**ARITIFICIAL INTELLIGENCE CHATBOT FOR HEALTHCARE AND MEDICAL SCIENCE**

**WHAT IS INTELLIGENCE**

There is no agreed definition or model of intelligence. Intelligence is a ability to understand and thing about things, and to gain and use knowledge. “action is the real measure of intelligence.” “Intelligence is what you do when you don't know what to do.” “Intelligence is a hypothetical idea which we have defined as being reflected by certain types of behaviour.” Einstein said, “the true sign of intelligence is not knowledge but imagination.” Can we increase our intelligence? Deep thinking Good reasoning Learning from experience Practise

**WHAT IS MACHINE LEARNING**

Machine learning is a branch of computer science which is used to become intelligent a machine. the concept of machine learning says that the machine gains some knowledge with its past experience as humans do. A machine is work, thing, understand and take self – decision like humans.

**WHAT IS ARTIFICIALINTELLIGENCE**

Artificial intelligence is a branch of computer science which is used to developed and design intelligent machine which work and thing like human beings , it is used to solve real world problems . artificial intelligence used perception, reasoning , learning , understanding , thinking and self- decision to expose intelligent behaviour.

**WHAT IS CHATBOT**

A Chatbot work in a couple of way : set guidelines and machine learning “A computer program designed to simulate conversation with human users , especially over the internet . “ The main factor that motivates the people to use chatbots are:- ¬Productivity ¬Entertainment ¬Social and relational factor ¬Curiosity

**INTRODUCTION**

• A chatbot is a service or tool that you can communicate with via text messages. Think of chatbots as human-to-robot instant messaging. Using artificial intelligence and carefully-written computer scripts, chatbots can recognise natural language to have rudimentary conversations with your customers.

**HISTORY OF CHATBOT**

¬ 1950-THE TURING TEST Alan turing theorized that a truly intelligent machine would be indistinguishable from a human during a text-only conversation . these ideas essentially laid the foundations for the chatbot revolution .

¬ 1966- ELIZA Eliza was created at he mit ai laboratory to simulate human conversation by matching user prompts to scriptes responses . it gave an illusion of understanding but had no built in framework for contextualizing events .

¬ 1995-ALICE The “artificial linguistic internet computer entity” was a natural language processing bot . she could apply heuristic pattern matching rules to human input in order to have a conversation, but was still not able to pass the turing test .

¬1972-PARRY

¬1988-JABBERWACKY

¬1992-DR.SBAITSO

¬2001-SMARTERCHILD

¬2006-IBM’S WATSON

¬2010-SIRI

¬2012-GOOGLE NOW

¬2015-ALEXA

¬2015-CORTANA

¬2016-BOTS FOR MESSENGER

¬2016-TAY

**CHATBOT IN HEALTHCARE AND MEDICAL SCIENCE**

¬ Chatbots in the healthcare field are providing patient assistance and care .

¬ AI-powered medical assistant can book appointment , monitor a patient health status and perform other time-intensive responsibilities such as inventory , billing and claims management . There are three key limitations :- Explainability, Data requirement &Transferability

**CURRENT AI USE CASES IN HEALTHCARE**

¬AI in “ data mining “ with ai can predict disease ¬AI in “ medical imaging and diagnostics “ provide precise information ¬AI in “ nutrition “ is enhancing the journey to a healthy and fit lifestyle ¬AI in “ emerging room and surgery “ is saving lives ¬AI in “ life style management and monitoring “ is changing the way we live . ¬AI in “ hospital information system ( HIS ) “ can enrich the delivery of healthcare system . ¬AI in “ research “ is providing fascinating insight . ¬AI in “ mental health “ is building a strong support system for patients ¬AI in “ pharma “ is enabling the discovery of a new class of diagnostic and treatment ¬AI in “ virtual assistant “ to communicate with patients in an efficient way

**HOWCHATBOT WORKS**

• Chatbots reside in the most commonly used apps and in the form of assistants on various websites where they can converse with the users.

• With advanced machine learning algorithms and natural language processing enabled, these chatbots can create maps linking symptoms and diseases.

• Chatbots in the industry for medical care, ask some standard questions and help create a profile based on age, sex, and medical history. They can record the user's history and analyze symptoms based on user's inputs.

• They can also use image and voice processing to record and match symptoms against the database.

**FEATURES OF CHATBOT**

1. Intuitive chatbot creation
2. Business workflow integration
3. Natural language understanding
4. Secure communication support
5. HIPAA compliance
6. Deployment on Facebook messenger , SMS and web θChatbot campaigns
7. Support for image and file
8. Support video chat
9. Scalable and expandable

**EVOLUTIONOF AI IN HEALTHCARE**

• The evolution of AIS and its application has a vast spectrum in healthcare. The most important reason is that there is non-availability of trained manpower in both medical and para-medical fields.

• Healthcare is one of the largest and most rapidly growing segments of AI, driven predominantly by innovation in clinical research, robotic personal assistants and big data analytics. Healthcare is poised to accelerate investments in AI over the next three years

**AI IN GLOBAL HEALTHCARE MARKET**

• In Canada, the city of Hamilton’s health department has collaborated with IBM to built AI capabilities that can improve health outcomes and decrease the cost of care , by leveraging existing patient data .

• Chief Information Officer ( CIO ) in healthcare organization are ready to engage AI platforms to achieve greater customer experience , particularly as a recent survey by HCF revealed that over 80% of australians are comfortable with AI being used to diagnose common medical problems are interpret test results .

**IMPACT OF AI IN HEALTHCARE**

• According to a 2016 report from CB Insights , about 86% of healthcare provider organizations are currently using AI in some way.

• As per world health organization (WHO ), the world will be short of about 13 million healthcare workers by 2035.

• Developers have launched more than 33,000 facebook messenger chatbots since April 2016 . What’s more, 80% of frands across industries will be using chatbots for customers interactions by 2020, according to research conducted by oracle .

**KEY AI TECHNOLOGIES TRANSFORMING HEALTHCARE**

Natural language processing

Deep learning

Context aware processing

Intelligent robotics

**TECHNIQUES OF A.I IN HEALTHCARE CHATBOT**

There have been a number of artificial intelligence (AI) tools developed over the past decade Many of these have found their applications in medical and health-related areas. Commonly applied AI techniques can be listed as: Neural networks, Fuzzy logic, Support vector machines, Genetic algorithms, Hybrid systems fuzzy logic and the relatively new support vector machines.

**APPLICATIONS OF AI IN HEALTHCARE**

• Managing medical records and others data

• Treatment design

• Digital consultation

• Virtual nurses

• Medication management

• Drug creation• Precision medicine

• Health monitoring

• Healthcare system analysis

**PREVIOUS DEVELOPING HEALTHCARE CHATBOT**

• BABYLON

• IZZY

• YOUR.MD

• CANCER CHATBOT

• SENSELY

• ADA

• ABBI

• SAFEDRUGBOT

• FLORENCE

• BOT4HEALTH

• GYANT

• INFERMEDICA

**OBSTACLE FOR AI CHATBOT IN THE FUTURE**

* One of the main hurdles for AI would be its adoption . Healthcare professionals would have to educated about the need for AI . They should also be made comfortable for work in an environment where AI is present . Many doctors would not be open to the information provided by a machine, and they would be educated to accept AI .
* Compliance and FDA regulations can be another major problem . Currently, with AI being only partially understood, the amount of importance that has to be given AI would also be a question that lurks in the minds of the FDA personnel .

**DIFFICULTIES IN HEALTHCARE AI ADOPTION**

The industry is receptive to new ways to improve diagnostics, patient care, and financial efficiencies. However, these AI healthcare companies contend with some significant challenges with regards to widespread AI adoption in the healthcare. Case study conundrum, Black box issue, Stakeholder complexities & Current trends

**COMPONENTS OF A CHATBOT**

**LOGIC**

Logic is the part of the chatbot that decide how to act on the user input . Standard IF – THEN logic can be enhanced with heuristics & AI creating powerful decision engines .

**CONTENT**

Content refers to the text & context of the chatbot conversation . Richer content with subject matter information leads to more useful chatbots .

**CHALLENGES AND LIMITATION**

* Giving human intelligence is almost impossible
* Time constraints
* Enough knowledge representation
* Should be very specific keyword
* Technological limitation of AI
* Medical limitation
* Ethical challenges
* Better regulations
* Misconceptions and overhyping
* Human rejection

**FUTURE SCOPE OF AI IN HEALTHCARE**

More efficient and Voice Chatting chatbot . Chatbots are everywhere, and the sector where they will probably make the maximum impact on in the near future is healthcare.

No need to pay unnecessary visits to a doctor, chatbots are here to help you AI and ml-powered solutions have already shown the ability to perform tasks, in many cases, Better than humans. Leaders like amazon are calling AI a “golden age” and are setting a new Standard for competitive differentiation.

AI is expected to enhance healthcare for both patients and doctors . Clubbed with big data analytics, AI could yield faster and accurate diagnoses . All these would result in decreased healthcare cost .

**DATA SAFETY AND PRIVACY AND RISK**

• The ministry of health and family welfare is working on a sector - specific legislation , tentatively called the healthcare data privacy and security act .

• In 2016 , the hacking of a Mumbai – based diagnostic laboratory database led to the leaking of medical records ( including HIV reports of over 35000 patients ) .

• Hacker can exploit AI solutions to collect private and sensitive information such as electronic health record .

**COMMON VULNERABILITIES ADDRESSED IN CHATBOT**

Man-in-the-middle

Chat log stored on user device

Encryption of messages in transit

Encryption of data at rest

Use of external NLP services

Logging and access rights

**SECURITY FOR CHATBOTS**

The privacy and security of patient health information is a top priority for patients and their families, health care providers and professionals, and the government. Federal laws require many of the key persons and organizations that handle health information to have policies and security safeguards in place to protect your health information — whether it is stored on paper or electronically. θHIPAA, also known as Public Law 104-191 . The act, which was signed into law by President Bill Clinton on Aug. 21, 1996 .

The Health Insurance Portability and Accountability Act of 1996 (HIPAA) is the main Federal law that protects health information. The HIPAA Privacy and Security Rules protect the privacy and security of individually identifiable health information. HIPAA Rules have detailed requirements regarding both privacy and security.

The HIPAA Privacy Rule covers protected health information (PHI) in any medium .

The HIPAA Security Rule covers electronic protected health information (ePHI).

**CONCLUSION**

THE KEY IS TO ENSURE THAT MAJORITY OF THE POPULATION CAN ACCESS AND THEREFORE BENEFIT FROM THIS TECHNOLOGICAL DISRUPTION. IF INDIA IS SUCCESSFUL IN DOING SO, THERE IS AN OPPORTUNITY TO BENEFIT FROM THE POSITIVE CHANGES THAT TECHNOLOGY WILL BRING TO HEALTHCARE.

ARTIFICIAL INTELLIGENCE HAS A RANGE OF APPLICATIONS ACROSS THE HEALTHCARE SECTOR. BY PERFORMING DESCRIPTIVE, PREDICTIVE AND PRESCRIPTIVE FUNCTIONS, AI IN HEALTHCARE IN INDIA IS CURRENTLY AUGMENTING HUMAN CAPACITY RATHER THAN TO REPLACING HUMAN LABOUR ALTOGETHER.