MAiZU TCM GenAI POC

1. Executive Summary

MAiZU is pioneering the intersection of wearable technology and Traditional Chinese Medicine (TCM) through high-resolution pulse diagnostic signals. This project will deliver an **AI-driven Pulse Evaluation and Pattern Suggestion POC** within a 3-week timeline.

The system will ingest synthetic waveform data (provided by the client) into an **AWS-native environment**. Using **Amazon Bedrock (Claude / Nova Pro)**, the system will bypass traditional ML training to perform zero-shot and few-shot classification of pulse qualities. The goal is to demonstrate a scalable, automated pipeline that maps complex biological signals to specific TCM patterns (e.g., Qi deficiency, Blood stasis) with high explainability.

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2. Project Success Criteria

Goal	Success Criteria
AWS Data Pipeline	Establish an automated ingestion flow using S3 and Lambda to process incoming waveform files.
GenAI Pulse Analysis	Successfully identify core pulse qualities (e.g., Wiry, Slippery, Thready) using Claude family or Nova Pro.
Diagnostic Pattern Mapping	Match identified pulse qualities to TCM patterns via custom prompt templates and rule-based logic.
Explainable Output	Deliver a comprehensive "Diagnostic Snapshot" including confidence scores and metadata-driven reasoning.

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3. Scope of Work (3-Week Sprint)

3.1 Phase 1 - Discovery and Environment Setup (Week 1)

- **Client Preparation Checklist:**
  - MAiZU provides sample synthetic waveform datasets in `.csv` or `.json` formats.
  - Share the codified TCM diagnostic rubric (Pulse Quality $\rightarrow$ Pattern mapping).

- **AWS Environment Initialization:** * Provision **Amazon S3** buckets for raw data ingestion and processed results.
  - Configure **IAM roles** and **Amazon Bedrock** access for Claude/Nova models.
- **Data Normalization:** Develop a **Lambda-based** normalization script to convert raw time-series metadata into structured text descriptors for the LLM.

3.2 Phase 2 - GenAI Implementation & Reasoning (Week 2)

- **Prompt Engineering:** Validate prompt templates in Bedrock designed to extract pulse features (frequency, rhythm, amplitude) from waveform summaries.
- **TCM Pattern Matching:** Implement logic to feed extracted features into **Nova Pro / Claude** for pattern suggestion based on the provided rubric.
- **Contextual Q&A Enrichment:** Configure the model to identify ambiguous data points and auto-generate clarification questions for "practitioner" review.
- **Confidence Scoring:** Apply a scoring algorithm that weighs model certainty against the completeness of the input signal.

3.3 Phase 3 - Integration and Handover (Week 3)

- **API Delivery:** Deploy an **Amazon API Gateway** and **AWS Lambda** endpoint to serve the diagnostic logic to the demo dashboard.
- **Demo UI (Streamlit on AWS):** Host a lightweight dashboard (via AWS Fargate or App Runner) to visualize:
  - The synthetic waveform profile.
  - The AI-generated TCM pattern suggestion.
  - Detailed "Rationale" metadata explaining the AI's logic.
- **Knowledge Transfer:** Deliver documentation covering Bedrock prompt templates, AWS infrastructure configurations, and the performance analysis report.

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4. Technical Environment Summary

- **Compute:** AWS Lambda (Orchestration) / AWS Fargate (Dashboard).
- **AI/LLM:** Amazon Bedrock (Anthropic Claude 3.5 Sonnet or Amazon Nova Pro).
- **Storage:** Amazon S3 (Waveforms & Logs) / Amazon DynamoDB (Diagnostic Results).
- **API:** Amazon API Gateway.

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5. Service Delivery Assumptions and Exclusions

- **Assumptions:**
  - All data provided is synthetic/simulated (no PII or clinical data).

- Model performance is based on the quality of the synthetic waveform metadata provided.

- **Out of Scope:**
  - Integration with physical wearable hardware or Bluetooth stacks.
  - HIPAA/Regulatory compliance audits (standard for POC phase).
  - Training or fine-tuning of custom models (strictly using Bedrock foundational models).