TRUSTED AI CHAT BOT FOR HEALTHCARE GUIDANCE

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Healthcare in Canada

On average, a doctor will let a patient talk for 18 seconds before interrupting them with another question

25% of doctors spend 9-12 minutes with their patients

Anything less than 20 minutes isn't beneficial to the patient

On average, it takes 11 weeks to meet with a specialist in Canada

How Can We Change This

Our chatbot allows you to make the most out of the little time you have and obtain correct referrals and the appropriate care

We will be discussing:

- Problem Description
- Solution Description
- Research and Data Utilization
- Integration of Microsoft and Azure Tools
- Business Case
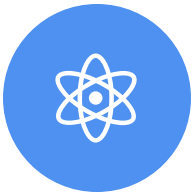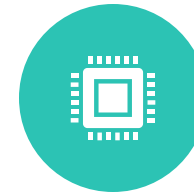- Ethical Considerations
- Measuring Impact

Meet Our Team

Emily Getejanc
Nanotechnology Engineering

Nima Arfeen
Computer Science

Yulin Xa
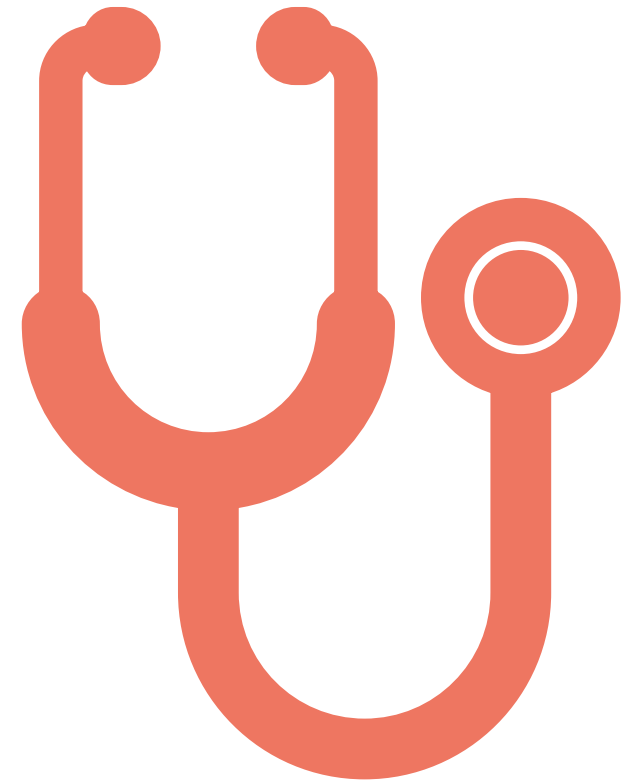Electrical and Computer Engineering

Zainab Mohiuddin
Psychology

Rami Shafikov
Math

Why is this important?

If you are apart of the 65 million Canadians that don't have a family doctor, or you just need some guidance on what to ask your doctor for, this chat bot will equip you with the knowledge you need for next appointment.

PROBLEM DESCRIPTION

Due to a backlogged and overburdened system, booking an appointment with your family physician is no easy task for most Canadians. Wait times have extended to multiple weeks only to experience a rushed meeting with your doctor and leaving with questions unanswered.

The proposed solution is trusted healthcare chatbot that increases accessibility of healthcare and empowers Canadians to make informed decisions regarding their well-being.

SOLUTION DESCRIPTION
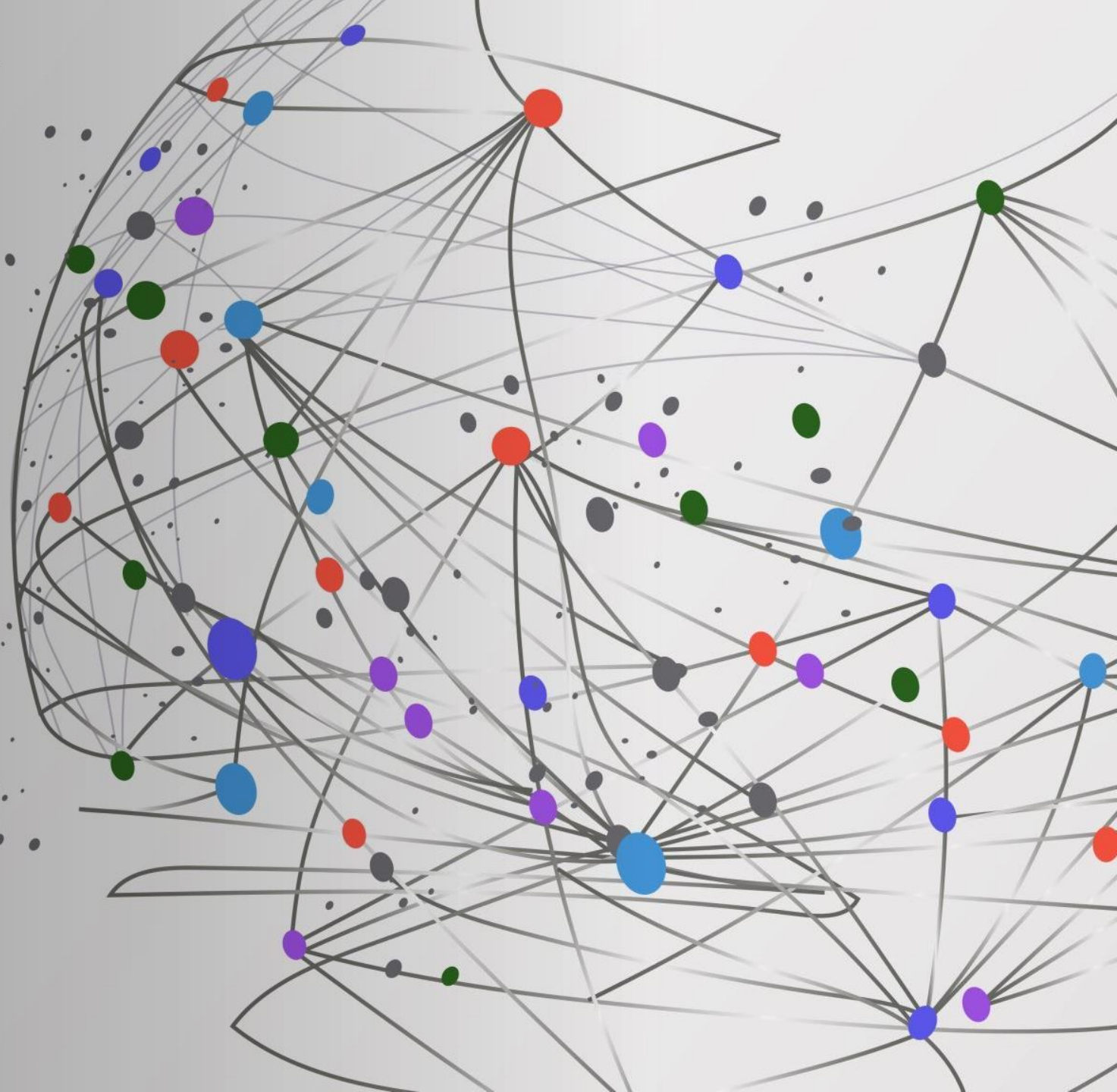
Our AI Solution

This AI Chatbot can:

Provide unique and specific guidance such as questions and referrals to ask your doctor about.

Immediately answer user queries, providing instant support

Operate around the clock, offering continuous service and support to users

Guide you to a hospital or walk in clinic that suits individual's current situation and recommend high rated specialists depending on your needs
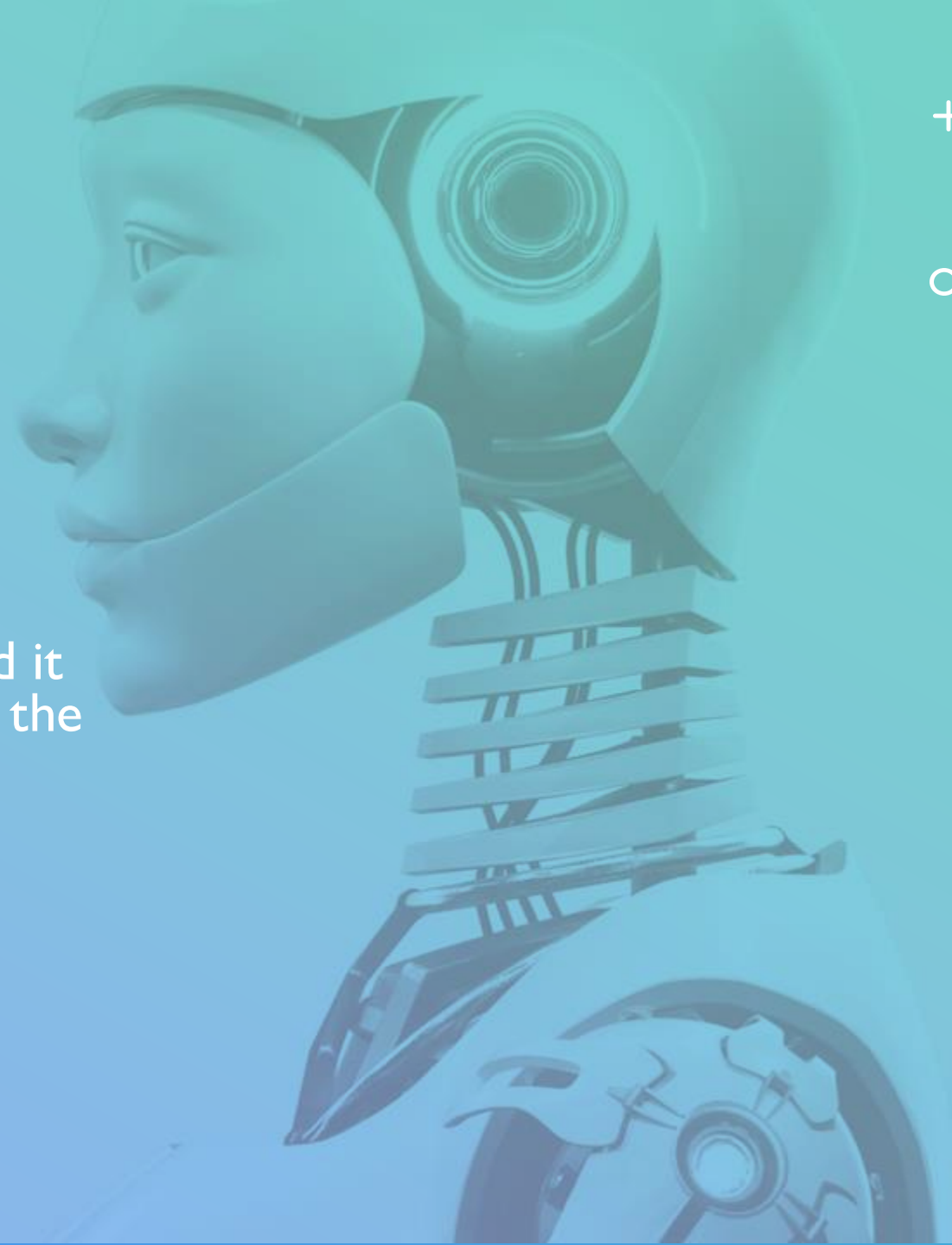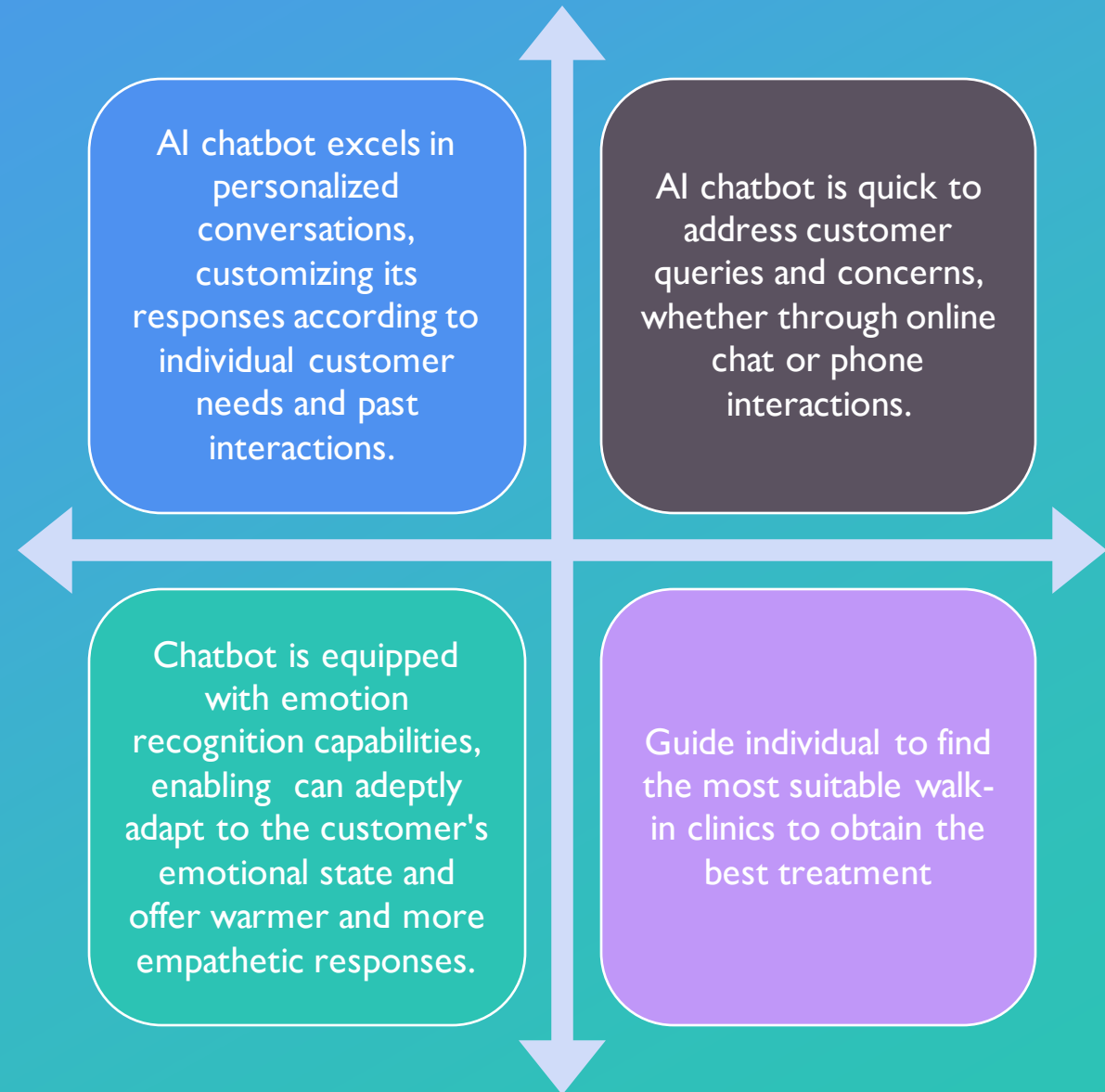
ARTIFICIAL INTELLIGENCE

The ways in which AI can contribute to accomplishing the chatbot objective.

Benefits of Using AI

- Artificial Intelligence can provide a precise and human-like chatbot, and it can learn more knowledge through the latest datasets.

- Continuous learning

- Speed and Efficiency

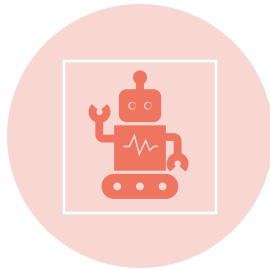- Cost-Effectiveness

Widespread Societal Benefits

CHATBOTS PLAY A ROLE IN PRESERVING SOCIETAL RESOURCES.

INTRODUCING A NOVEL AI-ASSISTED TECHNOLOGICAL APPROACH, CHATBOTS REVOLUTIONIZE TRADITIONAL HEALTHCARE PRACTICES

CHATBOTS COULD BE THE PRIMARY SAFEGUARD IN INDIVIDUALS' LIVES, CONTRIBUTING TO A HEALTHIER SOCIETY.

ADVOCATING FOR THE DISSEMINATION OF MEDICAL AND HEALTH KNOWLEDGE

Research and Data Utilization

- Azure documentation: what services can we use that are compatible with the chat bot and allow for the flexibility to do a lot of difference tasks

- Data Sources
  - Sets regarding symptoms and diagnosis
  - Databases that connect issues to a specialists

PREPARE DATA & DATABASE CREATION

Disease_symptom_and_patient_profile_dataset.csv (20.51 kB)

Detail · **Compact** · Column

Disease	Fever	Cough	Fatigue	Difficulty ...	Age
Influenza	Yes	No	Yes	Yes	19
Common Cold	No	Yes	Yes	No	25
Eczema	No	Yes	Yes	No	25
Asthma	Yes	Yes	No	Yes	25
Asthma	Yes	Yes	No	Yes	25
Eczema	Yes	No	No	No	25
Influenza	Yes	Yes	Yes	Yes	25
Influenza	Yes	Yes	Yes	Yes	25
Hyperthyroidism	No	Yes	No	No	28
Hyperthyroidism	No	Yes	No	No	28
Asthma	Yes	No	No	Yes	28
Allergic Rhinitis	No	Yes	Yes	No	29
Anxiety Disorders	No	Yes	No	No	29
Common Cold	No	No	No	No	29

dataset.csv (632.2 kB)

Detail **Compact** Column

Disease	Symptom_1	Symptom_2	Symptom_3	Symptom_4	Symptom_5	Symptom_6	Symptom_7	Symptom_8
Allergy	continuous_sneezing	shivering	chills					
Allergy	shivering	chills	watering_from_eyes					
Allergy	continuous_sneezing	chills	watering_from_eyes					
Allergy	continuous_sneezing	shivering	watering_from_eyes					
Allergy	continuous_sneezing	shivering	chills					
Allergy	continuous_sneezing	shivering	chills	watering_from_eyes				
GERD	stomach_pain	acidity	ulcers_on_tongue	vomiting	cough	chest_pain		
GERD	stomach_pain	ulcers_on_tongue	vomiting	cough	chest_pain			
GERD	stomach_pain	acidity	vomiting	cough	chest_pain			
GERD	stomach_pain	acidity	ulcers_on_tongue	cough	chest_pain			
GERD	stomach_pain	acidity	ulcers_on_tongue	vomiting	chest_pain			

Chat Bot Pipeline

Prepare Data

Collect medical data from reliable sources

Knowledge Base Creation

Consisting of questions and answers to common healthcare questions

Deploy Knowledge Base and Create a Bot

Centralized repository of information and an automated conversational agent for accurate and timely support and assistance

Dialog Management

Implement a dialog management system to maintain context throughout the conversation

Response Generation

Generate responses based on the user's symptoms and the information available in the knowledge base.

Natural Language Generation

Use natural language generation techniques to ensure responses are coherent, clear, and personalized to the user's needs.

Validation and Testing

Evaluate the chatbot's performance and accuracy through extensive testing

Deployment

Deploy the chat box onto a website so users can access through the Internet

Azure Bot Service

Azure Bot Service represents the frontend application, this is what users will see and interact with. Once connected to a knowledge base, the bot can be deployed into a website.

User Query:
"I have persistent hip pain"

Orchestration Workflow

QnA Maker

Conversational Language Understanding (CLU)

Parse through database to see what kind of doctor can help with hip pains

Identify intent and entities: *"hip pain"*

Trigger custom task flow

Recommend asking for a referral to see an orthopedical doctor

Provide highly rated walk-in clinic and orthopedic doctors in users area

BUSINESS CASE

- Economically viable for the government
- The Microsoft Azure services will be used to make this project economically viable:
  - The Azure Bot Services
  - Language Service Resources
- Limited number of competitors
- How will your solution be different?
  - Scalability
  - Efficient and Reliable

Ethical Considerations

| Privacy and Data Security | Consent and Confidentiality | Bias in Data & Algorithms | Equitable Access |

MEASURING IMPACT

Using a chatbot can save money in the healthcare industry by automating common questions, freeing up healthcare providers to prioritize more urgent cases

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24/7 constant access to medical information will decrease unnecessary trips to the hospital and help the healthcare system focus on more important issue.

In order to assess the value of our chatbot, we will monitor user engagement, collect feedback through surveys and ratings, and track health outcomes such as medication adherence and preventative care

By determining the decrease in expenses for healthcare services as a result of chatbot integration, the financial advantages of utilizing this technology can be illustrated

To minimize negative effects, we will follow both Microsoft and HIPAA guidelines and make sure that regular updates are made