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BY MEMBERS

5G + Healthcare: Technology in Action

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In this time of difficulty, pioneers of connectivity and the telco operators across the world have stepped up to the challenge, and have come up with novel ways to utilize 5G– the latest generation in telecom infrastructure.

With the COVID-19 pandemic rampant across the world, there is a new meaning for digital connectivity for all of us now. Social distancing and near lockdowns in various countries have reminded us how dependent social welfare and even economic growth of a country is on digital transformation. In this time of difficulty, pioneers of connectivity and the telco operators across the world have stepped up to the challenge, and have come up with novel ways to utilize 5G– the latest generation in telecom infrastructure.

Of course there are various challenges faced by operators in these trying times, especially in the most affected country where the fight against COVID-19 is unprecedented. The pandemic presents telecom operators with new challenges on multiple fronts, which can be broadly classified into three areas: emergency communications, a surge in online services, and how to improve the network capabilities. The early lessons learned in each of these three areas can help companies and nations in the Middle East to better cope with the COVID-19 pandemic, bringing the true value of digital to local communities.

Emergency Communications Powered by 5G + AI + Cloud

There is an increasing demand on healthcare networks worldwide, and ICT is proving to be a vital component in addressing those requirements. A clear example of that can be seen in the Hubei province of China, where Wuhan is located.

At the onset of the outbreak, there were a total 48 hospitals designated for COVID-19 patients with the capacity of 26,911 bed spaces—which were clearly not enough with the amount of new cases coming in every day. So the government built two new hospitals with a combined capacity of 2,600 beds in a record time of ten days. Both of these hospital locations were required to have 5G connectivity for high speed and real-time communications. All three national operators– China Mobile, China Unicom, and China Telecom—came together and covered both of the new hospital sites within 72 hours through the installation of pole 5G sites on location.

The initiative was so impactful that the next step was to interconnect other hospitals in major cities with 5G due to the spread of the virus. Again, the national operators stepped up and worked on a wartime scale to cover nine cities in seven provinces with 5G, comprising of 305 new sites within 72 hours, which was considered an important achievement of cooperation in technology deployment.

Furthermore, for the prevention of COVID-19, the combination of 5G + AI was used to detect face masks on medical professionals through cameras and potential patients through thermal cameras with zero touch. For detection, cloud computing supported by 5G was used for mobile test laboratories, where data from gene sequencers was uploaded to the cloud for enhanced virus identification.

With the high-bandwidth broadband connectivity and quick deployment, the combinations of using 5G, AI and cloud also enabled other key medical applications in the emergency. This included remote diagnosis, collaboration, consultations with high quality video communication and low latency data transfer. This ensured timely action even in a situation where critical patients were increasing and there was a shortage of medical staff.

This technical synergy proved instrumental for China to control the pandemic as quickly as it did. Similar initiatives are now being rolled out in nations around the world as we learn from the early instances of COVID-19 response.

5G for surging online services

Many of us have been spending more time at home due to the COVID-19 pandemic. Home network usage was the most impacted category. This has resulted in a sharp increase in data consumption across the board, with the classic busy-hour model shifting and the data throughput hot spots changing locations.

In particular, we can see three key scenarios contributing to the spike of online services:

1. Remote Education: As schools have been suspended, this has created a need for hundreds of millions of students to shift to online education. Taking China as an early reference point, this caused usage time per person to increase by more than 80%. We also see the average speed required for these services is 6.8 Mbps in 90% of the cases for no buffering in online education
2. Remote Working: In China, with many workplaces affected by lockdown, it has brought 400 million users online to finish their daily tasks digitally where possible. In places like Italy, the number of remote workers grew by more than 300%, and again, the average speed required for those remote work scenarios is around 6 Mbps. Enterprise applications such as Skype, WeLink, and ZOOM have witnessed significantly higher downloads and usage.
3. Online Entertainment: This is an important category for operators to remember amidst the COVID-19 pandemic. For example, in Italy 30% of the data traffic increase was contributed to gaming. In China, a newly-released online streaming movie reached 120 million concurrent users and short video apps such as TikTok have over 2.5 billion views/day. The average required speed for enjoying short video applications is 5.3 Mbps.

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In this context, operators in both Asia and Europe were successful in providing services with a fast time to market, especially in sub-urban and rural areas through 5G fixed wireless access (FWA). This provided the guaranteed network experience to meet the increasing public demands. For example, in Italy, the user accusation of TIM Italy has gone up 2.5 times by providing their customers much needed high bandwidth 5G service through FWA. Operators like AIS Thailand are also supporting work from home by bundling apps like ZOOM and Office 365 for free with their data packages. Many operators have given free data package and also made access to their entertainment apps free, to keep people at home and entertained.

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On the application front, to support citizens, all three operators in China took many initiatives like:

- Collaboration with multiple online education platforms: China Telecom's e-Cloud Classroom serves 1.01M students. China Unicom's WO Learning service provides free courses for 47M users and 10M high-quality courses for free. Online distance education provided by China Mobile covers 60.7M individuals.
- Remote office services for enterprise: China Telecom e-Conference service has added 858,000 new users. China Unicom Cloud Video Conference is providing services for 15,900 enterprises and institutions. China Mobile Cloud Video Conferencing covers 31,000 enterprises and 4.532M users.
- Free Access to Video/Game Apps: China Telecom granted free access to four video/game apps. Mobile Data of ten video games of China Unicom is offered free of charge in Hubei to 229,000 users. China Mobile's Migu app live broadcasted the construction progress of the Huoshenshan and Leishenshan hospitals through 5G. By February 10, the total number of viewers has reached 490M.

Fight against COVID-19 by strengthened network

During the epidemic, the spike in data usage posed multiple challenges to the telecom operators like poor network experience and high latency. This also shifted the classic busy-hour model and highly loaded hot spots, which are used to design telecom networks as work from home and home education changed the peak time. To address the problems and find out the corresponding solutions, telecom operators worldwide have taken lots of actions to guarantee the users' experience.

For example, a lot of measures have been taken in many places in China successfully:

- Operators are playing catch up now by the network optimizations in highly loaded areas. Through end-to-end customer service experience management and deployment of network visualization tools, provide means for deterministic positioning of business and network faults, which can effectively guarantee the

best QoS and good business experience in the target area.

- Over the years, the "Broadband China Strategy" was initiated by the Chinese government that clearly defines the fiber broadband networks as a national strategic public infrastructure. In this critical time, the massive FTTH and bearer network has demonstrated its high-elastic capability to cater to the traffic surge.
- The sharp increase in data consumption also resulted in a challenge to the system capacity. As Chinese operators usually reserve additional capacity for core nodes, this offered a good buffer time for necessary expansions, which made it easier to respond to the surging data throughput. Additionally, the massive launch of Voice over LTE network in China effectively increased the voice network capacity, resulting in no voice congestion during the whole pandemic.
- Most customer experience problems were attributed to last mile connectivity as usage hotspots shifted from CBD & recreational areas to residential areas and hospitals. 5G fixed wireless access acted as a quick and economic way to address these challenges, for ensuring a better home applications experience.

The advancement of 5G launches and the rapid deployment during medical emergencies have played an important role in fighting the pandemic in China. The experiences on ground have also brought the overall benefits of 5G to the forefront, while unleashing more innovative cases that have brought much more confidence to the public and to businesses for combating the pandemic.

In the Middle East, we hope to endure through this pandemic by learning from such experiences. We are encouraged to see that most of the ICT infrastructure leaders in the Middle East are executing or planning some positive measures to help governments and the public during this period. This will really benefit the public, along with obeying government regulations and staying at home, to instill confidence and to defeat COVID-19.

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Moreover, these learnings clearly depict how crucial 5G is for tackling a pandemic like COVID-19 on multiple fronts in healthcare and at home. It's fast deployment, high bandwidth, and low latency is necessary for running critical applications required at this time. It's time the world realizes the importance of better connectivity, not only to improve lives, but to save them as well.

Thought leadership contributed by SAMENA Council Member.