**Introduction:**

Alzheimer's disease, a progressive neurological disorder characterized by memory loss and cognitive decline, presents a global challenge, affecting millions. [Traditional diagnostic systems may no longer be fit for purpose for classifying mental ill health, facilitating understanding of its core underlying biopsychosocial processes, nor driving clinical developments [1]](https://psycnet.apa.org/fulltext/2020-10232-001.html). Furthermore, the subtlety of early symptoms combined with the complexity of traditional diagnostic methods underscores the critical need for more accessible early detection tools [2]. A home-based application capable of identifying the early signs of Alzheimer's could significantly enhance early intervention strategies and provide valuable insights to both individuals and healthcare professionals [3]. In addition, Machine learning (ML) can be applied to neuropsychological measures to lead to a successful automatic classification of patients with mild cognitive impairment (MCI), being more specific as screening rather than prognosis tool [4]. Therefore, this study aims to improve early identification of Alzheimer's disease as well as provide assistance for diagnosed individuals and their families.

**Problem:**

Current diagnostic methods can be invasive, expensive, and inaccessible to many. Moreover, presymptomatic detection is challenging, and cognitive decline can vary greatly between individuals. There is a growing need for a non-invasive, cost-effective, and easily accessible tool that can help in the early identification of Alzheimer's disease and track cognitive health over time.

**Aim:**

The goal of this study is to build an application that facilitates early detection of Alzheimer's disease, as well as to provide support for diagnosed patients and their families. The app offers a dual approach: For individuals with a clinical diagnosis of Alzheimer's, it provides access to a network of volunteer services for additional support.

**Methodology:**

The application is designed to address the urgent need for a non-invasive, cost-effective, and accessible tool that can identify early indications of Alzheimer's disease and monitor cognitive health. It embodies a dual-purpose approach:

1. Diagnosed Patients: It offers a community support feature by connecting patients with a compassionate network of volunteers. This component includes an interactive calendar allowing volunteers to offer assistance aligned with their skills, enriching the support system for patients and their families.
2. Early Assessment: For individuals without a diagnosis, the application acts as a preventive assessment tool, capable of detecting potential Alzheimer's markers before the condition fully manifests.

**Technology and Data Collection:**

The application intends to provide a personalized assessment of cognitive health by combining innovative technology and interactive capabilities, empowering users to seek informed medical guidance. It will collect information from a variety of sources, including:

1. Speech Analysis: utilizing natural language processing to detect subtle changes in speech patterns, which may indicate cognitive decline.
2. Activity Monitoring: syncing with wearable devices to track physical activity and sleep patterns.
3. Family History and Feedback: gathering genetic information and observational data from family members via secure questionnaires.
4. Cognitive Games: engaging users in games designed to test memory and problem-solving abilities, providing measurable cognitive performance data.

This data will be analyzed through AI models to discern patterns that could signify a risk of developing Alzheimer's. Moreover, all user information will be managed with the utmost respect for privacy laws and ethical standards to ensure data confidentiality and security.

**References**

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