Bio-Mapping Application

V.senthil kumar[1], G.Kanagaraj [2], T.Primya[3], P.Saranya[4]

[1, 2, 3, 4] Dept of CSE(AP)

[1, 2] Kumaraguru College of Technology, Coimbatore

[3] Dr.N.G.P Institute of Technology, Coimbatore

[4] Sriguru Institute of Technology, coimbatore

Abstract- *Wildlife conservation organisations and individuals who are deeply involved in the research and/or conservation of wildlife have started incorporating technological advancements into their efforts. This application endeavours to aid them in their efforts by enabling them to map out their activities so that it can be recorded and viewed by like-minded individuals and organisations. Researchers can map the various species of flora/fauna that they come across in the various National Parks or Wildlife Reserves that they are in. This would also enable people to view the basic biological information of that particular component of the ecosystem. The location of where it was come across is tracked to a live map and this enables other rangers/researchers to roughly triangulate the habitat of the flora/fauna. This would not only enable them to keep track of the biodiversity, but also ensure that they can prioritise efforts to protect the ecosystem from dangers even more efficiently. This application already has interest from some organisations that are involved in wildlife conservation and has even more potential for development in the future that can enable India's wildlife warriors to effectively use technology in their fight to keep track of and preserve our biodiversity.*

Keywords- GIS, Android Studio, Map Module, Filtration Module, Heat map option

I. INTRODUCTION

In the field of plant biologists and many researchers who study about various species, they have to constantly search for the species they have to research for them to make a research on the species they want to study about. Our group made a study on how they were keeping track of the species they want to study, and we learnt that they use the old school methods of noting the latitude and longitude with a compass and they write it down on a sheet they have with the species name.

So, we made our Bio-Mapping Application which reduces and makes their job much easier, as it can do multiple functionalities which would reduce the burden of the researcher as they don't have to carry the note, compass and pens when they go into the expedition of finding a species.

Our application can allow the user to take a picture of the plant he want to study later, and the picture along with the name the user gives gets stored in the database with the latitude and longitude, and the researchers can even open a map view to see all the plants and animals which were spotted in the area near him.

If the user wants to go to a particular species near him even the direction option is available to him which guides the user to the particular species and if a new species is spotted and the data of the species is stored it gets stored with the name of the researcher who spotted it along with the date and time when the particular species was spotted at the location.

II. LITERATURE SURVEY

2.1 Bio-Mapping Application – A Justification

The main reason this application would be very useful for the researchers is because it reduces the burden of carrying a compass and a notebook and note each and every plant they seek.

As our application is made of SQLite database and this has a database which is available 24x7 in the net the data can be accessed at any time anywhere and all these resources are within the hands, in a mobile phone which is nothing much to carry, and everything is loaded in the internet and can be accessed anytime that makes the job easier for them when compared to the traditional methods they are using till now.

2.2 GIS

A geographic information system (GIS) is a system designed to capture, store, manipulate, analyse, manage, and present all types of geographical data. The key word to this technology is Geography – this means that some portion of the data is spatial. In other words, data that is in some way referenced to locations on the earth. Coupled with this data is usually tabular data known as attribute data. Attribute data can be generally defined as additional information about each of the spatial features.

An example of this would be schools. The actual location of the schools is the spatial data. Additional data such as the school name, level of education taught, student capacity would make up the attribute data. It is the partnership of these two data types that enables GIS to be such an effective problem-solving tool through spatial analysis.

GIS is more than just software. People and methods are combined with geospatial software and tools, to enable spatial analysis, management large datasets, and the display of information in a map/graphical form.

2.3 Bio-Mapping Application Implementation

As the current method of study is paper and pen, the implementation is done with the mobile phones, the researcher should get the application installed in his/her mobile phone and they should register their accounts and after registering they would be given access to use the application's feature and they can do the following functionalities using the application insert, check nearby, path to the location, view the data inserter name and take picture of the species too and nearby species can be viewed with the help of the map.

2.4 Bio-Mapping Application using Android Studio

The Information about various species are collected by researchers from different geographical locations but with very little metadata information and that leads to duplication of data and information.

Develop a mobile based application to collage the information about various species from different geographical locations with its latitude and longitude coordinates and the information stored need to be retrieved and viewed by filtrations techniques, avoiding duplication and the application consists of following components and how these components are put to use are mentioned in the functionalities of the application mentioned below:

Registration:

The user registration panel where the users of the application have to give in the basic information about themselves like name, dob, age, username, password with these username and password the user can login and use his/her Mobile to do the functionalities

Storage of Data:

The application user can load the data from anywhere across the globe and the database would store the data the user wants to store as the latitude and longitude is available worldwide and the data stored in the database are the name of the user who is giving the data, picture of the species, latitude, longitude and date.

Retrieval of data:

From the database the data is retrieved at ease as the when the user wants to know what are the nearby species which has been spotted, the user can open the map it simply displays all the species with a balloon mark pointing to the location where it was spotted along with the date, time when it was spotted along with the species name.

2.5 BIO-MAPPING APPLICATION USING GIS

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So, we made our Bio-Mapping Application which reduces and makes their job much easier, as it can do multiple functionalities which would reduce the burden of the researcher as they don't have to carry the note, compass and pens when they go into the expedition of finding a species.
Our application can allow the user to take a picture of the plant he want to study later, and the picture along with the name the user gives gets stored in the database with the latitude and longitude, and the researchers can even open a map view to see all the plants and animals which were spotted in the area near him.

If the user wants to go to a particular species near him even the direction option is available to him which guides the user to the particular species and if a new species is spotted and the data of the species is stored it gets stored with the name of the researcher who spotted it along with the date and time when the particular species was spotted at the location.

A geographic information system (GIS) is a system designed to capture, store, manipulate, analyse, manage, and present all types of geographical data. The key word to this technology is Geography – this means that some portion of the data is spatial, and this GIS helps our application in managing the geographical features which is provided by google API

and our application path directing feature with typically shows the direction to the desired species nearby.

III. ISSUES IN THE EXISTING SYSTEM

The existing system has been on use for many years, but every method has some flaws and some of the flaws we found out in the existing system are as follows:

Portability:

In the existing system, there is there is no portability that is the researchers has to carry their compass along with their directory to store their sightings and thus this system cancels the idea of portability.

Identification:

In the present system, the identification of species is by the name, one cannot remember all the scientific names and the classification of the species our application can store the species name and retrieve at any time and the species name is stored along with image.

Location and path:

In the current system one can find the species by checking the latitude and longitude which they must check the compass periodically and go towards the direction of considering the latitude and longitude our improved application overcomes this problem with ease as it even shows the path to the specific species we want to know the location of.

Availability:

If a researcher doesn't carry his compass and noted down latitude and longitude of the species, he/she cannot find the specific species.

IV. PROPOSED SYSTEM

4.1 OBJECTIVES

To overcome the issues in the existing system re-modification is required. This project consists of the following objectives:

4.2 Everyday Mobile Phone

In the existing system we said that portability is a big problem faced by the existing system our application

overcomes this as it runs in a mobile phone which is known for its portability.

4.3 Search by

In the present system, compass and paper is used to search a specific species but our application allows to do the same with modern technologies and we can search for nearby species just by pressing the map option it displays all the species which were spotted in the nearby area.

4.4 Showing the path

Our application can show the path to a specific species if we click on the species popup balloon in the map and press the show direction to option it displays the path to the species along with the distance from the current area to the species from the current location where you are standing and multiple filtration techniques are used in the finding the species.

V. MODULE DESCRIPTION

The modules for the project consists of all the necessary functionalities that are done for overcoming the problems in the existing old system it comes with advancements made in the application which to overcomes the old problems, some of the modules which made this possible are mentioned below

5.1 Storage Module

The Bio-Mapping application has its storage module as its first and most important module as it makes most of the functions possible, it stores the data of the researcher and the data given by the researcher and stored in the database and it also stores the data of the species with the name and the photo of the species and it is retrieved later for future purposes which are explained in the following modules

5.2 Map Module

After storing the data in the database the data has to be retrieved from the database to be used for mapping the species here the main component is GIS where we are storing the species location on the map with the latitude and longitude, these details are retrieved from the database and represented in the map in form of a popup red balloon these data is gathered from the database and represented in the map and various filtration techniques can be applied.

5.3 Filtration Module

When the gathered data is needed to be accessed it can be done by various filtration techniques like showing the species in dense areas like a particular species is found more at a particular area than most of the areas, and displaying the species using heat map methods etc.

VI. DISADVANTAGES OVERCOMED

6.1 Features in Application:

The features in our application has overcome many disadvantages in the existing system our application has made everything digitally, the researchers can easily login and access the data needed for them and it is very user friendly, the location is represented in maps and even the path to the accurate location of the selected species is available in the path finder option and the cluster of species can be available in the Heat map option

6.1.1 Registration:

Registration form is where the researchers would be able to register their accounts and would be able to login later.
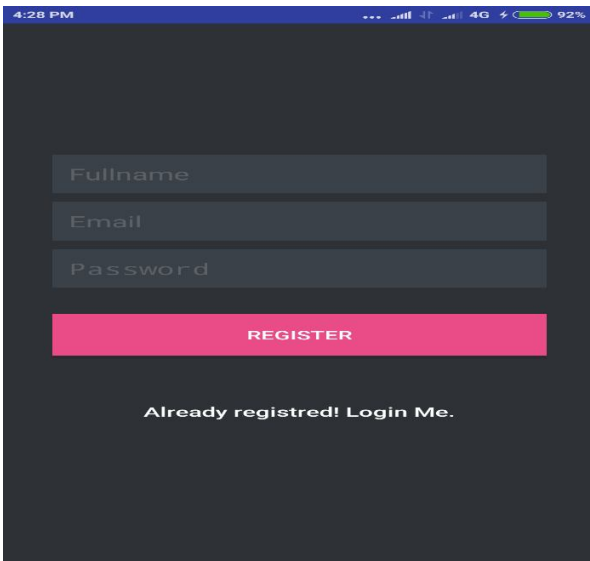

Fig 1. Registration form

6.1.2 Login:

The login form is where the registered researchers would be able to login and access the information of the species from the database, and also would be able to upload.
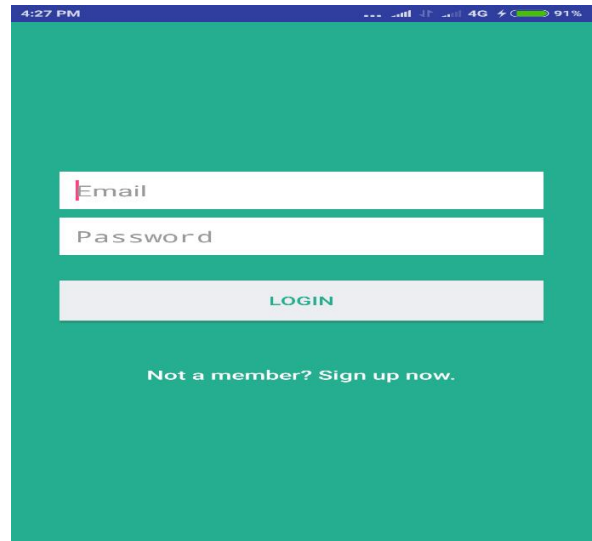

Fig 2. Login Form

6.1.3 Storing:

This is the page where the researchers would be able to store the information about the species which they would like to store, and we can also see the view in map option where the user would be able to view the species marked in the map.
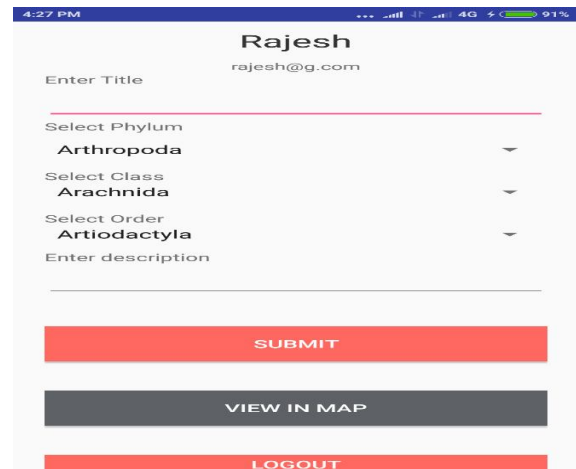

Fig 3. Storing data form

6.1.4 Map display:

This page displays the map where we can spot all the species which were spotted nearby in the area and when the species pop up balloon is pressed and the path button on the application is pressed it leads the user to the accurate location of the selected species.
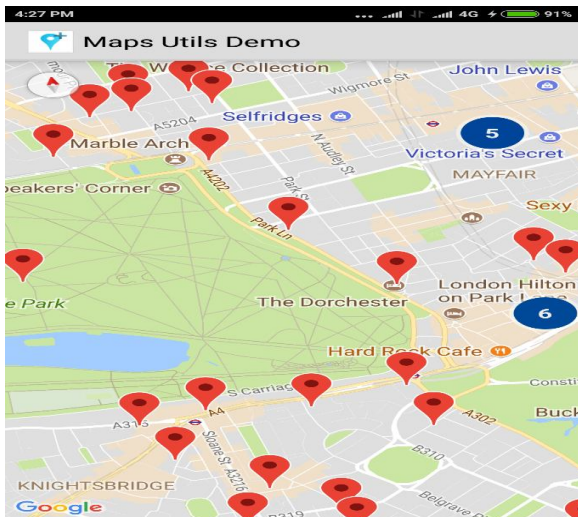
Fig 4. Map Display

VII. CONCLUSION AND FUTURE ENHANCEMENTS

7.1 Conclusion:

By implementing this proposed system as a real time project many disadvantages mentioned early can be rectified. Moreover, the project phase is completed successfully. This project is made with pre-planning, that it provides flexibility in operation. Time taken to retrieve the data from the database will be in seconds, so time consumption is reduced, this project "BIO-MAPPING APPLICATION" is designed with the hope that this application would reduce the burden of the researchers and make their job even easier as they are the ones who are conserving the future of our ecosystem.

7.2 Future Enhancements:

Nowadays technology is growing very fast even before 6 years we couldn't imagine us using satellite images of earth for our purposes, since the technology growth is never ending the project can be made better and better with the rise in needs, and the application can be made better with implementation of algorithms which can make the performance of the application even faster.

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