REQUIREMENT ELICITATION AND ANALYSIS

Project Name: Healthmate

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OVERVIEW

Our proposed system, **Healthmate**, endeavors to tackle the escalating demand for accessible and dependable medical advice by introducing a sophisticated medical chatbot. In the contemporary fast-paced lifestyle, individuals frequently encounter hurdles in promptly accessing precise medical information, resulting in perplexity and apprehension. Our aim is to close this divide by harnessing cutting-edge technology to establish a user-friendly platform that furnishes instantaneous aid and tailored assistance.

MAIN OBJECTIVES AND GOALS

Enhancing Accessibility: Our chatbot will provide users with instant access to medical guidance anytime, anywhere, eliminating barriers to healthcare information.

Improving User Experience: By employing Natural Language Processing (NLP) techniques, our chatbot will engage users in conversational interactions, offering a seamless and intuitive user experience.

Ensuring Accuracy: Through integration with reliable medical databases and sources, our chatbot will deliver accurate and up-to-date information, empowering users to make informed decisions about their health.

Promoting Engagement: Our chatbot will encourage user engagement through interactive features, such as symptom checking, virtual consultations, and health monitoring, fostering a proactive approach to wellness management.

Facilitating Continuous Learning: The system will continuously learn and evolve based on user interactions and feedback, enhancing its capabilities and effectiveness over time.

KEY STAKEHOLDERS

Users: Individuals seeking medical guidance and information, including   patients, caregivers, and individuals interested in health and wellness.

Healthcare Professionals: Doctors, nurses, and other healthcare providers who may use the system to assist patients, provide medical advice, and access relevant medical resources.

Healthcare Organizations: Hospitals, clinics, and healthcare facilities that may integrate the system into their operations to improve patient care, streamline processes, and enhance efficiency.

Researchers and Educators: Professionals in the medical field who may use the system for research purposes, medical education, and knowledge dissemination.

Software Developers and Engineers: Responsible for designing, developing, and maintaining the chatbot system.

Healthcare Administrators and Managers: Oversee the implementation and deployment of the system within healthcare organizations, ensuring alignment with organizational goals.

Technical Support and Maintenance Teams: Provide ongoing technical support, troubleshooting, and maintenance services to ensure the system's reliability, security, and performance post-deployment.

CURRENT PROCESSES, WORKFLOWS AND PAIN POINTS

Reliability of Information: The abundance of health-related information available online can be overwhelming and may not always be accurate or reliable, leading to confusion and anxiety among users.

Limited Healthcare Literacy: Some individuals may have limited healthcare literacy, making it difficult for them to understand medical terminology, treatment options, and preventive measures. This lack of understanding can impede their ability to make informed decisions about their health.

Language Barriers: Language barriers can pose significant challenges for individuals seeking healthcare information, particularly for those who are not proficient in the predominant language of their region. This can lead to misunderstandings, miscommunications, and inadequate healthcare access.

Privacy Concerns: Users may have concerns about sharing sensitive health information online, particularly regarding privacy and data security.

INITIAL HYPOTHESIS ON MAIN FEATURES/MODULES

Symptom Checker: The chatbot allows users to input their symptoms systematically and receive relevant advice or recommendations based on an algorithmic assessment.

Medical Information Database: A comprehensive database of medical conditions, treatments, medications, and other relevant information to provide accurate and up-to-date responses to user queries.

Personalization: Personalized recommendations and support tailored to each user's individual health profile, including factors such as medical history, demographics, and preferences.

Privacy and Security Measures: Robust privacy and security measures to protect users' sensitive health information and ensure compliance with relevant regulations such as HIPAA or GDPR.

Continuous Improvement: Mechanisms for collecting user feedback and data analytics to continuously improve the chatbot's performance, accuracy, and user experience over time.

Emergency Response and Crisis Support Module: Provide users with guidance and resources for managing medical emergencies and crisis situations.

Health Education and Wellness Module: Offer educational content on various health topics, preventive measures, and wellness practices to empower users to make informed decisions about their health.

USER ROLES AND SCENARIOS

1.User: We can classify these individuals seeking medical guidance and information into patients , caregivers/family members and general users or health enthusiasts:

i. Patients:

• <u>Symptom Checker</u>: A patient experiences certain symptoms and wants to understand possible causes or if they should seek medical attention.

• <u>Medication Information</u>: A patient wants to know more about a prescribed medication, including its side effects, dosage, and interactions with other drugs.

• <u>Health Condition Inquiry</u>: A patient diagnosed with a specific condition seeks additional information or support related to their illness.

ii. Caregivers/Family Members:

• <u>Supportive Information</u>: A caregiver seeks information about a loved one's medical condition to better understand how to provide care and support.

• <u>Medication Management:</u> A caregiver wants to ensure proper medication adherence for the person they're caring for and seeks guidance on dosage or potential side effects.

• <u>Emergency Assistance</u>: A caregiver encounters a medical emergency with their loved one and needs immediate advice on how to respond or whether to seek professional help.

iii. General Users/Health Enthusiasts:

• <u>Wellness Tips</u>: A user is interested in general health and wellness tips, such as diet recommendations, exercise routines, or stress management techniques.

• <u>Preventive Care</u>: A user wants information on preventive measures for common health issues or diseases, such as vaccinations or screenings.

• <u>Healthy Lifestyle Guidance</u>: A user seeks guidance on adopting a healthier lifestyle, including advice on nutrition, sleep hygiene, and mental well-being.

2. Healthcare Professionals:

• <u>Patient Consultation</u>: A doctor may use this to assist patients remotely by providing medical advice, diagnosing symptoms, and recommending treatment options.

• <u>Clinical Reference</u>: A nurse needs quick access to medical guidelines, protocols, and reference materials while attending to patients.

• <u>Collaborative Diagnosis</u>: A healthcare provider collaborates with colleagues to discuss complex cases, seek second opinions, or share insights for better patient care.

3. Healthcare Organizations:

• <u>Patient Management</u>: A hospital can integrate this system into its operations to improve patient engagement, provide round-the-clock assistance, and streamline appointment scheduling.

• <u>Process Optimization</u>: A clinic can utilize this system to automate administrative tasks, such as patient registration, billing inquiries, and medical record management.

• <u>Data Analytics</u>: A healthcare facility can analyze the interactions occurring on the platform to identify trends, gather patient feedback, and make data-driven decisions to enhance services.

4. Students, Researchers and Educators:

• <u>Medical Education</u>: A professor can use this chatbot to supplement medical lectures, provide interactive learning materials, and facilitate discussions on healthcare topics.

• <u>Research Support</u>: A researcher can leverage this system to collect data, conduct surveys, or recruit participants for medical studies and clinical trials.

• <u>Medical Students/Trainees</u>: Our system can aid medical students by providing quick help with medical concepts, case study analysis, and exam preparation, streamlining their learning process and improving academic performance.

• <u>Knowledge Dissemination</u>: An expert in the medical field shares insights, latest research findings, and best practices with peers and students through this platform.

5. Software Developers and Engineers:

• <u>System Development</u>: Developers work on designing, coding, and testing new features or enhancements for this platform based on user feedback and technological advancements.

• <u>Maintenance and Updates</u>: Engineers ensure the system's reliability, security, and performance by conducting regular maintenance, implementing security patches, and updating software components as needed.

• <u>Integration with Other Systems</u>: Developers collaborate with healthcare organizations to integrate our system with existing electronic health record (EHR) systems, telemedicine platforms, and other healthcare IT solutions.

6. Healthcare Administrators and Managers:

• <u>Deployment Planning</u>: Administrators oversee the implementation of our system within healthcare facilities, ensuring proper training for the people and alignment with organizational goals.

• <u>Performance Monitoring</u>: Managers track key performance indicators (KPIs), such as user engagement, satisfaction levels, and system uptime, to assess the system's impact and identify areas for improvement.

• <u>Budget Allocation</u>: Administrators allocate resources for the maintenance, upgrades, and expansion of the chatbot system based on its usage metrics, user feedback, and strategic priorities.

7. Technical Support and Maintenance Teams:

• <u>User Assistance</u>: Support teams provide technical assistance and troubleshooting guidance to users experiencing issues with this system, ensuring a seamless user experience.

• <u>Bug Fixing</u>: Maintenance teams identify and resolve software bugs, performance issues, and other technical problems to maintain the system's reliability and functionality.

• <u>Security Management</u>: Teams implement robust security measures, such as data encryption, access controls, and regular security audits, to protect user data and prevent unauthorized access or breaches.

QUESTIONNAIRE

1.Have you ever found yourself requiring assistance in any or multiple of the following scenarios?
- ☐ You're experiencing certain symptoms and would like to understand them better
- ☐ You urgently require medical assistance
- ☐ You want a convenient medication management system
- ☐ You want to track your health metrics and take preventive measures
- ☐ You want a personalized healthcare routine based on previous diagnosis
- ☐ Others: Please specify _____

2.As a healthcare professional, or part of a healthcare organization, have you ever found yourself needing these features in your daily practice?
(Skip this question if you don't fall in this category)
- ☐ Emergency clinical reference
- ☐ Automated consultation system
- ☐ Collaborative Diagnosis
- ☐ Data analytics
- ☐ Others: Please specify _____

3.In order to complete any of your requirements, do you think using a medical chatbot will be helpful?
- ● Yes
- ● No
- ● Maybe

4.Can you describe a scenario in which using a medical chatbot would be beneficial to achieving your goals?

_____

CURRENT CHALLENGES:

5.Do you find it difficult to sift through vast amounts of health-related information available online?
- ● Yes
- ● No

6.Are you concerned about the accuracy and credibility of information provided by non-expert sources?
- Yes
- No

7.Is the lack of immediate access to reliable medical information a challenge you often encounter?
- Yes
- No

8.Which online platform do you use to satisfy your health related enquiries?

_____

9.Have you found this platform to be an effective solution to all your healthcare needs?
- Yes:
  - Which other facilities would you like for it to include:
    _____
- No:
  - Please specify in which way this platform is lacking:
    _____
  - (Optional) List a recent experience where you struggled to fulfill your healthcare needs:
    _____

EXPECTED FUNCTIONALITY:

10.PLEASE RATE ON A SCALE OF 1-10 HOW ESSENTIAL THESE FEATURES ARE IN YOUR DAILY MEDICAL NEEDS:

- ❖ Providing accurate medical advice based on user input: _____
- ❖ Offering information about symptoms, conditions, and treatments: _____
- ❖ Allowing users to track their health metrics and progress: _____
- ❖ Connection with nearby healthcare facilities in case of emergencies: _____
- ❖ Offering medication reminders and dosage information: _____
- ❖ Multi-language support to cater to diverse user populations: _____
- ❖ 24/7 availability for accessing medical information and assistance: _____

11.Can you describe any performance-related concerns you have regarding the responsiveness of Healthmate?

_____

12.Are there any specific security features or protocols you would like to see implemented in a Healthmate to protect your data?

_____

13. (Optional) Are there any other specific requirements or preferences we should consider?

_____

INTERFACE EXPECTATIONS:

14.Would you prefer a conversational interface that mimics human interaction for interacting with Healthmate?
- Yes
- No
- Maybe

15.Should Healthmate offer a voice-enabled interface to accommodate users with visual impairments or motor disabilities?
- Yes
- No
- Maybe

16.Would you expect Healthmate to offer multimedia content such as videos or images to supplement textual information?
- Yes
- No
- Maybe

17.How important is it for the user interface of Healthmate to be intuitive and user-friendly? Rate on a scale of 1-10: _____

18. (Optional) Can you describe any design preferences you have for the layout and accessible navigation of Healthmate?

_____

SAMPLE INPUT-OUTPUT:

19.Can you provide examples of the inputs you would typically provide to the application (e.g. symptoms, health advice enquiry)?
_____

20. What outputs or results do you expect to receive from the application?
_____

ANY CONSTRAINTS, POLICIES, COMPLIANCE:

21.Should Healthmate allow users to control the sharing of their health information with third parties?
- Yes
- No

22.Would you expect Healthmate to encrypt user data to prevent unauthorized access or breaches?
- Yes
- No

23. (Optional) What other measures do you expect Healthmate to implement to ensure the confidentiality of sensitive health information?
_____

SURVEY METHOD

Considering the complexity and depth of understanding required for our analysis, conducting in-person interviews or remote video calls would be the ideal scenario. However, due to shortage of manpower and resources, we might have to resort to online forms or other lesser resource intensive methods. We might also have to adjust the planned questionnaire according to the scenario. Additional questions may need to be asked to clarify certain answers or to gain a deeper insight into the user requirements.