

CAN THE INTEGRATION OF ARTIFICIAL INTELLIGENCE SYSTEMS CONTRIBUTE TO THE IMPROVEMENT OF IRAQI HEALTHCARE SYSTEM?

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Executive Summary

- The first one, unravels Iraqi public health crisis, underlining the gaps of the low number of staff, hospital beds, and shortage of medicine.
- The second part highlights three Artificial Intelligence (AI) enabled tools and explains how each one can improve the healthcare system. For instance, the computerized Clinical Decision Support System (CDSS) for faster and more accurate diagnostics. Surgical robotics for better surgical treatment. Both working as the assistance to the low staff, hence, reducing heavy load on Iraqi hospitals. And, using AI tools for dealing with extensive data that are beyond human capabilities to better indicate corruption, hence, solving the issue of shortage of medicine.
- The third part explains the importance of providing fertile ecosystem for better implementation of AI-enabled tools by identifying two main challenges that can hinder the benefits of AI: the first one being the neglect of the system by the government; second, the corruption that plagues the healthcare system. The third part also discusses encouraging receptivity towards international cooperation, to better understand the standards and norms of the AI technologies.

Unraveling Iraq's Public Health Crisis

The technological revolution of artificial intelligence (AI) has been playing a significant role in improving services to humans, especially health services. These technologies have the potential to transform various aspects of healthcare systems and strengthen human security. At a time when in most developing countries it is at stake. That is why using the potential of AI-enabled tools to provide health services in a country like Iraq is essential. Decades of conflict, namely the Iran-Iraq war in 1980–1988, the fall of Saddam Hussein's regime in 2003,

and the war with the Islamic State (ISIS) in 2014; coupled with international sanctions and a lack of attention to the health sector, have harshly damaged Iraq's healthcare system. This created an environment that led to the migration of many doctors and other medical professionals. The ensuing political landscape offered an environment susceptible and accepting of corruption amongst politicians, which further deteriorated the sector. Eventually, this led to a low doctor to patient ratio; 9.7 doctors per 10k individuals; while the recommended number by the World Health Organization (WHO) is one doctor per 1K individuals¹.

Compared to other countries in the region, Iraq allocates a smaller portion of its budget to the health sector. In 2019, the country had an annual budget of 133 trillion Iraqi dinars (ID), of which only 4.5 per cent (six trillion ID) went to both the health and environmental sectors². Leading to a low number of hospital beds; according to the World Bank, for every 1k Iraqis, there are 1.3 hospital beds, a drop from 1.9 in 1980. At the same time, Iraq faces shortage of medicine, especially, the crucial types such as cancer treatment, forcing cancer patients to seek treatment abroad: in Jordan, Iran, Turkey, Lebanon, and India³. The issue is rooted in the high rate of corruption that exists within the system, as the medicines intended for the public use is often sold for private profit. Some companies were sued in United States courts for bribing the Iraqi Health Ministry to win contracts. On top of that both the Iraqi government and the Health Ministry were accused of selling medicines on the black market that were meant for the Ministry⁴.

AI-Enabled Tools for Iraq's Healthcare System

AI in healthcare describes the application of machine learning (ML) algorithms and other cognitive technologies in medical settings. In other words, AI in healthcare is when computers and other machines such as robotics, mimic human intelligence. Through which AI can assist doctors, nurses, and other healthcare workers in their work by producing accurate diagnosis, treatment plans, and surgical treatments. Especially, in cases where there is a shortage of doctors, such as in Iraq, in which patients may be left with inaccurate diagnosis or untreated conditions. As well as analyzing government, healthcare, and other sources for achieving a specific outcome such as tracking government's corruption. Therefore, leading to better patient experience. Considering the challenges; dwindling number of doctors and hospital beds, as well as shortage of medicine, the computerized clinical decision support system (CDSS), surgical robotics, and AI-enabled tool for detecting signs of corruption, are all potential viable options for enhancing the system.

Better Medical Diagnostic and Surgical Treatment

The CDSS is comprised of software designed to assist clinical decision making, by comparing the characteristics of the patient with the computerized knowledge base; consists of clinical information and guidelines. Through which provides the required clinical information and recommendations for the sake of optimal patient care. The system allows the clinician to receive evidence-based support that is customized to each individual patient, in shorter period, without compromising their outcomes. It is worth mention that CDSS is not intended to replace the clinicians but assist them. A study presented the case of a doctor named Jacinta-radiologist at a public hospital in the city of Quito, Ecuador. Dr. Jacinta attended to

hundreds of women every day at her clinic and wished to assist them all, but the hospital did not have enough staff to support her. However, as she received an AI-enabled radiology tool from her hospital, she was able to examine images of potential lumps and identify potential tumors more quickly and accurately. She still checked each result and followed the clinical protocols, but she could review three to five more samples per day.⁵

Surgical robotics are fed with large sets of data, through which they can highlight tools, monitor operations, and send alerts to surgeons. Mapping out the best steps according to the patients' needs, for better surgical treatment. All of this reduces the stress level of surgeons, which helps them to save significant operating time, perform a larger volume of procedures with better outcomes. At the same time, shorten the recovery time of patients. Hence, reducing costs for hospitals and patients, and inpatient stays. For instance, Neil Thomas, the former tech entrepreneur who had a tumor in his colon removed in June 2022, left the hospital only two days after his surgery. After three months he was able to return to his training for an Ironman triathlon.⁶

Indicating Corruption

To tackle the issue of shortage of medicine, there is a need for supervising the financial processes through managing enormous number of sources of information including: the ministry's official website, news, radio, newspapers, and official social media accounts of the officials. The amount of data is too large to be managed by humans. For this reason, the monitoring agencies of the government require the help of AI enabled tools to do the job. Amongst the variety of AI systems, what would be suitable for the Iraqi case, a system that is developed by Riigikontroll (The National Audit Office), an independent institution that audits

and reports on the government's use of taxpayers' money in the Northern European country Estonia. This office collaborates with MindTitan to improve the analysis of all public information sources for misuse of public funds and is funded by the European Regional Development Fund. The system highlights and visualizes the misuse of public money, using election dates, selected candidates, and various sources of data that the system manually collects from publicly available sources.

Filtering the candidates of interest, identifying their past and future claims of achievements. Through which it detects suspicious contract or misuse of public money. The data from the AI algorithm is stored in the database, until the National Audit Office (NAO) auditors determine its usefulness, with periodic deletion cycles planned⁷. Estonia is a good example for Iraq to follow in terms of AI adoption, apart from it shows the importance of choosing a suitable AI system, also shows the importance of creating a fertile ecosystem for it; passing legislation by its Parliament in 2000 declaring internet access a human right, the introduction of electronic ID cards in 2002, and enacting several laws and regulations to combat the abuse of public funds. Which helped the country rise to the 13th place on Transparency International's Corruption Perceptions Index 2021; amongst the least corrupt countries.

Creating a Fertile Ecosystem for AI Solutions

For Iraq to achieve a higher level of technological integration, it requires to adopt a process-oriented approach to AI implementation. Instead of a project-based one. Otherwise, the unresolved challenges in its healthcare system, as well as lack of receptive mentality towards international cooperation, will prevent it from attaining the benefits that developed nations experience.

The Challenges Hindering AI benefits

The failure of Iraq in effectively responding to the Covid-19 pandemic when it was first detected in March 2020 is the evidence for the neglect of the system by the government⁸. It is likely that the implementation of AI may also be subject to neglect. Whilst the accuracy of AI enabled tools depends on sufficient data reflecting the regional context, and qualified staff to feed it with and monitor its outputs. Therefore, even if the developed countries such as US develops and exports advanced AI-enabled tools to Iraq, they will provide inaccurate outputs. Which means it is required from the Iraqi Ministry of Health to seriously work on the digitization process that started on February 9, 2023, partnering with the World Health Organization (WHO) and United Nations Childrens Fund (UNICEF)⁹. Also, allocating money for the local staff training to regularly feed the system and monitor its outputs, most importantly to be able to use AI to its full potential. Otherwise, Iraq will be faced with bad digital infrastructure, that will cause alarm, fatigue, and error in rendering prescription.

On the other hand, the high rate of corruption that pervades the Iraqi system since 2003 and ranks the country amongst the most corrupt ones on the list of the agency Transparency International, shows the fragility of the governance system. Exposing a pattern within the enforcement agencies that leads to the violation of the regulations and laws, most importantly, stops it from meeting its responsibilities. Regardless of what percentage of Iraq's GDP is allocated to the health sector, the result will be futile, as the allocated funds are often misplaced, misused, or appropriated for personal use. This may also infect the AI-system that works as the indicator of corruption. Hence, hindering its positive impacts by corrupting the design of the AI system, as the codes and the available data can be manipulated to achieve corrupt objectives. However, the case of Estonia provides some tried

methods for Iraq to follow by enacting law and regulations concerning corruption and digitization for better outcomes.

Receptivity Towards International Cooperation

The two objectives mentioned previously requires international cooperation to share expertise, as well as, offering support through investing a part of its resources, to provide consulting services and training for the local staff to better understand the standards and norms of the AI technologies. At the same time, helping the government with producing more effective strategies and identification of crucial areas for investment and intervention. In order to avoid investing in the AI technologies that are portrayed and hyped up by the media as miracle tools.

Conclusion

Artificial Intelligence-enabled tools such as computerized clinical support (CDSS) that feeds the medical staff with fast and accurate diagnostics, surgical robotics that help surgeons to perform a larger volume of procedures with better outcomes, and AI-enabled tools for detecting indicators of corruption that paralyze the healthcare system are all viable options that may contribute to the improvement of Iraq's healthcare sector.

However, it is crucial to recognize that without adopting the process-based approach to AI implementation, through which a fertile ecosystem could be created to encourage technological flourishing, the full benefits from implementing AI-based technologies may

not be realized. Promoting international cooperation, to benefit from expertise and experience of developed nations, is another crucial component that would have effect on the success of integration of AI-based technologies in the healthcare sector. As a cautionary note, there will be a temporary hype around the idea of the AI-integration due to its reputation as a miracle tool. Expectations could be managed through proper introduction to the new technology, its limits and limitations.

Endnotes

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