

Medical Inclusion

Design of Medical and Healthcare Systems of 2050

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MEDICAL AND HEALTH CARE AFTER THE INTERNET

This research investigates the design model of medical and health care systems of 2050 under the cyber civilization era. The idea of 'Medical Inclusion' can be challenging in many ways because it would need a comprehensive perspective for the fundamental transformation of conventional medical care.

An extraordinary hint to this quest is a complete assumption of cyber civilization. That means exploring the possible new medical and healthcare systems with a whole assumption of cyber civilization basics, after the Internet, the world wide web, Blockchain, COVID-19, and so on. Medical and health care have developed with the scientific paradigm, and the Internet has been leading the recent paradigm shift everywhere. It is essential to re-recognize the fundamental premise of medical and health care systems in the rapidly changing digital society.

However, there has been surprisingly little research to ask what medical and health care should be in the digital era. Now, humankind has lived with the global pandemic from COVID-19 for over two years. This pandemic allowed us to see how the Internet and cyber civilization can impact our healthier and happier society. Medical Inclusion will lead to a fundamental transformation for conventional medical systems, which were the domestic and exclusive domain in many cases, compared to other social systems.

We already have a history of drastic revolutions in many aspects because of cyber civilization; e-commerce, e-banking, social network media are examples of such processes. Therefore, in the cyber society, medical and healthcare systems also have much room to be changed.

THE TECHNOLOGICAL BASICS OF THE CYBER CIVILIZATION

Here, it is necessary to get back to the essential ideas of the technological basics of cyber civilization for shaping the design model for Medical Inclusion.

First of all, what is the Internet? It is a single global space for everyone and everything. In short, it is a global infrastructure that can break any boundaries. (Jun, 1995) The Internet will have 100% coverage of the surface over our planet. People on the Earth will be eventually covered by the Internet securely by 2050. Namely, more and more people will interact over the Earth, instantly and safely.

Second, the World Wide Web is also a single global space for sharing digital data as an application platform for the open development of software, including enormous medical and healthcare applications. It can also be a security platform with public encryption and decryption.

Third, Blockchain has been developing trackable trust for keeping our digital data set.

Last, Artificial Intelligence analyzes the accumulated data through the Internet will powerfully reveal all the correlations in human life and further develop medical care. It has been accelerating the need for data science in the medical and healthcare field.

Already, the COVID-19 pandemic has shown the importance of data and science to build back more resilient health systems and equitably accelerate towards our shared global goals. (World Health Organization, 2021) It also will lead to rediscovering the fields which have been missed for a long time. On the other hand, many challenges will emerge, such as ethical and legal governance of the collected personal data.

For example, Femtech is a recent notable transformation of the health and medical industry. Femtech is a coined word that combines Female and Technology and refers to products and services that can solve women's health problems with technology. It includes a broad spectrum of digital technologies dedicated to improving women's health and well-being. (Femtech Analytics, 2021)

Whereas such new medical and healthcare areas have been emerging, we have to tackle finding the proper privacy control of these new types of healthcare data, for example, how to manage the data of women's menstrual cycles. All in all, what is the ideal medical and health care system on the premise of these fundamental technologies of cyber civilization? If we can

design, not tightly with the incremental manner, rather, innovative way with these technological basics of cyber civilization.

THE GOALS OF MEDICAL AND HEALTH CARE SYSTEMS

From a systems point of view, medical and healthcare systems have several common issues with these cyber civilization basics mentioned above. First, it must target everyone's health. Second, it must have excellent responsiveness. Third, fair means for cost burden are necessities. (World Health Report, 2000) In short, medical and healthcare systems have some goals from quality, efficiency, accessibility, and equality.

Conventional medical care systems should have these goals with digital technologies. Nevertheless, those points have been overlooked for almost thirty years regarding digital technologies. Significantly, a global cost design may have been the most challenging issue because the medical system has been supposed to be the nations' responsibility.

However, something complicated before the Internet might not be complex anymore.

GLOBAL DESIGN FROM COST AND EQUITY

Therefore, Medical Inclusion for 2050 should be designed instead from the sides of cost and equity with digital technologies, which could not be realized so far without the fundamental technologies of the cyber civilization.

According to the United Nations Development Programme (UNDP), 1.2 billion people in poverty did not have access to the essential goods and services, including education, work, food, health care, drinking water, housing, and energy. Eight hundred million of them also had no access to health services.

Moreover, due to the negative economic impacts of COVID - 19, the potential short-term poverty is expanding in developing countries. (Andy, 2020) There are fatal diseases that cost too much for some people who can not access essential medicine but can access the Internet.

Indeed, Medical Inclusion may be a part of concrete solutions to mitigate the worst effects of the disparity between the rich and the poor, which continues to widen on a global scale in the modern world. The main aim of this design model of Medical Inclusion is to create equal medical and healthcare systems globally for the socially vulnerable.

How can we break this problem with the essential technologies in the cyber civilization?

First of all, one of the minimum requirements must be that all of the stake folders are covered by the Internet, and they own any digital devices: they are in the state of connecting to cyberspace. The expanding use cases of telemedicine which are on the premise of accessing the Internet, have already become examples of the medical and healthcare methods in the cyber age.

However, in the Medical Inclusion, extra pieces of the design model have to be added.

In 2050, access to essential medical and healthcare will be enriched from both cyber and real space. Advanced Artificial Intelligence will accelerate clinical trials of medicines. It will increase the frequency of introducing innovative medicines and speed up the process of the international approval of medicines and medical devices. In addition, pharmaceutical insurance schemes will be drastically transformed due to access to and analysis of vast amounts of social data, including medical and healthcare data.

As a result of such practical data use: by the cyber civilization's essential technologies which expect lower potential costs, the interest rate which affects the total costs of one's medical and healthcare would change. A digital society in the cyber civilization can effectively manage the resources and cost of medical and healthcare. In other words, it enables people to support their own healthy life in a longer span, even if they are in an aging society or in a society where there is a high mortality rate in childhood. There is no question that this scheme will affect children's educational achievement in poverty.

Conclusively, making this situation under the global pandemic better depends not on how long the pandemic lasts but on how the global community reacts.

PLANETARY - SCALE COOPERATIVE DESIGN

The global pandemic proved the urgent need for global-scale medical care. It also revealed the flaws that made the fragmented medical systems in each country lead to the global crisis. (Arush, 2021) The pandemic is a global issue, so we should replace this disaster as one of the planetary-scale problems. Medical and healthcare investment, funding flow design, and governance must be consistently revisited on a planetary scale.

The critical point is that the cost design above needs advanced global policy frameworks in international relationships and advanced technologies simultaneously. That is, Medical Inclusion needs to organize multi-stakeholders global cooperation to move forward, for

example, national governments, commercial institutes, academics, religions, unions, and individuals, so that cyberspace will be able to include medical and health care. Moreover, Medical Inclusion must have a strong connection between cyberspace and real space. Namely, the design will be a dynamic fusion of cyber and real space on a planetary scale.

CONCLUSION

The Internet is the concept of a large-scale distributed computer system with a network that surrounds the Earth, as a single global space. One of the most significant issues to concrete an ideal digital society is how future medical and healthcare systems would be incorporated into the cyber civilization. In other words, the design of the new medical and health care systems is depicted within a single global space, i.e., cyberspace. More importantly, how human beings can cooperatively work for it.

Being healthy is one of the most fundamental demands of human nature: pursuing one's healthiness must be one of the fundamental rights. People should have some opportunities to receive medical and healthcare when they are covered by networks and have digital devices.

This proposal of a design model for Medical Inclusion above will continually need a broader range of wisdom and ideas, and each piece of design has to be tested. At the same time, we have to promote smooth cooperative frameworks globally.

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