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BrahmaX 1.0

The Creation of Tomorrow

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- Theme - HealthCare
- Problem Statement Title- AI-Driven Early Detection of Mental Health Conditions: Create an AI-powered system that helps detect early signs of mental health disorders (e.g., depression, anxiety, PTSD) through voice or text analysis.
- Team ID - (As per Unstop registration)
- Team Name - OPTIMA



- Proposed solution: Idea is to create a web application that is able to **predict** any and help a user to **recover** against **mental health problems** parallelly helping them to recover from their problems.
- Solution Overview: combines AI-driven **sentiment analysis** through various on-platform activities and keeping a track of the user's daily online/offline activities, making mechanisms that help to **rectify the mental issues**.
- Problem-Solving: By catching subtle behavioral and emotional cues early, the system supports users in managing stress, anxiety, or depression before they escalate, all in a private and accessible manner..
- Innovation: Providing **1 to AI conversations** over text/voice and also asking situation based behavioural questions along with emergency distress phone are some of the unique and noble features of the platform.



•Technologies Used

•1. Web & UI

•HTML, CSS

•**React.js** – for dynamic and responsive frontend

•**Flask** – lightweight Python backend framework

•2. APIs

•**Dialogflow** – for chatbot-based mental health interaction

•**REST API** – connects frontend to backend & ML models

•**Chrome APIs** – (*tabs, idle, storage*) for activity-based behavior tracking

•3. Data Visualization & Processing

•**Matplotlib** – graphs for mood tracking

•**Transformers** – for text classification (sentiment/emotion)

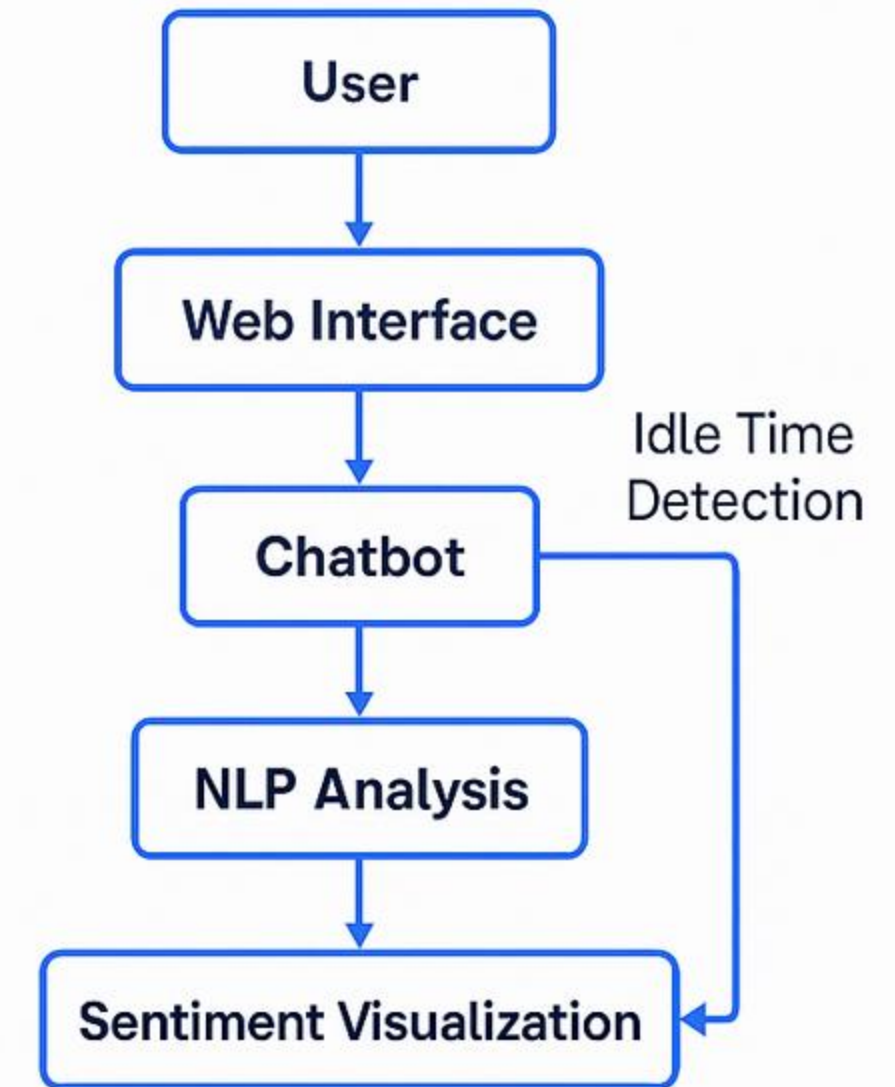
•**NLTK** – preprocessing and keyword analysis

•4. NLP Models

•**BERT, RoBERTa, DistilBERT** (via Hugging Face)

•Fine-tuned on mental health-related datasets (e.g., DAIC-WOZ, EmpatheticDialogues)

Process flow





Feasibility

• **Studies** have shown that **AI** can detect **mental health conditions** through **speech patterns, tone, and language use** in text. Advances in **NLP** and **machine learning** enable analysis of complex **patterns** in **voice** and **text data**.

Challenges & Risks

- **Complexity** of mental health makes **accurate detection** difficult.
- Gathering **high-quality, diverse datasets** that reflect **various mental conditions** is challenging.
- Managing **sensitive user data** requires **strong security** to prevent **privacy breaches**.

Mitigation Strategies

- **Regularly update** and **fine-tune AI models** to enhance **accuracy** and **fairness**.
- **Clearly inform users** about data handling and ensure **informed consent**.
- Use **robust encryption** and **secure infrastructure** to protect **user privacy**.



- **Target Audience Impact**

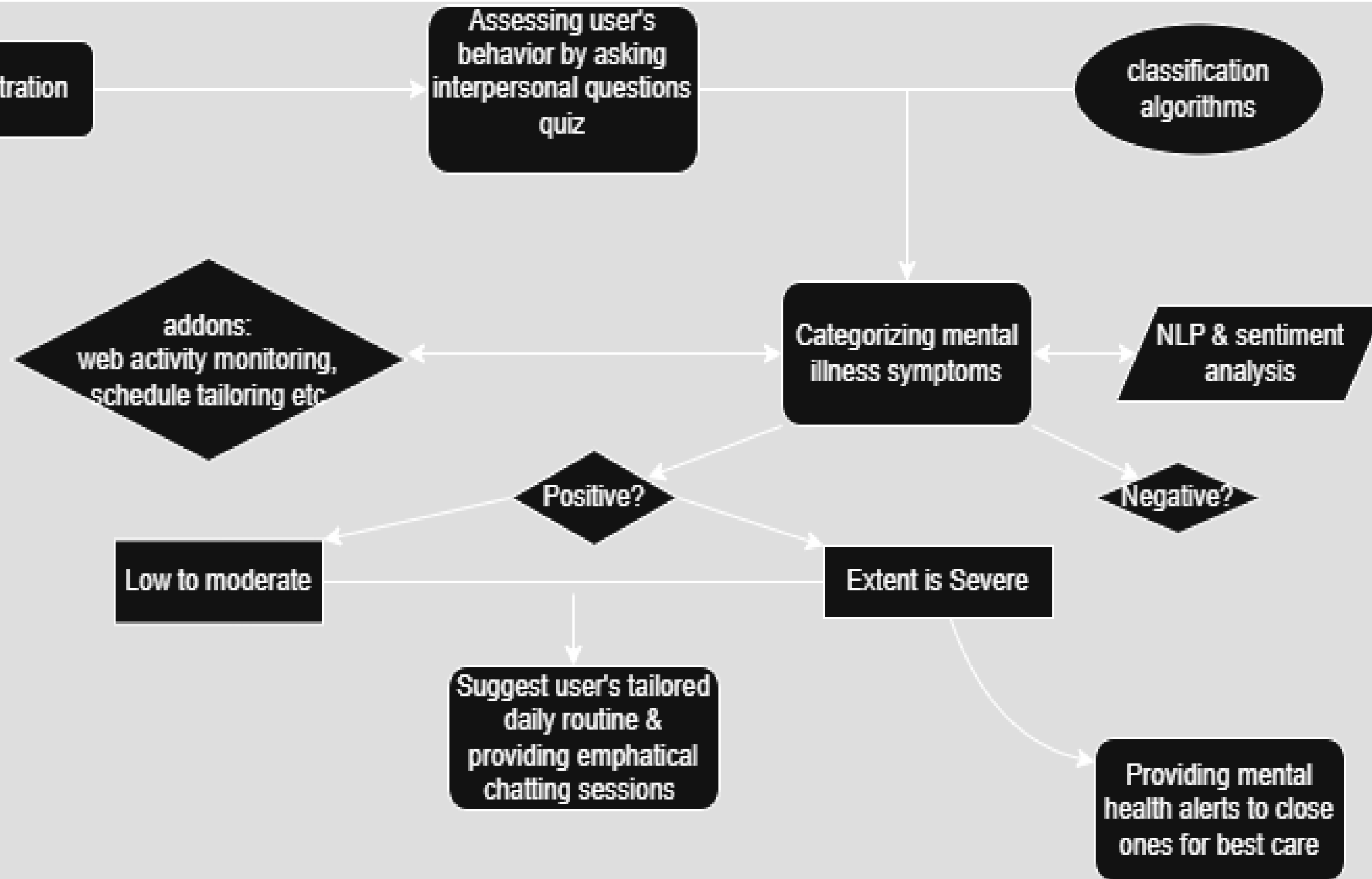
- People experiencing **mental health issues** such as **depression, anxiety, or PTSD**, who can benefit from **early detection and intervention**.
- **Therapists, psychologists, and psychiatrists** can use the system as a **diagnostic support tool** to enhance treatment planning.

- **Key Benefits**

- **Extends reach** to individuals without access to traditional mental health services, especially in **remote areas**.
- **Anonymous usage** encourages help-seeking behavior by reducing **stigma and fear of judgment**.
- Helps mental health professionals **prioritize patients and allocate resources** efficiently.

- **Long-Term Value**

- Contributes to **better mental health outcomes** through **early detection and timely intervention**.
- Can significantly **lower healthcare costs** by addressing issues before they escalate.
- **Raises awareness** and encourages people to focus on their **mental well-being**.



References:

1. The Lancet Psychiatry.
2. Natural Language Processing Applications in Mental Health Interventions.
3. Woebot
4. EMPATHETICDIALOGUES (Hugging face).