

Template for Project submission

The project document should have

1. Problem statement developed from need statement as per template given
2. block diagram / concept diagram explaining mechanical structure and general working of model handwritten diagrams / model using tinkercad / linkage is expected
3. Sensors , actuators and its control achieved using arduino type controller and its code
Simulation of circuit on tinkercad

Timeline: Finalization of theme: Jan 26, 2022

Problem statement and submission of Gantt Chart: Jan 26, 2022

Concept Diagrams / Structure: Feb 03, 2022

Simulation of control: Mar 8, 2022

Final Submission: Mar 8, 2022

Part 1:

Timeline and Gantt Chart (Distribution of work and Planning including Part 1)

Roll Number	Name of Student	Role played
1601022125	Hardik Shah	Client
16010321044	Dharmit Shah	Designer
16010321043	Amar Shah	Designer
16010521044	Jimil Shah	Client
16010321034	Janvi Panwar	Client

Smart Irrigation System (SIS)

Need Statement:

Table 1: List of the sample Questionnaire to design the problem

Questions such as	This question helps the designer to
1. How much does SIS cost	Identify client's objective
2. Is SIS model easy to deploy in farms?	
3. Is it easy to understand?	
4. How easy is the initial set-up process?	
5. What is the probability of malfunctioning and is it easy to repair?	
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1. The product might fail if the required amount of water is not available.	Identify constraints
2. Sensors might be affected by intense sunlight.	
3. Might be difficult in recognizing voice	
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1. The farmer can have exact information about the amount of water the crops need.	Establish functions
2. Live atmospheric updates and autonomous irrigation system.	
3. The SIS system is consumer-friendly and easy to operate.	

Table 2 The information obtained through basic research and Survey

Observation and from List Survey	Requirements
1. The sensors sense the humidity, the temperature of the surrounding, the wetness of the soil.	An active real time bunch of sensors that match the requirements of the customer.
2. The adequate amount of water is required or else it might fail to function in drought like conditions.	A big reservoir of water is required.
3. The crop yield might not be great if the the nutrient content of the soil are not proper.	A farmer/ owner of the land must make sure the soil is rich in nutrients according to the requirement of the crops.
4. If the sensors get damaged, an alert would be sent to the farmer and thus they can be replaced.	Active alert system do detect the health of the sensors.

1.1 Establish client's objectives

The target audience aims to purchase a smart irrigation system which is indeed cost cutting, easy to operate as well as budget friendly and ease of access. For this, they're looking for a product which comes with an user-friendly app.

1.2 Identify constraints

One of the biggest constraints faced by the customers would be during drought like conditions. The plants that require ample amount of water needs continuous supply chain as the device claims to deliver exact amount of water that is required at that particular time of the day avoiding the problem of downfall of crop growth due to over watering at once.

1.3 Establish functions

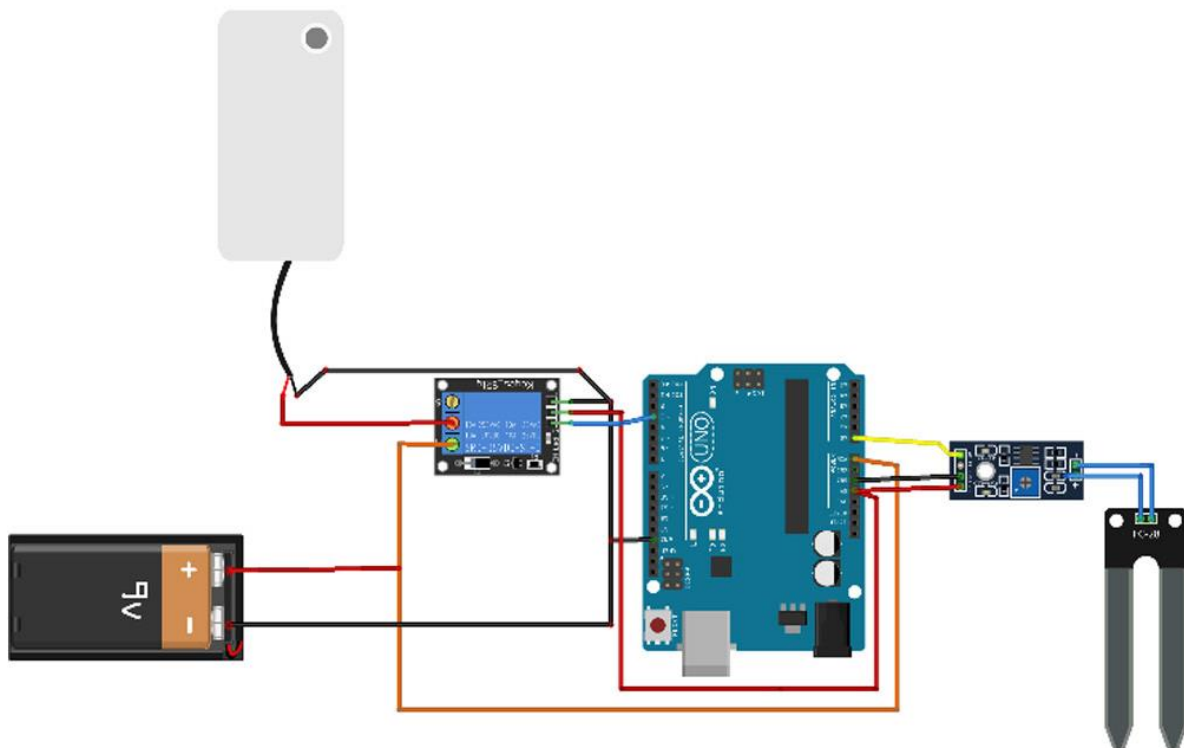
The established functions in the device are humidity sensor that actively senses the level of water vapour in the air and would predict the amount of transpiration occurring at various times of the day. The temperature sensor will measure the surrounding temperature and will predict the amount of water that is lost due to evaporation. The moisture sensor that seeps into the soil will actively report the water content in the soil and will give commands to the reservoir to call for the exact amount of water according to requirement.

Revised Problem statement

Part 2:

Design Specifications

Students can submit either of following in order to explain the design and working of idea



Designing a smart irrigation system would require a bunch of elements:

- Arduino Uno/Mega * 1
- Moisture sensor * 1
- 5V Relay Module * 1
- 6V Mini water pump with small pipe * 1
- A bunch of connecting wires
- 5V battery * 1

Part 3:

Control logic and Program

Students can submit either of following in order to explain the design and working of idea

- Circuit diagram
- Program / Code
- Simulation video

Part 4:

Learnings and scope of idea

Students can submit either audio or video presentation of the complete project work which will include a combination of Parts 1, 2 and 3 along with learnings from the project and scope of application of the presented idea.