IMPACT OF SAR-COV2 ON THE DEVELOPMENT OF ADVANCED TECHNOLOGIES - GLOBAL TRENDS

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Abstract: *The COVID-19 pandemic creates major pressure on the global economy, but also helps accelerate the development and commercialization of several emerging technologies such as drones, robots, telemedicine, virtual reality, 5G technology. The new coronavirus is producing a number of effects on the world that will be deeply felt and will bring about a number of changes needed to stimulate adaptation to everyday reality and progress in key areas.*
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The global COVID-19 pandemic has forever changed our experiences—as customers, employees, citizens, humans— and, as a result, our attitudes and behaviors are changing. The crisis is fundamentally changing how and what consumers buy and is accelerating immense structural changes in different branches of industry[1]. Aside from the obvious impacts on human health, the COVID-19 pandemic has also greatly impacted the global economy, negatively affecting industries such as the global financial sector, sports, and tourism. An increasing share of people worldwide believe COVID-19 poses a very high or high level of threat to their country and a growing percentage of people fear the outbreak will personally impact them financially. The impact of the pandemic on the global economy has already begun to show, however the true consequences

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[1]https://www.statista.com/topics/5994/the-coronavirus-disease-covid-19-outbreak/,accessed on 11.04.2020.

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of the pandemic are yet to be seen as case numbers continue to rise in many countries around the world[2].

The COVID-19 pandemic creates major pressure on the global economy, but also helps accelerate the development and commercialization of several emerging technologies that have previously been supported and promoted both in public and government opinion. This is especially true for innovations that reduce human contact, automated processes and increase productivity in social distance[3]. Among those that have been noted during this period, we can mention:

Delivery drones and robots can cope with a large workload and are not susceptible to disease or to the easy spread of virus. The unique challenges of COVID-19 could force the relaxation of existing rules and regulations as deliveries to the people at home and the infected persons escalate. For example, the drone company for medical supplies Zipline, which is currently delivering blood and blood products to Rwanda, was planning to start operations on US territory later this year, but due to global events, the company is negotiating with government regulators to launch the service earlier on the American market.

Robots - though they are predominantly used in factories, they remain unused or undiscovered in the vast amount of everyday activities. This could change because different types of robots have started to be enrolled on the list of assets used for protecting people during the pandemic. In China, robots help patients navigate between hospital departments, check the temperature, carry medical samples, distribute the hand disinfectant, disinfect residential and commercial areas and keep hospitals clean. Healthcare robots are also experiencing increased worldwide use and become more involved in patient care. For example, at the Regional Medical Providence Center in Everett, Washington, a robot was successfully used to treat a COVID-19 patient, doctors using the robot room, microphone and stethoscope to monitor the patient's vital signs.

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[2] https://www.statista.com/topics/5994/the-coronavirus-disease-covid-19-outbreak/, accessed on 11.04.2020.
[3] Victoria Petrock, https://www.emarketer.com/content/how-covid-19-is-fast-tracking-emerging-tech, 2020, accessed on 11.04.2020.

Telemedicine and asynchronous care - telemedicine, an all-inclusive term for healthcare services provided using telecommunications technology, has been steadily increasing in recent years, despite reluctance and intermittent support from health insurers, health professionals or even patients. Now the need for virtual guidance in healthcare and wellness has exploded and accelerates the take-up of telemedicine as a means of remote care or assistance. To prevent the overcrowding of hospitals, clinics and cabinets with those with coronavirus symptoms, the US Government has extended telecommunications technology consultations to almost 62 million health insurance beneficiaries, making it easier for them to speak to healthcare providers, receive treatment and complete prescriptions by telephone or video conferencing. The government also announced that it would temporarily ease HIPAA[4] privacy rules for suppliers wishing to provide remote assistance services. The stress related to the virus existence on the healthcare system stimulates the interest in asynchronous healthcare, a form of telemedicine that can help patients monitor and manage chronic conditions without face-to-face meetings.

Biometrics, imaging and termo-vision - the use of biometric technology remains controversial, but COVID-19 is leading some governments and organizations to use it in the interests of public health. Technical companies, including Baidu, Hanvon, Dermalog and Telpo, have developed systems that use facial recognition and temperature detection to identify suspect cases. In China, Baidu uses infrared sensors and facial recognition to scan for fever 200 passengers per minute in the Qinghe Station in Beijing.

Virtual social reality - some critics have considered virtual reality (VR) as a "problem-seeking solution", but COVID-19 - which forces millions of people to self-isolation for long periods - can be only a situation that increases the demand for this technology. While the pandemic caused a near-complete abandonment of VR usage in theme parks and malls (involving sharing headphones with others), it stimulated interest in using

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[4] The Health Insurance Portability and Accountability Act of 1996.

VR in other areas. Not only do people at home use VR headphones to play video games, explore virtual travel destinations and participate in online entertainment, they seek human interaction through social media such as Rec room, AltspaceVR, Bigscreen and VRChat.

Voice Tech and Smart Homs - everyday consumers aware of the spread of microbes are increasingly concerned that their mobile devices - which are touched more than 2.600 times a day, according to a study - can spread coronavirus. Recent statistics on the lifetime of the virus on glass, plastic, metal and board have led to an enormous increase in consumption of antibacterial products. As public panic on the spread of microbes/viruses increases, so will the use of voice technology, which can reduce these touches and, at least theoretically, slow down the spread.

A December 2019 poll by Comscore MobiLens Plus found that US smart speaker owners are already using their devices to ask general questions, transmit music and receive updates about sport, traffic and weather, among others.

Voice use will continue to extend to other smart-home components, several entertainment components, light switches, appliances, luminaires and alarm systems incorporate voice control functionality, reducing the need for touch control in the future.

5G connectivity - Wireless operators have spent the last two years promoting and developing 5G technology, but its availability is not widespread. In October 2019, CCS Insight estimated that there will be only 200 million 5G mobile connections worldwide this year, the majority of it, in Asia. As telecoms providers start operating their limited 5G services, the situation remains uncertain as they have been reluctant to develop their capacity until secure demand reaches the expected levels.

The proliferation of the coronavirus (COVID-19) has led to what the BBC dubbed the 'nationwide work-from-home experiment'. As companies began moving their staff into work-from-home (WFH) arrangements en masse during March 2020, tech companies have found themselves on the WFH frontlines. Microsoft Teams has seen a surge in daily active users, video conferencing company Zoom experienced a bump in stock prices,

Cisco Webex saw an increase in meeting minutes, and VPN usage has risen sharply in affected countries[5].

Meanwhile, consumers are wondering how soon 5G will be used, whether it is better than the current service and whether it is worth the cost. Thanks to COVID-19, the 5G market could materialize earlier than expected. Because a large number of people work and study from home, they stress networks and create a higher demand for bandwidth. "Due to the sudden increase in access to the existing network to support remote activity, we will see a rapid growth of 5G to ensure that existing infrastructure bandwidth and capacity problems can be addressed," said Ian Runyon, Vice President Tangoe. "Once available and accessible, 5G technology will serve as the basic support for emerging technologies in IoT and automation among other applications."

In March 2020, there was a major migration to the online environment for everything that could make the transition from general schools to university courses, small businesses that could adopt e-commerce to large home-working corporations. The coronavirus threat has forced a number of social measures, by ending any kind of collective entertainment and increasing the number of people working from home, changes that have caused an enormous proportion of the population who have based their work on broadband networks at home to interact with the outside world.

This switch is unprecedented, which can lead to the question: Can our current networks cope with the voltage?[6] What is more, will the coronavirus outbreak and the "social distance" needed to mitigate the spread become a reason for the development of more advanced and robust 5G technologies for a future where businesses, healthcare and human interaction need to be longer than the arm?

Jessica Rosenworcel, a Member of the FCC[7], said the influx of people working from home is a test of current networks. "We will have a big

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[5]https://www.statista.com/topics/6156/coronavirus-covid-19-impact-on-tech-goods-and-services/, accessed on 12.04.2020.

[6] Todd Wasserman, https://www.cnbc.com/2020/03/20/why-the-coronavirus-pandemic-may-fast-forward-5g-adoption-in-the-us.html, 2020, accessed on 12.04.2020.

[7] The Federal Communications Commission is an independent agency of the United States government that regulates radio, television, satellite, and cable communications in the United States.

stress test in our networks," she said. "There are lots of potential stress points." The FCC has given operators access to additional bandwidth for a period of 60 days to handle additional users. (T-Mobile is the only operator to have taken over the FCC offer to use spectrum in the 600 MHz band to help meet the increased demand of broadband consumers during the coronavirus pandemic). Some thought that 2020 would be 5G, the fifth generation of wireless technology. 5G is thought to have a speed that is100 times faster than 4G download speeds. The industry, including AT&T Inc. (American Telephone and Telegraph Company), Verizon and T-Mobile, started implementing the technology in 2019, believing that by the end of 2020 half of the US would have access to 5G, with the support of the US government.

To facilitate US leadership in 5G technology development and application, the FCC extended the 5G Fast plan in 2016 to accelerate the deployment of high-speed broadband in rural America and organized its third 5G spectrum tender in late 2019. FCC President Ajit Pai said in December 2019 that he would propose $9 billion in financing to bring America's rural parts on a par with urban segments. In addition, the US government is paying around $10 billion to satellite flow providers to accelerate the 5G auction in band C by 2023. The C-band spectrum is sought because it combines the ability to deliver download speeds of more than 1 Gbps with significantly improved spillover intervals compared to higher frequency spectra.

In 2019, 5G was available for only about 1 per cent of the phones sold, according to the NPD Group market research firm. 5G technology is being promoted as a major step forward for wireless technology, which will generate new usage cases - from driver-free cars to robotic surgery to smart buildings.

And the coronavirus could be just the 5G catalyst that the world needs, as it forces whole nations to apply quarantine, social distancing, remote work and the continuation of courses online.

China uses 5G to support health applications and user temperature monitoring applications. A program was recently launched at a Coronavirus

hospital in Wuhan, in which the health-care staff consists of robots that use 5G technology to protect doctors from the virus

The global pandemic has forced a supply chain slowdown that may delay the rapid expansion of 5G in the immediate future. There has been a dramatic slowdown in the production of Chinese plants, which could slow down the pace at which 5G equipment is migrating to the United States and other areas. "The Chinese will not save the world this time," said Jacob Kirkegaard, analyst at the Peterson Institute for International Economics. He said they have taken a "remarkable laissez-faire attitude toward economic stimulation" and, "as such, the slowdown in China is bad news for the world, including the US". However, the effect of such a slowdown would be limited, as the Trump administration has already banned the use of Chinese components in the 5G US network, if there were suspicions that they would be used for espionage.

In the political context, Rob Enderle, the director of the Enderle group, was not concerned about the potential delays. He said that while some expect hardware from Asia, they can improvise solutions. "For a period they can move toward the completion of the infrastructure and site preparation, but the hardware deficit undoubtedly damages the timetable," he said. "So, although the impact will not be as dramatic as in other areas, given the existence of working alternatives, it will lead to some changes in the programs." Telecoms analyst Roger Entner said the overall effect of the delay over coronavirus so far seems limited. "China is the world's factory. All 5G base stations are manufactured in China," he said. "I don't think there will be a big change, because the coronavirus will be a few months' effect." Representatives of industry companies can claim that, in the current epidemiological context and in relation to this sudden home-working influx, 5G technology needs more investment, because together with Wi-Fi 6 it can revolutionize the market for domestic workers. How quickly this combination of technologies can be achieved and applied, it remains to be seen.

CONCLUSIONS

The new coronavirus is producing a number of effects on the world that will be deeply felt and will bring about a number of changes needed to

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stimulate adaptation to everyday reality and progress in key areas as observed during this period.

The Romanian state of emergency in the context of the global pandemic recalibrated the population's demand on certain segments and brought a real awareness of the reality in terms of national industry, health, agriculture and technological development. The impact on the economy has been particularly marked by a strong need for investment in innovation (e.g. through a participatory budget exercise in the area of dual education) and the digitalization of non-technology companies.

Globally, the online environment has been most in demand from the point of view of self-isolation of individuals in all social segments, with distance interactions and real-time communication being a priority no matter when we report. This trend has also been implemented at the Romanian society level, with telecommunications operators in the region increasing internet speed so that networks can support the stress generated by increasing connections.

The current situation generated by the global pandemic may be an argument for the need to adapt 5G technology at global and national level, with more benefits in the long term, regardless of the situation, as technology allows us to perform our critical everyday activities even from our own home.

A positive aspect highlighted by the state of emergency, stated at national level, refers to the high adaptability of Romanian society to the crisis, to its capacity to find alternatives in order to meet its objectives and limit negative situations. This was done by using technology at educational level (online education) and the continuation of the activity of individuals (tele-work), as well as the use of the latest technologies to support directly involved staff (using 3D printer technology to produce essential components for artificial breathing fans and viewing).

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