


Ideation Phase

Brainstorm & Idea Prioritization Template

Date	18 September 2022
Team ID	PNT2022TMID30241
Project Name	IoT-Based Smart Crop Protection System for Agriculture
Maximum Marks	4 Marks

Step-1: Team Gathering, Collaboration and Select the Problem Statement

template




Brainstorm & idea prioritization

Use this template in your own brainstorming sessions so your team can unleash their imagination and start shaping concepts even if you're not sitting in the same room.

⌚ 10 minutes to prepare
🕒 1 hour to collaborate
👥 2-8 people recommended

[Share template feedback](#)



Before you collaborate

A little bit of preparation goes a long way with this session. Here's what you need to do to get going.

⌚ 10 minutes

A

Team gathering

Define who should participate in the session and send an invite. Share relevant information or pre-work ahead.

B

Set the goal

Think about the problem you'll be focusing on solving in the brainstorming session.

C

Learn how to use the facilitation tools

Use the Facilitation Superpowers to run a happy and productive session.

[Open article](#) →

1

Define your problem statement

What problem are you trying to solve? Frame your problem as a How Might We statement. This will be the focus of your brainstorm.

⌚ 5 minutes

PROBLEM

IoT Based Smart Crop Protection System For Agriculture

- An intelligent crop protection system helps the farmers in protecting the crop from the animals and birds which destroy the crop.
- This system also helps farmers to monitor the soil moisture levels in the field and also the temperature and humidity values near the field.
- The motors and sprinklers in the field can be controlled using the mobile application.
- It increases the growth of the crops and reduces wastage & easy to use.

Step-2: Brainstorm, Idea Listing, and Grouping

2

Brainstorm

Write down any ideas that come to mind that address your problem statement.

🕒 10 minutes

TIP
You can select a sticky note and hit the pencil icon to start drawing!

BHAVADHARANI S

DARSINI B

The speaker will be given the pre-recorded audio input, which will give different kinds of sounds that can scare the birds and prevent the crops. It can also be accessed and turned off when not needed

The proposed system uses a Raspberry Pi board and the different sensors and cameras are interfaced with the puppet. As soon as the PIR sensors go High on detecting motion within a range of 10 meters, the camera will be turned ON which first captures an image and then starts recording the video for about five to six minutes.

The camera used in the system is the OV7670 model which will take the picture of the intruder. Once the movement is detected, the buzzers are activated. Then the picture will be sent to the registered mobile number of the owner using GSM and the access is controlled.

The picture which will be stored on board as well as cloud, simultaneously a message will be generated automatically to the registered number using a SIM800L module to inform about the intrusion along with the details of the temperature and humidity obtained by interfacing the DHT11 temperature and humidity sensor.

The crop field protection from the intrusion of animals using wireless technology which protects the crop from damage caused by animals and birds as well as divert the animal without any harm. The animal detection system is designed to detect the presence of animals and offer a warning.

The APR board generate harsh sound to divert the path of animals. Due to this harsh sound animal will divert their path. The message and call will be given to the farm owner.

It includes the various sensors connected to the Arduino board such as motion sensor, ultrasonic sensor, LDR, etc and other components are APR board, LCD, DC motor, etc. When any animal tries to enter the farm then the ultrasonic sensor detects the presence of the animal and sends a signal to the Arduino board.

In the message, there is a facility that, shows the direction of the intruder i.e. 'Animal is just entered from the left side. Also, if any animal tries to enter the farm then an electric fence is provided which will give a small amount of shock that will not cause any severe harm to the animal.

SUVATHA A S

SUVETHA R

Once the sensor gets adapted to the surroundings, then any variation in the level of infrared radiations shall trigger the PIR sensor.

If the motion detection is due to an authorized person with a valid RFID, who is mostly a farm worker, his attendance gets recorded automatically.

The Arduino Uno also known as the ATmega 328p is an 8-bit RISC architecture microcontroller. Arduino Uno is a main component of the system. Other components which are important parts of the system are PIR and ultrasonic sensors, a camera, GSM Module, buzzers, and the speaker.

The camera used in the system is the OV7670 model which will take the picture of the intruder

Then the agricultural sling starts to rotate to divert the path of birds. Also, there is a light facility at night time. When the resistance of LDR decreases then the flashlight will be turned on. Due to the high intensity of light animals will not try to enter the farm at night time too.

The intention is only to divert the animals' path. Similarly when birds try to enter the farm then the motion sensor senses the presence of birds and gives a signal to the Arduino board

Whereas if the motion detection is due to that of an unauthorized person without a valid RFID tag, the system further processes the image and video using Haar feature-based Cascade Classifiers for object detection, and decides if the entity is an animal or human intruder.

A microcontroller (Arduino UNO) is used for reading the inputs from PIR, a Soil Moisture sensor. The GSM module is used for sending SMS to the farmer when movement is detected.

3

Group ideas

Take turns sharing your ideas while clustering similar or related notes as you go. In the last 10 minutes, give each cluster a sentence-like label. If a cluster is bigger than six sticky notes, try and see if you can break it up into smaller sub-groups.

🕒 20 minutes

IOT SYSTEM

The PIR sensors go High on detecting motion within a range of 10 meters, the camera will be turned ON which first captures an image and then starts recording the video for about five to six minutes.

Once the sensor gets adapted to the surroundings, then any variation in the level of infrared radiations shall trigger the PIR sensor. Camera used in the system is the OV7670 model which will take the picture of the intruder

The proposed system uses a Raspberry Pi board and the different sensors and cameras are interfaced with the puppet.

DETECTION AND SOUND

The camera used in the system is the OV7670 model which will take the picture of the intruder. Once the movement is detected, the buzzers are activated.

The speaker will be given the pre-recorded audio input, which will give different kinds of sounds continuously that can scare the birds and prevent the crops. It can also be accessed and turned off when not needed

The APR board generate harsh sound to divert the path of animals. Due to this harsh sound animal will divert their path.

INTRUDER'S ALERT

In the message, there is a facility that, shows the direction of the intruder i.e. 'Animal is just entered from the left side. Also, if any animal tries to enter the farm then an electric fence is provided which will give a small amount of shock that will not cause any severe harm to the animal.

Due to this harsh sound animal will divert their path. The message and call will be given to the farm owner.

Once the movement is detected, the buzzers are activated. Then the picture will be sent to the registered mobile number of the owner using GSM and the access is controlled.

Step-3: Idea Prioritization

4

Prioritize

Your team should all be on the same page about what's important moving forward. Place your ideas on this grid to determine which ideas are important and which are feasible.

20 minutes

