

SMART AGRI SCARECROW

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ABSTRACT

The project Smart scarecrow (Bujgavane) is an IoT based device. In this Project mobile app is used which would turn the way of agriculture production by not only enhancing it but by making it efficient, users friendly and safe. The objective of this project is to propose smart scarecrow(Bujgavane) in the agricultural fields which will enable to save the crops from the birds, also getting live data (temperature, soil moisture) for efficient environment monitoring which will enable them to increase their overall yield and quality of products and also handle the agricultural equipment (motor, sprinklers, sound making buzzers) through mobile app by one click .The project is also integrated with technology mixed with different sensors module producing live data on users mobile screen.

In our project we have used flapping mechanism to move the smart scarecrow hands in upward and downward direction. The details of flapping mechanism are given below. A smart scarecrow is used to scare the birds and to the animals to save the crops in the field. A farmer put the scarecrow in the middle of the field to save his crop from birds and animals. We have seen that scarecrow has no movement when the birds are come in the field. The flapping mechanism is used to convert the rotary motion of the motor into linear motion of flapping hands when the crank rotates, the connecting rods pushes the hands in up and down direction. The flapping consists of crank, connecting rod, flapping arm, support structure, nuts and bolts. Crank is join with one end of connecting rod and second end of connecting rod is join with flapping bar, when crank rotates the crank push the connecting rod connecting rod push the flapping arms ups and downs. Machinery such as windmills have been employed as scarecrow, but the effectiveness lessens as animals become familiar with structure. Farming contribute a major income to the Indian economy, it is a huge concern to the farmer when they are away from their crop and exposing it to crop threat such as crow damaging the crop and theft. Farming has contributed to nearly up to 60% land of a country.

Keyword: Scarecrow, Flapping mechanism, Temperature, Soil moisture.

1. INTRODUCTION

Monitoring systems are used in the field to collect the information on farming conditions (e.g., light intensity, humidity, and Temperature) with the aim of enhancing crop productivity. Internet of things (IoT) technology is a recent trend in numerous fields [1]. Including monitoring system for agricultural farming, farmers need manual labor to handle crops and livestock, obtain leading to inefficient resource use. The down side can be addressed through the concept of Smart farming whereby farmers receive training in the use of IoT, access to the global positioning system (GPS) and data management capabilities to increase the quantity and quality of their products [4]. A scarecrow is a decoy or mannequin, often in the shape of a human. Humanoid scarecrows are usually dressed in old clothes and placed in open fields to discourage birds from disturbing and feeding on recently cast seed and growing crops [2].

Scarecrows are used across the world by farmers, and are a notable symbol of farms and the countryside in popular culture. Scarecrow, device posted on cultivated ground to deter birds or other animals from eating or otherwise

disturbing seeds, shoots, and fruit; its name derives from its use against the crow. The scarecrow of popular tradition is a mannequin stuffed with straw; free-hanging, often reflective parts movable by the wind are commonly attached to increase effectiveness. Farming contributes a major income to the Malaysian economy [3]. It is a huge concern to farmers when they are away from their crops and exposing it to crops' threat such as crow damaging the crops and theft. Farming has contributed to nearly up to 22% of a country's Gross Domestic Product (GDP) and due to this fact; countries are trying to their best to keep the industry safe. Due to that cause, countries has been spending billions in order to safe keep their farms and in the long run, this is a heavy blow towards the country itself [5]. As the implementation of IoT in lifestyle has been progressing rapidly, the same goes for agriculture. Though IoT consists of connecting a series of devices into a network which could be controlled through the internet, connectivity is poor in farms as they are located in the rural areas. Professionally, there are the various things to consider before implementing IoT.

1.1 Motivation of the project

Traditional farming has been, is, and will continue in the future to be a manual and laborintensive industry. To address these challenges, efforts and research are in place to improve the quality and quantity of agriculture products by making them "connected" and "intelligent" through "smart farming".

Farmers being confronted with a labor shortage, more stringent legislation, increasing global population and the declining numbers of farmers, forces them to look to new solutions. With technologies such as the Internet of Things (IoT), Big data & Analytics, Artificial Intelligence (AI) And Machine Learning (ML) entering almost all industries. By monitoring the eating habits of your livestock and thus giving your livestock higher quality food and more optimal times you can reduce the amount of CO2 emissions. By implementing all of these things you can make a great effort towards Climate-smart agriculture and form of sustainable smart farming.

2. METHODOLOGY OF PROJECT

Mechanism Details: In our project we have used flapping mechanism to move the smart scarecrow hands in upward and downward direction. The details for flapping Mechanism are given below:

2.1 Flapping mechanism

The aim of the flapping mechanism is to convert the rotary motion of the motor into the linear motion of flapping hands when the crank rotates, the connecting rods pushes the hand up and down. The flapping mechanism consists of crank, connecting rod, flapping arm, support structure, nut and bolts. Crank is joint with one end of connecting rod and second end of connecting is joint with flapping bar, when crank rotates the crank push the connecting rod and connecting rod push the flapping rod up and down. The flapping mechanism used in automatic smart scarecrow is shown in fig. 1

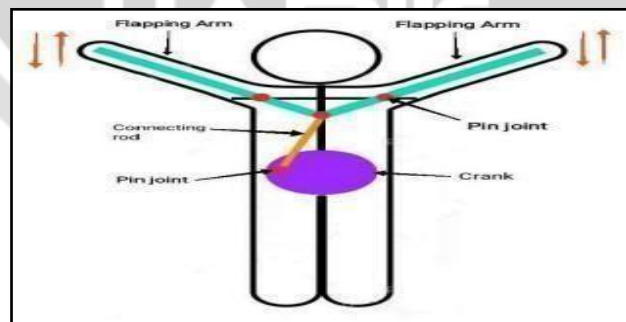


Fig-1: Flapping mechanism

2.1.1 Electronic circuit

The different component used in electronic circuit consists of following components:

- Relay
- Solar panel
- Motor driver Chapter
- DC Motor

- Charge controller
- Sensors
- Buzzer
- Battery
- Connecting wires

2.1.2 Components

a. Mechanical components

- Metal pipe
- Wood
- Nuts and bolts
- Thin steel box

b. Electrical and electronic components

- Solar panel
- Motor driver
- PIR sensor
- Battery and connecting wires

3. SYSTEM DESIGN

3.1 Use case diagram

A use case diagram is used to represent the dynamic behavior of a system. It encapsulates the system's functionality by incorporating use cases, actors, and their relationships. It models the tasks, services, and functions required by a system/subsystem of an application. It depicts the high-level functionality of a system and also tells how the user handles a system.

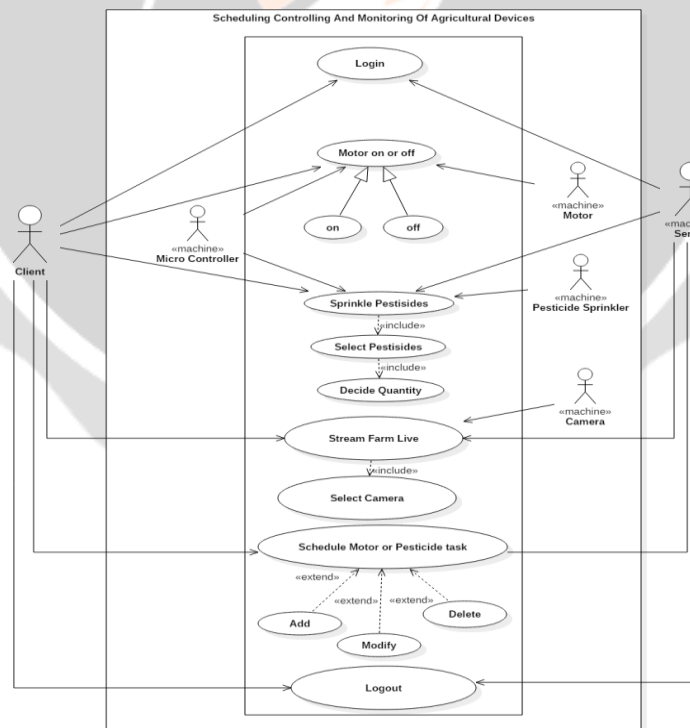


Fig-2: Use case diagram for smart agri scarecrow

3.2 Sequence diagram

A sequence diagram is a type of interaction diagram because it describes how and in what order a group of objects works together. These diagrams are used by software developers and business professionals to understand requirements for a new system or to document an existing process.

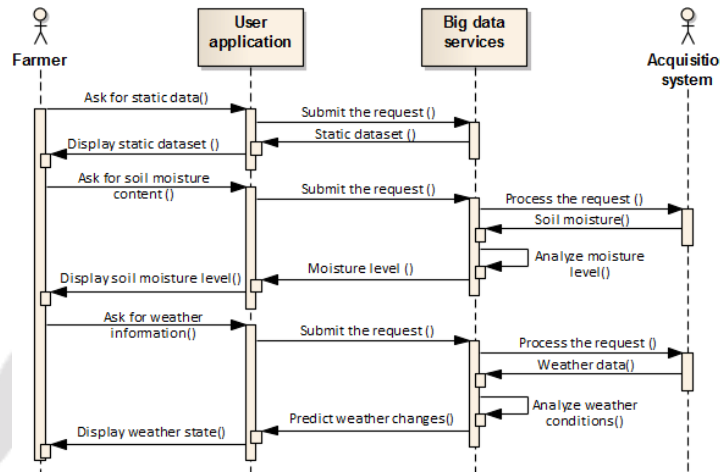


Fig-3: Sequence diagram for smart agri scarecrow

3.3 Block diagram

A block diagram is a diagram of a system in which the principal parts or functions are represented by blocks connected by lines that show the relationships of the blocks. They are heavily used in engineering in hardware design, electronic design, software design, and process flow diagrams.

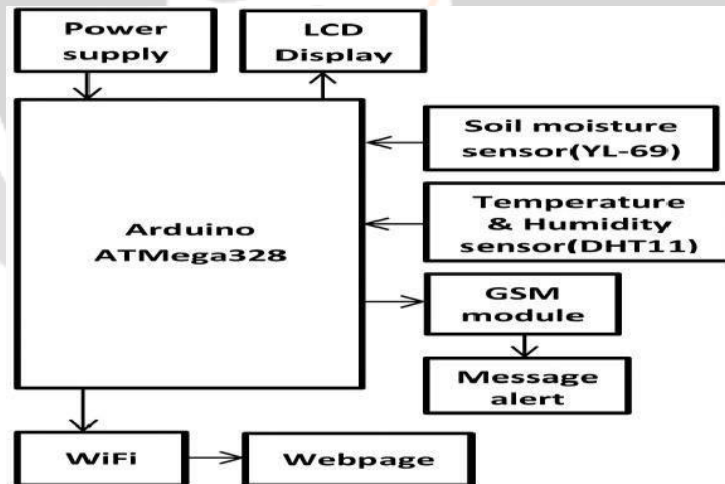


Fig-4: Block diagram for smart agri scarecrow

4. CONCLUSION

These days food demand is increased due the population, so the way of farming is very important to reach the demand of public. Focus on smarter and efficient way of cultivation is crucial. The improvement of new practices of increasing crops yield and handling, recently youth are inclining towards agriculture and choosing it as profession.

Technology like IoT helps them to simplified way of cultivation and monitoring crops by accessing the information using mobiles and internet. Taking these factors into consideration mainly IoT, which makes the farming smarter to meet the expectations in future. We use sensors, cloud Mobile app, buzzers and other devices as discussed earlier. Various farming methods and how effective they work. An IoT system Development for agriculture could resolve many real- time issues by increasing the quality and production management which enables the farmers to access huge amount of results from the real-time data from the crop field.

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