Pesticide Sprayer Using IOT

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Abstract - **Internet is experiencing a very explosive growth nowadays with the amount of the devices connecting to it. Earlier we had only personal computers (PCs) and Mobile handset connected to internet but now with Internet of Things i.e. IoT concept of connecting things with internet, millions of device are connecting with it. This development of IoT leads to the idea of machine to machine communication which means that two machines can communicate to each other and also all the data which was previously with private server can now is available on internet so the user can access it remotely. Application of IoT is feasible in almost all industries particularly where speed of communication is not an issue. This paper proposes the application of cloud based IoT in the agriculture domain. Precision agriculture is basically a concept which insists to provide right amount of resources at and for exact duration of time. These resources can be any things such as water, light, pesticides etc. To implement precision agriculture the benefits of IOT has been utilized in the proposed paper. The fundamental idea is to sense all the required parameter from the agriculture field and take required decision to control the actuator. These agriculture parameters are Soil Moisture, Temperature & Relative Humidity around plant, Light intensity.**

Keywords: Smart Farming, Precision Agriculture, IOT, WiFi, ESP8266, sensor, Node, Mobile Application.

I. INTRODUCTION

Agriculture is one of the rare industries where the technology has not been accepted in the large scale, one of the reasons behind that is the economic condition of most of the farmers in India or any developing country. The scarcity of the agricultural products worldwide is going to increase day by day due to two major factors i.e. overpopulation and urbanization. With overpopulation overall demand of agricultural product will increase urbanization has lead to process where lots of agricultural land is being converted into Non-Agricultural field (NA) for the infrastructure development near the urban areas.

Basically the rural area is decreasing quite significantly day by day and the amount of farming is also decreasing which may results in decrease in agriculture production. Now to overcome this situation world has only solution is to increase crop productivity by utilizing the resources very judiciously.

The wastage of available resources has to be decreased, there comes the concept of precision agriculture. Precision agriculture is an approach in which the agricultural crops are fed with the optimum amount of resources required by the crop for exact duration of time. Traditional irrigation process has a typical time based watering (irrigation) practice in which farmer used to irrigate the crop after certain amount of time (typically few days).

But problem with this approach is that sometimes that crop doesn't need water so early so ultimately that leads to wastage of water and sometimes crops needs water a bit early. So to overcome such issue this paper presents a soil moisture detection sensor to get soil moisture content so that crop can be irrigated accordingly. This also helps in preventing the over irrigation because apart from water wastage over irrigation can sometimes leads to diseases in crop. Like soil moisture, Temperature and Relative humidity along with light illumination around the plant is also key parameter to control.

II. METHODOLOGY

To make life easier to live, technology always helps mankind. The Smart Pesticide Sprayer robot is a semi-automated pesticide sprayer which is specially designed to use in villages, farms to avoid germs, insects, microbes, etc. Use of such technology helps farmers and also saves their time.

The recent trend in such technology is not that smart enough as they are not having any automation and IoT smart sub-systems to work with higher accuracy as well as to give higher efficiency throughout their life-span.

Our Smart sprayer is powerful and smart enough to work automatically as well as manually with or without any need of manpower. The system is designed using ATMEL's AVR Microcontroller ATMega328P which is 8-bit powerful RISC

architecture, it plays a major role as a backbone of whole system which controls and process all signals from various sensors and modules and as per programming algorithm gives output to control all output devices such as motors, light, etc.
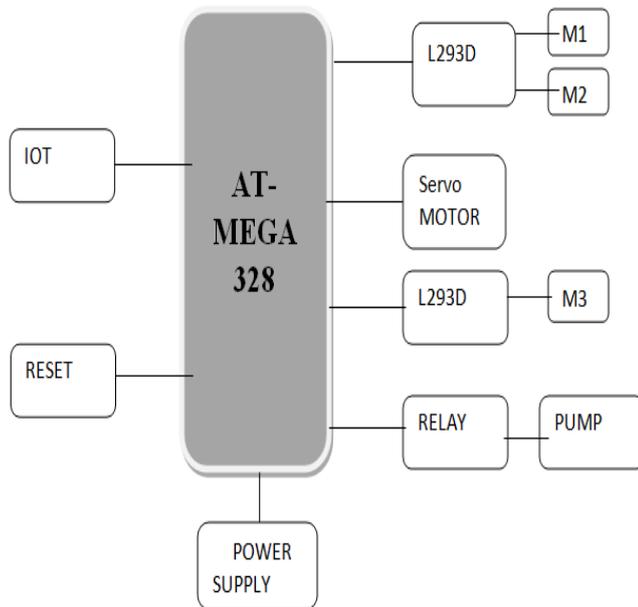

Figure 1: Block Diagram

Along with Microcontroller the system also consist of sensors, Bluetooth Module (HC-05), ESP8266 WiFi module (ESP-01), motor driver (L293D), Geared DC Motors (100 RPM), 12v/7.5A Battery, Charge Controller, BLDC water pump with spraying nozzle, SG90 Servo motors, and other passive/active electronic components.

The sprayer also have IoT data logging capabilities which continuously monitor and logs/plot battery charge percentage and pesticide tank level to thing Speak server channel in graph with proper time-date stamp. The public-sharing feature of thing Speak allows user to share their graphs with anyone using simple URL. Our bot is operated in two different modes, first one is auto mode and another is manual mode.

In auto mode, the bot moves forward and stops after 5 seconds, then it checks and spray pesticide to its right and left, this process repeats until it found any object in front of it. In manual mode, the user can control bot using android application, the application provides full control over the bot using various buttons and sliders, it also allows switching between manual and auto mode of operation.

III. EXPECTED RESULT

From that we have get the result, the solar powered pesticide sprayer using IOT is the automotive system technology which is the best for the farm. Hence it consumes the time, man power and no need to more than one person to handle the system.

IV. CONCLUSION

The prescribed contraption and spraying method enable to play out the spraying undertaking profitably and financially. The central duty of this Endeavour is in structure up a novel spraying contraption that ensures full incorporation of the recognized article with least shower. Pesticide application is decreased by spraying every goal independently. This is cultivated by planning the spraying device toward the point of convergence of the goal and setting the thing detachment of the spraying as demonstrated by the shape and size of the goal. A sharp mechanical structures for spraying pesticides in cultivation field for controlling the robot by the use of a remote choice rather than manual completion of yields shower tests, reduces the prompt prologue to pesticides and the human body, moreover decrease pesticide harm to people, and improve age adequacy. There can be diverse landscape and statures of yields for the spraying activity tests that demonstrates that a viable, portable robot, and gives the better splash impact at the workplace, for example, its low costs, simplicity of dealing with and simple support and different qualities of people with an expansive market in rural creation.

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