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The Role of Information Technology in Covid-19

A Comprehensive Research Study

Sahil Zagade

Abstract :

The abrupt emergence of the new coronavirus in China has brought the entire world to a halt. The epidemic was initially discovered in December 2019 in Wuhan, Hubei, China. More than 150 countries began reporting cases of the disease within a few months. This paper's goal is to investigate how information technology can be used to combat the COVID-19 pandemic. What part does information technology play in effectively managing the COVID-19 pandemic is the primary research topic addressed in this paper. The results of this study allow us to draw the conclusion that technology clearly had a significant part in the successful management of the COVID-19 epidemic.

1. INTRODUCTION

Covid-19 is a new strain of corona virus that is attacking and causing alarm around the world. Corona virus, according to the Centres for Disease Control and Prevention, cdc.gov, is a type of virus that has been recognised as a cause of respiratory tract disorders and was originally discovered in Wuhan, China. The World Health Organization (WHO) ultimately declared a global emergency against the corona virus on 30 January 2020, about two months after the epidemic began, because it had spread to 18 nations.

The pandemic of the Corona virus has altered all existing habits, such as how people interact and work, such as the usage of social and physical distance, and the use of technology for communication, such as meetings and seminars. The goal of using this technique is to minimise the propagation and transmission of the corona virus, hence lowering the number of infected viruses.

Starting to increase online usage in various fields of life in society, virtual reality (VR) is starting to become popular, starting to increase telemedicine patterns, virtual worship patterns, and including governance patterns that will change virtually in order to break off the corona virus transmission chain are some of the changes that will occur as a result of the use of these technologies.

2. Objectives:

To combat the coronavirus pandemic, several technological developments and applications have been created. The design, creation, and use of technology are also affected by the epidemic. A deeper comprehension of the potential contributions that information systems and technology experts may make to this widespread epidemic is urgently needed. The risks posed by COVID-19 are examined in this study along with pertinent

problems associated with technology design, development, and application. It also offers viewpoints and recommendations on how experts in information systems and technology might contribute to the battle against the COVID-19 pandemic. With improved strategies for combating the COVID-19 pandemic and upcoming pandemics, continued study and technological advancement are encouraged by the findings of this work.

3. Scope:

Some of the changes that will happen as a result of the use of these technologies include starting to increase online usage in various spheres of society, virtual reality (VR) is starting to gain popularity, starting to increase telemedicine patterns, virtual worship patterns, and including governance patterns that will change virtually in order to break off the corona virus transmission chain.

By merging data from the COVID-19 notification, hospitals, general practises, and death registries, this study intends to examine the health outcomes of patients diagnosed with COVID-19 in Queensland through time and in relation to patient characteristics. Compared to hospital data, general practise patient health information offers more complete, accurate, and current information on patient characteristics, including medical conditions and drugs at the time of infection. Patients who have COVID-19 or have had it will be contacted and invited to participate by providing their specific consent.

4. Literature review:

This essay examines the advantages and disadvantages of governmental oversight during a public health emergency, in this case the COVID-19 epidemic of 2020. We first take a look at how public health authorities are currently tracking COVID-19 infections before analysing the efficacy of optional and required mobile contact-tracing apps.

The rest of this Research Paper is structured as follows. We outline the research methods utilised for this study in this section on research papers. The results section contains the findings from the systematic literature review. In this research, we go over the conclusions drawn from the study's findings, point out some of the most pressing problems, offer advice, and pinpoint potential research topics for the future. Finally, in the conclusion section, we draw a conclusion to the article and provide possible directions for further research and analysis.

Importance of IT Department:

The weight of the bulk of global organisations would move slowly without well-functioning IT systems, to put it simply. Finding a business or sector in today's world that doesn't fully depend on computers, mobile devices, and networks that connect them to the internet is difficult, if not impossible. The department is in charge of preserving a uniform standard for service, connectivity, and security.

More companies are keen to employ IT to build more modern, clever, and dependable solutions. The following is a summary of some of the needs that current and future IT engineers and specialists will be working on.

Data overload:

Nowadays, most firms must mine or analyse large amounts of data. They'll need a lot of processing power, a polished software stack, and solid analytical skills to complete this work.

Mobile and wireless usages:

Remote employment is becoming more common in industries and businesses. Smartphones, PDAs, tablets, and laptops with decent internet connectivity are required, as well as being portable and easy to transport

Cloud services:

Almost every company today uses and collaborates with cloud-based services. They provide central hosting platforms for the daily generation of large amounts of data.

Bandwidth requirement for video hosting:

The best option is to use videoconferencing. It has grown in popularity over the last few years, necessitating an increase in network capacity to allow them to function correctly.

Role of IT to Prevent/Stop the Spread:

What role does information technology play in pandemic mitigation is the main topic of debate in this section. that is, the role that information technology plays in halting the spread of pandemics. Depending on the role of technology that can directly affect the process (prevention and halting the spread) as well as the role of technology that does not directly affect the process, find articles on preventing and/or stopping the spread of a pandemic (prevention and stopping the spread).

The process is directly impacted by technology that helps medical facilities and encourages community cohesion in the face of a pandemic. When mitigation is done using a method of keeping a distance, technologies without.

Impacting Technology:

- **Video Conference Dan Instant Messaging**

Since there are no cures or vaccinations for disease, the health authorities of each nation have to impose social restrictions that have both financial and non-financial repercussions. It takes a lot of social isolation to slow the transmission of COVID-19. The capacity of the healthcare system will soon be surpassed if transmission is not stopped. Without modern technology, social segregation would not be feasible. Examples include things like work, education, religion, and socialising on a personal level. Technology allows us to communicate online and traverse the smallest distance possible.

IT's role in this mitigation and preparation phase is demonstrated by the implementation of business continuity plans for employees using online communication tools like FaceTime, Zoom, Skype, WebEx, Slack, Microsoft Teams, and others, as well as more well-known instant messaging programmes like WhatsApp and

WeChat. This technology has made it possible for individuals all over the world to stay socially connected from the comfort of their own homes for both personal and business purposes.

- **Big Data and Smart Management System**

South Korea's strategy for regulating COVID-19 revealed the usage of Big Data technology. South Korea uses a big data-based technology called COVID-19 Smart Management System (SMS) to track COVID-19-infected people as well as anyone who have had previous contact with them. The South Korean Disease Control and Prevention Centre (KCDC) uses data from 28 organisations to track the movements of those infected with COVID-19. These institutions include the National Police Agency, Credit Finance Association, three smartphone firms, and 22 credit card companies. KCDC notified the local community health centre near the sick person's residence after successfully identifying persons who had contact with infected people, and the health centre sent them a notification. If the test findings are positive, they will be treated at a COVID-19-specific facility, but if they have no symptoms, they will be placed in isolation for 14 days.

Robot and IoT:

Physical contact between humans cannot be used to maximise recovery attempts in the absence of the Covid-19 medication and vaccine. Due to the limitations of human touch at this time, robot technology has emerged as a viable option.

Because robots are thought to be capable of replacing human labour, many industrial sectors are concerned that their deployment would threaten and disrupt their operations. The COVID-19 epidemic, on the other hand, may hasten communal acceptance of robots performing some human tasks. When the COVID-19 pandemic hit, the robot was deployed as a go-between for medical workers doing activities that put them at high risk of getting the virus.

It was discovered that China opened a robot-run health facility in Wuhan, the epicentre of the COVID-19 outbreak. Robots and Internet of Things (IoT) devices perform all medical services at the facility. Patients wear smart bracelets and rings that are synced with the AI CloudMinds platform to keep track of their vital signs, such as temperature, heart rate, and blood oxygen levels. Devices are also worn by doctors and nurses to detect early indications of infection. Meanwhile, other robots provide food, drinks, and medicines to patients, as well as execute jobs like disinfectant spraying and floor cleaning.

Role of IT for Society:

Work from home (WFH), remote learning, and the deployment of various monitoring initiatives are three domains where information technology will play a role in supporting the implementation of social and physical constraints laws.

Computing devices, internet connectivity, and, if necessary, a camera are the minimum prerequisites for working from home and distant learning. Video conferencing can be used to conduct meetings and conferences remotely. Remote work has been successful thanks to advancements in communication

technology and network access. Calls can be encrypted, and firewall software can be utilised for added security. Meanwhile, in China, surveillance measures employing IT were revealed to have been reinforced by placing CCTV in apartment entry access detected among Covid-19 patients. The government of Singapore has launched the Trace Together app, which uses Bluetooth technology to identify suspected coronavirus carriers in the vicinity of its users. Another example can be found in Hong Kong, where the government utilises wristbands to monitor individuals' compliance with quarantine policies by alerting authorities if they leave the specified area.

Bluetooth and GPS technology:

Bluetooth technology is a short-range technology that operates in the UHF (ultra high frequency) radio waves spectrum (300 MHz–3 GHz). It is mostly used to establish low-cost, low-power, and short-duration wireless connections between desktops, laptops, and Bluetooth devices such as mobile phones, printers, digital cameras, headsets, keyboards, and even computer mice. This cutting-edge technology operates in the 2.402 to 2.480 GHz radio frequency spectrum, which is reserved for industrial, scientific, and medical applications. In a nutshell, Bluetooth technology eliminates cable clutter by unplugging your digital peripherals.

Governments can utilise GPS technology to track the current and past whereabouts of positive patients during COVID-19. This will eventually aid in the identification of other COVID-19 sufferers.

Some common uses of GPS during COVID-19 pandemic are:

● Mobile applications:

Many countries have created different versions of mobile applications that use GPS to detect COVID-19 patients and assist prevent the virus's spread during this devastating outbreak. The majority of these apps may be downloaded for free using people's phone numbers. Once launched, it will classify users as safe or dangerous based on a variety of factors such as the presence of virus symptoms or overseas travel history. The suspected cell phone users' GPS position will be saved in the database. This information can be utilised for a variety of purposes, including (1) alerting a safe user if he encounters a suspected virus victim, and (2) sending the victim's GPS location to healthcare professionals if emergency assistance is required.

● Smart ambulance system:

Another effective way to mitigate COVID-19's impacts is to deploy a Smart Ambulance System, which combines GPS and GSM technology. The GPS component is utilised to determine the patient's and ambulance's location, while the GSM component is used for data transmission. An end-to-end smart health application makes up this system. Once a registered GSM mobile user with severe virus symptoms sends an emergency request, the system can use the GPS embedded in the phone to track the patient's location, identify the nearest hospital with available beds, and send smart ambulances equipped with major COVID-19 patient requirements like oxygen cylinders, oximeters, and other vitals measuring instruments.

It is critical that patients arrive at the hospital on time. The ambulance also has a GPS module for determining updated ambulance location so that paramedics can select ambulances that are already on the same route as the patient and for calculating the shortest/fastest possible route to the selected hospital; and GSM module for transmitting any vital information to the paramedics' database or the hospital. It would be even better if

the time spent transporting the patient could be used to acquire important medical information about him or her and transfer it to the hospital through GSM, allowing them to make emergency plans ahead of time.

AAROGYA SETU APP

This contact tracing tool was developed by the National Informatics Centre, which is part of the Ministry of Electronics and IT in India, in an attempt to reduce the spread of COVID-19. Any Indian citizen can download the software for free, and it is compatible with both iOS and Android devices. When the app is first launched, it will ask users if they have recently travelled internationally or if they are feeling any signs of the sickness. If none of these apply, the patient is considered to be in the green zone. The list of all positive COVID-19 patients who are in the red zone will be stored in a database. This application combines the user's GPS position with Bluetooth technology to determine whether he has been exposed to a COVID-19 patient in the database. If a person in the green zone comes into close contact with someone in the red zone, the former will be notified. He or she will also be given the directions to follow as well as the necessary pertinent information.

The software quickly gained a large following among citizens, with 10 million downloads in the first five days of its release.

Conclusion

All facets of our life have been significantly impacted by the current pandemic. It has changed how individuals view a variety of subjects. The best alternatives to the present technology solutions are being sought after globally. All of the technologies discussed in this chapter work to stop, slow down, or stop the transmission of illness.

Every person of the globe has a duty to help eradicate the deadly infectious illness following the abrupt breakout of the rare coronavirus. In this paper, we have examined many strategies for protecting inhabitants against diseases and unintended transmission. With the aid of technology and wise behaviour, we can each do our part to fend off the disease and safeguard our loved ones.

Since its discovery in Wuhan, COVID-19 has rapidly spread around the world. Being highly infectious, the illness easily spreads from one person to another. It is linked to a high mortality rate because to a shortage of vaccinations and antiviral treatments. Utilizing cutting-edge technologies to avoid and control this issue can be very beneficial. Diagnostics, thermal imaging, monitoring of regions under quarantine, infrared temperature detection, hospital disinfection, and monitoring of the health and conditions of doctors and other staff members are all made possible by technology. Thus, the IT sector can help to both prevent and, to a certain extent, treat the present COVID-19 outbreak

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