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AUTHORS' INFORMATION

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Open Access Full Text Article
https://doi.org/10.26524/royal.37.14

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REBOOTING THE WORLD WITH INFORMATION TOOLS DURING COVID-19

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Keywords

INFORMATION SCIENCES COVID-19 ARTIFICIAL INTELLIGENCE CHATBOT IOT

ABSTRACT

The present chapter envisions the influence of information technologies during the pandemic situation of COVID-19. The chapter makes important marking on different tools of information sciences employed in combating the situation. Among all the different sectors, information scientific domains is leading from the forefront ever since the first COVID-19 case was registered. The governing bodies like WHO is also greatly dependent on the techniques of information science and disseminates the accurate information across the globe. Based on these facts and consideration. The present study is presented to cite the technological advancement of information sciences and its role in rebooting the worlds activities to normalcy.

1. Introduction

The world has witnessed severe pandemic situation owing to the emergence of COVID-19, one of the novel member of corona viruses family. The impact of COVID-19 has ushered huge impact on all the spheres across the globe. At the same time world has witnessed rapid response against this virus attack and is bouncing back

with latest technological advancement. One such area which has burgeoned tremendous influence in combating the pandemic is the technological tools of informatics and computer applications which as greatly aided the WHO to rapid response in management of COVID-19. The role of information science cannot be underestimated in the current world wherein almost all sectors are greatly dependent on the online resources and with per click information at the finger tips. This has been successful with the untiring research and development in the scientific domain of information technologies. This the present chapter, we report and highlight some of the interesting tools playing significant roles in the current pandemic situation. Now more than ever, the technologies are ensuring the safety and security of the individuals and connects them with the world of information of their interest. Similarly, during the times of pandemic crisis, the information science coupled with telecommunication technologies are working well with the governing bodies to update the accurate information on the severity and the condition of the infected patients and forecasting the hotspots.

This can be cited with the development of different health care apps for example AROGYASETU which alerts the nearby infected patients and provide day to day updates on the happens of COVID-19 situation. This information is unleashing the power of communication technologies along with information sciences and are able to save many lives being infected for instance the WHO jointly with ITU has come up with the initiative of disseminating the health and infected messages with the subject of "BE HEALTHY BE MOBILE " this initiative works well even at remote areas and are able to connect with the health officials to track down the records during the survey process and prevent the infection rates. The health workers are utilizing the resources and coming up with the telemedicine process which can easily predict the patient conditions and triage them to connect with the nearby hospitals and triage them. Thus these efforts are clearly indicating towards the influence of digital world to cope with the impact of COVID-19 infections. In current world, the frontier technologies like artificial intelligence, big data sciences, machine learning, data mining tools are in leading from front to develop digital health solution and also predict the future hotspots and leverage the best possible solution to contain the infection rate [1-5].

2. Artificial intelligence

The use of artificial intelligence [AI] has grabbed wider attention in recent decades owing to its applications in different sectors of the world. One such area is use of artificial intelligences during COVID-19, wherein the health care authorities are well utilizing the principles of artificial intelligence to early diagnosis of the infection which aids in faster decision making and early treatment to save lives. The artificial intelligence can help in developing diagnosis and management platforms for infected patients by using the algorithms. Also, the use of AI is well documented in medical imaging process for instance in computed tomography (CT) and Magnetic resonance imaging to scan the human body in details and provide the accuracy of the disease. Further, neural network can help the health individual to diagnosis the patient with the visual features via contactless model, this can be very handy to health professional who can be protected from getting infected. The concept of AI can be utilized to track the infected patients from the healthy individual and identify the future hotspot and cluster spots. The AI can be also utilized to study the disease pattern of the virus by documenting the mortality and morbidity rates and their spread with the facts and parameters like geographical area, biotic and abiotic factors and predict the most vulnerable regions and individual thus acting efficiently to control the spread of the infection. The AI can aid in developing the best suited drug and vaccination process by accelerating the clinical trials and predicting the drug target molecule against the different components of the viral particles which can speed up the drug testing trails in real time and come up with the best drug candidate against the virus. [4-6].

3. IOT and Computing

The use of computing and internet of things can greatly work towards managing the spread of COVID-19, for instance, the can be useful in developing virtual business models as most of the companies and industries are working from home. This can cut down the reduction in human efforts to work on the ground and enables the business continuity with the physical presence of work forces. Further, the use of IoT and GPS enable the governing authorities to track the infected patients movement the countries are focusing on the Geofencing technologies by developing the tracking apps and wrist bands along with the unique QR codes. The development of 5G network based

connectivity using IOT principles to enhance the bandwidth in different rural and urban areas to connect with the people [1-7].

4. The automated and drone technology

At the contaminated zones, it is expected to have higher viral loads which can easily transmit the disease to the worker, hence the automated and drone technologies are being employed in place of humans which can work efficiently to sanitize the infected area for instance use of e-vehicles can be utilize to deliver the safe and facile route of spraying the disinfectants. Similarly, the use of drones can be implemented to sanitize the epicentre by spraying the disinfected using aerial route thus making it one of the ideal and safest route to clean the contaminated zones across the globe. Also use of robotic technologies can be handy to employed in the hospitals which are treating the infected patients, similar strategy was implemented in China to combat the spread of infection to the doctors and health care workers. The robots are the best replacement to the humans at the contaminated areas [5,6].

5. Web based learning tools

The pandemic situation has changed the functioning of the education system across the globe. The academic institutions and universities are operating online and are mainly dependent on the web based learning tools. One of the most popular application is zoom app which is the best way of learning and teaching the academic curriculum. In recent times of COVID-19, most of the scientific conferences and meetings are virtual based and happening using web based tools. Web based learning has been expanded remembering the pandemic limitations by a large portion of the training foundations. One of the best instruments for keeping a high pace of understudy maintenance alongside the upkeep of access to learning has seen to be that of an online course. There are colleges everywhere throughout the U.S, especially who have had the option to alter their projects as a reaction to that of the spread of Coronavirus. Though there is no replacement of traditional teaching practices but the use of innovative approaches are being implemented as quick response to COVID-19. The virtual curriculum is based on designing the remote learning process with learning models by using the digital content and resources [3-5].

6. The usage of online resources

The use of online resources is of ultimate choice during the pandemic situation wherein the different segments can be fulfilled it might be entertainment, connecting the loved ones, arranging the meeting, developing business models and many more. It has been estimated that during the pandemic time of COVID-19. The usage of internet has increased with almost every individual is directly or indirectly dependent on the online tools. People are using online sites for shopping the essential commodities, Large number of worlds population is on social networking sites to connect and expand their activities this might be in the form of entertainment by using tools like netflex, amazon primes and Youtube etc. At the same time usage of social platforms online like Facebook, VK, Instagram, Google, Yahoo etc, are estimated to be doubled compared to its previous algorithms.

7. Sensing and Monitoring

The use of sensing and monitoring has become one of the popular choices which are installed in the areas like hospitals, residential place, agriculture fields, warehouse, business places etc. which can be controlled and monitored with your mobiles and control the activity by minimal workload. This techniques are widely used in the remote areas and rural places which can provide the connectivity as per your needs without visiting the site you can easily monitor the happenings around.

8. Online and satellite tracking systems

In the situations like low network availability, the best alternative is the satellite tracking systems. This is one of the assets in tracking the movable commodities in logistics and transport systems. As there is shortage of supply chain process across the globe with most of the countries have stopped air cargo and sealed their border, use of local transport system is working with limited resources. During such circumstance, tracking of shipped goods are essential hence tracking systems are important.

9. Digital retailing

It is estimated that owing to shortage of supply process, there is great demand for the basic and essential groceries and medical supplies. During these tough situations, online merchants and e-commerce has gained popularity with chain stores working in US and Canada has estimated 80% increased in their sales. The online

resources like AMAZON is working towards fulfilling the ongoing demands and meeting the timely delivery of the ordered goods by using the local seller firms [6-8].

10. Chatbots

The use of chatbots are becoming the revolutionary in the digital world. It is an interactive portal which is replacing the humans to answer the slack calls during the pandemic times. Even the WHO and CDC are using the chatbots to address the queries and provide the accurate information. During the time of COVID-19, the extraction of scientific knowledge and reports on the ongoing clinical trails, updating the in-depth status of corona patients are highly important but to meet this demand, there is shortage of human work force, hence chatbots and robots are working well to replace and reduce the work load.

11. Bioinformatics

The use of information tools to serve in biology can be cited from past, but during the COVID-19 situation, when world is looking for the drug therapy and management. It is the bioinformatics platform which is providing the detail information about the novel corona virus with its morphological and molecular characterization. This information is highly essential to segregate the virus among its other family members. In the past decade the world has witnessed the emergence of other human infecting corona viruses such as SARS and MERS which had created pathetic situations. Even at present, the novel corona virus is also acting on the similar lines with much more infectious rate and spreading borderless across the globe. In order to contain this infection, use of bioinformatics tool is important which elucidate its identity with the previously reported corona viruses [6-8].

Conclusion

Overall the chapter highlights the importance of different technical advances related to information science and its influence on the world during COVID-19. The presented information is highly valuable in near future to bring back the normalcy. The chapter provides the importance of IT tools which cannot be underestimated towards the betterment of the society much more scientific research is awaited to expand the existing applications to other domains.

REFERENCES

1. R.R. Nadikattu, Rahul Reddy and S.M. Mohammad, and P. Whig, "Novel Economical Social Distancing Smart Device for COVID-19 (July 1, 2020)," International Journal of Electrical Engineering and Technology (IJEET), 11 (4),204-217, 2020.
2. D.N. Vinod & S. Prabaharan, "Data Science and the role of Artificial Intelligence in achieving the fast diagnosis of Covid-19," Chaos, Solitons, and Fractals, 2020
3. Binu Nepal, & Alok Atreya. (2020). Online Medical Education in Nepal: Barking a Wrong Tree. Journal of Lumbini Medical College, 8(1). https://doi.org/10.22502/jlmc.v8i1.325
4. Dhawan, S. (2020). Online Learning: A Panacea in the Time of COVID-19 Crisis. Journal of Educational Technology Systems. https://doi.org/10.1177/0047239520934018
5. Eysenbach, G., Makkonen, H., Talukder, S., Farooq, A., Laato, S., & Islam, A. K. M. N. (2020). Impact of Online Information on Self-Isolation Intention During the COVID-19 Pandemic: Cross-Sectional Study. Journal of Medical Internet Research, 22(5), e19128. https://doi.org/10.2196/19128
6. S.B. Naeem, & R. Bhatti, "The Covid-19 'infodemic': a new front for information professionals," Health Information and Libraries Journal, 2020
7. M. Gottlieb, & Dyer, S. Dyer, "Information and Disinformation: Social Media in the COVID-19 Crisis" Academic Emergency Medicine, 2020
8. S. Siuly, I. Lee, Z. Huang, R. Zhou, H. Wang, & W. Xiang, "Health Information Science," Lecture Notes in Computer Science, 2018