**Table of Contents**

|  |  |  |
| --- | --- | --- |
| **Chapter No** | Tittle | **Page No** |
| **1.** | **Requirements and Analysis**   1. Empathize & research 2. High-Level Requirement 3. Low-Level Requirement 4. SWOT Analysis 5. 5W 1H | **3** |
| **2.** | **Design**   1. Block Diagram 2. Structural diagram | **5** |
| **3.** | **Evaluation**   1. High-level test plan 2. Low -level test Plan | **7** |
| **4.** | **conclusion:**   1. Summary 2. Advantage and Disadvantage, Application | **7** |
| **5** | **Reference** | **8** |

Smart security system

**SMART CROP MONITORING SYSTEM**

1. **Requirements:**
2. **Empathize** **Research:**

Agriculture is the mainstay of the economy. It contributes to the gross domestic product. Agriculture meets the food requirements of the people and produces several raw materials for industries. But because of animal interference and fire in agricultural lands, there will be huge of crops. The crop will be totally getting destroyed. There will be a large amount of loss of farmers. To avoid these financial losses, it is very important to protect agricultural fields or farms from animals and fire. To overcome this problem, in our pro-posed work we shall design a system to prevent the entry of animals into the farm. Our main purpose of project is to develop intruder alert to the farm, to avoid losses due to animals and fire. These intruder alert protect the crop from damaging that indirectly increase yield of the crop. The develop system will not harmful and injurious to animal as well as human beings. Theme of project is to design a intelligent security system for farm protection by using Embedded system.

**3.2 PROPOSED METHODOLOGY**

In the proposed system, Crop monitoring is done where sensors are used to collect in- formation in the agricultural field. In our proposed work, PIC, Motion Detecting Sensor and GSM is used. When animals come near to the motion detecting sensor and it detects the animal movement. After getting that initial input signal, it is passed for further processing. Then it will be given to the microcontroller. Our system will be activated, Immediately buzzer will be on, at the same time it sends an SMS and makes call to the owner. Microcontroller Block is used for reading the inputs from GSM and Motion Detecting Sensor. Whole process is controlled by microcontroller. The GSM module is used for sending SMS and making call to farmer when movement or smoke is detected. It also turns ON the motor, when

Analysis:

1. **High-Level Requirement:**

|  |  |  |
| --- | --- | --- |
| **ID** | **Description** |  |
| HR01 | Motor Pump turn on /off |  |
| HR02 | Temperature >100 F Buzzing |  |
| HR03 | Check the status of Motor Pump |  |

1. **Low-Level Requirement:**

|  |  |  |
| --- | --- | --- |
| **ID** | **Description** | **Datasheet** |
| LR01 | 1 channel 30A Relay | [**Link**](https://www.electronicscomp.com/4-channel-12v-relay-module-with-optocoupler?gclid=Cj0KCQiAmeKQBhDvARIsAHJ7mF5hhRr3daW6KOzVLY4ALC-p_AV5SRne2lwJdds1wiW0NHRfIwb7H84aAuazEALw_wcB) |
| LR02 | AVR ATMega328 | [**link**](https://pdf1.alldatasheet.com/datasheet-pdf/view/392243/ATMEL/ATMEGA328.html) |
| LR03 |  | [**link**](https://drive.google.com/file/d/0B3wGBsOmfWhVanZqSVVvMGp3MXc/view?resourcekey=0-vCFJxLL_Xkdl7McRB091-Q) |
| LR04 | Single-phase Motor Pump | [**link**](chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/viewer.html?pdfurl=https%3A%2F%2Fwww.taropumps.com%2Fmedia%2F1618%2Fommb002a-single-phase-monoblocks.pdf) |

1. **SWOT Analysis:**

Timeline

Description automatically generated

Accuracy is varied in ever field

Power is need for 24 hours.

It dedicated for agricultural field

1. **4W 1H:**

**STRENT:**

1. **It used to Protect the Crops**
2. **It is detecting the Day/ night Status**
3. **It is maintaining the field with wet status.**
4. **It is used to fire detection and Rainwater detection**
5. **Its password protection**
6. **It Alarm if it breaks in door**

**Weak nesses:**

1. **Power backup is necessary**
2. **It can’t control by mobile phone**

**Opportunities**

**:**

**Banking fields**

**Home security system**

**Government place**

Agricultural Products

Crop Protection Products

Farming Products

1. **Design:**
2. **Block Diagrams:**

Diagram

Description automatically generated

* **Sensor:**
  + **Soil sensor**: It shall be sensing the level of the water in fails to avoid the dry field prevention.
  + **Temperature sensor**: It used to detect the fire occurs in fields or Rain detected in field.
  + **LDR sensor:** It is used to sense the Day / Night Status.
* **Actuator:**
  + **Relay module**: It shall be used to control the single-phase motor and used as a protection circuit.

* + **Single -Phase motor Pump**: it shall be used to pump the water from the tank and feed to the agricultural field.
  + **Buzzer:** It is used to give Alert when the fire is detected or over Rain wall is detected
* **Microcontroller:** 
  + **AVR At mega 328:** Microcontroller development board with a chip of ATmega328P. 6 GPIOs, 6 PWM and 6 ADC, a 16 MHz crystal frequency, USB program debug with the reset button.

1. **Structural Diagram:**

Diagram

Description automatically generated

1. **Behavioral Diagram:**

Graphical user interface, diagram, application

Description automatically generated

1. **Evaluation**
2. **High Level Testing Plan:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id** | **Test case** | **Expected output** | **Actual output** |
| 1 | GSM module for “**Turn On**” | “Motor Started” | “Motor Started” |
| 2 | GSM module for “**Turn Off**” | “Motor Stopped” | “Motor Stopped” |
| 3 | GSM module for “**Status**” | “Motor in running “ | “Motor in running “ |

1. **Low Level Testing Plan:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id** | **Test case** | **Expected output** | **Actual output** |
| 1 | GSM module | “Motor ON “ | “Motor ON” |
| 2 | Water level sensor | 1 | 1 |
| 3 | Relay Module | 0 | 0 (Turn ON) |

1. **Conclusion:**

**I. summary:**

Agriculture is one of the economic developments of country. In this case study Mobile Starter is provided to monitor and control the status of agriculture motor pumps at anytime from anywhere motor can on/off through SMS. So, farmers take full control without visiting the agriculture field. They have some features like staring at the motor and stopping the motor and checking the status of the motor. Even if any low water detected the water level sensor it stops running and intimated to the controller to avoid the dry run prevention and the additional features can be added by changing into IOT technology.

* **Advantages:**
  + It shall be controlling the motor by Starting and Stopping, checking the status of the motor through the mobile phone.
  + It shall use for Dry run prevention.
* **Disadvantages:**
  + It may cause some network issues based the locations.
  + It must recharge sim which has been inserted in GSM module.
* **Applications:**
  + It shall be used for Agriculture Field
  + Building water tank can be controlled.

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3. Biswarup Nandi, Bhutada, Rinkesh Thakur, Piyush Bhattad, Mobial Stater based GSM Automation, International Research of Computer Science Engineering, 2015978-17281-5374- 2 2 2 (ICIRCA-2020).