T$O GEN-AI HACKATHON - FRAMEWORK DOCUMENT

TEAM MEMENT-NO

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Problem Statement: Dementia affects over 55 million people globally, leading to memory loss, confusion, and difficulty performing daily tasks. This condition affects not only the patient but also the caregiver in numerous ways. People with dementia often forget their own children or themselves, to take medications, to attend medical appointments, or even complete basic routines like eating or bathing. These challenges can lead to health complications, emotional distress, and social isolation. Despite the availability of reminder apps in the market, most are not personalised enough to cater to the level of cognitive decline of the individuals. There is a lack of an intelligent, empathetic, and accessible system; hence, we introduce our product that aids in memory recall, routine tracking, and context-aware interaction, improving independence and well-being for both patients and caregivers.

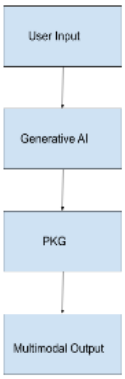
Target audience and context: Our app targets elderly individuals with mild to moderate dementia and their caregivers. These patients, living at home or in care facilities, face daily memory lapses, such as forgetting family names or recent events, which prove to be detrimental to their emotional well-being by causing distress. Caregivers, often family members or professionals, seek tools to support patient autonomy while reducing their burden. The app operates in home settings, using local device data like contacts and photos to provide personalised recall, addressing both practical memory challenges and emotional well-being in a familiar, comforting environment for dementia patients.

Use of Gen-AI: The app proposed is being implemented using Generative AI. It uses Text-to-Speech (TTS) and Speech-to-Text (STT) technologies to enable intuitive voice interaction, making the interface highly accessible for users with dementia. The app integrates calendar-based reminders to help users stay on track with doctor appointments and monthly bill payments. The app provides timely voice notifications for medications and essential daily activities such as eating, bathing, and drinking water.

Generative AI, powered by Google's Gemini model, interprets and processes natural language queries entered via a text input or voice entry and accesses a personal knowledge graph built from device data (contacts, photos, call logs).

Solution framework: Our solution is Fambridge, our memory assistant app which empowers dementia patients with personalised recall and daily support using Generative AI. Patients can type or voice queries into a simple interface, and Google's Gemini model processes them, accessing a personal knowledge graph (contacts, photos, call logs) to deliver elder-friendly responses with multimodal outputs (text, photos, timelines). The app integrates a calendar for scheduling monthly health check-ups and bill payments, sends reminders for daily activities, and features a widget displaying the next task, enhancing routine management.

Each morning, a soothing song plays to wake patients, prompting a gesture(a swipe) to launch the app and ask, 'How are you this morning?' Responses inform Gemini to personalize interactions, such as adjusting tone based on mood. A distinct gesture on the app's screen triggers alerts to caregivers for immediate support. Patients can record voice notes reflecting on their day, which Gemini uses to improve response accuracy and summarize activities as voice or text, per the patient's preference, fostering engagement.



The workflow: User Input → Gen-AI Processing → Knowledge Graph → Multimodal Output

This workflow extends to these features, with TensorFlow Lite ensuring local processing for privacy and Firebase enabling caregiver updates. The architecture, depicted in the diagram, combines accessibility, AI-driven personalisation, and caregiver integration, making it a combined solution for the affected of this brutal disease.

Feasibility and execution: Its feasibility is assured by its easy use and the assistance provided by Generative AI with personalised reminders, memory prompts, and emotional companionship. Using tools like Gemini for conversation, Whisper for voice input, and Firebase for secure data storage, the app engages users naturally. Caregivers or the patient who is in their early stages of diagnosis can upload photos, names, and routines to build a personalised memory base. The app includes emergency contact features, mood detection, and voice-first navigation. It supports offline use, ensures privacy compliance, and offers multilingual support, making it a practical, scalable, and compassionate solution for dementia care across diverse settings.

Scalability and impact: The solution is highly scalable across diverse care settings—homes, assisted living, and hospitals—by adapting to different devices and languages using cloud-based AI and modular architecture. Integration with existing healthcare apps and smart devices expands its reach. The impact of this app will be profound on the aging populations and their caregivers as it promotes autonomy, reduces caregiver stress, and improves emotional well-being of the affected person. Its design supports easy localization and updates, making it suitable for global deployment.The system uses on-device AI (TensorFlow Lite) for private, fast actions and Gemini's cloud AI for complex memory support, ensuring safe, personalized, and responsive assistance for dementia patients.

Conclusion: Our solution combines voice interaction, contextual memory recall, and caregiver integration to support dementia patients with personalised, accessible assistance. By leveraging on-device and cloud-based AI, the concept addresses key daily challenges like missed medications, confusion, and emotional distress.

Bonus: Minimum Lovable Product - Fambridge can be built into a viable business by partnering with health care organisations such as hospitals and old age homes, by integrating our app into their remote care ecosystem. By including subscription-based bonus upgrades such as memory games and a community feature, this can become a profitable business venture.