

INFORMATION TECHNOLOGY SECTOR AND THE PANDEMIC

Dr. Girdhar Gopal^a, Chhavi Kiran^{b,c}

^aAssistant Professor, Department of Computer Science, Sanatan Dharma College, Ambala Cantt, Haryana (India)

^bAssistant Professor, Department of Commerce, Sanatan Dharma College, Ambala Cantt, Haryana (India)

^cResearch Scholar, School of Management Studies, Punjabi University, Patiala, Punjab (India)

Abstract

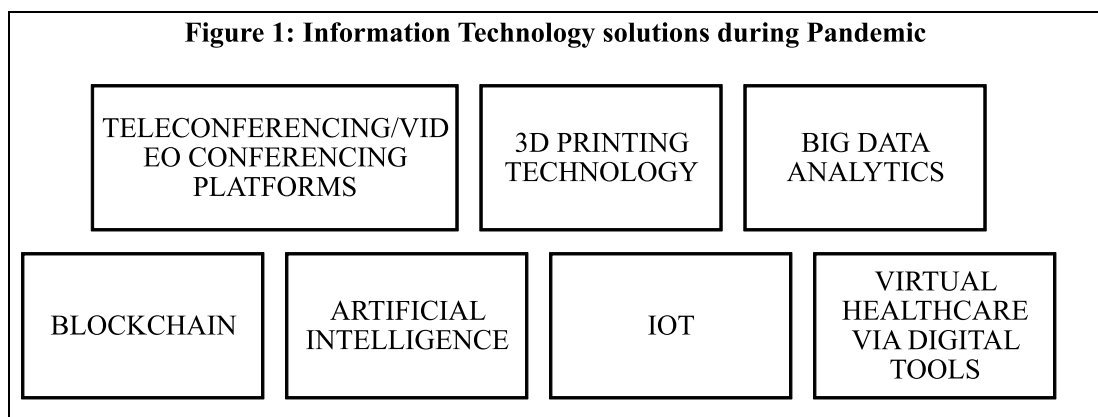
The impact of pandemic has been multidimensional spreading across economic, social, political, demographic and geographic domains simultaneously. Availability of Information technology was the only aid instantly available during pandemic time. There is a need to understand the role that technological developments have played during these times. The pandemic had generated rapid demands to innovate more technologies to cope up with the damage caused. Rapidly changing demands of consumers, needs of modernised supply chain mechanisms, requirement of workforce collaboration, equipment to support remote work was the need of the hour. Digitalisation played an unprecedented role for fulfilling all these requirements. Digital adoption has taken a quantum leap at both the organizational and industry levels. Robotics, Blockchain technology, Artificial Intelligence, Internet of Things were some of the technological innovations used by the different industries for surviving during and in post pandemic times.

Keywords: AI, Blockchain, COVID 19, Pandemic

● **Introduction**

The COVID 19 Pandemic of 21st century has caused lot of damage to different spheres of the world. The business sector, the healthcare industry, the pharmaceutical industry, education sector etc. all have been impacted drastically because of the pandemic. The only ray of hope for continuous working in late 2019 and in year 2020 was the access to Information Technology. The advancements of IT sector proved to be a boon during the

pandemic. With more work at home laws and regulations, employees had no option apart to resort to online sources for continuous working. Information technology solutions also proved to be a boon in managing the COVID 19 situation. Apple, Google, Facebook announced launch of COVID-19 mapping tools which were based on location tracking data from user's device. Various other companies have been working to imbibe technological solutions in day-to-day working. The different departments of the organisations have been aligned together on virtual platforms for better results.



● **Information Technology solutions during Pandemic**

- *Teleconferencing platforms:* Numerous teleconferencing applications like CISCO Webex, Zoom, Google Meet, GoTo Meetings have been used by different industries for making the two ends meet (Chhabra et al., 2021). Even the education sector has undergone a drastic change with a shift to online mode of teaching. Innovative online platforms are being accessed by teaching fraternity for captivating the interest of students (Joshi et al, 2020).
- *3D Printing Technology:* During the times of pandemic, the 3D printing Technology has been helpful to various industries. Many manufacturers used this technology for making face masks and Personal Protective Equipment (PPE) for healthcare workers. American additive manufacturing Company, Markforged partnered with Neurophotometrics to produce 3D printed rayon wrapped nasopharyngeal (NP) swabs for COVID-19 testing. Using this technology, swabs can be made in less than three minutes.

- *Big Data Analytics*: The digital technology of Big Data analytics was aggressively used in predicting the COVID-19 curve by tracing the travel history of the citizens which assisted in identifying the people who were required to be isolated. In addition to it, big data analytics has many other applications like analysis of the fast-moving disease, identification of infected cases, faster developments of medical treatments (Haleem et al, 2020).
- *IOT*: Internet of Things based smart surveillance systems were a major breakthrough during the times of pandemic. The major crisis during the pandemic times was to cure the patients by being utmost cautious. In those times, IoT ensured proper monitoring of patients in remote areas and ensured patient compliance with quarantine requirements (Rahman et al, 2020).
- *Virtual healthcare via Digital tools*: Easier contact between doctors and patients was ensured during pandemic. Using virtual media for consultations helped in curbing risks at both the ends. A report, *Healthcare goes mobile: Evolution of teleconsultation and e-pharmacy in new Normal*, published by EY and IPA in September 2020 stated that the telemedicine market in India is expected to grow at a CAGR of 31 per cent for the period 2020-25 and reach \$5.5 billion. Online consultation sessions with doctors on platforms like Teladoc, MeMD, iCliniq, Amwell, LiveHealth Online, Virtuwel helped patients in getting the disease cured. Using technology as a medium for dealing with a crisis situation, many companies also took initiatives. Netherlands based company Philips introduced telehealth service for monitoring and remote screening of COVID 19 patients.

Name	Website
Practo	https://www.practo.com/
Health Basix	https://www.healthbasix.in/
MyHealth care	https://www.myhealthcare.co/
Care simple	https://caresimple.com/
Doctor on demand	https://www.doctorondemand.com/
Well doing	https://welldoing.org/

- *Blockchain*: The information is systematically recorded in blocks which are chained together in blockchain technology. It is secured by cryptography and hence it becomes difficult for the hackers to attack it virtually (Chong et al, 2019). The Blockchain technology has also been applied to resolve the conflicts between maintaining privacy and addressing public health needs, such as tracking infected patients in the fight against COVID-19 (Khurshid, 2020).
- *Artificial intelligence*: AI technology was not something new during the times of pandemic but some major developments in AI and its exploration in new domains changed the outlook of data science. A Canadian firm *BlueDot* used new AI technology to scroll data through news reports, forums, blogs, ticketing data for the purpose of infectious disease surveillance. The firm aggressively used AI to establish relations and to predict the possible disease outbreak in different domains by tracking unusual news events from different regions. In order to ensure authenticity, the firm further employed epidemiologist to further analyse the information before making it public.

Table 2: Applications of Information Technology solutions	
Technology used	Application areas
Teleconferencing/Video Conferencing Platforms	Education Sector, Businesses
3D Printing Technology	Manufacturing of face masks and PPE
Big Data Analytics	Tracing of travel history
Blockchain	Addressing public health issues
Artificial Intelligence	For prediction of pandemic spread
IoT	For monitoring the spread of pandemic
Virtual healthcare via Digital tools	Healthcare industry

● **Impact and use of technological solutions by different industries**

During the pandemic times when social distancing norms were to be followed, technical solutions were used for establishing communication between different stakeholders of the society. Through technology, safety measures, status of pandemic in different areas, national announcements, public policies were communicated. Considering the business angles the company's policies, remote working protocols, business projects information were communicated to all the executives via e-mails, WhatsApp groups and other formal platforms of disseminating information.

● **Tourism Industry:**

As per FICCI- Yes Bank report, India has been described as the tourism powerhouse and the largest market in South Asia. Tourism industry faced a major backlash during the pandemic. With the increasing cases of COVID 19, people were reluctant in planning a travel to different places. During nationwide lockdown in March 2019, the tourism industry came to a halt altogether as no individual was allowed to make a move. Technology helped in providing tourism specific solutions not just in India but across the world. Contactless payments, use of robotics, virtual reality hotel tours are gaining trend. Table 3 shows few Technological solutions used by Tourism Industry.

Table 3: Technological solutions used by Tourism Industry		
Company/ Place	Technology used	Description
Megvii at Beijing Railway Station	Artificial Intelligence (AI)	AI powered thermal imaging for recording and displaying temperature of commuters
Google Arts and Culture	Virtual Reality	Online streaming platforms enabled virtual visits to places like the American Museum of Natural History and the Temple of Olympian Zeus in Sicily.
IBM	Blockchain	Digital Health Pass based on blockchain that can be customized and used by organisations to establish their own criteria like COVID test result and scan results.
Henn-na Hotel in Japan	Robotics	Robots are used since 2015 in a hotel in Japan for providing different services to the customers. From reception to hotel room, different kinds of robots have been installed in place.

- ***Aviation Industry:***

Even the airport authorities made efforts to blend with technology for maintaining post pandemic services. Virtual boarding queues by Delta Airlines and self-baggage drop counters at the airports were introduced. Using Big Data analytics, personalised experience. With more flight cancellations and restrictions in aviation sector, the Companies are developed low-cost solutions for customers. Also using Big Data analytics more customised solutions are being developed so that the companies may revive themselves.

- ***Healthcare Industry:***

Patients and healthcare providers resorted to telehealth alternatives to provided treatment and to reduce the risk of infection. Increasing social distancing norms were a reason for boost in telehealth services. In March 2019, US government officials relaxed privacy restrictions under the Health Insurance Portability and Accountability Act (HIPAA) to allow Apple, Google, and Microsoft to facilitate virtual doctors' visits through their existing chat and video apps, including FaceTime and Skype. The technological upgradation also assisted in continuous and remote diagnostics (Golinelli et al, 2020). Virtual fitness platforms were also introduced for providing fitness services to the customers.

- ***Education sector:***

With global demand for need of technologically sound academicians, many online platforms were developed for smooth conduct of education online. In the framework of the UNESCO OER Recommendation, adopted by UNESCO Member States in November 2019, UNESCO is enhancing cooperation with the OER Community to support openly licensed teaching and learning materials. Moodle Learning Management System, MyeClass Academy, Google Classroom have been some of the assisting aids for students during pandemic.

- ***Entertainment industry:***

When many industries were facing loss of sales and customers during pandemic, one segment of entertainment industry made efforts to reap benefits

out of the situation. Various on demand entertainment options like Netflix, Amazon Prime, Disney Plus were the choice of consumers during pandemic. Also, other entertainment companies used virtual platforms for showcasing the talent of different artists. Few of the virtual events are listed in the Table 4.

Table 4: Use of technology by Companies in entertainment industry	
Company/Event/Organisation	Description
Seattle Symphony Orchestra	Hosted live broadcast of virtual performances and special query sessions with musicians
Virtual Grand National Horse Race	Computer simulated race was organised
Twitch	Virtual video gaming platform of Amazon

● Conclusion

Technologies can be useful for reducing the severity of the coronavirus pandemic's impact on people, organizations, and society. The pandemic of COVID 19 was not predicted at all. But still the whole world stood together and is still fighting with the pandemic. Hence there is a need to develop more viable solutions in every walk of life for dealing with any uncertain situation. The industry experts need to identify the untapped potential in every challenge and convert it into an opportunity. The technological solutions will keep on upgrading with the advent of liberalisation, privatisation and globalisation. Despite of its availability, few organisations have not blended with technology which will be indispensable for every organisation in coming times. However, the use of technologies also creates a concern of security issues and privacy. Technology is actually a double-edged sword which acts as a boon and a bane. It depends on the users of technology that how they aim to use it.

References

Research papers:

- Chhabra, N., Winfield, A., Dyer, S., & Hedayati, T. (2021). Mock Oral Board Examinations via Web based Video Teleconferencing in the Era of COVID 19. *AEM Education and Training*, 5(1), 116-119.

- Chong, A. Y. L., Lim, E. T., Hua, X., Zheng, S., & Tan, C. W. (2019). Business on chain: A comparative case study of five blockchain-inspired business models. *Journal of the Association for Information Systems*, 20(9), 9.
- Golinelli, D., Boetto, E., Carullo, G., Nuzzolese, A. G., Landini, M. P., & Fantini, M. P. (2020). Adoption of digital technologies in health care during the COVID-19 pandemic: systematic review of early scientific literature. *Journal of medical Internet research*, 22(11), e22280.
- Haleem, A., Javaid, M., Khan, I. H., & Vaishya, R. (2020). Significant applications of big data in COVID-19 pandemic. *Indian journal of orthopaedics*, 54(4), 526-528.
- He, W., Zhang, Z. J., & Li, W. (2021). Information technology solutions, challenges, and suggestions for tackling the COVID-19 pandemic. *International journal of information management*, 57, 102287.
- Joshi, A., Vinay, M., & Bhaskar, P. (2020). Impact of coronavirus pandemic on the Indian education sector: perspectives of teachers on online teaching and assessments. *Interactive Technology and Smart Education*.
- Khurshid, A., Shah, G. H., Nguyen, T. H., & Jones, J. A. (2020). Building Informatics Capacity of Local Health Departments to Combat COVID-19: A Call to Action. *Journal of Public Health Management and Practice*, 26(4), 322-324.
- Rahman, M. S., Peeri, N. C., Shrestha, N., Zaki, R., Haque, U., & Ab Hamid, S. H. (2020). Defending against the Novel Coronavirus (COVID-19) outbreak: How can the Internet of Things (IoT) help to save the world?. *Health Policy and Technology*, 9(2), 136.

Websites:

<https://www.philips.co.in/healthcare/solutions/enterprise-telehealth/hospital-telehealth>