INFORMATION TECHNOLOGY FOR THE MANAGING ELECTRONIC APPLICATION IN SAUDI ARABIA DURING COVID-19: OPPORTUNITIES, CHALLENGES, AND ISSUES

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ABSTRACT

To battle the Covid pandemic, a few specialized headways and applications have been created. The pandemic has sweeping ramifications for innovation plan, advancement, and application. It is fundamental to improve comprehension of the jobs that innovation specialists and data frameworks might play in this worldwide pandemic. This article talks about the significance of new innovations used to battle COVID-19 dangers, just as the difficulties related with innovation creation, headway, and arrangement. It additionally makes ideas and gives significant bits of knowledge into how innovation specialists and data frameworks may help in the battle against the COVID-19 pandemic. The utilization of data innovation has been basic in the upkeep of COVID-19-based sites and electronic applications. This article offers help for future exploration and innovative progression to give victories to battling the COVID-19 pandemic and future pandemics. The significance of data innovation and its impact on the COVID-19 plague in Saudi Arabia is examined in this article.

Keywords: Information Technology, COVID-19, Big Data, IoT, Block Chain, Epidemic and Digitization.

INTRODUCTION

The World Health Organization's Situational Report 175 has revealed insight into the worldwide truth of COVID-19 contaminations and fatalities. The truth and viral spread are fundamental. In spite of this, most of victims are killed by the infection. The pandemic situation has destroyed devastation on all parts of human existence, with governments and clinical specialists from one side of the planet to the other endeavouring to ensure human endurance Agbo et al. (2019). The COVID-19 pandemic has significantly affected clinic administrations, organizations, schools, and the monetary area. Telemedicine, online training, and telecommuting are generally turning out to be more fundamental in the fight against the Covid.

With the outbreak of COVID-19, there has been an increase in the number of organisations attempting to use cutting-edge technology to mitigate the disease's effect on people' day-to-day lives. Not only has the pandemic provided the chance to improve innovation-based outcomes, but it has also provided a unique opportunity to investigate innovation investigation and work on, including data from executives, work methods, and innovation production and usage Ågerfalk et al. (2020), among other things. In light of the COVID-19 threat, the rapid acceptance of telemedicine, telecommuting, and online teaching serves as a reminder that modern innovation has many benefits and may assist in managing and minimising

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the dangers connected with the lockdown both during and after the flare-up Aljaber (2018). Data frameworks and data innovation are well recognised for their significance in medical services, clinical dynamics, emergency/crisis response, and hazard reduction (Bansal et al., 2020; Bardhan et al., 2020).

Many information and technology (IT) professionals are assisting in the fight against the pandemic in a variety of ways, including developing anti-infection plans, monitoring and forecasting its progression, and protecting the medical services infrastructure from digital attacks Bardhan et al. (2020). Researchers in information systems and information technology (IS/IT) should contribute to a critical effort to combat COVID-19 and future pestilences Ben-Assuli & Padman (2020) by drawing on their previous experience and involvement with emergency response, being dynamic, working remotely, overseeing virtual groups, and examining a large amount of information, among other things. There are currently very few data situation (IS) research efforts to assist in the battle against COVID-19, which is unfortunate.

The pandemic has repercussions for IS/IT-based plan, progression, and utilization (Ben-Assuli & Padman, 2020). IS/IT experts and specialists can aid the assessment of COVID-19 worldwide pestilence data and partake in likely development in research subjects like day-by-day work while socially separating, non-contact exchange and business, facial recognition while wearing a veil or in different struggles, security issues with COVID-19 applications, information gift, publicly supporting, following situations, and robocalls.

A few different ways that IS exploration can help with building versatility to pandemics and cataclysmic occasions incorporate I updating the public medical services framework from responsive to proactive by using continuous checking frameworks and contact detectability instruments to stem proliferation, (ii) changing associations by further developing struggle dexterity and limiting emergency uncovered delicate nativity, and (iii) changing associations by further developing clash deftness and limiting emergency uncovered delicate nativity.

An evaluation of COVID-19 primary issues from the stance of IS/IT gives vital bits of knowledge to read and proposals for researching COVID-19's effect on data the board hypothesis and practice in changing regular daily existence, work, and training (Chavez & Kounang, 2020). To limit cross-over, the examination centers around data frameworks and individuals' points of view to explore how IS/IT researchers may offer information and skill to support the battle against the pandemic Chen et al. (2020). As data frameworks and data innovation (IS/IT) become progressively essential to society, data frameworks and innovation-based scholastics who are special to the situation Choong et al. (2020). To utilize their insight and experience of IS/IT frameworks and strategies to work on current frameworks and innovation practice, just as to help society in turning out to be all the more electronically versatile to potential enormous scope interruptions (Digital, 2019; He, S, 2020). This article covers the COVID-19 pandemic and its impact on an assortment of enterprises. The significance of IS/IT in the organization of electronic applications and their effect in Saudi Arabia is examined inside and out.

The following is how the rest of the article is organised: Section 2 discusses information technology solutions, Section 3 discusses IS/IT in Saudi Arabia and COVID-19, Section 4 discusses different possibilities, difficulties, and concerns, and Section 5 concludes the paper.

Solutions based on Information Technology

Utilizing the information human framework approach, this examination researches innovation opportunities for moderating the impacts of the COVID-19 pandemic (Holt 2020). It

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exhibits a multidisciplinary way to deal with treating and controlling persistent sicknesses by zeroing in on three parts: (1) wellbeing information assortment, combination, and dispersal; (2) framework interoperability; and (3) suggestions and interfaces to impact individuals' conduct. It is worth focusing on that the first information of individuals driven framework based construction was made for persistent sickness the board, it actually should be upgraded for the point of being proactive and considering the pandemic situation.

With the COVID-19 pandemic in full swing, it has been brought to light the critical need to shift the general health framework away from a receptive to a proactive mode, as well as to implement innovations that provide constant information to a proactive dynamic at the local, state, and national levels (Ienca & Vayena, 2020). When compared to other chronic disorders, coronavirus is very contagious, may be transmitted from one person to another, and has a high mortality rate.

Furthermore, since COVID-19 is a new disease, logical understanding of the virus that causes it, clinical medications, as well as government and hierarchical actions, are all contributing to its development on a consistent basis. The impact of COVID-19 on people and society is growing in previously unfathomable ways, and it will continue to grow. Due to the fact that the present pandemic situation and its assets are constantly changing, combating the COVID-19 pandemic would require extensive coordination of different assets.

Certain new innovation arrangements, for example, portable COVID-19 contact checking applications and chatbots, have arisen as of late to battle the pandemic. These strategies might be utilized to help people, associations, and society adapt to the outcomes of the Covid pandemic. Mechanical headways might assist with distinguishing the Covid's people group spread, survey contaminated patients' conditions, further develop COVID-19 tainted patients' therapy, and contribute in the improvement of clinical prescriptions and antibodies (Johnstone, 2020).

In this part, the information human framework system is used to break down various innovation applications. AI, picture acknowledgment, and profound learning calculations fuelled by man-made reasoning (AI) might be utilized for early contamination identification and finding, just as faster medication disclosure for growing new medicines (Liang et al., 2020). A few organizations have additionally repurposed existing AI calculations and IoT techniques created for different motivations to help with social distance consistence and agreement observing (Liu et al., 2020; Loh & Fishbane, 2020). Table 1 shows the techniques investigated to manage the COVID-19 pandemic.

Information Technology during COVID-19 in Saudi Arabia

A Saudi individual's returned from a foreign trip on March 3rd, 2020, and tested positive with COVID-19. Saudi Arabia individual has been prepared to address disease containment indicators like active monitoring at all access points of arrival point in the country and intercity, shutdown of academic institutions and administrative buildings, the restriction of domestic and international flights, and the shutdown of all other forms of transportation across the domestic. It has also taken steps to affect worldwide health, including as suspending Umrah activities and suspending synchronized rituals in all mosques for the first time (Wang, 2020).

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Table 1
Overview of COVID-19 based Technology

Technologies	Data	Solution	People	System
Blockchain	Health information related to COVID	Establish identity digitally for people health, accomplish buyouts and claims are processed	Public	Immune certificate generation system
Three dimensional technology for printing	-	Accomplishing test swabs and generate protective swabs	Healthcare workers and patients	Safeguarding system for individuals and COVID 19 practice system and procedures for testing with swabs
Internet of Things	Sensor and mobile data	Assure patients with the necessities of quarantine and patients are monitored remotely	Public and patient	Smart disease observation system
Technology for tracing the contacts digitally	Social media and mobile data	Every individuals movements are tracked and the COVID-19 hotspots are identified and alerts the people	Public, healthcare workers and patients	Tracing applications for smartphone
Robots	-	Medicine and food delivery system. Patient treatment and room disinfectant.	Public, healthcare workers and patients	Noncontact ultraviolet (UV) field sanitizing system operated by a robot; Temperature measuring robots on wheels Oropharyngeal and nasopharyngeal swabbing that is computerized or aided by a robot; Drones or land vehicles that are automated; Camera systems that are completely automated; Robots that are social
Infrastructure based on HPC	-	Selection of drug and exploration of target	-	Supercomputing power by alibaba [
Infrastructure based on HPC	The screening process is approved for 2201	Progression of vaccine and new drug development	-	-
Big Data Analytics	26.76 million sleep mode and rest mode heart rate from the smart band users	Controlling and regulating pharmaceutical supply, as well as tracking people's travels and analysing epidemics	In Hubei province 115,000 people and	Migration app by baidu
Big Data Analytics	Tracing the contacts smartly that is by the sensor based mobiles and other big sensors for monitoring.	Identification and diagnosis at the early stages	627,386 individuals with COVID-19 contact	-
Deep and machine learning	Information generation system in real-time	Epidemic situation investigation	-	-
Deep and machine learning	Images of computed tomography	Prognostic and diagnostic investigation	5372 patients	Automated deep learning system and it is automated completely
Deep and machine learning	X-ray images of raw chest	COVID-19 cases automatic identification	125 patients	-
Deep and machine learning	Hospitalized cases and laboratory health	COVID-19 patients and ill patients early triage	1590 patients were 131 are progressed with critical	-

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	records		illness, from medical centers of count 575	

With the implementation of these mitigating strategies came with the necessity to activate distant digital services in order to assure the private and public sector sectors' utilities and operation across Saudi Arabia. It has a populace of 30,260,000 online consumers (89 percent of the population). The aforementioned devices are used by the grownup population in Saudi Arabia (in order of largest to smallest consumption): mobile phones, televisions, desktops and laptops, computers, and tablets. A prominent declaration was released in 2017 underneath the Saudi Vision 2030, which aims to diversify its economy by growing diverse sectors (Wang et al., 2020; Woo, 2020).

The vision stresses the development of digital infrastructure by expanding high-speed broadband service with wide coverage and huge capacity, as well as enhancing efficiency, via a countrywide technology innovation unit implemented under a public-private joint program. Considering the fact the World Health Organization's statement and the necessity of digital data exchange for rapid policy changes has made. In Saudi Arabia, educational institutions and other business firms started to adopt the work from home scenario that is possible with the digitization. The COVID related information is shared, and the patients are tracked with the assistance of website tawakkalna where the Saudi Arabian government has developed the same as mobile based application for sharing the data (Digital, 2019).

Opportunities, Challenges and Issues

The COVID-19 flare-up has shown shortcomings in existing general wellbeing frameworks. The utilization of innovation is principally to battle the pandemic, which additionally presents various difficulties. Due to the extraordinary qualities of the COVID-19 pandemic, huge coordination of incorporated information, individuals, and frameworks Yang et al. (2020) is expected to empower for overall collaboration in battling it. All things considered, general wellbeing specialists and medical services partners didn't utilize similar frameworks, record arrangements, or guidelines, making it hard to recognize drifts and foster pandemic-battling strategies. To more readily comprehend the expanding pandemic and settle on joint decisions on the best way to deal with it, general wellbeing experts, disease transmission specialists, and government authorities should be connected through related information from connected gadgets. Since individuals are so vital in the battle against COVID-19, it is fundamental to use inventive and incorporated innovations to sort out, associate, and help various partners.

Technology Integration with Connected System

The use of cutting-edge technologies such as the Internet of Things, big data analysis, artificial intelligence, and blockchain to manage the problems in Covid's has resulted in the development of sharp methods for managing the challenges. Facebook, for example, has taken use of artificial intelligence and massive information innovation to create maps that depict the population density, demographics, and examples in venturing out to assist or select where to send supplies or how to limit the spread of an illness (Budd et al., 2020). Geographic data frameworks (GIS) and Internet of Things sensor information collected from debilitated patients may assist

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disease transmission specialists in tracking down patient zero and identifying contaminated patients' close connections (Fahey & Hino, 2020).

According to the National Science Foundation, a RAPID award has been granted to investigate the feasibility and potential outcomes of combining web-based media large information, geospatial information, and man-made consciousness innovations in order to permit and further develop spatial the study of disease transmission exploration and hazard correlation. The convergence of blockchain, IoT, and artificial intelligence has tremendous promise for addressing trust and security concerns in the general public's well-being (Brohi et al., 2020). In the case of clinical hardware information or nonpersonal sensor information collected via the Internet of Things, for example, blockchains may be used to secure and appropriate the information. Patients' very own information may in any case be kept in medical clinic business frameworks due to security regulations such as the GDPR (Tharini & Vijayarani, 2020), which govern how personal information is handled.

Sharing Effective Practices with Connected Data

According to the World Health Organization (2020), increased sharing of knowledge and collaboration are required to offer needed solutions via a synchronized effort to help nations experiencing diverse phases of the pandemic at varying periods. In the face of a worldwide outbreak, governments must collaborate to exchange data, resources, and information for successful practises and tactics in order to battle the coronavirus. Furthermore, to coordinate the collection and utilization of data and information to tackle the challenges. Worldwide coordination amongst important stakeholders, organisations and governments would be critical in this pandemic.

Connecting with Everyone Using Enriched Collaborative IT Infrastructure and Tools

The working environment is rapidly changing because of the COVID-19 pestilence. Teleworking permits a great many people to work from the solace of their own homes. As talented laborers adjust to work on the web, telecommute, store and break down information utilizing cloud administrations. During this scourge, everybody is seeing a more noteworthy reception of internet providers by shoppers and organizations of all kinds. It is normally recognized that IT foundation is basic in permitting web based business, teleworking, e-government, web based learning, and other web interchanges.

Because of the pandemic, countless laborers are being constrained to turn out basically for longer timeframes, bringing about expanded traffic on remote access organizations. To balance the outcomes of COVID-19 and future wellbeing emergencies, society should keep on putting resources into IT foundation and backing computerized change endeavors. The pandemic situation permits laborers and scattered groups to impart web based, expecting organizations to extend their interests in innovation like as video conferencing and collective choice making support instruments. IT framework costs are ascending with regards to COVID-19, as organizations use teleworking and understudies try out an assortment of online projects.

Human Behaviour Analysis in Relation to the Digital Divide and Technology

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As time progresses Affiliation with COVID-19 is linked with technologies developed, integrated, and implemented by organisations, companies, and individuals. When it comes to developing, manufacturing, and deploying technology, it is critical to do human behaviour study. In order to fight the pandemic, many initiatives have been established, many of which make use of new technical advancements and ways for connecting disparate systems and technologies. It must, however, recognise that people's inappropriate use of technology may limit the efficacy of technology-related interventions or therapies in terms of reducing the coronavirus pandemic. This is especially true in developing countries. Researchers in the fields of information systems and technology may be able to help by integrating their knowledge of human behaviour into the design and development of new technologies.

CONCLUSION

The COVID-19 scourge modified the idea of business, individuals' ways of life, and the worldwide economy. The progression of innovation and electronic devices has supported beating the difficulties of pandemics. Nations from one side of the planet to the other put on lockdown, and the plague constrained individuals to isolate themselves from each other. Individuals profited from the digitalization of tutoring and the work-from-home environment. The impacts of COVID-19 on schooling and business have been controlled through the execution of a few measures, which are definite in this article, just as the impact of computerized innovation on instruction and business during the pandemic scenario. The headway of digitization has helped people and their workplaces in an assortment of ways, as has the mix of man-made reasoning, enormous information, the web of things and mechanical technology. This article additionally incorporates various important post-pandemic data framework and innovation perceptions.

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