology, integrating it with television broadcasting. In the United Kingdom, they have done a lot of research using industry data based on communications regulators and trade associations' views such as PACT and Ofcom, interviewing producers, executives, and editors to understand the real impact of 5G technology on the television industry.

All mobile technologies, whether smartphones or multiple-screens, or upcoming technology such as 5-G, have a profound impact not only on the users, but also on the financial revenue streams in broadcasting, changing the way that producers look at funding television.

Keywords:- 5G, VOIP, Multimedia Streaming, LTE, Quality of Service

1. INTRODUCTION

The world has utilised from the wireless technology which have proven an extraordinary change on the field of communication. This transformation is importantly noticeable by how everybody is embracing the use of technology through hotspots, education and workplaces. Since 1979 when the first generation 1G of wireless cellular technology to the third generation 3G, telecommunication developed speedily to provide better enduser knowledge than before. At this time 4G and LTE changed our lives drastically, smartphones become something indispensable in our lives. Kingdom of Bahrain will be launching 5G services in June 2019 [1].

5G technologies will be able to offer higher bandwidths 1Gbps and more, which help and assist many applications such as multimedia streaming and Voice over IP (VOIP) [2].

One of the streaming media examples is the Internet Protocol television (IPTV) systems that offer the skills and ability to stream the media constantly and immediately. IPTV helped to improve the entertainment and media industries that proved a better delivery of content from internet sources which is related to quality of service (QoS) [3].

2. EVOLUTION OF NETWORK GENERATIONS

2.1 First Generation: 1G was first introduced in 1980s and continued till 1990, it has used the Analog Mobile Phone Systems (AMPS) which was established in United States of America, 1G uses simple voice cellular telephone parameters. The speed of 1G was 2.4 Kbps. It allows end users to make voice calls only within 1 country [4, 5]. 1G has limited benefits but major disadvantages such as poor voice quality, handoff dependability, and battery life, large size of phones, no security mechanism alike many more.

2.2 Second Generation: Second-generation 2G cell network was launched in 1991 by Radiolinja (now part of Elisa Oyj) in Finland. it used the GSM standard. [6] Three primary advantages of using 2G networks over their predecessors were that phone conversations were digitally encrypted; 2G systems were importantly more effective on the range allowing far larger wireless penetration stages; and 2G presented data services for mobile, initially started with SMS text messages. 2G technologies allowed the various networks to offer the services such as text messages, picture messages, and MMS (multimedia messages).

All text messages sent over 2G are digitally encrypted.

2.3 Third Generation: 3G technology was known in the 2000s as International Mobile Telecommunications-2000 [7]. 3G network has the highest speed as compared with 1G and 2G, it enables transferring packet switch data at higher and better bandwidth. It offers great services to the end users such as clear voice calls services, high security methods faster communication, high broadband capabilities, video conferencing, 3D gaming and high speed web however there are many disadvantages such as expensive fees for 3G Licenses Services, big size of mobile phones, expensive in nature, higher bandwidth requirements etc.

2.4 Fourth Generation: 4G of broadband cellular network technology, succeeding 3G. A 4G system provides capabilities defined by ITU in IMT Advanced. Potential and current applications include amended mobile web access, IP telephony, gaming services, high-definition mobile TV, video conferencing, and 3D television.

Long Term Evolution (LTE) was deployed in 2009 in Oslo, Norway, and Stockholm, Sweden then it was deployed in most of the parts of the country. The 4G can offer any sort of service to remote users at any time as per requirement everywhere [8]. Very spectacular features include high speed high Capacity and low cost in roaming network therefore there are few disadvantages of 4G as it needs complicated hardware, high battery power, hard to access in addition to requiring an expensive equipment to implement next generation network.

2.5 5th Generation: 5G is the newest generation of cell mobile communications. It prospers the 4G (LTE-A, WiMAX), 3G (UMTS, LTE) and 2G (GSM) systems. 5G aims for cost reduction, high data rate, decreased latency, energy saving, higher system capacity & massive device connectivity.

The first stage of 5G specifications in Release-15 is to accommodate the early commercial deployment. The second stage in Release-16 is to submitted by April 2020 to the International Telecommunication Union (ITU) as a candidate for IMT-2020 technology.[9] .

G	Start /Deployment	Data Bandwidth	Technology	Services	Switching	Multiplexing	Core Network
1 G	1970-1980	2kbps	Analog Cellular Tech	Mobile M/C	Circuit	FDMA	PSTN
2 G	1990-2004	64kbps	Digital Cellular Technology	Packetized Data	Circuit Packet	TDMA,CDMA	PSTN
3 G	2004-2010	2Mbps	CDMA 2000	High Quality Data	Packet	CDMA	Packet N/W
4 G	Now	1Gbps	Wi-FI	Wearable Devices	All Packet	CDMA	Internet
5 G	2020	Higher than 1Gbps	WWWW	All with AI capabilities	All Packet	CDMA	Internet

Table.1 the Difference between Different Generations

3. 5G TRAILS

BBC announced on February 22, 2019 that a trial of broadcasting live radio over 5G on Stronsay, Orkney, [10] which will be conducted very soon to check the capability of using 5G technology that will be run for six weeks or more. The main objectives of this trial is to boost the BBC's scope in rural areas to help reduce network congestion on the rest of the network, while easing the strain on users' data allowances. The trial uses the support of 4G/5G, cloud net and the local wireless ISP.

In 2018, BT Sport hosted the EE Wembley Cup, which was the first live recoded sports event using 5G.[11] It became available on Youtube on Sunday, the 25th of November 2018. The trial tested a 4G/5G network, featuring a 3.4 GHz spectrum from the antenna and a 10Gbps backhaul link.

More over the 5G was tested by Chinese mobile technology manufacturer, Huawei. It was hosted by EE and BT Sports, with Matt Smith and Abi Stephens, who presented a live show using 5G, which was broadcast across London, between Wembley Stadium and Global MBB Forum. The idea behind this test it to understand the implications of 5G, especially within the field of sports broadcasting.

4. THE IMPACT OF USING SOCIAL MEDIA OVER TRADITIONAL TV BROADCASTING

The impact of mobile technology and social media is so important, that many fundraising efforts, such as scholarships, conferences and festivals, have been conducted for this issue. The purpose is to enlighten and educate television professionals, giving them vital reasons to adopt this new technology and showing them how this is changing their industry, preparing them to make changes to the ways that their business is conducted. Most of the social media outlets (Twitter, Facebook, Youtube, and Instagram) have already integrated short videos, which give briefs about headline news stories. Facebook is the main owner of Instagram and it has more than 400 million active monthly users. Vine, which is owned by Twitter, has had over a two hundred million viewers, up from a hundred million in August of 2014. Vine became integrated as part of Twitters video functionality. These short videos are how many people are now receiving their news, changing the broadcasting industry. Disney has also gotten into the game, with Maker Studios, their short-form production house. Short form content on Youtube is exploding in popularity with over 400 hours of contented uploaded every minute. Established broadcasters, such as Jon Stuart, are also uploading their own short-form content, staying current with the trends and both keeping up with their audience base and gathering new fans. The BBC is also using short-form, reaching out to local vloggers to produce videos for all of their channels.

Benefits of using 5G:

There are several benefits of using 5G and 4G for broadcasters especially in covering live outdoor events for example festivals, tournaments, street manifestation, using 5G will lower the cost of the operations reducing complexity and operational flexibility.

If we compare the traditional way of using live broadcasting and the new way of using 5G in covering the live coverage tournament or any events , we can see that it will eliminates a lot of obstacles and cut down the operation process as you can see below. The traditional production consists of many segments to reach the studio through satellite connections as you can see in figure 1. On the contrary that using 5g has a direct connection between the cordless camera and the studio by one mediator which is the 5G connection.



Figure 1: Traditional production –setup



Figure 2: Remote production –using 5G

5. CONCLUSION:

5G would be very beneficial for live sports broadcasting, such as using smaller technology without the need for fibre networks. By using 5G mobile networks, there is no longer a use for traditional satellite networks or OB trucks, as transmission will send directly from the cameras to the main broadcast headquarters. Another benefit for using 5G, is there will be less of a need for staff to be onsite at the event, only core staff would be needed, cutting down on expenses, such as travel and accommodations. It would be very easy to train junior staff on the technology, who would be exposed to more live broadcasts in a shorter time. According to Mr. Hindaugh, he stated that using 5G would provide no difference for viewers between live broadcast and 5G transmissions. [12]

References

- [1]. https://www.telegeography.com/products_commsupdate/articles/2019/03/29/ministerhopes-for-5g-launch-by-june/
- [2]. Tanwar, G., & Singh, G. Multimedia Streaming Technology in 4G Mobile Communication Systems. International Journal on Computer Science and Engineering, Vol.02 (Issue 03), 2010, PP. 695-699.
- [3]. Al-madi, A. M., Idrus, R., Ramadass, S., & Budiarto, R., A Proposed Model for Policy-Based Routing Rules in the IPv6 Offering QoS for IPTV Broadcasting. International Journal of Computer Science and Network Security, Vol.8 (No.3) 2008 .
- [4]. Shukla S and Pandey M.C, "Mobile Technology", International Conferences on Recent Trends in Engineering and Technology 2012.
- [5]. Mishra, "Fundamentals of Cellular Network Planning and Optimization", John Wiley and Sons 2004.
- [6]. "Radiolinja's History". 20 April 2004. Archived from the original on 23 October 2006. Retrieved 23 December 2009.
- [7]. Pachauri, A.K Singh," 5G Technology Redefining Wireless Communication in Upcoming Years" International Journal of Computer Science and Management Research 2009.
- [8]. D Valerdi Q Zhu, K Exadaktylos, Sxis M Arrahz, R liu and Zxu," Intelligent Energy Managed Services for Green Base Stations" Proc, IEEE International Global Telecommunication Workshops 2010.
- [9]. "TELCOMA GLOBAL | 5g Technology Introduction". telcomaglobal.com..
- [10]. <https://www.psneurope.com/broadcast/bbc-live-radio-5g>
- [11]. <http://www.sportspromedia.com/news/wembley-hosts-first-live-5g-sports-broadcast>
- [12]. http://www.sportspromedia.com/quick_fire_questions/5g-network-live-tvproduction-bt-sport-ee