

Andro App For Alzheimer's Patients

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Abstract: The aim of the paper is to focus on Important Aspect of the Diseases which is Effecting a Huge Amount of Population today i.e Alzheimers and building an Android application that could ease the everyday life of a person affected by Alzheimer's disease. This app provides various functionalities such as tracking movements of the patient through GPS, providing medicine and food timing notifications, daily routine tracker and quiz/Games to increase cognitive functioning of the patient and Timely Alarm for to Provide a Reminder of the App. The main objective of this project is to make people suffering from Alzheimer's as independent as possible. So this project is not only about creating an application but also address the problem of increased dependency of Alzheimer patients on caregivers and Helping them in a Techie Way as Each Person on Earth Owns a Mobile Phone Specially if you Consider India as India is Ranking Among Top Countries wherein its Population is Suffering from This Diseases.

Keywords: Android, Alzheimer's, Location tracking GPS, Alarm Notifier, Popups.

I. INTRODUCTION

In 2015, there are 4.1 million Indians with dementia and the total societal costs is about 52,000 crore. While the numbers are expected to double by 2040, costs would increase three times. India has second Most Number of Individual suffering from Dementia While worldwide in 2015, there were between 35 and 47 million people worldwide with AD. It begins over 65 years of age, though there are only 4% to 5% of cases of early-onset Alzheimer's beginning before this. As per a Research it affects about 6% of people 65 years and older. In 2010, dementia resulted in about 486,000 deaths. Alzheimer's disease (AD), accounts for 60% - 70% cases of dementia. It's chronic neuro-degenerative disease that starts slowly and gets worsen Up Over the time. The early symptom is difficulty in remembering recent occurred events i.e (short-term memory loss) [1] [15]

As we can know the Alzheimer patients have short term memory so they face some common day to day Problems like wandering off, forgetting their diet, forget faces/names of family members are the most common one. Some of the Big Problem that they may face is They Forget the Important Data like Their Address and Doctors treating them etc. To solve all this problem Alzheimer patients have to keep a caretaker with them.

But in today's IT World What if there is an application which will take care of the patient instead of the Human caretaker, which helps the patient to remember faces/names of family members, gives reminder to have medicine, helps them to follow full schedule, etc. It also helps the patients to work on their Mental Ability and estimate his/ her progress by progress report which will be generated by playing games. Solving problem games which will help him/her to stimulate brain functioning.

The purpose of this project is to make patients independent as much as possible and help him/her to live a Independent Life.

II. LITERATURE SURVEY

It affects memory. Alzheimer's disease (AD) is popular known as dementia in elderly people worldwide. Its expectation is that 1 in 85 people will be affected by 2050 and the number of people effected by (AD) will double in the next 20 years [2].

There are 3 phases of AD: A) Early stage B) Moderate stage C) Severe stage

A) Early stage:- In the early stages of Alzheimer's, a person may function independently. He or she may still drive, work and be part of social activities. Still, he/she may feel as if he or she is having some kind of memory lapses, such as forgetting familiar words or the locating day-to-day objects. Its Important to know here that During this Phase the Patient is Unaware that He/She is Victim of this Diseases and they takes it as a Usual Memory Loss.

Common difficulties which are phased include:

- 1) Memory loss that disrupts daily life.
- 2) Challenges in planning or solving problems.



- 3) Confusion with time or place.
- 4) Trouble understanding visual images and spatial relationships.
- 5) Decreased or poor judgment.
- 6) Withdrawal from work or social activities.

B) Moderate stage:- Moderate Alzheimer's is typically the longest stage and can last for many years. As the disease progresses, the person suffering with Alzheimer's start Suffering and requires a great Level of Care as if not taken Care Properly may led to Instense Bad Condition.

The General Common difficulties include:

- 1) Forgetfulness of events or about one's own personal history
- 2) Undergoing Quick Mood Swings, especially in socially or mentally challenging situations
- 3) Being unable to recall their own address or telephone number or the high school or college from which they graduated
- 4) Confusion about where they are or what day it is
- 5) The Confusion state while Selecting a Dress or Forgetting the Clothing to Relate with an Event
- 6) Trouble controlling bladder and bowels in some individuals
- 7) Changes in sleep patterns, such as sleeping during the day and becoming restless at night
- 8) An increased risk of wandering and becoming lost

C) Severe stage: - Its final stage of disease, wherein the individuals lose ability to respond to their external Stimula i.e Enviorment , to carry on a conversation and, eventually, to control movement. They may be able say words or phrases, but communicating and interconnecting becomes difficult. With the Time Passing by memory and cognitive skills continue to worsen up leading to personality changes and individuals need extensive help with his/her daily activities [3].

Common difficulties include:

- 1) Require full-time, around-the-clock assistance with daily personal care
- 2) Lose awareness of recent experiences as well as of their surroundings
- 3) Require high levels of assistance with daily activities and personal care
- 4) Experience changes in physical abilities, including the ability to walk, sit and, eventually, swallow
- 5) Have increasing difficulty communicating
- 6) Become vulnerable to infections, especially pneumonia

Assistive technology is a kind of devices or systems that support a person to maintain or improve their independence, safety and wellbeing. It tends to refer to devices and systems that assist people with memory problems or other cognitive difficulties, rather than those that are used to aid someone with mobility or physical difficulties.

Many devices such as smartphones and tablets, coupled with widespread internet coverage, are making technology more accessible for everyone in ways that we couldn't predict just a few years ago. Widespread use of social media (such as Twitter and Facebook) also means that many people now live some of their life in a virtual environment, as well as in a more traditional face-to-face one.

All this means that the nature of assistive technology for people with dementia is changing. Technologies and 'apps' (applications or programs for smartphones and tablets) that have been developed for the general public are increasingly being used by people with dementia as well. Over time these mainstream technologies will probably replace many of the products that were developed specifically for people with Alzheimer disease [4].

Technology can be used in a variety of ways, and for a variety of purposes. It can support people in carrying out everyday tasks and activities, enhance a person's safety, support their social participation, and monitor their health. This Assistive technology can prove beneficial to people with problems like :

- 1) Hearing and eyesight
- 2) Finding their way around
- 3) Memory and cognition (thinking and understanding)

Although the onset of Alzheimer's disease cannot yet be stopped or reversed but by using assistive technology like mobile application it can make the patients independent and improve the quality of life of patients with AD or dementia. By considering symptoms in various stages, technology can be used for the patients in mild stage. [5]

In recent years, mobile phone technology has improved processing power, embedded sensors, storage capacity, and network data rates has boomed . Mobile phones of today have evolved from merely being phones to full-fledged computing, sensing, and communication devices. These advancement in mobile phone technology have paved the way for exciting new applications. Smartphones can be used as helping hand in the Field of Medical Science Now . [6]

In this paper, we propose using smartphones to Enhance the quality of life Of an individuals Suffering from (AD). The goal is to maximize the patients capabilities and overcome disability. The focus of our work is to improve people's



abilities to perform activities of daily living and hence to promote independence and participation in social activities in much better way . Our work also aims for reducing the burden on caregivers by increasing the AD patients sense of competence and ability to handle behavior problems.

Following Iconic features such as GPS tracker, Routine tracker, Reminder, Flashcards, SOS, etc. are included in the application that can help in stimulating the patient brain, decreasing the depression and also reducing the symptoms of AD. The primary aim of the current project is to offer persons with Moderate (AD) an assistive Help Via An Android App [7].

GPS is technique of surveillance on an Object location through use of the Global Positioning System (GPS) which in turn track the location of an entity or object remotely with Precise Location . Using this one can pinpoint longitude, latitude, ground speed, and course direction of any target . GPS location tracking feature in this application can be used here to track location of patients suffering from (AD) as there is high risk Patient forgetting its Home Address [8].

Timely Reminder is another feature in our application that allows users to set notifications for themselves and create lists work List . It will remind its users to take the correct medicines on time and record the in-take schedules for later review by the caregiver or family Members.

It will also alert the patients about potential drug-drug/drug-food interactions through push notification or alarms. It will issue an alert approximately 5 – 15 minutes before the scheduled time to take certain medicine. The alert will be issued repetitively until it is cancelled by the user. It will record the time at which its user cancels an in-take alert and regard that at the time that specific medicine was taken. These medicine in-take records can be stored on board and synchronize with the database [9].

Personal emergency notification system is an important tool for personal security and safety .There are two kinds of common emergency notification systems. One is designed to allow the user wearing a designed button with a connection to the device host at home. Another is specially designed single-function phone (the phone for elders) whose back has an SOS button. Users can quickly push the designed SOS button for help via sending (short) messages or phone calls to default emergency corresponding people (caregiver) [10].

III. EXISTING SYSTEM

3.1) *Alzheimer's Daily Companion* [11]

The features of the existing system called “Alzheimer’s daily companion” are as follows:

- Free and immediate advice and tips for dealing with Alzheimer’s and dementia behaviors and situation.
- 24-hour assistance via toll free Call or email submission.
- Access to free Alzheimer’s and other dementias caregiver resources and training materials.
- No internet connectivity required.

The Major Drawbacks of “Alzheimer’s daily companion” are as follows:

- It does not provide GPS tracking or any other mechanism to solve the wandering problem of the patient.
- It does provides Independence to the Patient and always requires a Care Taker to keep a Track thus useless
- Its not Patient Oriented application.

3.2) *Alzheimer Caregiver Buddy* [12]

The features of “Alzheimer caregiver buddy” are:

- Get instant help and advice.
- Provides the Caregiver an Idea about how to deal with wandering, bathing and meals i.e how to interace with Patient.

Drawbacks of this system are:

- It is again not Patient oriented.
- It doesn't Provides Location information to the patient.

3.3) *Tell My Geo* [13]

The features of “Tell My Geo ” are as follows:

- Display the Current Location where he/she is .
- Provides the Patient Location to its Relative .
- Stores the Medical Information of the Patient .

Drawbacks of this system are as follows:

- It Doesn't provides Notification of to do list.

- It doesn't provides Alarm of App Reminder .
- It doesn't gives Information related to its Family Members

IV. OUR APPROACH

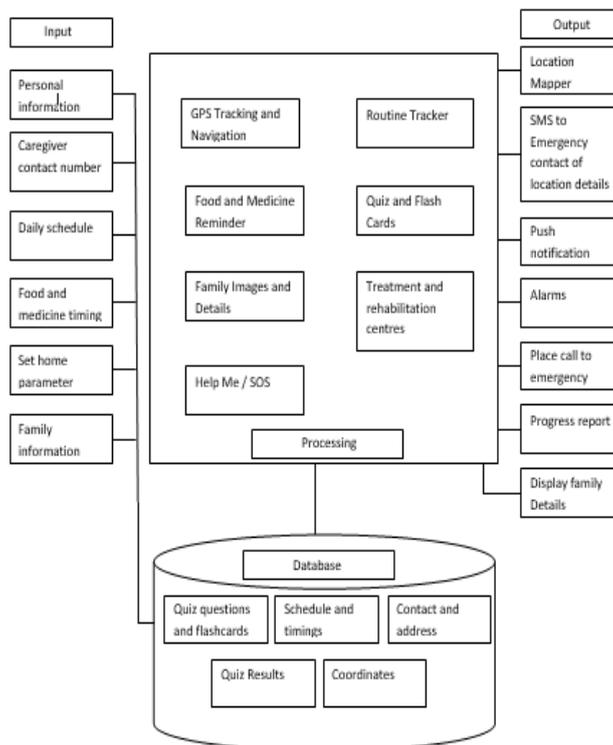


Fig1: Block Diagram of Alzheimer App System

The features of assistive toolkit can be briefly summarized as follows:

- 1) **Personal Information:** It will Include user name, age, address and contact number of Caregiver stored in the database.
- 2) **Task Schedule:** This will include schedule for all the daily chores to be Performed by Patient . This schedule will be again stored in the database for easy retrieval.
- 3) **Relative Information:** This part will store the Information of Patient Family Member along with their Photos .
- 4) **GPS Tracking and Navigation:** After Providing the Initial Details in the App it will be stored in the Database and User can Leave Home if he/she forgets the Route then he/she can Look into App and Reach Destination.
- 5) **Food and Medicine Reminder:** User will be reminded about their food and medicine timing through push notification.
- 6) **SOS Button:** An SOS Button is included in the App wherein if he/she clicks it, an Emergency Message will be Forwarded to the Details Provided.
- 7) **Quiz and Games:** It will include certain kind of Quizes mostly related to Family which will help him/her to remember his Family and Games that help Boost Brain .
- 8) **Medo :** It will include the list of medicine, the exercise to be performed by the user suffering from AD
- 9) **Counselling Center :** It will provide data of Doctors that can help Patient Including doctor where his/her Treatment is Going on and also information about the rehabilitation centre.

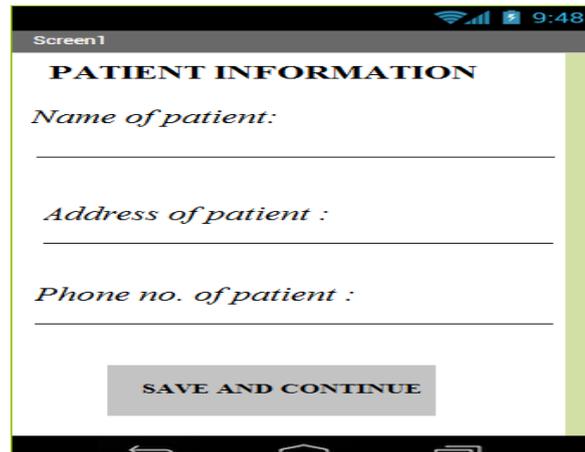
V. IMPLEMENTATION

1) Setup:

The following Images are of the App specifying the information that has to be provided by the user at the beginning.

(a) Patient personal information:

In the beginning, user will provide basic information of the patient such as name, age and contact number and other details which ever Necessary to generate its Profile.



Screen1

PATIENT INFORMATION

Name of patient:

Address of patient :

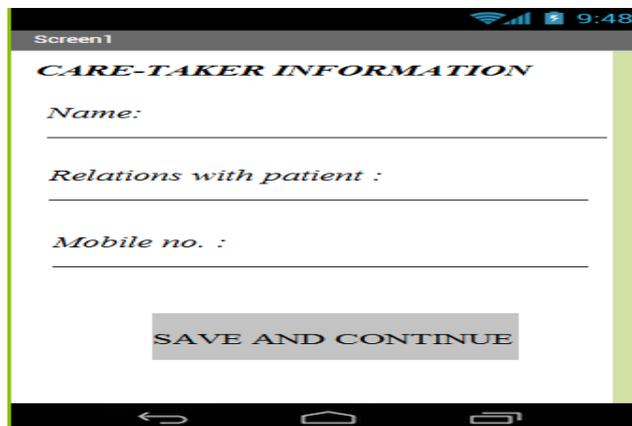
Phone no. of patient :

SAVE AND CONTINUE

Fig 2: Patient personal information

(b) Caretaker personal information:

User has to provide basic information such as name, contact no. and email id of the person who will be taking care of the patient along with an Certification Number to be Uploaded by Care Taker to prove his/her Identity.



Screen1

CARE-TAKER INFORMATION

Name:

Relations with patient :

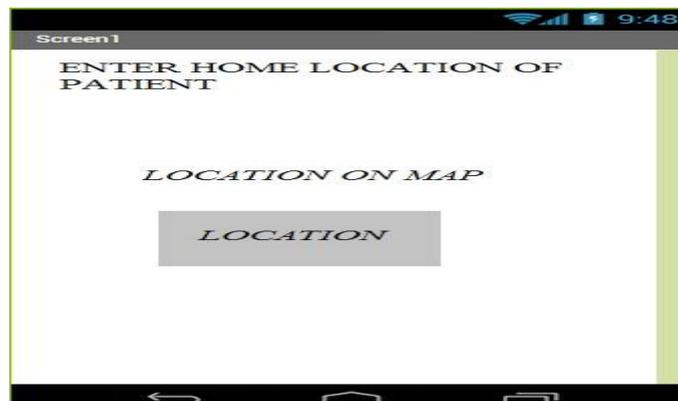
Mobile no. :

SAVE AND CONTINUE

Fig 3: Caregiver personal information

(c) Location setup:

In case the User forgets his/her Home Location it will be difficult for him to return back So in this case he/she has to Enter the Detail Location in App.



Screen1

ENTER HOME LOCATION OF PATIENT

LOCATION ON MAP

LOCATION

Fig 4: Location setup

(d) Reminder setup:

Our App Provides an Extensive Feature to Create a Event List wherein he/she will be able to create Event list of his day to day Activity and Keep Track on it to complete the Work and Avoid Forgetting any Task.

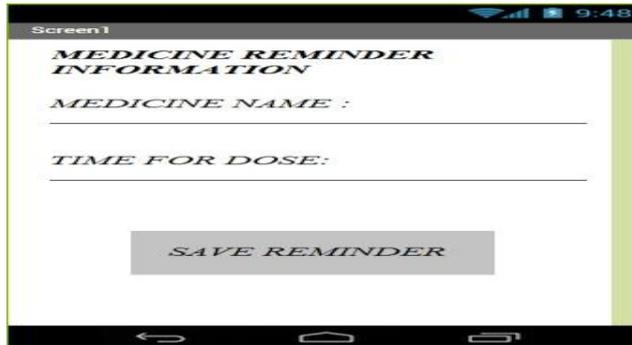


Fig 5:Reminder setup

(e)Gallery:

The Gallery Provides Options to Edit and Add the Family members in the database wherein he/she will add Images of his/her Family Members and can Even Edit and Update the Images.

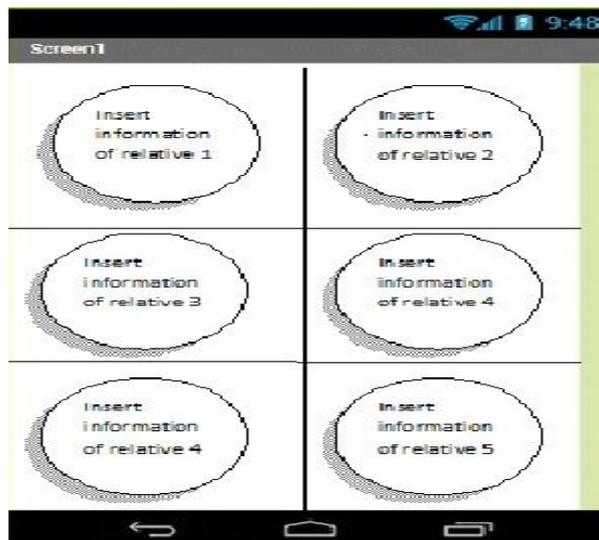


Fig 6: Gallery setup

2) Main Page:

The following images specifies the important features of the overall application.

(a)Home:

This page includes button such as navigation, schedule, reminder, gallery, quiz and help me button which will help the user to tackle some of his daily problems and Select Option as per his/her Requirement.

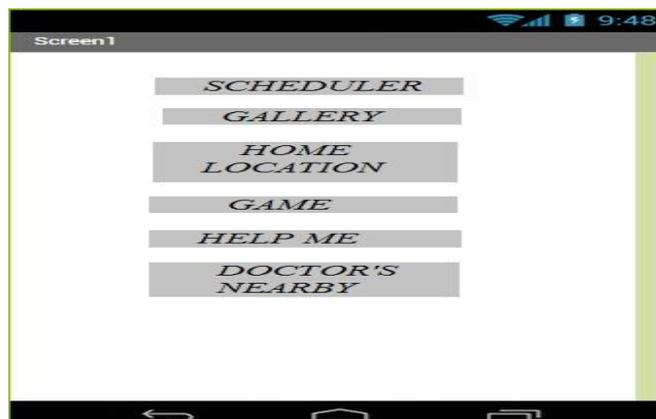


Fig 7: Home

**(b) Location tracker:**

User just need to specify his source and destination. Location mapping will begin using GPS and navigation feature as soon as the user will leave from home parameters. And if the user forgets the returning route to reach to the source then the coordinates which will be saved in the database using GPS, will help the user to map the route for returning back.



Fig 8: Location tracker (Not Actual Image)

(c) Schedule:

User will include schedule for all the daily chores starting from morning to night like meal timings, reading books or newspaper, medicine timings and so on. User can also delete and view the schedule by using “delete” and “view” buttons.



Fig 9: Schedule (Not Actual Image)

(e) Quiz:

It will include certain kind of games which will stimulate the user’s brain and even his/her Family Identification game so that he remembers them .

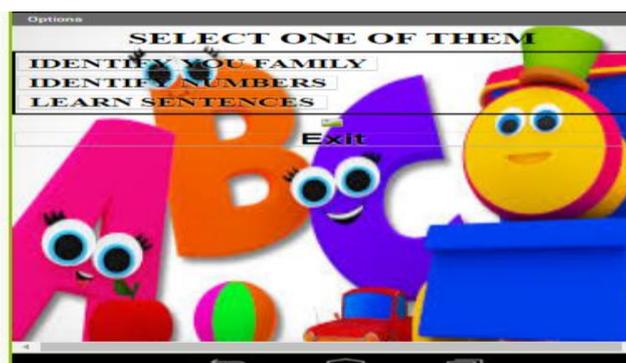


Fig 11: Quiz

(f) Counselling Center:

It will include the list of information such as address and phone no. of the center along with the Information of their own Doctor.

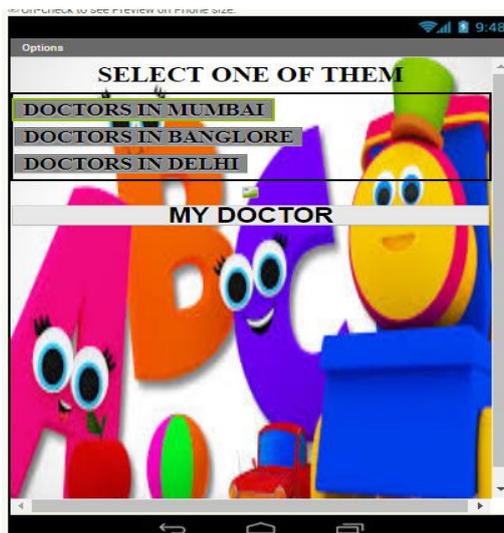


Fig 12: Rehabilitation centre information

VI. FUTURE SCOPE

Since its an Android based Project wherein the Android is developing with a great Speed and all New Technologies are Coming up with Android Enable feature the So there are Lost of Future Improvement that need to be done on this Project which will help the User's of this App and Help us to provide a better Services

One of the Biggest Future Improvement/Scope that is in front of us Currently the App to Support the Android T.V so that Patient if even Sitting in front of his T.V he/she should be able to Access the App and Check out the Task List if he/she has Forgotten anything.

Apart we have Even Plans to Link this App to Android Watch which thus Providing a detail Information on a Click on the User's Hand thus he/she Need not require to Search the Mobile.

The App has Even Future Scope of Inter Relating and generating a Report of User's Activity of Particular Time Period and Sending it to the Doctor So that Time to time Medical Care can be Taken.

Reminder and scheduling effectiveness:

Every android application has a particular technology after which it gets outdated in order to keep the users from preferring another and an improved version of a similar technology. So we will update our application with some new technologies to keep our self in the competition with other competitors and we would even plan to Tie Up with Companies So that We could Provide a Better Service.

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VII. CONCLUSION

Looking at the Current Systems in the Market and Their Services We can Say that Our Project / System has Overcome all the Drawbacks of System Available So far and we have made a thorough in depth research of the requirement that a Alzheimer Patient suffers and Targeted the Problems in more Precise Way also the Current Available Systems have lagged few Information which was needed

The must and thus our Project even provides those Information Such as Counselling centers and the Doctors that are Treating them .

Thus this project will pave a new way in the Life of Alzheimers patient providing them a life of Independence wherein they can Believe in our App and leave freely.

Thus we can Conclude that in coming next Months this App would be developed totally and launced in the Market and Serve the Needs of the Patient's.



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