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AURAHER-AN AI INTEGRATED EMOTIONAL AND WOMEN'S HEALTH SUPPORT SYSTEM WITH PREVENTIVE GUIDANCE

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Abstract: AuraHer uses artificial intelligence to provide preventive care, mental well-being, and health tracking services to women through digital means. The platform incorporates various functionalities like menstruation tracking, symptom checking, post-partum health tracking, mood analysis, wellness alerts, and emergency services, among others. Using artificial intelligence in a conversation module based on large language models guarantees individualised services related to emotional well-being. Predictive analytics aids in tracking cycles and health trends to facilitate timely identification and prevention services.

Index Terms -Artificial Intelligence (AI), Language Learning Model (LLM), Python, HTML, Women's Health.

I. INTRODUCTION

Over time, there has been a rapid increase in the number of health-related applications targeted towards women. Although health-related applications have been on the rise, many of these women's health applications are focused on their physical health only, while ignoring their emotional and mental well-being.

The proposed project involves the development of AURAHER (An AI-Integrated Emotional and Women's Health Support System with Preventive Wellness Guidance). This will be a web-based platform aimed at improving the health of women physically and emotionally with wellness guidance.

There will be a digital assistant in the application Luna, a chatbot that can help users cope with their emotional problems and avoid feelings of loneliness and isolation. Depression risk assessment will be included to provide more safety and security for the users. It will analyse inputs from the user and allow emergencies to communicate through a message or email.

The objective of this application is to come up with an innovative way of providing support to women by designing a women-friendly platform to observe their physical and emotional well-being during their menstrual and postpartum periods.

II. OBJECTIVES

The main objective of AuraHer is to create a solution that helps women maintain both their physical and mental well-being.

[1] This system, AuraHer, has a biological tracker that creates a tool to accurately log and predict menstrual cycles by collecting historical data from the user. However, the conversational AI companion implementation incorporates an empathic AI agent that can recognise emotional distress and provide comfort through conversation to fight off feelings of loneliness.

[2] Promotion of preventive wellness creates customizable task checklists that motivate individuals to engage in wellness activities such as drinking water and light exercise, depending on the user's biological stage.

[3] Development of an automated alert system that manages risk assessment of psychological well-being of the individual (postpartum depression) and web-based communication protocols (mailto: and sms:) for automated alerts sent to an assigned emergency contact in case of danger.

III. Problem Statement

[1] The existing solutions are separate from each other, and their solutions include such components as tracking of menstrual cycles, postnatal care and ovulation tracking.

[2] Due to a lack of integration, the lack of digital retention is experienced. Women have to use several apps for managing their health.

[3] The current applications ignore the emotional side of female wellbeing during their menstrual period or postpartum. The poor functionality implies inappropriate treatment of premenstrual syndrome (PMS) or postpartum depression.

[4] Chatbots used today rely on rules for generating responses. The inability to understand the core of a question does not allow building any emotional connection between the app and the user.

[5] The current solutions do not consider the emotional aspect when addressing the physical one. While the existing solutions allow notifications on critical issues, they cannot provide help in emergencies since there are no security measures incorporated in the application.

[6] The existing wellness recommendations are generic and do not account for the biological and personal differences. A comprehensive solution to integrate all of these aspects

IV. Proposed System

This project represents an AI-driven web application design that links the physical component of health tracking and the psychological one for the benefit of females' health. Different from other applications, which separate psychological and physical health components from each other, this proposed design brings together both parts and merges them to create a more effective digital world.

The software application, AuraHer, is created as a compact and very responsive Single Application (SPA), which is built on HTML, CSS, and Vanilla JavaScript. Rather than using bulky database management on the back-end side of operations, the software uses local memory sessions and native browser communication to ensure fast and safe transactions.

[4] A safe and soothing user experience is designed by creating a visually pleasing, accessible and highly secure interface that promotes daily usage.

The interaction between the software and the user involves cycle prediction, personalised recommendations during certain periods, an AI-driven companion, and efficient intervention tools.

Following is the architectural workflow of the proposed software, AuraHer.

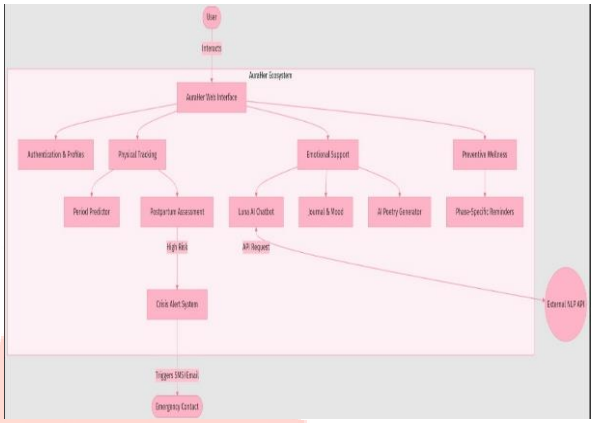

figure 1: System architectural flow

It highlights how the user communicates with each module, the involvement of AI within the process, and how the crisis alert mechanism connects with the external world. Explanation of Key Modules. The suggested system works using four major interconnected modules:

Authentication and Profile Setting

Personalisation is the key focus, as it aims to create an experience that is safe and comfortable for the user. Registration in this system consists of the creation of a personalised profile, where the user picks his/her "Spirit Animal" avatar, selects the theme type (Light, Dark, and Nature), and most importantly, stores his/her emergency contact details (email/Phone Number).

Physical Tracking Module

In the period cycle predictor, women need to enter the start and end dates of their periods, together with any physical symptoms and food cravings that they may have. Through its mathematical logic engine, the software is able to determine the average number of days between one cycle and the next.

In the postpartum evaluation, a module was developed to assist new mothers in entering their

delivery date and taking the depression risk assessment test.

Emotional Support Module (With AI Integration)

This is the psychological backbone of the application. Luna functions as an empathic virtual friend. Once a user types out their thoughts, a call is made to an artificial intelligence application programming interface that is based on natural language processing (NLP) using HTTP requests (https://text.pollinations.ai). An appropriate contextual response from the AI is returned. The application has been programmed with appropriate backup messages for the chat feature in case of any Internet connection failure.

Whereas the Diary & Mood Tracking offers a private journaling space where the user can express themselves by writing down their fears or anxieties.

An AI Poetry creates soothing poetry inspired by nature that can help ground the user in times of extreme anxiety.

Wellness Prevention and Crisis Management

The Reminders in the system create a daily checklist based on the user's condition. In case the user is on her period, reminders are for water intake and using heating pads. When it comes to postpartum recovery, reminders focus on rest and pelvic floor exercises.

The crisis notification system is the crucial safety mechanism that makes the system work. If the assessment logic concludes with "high risk" in terms of depression, then the system would automatically kick off a response process. Leveraging web standards such as mailto and sms, the system would draft an emergency message and try sending it out to the saved contact number.

IV. System Design

Through the architecture, modules, interfaces, and data of a system are designed to meet certain specifications and requirements. AuraHer's system design is centred around making a seamless, lightweight and highly interactive system that guarantees privacy and immediate access. Since the personal data about women's health is sensitive, the software development approach of AuraHer has been designed as a Client-Side SPA application. In this way, all essential computations (including period prediction and depression score calculation) are done using Vanilla JavaScript and occur on the client-side, i.e., on the user's web browser.

The system design excludes the use of a database server for any kind of processing of data. It interfaces with the outside environment only in specific situations where the requirement for that exists, e.g., when the system needs to fetch text data from the external API or calls an emergency application installed natively on the user's phone. As part of our design, there is a clear separation between the Presentation Layer (HTML & CSS) and the Business Logic Layer (JavaScript controllers).

Use Case Diagram

The interaction of the external actors and the system capabilities is depicted in the use case diagram. A use case diagram shows the usage and interaction of the system as well as its capabilities.

There are three major actors in this project. The primary actor is the user who uses the application to monitor herself and search for answers about her emotional health.

The external AI API acts as a supporting actor, providing answers to the Luna chatbot. Whereas an emergency contact is a supporting actor who gets the notification from the application during emergencies.

Use Case Diagram for the system behaviour of the AuraHer application has been provided below.:

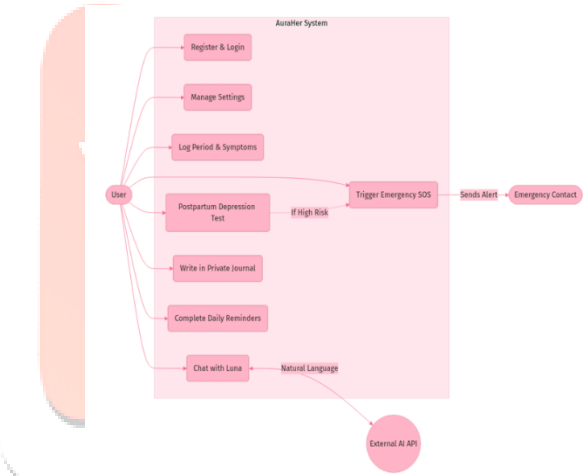

figure 2: Use Case Diagram

Below is the Explanation for the Use Cases:

(i) UC1 and UC2 (Profile Management): The user logs into the application and controls his/her environment. It involves choosing an interface that will calm him/her down, as well as saving either a phone number or email of the appointed Emergency Contact. (ii)UC3 (Physical Logging): The user enters physical data such as dates when the periods started/ended and experienced cramps or cravings. The system uses this information internally to calculate the next menstrual cycle. (iii) UC4 (Mental Health Assessment): The user takes the 7-day retrospective postnatal depression quiz. The system acts here as a rater. (iv)UC5 (Chatting with Luna): The user sends the input text and receives a reply after the interaction with the External AI API. (v)UC8 (Emergency SOS): This is probably an important aspect since it could occur voluntarily on the user's part when he/she feels overwhelmed, as well as involuntarily when the user fails the

depression test. The system composes an emergency message and pushes it to the Emergency Contact actor.

Architecture for Security and Data Privacy

These are the essential elements of AuraHer's architectural design solution, including privacy in design. Since data related to menstrual and mental well-being is highly confidential, the architecture permanently leaves out the external database.

The client-side database will store all physical symptoms, journals, and moods locally during the user's browser session. The user's personal data is never sent across the internet to a central server, which eliminates the chances of a massive data breach.

Empathetic AI messages, while engaging with the Luna AI, the user sends the current message in text. It is important to highlight that there is no username, email, or physical wellness information. Thus, the user remains anonymous to third-party AI models.

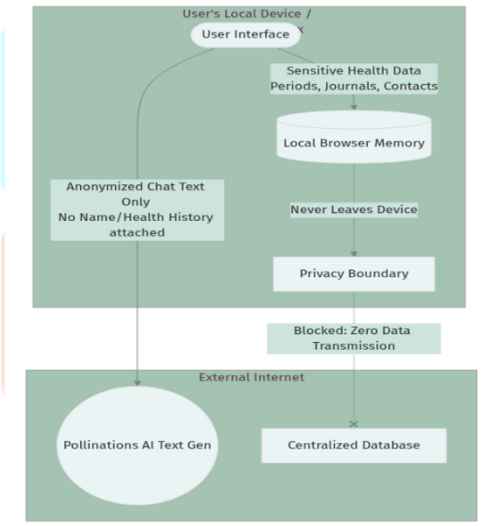

figure 3: security and data privacy architecture

V. DATA FLOW

Data Flow Diagram

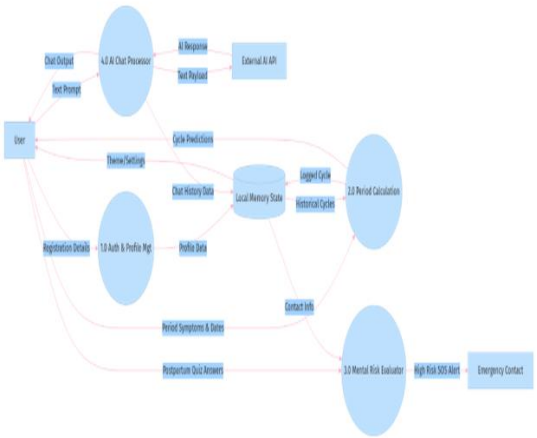

Figure 4: dataflow diagram

Whereas the Architecture Diagram depicts the technical architecture, the Data Flow Diagram (Level 0/1) shows the movement and transformation process of raw data through AuraHer's ecosystem.

According to the DFD, the Data Store (Local Memory State) acts as the primary component in the application.

[1] *Entity (Square)*

This component acts as the source of data inputs or outputs. This involves user input data, text-based data from the AI API, and emergency contact data in case of SOS.

[2] *Process (Circle)*

Here, the processing occurs on the collected data. For example, Process 2.0 collects data on "Dates & Symptoms" provided by the User and then produces "Cycle Prediction" information back to the User.

[3] *Data Store (Cylinder)*

Due to a lack of an external database, all information moves through the Local Memory State.

VI. RESULTS

Register on the Login Page

This is the page that one will see as soon as he visits this website, and here the individual will enter all their required information, and now they will be able to log in and select their favourite animal as a profile.

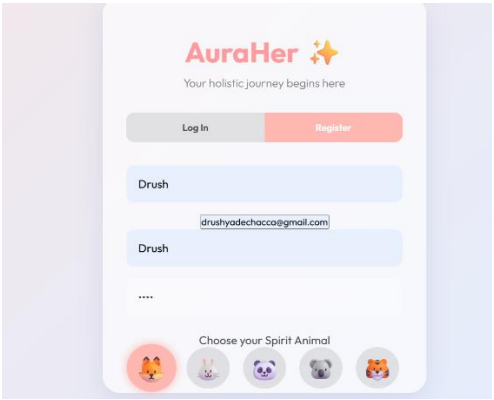

figure 5: register on the login page

Dashboard page

AuraHer is a wellness management app for women to keep a record of their menstrual cycle, make reminders, and seek mental support with the help of artificial intelligence. The website has an easy-to-use and user-friendly interface for personal health management. Users can use the Period

Cycle tool to record the dates of onset and cessation, note any symptoms and cravings, and track past periods. Predicts when the next period will come based on previous entries to help keep tabs on their health.
Postpartum includes a depression test to monitor your mental well-being post-birth.

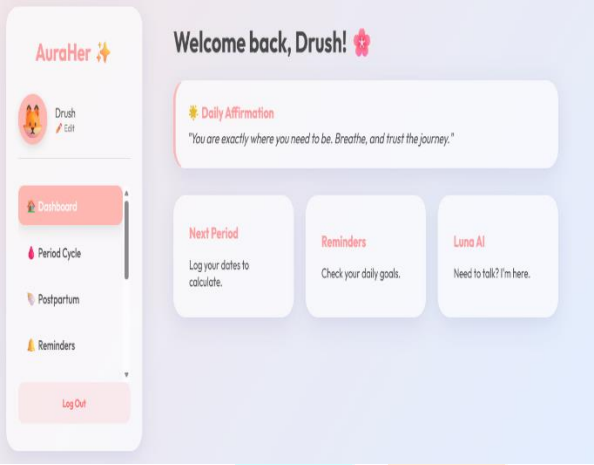

figure 6: dashboard page

Features Related to Self-Care and Emotional Wellness

The Reminder tool ensures that users maintain healthy practices during menstruation and the postpartum period through daily wellness checklists. The Personal Diary lets users jot down their thoughts, emotions, and everyday experiences in a safe manner.

Chat with Luna provides virtual emotional assistance and chats with users to relieve stress and feel less lonely. The Mood Tracker lets users track their emotions easily with just a selection from a list of moods.

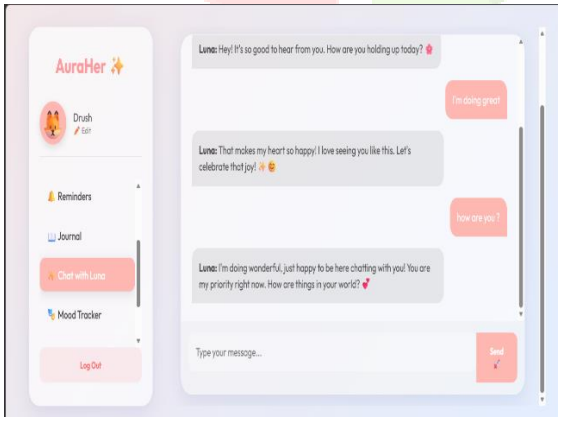

figure 7: Luna chatbot

VII. Conclusion And Future Enhancements

Conclusion

AuraHer can be considered an example of AI-supported women's healthcare software that addresses the limitations of existing healthcare apps by integrating menstrual health, postnatal care, emotional well-being advice, and preventive healthcare into one system. This platform utilises artificial intelligence to offer conversational assistance, personalised recommendations, crisis intervention features, and health monitoring tools to support comprehensive wellness by integrating physical and emotional wellness. AuraHer exemplifies the potential of high-tech healthcare applications in helping women access an empathic, personalised, and safe healthcare experience.

This system will combine both physical and emotional wellness support. AuraHer shows how advanced digital healthcare can help women have access to personalised, caring, and secure healthcare experiences.

Future Enhancements

[1] Future enhancements will include improvements in features such as scalability, intelligence, and connectivity within the healthcare industry.
[2] Machine learning algorithms can analyse data trends regarding the health of the individual and give him/her personalized health advice. The whole process will then be intelligent and efficient.
[3] Devices like health bands or smart watches will enable automatic gathering of health data of the user's health data and thus will save time as manual data entry will not be required, and the monitoring will be done in real-time.
[4] The future system will ensure that patients can communicate with their doctors and schedule appointments.
[5] Developing a reliable cloud-based platform where health data will be securely stored in the cloud. This will help in ensuring that security and synchronisation of information is guaranteed.
[6] Creation of therapeutic content with the use of artificial intelligence technology to create materials that encourage people and also assist them in managing their feelings.
[7] Creating a native application that will run smoothly and push notifications. Mental well-being forums can also be created where individuals are able to vent their frustrations and gain emotional support.

VIII. Acknowledgement

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