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MSPIG AGRI BOT
(Moisture Seeding Planting Irrigation Gaming Agricultural Robot)

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ABSTRACT
In modern days, many tasks are performed by the single machine with the latest technology. In this paper, MSPIG AGRI BOT (Moisture Seeding Planting Irrigation Gaming Agricultural Robot) is discussed, which discuss about multiple agricultural tasks are done by the single robot. To increase the efficiency of the agricultural tasks we have to find the new technical solution. Here we develop a robot capable of performing operations like automatic seeding, irrigation &fertilization [5].It can be controlled by both automatic and manual controlling methods. The main component used here is PIC16F877A that supervises the entire process. In recent days, the robots are integrated to perform various tasks in order to replace humans from various special activities .The distinctiveness of this agricultural robot system is to provide with multitasking abilities which include pick and placing of seeds, sprinkling water and fertilizers [1], weather monitoring and they are made to work in various fields like agriculture, afforestation and in gardening platform. Here the gaming is used as the important component through which we promote the knowledge and it develops keen interest towards agriculture. It can be an effective step towards promoting agriculture to the future generation.

KEYWORDS: ***Robot, microcontroller, multiple sensors, wireless camera, zigbee, automatic irrigation.***

I. INTRODUCTION

Basically India is an agricultural country. But in recent times the importance and awareness of agriculture and knowledge required for performing agriculture is not provided to the present younger generation. According to the present survey results we can identify that the younger generation are highly addicted to gaming. These gaming activities results in several problems and health issues in future. In order to overcome this drawback in gaming and to convert gaming as an efficient tool to promote knowledge regarding agriculture. We have found a new technical solution through which many agricultural activities such as identifying moisture and humidity content, pick and placing of seeds, planting, irrigating the fields are performed by a single robot. The zigbee module is used to transmit and receive the required information to perform the required function. Here the activities and the performance of the robot can be performed similar to gaming methods. Through which the gaming can be performed in an efficient way and in the similar way the knowledge regarding agriculture is provided to the future generation.

II. EXISTING SYSTEM

In earliest times the man power is commonly used to perform every agricultural activities .But at present due to the advancement in scientific research and due to the several problems faced by the farmers such as scarcity of efficient labors, high wages than their profit etc. Due to the above reasons many new machines were developed in order to perform the works efficiently and to reduce the activities performed by the farmers. But each machine can perform only a certain task which is also provided with few drawbacks in it such as for the purpose of sprinkling of water and fertilizers the machine name **DJIAMG1** is used but efficient technicians required to operate this machine. Similarly for viewing the agricultural farm the **Precision Hawk Land castor** is used but its cost is very high. For the purpose for irrigating the fields the **surface drip irrigation** is used which is very helpful in providing a necessary amount of water to the plants but the frequent supervision is required [2]. For the purpose of seeding the **seed wind** is used through which the seeds can be sowed evenly but they are high in cost. To identify the moisture content in the soil **Tensiometers** are used but it requires a special knowledge to perform the process. Similarly for crop cutting the agricultural automatic cutter machine is used which helps in clearing off weeds and to cut the crops evenly but they are high in cost. Thus in order to replace the separate individual machines into a single machine and to overcome the disadvantages in the above machines the new technical solution is identified through which a single machine can perform multiple tasks which is very low in cost and it does not require any special knowledge to operate it .

III. PROPOSED SYSTEM

Here in this paper by considering all the existing methods and based on the current scenario a new machine is developed which can perform various agricultural tasks .It is cheap in cost when it is compared with all existing methods and it does not requires any special knowledge to operate this machine. The major component used here is **PIC16F877A** which is small in size and it helps in performing multiple tasks and they are provided with the flash memory through we can read and write several times but it will not affect the system under any cause. The PIC microcontroller is also provided with EEPROM by which the data and coding can be stored up and they can be properly transmitted between the transmitter and the receiver. This machine is provided with various sensors such as moisture sensor, DHT sensor and rain sensor. These sensors are provided with the interfacing circuits by which the data received by the sensor can be properly provide to the microcontroller. Through these sensors the machine can provide various information such as the presence of moisture content in the soil and the availability of humidity level in the atmosphere [5]. It is provided with pick and place arm which can perform various operations such as planting of plants and pick & placing of seeds through which the seeds and plants can be evenly placed. Here the each segment of the machine is connected with the motor driver circuit through which the data provided will be received by the components correctly.

This machine contains the DC pump which can be also used for irrigating the plants through which the plants can be provided with the required amount of water and the wastage or unnecessary watering can be avoided [1]. Here the machine is also provided with the fertilizer sprayer through which the fertilizers can be sprayed off hence only the fixed limited amount of fertilizers are allowed to get sprayed off. Through this method the over spraying of fertilizers can be reduced [4]. They are also provided with the crop cutting arrangement by which the crops can be maintained in proper heights and they can also be used during the time of harvesting .In this project the water conservation technique is followed up by which the supply of water to the plants will be stopped automatically in the event of rainfall[2]. Here they are provided with wireless camera for viewing the agricultural farms. These wireless camera are connected with the servo motor through which the agricultural farm can be viewed completely around 180 degrees from far areas [3]. The zigbee module is simple wireless network like Bluetooth. It is a low power consuming device. It is provided in this machine which helps in transmitting and receiving the data to the user .In the receiver end the Max -232 is used in the PC serial communication and in interfacing mechanisms .The gaming technique is also used in this machine in order to use gaming in efficient way and it provides the awareness and the basic knowledge regarding agriculture to the future generation. By providing the required knowledge the agriculture can be practiced in the future generation by which the resources that is available in the present will be maintained in the upcoming generation .It can prevent the

occurrence of drought or the scarcity of food products in the future .Through this the necessity and the importance of agriculture will be known to the future generation and it will lead our country in the way of prosperity.

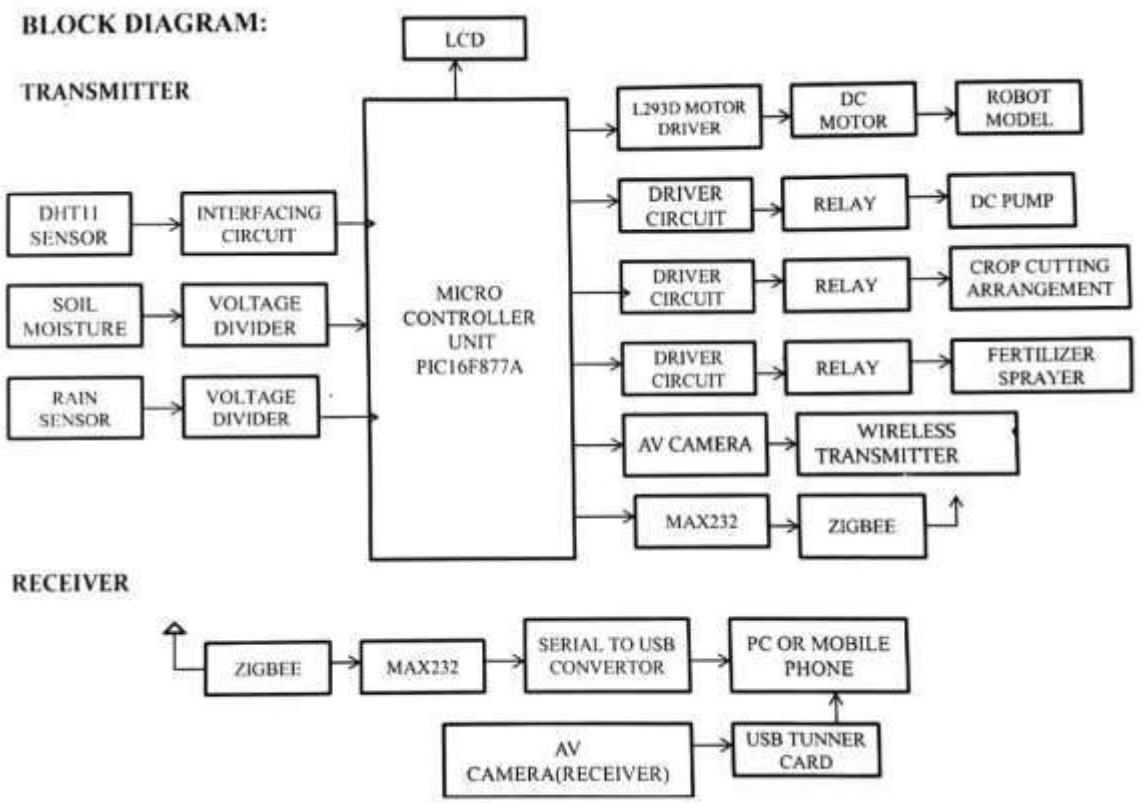

Fig 1: Block Diagram of the project

IV. HARDWARE USED

A) PIC16F877A:

The acronym PIC means Peripheral Interface Controller and it is a specialized form of microcontroller. It consists of 40 pins out of which 33 pins is for input and output. It also contains two 8 bit timer and one 16 bit timer. It is also provided with serial and parallel ports and it contains 5 input and output ports. It consists of 256 bytes of EEPROM, 2 comparators and 10 bit analog to digital comparator. It is also provided with the flash memory through which it can be allowed to read and write no of times but it will not affect the system. It is small and it can perform no of tasks.

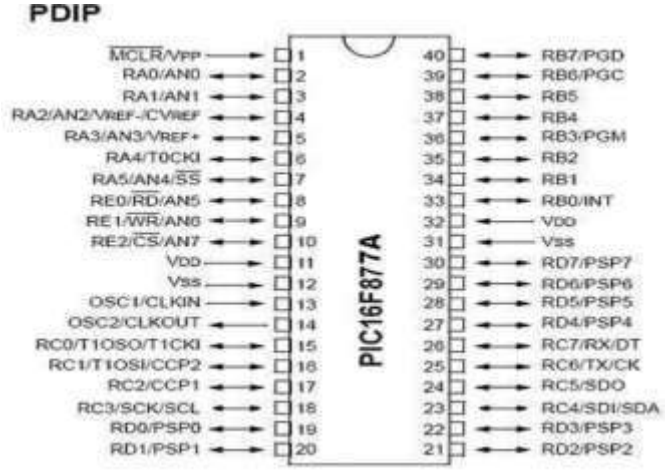

Fig 2: PIC Microcontroller

B) SERVO MOTOR:

Servo motor is a linear actuator or rotatory actuator which can generally used for precise control of the angular and the linear positions, velocity and acceleration. It is also provided with the required motor coupled to sensor for positioning feedback. They are generally used in robotics, automation etc..In this project they are used to rotate wireless camera around 180 degrees

.

Fig 3: Servo motor

C) ZIGBEE:

Zigbee module is a simpler wireless technology like Bluetooth which is used to transmit and receive data. It is a low power consuming device and it can transmit data around 10-100 meters. It is built in physical layer and it varies from 20kb -250 kb. They are commonly used in home automation and in embedded systems.

Fig 4: Zigbee

D) *SOIL MOISTURE SENSOR*:

The soil moisture sensor is commonly used to find the presence of moisture content in the soil. It also provides the details such as volumetric water content in soil. It is also used in irrigation and various agricultural activities.

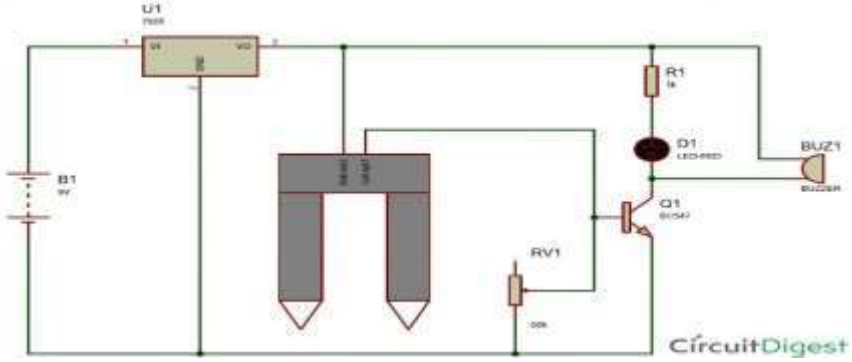

Fig 5: Moisture Sensor

E) DHT SENSOR:

The DHT sensor is made up of two parts namely capacitive humidity sensor and thermister.The basic chip is provided in the sensor which converts analog to digital signal and it splits the digital signal with temperature and humidity.

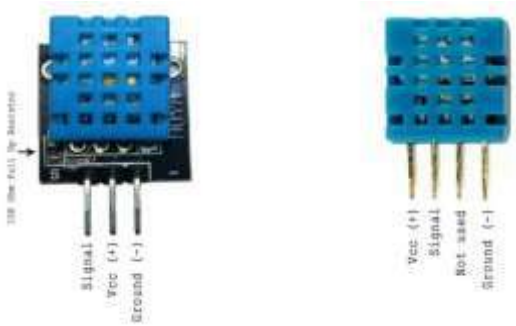

Fig 6 : DHT Sensor

F) *RAIN SENSOR*:

The rain sensor is a switching device which gets activated by rainfall. They are used in satellite communication systems and in many other aspects. It can be used as a water conservation device through which in our project the irrigation systems can be automatically made shut down in the event of rainfall.

Fig 7 : Rain Sensor

G) DRIVER CIRCUITS:

The motor driver is an integrated circuit which is used in autonomous robots. The commonly used series is L293 series .In this project we have used L293D which contain 2H bridges .The H Bridge is used for controlling the low rated motors .It consists of 16 pins which can control 2 DC motors

Fig 8: Driver Circuit

H) SCU (LM358)

LM358 is a low power dual operational amplifier circuits. It is used in detector circuits like sensors. It consists of 8 pins which contain two operational amplifiers at low power. It is used in circuits like amplifiers, high pass and detector circuits.

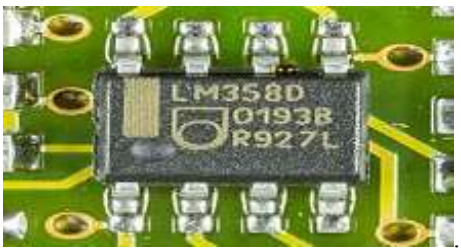

Fig 9: SCU(LM358)

V. CONCLUSION

Agriculture is the important factor in the human civilization. It performs various operations such as identifying the presence of moisture and humidity content, pick and placing of seeds, automatic irrigation, spraying of fertilizers etc. By using the pick and place arm the seeds and sapling can be evenly placed. Here through the efficient irrigation mechanism is used through which the plants can be properly irrigated. The machine contains many sensors which provide the information regarding presence of moisture and humidity content. Through the fertilizer sprayer the required level of fertilizers are sprayed over the farm in this method the over spraying can be avoided. By means of crop cutter the crops can be maintained at certain heights and they can be used in the time of harvesting. The machine is also provided with wireless camera that is connected with the servo motor which helps in viewing the farm around 180 degrees. Here it also acts as a water conservating mechanism by which the irrigation mechanisms automatically get stopped during rainfall. The Zigbee, the simple wireless transmitting medium is used for transmitting and receiving the data efficiently. The mechanism similar to Gaming is used here to control the devices efficiently and it helps in promoting the knowledge to the future generation. The output of the proposed system has lots of advantages when compared to the present existing method under various aspects. These systems contain several advantages and they are very efficient to the current and future generation. It promotes the knowledge regarding agriculture and it helps the sustain agriculture to the future world.

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