Smart City Hackathon Rajkot 2020-21

A Project Report On

Industry Type: Environment

Problem ID: SCHR033

Problem Statement: Plant a tree app

Team ID: TM000079

Team Leader Details: Aghera Kevin Bipinbhai

Faculty Details: Niraj Bhagchandani

Team Members:

1. **Aghera Kevin Bipinbhai (kpatel9899s@gmail.com)**
   Contact No. : 8140169137
   MCA Semester - 4 , Atmiya University – Rajkot

2. **Changela Savan Prasudbhai (savan.changela273@gmail.com)**
   Contact No. : 9537839403
   MCA Semester - 4 , Atmiya University – Rajkot

3. **Garach Devang Bharatbhai (devanggarach@gmail.com)**
   Contact No. : 8460352525
   MCA Semester - 4 , Atmiya University – Rajkot

4. **Panara Shivang Dilipbhai (shivangpanara@gmail.com)**
   Contact No. : 9106861734
   BE in Electronic & Communication – 6, Atmiya Institute of Information and Technology – Rajkot

Synopsis Abstract –

CareTree is designed to aware and motivate citizens to grow trees ad take care of trees. For that citizens can request to NGO for sapling or plant a tree in the neighborhoods.

We build the app for that citizen can request trees from directly NGO and NGO team can accept that request and deliver the sapling to the citizen. NGO member came with Tree kit having sapling, tree caring gadget and tree protection cage. After that our app will provide all facility like water manage, damage control and same informatics notification.

If citizen don't need to plant tree but want to care the trees, For that we are provide map facilities in this app to where the trees are damaged or having same problem. If citizen near that location they can help tree, example if tree water level down, cage damaged or other issues.

Literature Review/Existing Innovation-technology to address related to your problem –

There are many tree care teams available but many of that are paid, So many citizens avoid that. And many applications but they are paid for to serve and planting trees.

In the market, to check the humidity of tree and soil moisturization sensor available but it's very costly. There is no application to use the sensors and locate damaged trees and protecting on the base of application by getting reading.

There is no application found that will make SETU between Citizen – NGOs – Municipal Corporation and taking care of environment by encouraging.

What would be your approach to solve the problem –

Citizens can order sapling from NGOs and NGOs will get a grant from RMC.

They will provide sapling and one gadget that can check soil moisturization and humidity of tree/plants and send data to the server & receive data on this application.
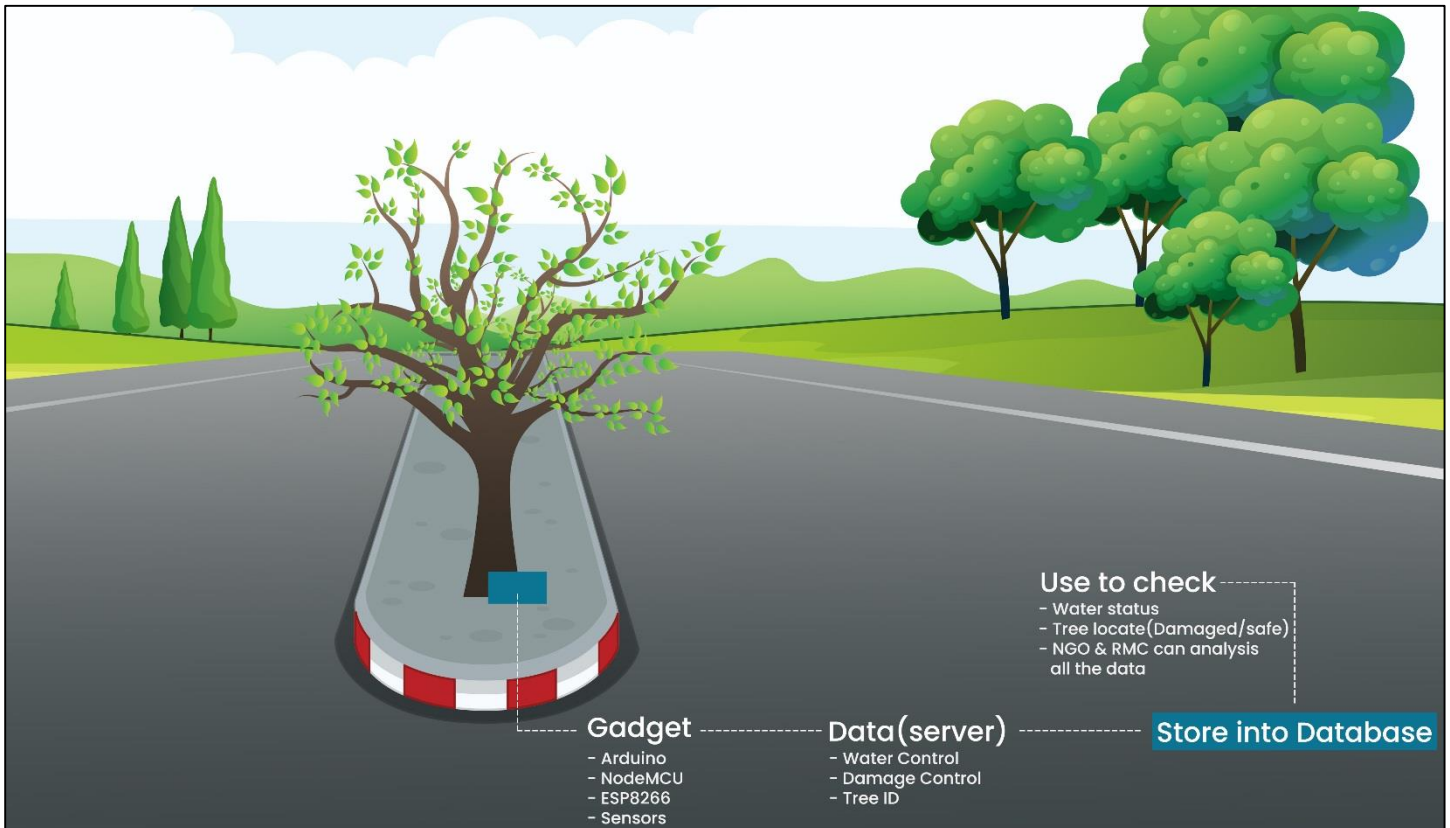
Citizens take care of trees easily from this application. If a citizen wants to care about the nearest trees by using our tree locate services on the map in this application.

It will get an impact like Self-Awareness and self-discipline and it will be a small but very impactful point to save the environment.

Road map/Flow diagram to develop final solution (1) –

Road map/Flow diagram to develop final solution (2) –

Tools and technologies to be used to solve the problem –

- **Android Studio**
  Android Studio is the official integrated development environment for Google's Android operating system, built on JetBrains' IntelliJ IDEA software and designed specifically for Android development. It is available for download on Windows, macOS and Linux based operating systems.
- **MySQL**
  MySQL is an open-source relational database management system. Its name is a combination of "My", the name of co-founder Michael Widenius's daughter, and "SQL", the abbreviation for Structured Query Language.
- **PHP**
  PHP is a general-purpose programming language originally designed for web development. It was originally created by Rasmus Lerdorf in 1994; the PHP reference implementation is now produced by The PHP Group.
- **C language**
  C is a general-purpose, procedural computer programming language supporting structured programming, lexical variable scope, and recursion, while a static type system prevents unintended operations.
- **Arduino**
  The Arduino IDE supports the languages C and C++ using special rules of code structuring.
  The Arduino IDE supplies a software library from the Wiring project, which provides many common input and output procedures.
- **NodeMCU**
- **ESP8266(microcontroller)**
- **Sensors**
- **at mega microcontroller chips(optional)**

Challenges/Risk in implementing your Final prototype -

The same time weather not good and the chance to may damage gadgets, so data could not be received.

Any hardware is damaged, a wire is disconnected or maybe the device is not in-network at that time it may not get any data.

We have a solution to prevent any damage of hardware, will use the PVC box fully waterproof and safe.

If the internet is not working at that time, connectivity will be affected, and the server could not get data.

We have the solution, if the gadget is not in-network, it will also work as-it-is get reading and if plants required water, the gadget will supply water from storage/pipe only we cannot get data on the server.

Possible outcome of your work -

After using this application regularly citizen will aware to save the trees and these small steps will impact, save our environment.

After using this gadget trees will be automatically care by our Application services, it is very useful at public places such that RMC garden, road divider, RMC office ground, etc.

If a citizen needs sapling they can contact NGOs directly from this application and NGO can approve and NGO member will plant the sapling at the citizen's given address.

For example, if we set this gadget at kalawad road's divider area all plants/ trees will get automatically care like supplying water, moisture control, damage alert, etc.
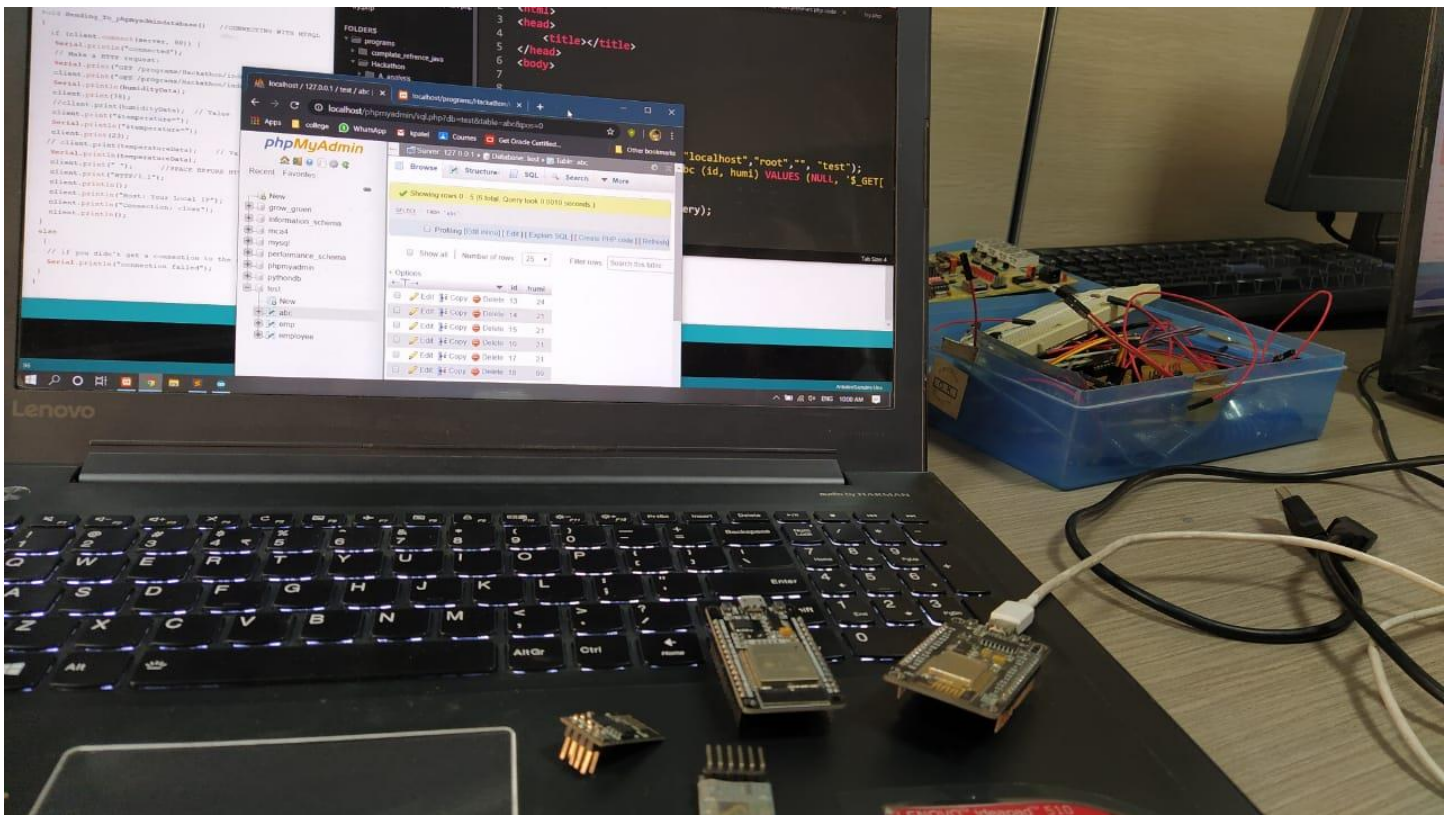
Work done till date -

We have done Complete Analysis of this project, we had also visited the NGO office and nursery to understand types of soils, plants, at how much humidity it required.

On the base of analysis, we had done some testing of Electronic and Communications components NodeMCU / ESP8266 (microcontroller), humidity sensor, etc. analyzed that works well.

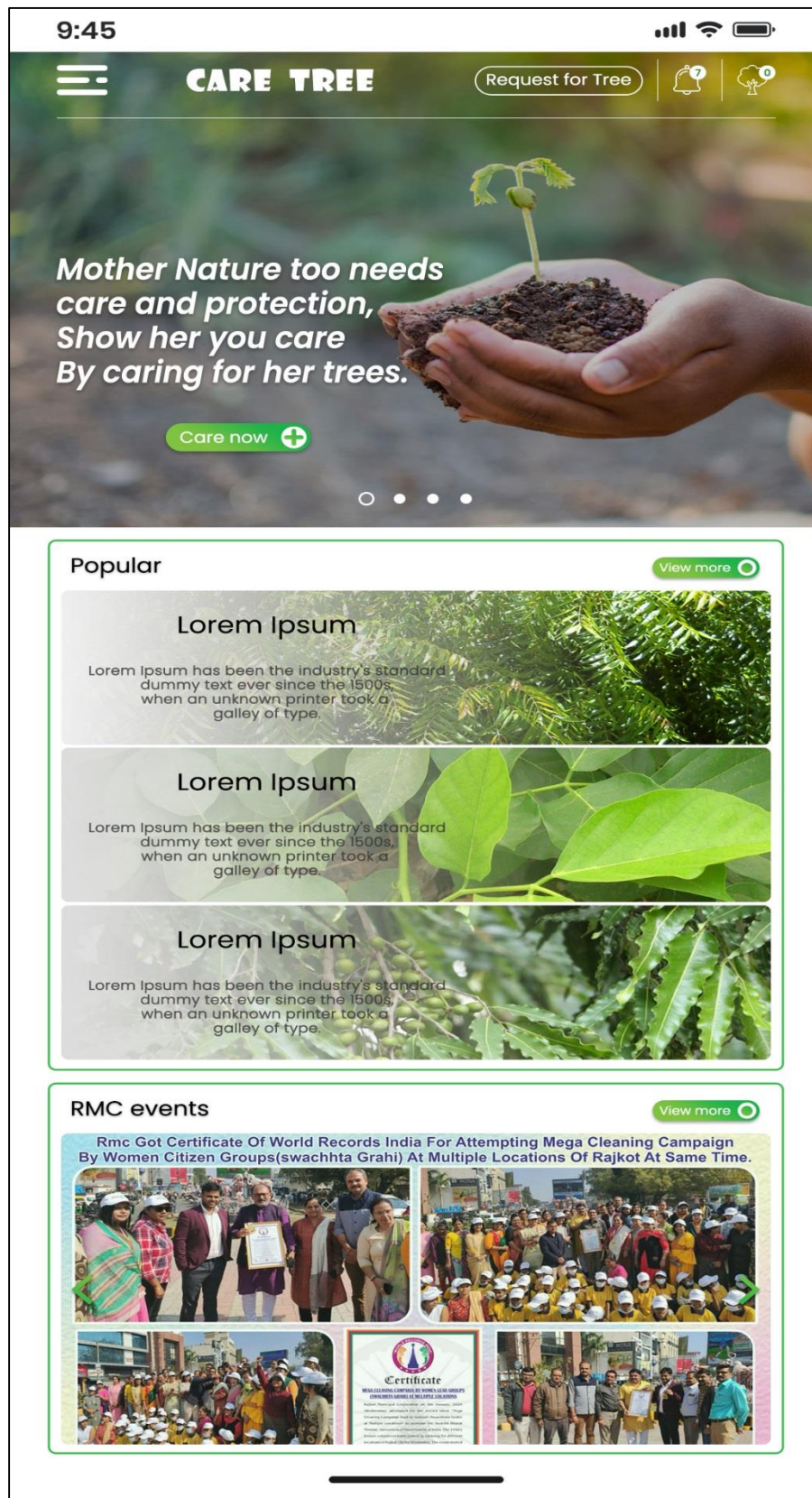Tested that we can also get data from sensors and it will also insert data on the database.

We had done some user interface designing of application and database design.

Image/Screenshot of Solution (1)

Image/Screenshot of Solution (2)

Report

- **NGOs can generate report of**
  - How many request received from which area?
  - How many trees are planted by them on which area?
  - Status of all trees/plants which is affected by somewhat reason

- **Admin can generate report of**
  - Total number of trees planted in Rajkot
  - How many trees are planted on which area?
  - Status of all trees/plants which is affected by somewhat reason
  - How many trees are planted by NGO on which area?
  - List of NGOs which are active and working on this project