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Design of Automated Seed Sower with extended application using IoT

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Abstract-- *Agriculture may be divided into several stages, such as seed sowing, seed germination, irrigation, etc. Our research is about the automation of some phases of farming. This study outlines the use of increased automation in the agricultural sector. It is recommended to have an automatic seed sprouting robot controlled by a controller & Wireless sensor network (WSN). Crop in the soil within predefined distance is seeded using the automatic mechanism & controller. Post planting a seed in a series, the proposed robot automatically performs soil covering when it reaches the specified planting area. The seed planting machine could be operated via a phone or tablet, & this robot's action can also be monitored remotely via a smartphone or Computer.*

Keywords*--Seed sower, Agriculture, Robotics, IoT, WSN, Automated machine.*

I INTRODUCTION

Agricultural production is an industry that takes time, & demands labour. The implementation of technology into the agricultural sector is the best approach to these issues, & it allows farming in a systematic way that yields a high production rate. Using this automated approach it is possible to obtain higher efficiency in no time.

Throughout this age, development in the area of robotics is slowly increasing, & it is important to use these innovations for the good of humans. Here this proposed work is being conducted to produce better agricultural outcomes. The adoption of such innovations will solve problems due to the lack of jobs and higher labor costs. The handset helps to connect the farmer with the robot.

The rest of this paper is made as follows. Section II states existing work made in this stream. Section III provides the proposed methodology and its working. Section IV presents Results and discussions. Finally, section V concludes with the conclusion respectively.

II LITERATURE SURVEY

The machine 's architecture is for automatic planting, & it requires a motor activity powered by a controller to travel. The accelerometer decides the way the machine heads. UV scope finding sensor senses the edge of ground. Each dc motor is composed of a MOSFET H-bridge control system. The controller is combined with an actuator for seed falling function. The power transistor is meant to drive massive inductor loads and avoid current spikes[1].

The reference frame can attain the robot 's direction. This can map the robot's exact route by providing a reference point & having a guide axis. It constantly schedules steps at the stage and also at the predetermined point. The gps, locating location, changing direction[2].

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The two major production factors in the agricultural sectors are the volume of water & fertilizers. Both should be in a particular ratio to deliver high gain among them. Higher efficiency could be reached when their proportion rises with a high degree. The level of humidity & fertilizers reveals important orthogonal relationships[3].

For their movement & control the Device must be supplied with sufficient instructions. One of the approaches used for their research is by using bluetooth device. Linking to the machine using the Bluetooth is one of the contact methods with the machine by the use of the mobile. The mobile application will interact with the assistance of the bluetooth that fits the robot[4].

The unmanned aerial agriculture vehicle is powered by GPS & magnetometer to begin drainage for plowing, sowing, leveling& the notification indication. Using GPS gyroscope & proximity sensors to get to the required spot. The System is powered by servomotors. Tires driven by DC geared engine can be used for machine movement. Also, the camera for the users to live monitor the ongoing process. Water supply is achieved by controlled micro - controller order from the reservoir[5].

III PROPOSED APPROACH

Robot Unit:

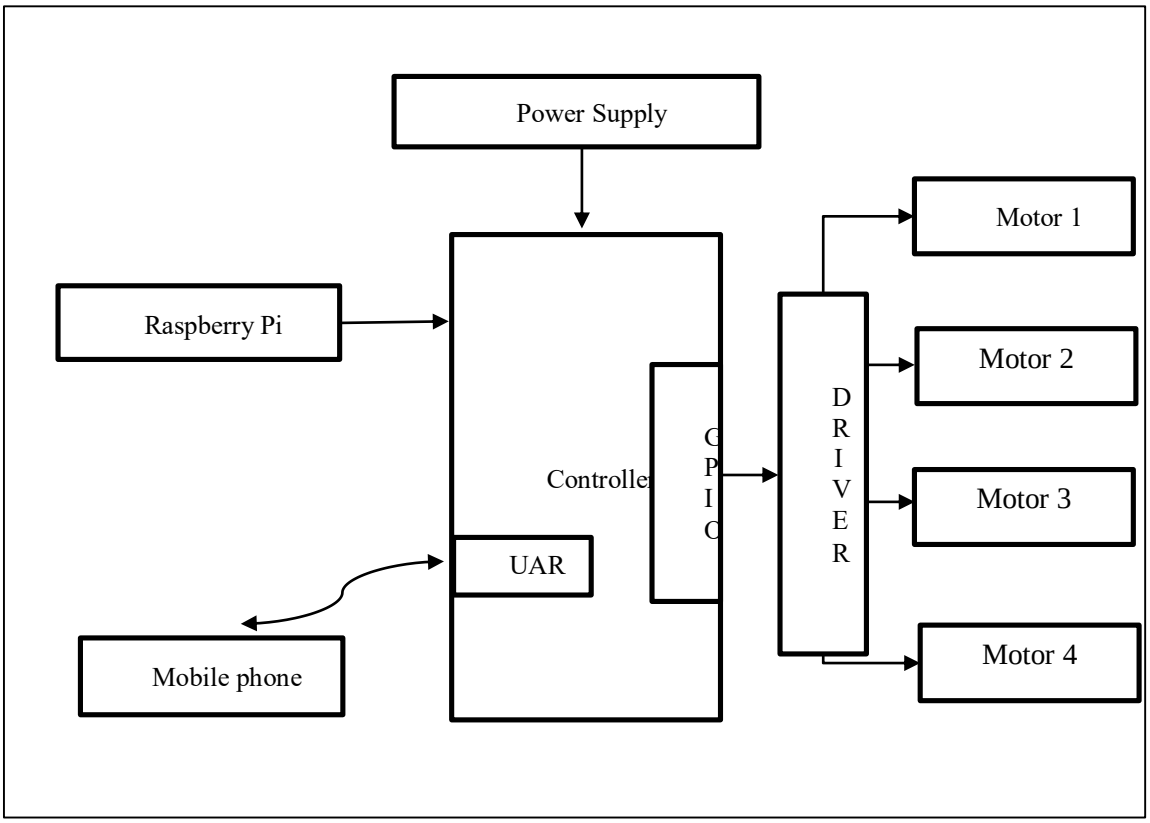

Fig 1 Block diagram of the Robot unit

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In Above fig shows the block diagram of the Robot unit. This is a locomotive part which carries the sower on it. This locomotors part consists of a Raspberry pi, Driver circuit and DC motors. Raspberry Pi module is used to interface a USB Web cam with the robot. DC motors are connected to the controller via GPIO pins. Mobile phone is connected to the controller via serial port.

Sower Unit:

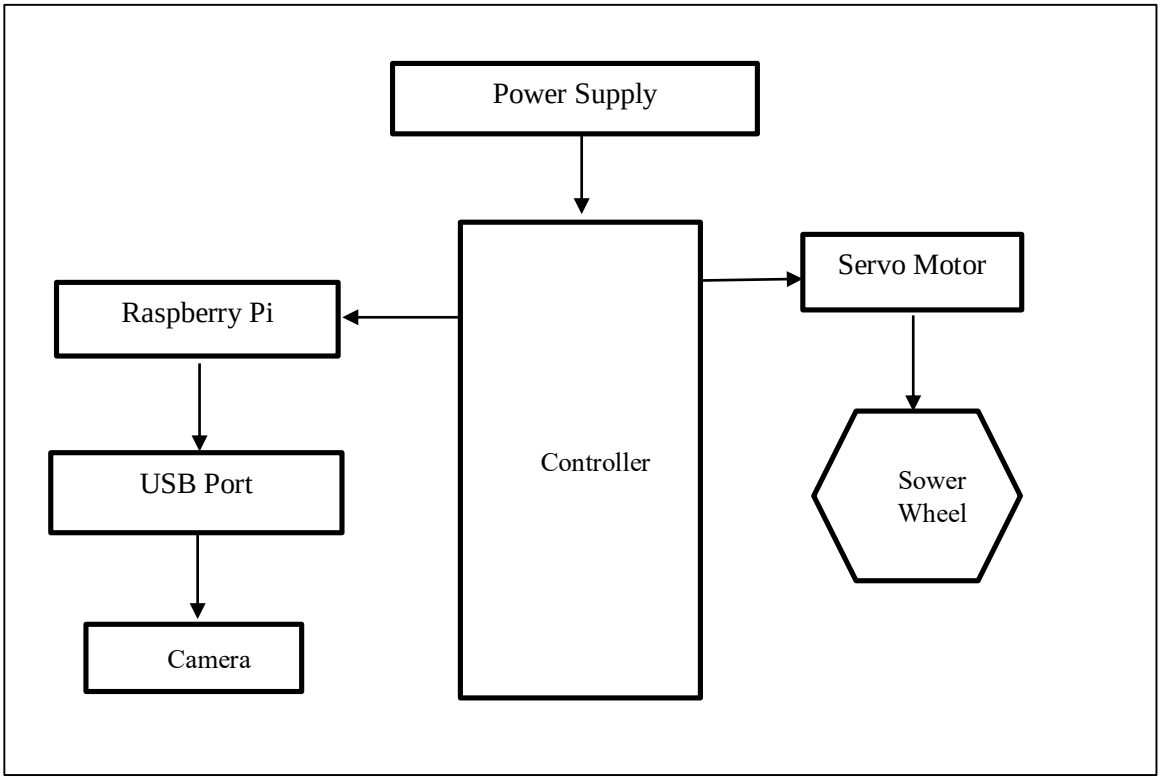

Fig 2 Block diagram of the Sower unit

Above fig shows the block diagram of the Sower unit. This is a mounted part which is placed over the robot unit. This sower part consists of a Raspberry pi, camera and sower wheel. Sower wheel is a wheel like structure which carries the seed from a bowl. Camera is connected to monitor the track of the locomotry unit. Using mobile phone one can view the camera screen so that one can drive this sower unit.

IV RESULTS

In the selected area the proposed automated seed planting robot has been developed and implemented.The DC motor, Web camera, raspberry pi, & sower wheel were independently checked for their usability and incorporated

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into the machine

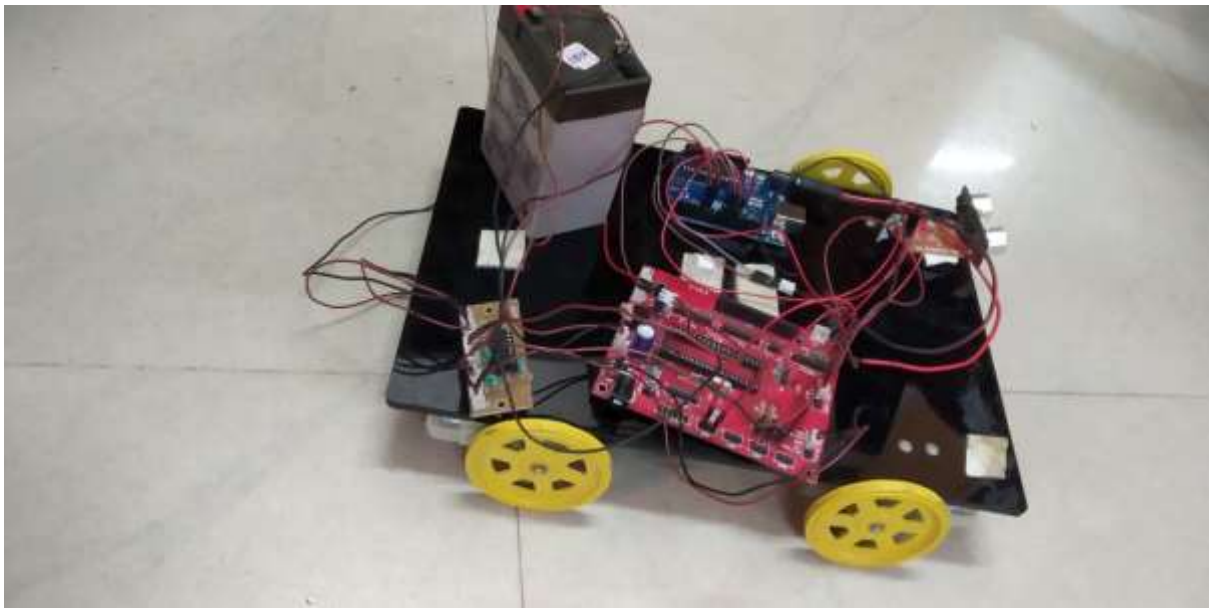

Fig 3 Hardware Implementation of the Robot Unit

The robot unit can be driven from blynk application, and the path can be monitored via the server which is specially created by raspberry pi for monitoring purpose. In the Hardware Implementation single motor driver is connected to four wheel of the robot. Through UART serial communication is done in which user and the robot kit communicates successfully.

V CONCLUSION

While the time taken for seed sowing by normal method in a normal farm takes few hours or part of a day, in the proposed system the results are obtained within 90 minutes for an acre of land. The live camera results obtained from the raspberry pi are fed to server and viewed from a mobile phone using raspberry pi unit also user can drive the robot kit by seeing the camera update. Hence, whole process of seed sowing for all the types of seeds which requires a maximum 30-40 minutes after which the field can be fertilized.It can be seen from the above findings that the suggested program solves the difficulties faced by peasants.

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