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The Role of Information Technology in the Prevention of Covid19

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Abstract: The world came to a halt when the new coronavirus emerged unexpectedly. The epidemic was initially discovered in late December 2019 in Wuhan, China. The infection quickly spread outside of the country and around the world. Reports of an outbreak of the virus began to emerge from more than 150 nations. The entire planet was in a state of terror. And in no time, the confirmed death toll had risen to 89206, out of a total of 812 worldwide (29th February 2020). It is believed that IT will play a significant role in COVID-19's revival. Governments should pay more attention to providing IT infrastructure and financial support to facilitate IT capabilities.
Keywords: Coronavirus, Information Technology, Prevention.

I. INTRODUCTION

Coronaviruses are a type of virus that infects humans, animals, and birds. The virus is mostly a respiratory virus that infects and attacks the respiratory system. In some cases, the infection is as mild as a regular cold, while in others, such as COVID-19, it can be serious (Corona Virus Disease 2019), SARS (Severe Acute Respiratory Syndrome) and other respiratory illnesses, for example. Once infected, patients have sore throat, cough, fatigue, and, in severe cases, breathing difficulties.

The information technology sector has a lot of potential in terms of preventing and, to some extent, healing the current COVID-19 pandemic.

II. COVID-19

COVID-19 was first discovered in Wuhan, China's capital, in the year 2019, and has since spread around the world. The World Health Organization (WHO) declared the disease a Public Health Emergency of International Concern due to its rapid spread. Moreover, 35000 persons were affected, with over 3100 of those sick succumbing to the disease. SARS-CoV-2 is the new name for the novel coronavirus.

Like other coronaviruses, the virus atoms are spherical and have protein spikes on their surfaces. The spikes hold the human/animal cell in place before changing their form and fusing their membrane to the cell membrane. Once the genes have reached the host (human/animal) cell, they begin to produce more viruses.

China has disclosed the genetic sequence of the new revolutionary coronavirus to aid in the rapid study and creation of any type of medication. On February 26th, 2020, the virus was claimed to be prevalent on every continent except Antarctica.

In humans, the development of symptoms takes anywhere from 2 to 14 days after exposure, with an average of 5 days.

The new coronavirus causes higher fatality rates in people than the seasonal flu. The virus impacted people differently depending on their age, current health, and occasionally even their location. For example, in Wuhan, the death rate was 2.9 per cent, whereas in other regions it was only 0.4 per cent.

III. MEDICATION

In recent days China has announced the first animal tests, and researchers from the University of Queensland in Australia have also announced that, after completing the three-week vitro study. Animal studies are essential for advancing medicine and science. This includes the current global quest for treatments and a vaccine to combat the COVID-19 pandemic.

Below are recent news stories that feature the role of animals in this important work.

December 13, 2021

FOX31 Denver: Nasal COVID vaccines may be on the way for those who have needle fear

December 12, 2021

News Medical: Nasal infection drives lethal lung injury due to SARS-CoV-2 in mice

December 10, 2021

Devdiscourse: Two common drugs found effective against Covid in early testing

December 8, 2021

PBS News Hour: Some experts suggest omicron variant may have evolved in an animal host

November 10, 2021

Medical Express: Immune system early responder can combat COVID-19

University of Miami: Researchers develop a 'net' to prevent the coronavirus from entering cells

Meanwhile, scientific research into developing a coronavirus vaccine is progressing. In recent days, China reported the first animal experiments, while researchers from the University of Queensland in Australia revealed that they are moving on to animal testing after completing a three-week in vitro trial. In addition, the National Institute of Allergy and Infectious Diseases (NIAID) in the United States have reported that a phase 1 study for a novel coronavirus vaccination has commenced in Washington State.

IV. INFORMATION AND COMMUNICATION TECHNOLOGY

Information Technology, in its most basic form, refers to the use of technology to solve and decrease organizational or economic challenges on a wide scale. Every person in an IT department, regardless of their job or role, collaborates with others to solve technology issues, major or little. An IT department has several primary duties.
Here are a few examples:

A. Information Technology Governance

This refers to a set of protocols, policies, and procedures that ensure IT systems are working efficiently, effectively, and per the organization's needs.

B. Information Technology Operations

Providing technical help to end-users is part of the information technology operations. Who are largely inexperienced users, network upkeep for optimal operation, and security testing to keep the system safe from illegal intrusions and perform device management chores.

C. System Hardware and Infrastructure

This term refers to all of the various types of physical components that make up a system. Server systems, end-user interfaces, and other IT infrastructure components, features, and upgrades, and so forth. This includes tasks such as setting up. And the upkeep of various is networking equipment such as routers, both at home and in the office individual gadgets such as PDAs and computers, as well as phone systems.

V. IT DEPARTMENT'S IMPORTANCE

The importance of an IT department can be summarized as follows: Without properly working IT systems, the bulk of the world's enterprises' workloads would be slowed to a crawl. Nowadays, it's difficult, if not impossible, to find a firm or industry that doesn't rely entirely on computers, mobile devices, and networks that connect them to the internet. The department's responsibility is to maintain a standard level of security, service, and interconnection.

An increasing number of businesses are eager to use IT to implement more current, smart, and reliable solutions. Some of the requirements that present and future IT specialists and engineers will be working on are listed below:

A. Data Deluge

Today's enterprises 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.

B. Mobile and Wireless Usages

Industries and enterprises are given remote work choices through the use of mobile and wireless technology. Smartphones, PDAs, tablets, and laptops with decent internet access are required, as well as being portable and easy to transport.

C. Cloud Services

Almost all firms today use and collaborate with cloud-based services. They provide central hosting platforms that keep track of the massive amounts of data created daily.

D. The Bandwidth Requirement for video Hosting

Videoconferencing is the way to go when it comes to bandwidth requirements for video hosting. It has been successful. In recent years, it has grown in popularity, increasing the number of networks. To enable them to function correctly, bandwidth is required. Based on the aforementioned developments, it is predicted that computer and information technology jobs will increase. From 2016 to 2026, technology occupations are expected to grow at a quicker rate of 13% according to the Bureau of Labor Statistics, than the national average for all occupations.

VI. COVID-19 AND I.T

The Wuhan new coronavirus outbreak has turned into a global disaster that has killed thousands of people and left millions more exposed. Supply chains have collapsed, economies have entirely derailed, firms have shut down operations, and large cities throughout the world have been placed under lockdown. China, the source of the novel virus, has not been the hardest afflicted. The virus has wreaked havoc on countries such as Italy and the United States. Countries are attempting to reduce the spread of the virus to a great extent by utilizing resources at their disposal and employing cutting-edge technology. . With the outbreak of SARS (Severe Acute Respiratory Syndrome) in 2002, scientists took more than a year to decode the virus's genome with the technology available at the time, whereas today, thanks to better technology, the novel coronavirus genome was detected in less than a month. The following are some of the ways that countries are fighting this deadly strain.

A. Systems for Bioinformatics

Quick drug discovery has been achieved utilizing bioinformatics systems that employ diverse methodologies such as deep learning, machine learning, virtual screening, and so on. To put it another way, the quick discovery of COVID-19 antiviral is important in preventing outbreaks. Virtual drug screening is a practical and cost-efficient method of identifying effective antiviral medicines and promising protein targets quickly. Traditional drug research is expensive and takes time to complete. Ligand/target-based virtual screening, molecular docking, homology modeling, molecular dynamics simulations, small molecule docking, machine intelligence-based GNC, homologous targets screening, and structure-based ab initio drug design are some of the protocols or methods used in computational drug discovery.

B. Telemedicine

Face-to-face communication between consumers and healthcare practitioners has become increasingly difficult because of the rapid spread of COVID-19. Another issue is limited access to experts, particularly in remote facilities. Telemedicine services were utilized to share healthcare services over the internet utilizing a doctor-to-doctor approach to diagnosis and consultation. Telecommunications and online education have the potential to be a game-changing solution for reducing the epidemic's detrimental cultural and educational repercussions, such as environmental dangers, physical health, mental health, and social life as a result, the development of online mental health services aided in the control and treatment of individuals' psychological issues.

C. Decision Support System

DSSs could be built for administrative and clinical purposes to assist decision-makers (managers or healthcare practitioners) in making the best judgments. Two applications of DSS that were designed to respond to the COVID-19 outbreak include assessing the severity score of COVID-19 patients and supply chain management.

D. Online Interactive Dashboards/GIS

The online Dashboards (e.g., WHO, Johns Hopkins CSSE, and Early Alert Inc. (dashboard) are used to report many types of information, such as location, number of new cases, number of deaths, number of recovered cases, and controlling patterns of the epidemic. Dashboards are supervised by regional and municipal health departments as an important data source. Furthermore, GISs are useful tools that provide a variety of information that could lead to better epidemic control. The benefits of employing GISs include identifying the spreading sources, location-based data for analysis/modeling, informing public events, site selection, supply chain management, and resource locator.

E. Infection Control System

During patient care, health providers in hospitals, particularly those working in negative pressure isolation units, are exposed the most. Infection control systems with real-time monitoring are employed as a powerful tool for lowering infection rates, resulting in prompt protection and remedial action.

F. Robotics

In hospitals where people are being treated for sickness, robots can be utilized to prepare meals. They can also be used to dispense hand sanitizers when needed, as well as spray disinfectants and clean around the facility. Robots can be deployed on the front lines wherever the spread of coronavirus is a concern. Diagnoses and thermal imaging can both be done with the help of robots. They're also useful for transporting medical samples and compiling reports.

G. Drones

Drones can be of huge assistance in situations where quarantine is enforced. Drones can help in disaster-stricken areas by bringing both medical equipment and patient samples. This will assist save time, reducing transportation time, and reducing the chance of contamination of the samples. Drones can also be used to keep an eye on locations when quarantine is in effect and to check for unwelcome movement of persons. In the countryside, drones can also be used to spray disinfectants. Drones can be used to issue warnings to citizens not to leave their houses and to penalize them for not wearing facemasks or other protective gear. Drones can also be used to deliver medicines to people who are sick or in need.

H. Facial Recognition with Big Data

The government can use facial recognition software and big data techniques to monitor the citizens in the area because cameras are put at most spots on roads. Face recognition and infrared temperature detection are two techniques that can be used in major cities. CCTV cameras can also be deployed in high-risk areas to ensure that persons who have been quarantined do not leave.

I. Autonomous Vehicles

At a time when there is a significant shortage of healthcare personnel (doctors, nurses, and other staff) and the risk associated with human-to-human interaction is high, autonomous vehicles can be extremely useful in delivering necessary products such as medicines and food. Self-driving cars that run on electricity or are powered by batteries can be used to clean the streets and to transport other vehicles. Hospitals can also benefit from the utilization of these vehicles. Self-driving automobiles could be utilized to deliver goods to customers' homes. They'd finish the job and cover the remaining mile of the supply chain ledger without risk of virus transmission or infection.

J. Using the Internet of Things (IoT) and Artificial Intelligence (AI)

Together, AI and IoT can help reduce operating costs and increase efficiency by discovering problems at an early stage. IoT devices can capture patient data at any time and aid in the diagnosis and lifespan of the disease. IoT sensors can also be utilized to keep track of the doctors and other staff's health and well-being. AI would produce outputs that would aid in the monitoring of critical aspects of the disease that enhance or lessen the disease's effects on patients. We can make decisions about how to combat the disease based on the data, and we will also have an understanding of how the sickness affects patients. Once we get the huge data from the IoT sensors, AI can be used to create more affordable kits for detecting illnesses.

VII. CONCLUSION

COVID-19 has spread fast throughout the world since its discovery in Wuhan. The disease is very contagious and readily spreads from one person to another. It is linked to a high mortality rate due to a shortage of vaccine and antiviral treatments. With the sudden outbreak of the unique coronavirus, it is the responsibility of every citizen of the world to assist in the eradication of the deadly contagious virus. Using cutting-edge technology to prevent and control this condition can be extremely beneficial. Diagnoses, thermal imaging, monitoring regions where quarantine is in effect, infrared temperature detection, disinfecting hospitals, and monitoring the health and conditions of doctors and other employees are all done with the use of technology. We have discussed several techniques for keeping residents safe from illnesses and unwanted transmission in this study. We can do our part to protect ourselves and our loved ones from the disease by utilizing technology and taking prudent decisions. As a result, the IT sector has a lot of potential in terms of preventing and, to some extent, during the present COVID-19 pandemic.

In every disaster situation, like as the COVID-19 outbreak, information technology applications are unavoidable. During this time, the importance of information technology in the response phase of disaster management was underlined. IT could aid in the management of the outbreak's danger and hazardous impacts, as well as the reduction of crisis damages. The successful use of various IT applications in countries during epidemics could educate communities about infectious disease and outbreak management. Before the virus surfaced, there was no effective planning for COVID-19 emergency management, which could be one of the reasons for the epidemic's continued global expansion. Improving technology for predicting infectious disease outbreaks should be studied since they play an important role in strengthening a country's and government's ability to deal with epidemics before they become dangerous. Appropriate strategic planning improves public health response to outbreaks, reduces economic losses, and saves money. To summaries, the community should take full advantage of technology to aid emergency management.

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