Nature Trail Location Based Discovery Application

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Abstract-*This paper discusses the theoretical assumptions and design aspects of developing an android application that supports nature learning. This project aims to develop an application that would help people to travel through different unfamiliar locations. It will load the user's location and display points of interests. It will help the user to travel through the trail and will also notify the user about information of bird and tree species along the trail. Its objective is to provide quality information about a location available publicly at any time according to the convenience of the user.*

Keywords: Location based app, nature trail, geo – location, Smartphone, android, trail, GPS tracking.

I. INTRODUCTION

A Nature trail was organized at Pashan Lake on 26th January 2017 for school students by Centre of Environment Education (CEE). These students were given a specially designed "Nature Observation Book". This book contained information about the area such as flora and fauna, species of birds and ecology. This book also contained information about the history of the place and how there were several endangered species. After the nature trail, it came to their minds that such information should be made available to the public that visit Pashan lake ,but it would not be possible for CEE to provide a tour guide for all the visitors that come to Pashan lake as they don't have the man-power to fulfill the demand. Thus the idea to create a Nature Trail Location Based Application for Pashan Lake was born. This app will load the user's location either through GPS or by allowing the user itself to manually enter the location and display points of interest.

Initially the screen shows a full screen map with the user's location, the destination location and an arrow pointing the direction to go. It will guide the user to travel through the trail (route) and will notify the user if he/she is in the proximity of an area which has good information related to that area. As the user moves closer, the app will provide detailed information of the key point in the form of audio, video, image, web link etc. For Example: A certain tree species, with text details like species info and history and ecological benefit. A photo slideshow of the tree's general appearance, leaf, flower, bark etc that user can see and use to identify the tree around them. It will also provide the information about the bird species and immediate surroundings. There will be a button on screen to go to the next location. On clicking the next button, the information on the screen goes away and it is again a full screen map as explained above, and the cycle repeats until user want to continue the trails.

II. MOTIVATION

When a person visits a new location (e.g. a tourist location or a wild life sanctuary) which is unfamiliar to him/her, it is important for them to have the basic knowledge about that location. The information enhances the users experience by directly involving them in the exploration about that location. When they travel to new locations, they might need an instructor or a guide to help them through the place, to give them important facts, and sites worth seeing of that particular place. The people who visit a new location won't have enough knowledge about the location and also it is not always possible to provide a guide for them.

So we came up with an idea to develop an application which will be very helpful for the end users to find their way through unfamiliar locations even when they don't have basic knowledge of. At the same time make it a user-centric experience.

III. LITERATURE REVIEW

A similar paper was published by Ryan Dias, Terje Valjataga, Priit Tammets, Kairit Tammets, Pjotr Savitski published on 8th August 2017 titled Location Based Game Development Tool Kit. According to the paper it has been a norm that learners with their personal devices take an active role through accessing interpreting and processing informational artifacts on the go. The paper discusses the developing a tool kit that supports adventure learning. The smart zoo project aims to design and develop a tool set which allows teachers but also students to take an active role in designing location based games, adventure trails and other challenges such as quiz, assignment, etc. on personal mobile devices [2].

There is this application called "Louisiana's Creole Nature Trail Application" which is similar to what we are

going to implement for Pashan Lake. This application trail is a hands-on opportunity to experience one of America's untamed natural wonders near Lake Charles. The Louisiana Scenic Byways are a network of roadways within the US in state of Louisiana's that have been deemed of cultural, historical, or scenic value. The routes follow various segments of the state-maintained highway system, usually rural in character, and are mostly located in the central and southern areas of the state [1].

The Creole Nature Trail travels through thousands of acres of untouched wetlands that reflect an area blessed with some of the most beautiful scenery imaginable. The trail takes you to three different wildlife refuges and a bird sanctuary. The combination of fresh and saltwater areas provides a unique habitat for many of the plants and creatures that live along the byway [1]. This application helps the visitor to travel through the trail and also provide information about the animal and bird species residing there.

IV. PROPOSED SYSTEM

The system architecture consists of some components which are as follows:
- Smartphone
- GPS tracker
- Android Application

Nowadays most of the people own a Smartphone. Almost all the phones have GPS chips embedded in them. Using the GPS feature we can enhance the user's experience of exploring nature and various ecological habitats. Taking advantage of this we implement a location based nature trail android application.

When the user opens the application they would be prompted for the location. The location could be got by enabling G.P.S or manually entering the location. The app then fetches the route data from the database. The database would contain multiple attributes such as the trigger coordinates, proximity range location information, tree species information, bird species information etc.

Once the data is fetched and loaded, it is the task of the UI to arrange the information in an appropriate readable manner. The trail data is displaced on the screen to the user and the user can begin the trail by simply moving to the next location .Once the user reaches the pre defined proximity then a function is triggered. The information regarding the location is displayed to the user. The user may choose to stop at the location, read and explore the area. After that the user may

move to the next location or directly skip the current location and move to the next location.
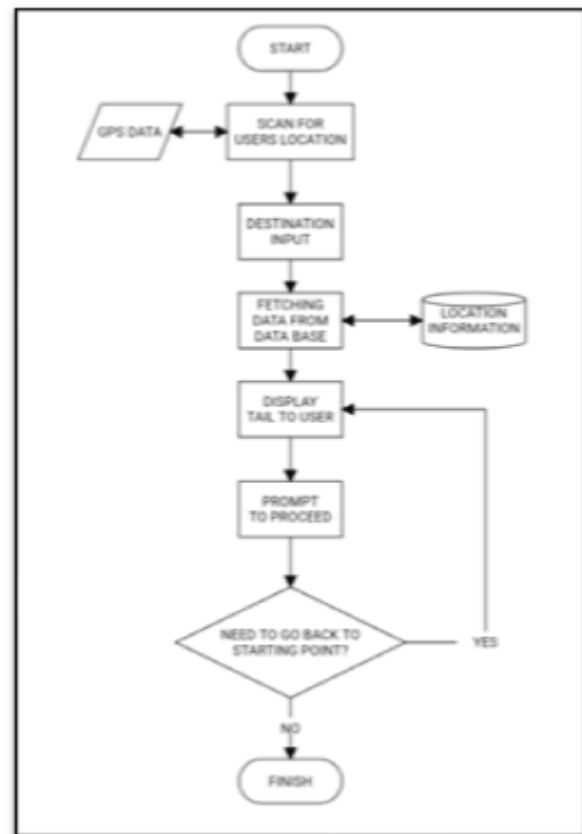

Fig. 1 Flow chart

There are three cases to consider when the user enters the location .Based on the users current location and the starting point of the trail the following cases are presented.

1) When user's location and the starting location point of the trail is the same then we start the trail normally.

2) When the user's location is in the middle of the trail then an option is presented to the user to either start the trail from the current location and visit the unexplored parts or start the trail from the starting point itself.

3) If the user's location is at the end point of the trail, then the trail could begin from the last point if the data is not sequential and is not dependent on the previous location.

While displaying the information we could also provide an audio or video experience to the user by either embedding the video in a link or preloading all the images and videos. It must be kept in mind that the user is using the application for an interactive knowledgeable session. The data in the database is divided into many attributes such as the

sequence of the points, latitude, longitude, description, Image, video, proximity as shown below:

Seque nce	Latit ude	Longit ude	Descrip tion	Feature img	Video URL	Proximity limit
1	1.985 74	1.4231 56	Plant a ;Bird B	Image path	Video path	10mts
2	1.754 24	1.4269 84	Plant C; Bird D	Image path	Video path	10mts

Table1. Database schema

V. FUTURE USE AND SCOPE

The purpose of this idea is to offer knowledge to people at a given location and even help them through the area if they are not familiar with the place. Trails will be displayed which gives the user insight about what a given place has to offer. In order to achieve this we will be using a database which has the facts and information preloaded with multimedia if available. GPS would be used to determine the user's current location. Based on the GPS readings the next location would be displayed. If the user wishes to trace back the followed path the option would be made available. Also the user would have the freedom to skip a certain location and move onto a next one.

While developing this application our main focus is to develop community engagement with nature. This technology will help the user to know more about their surroundings and the nature. We can use this application on any android phone. Once the application is ready it can be expanded to create an open source resource for species at any geo-location.

VI. CONCLUSION

This app helps the user get information about unknown places. It will guide the user through unfamiliar locations even in the absence of the instructor. It will help the user to be aware of its surroundings. It will also help in boosting the user's knowledge about animal and plant species.

ACKNOWLEDGMENT

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