

# **Design and Development of a Conversational Artificial Intelligence –based System for Dementia Patients Support**

## **Summary the Project**

### **A). Deliverables**

- 1). The Conversational AI should provide real time support by interacting naturally with the patients. Monitoring the patient mental and emotional state and offering tailored assistance
- 2). The Conversational AI should be able to:
  - Engage users in cognitive exercises
  - Providing reminders or even offer emotional reassurance to patient wellbeing
- 3). This project involve designing a Chatbot-based system that understand Natural Language Processing (NLP), understand patients’ needs and respond to their needs

### **B). Core Features of the Designed System**

**NOTE:** The proposed system will capture the following fundamental needs of Dementia patients:

- i. Daily routine and medication reminders
- ii. Personalized memory aids (names, faces, places)
- iii. Simple games and cognitive exercises
- iv. Emergency contact and alert system
- v. Emotional tone analysis and empathy responses

At the end of the project, a functional **Conversational AI prototype will be developed, design specially to support Dementia patients by providing personal assistance, reminders, and cognitive engagements**

### **C). Technology Stack (System Development)**

The next step is the system development. The overall system to be developed will comprised of the following features

- i). **Natural Language Processing (NLP)**  
The NLP will be developed using OpenAI GPT and Dialog flow processes
- ii) The Voice Interface involves the use of Google Text-to-Speech / Amazon Polly / Azure Speech Services in the development.

### **Reasons for using Google-to-Speech for the voice interface**

The reasons for the choice of Google-to-Speech voice interface is because of its high quality and natural language processing. It also has the capability of Mult-Language and

Multi-Ascent support. It is user friendly and it can easily be integrated with Android and Google services.

**iii). Backend**

The backend development will be written using Python/Node.js

The choice for Python and Node.js is simply because of the following reasons.

It is easy to use and reliable. It has powerful libraries and good frameworks. It is strong in AI and Machine Learning. It is cross platform capability. In the case of Node.js, it is build on real-time applications with massive ecosystem and high performance

**iv) Database**

MySQL will be used for storing user preferences, reminders, and conversation history, cognitive tasks etc

The reason for chosen MySQL for the development of the database is because, it is an open source application and it is widely supported with cross platform compatibility. It is also highly secure and strong data integrity.