

Research for the Business Role and Value of AI in the Medical Industry

Runze Li¹, Ping Yuan^{2,*}

¹ Shenghua Zizhu Academy, Shanghai, China

² Shanghai Yangsi Senior High School, Shanghai, China

* Corresponding Author Email: 1811000218@mail.sit.edu.cn

Abstract. This paper discusses the development of AI in healthcare, from the past to the present, and the future. We carefully analyzed the process of AI penetration into the medical field and also envisioned the future development of AI in the medical field. Because of AI's excellent computing power and analytical capabilities, it has a great impact on the medical industry. This paper describes the use and value of AI and sorts out the relationship between advantages and disadvantages from the aspects of image diagnosis, pharmacy, ChatGPT and human-computer interaction equipment. Based on recent research, the position of AI in the medical field is demonstrated from multiple perspectives, and their future market is speculated, for various reasons, some development cycles are relatively long, and many aspects need to be considered. Finally, this article presents some of the existing problems of AI in healthcare, from different aspects of patients, hospitals and doctors, and then gives different solutions.

Keywords: Medical Industry, AI, image diagnosis, pharmacy, ChatGPT, human-computer interaction.

1. Introduction

1.1. Background

Nowadays artificial intelligence has developed for decades and it went from vision to reality. AI was first proposed in 1956 and before that, it was just scientists thinking about human intelligence. Brewing for nearly half a century through multiple low periods and the efforts of countless people in multiple countries, AI finally began to flourish in the 21st century. AI opens a new age with its skills providing unimaginable convenience and space for scientific and technological development. More importantly, AI can be used not only for academic research and experiments but also for replacing repetitive work and big data analysis in numerous basic aspects. The healthcare industry has also been affected by AI it has improved patient information systems in hospitals, management systems for various medications and increased the accuracy of high-precision surgical instruments. In addition, artificial intelligence has played an important role in the prevention and control, diagnosis and treatment of the novel coronavirus epidemic that has swept the world in recent years. Therefore along with the spread of AI, it once caused people to discuss and think about humans themselves.

1.2. Related research

In the early days of artificial intelligence, people were divided into two factions, those who advocated the use of numbers and logical symbols to create artificial intelligence and those who wanted to use a form like neural networks to achieve artificial intelligence. During this period, the term artificial intelligence and its clear concept were introduced in 1956. The founders of modern artificial intelligence, such as Turing and Pitts, also published their work around this time. At that time, AI did not have quantum computers, and the accuracy was relatively low, so even in the 21st century, the acceptance rate of medical AI and human-computer interactive remote surgery was typically low. In addition, people did not have electronic medical records, and it was difficult for AI to aggregate and organize the data for learning. And early medicine and computer science were almost

unrelated, so few people developed related programs. And because of technical limitations, the efficiency is not high [1].

As for now, it believes that the use of artificial intelligence in medicine is very beneficial to mankind. Because he was far more efficient at both clinical and preventive work than humans thanks to his great computational and analytical skills. Artificial intelligence to help humans make judgments can also greatly reduce the probability of misdiagnosis. And the scope of application of artificial intelligence has grown larger and larger over time, and it has helped more and more people [2]. The study found that although the promise of artificial intelligence in medicine is very good, its application in cardiology is very small. Because the basic logic of artificial intelligence lacks standardization, if it is used in clinical practice, it is difficult to ensure quality, and it may interfere with artificial judgment. As a result, there is little impact on patient care [3]. A lot of people including professional doctors and scientists believe that artificial intelligence can provide great help in intensive care because there are a large number of clinical trial data in ICU, which is very suitable for artificial intelligence learning, but correspondingly, doctors are required to have a certain understanding of artificial intelligence and will apply it, which is difficult to do [4]. The research also shows that although artificial intelligence technology has made great progress, it can even complete clinical diagnosis and treatment independently. However, if there is a misdiagnosis in the diagnosis and treatment, then if the responsibility is borne by the patient, the patient will think that it is not guaranteed and reduce the use [5].

There is a lot of speculation about the future of medical technology like instant cures and even bringing the dead back to life, this is possible but remote. At present, artificial intelligence is still limited to the imperfections of human-computer interaction and is more focused on assisted nursing [], surgery and postoperative rehabilitation, but in the future, the research and development of robots and the breakthrough in the use of digital model neurons will be able to comprehensively cover the entire medical field including but not limited to clinical medicine [6], internal medicine and surgery which involves the prediction from experts that the next ten years is the best period for the development of AI [], and its coverage in various fields will reach or affect most industries and industries at the same time accelerate the development of precision medicine [7]. However, there are hidden pitfalls including but not limited to lack of transparency, perception bias and hype cycles [8]. Back to Artificial intelligence itself, originates from and relies on big data. Based on imitating human brain neurons with the high computing power of new electronic computers [9], it establishes multiple interconnected digital neural circuits to create information aggregation similar to human understanding and intelligence to make up for the lack of ability and talent in some medical fields and promotes personalized medical development with information big data [10]. Simplifying the difficulties of narrowing the field of predictive and proactive medicine.

1.3. Objective

In contrast to the previous discussion and the description of the development and other facts, the following is more focused on the current discussion of commercial medicine and technology and the possibility of future development. This article will examine the different applications of AI in detail and the benefits, difficulties, and problems of its commercialization in business models. At the same time, there will be corresponding solutions and suggestions for existing problems and potential hidden dangers in the future. Finally, by comparing the large base demand and the large number of customers that medicine has, we can look forward to and plan for this industry, which is also the most important.

2. Application

2.1. Image diagnoses class

As for the precise commercial applications of AI in the healthcare aspect. There are four representatives. In common imaging examination methods such as CT, MRI, ultrasonic wave and X-ray, AI can automatically identify various organs to improve inspection efficiency and produce

inspection results quickly and reduce the physical harm to the examiner. One basic technique of it are Image recognition AI uses established procedures for efficient screening to achieve the purpose of image recognition, and in this process of automated processing and analysis, AI can provide recommendations to doctors and obtain analysis results at the end, image segmentation which divides the image into different regions after recognition, and each region corresponds to different tissues, organs and structures to solve the problems of fuzzy and low contrast in medical imaging image, disease inducement that AI will use existing data to analyze the development trend of lesions and treatment effects to provide doctors with personalized treatment recommendations for patients and disease prediction can find the location and size of the lesion. All of the applications above can help to form a personalized medical model and forming a commercial operating model has reached the purpose of commercialization because the service is now closer to the product but not the necessity of survival.

2.2. Medicine

AI pharmaceuticals are also developing rapidly. Companies large and small rushed to the circuit, raising about \$4.5 billion globally, which is very popular with capital. The survival of AI pharmaceutical companies is also very optimistic, 46% of the companies have entered the Series C financing. Many people think that AI pharmaceutical is now the turret, however, with the support of such a large amount of funds, no AI drugs are on the market, all in the clinical stage. This result made many people doubt, but it is true. There is not much AI in the process of AI pharmaceuticals. AI is only there to help screen drugs, to do theoretical research, to do real clinical trials - the longest part of the drug development process, AI can't participate in, let alone speed up efficiency. At the same time, the success rate of drug development is itself very low, which also makes AI pharmaceuticals greatly more difficult. AI pharmaceutical requires a large number of samples for research and development, but many relevant data are in the hands of traditional pharmaceutical companies, AI pharmaceutical access to resources is extremely limited, and it is also one of the ways that various companies compete with each other. If the drug developed by AI can break through the technical bottleneck and successfully market, will people have doubts about this drug? In summary, the development prospects of the AI pharmaceutical industry are great, but the lack of breakthrough technology is not as good as traditional pharmaceutical companies in many aspects.

2.3. ChatGPT

As for the commercialization, companies are also the good helpers. Besides, the famous AI which has widespread in the whole world is ChatGPT. As a representative AI, it is a natural language processing model created by OpenAI. Its services include telemedicine virtual assistant, clinical decision support, record keeping, medical translation, medication administration, disease monitoring, medical writing and documentation clinical trial recruitment creation, symptom checker, patient triage, drug information, medical education, mental health and support for remote patient monitoring which not just about the patient's physical recovery and future protection but it's also about niche areas like mental health. In addition, compared with mechanical work, AI can also carry out human-like thinking about medical treatment and spontaneous optimization and rectification, and change treatment standards and applications can also better interface interaction and communication with doctors to achieve human-machine cooperation and rapid development of industry efficiency and industry demand. More importantly, ChatGPT is accurate in the purpose of the service and expands the wide use of AI in the healthcare market. But AI can also undergo higher-level metamorphosis in the future, such as transforming big data into small models or making an initial entry into the field of innovation.

2.4. Human-computer interaction device

As early as 1985, surgical robots have infiltrated medical care. The benefits of surgical robots are manifold. Surgical robots can give the doctor a broader perspective, more convenient operation, and

reduce the probability of error, which is also responsible for the patient. In addition, surgical robots can allow patients to recover faster, allowing more patients to be treated and reducing the waiting time for surgery. However, the technical requirements of surgical robots are very high, so the development cycle will be longer and the investment will be more. So it takes a long time to reach a profitable state. At the same time, the operation of the surgical robot requires a certain operation, and the doctor also needs to have the relevant foundation to operate. The market for surgical robots is getting bigger and bigger, because some big companies have successfully made and listed, and many people are competing to enter the field. Even though the individual cost is not low, most hospitals use surgical robots, and once doctors get used to the use of surgical robots, there will be a certain dependence, which is one of the reasons for the increase in demand. All in all, surgical robots are very convenient and can help hospitals make profits, but they also have certain technical defects and need more research and development.

3. Business model analysis

3.1. Problems

AI is flourishing in the medical field, and as an emerging industry, it also has many problems. First of all, its research and development costs are usually high, so the price will be very expensive. So as healthcare workers, they don't necessarily think about using AI. Moreover, as an emerging industry, people do not know about AI, so if it is put into use, publicity and marketing are also small expenditures and need a certain amount of time to let people accept it. Secondly, the use of AI in healthcare will require doctors to have a certain technical foundation. Many doctors are used to not having AI, so if they are suddenly asked to change ways, they will not adapt, but increase the burden on doctors. Moreover, as medical students, their courses are not only medical knowledge but also computer-related knowledge, which will be very stressful. In addition, if mistakes in the use of AI result in harm to patients, who should bear the responsibility? At least there are no clear legal provisions, so this is relatively insecure, and now AI does not appear in the process of medical treatment, the public does not understand the use of AI in medical treatment, so they may not trust AI, which is also one of the difficulties of AI entering the medical market. Finally, the use of AI in medical treatment is as powerful as people think, and the actual use of AI in the medical field is not important at the current level of technology. Most of them are still doctors, and the participation of AI is not high, so the benefits will be less than expected, and if AI appears irreplaceable in the medical industry, the value will be higher. In summary, although AI provides great convenience to people in medical treatment, the development prospect is very good. But people will also consider whether his value is worth so much investment, which also proves that there is a big problem.

3.2. Solution

And there are appropriate solutions to the above problems. First of all, as patients are reluctant to use AI technology for medical applications, the price is high and psychogenic barriers, people's resistance and financial pressure can be reduced through government supplements, technological innovation, or higher information density collection, so as to help AI develop more completely and gradually improve its independent diagnosis ability from the current auxiliary positioning. While some of the problems with doctors working with AI can be solved, other measures are needed to modify them. In order to solve the problem of poor computer skills of medical students, the learning model can be explained through the new generation of education so that students have more basic or even high-end computer skills without rushing. However, at this stage, the addition of new computer technology modules to improve and simplify the operation of AI will bring more direct results or change the operation process, such as using the button simple link model can be equally effective in putting AI into use.

While what is more important is how to get rid of the auxiliary positioning of AI at this stage and successfully have irreplaceable, people doubt that the event itself is still due to technical limitations

and true error rate This can be solved because the basic computing power of AI is already sufficient. What is needed now is the substantial accumulation of data and specific standards for image analysis, and the fuzzy image recognition technology of AI in this area to offset the possibility of miscalculation and reduce people's fear and mistrust.

4. Conclusion

All in all, compared with what we already know about the great achievements of celebrities in the past and the remarkable progress of the present, the future is more worthy of reflection and imagination. At a deeper level, development depends not only on technological breakthroughs and innovations but also on business models and institutions for new development and new societies, which will help actual, formed technologies to become systematic new medical business markets in the future. This can also solve the problem of insufficient time at the same time, and thoroughly implement the partial implementation projects such as precision medicine, drug development and surgical robots. Whereas, similar to the portability, simplification, low cost of equipment and the use of big data to achieve the second big shift or the full commercialization of the industry require night and day research and persistence. Not just to be at the top of the world but to be a great race of humanity. Now it is equally important to cultivate the next generation of big data concepts in the new era, more open computer courses, reflecting autonomy and universality to pave the way for the second information explosion of AI which can pave the way for full commercialization as well.

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