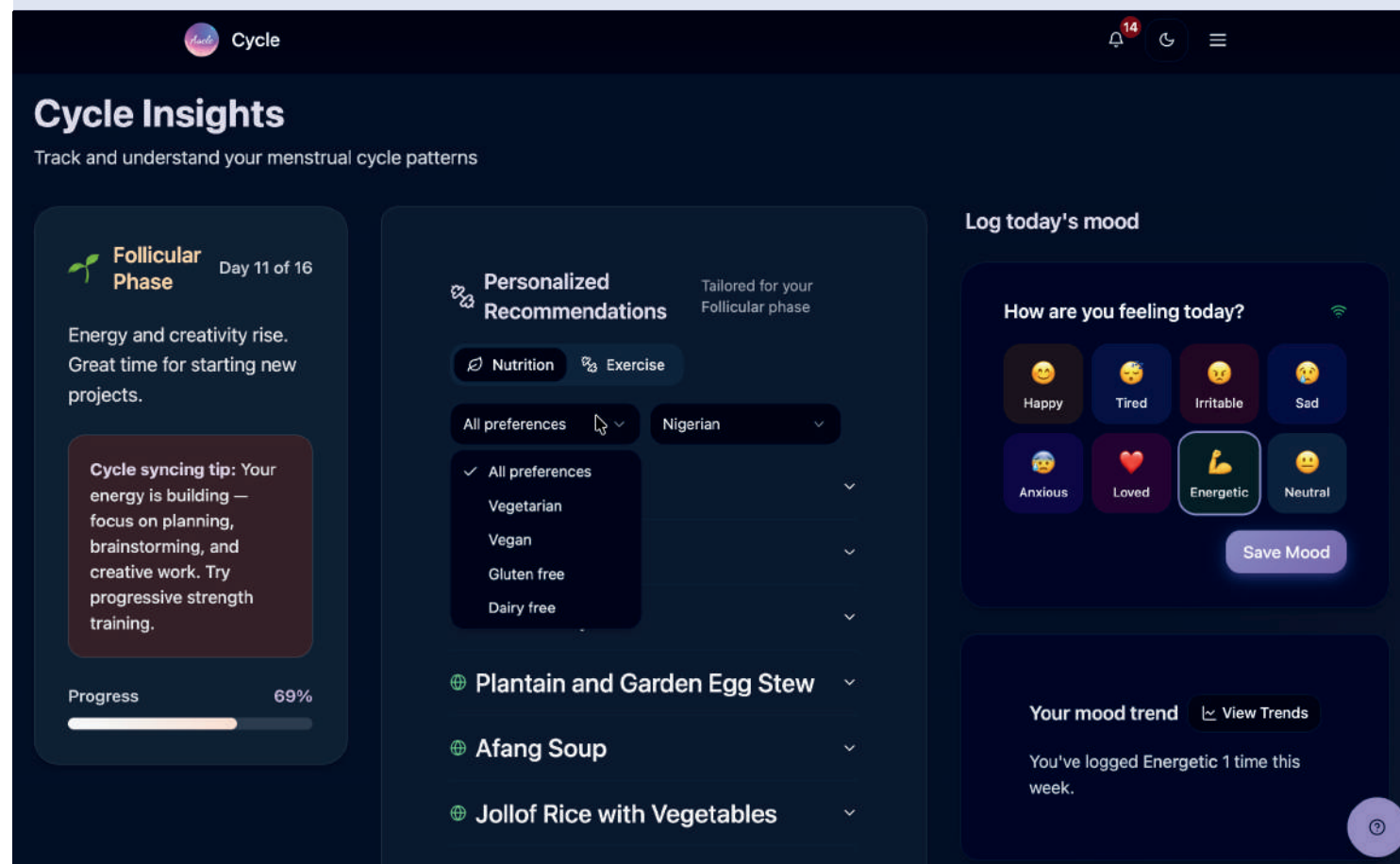


Localizing Cycle-Aware AI Nutrition and Productivity Guidance for African Women



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A lightweight, privacy-first chatbot that localizes AI-powered cycle guidance for African women – balancing intelligence, safety, and cultural relevance through a TypeScript and OpenRouter-driven architecture.



01. Background

Cycle literacy, nutrition knowledge, and stress management tools are limited for many women in Africa. Most health AI systems are built on Western data and often give advice that does not align with local food, daily life, or language.

Asele includes Amara AI, a cycle aware assistant that offers health aligned guidance using African context, local food references, and multilingual support. The system uses cycle phase as the core personalization signal to avoid intrusive data collection.

02. Objective

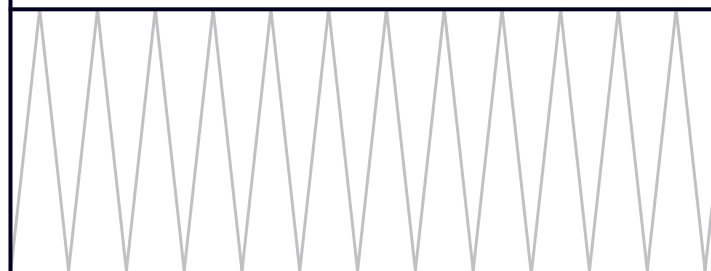
Design an AI assistant that:

- Supports cycle awareness and everyday health choices
- Works with only one input: cycle phase
- Avoids collecting medical records unless a user chooses
- Operates in low data environments
- Produces safe, culturally familiar guidance

The goal is to improve access to reliable cycle education for women in Africa without sacrificing privacy or trust.

Related literature

- Prior JC. Ovulation matters: menstrual cycles as a vital sign. *Frontiers in Public Health*, 2023.
- Cross JL, et al. Bias in Medical AI: Implications for Clinical Decision-Making. *PMC article* (2024).
- Yu E. Large Language Models in Medicine: Applications, Challenges and Future Directions. *Medical Sciences* (2025).
- Alami H. et al. (2020). Artificial intelligence in health care: laying the foundation for responsible, sustainable, and inclusive innovation in low- and middle-income countries. *Globalization & Health*.



03. System Design

Architecture

- TypeScript based chatbot layer
- Model access through OpenRouter
- Cycle phase context injection
- Privacy and safety rules embedded in middleware

Privacy

- AES 256 local session handling
- Zero retention unless user opts in
- Filters that avoid medical advice, diagnosis, or prescriptions

Data

- Only cycle phase required
- No private health records needed

Computing

- Lightweight inference suitable for low-bandwidth settings
- Possible migration path to on-device models for future versions

04. Cycle Personalization and Localization

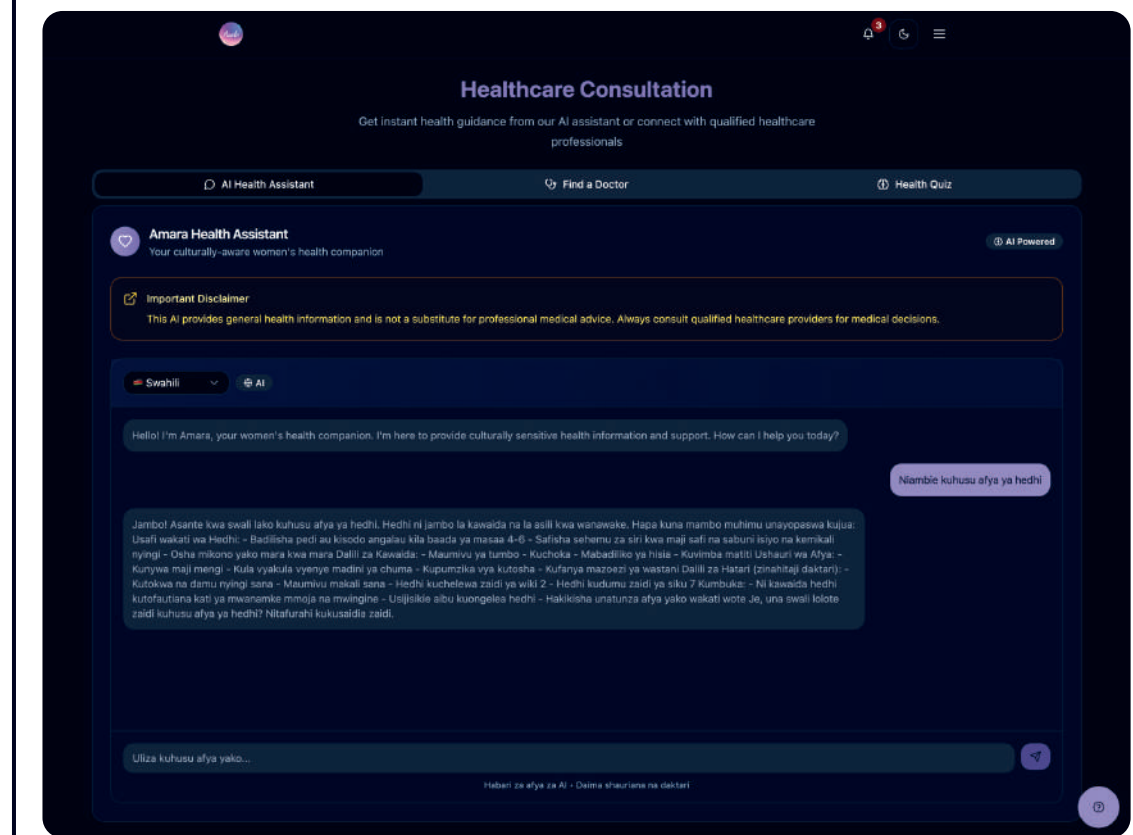
Cycle logic

- Adjusts responses across menstrual, follicular, ovulatory, and luteal phases
- Shares nutrition, stress, and energy guidance based on hormone shifts
- Encourages balanced meals and gentle rest cycles

Localization

- Local food lists (plantain, millet, beans, leafy greens)
- Everyday movement suggestions
- Language support: **Yoruba, Hausa, Igbo, Swahili, English, French**
- Clear phrasing adapted to cultural context

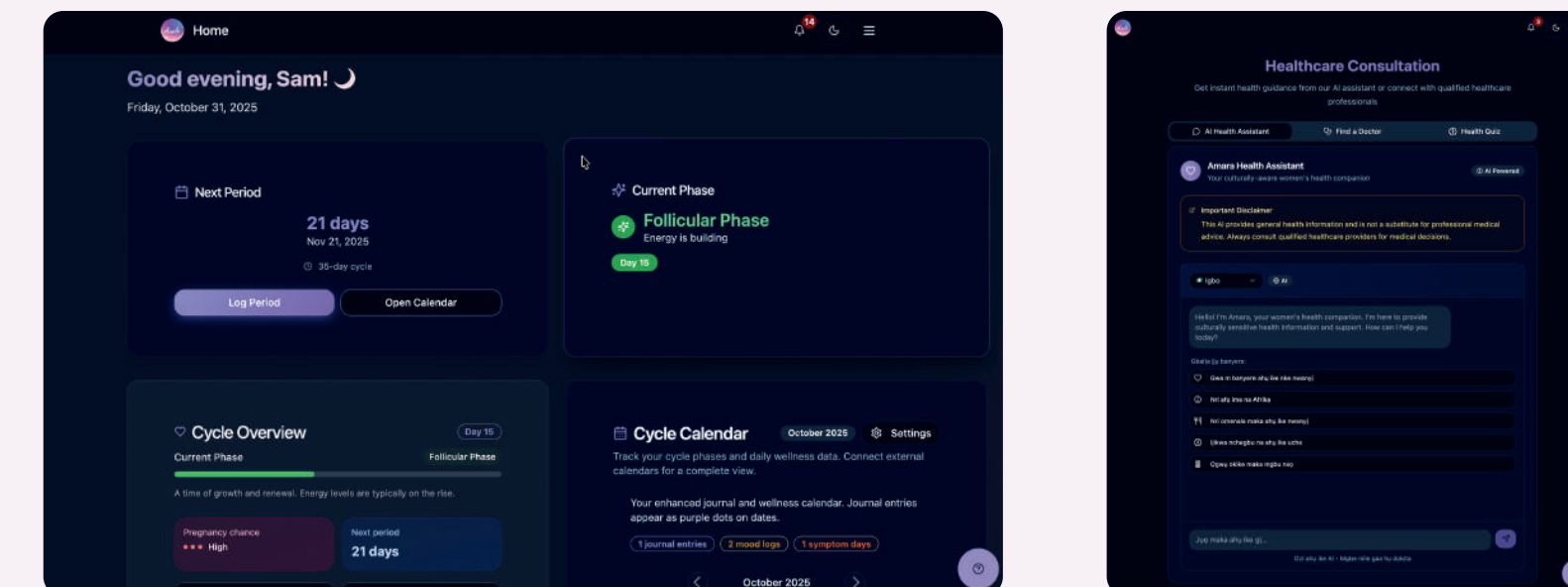
This approach improves trust, comprehension, and engagement.



05. Early Insights

Initial testing with women in Nigeria showed that cycle-adjusted guidance improved awareness and confidence in daily choices around food, rest, and focus. Users responded well to familiar foods and simple language, noting that local context made the assistant feel reliable and relevant. Privacy controls and clear safety limits increased trust, especially among users new to digital health tools.

The system performed stably in low-connectivity settings through request caching and retry logic, and the prompt structure reduced drift and unsupported claims. These results suggest that a low-input, culturally aware AI can support cycle learning and everyday health decisions for women in African settings.



06. Key Technical Insights

Amara AI is a **TypeScript-based chatbot** integrated into the Asele App, built on the **OpenRouter API** to deliver cycle-aware and culturally adaptive guidance for African women. Its architecture combines **privacy, localization, and efficiency** for low-connectivity environments.

Security

- Local session handling with AES 256
- Middleware input checks

Efficiency

- Async TypeScript logic
- Prompt chaining to reduce calls
- Retry logic for low bandwidth use

Scalability

- Works with multiple models (Mistral, Llama 3 etc)
- Future ready for wearable inputs or offline models