Topic: AI-Powered Patient Screening and Intake Website

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Project Overview

Healthcare providers often spend excessive time gathering patient information during initial consultations. This project aims to streamline patient screening by leveraging AI-driven voice interactions, reducing information gathering time while ensuring accurate data collection. The system will automate the intake process through AI-based speech-to-text conversion and dynamic screening reports, helping providers make informed decisions faster.

Key Features & Workflow

1. Patient Look up
    a. Provider sees history, appointment, charts of the patient.
2. Provider Notification
    a. Basis will be the type of appointment.
    b. The provider selects a template and sends a screening request to a patient via email, SMS, or phone call.
    c. If using a phone call, an AI bot interacts with the patient using voice-based questions.
3. AI-Driven Voice Screening
    a. The patient responds to screening questions via voice.
    b. AI dynamically adjusts follow-up questions based on responses.
4. Speech-to-Text & Analysis
    a. Responses are transcribed into text using speech-to-text AI (e.g., OpenAI Whisper, Google Speech API, AWS Transcribe).
    b. Transcripts are processed using an AI model to populate the screening questionnaires.
5. Screening Report Generation
    a. AI analyzes patient responses and produces a structured screening data
    b. This structured data (x chief complaints, key symptoms possible diagnosis, etc) will be filled into the record system
    c. The provider and patient can access this via a secure portal.

Technologies & Justification

Technology	Use Case
Frontend (React, Next.js)	Interactive patient-provider portal
Backend (Flask/Django)	API endpoints, AI model interaction
Medplum FHIR EMR system (https://www.medplum.com/)	This will help initiate patient records and store AI captured data
AI APIs (OpenAI Whisper, Google Speech-to-Text, AWS Transcribe)	Converting voice responses to text
NLP Model (OpenAI GPT, AWS Comprehend, spaCy, BERT)	Generating structured screening reports
Twilio API/SendGrid	SMS, email, and phone notifications
Authentication (OAuth, Firebase Auth, Auth0)	Secure patient-provider access

Expected Outcome

A fully functional application which we plan to build over medplum and perform interactive patient screening that allows providers to efficiently gather information before appointments, improving efficiency and patient care.