Barun ICT Global News

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01 Using ICT to Address Ethical Issues in the COVID-19 Vaccine Distribution Process

Global Student Reporter & Researcher

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As the COVID-19 pandemic changed daily lives for many on a global scale, the world has anxiously waited for a cure. Major pharmaceutical firms have devoted themselves to creating a vaccine, and Pfizer, Moderna, AstraZeneca, and others were successful in developing a vaccine. Governments have since vowed to obtain doses for their citizens.

Although the process has just started, there have been many controversies in the vaccine distribution process due to the limited supply. Many ethicists have pointed out that the allocation process favors first-world countries, as the current development system uses government funding for research whilst retaining exclusive rights to their vaccine technologies. Mohga Kamal Yanni, a physician speaking for the People's Vaccine Alliance, stated: "rich countries have enough doses to vaccinate everyone nearly three times over, whilst poor countries don't even have enough to reach health workers and people at risk" [1].

Professor Kok-Chor Tan from the University of Pennsylvania states that there should be a focus on "equitable" over "equal" allocation, meaning areas with greater vulnerability should receive a higher proportion of vaccines [2]. So how can a constructive use of ICT mitigate these distributive concerns? The answer lies in the maximization of available resources and educating vulnerable populations. Countries like Canada have pledged to donate excess doses to nations in need, but just because a vaccine is distributed to a country does not guarantee its correct usage; substandard medicines are defined as "pharmaceutical products that do not meet their quality standards and specifications" [3]. AI would be able to identify substandard medicines at a faster pace than humans while allowing pharmaceutical companies to pinpoint exactly where any defect originated in the supply chain [4]. This would maximize resources and allow continuous supply, making more vaccines available for countries with less technological advancement. Using technology to monitor the distribution is especially important as COVID-19 vaccines require being maintained in extremely low temperatures.

Image from https://unsplash.com/photos/gQd4SRfKs40

ICT can be further used to identify vulnerable populations whilst educating them about the vaccine. Technology assists in increasing outreach and can mitigate the risks of a questionable source of information. By increasing healthcare literacy, members of the vulnerable population can make informed health choices. Greater health literacy is linked to increased use of preventive services and lower hospitalization rates, which translates to better outcomes and lower costs [5].

From hospital beds to ventilators and medical masks, the ethical dilemma does not apply just to vaccines. The battle against COVID-19 should protect vulnerable populations while not exacerbating existing inequalities. Technology such as predictive modeling, AI, and big data has proved it is competent in handling large volumes of data and extracting meaningful information within it. Taking advantage of technology will be a substantial step towards this goal, and countries with strong ICT infrastructure have the responsibility to look after third-world countries that are unable to create an equitable distribution process.

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02 Regulatory Crackdown on Big Tech Companies Expected in 2021

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The new year has a lot in store for development in the ICT world. The regulatory landscape facing tech companies, particularly Amazon, Apple, Facebook, and Google, is expected to tighten [1], controlling their power and influence over the economy, internet, and industry competition. In the United States, all four companies' chief executive officers testified at Capitol Hill regarding their business practices, and 2021 will likely see a continuation of attempting to control them in the form of stricter regulation.

Image from https://www.marketwatch.com/story/regulating-big-tech-was-mostly-talk-in-2019-expect-the-same-in-2020-2019-12-27

Given the bipartisan support for more regulation of Big Tech, President Joe Biden is predicted to act against the tech giants on privacy mismanagement, misinformation, and antitrust matters. Lawmakers in the U.S. expect Biden to use and strengthen the antitrust laws to "protect consumer innovation, small business and all things that are at risk if we don't have competition in the digital marketplace," according to Rhode Island representative David Cicilline [2]. There are a few key areas of antitrust regulations that the Biden Administration is expected to emphasize over the next four years.

The first is a focus on the practice of self-preferencing by the dominant tech companies [3]. Amazon was recently sued for allowing certain third-party retailers to receive advantages on the platform, allowing third parties closely affiliated with Amazon to be more competitive over rivals in the market [4]. There is also expected to be more regulation and scrutiny regarding acquisitions by dominant tech companies [3]. The Antitrust law did not stop any of the hundreds of mergers and acquisitions that occurred between 2000 and 2019. Such mergers are often harmful for competition in the industry, as Facebook acquired WhatsApp for $16 billion due to the platform's potential to compete with Facebook on its key battleground [5]. To enforce regulations to a greater extent than done in the past, it is expected that merger filing fees will be increased to $2.5 million to help the Department of Justice and the Federal Trade Commission fund a stronger regulatory environment [3].

The discussion regarding the power of the great tech companies is, on an international scale, largely calling for more checks on their power. Such tightening of regulation is expected not just in the United States, but also in the European Union. As of December 2020, the EU has put forth new tech antitrust legislation through the Digital Markets Act, which "outlaws tactics like spying on competitors who sell their products on a marketplace you control," [6] following a similar proposal by the post-Brexit United Kingdom.

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03 Information and Communication Technologies in Non-state Violence: The Case of Boko Haram

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Governments around the world are continually concerned with combating violence from non-state actors such as terrorist and guerrilla groups, drug cartels, and others. On one hand, the development of ICT has improved the effectiveness of counter-terrorism efforts. However, this same advance has created new avenues for non-state actors to spread around the globe. We can find multiple examples of such phenomena, such as the case of Boko Haram in Africa.

Image from https://www.nytimes.com/2019/09/13/world/africa/nigeria-boko-haram.html

Boko Haram is a terrorist group that operates mostly in Nigeria and has become increasingly violent in recent years. Even though they have existed for over two decades, it was not until 2009 when they became highly active especially through suicide bombing attacks. In response, the Nigerian government implemented an intense military response and, in 2019, President Muhammadu Buhari announced that Boko Haram had been defeated [1]. Nevertheless, this statement was soon rejected by community members and other politicians because Boko Haram still maintains control of more than 10 regions in Nigeria.

Since 2018, Boko Haram has been using drones to perpetrate attacks on the Nigerian government and its citizens - making them the first terrorist organization in Africa to use such technology [2]. Furthermore, some media note that the drones used by Boko Haram are more sophisticated than the ones used by the government [1]. In addition to using drones for violent operations, they also use them for surveillance and to monitor the military [3].

The use of drones is just an example of active strategies by terrorist organizations. However, Boko Haram also uses ICT for passive tactics such as recruitment and financing operations. Previously the organization depended on physical media such as pamphlets, newspapers, and videos delivered to households to communicate. However, these days they rely on social media and the internet to spread their ideologies and recruit new members. The most representative example of this happened in 2014 when Boko Haram's leader ordered his supporters to perpetrate attacks against Christians. Such messages spread globally, even to the point of being published in the New York Times. Additionally, terrorist organizations usually claim responsibility for the attacks they perpetrate, whereas before Boko Haram took time to claim their operations. Nowadays however the group can immediately claim itself as the actor behind the attacks - thanks to the internet [4].

These activities perpetrated by terrorist organizations show the lack of cybersecurity awareness in developing countries. The case of Nigeria and Boko Haram is only one example; multiple case studies reflect the same problem (Al Shabaab in Somalia, the Islamic State in Syria, to name a few). To combat non-state violence related to ICT, states must increase their knowledge of cybersecurity, implement specific counterterrorism policies that focus on ICT, train personnel in subjects related to technology and security, and create specialized units that detect, deter and defeat cyber threats.

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04 Virtual Education During COVID-19: Status Quo and Future Prospects

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Image from https://unsplash.com/photos/I862hX_FET8

As the fear and uncertainty of COVID-19 spread last March, most American schools from kindergarten through to college turned entirely or partly virtual. According to Burbio, a digital service that tracks the status of K-12 schools, more than half are employing completely virtual learning as of January 22nd, 2021. Among the 50 states in the U.S., two ordered full closure of in-person education beginning this year, seven partial closure, and thirty-seven did not come up with a specific regulation. New York, one of the states that did not give an order, announced that schools may reopen in the fall if the spread of the virus weakens, which implies that students would have to bear at least another semester of virtual learning [1].

Image from Freepik

Remote learning yields different results for different students. For some, distance education or asynchronous learning lowers anxiety and increases engagement as it grants them choices of the methods via which to engage such as chat, audio, video, or email [2]. Some researchers, on the other hand, noted that in-person learning results in better educational outcomes especially for primary and secondary students [3]. However, critics emphasize that prolonged online learning yields a digital divide between wealthy and low-income students. Virtual learning deprives students of an equal environment and technology, and those who lack appropriate technology (such as laptops and wifi) or a discrete and well-equipped studying space are likely to be negatively impacted by the new method. Research found that schools with more students from low-income families had lower engagement as their parents did not have the time or skills to troubleshoot or help them with digital issues, making it easier for them to fall behind [4].

Virtual and in-person blended models are likely to be the new normal after COVID-19 as both instructors and students get used to it. The head of education at the OECD, Andreas Schleicher, has mentioned that the pandemic is “a great moment” for learning. However, in this period of transition, privacy is a significant concern. Google had dominated the education market before the pandemic by providing its tools at low cost, and last April, donated 4,000 laptops and 100,000 wifi devices for students lacking technology in California. Tech companies such as Google and Microsoft expanded their educational platforms, and it is reported that 79 out of 123 relevant apps shared the students’ data with third parties [5]. It is also concerning that schools’ dependence on education platforms of big tech companies could result in stealth privatization and grant them the power to shape the way schools function or structure curricula. The transition to virtual or blended education was unavoidable, but it is important to be aware of and to address its drawbacks in light of their relation to the digital divide, privacy concerns, and the privatization of education.

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05 Friendly Robots: Programming Empathy into AI Systems

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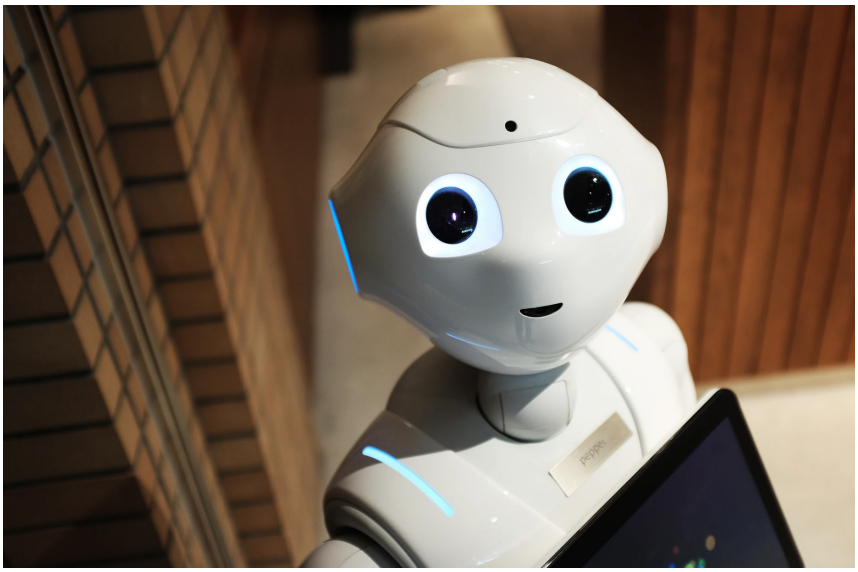

Image from https://unsplash.com/photos/2EJCSULRwC8

A common argument for why humans cannot be fully replaced by robots points to one key difference between the two: empathy. The issue of whether to incorporate empathy into artificial intelligence systems concerns its ethical implications. Because artificial intelligence in the form of robots is increasingly being used in areas like healthcare and personal care-taking [1], it is important values such as compassion and empathy are incorporated into the behavior of these AI systems.

The technology for emotion does exist and allows robots to make empathetic decisions. Emoshape, the first company to have a patent for emotional synthesis, has introduced an emotion chip (EPU) that enables an AI System to understand the range of human emotion up to speeds of 64 trillion possible emotional states every decisecond [2]. The company has released a statement that according to its research, overall humans will talk more to machines capable of empathy than to other humans [3]. Artificial intelligence that can experience and respond to emotion is no longer science fiction, but an ever-expanding area of research that has already seen significant progress.

Researchers continue to explore the possibilities of incorporating sentience into AI systems. Recently, Columbia Engineering's Creative Machines Lab demonstrated the robot's ability to not only understand, but also anticipate the actions of other fellow robots based on visual stimuli [4]. One robot merely observed its partner for two hours and was able to predict its partner's path with 98% accuracy across different scenarios. Researchers say that these findings lend credence to a robot's ability to "see the world from another robot's perspective", which they interpret as a "primitive form of empathy" [4]. This is because identifying another robot's path is indicative of behavior called Theory of Mind (ToM). ToM is known as one of the distinguishing factors between human and primate cognition and is necessary for social interactions, which includes empathy [4].

Even if robots can display an understanding of empathy, there is still the question of whether humans can relate to or even recognize patterns of sentience and emotion from robots. Researchers from Yale and Cornell [5] programmed robots to act vulnerably, apologizing for mistakes, sharing jokes and stories, and talking about feelings. These robots engaged in conversation with humans for a greater length of time than did another experimental group without vulnerable robots. This finding strengthens the researchers' hypothesis that social behavior of robots can often affect how they influence others, even humans.

These recent developments in building empathy within artificial intelligence systems present copious opportunities and possibilities for further incorporation of AI into society. Industries like healthcare could benefit from empathetic robots, who can care for patients with dementia and other mental conditions that often result in physician burnout [2]. Although more corroborating studies and findings are needed to further propel this research forward, the findings thus far make the future of friendly robots quite promising.

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