

AI-Powered+ Medical Assistant

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Revolutionizing Preliminary
Healthcare Diagnostics through
Generative AI

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Problem Statement



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- **Limited Accessibility:** Lack of access to medical professionals in underserved areas.
- **Overburdened Healthcare Systems:** High patient loads lead to delayed consultations.
- **High Costs:** Expensive diagnostics and treatments deter timely medical care.
- **Lack of Personalization:** Generic solutions fail to meet individual needs.
- **Inadequate Documentation:** Poor medical record-keeping hinders effective treatment





Objective

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- **Provide accurate, personalized, and accessible medical guidance.**
- **Enable symptom analysis, preliminary diagnosis, and treatment recommendations.**
- **Generate professional PDF reports summarizing diagnostic insights.**
- **Utilize advanced AI technologies for efficient task automation.**



Methodology

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Multi agent used are:

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- **Symptom Collector Agent:** Gathers detailed symptoms from the user for diagnostic purposes, focusing on structured and specific information.
- **Diagnostic Agent:** Analyzes collected symptoms to identify potential conditions and suggests next steps like tests or treatments.
- **Treatment Agent:** Provides practical and patient-specific treatment recommendations, ensuring safety and clarity.
- **Summary Agent:** Creates a concise and user-friendly summary of diagnostic findings and actionable next steps.
- **Document Generation Agent:** Produces a professional, structured document summarizing diagnostic information and recommendations.



Crew Framework: Managed workflows using the CrewAI framework, allowing the orchestration of tasks across multiple agents in a sequential process. This enabled smooth collaboration between retrieval, analysis, summarization, and drafting agents.

Process Flow:

1. User submits a query.
2. Retrieval: Relevant information is extracted.
3. Analysis: The extracted information is analyzed for clarity.
4. Summarization: Key information is summarized.

Drafting: Drafted document based on the provided context and retrieved information





Dataset

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- ✓ **Static Dataset:** `medical_references.pdf` with comprehensive medical data.
- ✓ **Dynamic Dataset:** Real-time web data fetched via Serper AI for updated insights
- ✓ **Structured Dataset:** Symptom mapping and diagnostic guidelines (`medical_data.txt`)

Overview of Existing Medical Health Assistants

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Ada Health

- A highly intuitive interface for symptom reporting.
- A medical-grade AI system trained on real-world clinical data



Healthily

- A free-to-access health library with content authored by certified medical professionals.
- Available in multiple languages, catering to a global audience.
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Babylon Health

- A highly accurate AI symptom checker developed with input from healthcare experts
- Premium services such as electronic prescriptions and referrals to specialists

Technology Stack



Frontend

- Framework: Streamlit

Backend

- Python: Core language for AI workflows.
- CrewAI: Manages multi-agent workflows.
- FPDF: Generates professional PDF reports.

Machine Learning Models

- Groq LLaMA-based Models: NLP for user input understanding.
- Cohere Embedder: Embeddings for advanced search.

Data Sources and Tools

- Dynamic Data: Serper AI for web-based medical info.
- Static Data: PDFSearchTool & TXTSearchTool for document processing.

Deployment

- Environment: Local/cloud Python setup.
- API: Cohere API for embedding services.



Results



Tell me your basic symptoms:

Describe your symptoms in detail:

Pain

Provide specific details below:

Location (e.g., chest, head, abdomen):

Head

Duration (e.g., 2 days, 1 week):

3 days

Severity (1 = Mild, 10 = Severe):

5

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Pattern (e.g., intermittent, continuous):

Continuous

Additional factors (e.g., triggers, previous conditions):

Hot water makes the pain less

Symptoms submitted successfully!

Diagnostic Summary

Diagnostic Summary

Based on the provided symptoms:

Basic Symptoms: Pain

Location: Head

Duration: 3 days

Severity: 5

Pattern: Continuous

Additional Factors: Hot water makes the pain less

Analysis Complete!

Diagnostic Summary

[View Full Report](#)

[Download Medical Report \(PDF\)](#)

- Medication overuse headaches

Diagnostic Tests or Evaluations: To further clarify the diagnosis, the following tests or evaluations may be recommended:

- Physical examination to assess the patient's overall health and rule out underlying medical conditions.
- Sleep study or polysomnography (PSG) to evaluate sleep quality and identify potential sleep disorders.
- Mental health evaluation to assess for anxiety or depression.
- Imaging studies (e.g., CT or MRI scans) to rule out structural abnormalities in the brain.

Recommendations: To alleviate symptoms and further evaluate the diagnosis, the patient can take the following steps:

- Medications:** Over-the-counter pain relievers such as acetaminophen or ibuprofen may be used to manage headaches. However, it is essential to follow the recommended dosage and avoid overuse.
- Lifestyle Changes:**
 - Establish a consistent sleep schedule and create a relaxing bedtime routine to improve sleep quality.
 - Engage in stress-reducing activities, such as meditation or yoga, to manage stress levels.
 - Avoid triggers that may exacerbate headaches, such as certain foods or environmental factors.
- Home Remedies:** Apply gentle heat or cold compresses to the forehead and temples to help relieve tension and ease headaches.

Thank You.

For Your Attention

