

Challenges in the use of Artificial Intelligence for the health sector

Desafíos en el uso de la Inteligencia Artificial para el sector salud

Desafios no uso da Inteligência Artificial para o setor da saúde

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One of the technologies currently gaining popularity in the international healthcare sector is Artificial Intelligence (AI), which has arrived today as a powerful transformation that serves as a tool for the medical scientific community, patients and suppliers of medical supplies, a trend that foresees its possible use during the next decade.

This AI technology has been integrated by Microsoft in its search engine Bing, which groups a set of natural language processing models, trained with a large corpus of text data to be able to autonomously generate human-understandable text when used in dialogue or conversation mode, without direct supervision.

Also, the powerful Google Company has Bard, an AI tool that draws on the most up-to-date information available on the web. Available in English, Japanese and Korean, its responses include text and images that can be exported to Gmail and Google Docs and are expected to be integrated with other tools such as spreadsheets and maps.

However, one of the tools that has recently made a major breakthrough in various sectors has been ChatGPT (Generative Pre-trained Transformer), referring to the deep learning model used by other AI systems, which is to date the "flagship product" of OpenAI, which is focused on the research and development of intelligence products and services.

AI consists of a number of branches, including: machine learning, natural language processing and understanding, pattern recognition, machine vision, robotics, computer-aided hearing, and potentially contributes to biomedical research, medical education, and healthcare delivery.⁽¹⁾

There exists artificial intelligence tools in the healthcare sector or healthcare solutions based on artificial intelligence, such as, for example: Merative (formerly IBM Watson Health) set of digital tools that help facilitate medical research through AI, data analytics, cloud computing.

Deep Mind Health is a Google project based on diagnosing diseases from medical retinal scans, with the aim of detecting signs of eye diseases more quickly.

Infermedica is another example of a tool based on AI, which advises patients on what to do when feeling unwell, suggests possible conditions and appropriate measures to be considered by the patient and healthcare staff, and MedWhat, a virtual medical assistant, provides answers to medical questions.

On the other hand, ADA Health combines medical knowledge with AI to help people better understand and manage their health; it has an algorithm that combines their information with various combinations of similar symptoms.

Medical images have also been a target for AI tools, especially for deep learning, as they have been shown to be highly competitive for human medical performance due to their characteristics of identifying patterns and signals that are complex for the human eye to detect.

The application of deep learning has been investigated in a variety of health and disease fields to diagnose and detect abnormalities such as: radiomics, neurosurgical imaging, skin lesions, tumors, breast pain, breast cancer, as well as neurological diseases such as Alzheimer's disease.^(2,3)

The possible design of smart homes designed, redundantly, to extend the independence of older adults is now emerging as a clinical solution to help manage the health of the elderly, with the present consideration of the growing aging population, for which nurses may play a key role in the development and application of Smart Home technology.⁽⁴⁾

On the other hand, surgical robotics can help surgeons perform complex surgical procedures with greater precision and efficiency by analyzing medical images in real time and performing precise and controlled movements.

Although each of these tools is currently being improved, one of the major shortcomings pointed out by researchers and users is related to the explanation of how these AI models are trained to return the answers they generate from the information available up to the year in which the output of their corresponding version is made, and how the information they generate in their results could lead to ethical-legal problems associated with plagiarism and the use of information protected by copyright.



It has also been identified as a deficiency the validity it returns in terms of information sources in the form of URL (Uniform Resource Locator), once they are requested by the user where it may return links that do not work or that address similar topics to the one requested, but that are not related to the topic under analysis.

Regardless of the above, the deployment of AI tools in the healthcare sector has led to significant innovations in diagnostics due to the ability of these tools to analyze large volumes of data in real time. This enables the individualization of common outcomes, imperceptible to clinicians by collecting and processing large amounts of clinical data in AI algorithms and discovering patterns that can lead to new treatments or therapies, considering a wide range of genetic characteristics of patients such as: age, gender, medical history and personal preferences to provide personalized treatments, which is part of predictive medicine and thus making diagnosis more centered in patient.^(5,6)

The use of AI software to address health issues could generate problems related to privacy and the protection of the health data of the patients involved in the treatments, requiring legal regulations that comply with the right to personal privacy, while promoting scientific research and the ethical use of data, based on the consent of the patients with the data generated about them.

Therefore, universities, health service managers and policy makers are required to monitor information on each of the developments in this field, to evaluate the progress of each new development or improvement of AI in the health sector from a multidisciplinary perspective, including accounting, business and administration, decision sciences and health professionals, for subsequent application according to the conditions and resources available in each country.

Corresponding to the above, it is necessary the analysis of the total amount that a healthcare organization should pay for the use of AI technologies for the management of healthcare services and the treatment of patients, and how much is required to be invested to contribute to the modernization of healthcare organizations, either with own funds or from government investment funds as in the European case with the Next Generation EU⁽⁷⁾ program.

In conclusion, it is not expected that AI will replace healthcare professionals, but rather that it will increase their capabilities to generate impact for patients and healthcare systems. This increase in new roles and capabilities of healthcare professionals will have to be in correspondence with the digitization of the healthcare system and the collection of the correct, robust and interoperable data, which will allow the generation of other data to prioritize patient-centered solutions.

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