GUJARAT TECHNOLOGICAL UNIVERSITY
CHANDKEHDA, AHEMDABAD

VISHWAKARMA GOVERNMENT ENGINEERING COLLEGE
(Affiliated with Gujarat Technological University, Ahemdabad)

A PROJECT REPORT ON

Automatic sprinkler system

Prepared as a part of the requirement for the subject of

B.E- Semester- 5
(Computer engineering)

GROUP ID:- 233603 Submitted by:

Sr. No.	Name	Enrollment No.
1	Parth bharucha	180170107004
2	Anant doshi	180170107028
3	Shubham hirani	180170107036
4	Daxesh italiya	180170107037

Guided by:
Prof. Kaushik k. rana
Assistant Professor, Computer Engineering, VGEC, Chandkheda

Head of department:
Prof. M. T. SAVALIYA
Professor & Head, Computer Engineering, VGEC, Chandkheda

Academic Year
2020-2021

DEPARTMENT OF COMPUTER ENGINEERING

Vishwakarma Government Engineering College, Chandkheda

Opp. Sangath Mall, Visat-Koba Road, Chandkheda, Ahmedabad

Email:hod_ce@vgecg.ac.in **Website:**https:https://www.vgecg.ac.in/dep

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towards the partial fulfilment in Project of Gujarat Technological University is the record of work carried out by him under our supervision and guidance in the Academic Year 2020-21.

The work submitted has in our opinion reached a level required for being accepted for examination. The results embodied in this Project Work to the best of our knowledge have not been submitted to any other University or diploma.

Guided by:

Prof. Kaushik k. rana
Assistant Professor,
Department of Computer engineering,
VGEC

Prof. M. T. SAVALIYA
Professor & Head,
Department of Computer Engineering,
VGEC

Date: 10th April, 2020

Place: Vishwakarma Government Engineering College, Chandkheda- 382424 Ahemadabad (India)

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CONTENTS……..…..……Page No.

1. Introduction

Automatic sprinkler system

- This project is useful for small gardens which is located in house or office
- When a person goes on holiday or small trip outside home and there is no one to handle the plans after him then this system comes into action
- One can remotely water the plant according to their schedule or according to moisture
- In this system we have planted moisture system, temperature system that can give the moisture reading and temperature readings that can help to get identified when to water the plant and when to not
- When it is summer then we need more water for plants and likewise for monsoon we need less water
- This system is automatic and manual both kind means we can water the plant according schedule or we can give it automatically when system reads the data form sensors and works automatically

2.Observations

2.1 AEIOU SUMMARY

AEIOU is an investigative tool to help interpret observations gathered by ethnographic practices in the field. It is an Observation tool. Its two primary functions are to code data, and to develop building blocks of models that will ultimately address the objectives and issues of a client. AEIOU stands for 5 elements to be coded: Activity, Environment, Interaction, Object, and user.

1. **ACTIVITY:**
    - This section will include the applications of the product such as: user login signin,water level monitoring, start and stop water supply,etc
2. **ENVIRONMENT:**
    - This will include the effect of the objects placed in its surroundings such as: home, gardens,farm, etc

3. **INTERACTION:**
    - This will include the Stakeholders such as Industries: with college Gardner, school Gardner, farmers, nursery owners, etc

4. **OBJECTS:**
    - This section of the canvas includes the equipment used for the production such as plants, valve, pipeline, mobile, GSM module, etc

5. **USERS:**
    - As usual it will include the people who are associated with the product: Gardner, farmer, student, etc

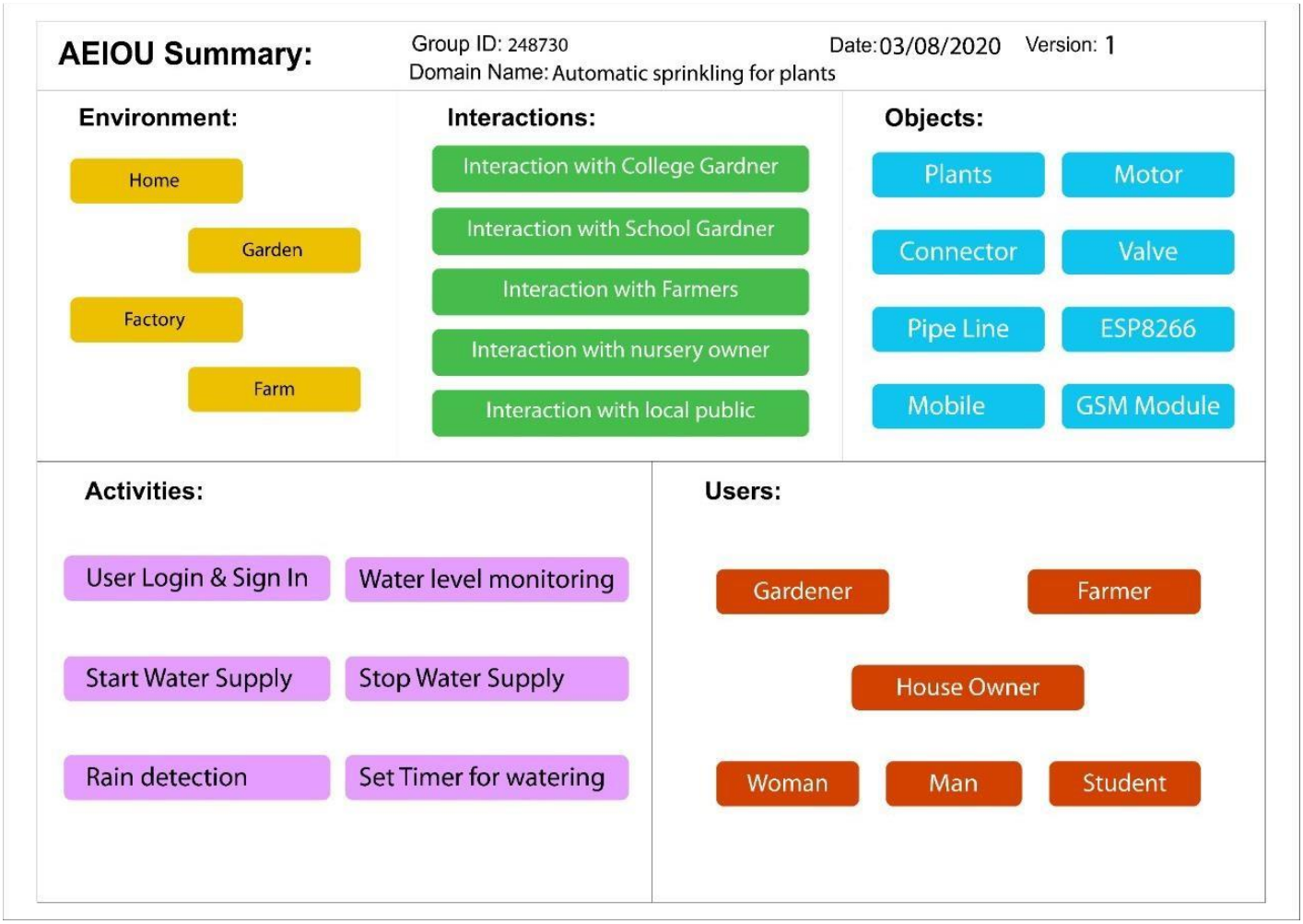
AEIOU Summary:
Group ID: 248730
Date: 03/08/2020
Version: 1
Domain Name: Automatic sprinkling for plants
Environment:
Home
Garden
Factory
Farm
Interactions:
Interaction with College Gardner
Interaction with School Gardner
Interaction with Farmers
Interaction with nursery owner
Interaction with local public
Objects:
Plants
Motor
Connector
Valve
Pipe Line
ESP8266
Mobile
GSM Module
Activities:
User Login & Sign In
Water level monitoring
Start Water Supply
Stop Water Supply
Rain detection
Set Timer for watering
Users:
Gardener
Farmer
House Owner
Woman
Man
Student

Fig: 1.1

2.2 MIND MAPPING.

Mind mapping refers to a technique that designers and engineers use to express and generate ideas.

All that mind mapping really is, however, is a way to get all of the ideas in your head down onto paper. There is no right or wrong way to mind map. It is simply a visual representation of the thoughts in your head, and it often looks like organized chaos.

Mind mapping helps you to release all of the ideas in your head and gives you the opportunity to see those ideas visually. It is a fast and simple way to get your creative juices flowing, and the only tools you need are a pen or pencil and your design notebook

To start a mind map, write down one, central idea or theme in the middle of a blank page. All mind maps have this common starting point. Then, stem off of the central idea by writing down anything that comes to your mind when thinking about the idea.

You can include drawings, questions, comments, solutions, problems, etc. There are no limits. Simply write down everything that relates to the central theme or anything that enters your mind.

You can create a mind map at any stage in your design process and for absolutely any purpose. You can mind map at the very beginning before you have even decided what problem you are going to solve.

You can also mind map to generate possible solutions to your problem or to identify different types of users for your project. Mind map whenever you feel the need to empty the thoughts in your head or whenever you feel stuck during the design process.

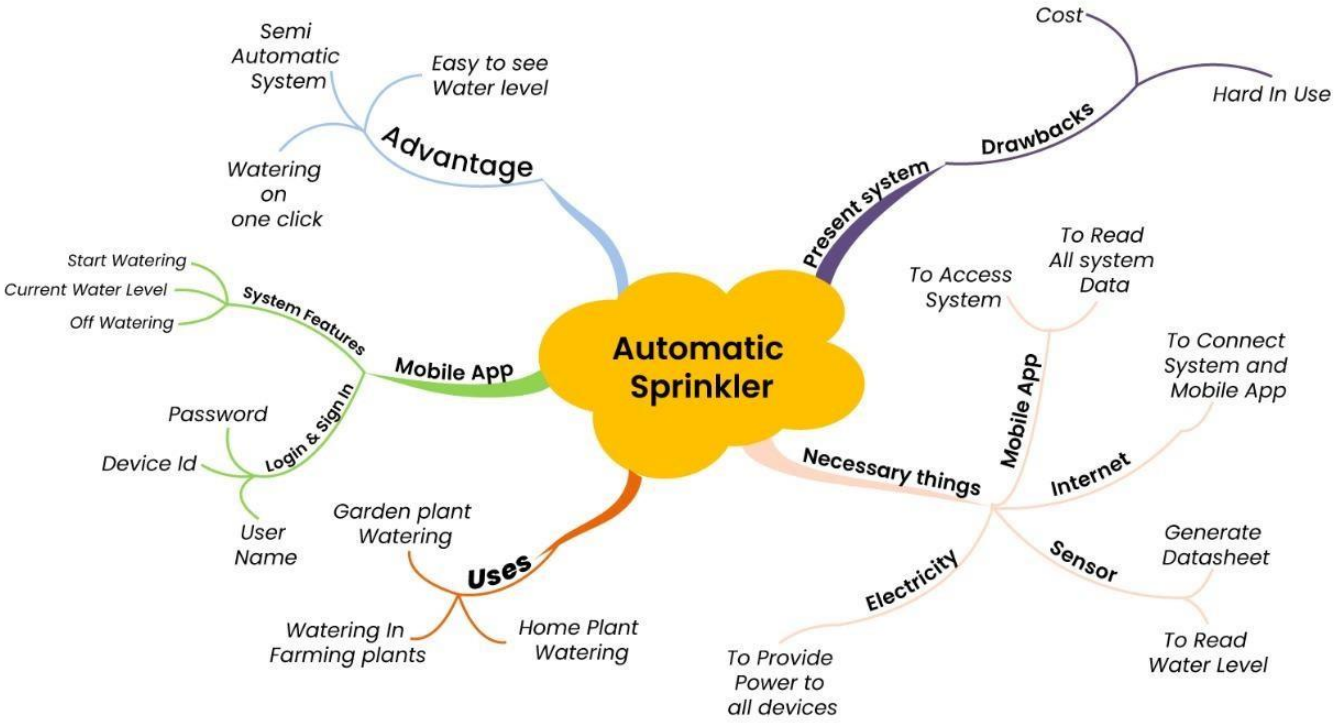

Fig:1.2

- **This mind map canvas shows various fields such as mobile app, present system, advantages, uses, etc**
- **Each further divided into its fields, elaborating it.**

2.3 PRODUCT DEVELOPMENT CANVAS

PURPOSE:

- The most important and the most needed purpose of such products is for time saving purpose**.** Secondly the other important things that have to be noted down is more more care for tree, watering tree when out of town and grow more trees

  - Time savings
  - Grow more trees

PRODUCT FEATURES:

The most important feature of this is;

- Semi automatic
- Mobile control
- Rain detection
- Watering plants

PRODUCT FUNCTIONS:

- The most important and basic functions of these products are:

  - Watering on one click
  - Manual and auto control

CUSTOMER REVALIDATION:

- Here comes the very important part of developing any product, Customer Revalidation. As to decide that the product is successful or not Customer Satisfaction is must.

- Now image below shows the customer reviews and ratings on various aspects of the product.

  - Easy to use
  - Easy to watering
  - Helps to save time

REJECT, REDESIGN, AND RETAIN:

- After pondering on customer revalidation the following points can be revisited:

Reject

- It can not work without electricity
- It can not work without internet

Redesign

- It can not work without electricity
- It can not work without internet

Retain

- We can’t find alternative of internet

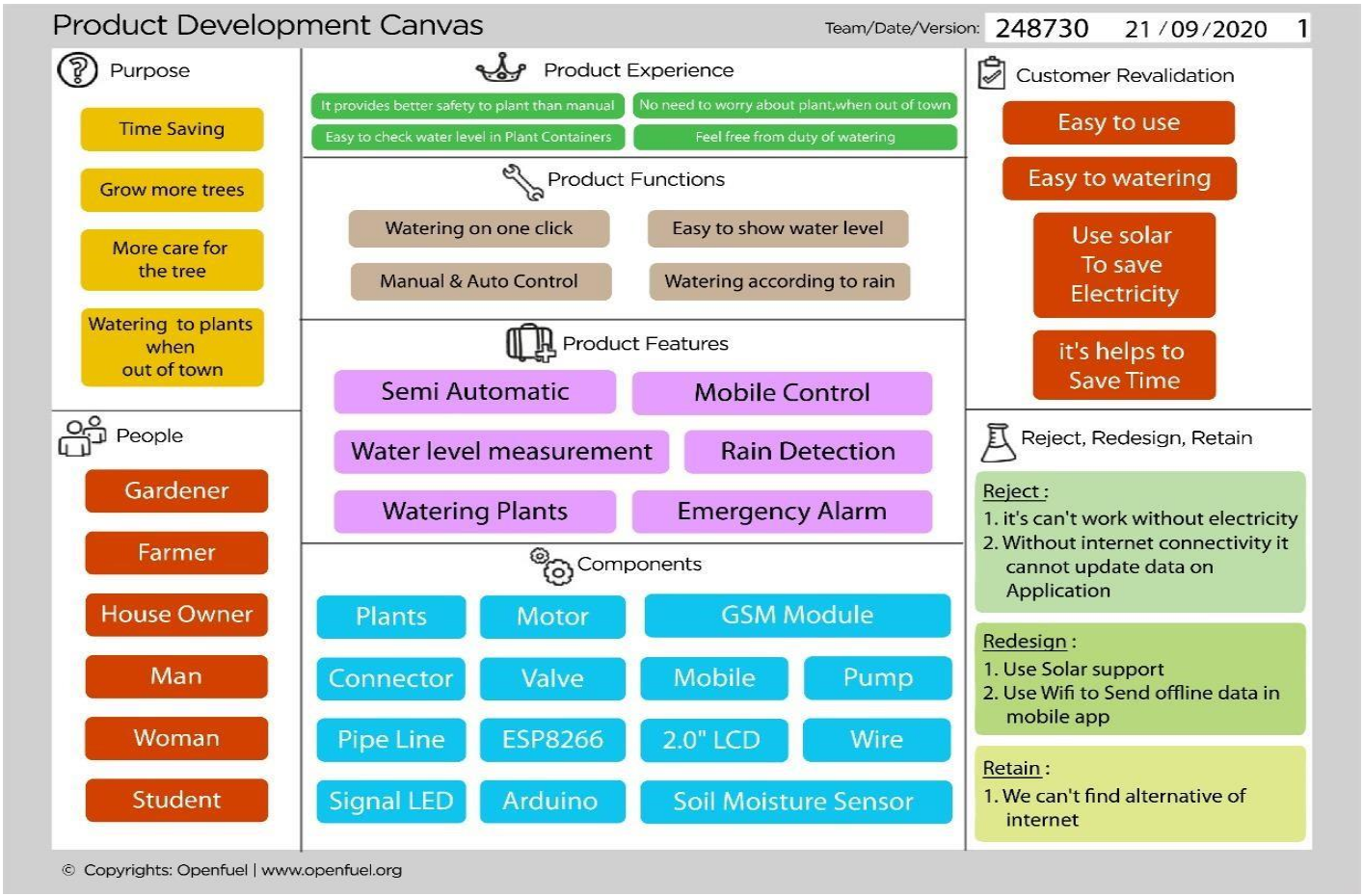
Product Development Canvas
Team/Date/Version: 248730 21/09/2020 1
Purpose
Time Saving
Grow more trees
More care for the tree
Watering to plants when out of town
People
Gardener
Farmer
House Owner
Man
Woman
Student
Product Experience
It provides better safety to plant than manual
No need to worry about plant,when out of town
Easy to check water level in Plant Containers
Feel free from duty of watering
Product Functions
Watering on one click
Easy to show water level
Manual & Auto Control
Watering according to rain
Product Features
Semi Automatic
Mobile Control
Water level measurement
Rain Detection
Watering Plants
Emergency Alarm
Components
Plants
Motor
GSM Module
Connector
Valve
Mobile
Pump
Pipe Line
ESP8266
2.0" LCD
Wire
Signal LED
Arduino
Soil Moisture Sensor
Customer Revalidation
Easy to use
Easy to watering
Use solar To save Electricity
it's helps to Save Time
Reject, Redesign, Retain
Reject :
1. it's can't work without electricity
2. Without internet connectivity it cannot update data on Application
Redesign :
1. Use Solar support
2. Use Wifi to Send offline data in mobile app
Retain :
1. We can't find alternative of internet
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Fig:1.3

2.4 EMPATHY CANVAS

This is the first step of the project or a problem. In this canvas, we will find out what is user? Who is a User? What is Stakeholder? Who are they? And what are the broad stories of their activities?

1. **User:**
    - In this stage, we find various users who are directly or indirectly related to our product
    - For Example: Gardner, farmer, house owner

2. **Stakeholders:**
    - Stakeholders are people or an organization with an interest.
    - In this stage, we find those users which are directly or indirectly related to the users.
    - For Example: app developer, IOT expert

3. **Activities:**
    - Activities are directly or indirectly related to the stakeholders.
    - For Example: user login sign in, water level monitoring, start and stop water supply, rain detection

Story Boarding:

- **Happy:** house owner can water the plant when he is out of town without any help of others

- **Sad:** can't water the plants due to electricity issues on time

Design For Automatic sprinkling for plants **Design By** 248730

Date 05/08/2020 **Version** 1

USER

Gardener | Farmer | House Owner

STAKEHOLDERS

App Developer | PCD Designer | IOT Expert

ACTIVITIES

User Login & Sign In | Water level monitoring

Start Water Supply | Stop Water Supply

Rain detection | Set Timer for watering

STORY BOARDING

HAPPY

I am worried about my home plant when i was out of town because no one for watering.But after setup this device I feel like i am free from duty of watering plants. Also I do not worry about watering when i am out of town.

HAPPY

I love nature so i want to plant trees but i have not enough time to watering all those plants in my busy schedule. But after getting this device I am free from this watering duty. I can chek water level of all plants on my Mobile phone and also i can watering on one click of mobile app

SAD

This facility is very good but once I got bad experience.once I was out of town then cause of some issue electricity gone and when it comes back then automatic system fails to do its task so I was not able to see water level on that day

SAD

working performance is good but once I faced an unbelievable situation, after i returned home from office, I was standing in the balcony of my house and suddenly i saw a cat in my neighborhood removed the sensor wire from the plant container and the valve was opened due to 0% water detention. Thus the house got flooded.

Fig:1.4

2.5 IDEATION CANVAS

This canvas consists of the ideology behind the user, so in this canvas some brief ideas are expressed. People section consists of persons related to user technically and similar persons may relate to user. Then we divided activities in social & technical and try to find out the importance of each activity and situations & location regarding are find out related to each.

PEOPLE:

- Gardner
- Farmer
- House owner

ACTIVITIES:

- User login
- Start and stop water supply
- Rain detection

LOCATION:

- Home garden
- Farm

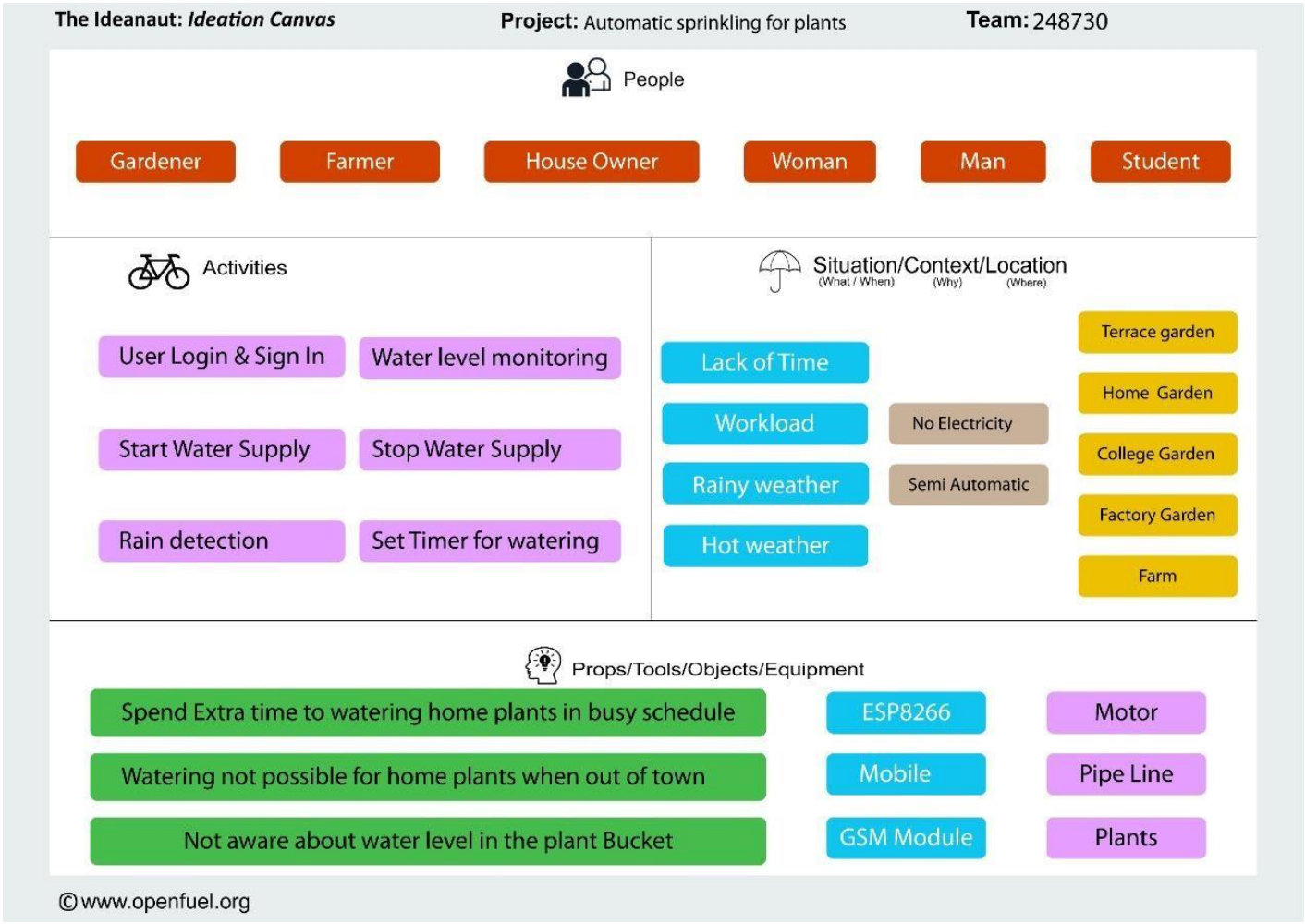

The Ideanaut: Ideation Canvas
Project: Automatic sprinkling for plants
Team: 248730
People
Gardener
Farmer
House Owner
Woman
Man
Student
Activities
User Login & Sign In
Water level monitoring
Start Water Supply
Stop Water Supply
Rain detection
Set Timer for watering
Situation/Context/Location
(What / When)
(Why)
(Where)
Lack of Time
Workload
Rainy weather
Hot weather
No Electricity
Semi Automatic
Terrace garden
Home Garden
College Garden
Factory Garden
Farm
Props/Tools/Objects/Equipment
Spend Extra time to watering home plants in busy schedule
Watering not possible for home plants when out of town
Not aware about water level in the plant Bucket
ESP8266
Mobile
GSM Module
Motor
Pipe Line
Plants
©www.openfuel.org

Fig:1.5

LEARNING NEED MATRIX

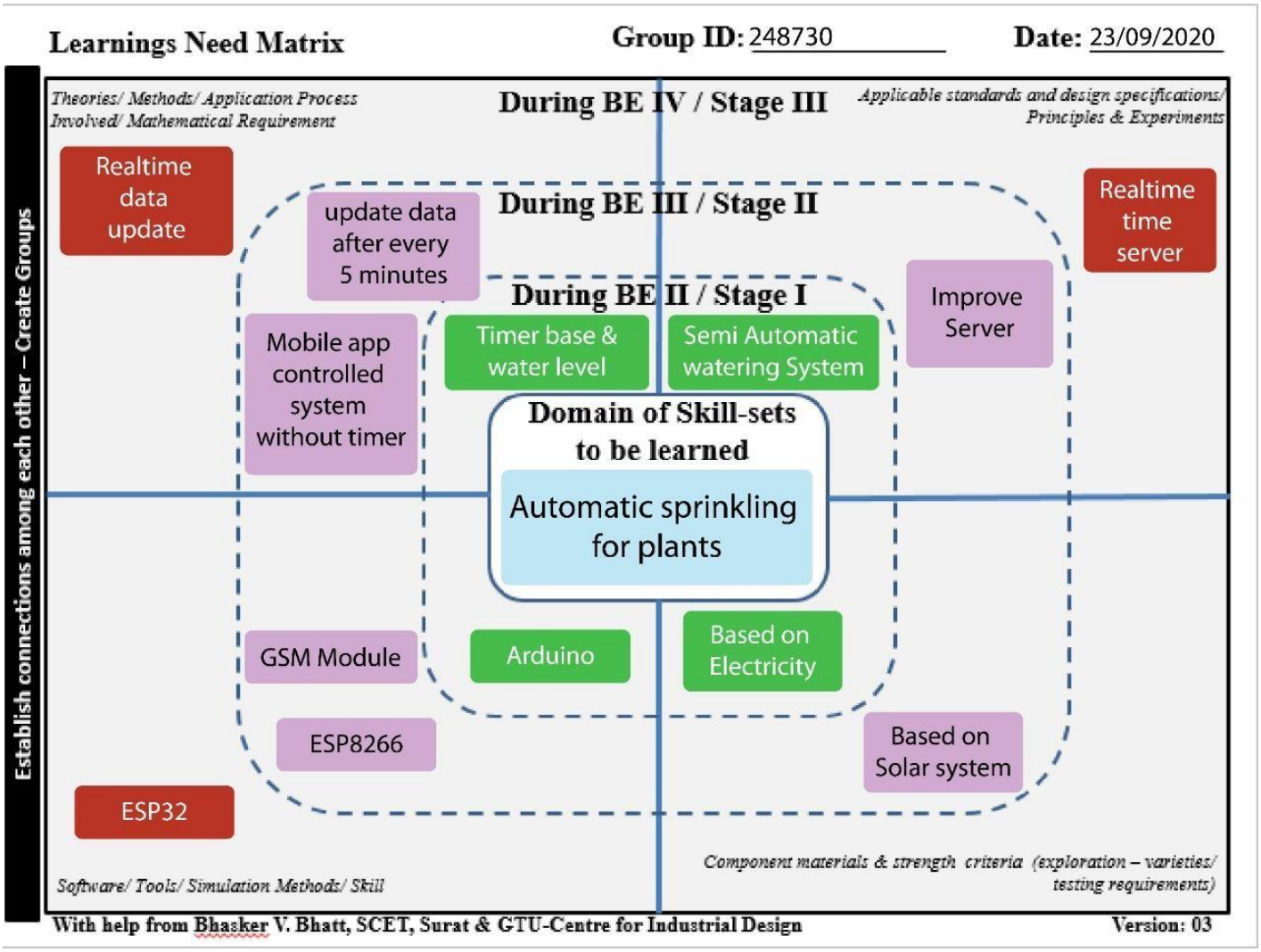
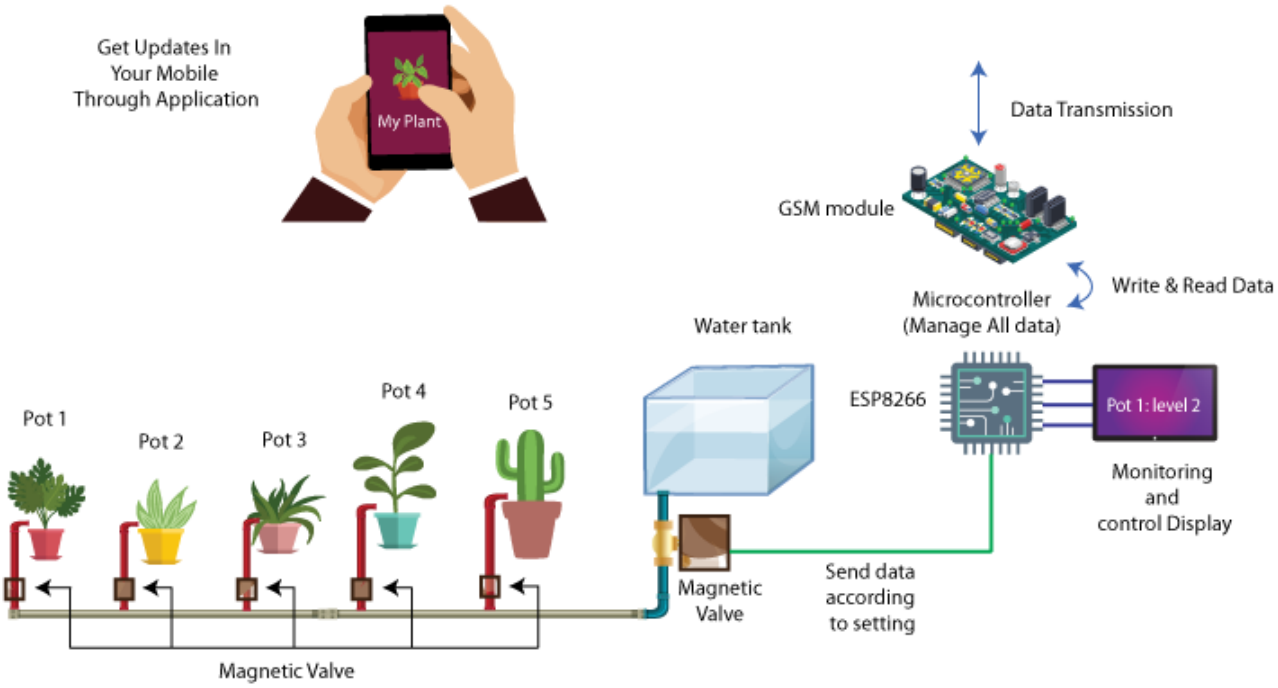


Fig:1.6

PROTOTYPE:



Automatic sprinkling for plants

Fig:1.6

Result and conclusion:

It is a system that can help to water the plant when you are not available at certain time or time period ,it is operated through the mobile application and also it is automatic as well. It can help to setup your small garden at your home without any need.