

Voice Recognition in Healthcare

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1. INTRODUCTION

A computer programme known as voice recognition software can translate human speech into text that is simple to read. In addition to being able to recognise human speech, speech recognition software may also use the data to carry out tasks more precisely. Voice-activated assistants, like Alexa and Siri, carry out simple activities in response to voice commands. The Daily Speech Recognition software application automatically decodes the voice answer and directs the customer to the appropriate service or support function. consists of phone bots.

When a spoken word is recognised by a speech recognition system, the system either completes the task or converts the spoken word into text. You have utilised speech recognition technology if you have ever spoken something to your phone or car, such as telling it to "Call Mom or Dad." Speech recognition is frequently used by healthcare professionals to build medical records.

The technology of speech recognition is not new. It has been in use for a long time. But it is now easier to use, more inexpensive, and more precise. Speech recognition is becoming a more reliable technology to utilise in the healthcare industry and has the potential to change how healthcare providers carry out their regular tasks.

1.1. WORKING OF VOICE RECOGNITION

To convert speech to text, speech recognition software typically follows four main processes.

- A voice's analogue waves are first transformed into digital data that computers can understand by the use of an analog-to-digital converter.

This information is then divided into smaller sound segments and contrasted with each language's phonemes.

- To identify words, phrases, and sentences, the software compares the strings of the chosen phonemes to a database of known words, phrases, and sentences.
- Following this process of comparison, the computer draws conclusions about what you are saying and

uses this knowledge to convert it into text or carry out orders.

The speech-to-text conversion process is used by medical speech recognition software, which calls for a database of languages specialized for the medical industry. As a result, there is a learning curve where physicians must correct software errors and give input to the algorithm in order to increase accuracy. Increased accuracy lessens the need for input and frees up the doctor's hands more and more.

1.2. TYPE OF MEDICAL VOICE RECOGNITION SOFTWARE

Speech recognition software falls into two primary groups when it comes to medical documents: dictation software and AI typists.

DICTIONATION TOOL: The Dictation Tool uses a microphone to capture speech and immediately and accurately transcribe what you hear. In light of this procedure, it is recommended that the doctor guide the patient's examination exactly how they wish to be noted in a memo.

AI WRITER OR AI SCRIBES: This technique is carried out by AI Writer or AI Scribes in several steps. The AI writer employs natural language processing (NLP) to omit material that is medically relevant and to remove short stories and folders after verbatim transcription of the voice input. As the software listens, transcribes, and summarizes the patient's notes, the doctor and patient can have a natural discussion.

2. ADVANTAGES OF SPEECH RECOGNITION IN THE HEALTHCARE SECTOR

Speech recognition is widely used in the healthcare industry and gives patients the option of receiving care at home. The healthcare sector may gain a lot from the use of speech recognition technologies.

The advantages of healthcare include the following:

The use of speech recognition technology as a medical tool and method of communication between healthcare

providers and patients minimizes the need for written documentation.

Face-to-face communication: It enables the affected individual to remain connected even when they are not physically there.

Language Dependability: Speech recognition technology can help with the language barrier, which can be a big obstacle for people who don't speak English or any other language.

Dispute-free dialogue: Speaks for the patient and may help with communication issues, increasing conversation between patients and their families.

An example of a discussion strategy: supporting patients using conventional approaches who are unable to communicate.

Improved diagnosis and documentation: Speech popularity speeds up the documentation process and, by transmitting accurate clinical records, may reduce transcription errors.

Doctors can spend enough time helping patients recover from fitness-related issues, which is what they do best. They may spend less time navigating difficult menus on touch screens or typing lengthy search terms if they used voice-enabled gadgets.

Accuracy and speed: The accuracy of speech popularity speeds up analysis by reducing mistakes made by entering data into computers, which could lead to the wrong conclusion regarding a disease's origin.

Having trouble reading prescriptions: Voice recognition facilitates communication for patients who may also struggle to read or comprehend information sent to them on paper.

3. USE OF VOICE RECOGNITION SOFTWARE IN HEALTH AND SOCIAL CARE

The use of voice-activated medical software helps to reduce patient monitoring errors. When there are 12 people present, this frequently occurs. Because he didn't examine the room, the hospital, in some instances, missed the patient's passing. As a result, they were not required to make an inventory before tossing away food, bedding, or clothing.

It is well known that errors happen in a normal hospital setting where 10 to 20 nurses are responsible for patient care. As a result of not checking the patient's room and frequently not being requested to make an inventory before tossing away food, bedding, and clothing, hospitals frequently were unaware that the patient had passed away.

By decreasing "sheep counting," voice-enabled healthcare IT technology helps avoid these errors. It can be distracting and make staff members less inclined to make mistakes to know that they must and will take good care of all patients. By simply speaking and taking notes, you can lower your risk of making these expensive mistakes. The patient's experience in the hospital can be enhanced with voice assistants. Early applications included automating routine operations like ordering a patient's meal and taking their blood pressure without the need for constant human supervision.

4. VOICE TECHNOLOGY'S IMPACT ON HEALTHCARE

Voice recognition software aids doctors in identifying issues earlier and improving their chances of solving them. Healthcare voice recognition in the warehouse can find a product right away. Additionally, voice technology is a fantastic tool that opens up additional internet options for people who cannot type or write.

A few well-liked voice assistants in healthcare are:

Voice technology is being used by more and more healthcare professionals for inpatient treatment. A doctor in a hospital can examine a patient's vital signs by asking Alexa or Siri, "What is the patient's blood pressure?" The doctor and the assistant can communicate directly, which saves time and minimizes transcription mistakes.

By enabling those who we have communication challenges with to communicate online, make an appointment, or conduct a search, voice recognition in healthcare can also open doors for those individuals.

5. EFFECTIVE VOICE RECOGNITION IMPLEMENTATION IN HEALTHCARE AND OTHER MEDICAL FACILITIES

In Portland, Oregon, a significant hospital is called Oregon Health & Science University. The only way they could communicate with the programme when they first started using OHSU's new speech technology was by entering commands. Another such is the University of New South Wales' HINARI programme, which was started in 2005 with the goal of enhancing patient care in African rural hospitals.

Some hospitals now have additional locations where this technology can be utilized thanks to the effective installation of this technology. To aid deaf and illiterate patients, speech technology has been implemented in some hospitals in India. For instance, a hospital in Delhi employs voice technology to make it easier for patients who are hard of hearing to find doctors and obtain test results quickly.

Another illustration is the HINARI initiative at the University of New South Wales, which was started in 2005 with the goal of enhancing patient care in African rural hospitals. Medical staff can communicate with surgeons who specialize in general surgery using voice technology. As specialized surgery is not easily accessible where they live, this enables more patients to obtain the assistance they require. In reality, this initiative has increased surgery by 67 percent in East African regional hospitals.

With voice technology becoming increasingly widespread, it won't be long until everyone, even hundreds of kilometers away from home, can access medical care. Not only is voice technology commonplace in the US, but it is also starting to expand to other nations.

6. DISADVANTAGES AND LIMITATIONS OF VOICE RECOGNITION FOR HEALTHCARE SYSTEM

ACCURATE VOICE TRANSCRIPTION ISSUES

Accuracy issues with voice dictation can have a variety of effects on patients and doctors. A medical negligence claim against the doctor based on erroneous records could make him accountable for damages resulting from his negligence. Patient records that contain erroneous information can result in wholly false diagnoses that can worsen or prolong the disease.

NOISE FROM MANY DISCUSSIONS IN THE ROOM

Speech recognition software may have trouble understanding words when there is too much ambient noise. One reason for this is that while dictating to a computer, particularly when they are in a setting where others are conversing, doctors should endeavor to speak as quietly as they can.

WORD RECOGNITION IS AFFECTED BY DIALECT AND ACCENT (PRONUNCIATION)

Due to the necessity to train speech recognition software for a certain language, accents and dialects might impact word recognition. For instance, if a doctor uses an American speech recognition system but speaks with an Irish accent, it will be challenging to comprehend what they are dictating because the technology is set up to recognize other accents or dialects.

THE PATIENT'S REFUSAL TO RECORD

The biggest disadvantage of voice dictation is that some patients might not wish to record due to privacy concerns. They may speak more quietly or be silent in order to avoid being recorded during the doctor's visit. Because of the lack of privacy, it might be challenging for doctors to

conduct live audio interviews with patients in mental health and rehabilitation facilities.

7. CONCLUSION

A brand-new and exciting technology called voice recognition systems has the potential to significantly improve healthcare in many ways. One of the main advantages of speech recognition for healthcare professionals, such as doctors or nurses, is that they may transcribe notes onto their computers while still providing patient care. This enables them to do all of their work effectively while still having more time for personal contacts or other obligations.

Patients also benefit from the fact that it's less difficult than ever before for them to get help if they're not feeling well, thanks to an app on their tele-cell smartphone that transcribes what they have said aloud so that someone else can review it again and identify whether there are any concerns regarding symptoms or medication options. The most basic problem we've discovered via our research is that speech recognition technology is still very new, so there are some issues that need to be worked out before it can replace traditional textual dictation. For the time being, this technology must be used instead of the simplest procedure since if mistakes are made, the patient's safety could be put in danger.

8. REFERENCES

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