AiZi Assist Application – A Tool for Alzheimer Disease Patients.

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Abstract- *For Alzheimer's sufferers, "AiZi" offers a comprehensive aid for daily living. The hallmark of Alzheimer's disease is a gradual deterioration in symptoms over a number of years. The execution of everyday tasks is impacted and memory loss occurs. Memory loss can cause problems with recalling names, faces, locations, and other details. The purpose of the application's goal is to increase daily communication and the capacity to accomplish daily tasks independently with an Alzheimer's sufferer. The AiZi application intends to dramatically improve assist them in their day-to-day activities. Thus, this study emphasizes the The significance of incorporating artificial intelligence (AI)-based features. Memory games, math tests, general knowledge quizzes, and a family recognition section are among the features a secure login/sign-up screen make the application stand out. The major goal of our research is to organically engage in activities that boost the memory efficiency of the appropriate patients in varied activities and a timely doctor. Section for appointment reminders. So, while this study focuses on our development of the AiZi app, it also addresses the growing issue of Alzheimer patients' reliance on caregivers.*
Our software acts as a smart assistant, supporting patients in recognizing family members through the use of photographs that can be added to the app.

Android Application, API, Multiple Interface, Task Reminder are all index terms.

I. INTRODUCTION

One of the dementia syndromes is Alzheimer's disease. It is a syndrome caused by a brain disease that impairs human memory, thinking, orientation, comprehension, calculation, Language, learning, and decision-making are all aspects of judgment. Alzheimer's disease is responsible for 60-70% of dementia cases. More than 4 million people in India have dementia of some kind. The most Alzheimer's illness is very frequent. Alzheimer's disease is the most common disease, impacting millions of people approximately 1.6 million people. Alarmingly, this number is expected to triple by 2050. We are working to find solutions to prevent this growing disease and help people with Alzheimer's disease live better lives.

Alzheimer's patients suffer from memory loss, which causes them to forget certain things important daily tasks. Patients may forget where their home is and become disoriented. has no idea how to contact anyone concerning his family. Patients get quite sad and dejected when they are unable to recognize family members cause difficulties. There are some existing

Bluetooth overhead, systems with login issues. The connectivity issue and outputs are shown in a variety of ways. languages.

Memory loss occurs at a moderate rate in the early stages of the disease, and studies have indicated that continuous memory recall can postpone late onset. To practice, the AiZi app would state. In the case of a late onset, the patient will He won't remember his name or any faces. Constant reminders displayed by the AiZi application would postpone memory lapses. Both the patient and family members would be able to use the AiZi application. The sufferer could see he or his family members set reminders. Family members could track the patient's location.

The main goals of the proposed program are to improve the quality of life of Alzheimer's patients easier for them and those around them to live with the condition. It also explains how to prevent the progression of the disease isolation.

Using tests of general knowledge, Math tests, and puzzles that Alzheimer's patients can improve and strengthen their memory with the right method.

A. Need and Motivation

Alzheimer's disease is slowly becoming a public health concern as age is a known risk factor, and as a result, prevalence rates are projected to climb as more people live longer. People developing this condition in an aging population.
People with Alzheimer's experience challenges in carrying out routine daily duties such as cleaning their teeth or eating meals.

People with Alzheimer's disease suffer from memory problems that can make it difficult to remember a person's name, face, or certain information, putting them in potentially dangerous situations. embarrassing situations.

Therefore, our AiZi app works as an intelligent helper that enables Alzheimer's patients to distinguish and even recognize the photos and names of their family members. determining the nature of their interaction with them.

B. Contributions

This further study could develop an application that provides various features including GPS tracking of patient movements, medication as well as food timing reminders, daily

routine tracking, and tests to improve patient cognitive performance.

We provide insights and improve their memory capacity by studying the data, which has an impact on the overall health of the patients.

The primary purpose of this initiative is to provide persons with Alzheimer's illness as much as possible independence as possible. As a result, our initiative is about more than just developing an app; it is also about tackling the issue of Alzheimer's patients' increasing reliance on their caretakers.

C. Organization of this paper
The following is the continuation of the article. The second section provides a thorough history and introduces keywords in the discipline. The final component is a comprehensive literature analysis of present Alzheimer's research efforts. Section 4 outlines potential future projects. Section 5 investigates potential applications in the fields of memory, general knowledge, education, and rehabilitation. Section 6 wraps up the report with a summary of the findings.

II. OVERALL BACKGROUND
Previously, due to small fonts, confusing menus, and fear about using computing equipment in the early days of mobile devices, elderly people were hesitant to use applications. We develop user-friendly and simple-to-use mobile apps for seniors and adults with Alzheimer's disease. Our project's major purpose is to assist patients with Alzheimer's disease in making their lives simpler on their own.

Alzheimer's patients, as we know, suffer short-term memory loss, thus they confront some common everyday challenges. The most prevalent issues include wandering, forgetting food, and forgetting family members' faces/names. One of the most serious issues people may experience is forgetting crucial information such as their address and the doctors who are treating them. Alzheimer's sufferers need to have a caregiver with them to tackle this problem, and our AiZi app will be a perfect option for them.

A. .Problem Statement
How to create an Alzheimer's disease support plan to improve your daily communication and your capacity to do daily duties.

B. Features
Key features of AiZi include:
Improve your daily communication with those around you. It reminds you of important daily tasks that you need to do. Locate Alzheimer's patients to keep them safe and prevent them from getting lost in public places.
Help and encourage family members and caregivers of people with Alzheimer's disease to communicate with them. Our program has the potential to help all Alzheimer's patients and their caregivers with mild to moderate conditions by developing applications that include features such as facial recognition using machine learning.
This helps Alzheimer's patients remember the people around them and provides a wearable device with GPS tracking to help caregivers determine the patient's location.

C. LITERATURE SURVEY
Popular tablets and iPads can be used by people with dementia to pull up favorite music or photos of their family members through an app developed in close collaboration with senior living facilities (Klinberger et al., 2007). A new study has proven that using brain, memory, and problem-solving games can stimulate the brain and aid in the reduction of Alzheimer's symptoms. A study carried out in one of the kindergartens for the elderly in Spain shows positive signs that the use of games improves the mental stability of Alzheimer's patients.

This section explores many facets of the field and gives a complete survey of the available literature on Alzheimer's disease and its applications to date. Let us begin with many discussions. To create the app for our project, we largely used Android Studio. The Android Studio IDE (version 2020) was utilized. to program the application, design the interface, and test it.

The Android Studio emulator was used, which is a utility supplied by Android Studio. to run and test applications on virtual smartphones and smartwatches. Alzheimer's disease symptoms worsen over time, but the rate of progression varies. The following steps give a general idea of how abilities change after symptoms appear

a. Early-stage Alzheimer's (mild)
In the early stages of Alzheimer's, a person may be able to operate independently. He or she may continue to drive, work, and attend social functions. Despite this, the person may experience errors in memory, such as forgetting simple words or misplacing commonplace objects.
❖ Common difficulties include:

i. Choosing the appropriate word or name.

ii. Remembering names while meeting new individuals.

iii. Difficulties accomplishing duties in social or professional situations.

iv. Forgetting what you've just read.

v. Having increased difficulty planning or organizing.

b. Middle-stage Alzheimer's (moderate)
Middle Alzheimer's disease is usually the longest stage and can last for years. As the disease progresses, people with Alzheimer's disease require more advanced care.

In the middle stage of Alzheimer's disease, the symptoms of dementia are more pronounced. The person may mix up words, be frustrated or angry, and act in unexpected ways, such as refusing to take a bath. Damage to nerve cells in the brain can also make it difficult to express thoughts and perform routine tasks without assistance.

Symptoms vary from person to person, but may include:

- Forgetting events or personal history.

- Being moody or withdrawn, especially in difficult social or emotional situations.

- You cannot remember information about yourself, such as your address, phone number, high school, or university.

- Confusion about where you are or what day it is.

A person in the middle stage of Alzheimer's disease is able to engage in everyday tasks with assistance. It is vital to learn what else the individual can do or how to make responsibilities easier

c.Late-stage Alzheimer's (severe)

The symptoms of dementia are severe in the latter stages. Individuals gradually lose their ability to respond to their surroundings, communicate, and, lastly, control their mobility.

They can still pronounce words or sentences, but it is difficult for them to express their pain. As memory and cognitive functions deteriorate, significant personality changes may occur, necessitating careful care. Individuals at this stage may:

• Require 24-hour personal care help.
• Lose awareness of their environment and recent events.
• Changes in bodily ability such as walking, sitting, and, finally, swallowing
• Have communication difficulties.
• Develop an increased susceptibility to infections, including pneumonia.

At this point, caregivers may want to use supportive services that focus on providing comfort and dignity at the end of life, such as hospice care. AiZi will be very useful for people in the final stages of Alzheimer's disease and other Alzheimer's patients and their families.

EXISTING SYSTEMS

1]   Alzheimer's Daily Companion:

- ❖ The features of the existing system called "Alzheimer's Daily Companion" are as follows:

- Free and instant advice and tips on how to deal with Alzheimer's and dementia behaviors and situations.
- 24-hour assistance via free call or email.
- Access free information and training materials for Alzheimer's and other dementia caregivers, with no need for an internet connection.

- ❖ The Major Drawbacks of "Alzheimer's daily companion" are as follows:

- It does not include a GPS locator or any other device to address the patient's wandering issue.

2]   Alzheimer Caregiver Buddy

- ❖ The features of the "Alzheimer caregiver buddy" are:
  • Get immediate help and advice.
  • Gives the caregiver an idea of how to deal with ambulation, bathing and eating ie how to communicate with the patient.

- ❖ The disadvantages of this system are as follows:
- It is not patient centric
- It does not provide location information to the patient.
-

3]   Tell My Geo
- ❖ Features of "Tell My Geo" are:-

- Show the current location where it is.
- Provides the location of the patient to his relative.
- Stores the patient's medical information.
- ❖ The drawbacks of this system are as follows:

- It doesn't provide Notification of to-do list
- It doesn't provide an Alarm or App Reminder.

According to the author, the earliest signs of Alzheimer's disease are sometimes confused with old age or stress in the patient. A thorough neuropsychological evaluation can detect moderate cognitive impairments up to 8 years before the individual achieves the diagnostic criteria. These early warning symptoms can frequently interfere with regular activities. Memory loss is the most noticeable weakness, shown as difficulties remembering recently learnt data and an incapacity to acquire new information. Mild problems with executive functions such as attention, planning, flexibility, abstract reasoning, or abnormalities in semantic memory, or recalling the meaning of words of things, and the interdependence of concepts can also be indications of Alzheimer's in the early stages. Apathy may arise as one of the disease's persistent neuropsychiatric symptoms.

PROPOSED SYSTEM (AiZi)

This program's methodology is especially developed to achieve the program's objectives.

As a result, the needed phases include data collection, application design (including interfaces and databases), implementation, and testing.
Alzheimer's patients require a companion to assist them with their everyday routines.
This type of tool is desperately required, and our AiZi app provides a solution for Alzheimer's patients.
The following are some of the characteristics of the assistive toolkit:

[1] Personal data: This will comprise the carer's user name, age, address, and phone number, which will be maintained in the database.
[2] Task Schedule: This will include a list of all the daily chores that the patient will need to do. This plan will be saved in the database once more.
[3] Relative Information: This part will contain information about the patient's family members as well as images of them.
[4] GPS Tracking and Navigation: After entering the initial information into the program, it is saved in the database, and the user can leave the house if he forgets the path, then check the application and arrive at his destination.
[5] Food and medication reminders: The user will be notified of the time of food and medication via push notification.

[6] SOS Button: The app has an SOS button, which when pressed sends an emergency message to the details entered.

[7] Quiz and activities: It will include quizzes, usually about family, to assist him/her recall his/her relatives, as well as activities to help improve the brain.

[8] Medo: A list of drugs and activities to be undertaken by a person with Alzheimer's disease.

[9] Counseling: Will provide information about doctors who can help patients, including the doctor receiving therapy, as well as the rehabilitation center.

IV. METHODOLOGY

Depending on the sort of project, many approaches can assist you in developing it.

Increase of the mobile application modules

Depending on the sort of project, many approaches can assist you build it.

Increase in the number of mobile application modules

The roles of the modules including their relationship with their respective prototype are outlined below.

Login Module is the first add-on. The current session's home screen is presented to all users in this add-on; must be beforehand registered to enter.

Registration Module (Addendum 2) the registration area of this module is accessible via a form that requests some user information.

Addendum 3: Patient and Alert Module Main View The primary page of the patient view is produced in this module; here you will discover various important settings, as well as the development of an emergency button, which will immediately contact the assigned caregiver in the event of danger.

Module for Reminder Logging (Addendum 4) This addendum includes a form where you can enter a reminder, complete with an image, in case the patient's condition worsens and the patient loses both short-term and long-term memory, rendering the sufferer unable to remember anything.

Module 5 of Cognitive Games This add-on generates cognitive games to assist the patient in improving memory, remembering and recognizing objects, places, and people.

Nurse Master View Module.

Addendum 6 This module creates a view of the nurse assigned to the patient and its associated available actions, which, in addition to the device's special configuration, allows it to know the patient's situation at any moment. The patient is shown cognitive games.

Medication Management Module (Add-on 7) It is possible to include the prescriptions prescribed to the patient with this add-on. This will assist with reminders and messages when it is time to take the prescription.

8th addition: the Home Location Module. This add-on displays the patient's home address, as well as the route and time required to go there from their current location.

V. HELPFUL HINTS

A) Figures and Tables

Figures and tables depict our project visually depictable.

The AiZi Application's system architecture is depicted in Fig (a). Family members and those with Alzheimer's are linked, and they can send reminders and track the patient's whereabouts together.
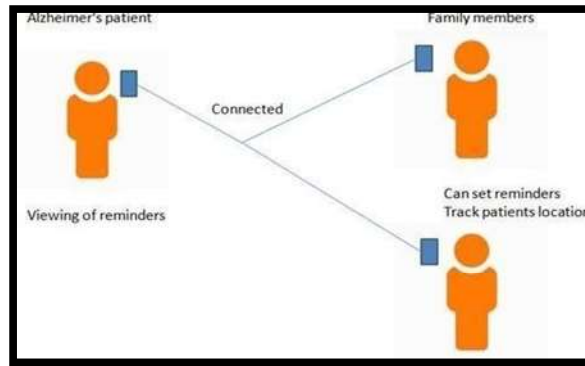

Fig (a)

The process structure of our AiZi is depicted in Fig (b). Our project's Flow Diagram contains four major components in total. Alzheimer's patients can register their information, which will be saved in a database. The same is true for the family member. The Firebase stores all of the updates.
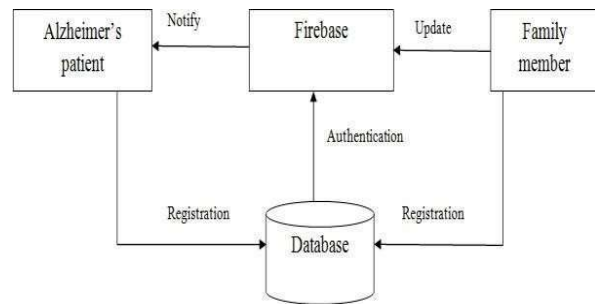

Fig (b)

Table:-1 shows a comparison of various previous applications vs. AiZi (Alzheimer Assist).

Applications	Face recognition	Task reminder	Multiple interface	Adding pictures	Arabic language	Alert notification	GPS tracking device
Timeless (*Timeless*, 2019)	✓	✓	✓	✓			
It's done (*It's done*, 2019)		✓					
MindMate (*MindMate*, 2019)		✓				✓	
Remember Me (*Remember me*, 2019)		✓				✓	
Alzheimer's Helper (*Alzheimer's Helper*, 2019)				✓			
AngelSense (*AngelSense*, 2019)			✓			✓	✓
Alzheimer's Assistant	✓	✓	✓	✓	✓	✓	✓

Table-1

V. Results and Discussions

A) About the case study

As an example, the mobile screen design for this program is intended to be easy and interactive for target consumers, so no training is required to understand its functions. The following Figma tools were used:

Prototype because this tool is different from other tools and provides a lot of advantages and freedom when creating a prototype.

One paper developed Adults with Alzheimer's disease can benefit from a mobile app that provides cognitive stimulation. In contrast to the case study, an application that, among other things,

a space dedicated to patient cognitive enhancement, as well as the ability to limit and determine the sort of user accessing the application, allowing us to detect if the user belongs to a patient or a caregiver associated with an assigned patient

This survey aims to identify app features that can help patients perform daily activities and also improve their quality of life.

B) SCOPE

The following is an Android project, and Android is evolving at a breakneck pace, with all new technologies incorporating the Android Enable feature, therefore is a lot to do in this project to help the users of this app and help you. Future improvements we believe that one of the biggest improvements/expansions we have in the future to provide better services is that the app now supports Android TV, making it easier for patients to sit in front of the TV. You should be able to access the app even while using the app. Check your to-do list to make sure you haven't forgotten anything.

In addition, we plan to link this app with Android watches that provide detailed information by clicking on the user's hand, eliminating the need for them to search on their mobile device. The app may also be linked in the future to generate a report on the user's activity over time and transmit it to a doctor so that medical care can be obtained as needed.

C) FUTURE IMPACT

Alzheimer's patients can benefit from regular reminders set by both family members and patients. AiZi Assist will assist patients in their recovery from Alzheimer's disease. Our software offers secure login, login, and registration in terms of security and privacy.

Future study will also concentrate on facial recognition utilizing deep learning algorithms, as proven by their superhuman performance and very accurate output findings. Both family members and patients can set daily reminders for Alzheimer's patients. AiZi Assist will help patients recover from Alzheimer's disease.

In terms of security and privacy, our app provides secure login, and registration.

Future studies will also concentrate on face identification utilizing deep learning algorithms, which have a huge impact on face recognition because of their superhuman performance and very accurate output results.

D) RESULTS

People with moderate Alzheimer's disease forget the minor things following the advent of indications that can be misinterpreted with age. By contrast in the intermediate stage, it is more noticeable in relatives if the symptoms occur suddenly.

You become grumpy because you can't remember or do certain things that used to be easy.As a result, it is critical to postpone cognitive degradation while beginning cognitive stimulation in the mild phase.

Dementia patients with Alzheimer's disease frequently wander. They may be readily tracked by family members from anywhere in the world with our AiZi app.
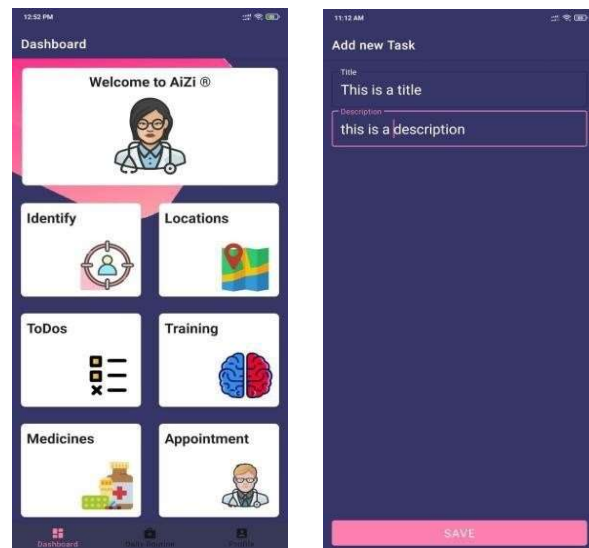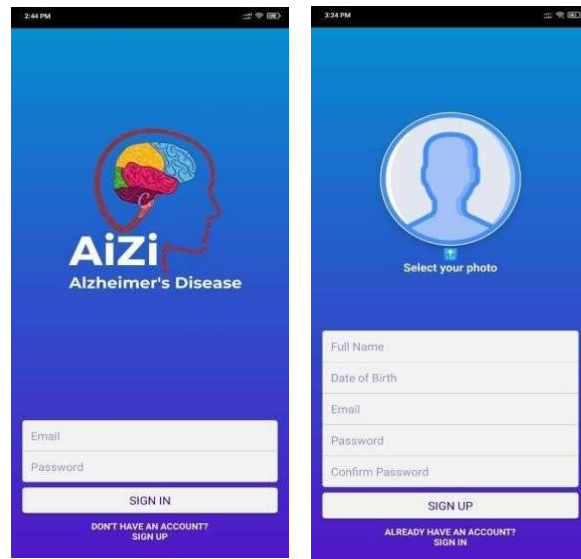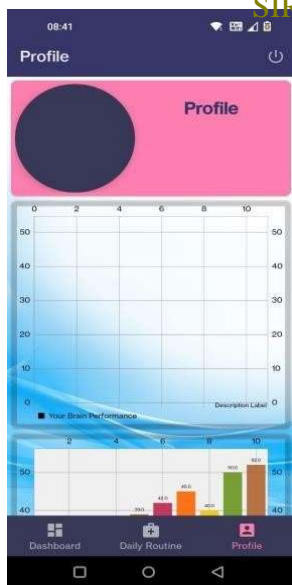
The patient's memory and mental health will benefit from the regular reminder. The Alzheimer's Assistant app adds to the existing range of software solutions that assist Alzheimer's patients in remaining sociable with friends and family. As a result, the app was designed with the appropriate knowledge, skill levels, and excitement to solve the issues associated with this condition in today's culture.

ACKNOWLEDGEMENT

CONCLUSION

The application's findings for patients with mild and moderate Alzheimer's illness show that the application under development is one of the additional supports to support caregivers of elderly or young people with Alzheimer's disease.

Users can keep their minds active, remember tasks that the app prompts them to do, and stabilize with continuous mental exercises without the need for a caregiver. A smartphone or iPod touch is one useful assistive technology that can be useful for both categories of personal features. Not only caregivers, but Alzheimer's patients as well.

Therefore, our project should also provide information such as counseling centers and their treating doctors.

This project opens a new path in the lives of Alzheimer's patients and provides them with an independent life where they can live freely and believe in our program.

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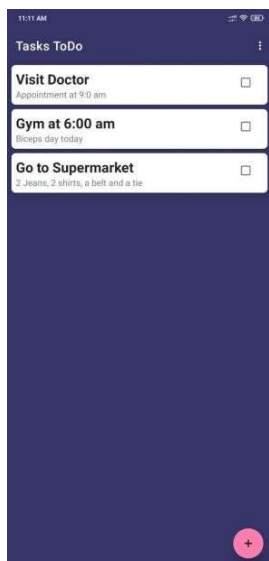[6] Hoffer, J. A., Venkataraman, R. and Topi, H. (2016). Modern Database Management. 12th Editi. Pearson Education.

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