

An Overview:

Use of Technology in the Novel Corona Virus Crisis (COVID-19)



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Abstract

This report reviews how technology was used by countries in responding to the outbreak of the Coronavirus and how effective this was in improving conditions during the crisis. It also analyzes the impact of the use of these technologies on the future direction of governments and technology companies in the field of health, e-commerce and labor policies. Accordingly, this report specifically seeks to answer the following questions:

- How technology was used by countries and companies to tackle the Coronavirus crisis?
- What benefits have been obtained and how effective was the use of technology in responding to the challenges posed by the Coronavirus crisis? What are the observations or lessons that can be learnt?
- What approaches will governments and tech giants adopt in the areas of health and pandemics after the crisis?
- World economies were directly impacted by the repercussions of the Corona crisis, so what are the effects of the crisis on local and global e-commerce?
- Many government agencies and private sector companies have shifted to “work from home” to achieve social distancing and reduce the risks of the spreading the virus. What are the implications of this for labor policies after the crisis?

I. How technology was used by countries and companies in responding to the Coronavirus crisis?

1. A number of technologically advanced countries that possess highly developed communication and information infrastructure used, to varying degrees, smart systems and advanced technologies in the implementation of some of the measures that they have taken to control the spread of the Coronavirus. These countries include China, Japan, the United States, South Korea, Taiwan, France, the United Arab Emirates and the Kingdom of Bahrain. The following are some of the applications of artificial intelligence and technologies that were used or developed during the crisis:

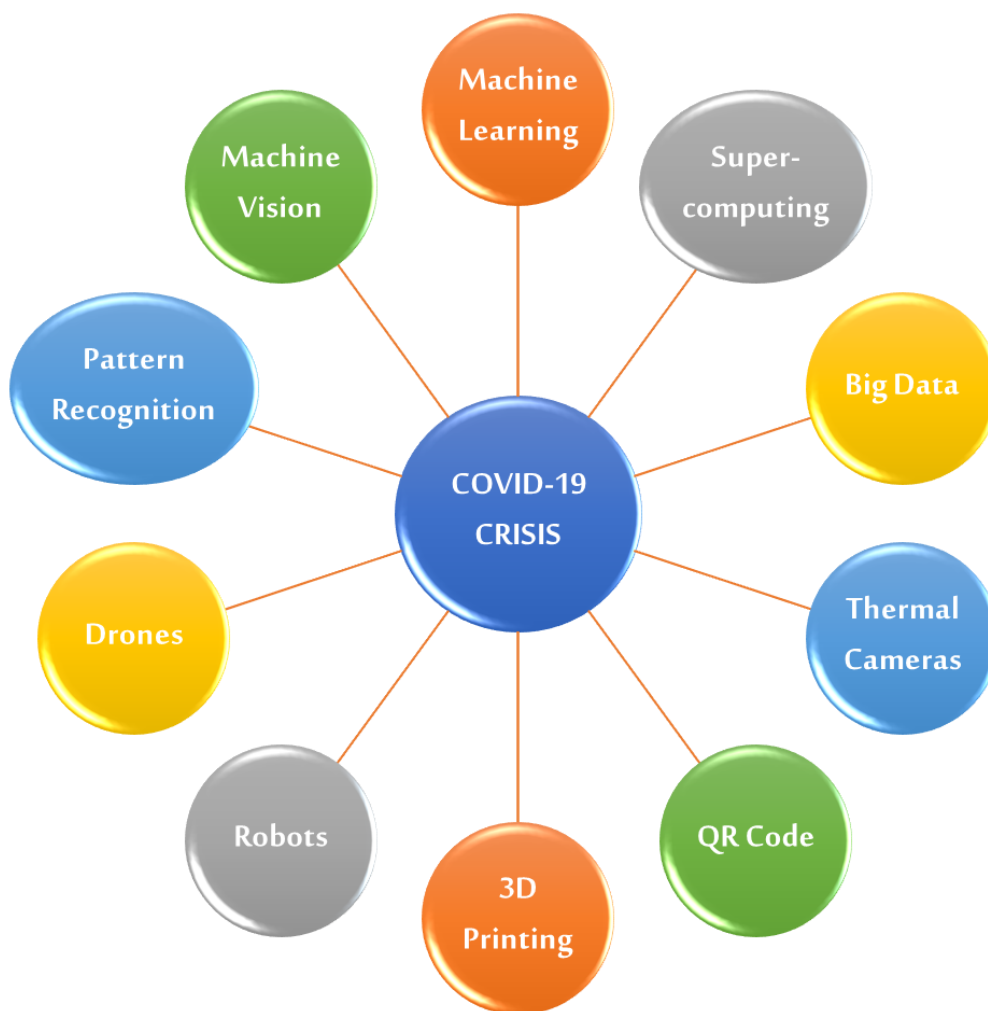


Figure 1: Technologies used in responding to the novel Covid-19 crisis

2. Thermal cameras were used to measure the temperature of persons from a distance. These cameras which use machine vision and pattern recognition systems can examine and check the temperature of up to 200 persons per minute in public places
3. Machine learning systems for the detection of the virus in chest tomography.
4. Remote electronic monitoring applications, by using QR-codes and mobile phones, to locate and track the movements of home-quarantine cases and ensure that they remain within the designated areas.
5. Drones to deliver test specimens and medical supplies to and from hospitals and medical laboratories, remotely measure the temperature of persons to detect people potentially infected with the virus in public places, decontaminate external surfaces and spaces such as rooftops and streets, and monitor public places to ensure people do not go out of their homes in violation of measures taken by governments to combat the spread of the virus.
6. 3D printing to produce protective masks for medical personnel and respirators which some hospitals seriously required as the number of positive cases escalated.
7. Robots to disinfect the inside of hospitals and deliver food and medicines to COVID-19 patients in hospital wards, in order to reduce contact between medical personnel and those infected to prevent the spread of the virus.
8. Machine learning systems to analyze big data about travelers and their movements within certain areas to track and reach out to possible suspected cases/ contacts with positive cases.
9. Use of supercomputers with high artificial intelligence (AI), to help researchers find a vaccine to the Coronavirus. The "Summit" supercomputer of IBM was used to analyze data related to 8,000 compounds linked to the main protein in the Coronavirus at record speed, to determine which could be tested experimentally to find a drug to fight the virus.

II. What benefits have been obtained and how effective was the use of technology in responding to the challenges posed by the Coronavirus crisis? What are the observations or lessons that can be learnt?

- Artificial Intelligence applications have helped in finding more efficient and effective solutions for dealing with the Coronavirus, by facilitating and speeding up the process of implementing some of the measures taken by countries. These include remote monitoring and temperature testing, tracking the spread of the virus and decontamination of places and areas, dealing with patients, delivery of medical equipment and supplies and also helping researchers by speeding up research to find a cure. Also, 3D printing has partially helped solve the problem of medical equipment and supplies shortages experienced by some hospitals in certain countries during the crisis.
- The crisis demonstrated more than at any time before, the worlds need for faster, more efficient and more intelligent systems and tools to respond to global crises and pandemics and deal with them professionally.
- The crisis highlighted the importance of the wide-spread use of AI in multiple fields and across all countries. It emphasized the roles and uses of big data and Fourth Industrial Revolution (4IR) technologies such as the Internet of Things (IoT) and Blockchain, and how these enhance the ability to innovate solutions to overcome the problems and difficulties that governments, organizations and institutions may face during a crisis.
- The crisis provided an opportunity to gain a deeper understanding of the role of Artificial Intelligence and appreciate its potentials. This helps correct the misconception that AI interferes with human life and encourages using it to make the most use of its capabilities in serving humanity, opening new economic horizons and making advances in numerous fields.

III. What approaches will governments and tech giants adopt in the area of health and pandemic control after the Coronavirus crisis?

- The understanding by governments of the importance and usefulness of technology and smart systems in combatting the Coronavirus may encourage them to expand the use of AI applications such as machine learning, pattern recognition, computer vision, robots, drones, and the use of big data in the areas of medical services, public health and safety. The use of these applications and technologies will spread gradually in many countries over the coming years.
- Countries, after the crisis, are likely to start local manufacturing of some medical equipment and hospital supplies using 3D printing.
- After the crisis, tech giants will focus more on the use of AI and big data in the early prediction of the outbreak of epidemics, areas of spread, decoding of viruses that cause them and developing possible vaccines. Big tech companies will also seek to harness the use of AI in research and for other medical purposes, and in designing expert systems to diagnose diseases and develop new drugs and vaccines.

IV. World economies were directly impacted by the repercussions of the Corona crisis, so what are the effects of the crisis on local and global e-commerce?

- Despite the drop in global trade volumes and the negative impact on the markets during the current year due to the crisis, the global e-commerce market has witnessed a good increase. The health measures taken by many countries to control the spread of the virus, including lockdown, led consumers to shift to online shopping, thus increasing the sales on international e-commerce platforms and the demand for electronic services, such as internet-based home entertainment, movies and drama series worldwide. The longer the shops remain closed and the longer people stay at home, the greater the opportunities for more sales on these platforms and services and the higher increase in the share prices of the companies that own them.

- Amazon, Alibaba and Netflix are among the most prominent e-commerce companies that benefited during the crisis. Amazon's share price has increased by 25%, adding US\$ 24 billion to the riches of the company's owners to reach US\$ 138.5 billion since the beginning of the year, according to the Bloomberg Billionaires Index. The website of the British newspaper "The Independent" reported that Netflix's share has risen by about 0.8% during the month of March. Both Alibaba and Amazon are hiring more delivery workers to cope with the increase in online sales. According to CNN, Amazon announced that it was adding during the crisis 100,000 new jobs in the US.
- Although there is no official data on the extent of the increase in e-commerce transactions during the crisis, some published statistics indicate that the volume of online sales has increased in many countries to varying degrees. For example, from 17 February to 8 April 2020, Italy¹ recorded an increase of 90% in online sales over the same period in 2019, and during the period from March to April, France² reported 13% increase in online sales, Brazil³ 40% and Poland⁴ 12% in 2020 compared to the same period of 2019, according to statistics published on the "Statista" website.
- Retailers and shops realized that e-commerce is the only solution for them to offset the reduced sales during the crisis, which led to increased competition on local and international delivery services. Available statistics show that home deliveries from restaurants, supermarkets and groceries are the most requested online service within each country during the crisis. "Statista"⁵ published on 16 April 2020, the results of a survey it conducted on the deliberate shift to online purchases because of the Coronavirus pandemic. The survey covered a sample of 2,847 respondents from 4 different countries: China, Germany, the United Kingdom and the United States. The results showed that consumers prefer to order online, with big percentages for the

¹ <https://www.statista.com/statistics/1101844/impact-of-coronavirus-covid-19-on-e-commerce-in-italy/>

² <https://www.statista.com/statistics/1102648/online-shopping-sales-increase-corona-virous-outbreak-france/>

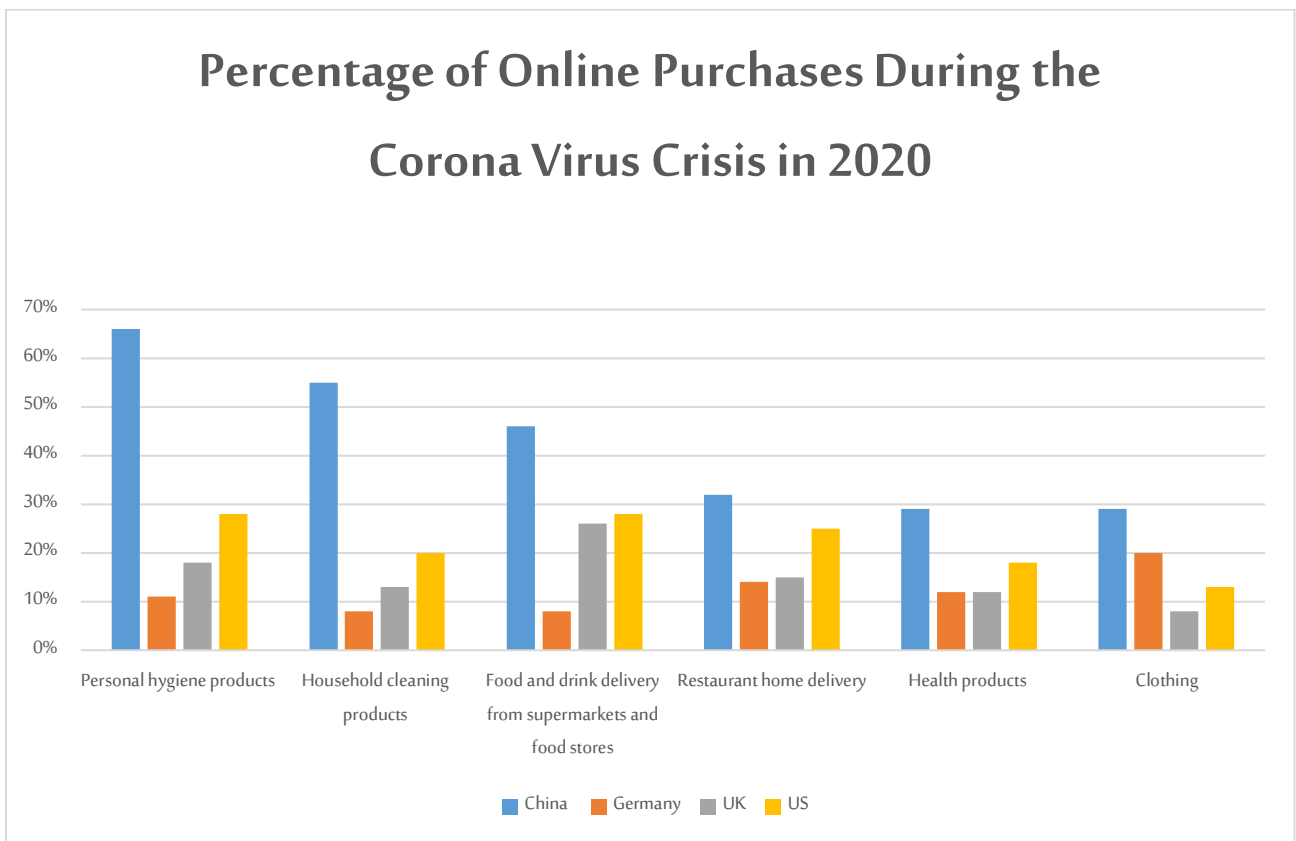
³ <https://www.statista.com/statistics/1106009/change-online-sales-coronavirus-brazil/>

⁴ <https://www.statista.com/statistics/1110827/poland-growth-in-fmcg-online-sales-due-to-covid-19/>

⁵ <https://www.statista.com/statistics/1107859/shifting-to-online-purchases-because-of-the-covid-19-pandemic-by-category/>

following services and products: (1) restaurant home delivery; (2) food and drink delivery from supermarkets and food stores; (3) personal hygiene products such as hand sanitizers and toilet paper; (4) household cleaning products; (5) health products such as medicines and (6) clothing. These categories of products achieved higher rates than the other products and services listed in the survey.

- It is expected that the volume of global e-commerce will register strong growth by the end of 2020, with the increase in the volume of online sales globally because of the protection it provides from the spread of the coronavirus, unless online sales and e-commerce platforms are restricted in response to unforeseen developments in the crisis.



V. What conclusions can be drawn from the impact of the Coronavirus crisis on e-commerce?

- E-commerce will become one of the top priorities for companies and commercial establishments after the crisis, which will lead to the rewriting of strategies and unleashing of a full competition between e-commerce and the traditional marketplace/ shops.
- The crisis is likely to help the spread of e-commerce and gradual expansion of its scope in countries and encourage the creation of virtual companies. This will lead to the opening of new markets and creation of new jobs. The local markets will expand and in the long run reach out to the global markets.
- Consumer behavior and the high demand for home delivery services during the crisis has shown that the culture of online shopping is widespread in the developed countries where there were good Internet services. This in turn requires the use and optimization of mobile devices and the Internet to meet the daily needs of life and expectations of consumers, and as well expand the scope and quality of e-commerce services to reach all segments of the society.
- The crisis has brought to light the importance and value of e-commerce and its competitive strengths. E-commerce has clearly demonstrated its robustness and ability to mitigate the effects of the crisis, compared to the limited flexibility of some other economic sectors. This will encourage governments to develop policies to help grow e-commerce, support advanced-technology-based investments and projects and develop the digital economy in their countries.

VI. Many government agencies and private sector companies have shifted to “work from home” to achieve social distancing and reduce the risks of spreading the Coronavirus. What are the implications of this for labor policies after the crisis?

- The Coronavirus crisis may prompt countries to seriously look into their existing work models and policies, so that the focus will be more on productivity and quality of output. Technology will be used to support and regulate "work from home" labor laws. Working from home gives workers more flexibility in setting the working conditions and reflects positively on striking a balance between "living" and "work". People will have more time to enjoy life.
- The shift to working from home may result in the emergence of new work models, in addition to the existing work models we see now in companies. New jobs and new types of jobs will in the future be created in the labor market.
- After the crisis, the world will become more receptive to the "work from home" model, especially in education (schools and universities), training and medical consultation, which will help reduce costs and spending on these services.