ROLE OF DIGITAL TECHNOLOGIES AND APPLICATIONS AGAINST COVID-19 IN INDIA

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Abstract

Technology helps us in the process of achieving our target in an intelligent way. It has a vital role in all features of our existence such as communication, education, business, medical, banking, agriculture, transportation etc. Technology has a crucial role to predict a natural catastrophe like hurricane, floods, earthquakes, eruption, landslides, tsunami etc. and it also provides the way to manage. Life without technology is useless in today's digital world. Today the whole humankind itself is affected by COVID-19 disease created by a new Corona virus and in the state of lock down. All walks of our life are affected and it spread asymptomatically. All medical professionals, police, government officials and hospitals, are in the front end to fight against this virus. The information technology provides tremendous support to spread the awareness and helps the people and government in controlling its pandemic nature. This digital technology makes "Work from home", a possible solution in every sector. As India is a developing third world country with large population this paper identifies how digital technologies and its applications help people of India to fight against pandemic COVID-19.

Keywords: *PandemicCOVID-19, Digital technologies, Robotics, Mobile applications, Online Learning.*

1. INTRODUCTION

On 31 December 2019, the virus that causes COVID-19 imparts a major outbreak across the globe. This pandemic virus can easily spread from person to person. The entire world faces the mandatory lockdown the ordered given by their respective government in order to protect the common people from this prevalent virus. The most important sectors such as educational institutions, transportations, restaurants, shopping malls, theaters, and many public places has been drawn. Several precautionary measures are carried out as per the guidelines given by the higher officials. The most prominent measure to stay away from virus is to "**Stay at home and keep social distancing**". Though in the state of lockdown the spreading of COVID-19 has expanded its wings which lead to downfall. The ray of hope to overcome this major issue depends on the field of Medicine and Digital Technology. Since the development of vaccines against COVID-19 is on process by the experts group under World Health Organization (WHO), technology has its major impact against COVID-19.

Development of drones and robots has been widely used in times of less human interaction. Artificial Intelligence and Machine Learning based systems are used in everyday of our life through social media (Face book, Instagram, Twitter), smart phones, searching the content in web and many others. They also used to predict and prevent from the epidemic diseases. Technology makes rigid situation to be more simple and convenient.

This paper review on some of the digital technologies and software applications used in the present situation in India to help people, medical practitioners and governments to fight against COVID-19in the following ways: by tracking corona patients, by creating awareness, and helping people to work and maintain social distancing.

2. LITERATURE REVIEW

During this outbreak of pandemic, technologies has become boom to our nation. The Digital technologies have spread its wings in all aspects of humankind. It has its prominent role in the field of education, medicine, banking, social media etc., which makes people to be socially connected in a distance.

In the field of education, online learning or e-learning has its greatest impact on students and teaching professionals. In the article [1] "MHRD is meeting the COVID challenge" by Dr. Ramesh Pokhiryal states various NPTEL (National Program on Technology Enhanced Learning)courses are available with good quality of content and it is designed by highly trained professionals for the betterment of students. The development of virtual labs with the support of MHRD is very useful for the students. The recent development of YUKTI (Young India Combating COVID with the Knowledge, Technology & Innovation) is an extraordinary medium for the institute and for the students. Some of the National Digital Initiatives (MHRD) is Swayam platform, Swayam prabha, E- Vidwan, E-Yantra, National Digital Library and many more. Technology has a major role [21] in the field of medicine and healthcare. Artificial Intelligence, Machine Learning, Big Data has their

major impact towards it. The Government of India has taken various initiatives in Healthcare and it is named as e-health division [2]. This division is purely based on Information and Communication Technology. Drones, tele-consultations [3] are used to protect citizens in smart cities. The COVID-19 crisis has made banking sectors [4] to work in digital platform which includes social media, chat bots, mobile applications, and the Internet of Things to face the current situation. People have shifted to digital banking services due to this outbreak. Each and every transaction is done digitally. However this pandemic outbreak creates an eye opener of the importance of digital technologies and its usage across the globe.

The following sections elaborate on the role of digital technologies and its uses during this outbreak in India to fight against India.

3.   DIGITAL TECHNOLOGIES AGAINST COVID-19

World's first software to predict, locate and to track the person who is infected with COVID-19 is provided by BlueDot[5] a Canadian startup product. This software is based on Artificial Intelligence (AI), Machine Learning and Big data. It collects data from various sources including public health organizations, digital media, global airline ticketing and so on.With the help of global airline ticketing data, BlueDot able to identify the cities that were connected to Wuhan. It predicts the largest number of travelers from Wuhan were Bangkok, Hongkong, Tokyo, Taipei, Phuket, Seoul and Singapore. BlueDot predicted correctly eleven cities stood first in COVID-19. The following sections describe the technologies used in India during this pandemic lockdown.

3.1 Adoption of Robots

The purpose of robotics is to design intelligent machines that helps human in tedious situation. As the consequence of COVID-19 robots are widely used in medicine stream. Robots utilization is massive in hospitals in Wuhan [6], robots are used to spray the disinfectants, checks the temperature, disinfects and deliver the medicine and meals in the isolation ward.

And now in India the usage of robots becomes the prominent one, AIIMS hospital in New Delhi has deployed a humanoid [7] and floor disinfectant robot for the isolation wards. In Bangalore, Fortis hospital deployed an interaction robot named MITRA [8]. It is kept in the entrance to screen everyone. The government ITI in Cuttack association with SakRobotix[9] has developed two robots. One is COBOT used for providing food, water and medicine to the patients in isolation ward. The second one is NIGABOT used for surveillance and teleconsultation by doctors.

The robot named "Nightingale – 19" [10] is used to provide food and medicines in Ancharakandi in Kannur district, Kerala where a large number of cases have been reported. It can also interact with patients and disinfect. To limit interaction between the patients and health workers the robot named "KARMI – Bot" [11] is used in Ernakulam Government Medical College hospital, Kerala. Robots are used in food preparation. They are used to

deliver the food, grocery in order to have less human contact. Robots are "Health Care Workers" because they can minimize the spread of virus, they can be easily disinfected and they cannot carry diseases.

3.2 Mobile Applications launched by the Central and State Government of India

Smart phones play a major role in fighting against this deadly situation. Many applications are developed to find out the person who is infected with COVID-19. These applications can be easily installed in smart phones. Central Government and State Governments (listed in Table 1) are initiating the installation of applications that are developed against COVID-19 as a mandatory one. Bluetooth, GPS are the major component of these applications to track the patients and provide alerts to others who come to contact with patients.

3.2.1 Aarogya Setu

Prime Minister of India urged people of India to download the "Aarogya Setu" [12] mobile application, saying it is an important feature to fight against COVID-19. "By leveraging technology, it provides important information. As more and more people use it, its effectiveness will increase" [13], he tweeted on Twitter. The application is developed by the National Informatics Centre, a part of the Ministry of Electronics and Information Technology, India.

This application is based on Singapore's successful community tracing application named "Trace Together" [14, 15]. Aarogya setu was launched by the Central Government on 2nd April 2020. It uses the Bluetooth technology to identify any COVID-19 confirmed person. This application is available in 11 languages including English, Hindi, Gujarati, Punjabi, Bengali, Kannada and others. It is suitable for both android and iOS devices. This application is available in play store of Android and iOS version. The government has an official portal mygov.in [16] to download this application.

The user carries out the self assessment test through the chat box. It requires gender, age, travel history and symptoms. It is used to identify and alert the users if they come across anyone who is suspected of COVID-19.As of now 9.8 Crore people has been downloaded this application in smart phones [17]. The Central Government has made mandatory for all central government employees, for working professionals, students and common people to break the chain of this pandemic.

3.2.2 Corona Kavach

Corona Kavach[18]application is released by Union Ministry of Electronics and Information Technology (MeitY) in association with the Ministry of Health and Family welfare (MoHFW). It is available in Google play store. This application provides with real time location of the infected users whenever they activate this application.

State Governments has also taken various measures to break the pandemic. One such most prominent and mandatory component is the development of mobile applications. These applications are used to find or identify who is infected and to diagnose the symptoms of COVID 19 based on the user data. Some of the applications launched by State Governments of India are listed in Table 1.

Table 1. Applications from various state governments of India

State	Name of the Application	Released/Developed/ Collaborated by	Features	Available on
Goa	Test yourself Goa	Goa Health Ministry with Innovaccer	Self –diagnose to find out the symptoms	Google play store
Puducherry	Testyourself Puducherry	Puducherry Government collaborated with Innovaccer	Self –diagnose to find out the symptoms	Google play store
Tamil Nadu	COVID 19 Quarantine Monitor	State Government collaborated with the pixxon Ai solutions	To ensure who are diagnosed and to maintain social distance	Google play store
Karnataka	Quarantine Watch	Revenue Department of the Karnataka Government	To monitor the location who are inhome quarantine	Google play store
Karnataka	Corona Watch	Karnataka Geographic Information System Agency	It uses the map visited by the people who were later diagnosed with positive symptom	Google play store
Punjab	COVA Punjab	By the Government of Punjab	Includes self-diagnosis, COVID awareness, travelling history etc.	Apple app store and Google play store
Kerala	GoK	By the Government of Kerala	To ensure citizen's awareness during pandemic	Apple appstore and Google play store
Maharashtra	Mahakavach	Maharashtra state innovation society	It has contact tracing and quarantine tracking	Google play store

4. USAGE OF INTERNET DURING LOCKDOWN

Internet and Digital technology are the pillars of this era. Internet has become more significant tool in the world. It has its major contribution towards Education, Business, Social media, Banking, Medical and so on. Internet can be accessed either through a desktop, a laptop or even with mobile phones. All smart phones which are in the market support browsing facilities. The usage of internet has increased rapidly during this lock down period. It is the only solution to carry forward our task during this pandemic lockdown when we are isolated from work places.

4.1 Work from Home (WFH)

Work from Home popularly known as WFH, has emerged in all sectors. Due to the lockdown, all companies, IT sectors and many other important organizations had asked their employees to do their job from home in this tedious situation to ensure social distancing. As a result, [19] about 90% of employees worked from home. In which 65% of employees are from metros and 35% of them belongs to small towns. The basic requirement for work from home are a personal computer or a laptop, good LAN or Wi-Fi connection and constant power supply.

4.2 Online Learning

The outbreak of corona virus resulted in educational institutions to close down across the world. As a result,[20] the way of teaching mode has been changed drastically with the emergence of online learning, in which teaching is done virtually through digital platform. Several application tools are made available to conduct the teaching and learning process. Applications such as Zoom, Google classroom, YouTube, Mail, WhatsApp are common among student's community. Many online courses are available (free & paid) whereby students can enrich their knowledge in a better way. The most important and attractive aspects of online learning are its convenience, affordability and effectiveness.

4.3 Webinar and Video Conferencing

The internet has made certain things easy and more convenient for working and teaching professionals. Web – based seminar (Webinar) is a lecture, workshop or seminar that is conducted over the web using video conferencing technology. Equipments required are computer, web cam (for video), microphones or head set. Webinar are the greatest eye opener for learning and improving new skills in our career. Many organizations and institutions are conducting webinars to make this quarantine period a useful one. Webinar plays a big role in education during this pandemic crisis. The primary benefits of webinar are flexibility, can choose more courses, cost effective, and provide interaction. Applications like Zoom, Skype, Cisco Webex Meetings, and Google Meet are used for communicating, conducting virtual lectures, workshops, meetings and so on.

Higher officials of various nation and states discuss with officers in the field using this digital mode. This connects them immediately and helps them to understand the situation and helps them in taking decisions. This kind of applications motivated many institutions and universities to connect the students with their mentors in completing the syllabus.

4.4 e- banking

Since ATM's are drawn due to this crisis, the role e-banking and payments are most important during this COVID-19. To control the spread of the corona virus most of the services that the bank offers are available online to safeguard their customers and staff. The Reserve Bank of India, the government and other banks are stating the customers to use digital platform to carry out their banking transactions.

5. RESULTS

Digital India was launched on 1 July 2015 by the Prime Minister of India. The aim is to make the country digitally empowered in the field of technology. Due to the outbreak of pandemic COVID-19 has made almost all the sectors digitally such as traditional learning into e-learning, development and usage of many applications for meetings, conferences, communications, entertainment, transactions, payment, marketing, digital attendance, and many other services. Providing e-pass and maintaining traveler register become digitally possible to track the history to break the spread. Though the Government of India has taken steps towards Digital India and encourages for new startups yet it has to cross some more milestones to make it prominent.

6. CONCLUSION

All nation of this only earth put their hands and hearts together in identifying various measures to break the pandemic. IT industry and Digital technologies has become the backbone of the world during in times of pandemic. The need for personal protective equipment will be minimized by adopting robots in Hospitals. It also helps health care workers in monitoring the patients even after pandemic where human less intervention is needed. These technologies help us to move in a virtual environment to stay connected with the people in less contact. One such most prominent and mandatory component is the development of mobile applications. All these applications require internet connection and technical software run in the background helping silently. From this review work it is understood that still India is crawling towards the dream of DIGITAL INDIA as many of the rural areas do not have internet and people do not know how to use. High speed connection and security issues are in the top priority seeking great attention for solutions. Good IT infrastructure facilities are required in all sectors and works that are possible should be automated or keeping it electronically paves the way to work at home without damaging the economy.

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