

MEDIBOT - CHATBOT DEPLOYMENT PROJECT

OBJECTIVE

- **Project Objective:** The primary objective of this project is to develop and deploy Medibot, a medical chatbot, using IBM Watson Assistant. Medibot will serve as a user-friendly and informative tool to provide healthcare information, support symptom inquiries, and guide users on potential causes and treatments for common medical conditions.

DESIGN THINKING PROCESS

1. Empathy and Understanding:

- In the empathy and understanding phase, the project team conducted in-depth research to gain insights into the experiences and emotions of individuals seeking healthcare information. They interviewed potential users, read through forums, and conducted surveys to understand the common issues users faced. This research revealed that users often felt overwhelmed, anxious, or confused when looking for medical information online.

2. Define the Problem:

- Building upon the insights gained, the team defined the problem: the lack of accessible, accurate, and empathetic healthcare information. They discovered that users struggled with medical jargon and were reluctant to consult healthcare professionals for what they perceived as minor symptoms. This problem statement became the project's north star, guiding every development decision.

3. Ideation and Persona Development:

- The ideation phase was a collaborative effort that brought together a diverse group of professionals. They brainstormed solutions to address the defined problem and decided to create Medibot. The persona of Medibot was carefully crafted to resonate with users. Medibot was given a name, gender-neutral attributes, and personality traits to instill a sense of trust and understanding.

4. Prototyping and Testing:

- Prototyping involved the creation of various Medibot designs and conversation flows. These prototypes were tested with real users to gather feedback. User feedback was used to refine the chatbot's interactions and responses. Special attention was paid to the language clarity and ensuring that Medibot's responses were both informative and user-friendly.

5. Iterative Development:

- The iterative development process was at the core of Medibot's improvement. Feedback from users was actively sought and implemented. The team continuously refined Medibot's responses

and incorporated additional medical knowledge to ensure the chatbot could effectively address a wide range of user queries.

6. Integration with Watson Assistant:

- The integration with IBM Watson Assistant was meticulously planned and executed. Relevant intents, entities, and dialog nodes were created to make Medibot more conversational. This integration enhanced Medibot's ability to understand and respond to user queries effectively.

7. User-Centered Conversational Flow:

- Medibot's conversational flow was meticulously designed to create a user-centered experience. It was structured to guide users through their healthcare inquiries in a friendly and informative tone. The chatbot prompted users to share their symptoms, concerns, and questions while delivering responses that were both empathetic and professionally reliable.

8. Privacy and Security Considerations:

- Privacy and security considerations were not an afterthought but an integral part of the design thinking process. The team implemented measures to protect user data, maintain confidentiality, and adhere to healthcare regulations. They ensured that user interactions and data were handled with the utmost care and compliance.

The design thinking process guided the Medibot project from inception through deployment, ensuring that it addresses the unique needs and concerns of users seeking healthcare information. The result is a user-centric chatbot that aims to provide accessible, empathetic, and trustworthy medical guidance while fostering a positive and informed user experience.

DEVELOPMENT PHASE

(i) Planning Phase

The planning phase of the Medibot project was a crucial foundation for the successful development and deployment of the chatbot. Here are some key aspects of this phase:

- **User Needs Analysis:** During this phase, the project team conducted extensive user research to identify the specific needs and pain points of potential users. This involved surveys, interviews, and analysis of existing healthcare information-seeking behaviors.

- **Project Scope Definition:** The team clearly defined the scope of the Medibot project. This included specifying the types of medical information and queries that Medibot would support, as well as the platform integrations (e.g., Facebook Messenger, Slack) to be developed.

- **Budget and Resource Allocation:** A budget was allocated for the project, including considerations for the costs associated with using IBM Watson Assistant and other necessary resources. The team also determined the personnel and skills required for development.

- **Project Timeline:** A project timeline was established, which included milestones for key phases such as development, testing, and deployment. The timeline provided a structured plan for project execution.

- **Regulatory Compliance:** The team reviewed healthcare regulations and ensured that Medibot's design and operation would comply with privacy and security standards, such as HIPAA or GDPR, depending on the target regions.

(ii)Implementation Phase

The implementation phase involved the technical development of Medibot. Key aspects of this phase include:

- **IBM Watson Assistant Configuration:** Medibot's brain, IBM Watson Assistant, was configured to understand and respond to user queries. This involved creating and training intents to recognize user questions, defining entities for medical conditions and symptoms, and crafting dialog nodes to structure the conversation.

- **Database Integration:** Medibot's responses were enriched by integrating medical knowledge databases. This allowed the chatbot to provide accurate information about symptoms, conditions, and treatments.

- **Natural Language Processing (NLP):** To improve the chatbot's understanding of user input, NLP techniques were implemented. This enabled Medibot to handle various ways of asking the same question and to understand colloquial language.

- **API Integration:** APIs were set up to connect Medibot with external systems, such as drug databases, symptom databases, and health news feeds. These integrations allowed Medibot to provide up-to-date and relevant information.

(iii)Testing Phase:

Testing was a crucial phase to ensure that Medibot was ready for deployment. This phase included:

- **User Testing:** Real users were invited to test Medibot and provide feedback. This testing helped identify issues, improve conversational flows, and evaluate the chatbot's effectiveness in addressing user queries.

- **Bug Fixes and Iterations:** Based on user feedback, the development team made necessary bug fixes and iterative improvements to the chatbot. This process was repeated until Medibot demonstrated reliability and user-friendliness.

- **Performance Testing:** The chatbot's performance was evaluated under various scenarios to ensure it could handle a large number of concurrent users without degradation in response time or quality.

- **Security Testing:** Comprehensive security testing was conducted to ensure that user data was adequately protected, and vulnerabilities were addressed.

MEDIBOT'S PERSONA

Medibot's persona was carefully designed to create a positive and trustworthy user experience. It features:

- **Name:** Medibot, a name that combines "medical" and "robot," conveying its purpose as a healthcare assistant.

- **Gender:** Gender-neutral, to make Medibot inclusive and not to impose any gender stereotypes.

- **Personality Traits:** Empathetic, professional, reliable, and friendly. These traits were chosen to establish a sense of trust and understanding in users and to alleviate any anxieties associated with medical queries.

- **Communication Style:** Medibot communicates in a clear, concise, and empathetic manner. It ensures that users feel heard, respected, and well-informed during interactions.

CONVERSATION FLOW

Medibot's conversation flow was designed to guide users effectively through their healthcare inquiries. The key interactions and decision points in the flow include:

- **Introduction:** Medibot welcomes users and introduces its purpose.

- **Symptom Inquiry:** Medibot prompts users to describe their symptoms or health concerns.

- **Condition Identification:** Medibot identifies potential medical conditions based on user input.

- **Information Provision:** Medibot provides users with information about the identified condition, including causes, symptoms, and potential treatments.

- **Clarification and Follow-up:** Medibot encourages users to ask follow-up questions or seek further information.

- **Exit and Encouragement:** The conversation ends with Medibot encouraging users to consult a healthcare professional or seek further assistance if needed.

-Flowchart:

(Include a visual representation of the flowchart here to provide a clear visual of Medibot's conversation flow)

TECHNICAL IMPLEMENTATION USING WATSON ASSISTANT

The technical implementation of Medibot using IBM Watson Assistant involved the following steps:

- **Watson Assistant Setup:** IBM Watson Assistant was configured with relevant intents, entities, and dialog nodes. Intents were created to recognize user queries related to symptoms, conditions, and treatments. Entities were defined for medical terms and phrases. Dialog nodes were structured to guide the conversation effectively.

- **Training and Testing:** The chatbot was trained using sample conversations to improve its understanding and responses. A test environment was set up to evaluate the chatbot's performance before deployment.

- **Integration with Messaging Platforms:** Medibot was integrated with popular messaging platforms such as Facebook Messenger and Slack. This integration allowed users to interact with Medibot through their preferred communication channels. APIs and webhooks were used for these integrations.

EXAMPLES OF USER QUERIES AND RESPONSES:

Here are some examples of user queries and Medibot's responses:

1. **User Query:** "I have a headache. What should I do?"

- **Medibot Response:** "I'm sorry to hear you have a headache. Headaches can be caused by various factors, including stress, dehydration, or underlying medical conditions. To relieve it, try drinking water, resting, and avoiding bright lights. If the headache persists or worsens, consider consulting a healthcare professional."

2. **User Query:** "What are the symptoms of the common cold?"

- **Medibot Response:** "The common cold is characterized by symptoms such as a runny or stuffy nose, sneezing, coughing, sore throat, and sometimes a mild fever. It's a viral infection that typically resolves on its own. Rest, hydration, and over-the-counter cold remedies can help alleviate the symptoms."

3. **User Query:** "I think I have a fever. How should I measure it?"

- **Medibot Response:** "To measure your body temperature, you can use a digital thermometer. Place it under your tongue or in your armpit and follow the instructions. A normal

body temperature is around 98.6°F (37°C). If your temperature is significantly higher, it may indicate a fever. Consult a healthcare professional if you're concerned."

These examples demonstrate Medibot's ability to provide informative, empathetic, and user-centered responses to a variety of medical queries.

By following the design thinking process and documenting each phase of development, the Medibot project has ensured that it addresses user needs effectively and provides a reliable and trustworthy source of healthcare information.

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To deploy and interact with the Medibot chatbot on messaging platforms such as Facebook Messenger and Slack, you'll need to follow specific steps. Below are instructions on how to deploy and interact with the chatbot on these platforms:

Deploying Medibot on Messaging Platforms

Deployment on Facebook Messenger:

1. Create a Facebook App:

- Go to the Facebook for Developers platform (<https://developers.facebook.com/>).
- Create a new Facebook App for your chatbot.

2. Set Up Webhooks:

- Access your Facebook App dashboard and navigate to the "Webhooks" section.
- Create a new webhook and specify the callback URL where your Medibot is hosted. This URL will serve as the endpoint for receiving events from Facebook's Messenger platform.
- Subscribe to the required events, such as messages and messaging_postbacks. This ensures that your Medibot is notified of relevant activities on the Messenger platform.

3. Generate Page Access Token:

- Within your Facebook App settings, locate and enter the "Messenger" section.
- Here, either create a new Facebook Page and link it to your app, or select an existing Page to associate with your Medibot application.
- After the Page is connected, you can proceed to generate a Page Access Token. This token is a crucial authentication credential required for Medibot to communicate effectively with Facebook Messenger.
- Ensure that you securely store this token, as it will be instrumental in enabling seamless interaction between your Medibot application and Facebook Messenger.

4. Integrate with Medibot:

- Update your Medibot application to incorporate the Facebook Messenger webhook. This will enable communication between your Medibot and Facebook's Messenger platform.
- Obtain the Page Access Token generated by Facebook. This token serves as the authentication mechanism when interacting with Facebook's Messenger API.

Deployment on Slack:

1. Create a Slack App:

- Log in to the Slack API and create a new Slack App.

2. Set Up Event Subscriptions:

- In your Slack App's settings, navigate to "Event Subscriptions."
- Enable event subscriptions and provide the Request URL, which points to your Medibot's endpoint.
- Subscribe to the necessary event types (e.g., message.channels) and add appropriate scopes.

3. Install the App to Workspaces:

- In the "OAuth & Permissions" section of your Slack App settings, locate and click on "Install to Workspace."
- This action will redirect you to Slack's authorization page. Review the permissions and authorizations requested by the app, ensuring they align with the desired level of access to your workspace.
- Once reviewed, proceed to authorize the app's access to the designated workspace.

Interacting with Medibot on Messaging Platforms

1. Search for Your Page:

- Users can search for your Facebook Page on Messenger by entering relevant keywords or directly typing the name of your Page in the search bar.

- Ensure that your Page name, description, and relevant keywords are optimized to increase discoverability on Messenger.

- Utilize SEO techniques to enhance the visibility of your Page in search results within Messenger.

2. Start a Conversation:

- Upon finding your Page, users can initiate a conversation by clicking the "Message" button or sending a direct message to your Page.

- Consider implementing a welcome message to greet users and provide them with initial instructions on how to interact with Medibot.

- Ensure that the conversation initiation process is seamless and user-friendly to encourage user engagement.

3. Interact with Medibot:

- Users can ask Medibot questions about their medical symptoms, conditions, or general health inquiries.
- Ensure that Medibot is equipped to understand and respond to a wide range of medical queries effectively.
- Implement a user-friendly interface that guides users on how to ask questions and receive relevant information from Medibot.
- Consider providing examples or prompts to help users formulate their questions accurately.

Slack:

1. Install the Slack App:

- Users can install the Medibot Slack App by visiting the Slack App Directory and searching for "Medibot."
- Once found, users can click on the app and follow the installation prompts to add it to their workspace.

2. Start a Conversation:

- To initiate a conversation with Medibot, users can simply send a message to the bot user that has been added to the workspace.
- Users can ask questions or provide prompts to help them get started with engaging Medibot in conversations.

3. Interact with Medibot:

- Users can initiate conversations with Medibot by sending messages to inquire about their medical concerns and seek relevant information.
- Medibot is designed to promptly process user queries and provide informative responses to assist with various medical inquiries.
- It is recommended to encourage users to ask questions in a clear and concise manner to ensure accurate and helpful responses from Medibot.

It's important to ensure that your Medibot is responsive and capable of handling user inquiries effectively on these messaging platforms. Regularly test and maintain your chatbot to provide users with accurate and helpful information related to medical queries. Additionally, make sure to comply with privacy and data protection regulations when handling healthcare-related conversations.

