

Fabrication of Advanced Agribot Robot

Devendra Jha, Divyansh Tayal, Abhishek Kumar, Mudit Sharma, Dhruv Kumar

Abstract: Numerous nations in Asia including India are agrarian economies and the majority of their rustic populaces rely upon horticulture to acquire their business. The utilization of apparatuses and domesticated animals in the rural procedure has decreased the human exertion. Central point that influence agribusiness incorporate less holding territory, deficiency of seeds, manures and work and vulnerability of storm. The motorization of horticulture alludes to the utilization of devices or machines in the rural procedure that conceivably lessens the human exertion. In spite of the fact that it lessens the human exertion in the horticultural procedure, it requires total human collaboration. The mechanization and apply autonomy application in the part of agribusiness is at the blasting stage when contrasted with its wide scope of use in different divisions. Numerous inquires about have been done in this field to robotize the procedure. In the current paper an exertion is made for the plan and advancement of the robot that can perform seeding process with no human intercession. The robot created is equipped for causing a gap in the dirt to up to certain profundity, putting the seed precisely in a similar gap and shutting the mud. The procedure is constrained by a microcontroller. The robot created defeats the disadvantages in the customary technique for seeding which incorporates wastage of seeds, high work wage, lower use of land and so forth. By the utilization of computerization and mechanical technology in the field of farming it is conceivable to build the general proficiency of the agrarian procedure and can alleviate impacts of work lack. This paper likewise presents the IoT-based horticultural creation framework for balancing out organic market of rural items while building up the earth sensors and expectation framework for the development and creation measure of yields by social affair its ecological data. As of now, the interest by utilization of horticultural items could be anticipated quantitatively, be that as it may, the variety of reap and creation by the difference in homestead's developed zone, climate change, infection and bug harm and so on. Couldn't be anticipated, so the market interest of agrarian items has not been controlled appropriately. To beat it, this paper structured the IoT-based checking framework to dissect crop condition, and the technique to improve the effectiveness of dynamic by investigating harvest measurements.

Keywords: IoT; Wi-Fi; ESP 8266; Bluetooth; WSN; Smart Device; Agri bot

I. INTRODUCTION

Agribusiness assumes a significant job in India's economy. The requirement for the mechanization in the field of

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farming area is for the most part because of the expanded need of agrarian items because of expanded populace and lack of work in the horticultural division. This paper is chiefly worried about the computerization of an incomplete procedure associated with the agribusiness. The customary techniques for seed planting incorporate telecom, putting seeds behind the furrow, line planting, transplanting, spilling and so forth. The utilization of tractor is generally basic in the current horticultural pattern. Before the seeding procedure is done it is important to appropriately blend the top layer of the dirt with the prolific base layer of the dirt which is normally done by the tractors or creature driven furrow. This requires a ton of vitality and human collaboration. Because of the substantial load of the tractors the dirt will be compacted, the compacted soil will lose porosity and it gets hard for the seeds to sprout. The horticultural statistics gives indispensable data on the conveyance of land property in our nation. As per the registration lion's share of the ranchers are having the land under 1 hectare. This is one of the significant disadvantages for the automation in rural division in India. The apparatuses that are presently being utilized in the rural part are climate subordinate. These hardware utilize a great deal of vitality and require human work to co-ordinate the procedure. Notwithstanding that the expenses of these sorts of apparatuses are high. Motorization is only utilization of apparatuses and hardware that are useful in rural procedures. The motorization of farming can be partitioned into two classes, one is the portable kind and another is the fixed sort. The previous targets supplanting the creature power and the last targets lessening certain activities that are performed either by human work or by a consolidated exertion of work and creatures. The automation of farming prompts the expanded efficiency somewhat anyway the human exertion and the interest of human in the rural action are not decreased.

II. LITERATURE SURVEY

[1] Suraj Chavan , Anilkumar Dongare , Pooja Arabale , Usha suryanwanshi , Sheetal Nirve, et al., Agriculture Based Robot (AGRIBOT). Numerous nations in Asia including India are agrarian economies and the majority of their country populaces rely upon farming to gain their occupation. Planned for expanding the profitability and diminishing the work in question, this robot is intended to execute the fundamental capacities required to be completed in ranches. We intend to make a performing multiple tasks horticulture robot which will concentrate on essential work of estate. To plant the seeds a mechanical arm will burrow to an exact profundity with equivalent separation between the seeds. At base of robot water siphon will be put and according to the necessity water will be sprinkled.

The perfect measure of manure will be spread over the seed.

[2] Pavan T V1, Dr. R. Suresh2, Dr. K R Prakash3, Dr. C. Mallikarjuna et al., Design and Development of Agribot for Seeding. This paper is an exertion towards the computerization of seeding process. The created framework is fit for playing out the seeding activity in the rural field. The significant confinement that was found in the past frameworks is the seeding plan. The seeding course of action isn't adaptable and just one kind of seeds can be utilized. This impediment is defeated in the current framework. In view of the preliminaries done the framework is equipped for playing out the seeding activity. Uniform profundities for the seed situation and uniform separation between the two progressive seeds were gotten. The created robot is fit for playing out its activity with no human exertion and the human intercession in the process is fundamentally decreased. Building up a robot that can perform wide assortment of farming undertaking is a difficult procedure. The utilization of robots can be monetarily defended when they are fit for performing wide assortment of horticultural procedure without human mediation. Aside from the agrarian procedure these sorts of seeding robots can be utilized for mass manor, reforestation and afforestation.

[3] Mr. V. Gowrishankar, Dr. K. Venkatachalam et al., IoT Based Precision Agriculture utilizing Agribot. In excess of 60 percent of the populace in the India, horticulture as the essential segment occupation. As of late, due increment in labor deficiency intrigue has developed for the advancement of the independent vehicles like robots in the farming. A robot called agribot have been intended for rural purposes. It is intended to limit the work of ranchers notwithstanding speeding up and exactness of the work. It plays out the basic capacities engaged with cultivating for example showering of pesticide, planting of seeds, etc. Showering pesticides particularly significant for the laborers in the territory of conceivably unsafe for the wellbeing and soundness of the laborers. This is particularly significant for the laborers in the zone of possibly destructive for the security and soundness of the laborers. The Proposed framework targets structuring multipurpose self-governing rural automated vehicle which can be controlled through IoT for seeding and showering of pesticides. These robots are utilized to diminish human mediation, guaranteeing high return and effective use of assets.

[4] Dr. Premjyoti Patil, et al., Wsn Based Advanced Agricultural Vehicle Operated Using Smart Phone – Agribot, This venture presents remote innovation in the field of agribusiness. It diminishes difficult work and can work in any kind of climatic condition too as can work relentless not at all like people. The time required to complete the five functionalities lessens extensively in correlation with doing similar exercises physically. Rural robot or AGRIBOT is a robot sent of rural purposes. This multipurpose framework gives a propelled strategy to seed planting, furrowing, watering the yields and reaping with least labor and work making it a productive vehicle. The entire procedure count,

preparing, checking are planned with engines and interfaced with Microcontroller.

[5] Ankit Singh, Abhishek Gupta, Akash Bhosale, Sumeet Poddar. et al., Agribot: An Agriculture Robot. This paper has set out a dream of how parts of harvest creation could be robotized one. Albeit existing kept an eye on activities can be proficient over enormous regions there is a potential for diminishing the size of medications with independent machines that may result in much higher efficiencies. The improvement procedure might be gradual yet the general idea requires a change in outlook in the manner in which we consider automation for crop creation that depends more on plant needs and novel methods for meeting them instead of altering existing strategies. Agribot is a robot intended for agrarian purposes. As one of the patterns of improvement on mechanization and insight of horticultural hardware in the 21st century, a wide range of farming robots have been looked into and created to actualize various rural creations in numerous nations. This Bot can perform essential rudimentary capacities like picking, gathering, weeding, pruning, planting, joining. [6] Ms. Aditi D. Kokate , Prof. Priyanka D.Yadav et al., Multipurpose Agricultural Robot, This undertaking is basically founded on limiting labor just as cost of the gear. The robot can be with open source framework rather than ordinary mechanical vehicle. Mechanization is required, for example, industry, bio-clinical, overview line and so forth. Particularly in horticulture field for expanding yield of harvests. Adaptability of mechanization framework is high than conventional framework. The upside of this framework diminish the work cost, and time. In this work a robot is assembled and built up to complete programmed and manual seeding, Irrigation, Fertilization in a farming field. The working of the robot is performed by sustainable power source like sun oriented vitality. It is normal that the robot will bolster the ranchers in improving the proficiency of activities in their homesteads.

III. IMPLEMENTATION

As we as a whole know the fundamental necessity in the business or any firm is labor. Along these lines, the fundamental goal of our undertaking is to decrease the need of labor. This paper is to build up a robot equipped for performing tasks like programmed seeding, water system, preparation. It gives manual just as auto control. The primary part here is the ARDUINO that directs the whole procedure. Right now, robots are progressively being coordinated into working errands to supplant people uniquely to perform dreary undertaking. Seeding is one of the initial phases in cultivating. During this procedure seeding is done in all the lines of the cultivating.

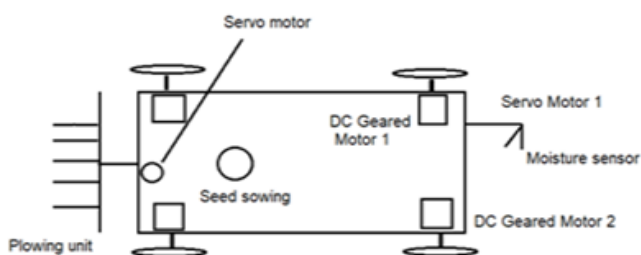


Fig. 1. AgriBot Block Diagram

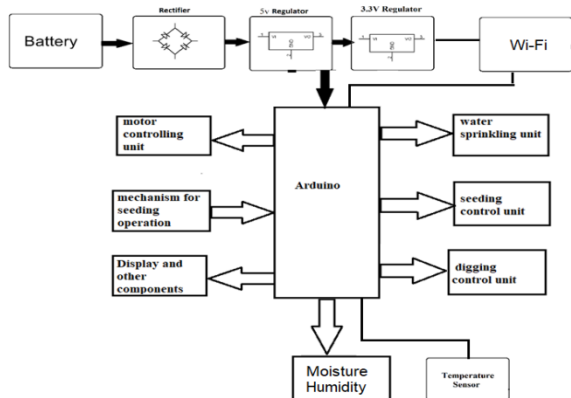


Fig. 2. Control Unit Block Diagram

Fig.1 and Fig 2. Shows the block diagram of bot side and control unit side. In the control unit the sensors information and display, motors control unit are present, also motors to water plow, etc are present for automatic agriculture support. Both these are in one bot unit. In control unit the controlling of bot for seeding and working in all directions is also included.

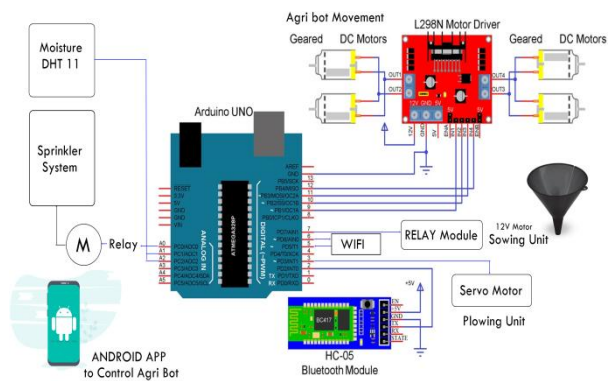


Fig. 3. Circuit Diagram

The hardware components used in this project are: Arduino, DC Motor, Servo Motor, Humidity sensor (DH11), Moisture sensor, Bluetooth sensor HC-05, Wi-Fi module, Wheels, Seed container, clamps, Battery. The code is written on Arduino IDE in version Arduino 1.8.7 with windows OS.

IV. RESULT

In this section, the results are mentioned. The prototype image is shown in fig. 4 and fig. 5. It worked well and up to high accuracy.



Fig. 4. AgriBot Prototype Image 1

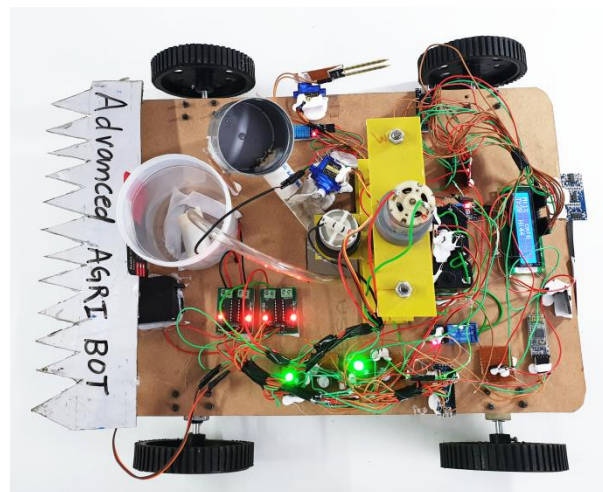


Fig. 5. AgriBot Prototype Image 2



Fig. 6. Screenshot of results in IOT App

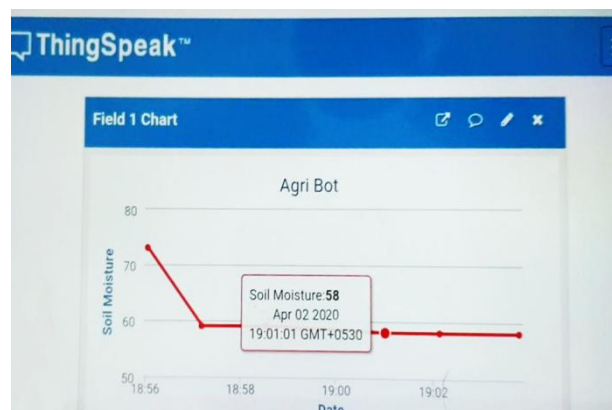


Fig. 7. AgriBot result for Soil Moisture

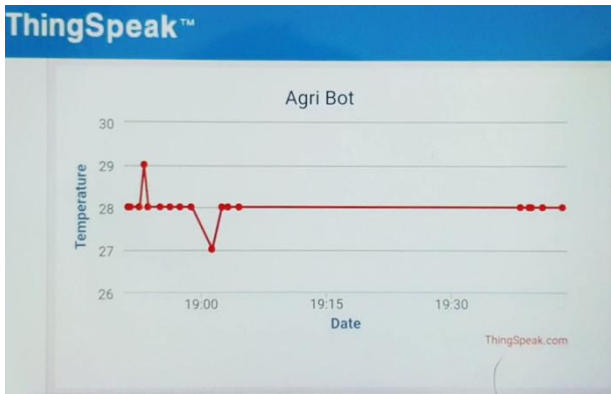


Fig. 8. Agribot result for Temperature

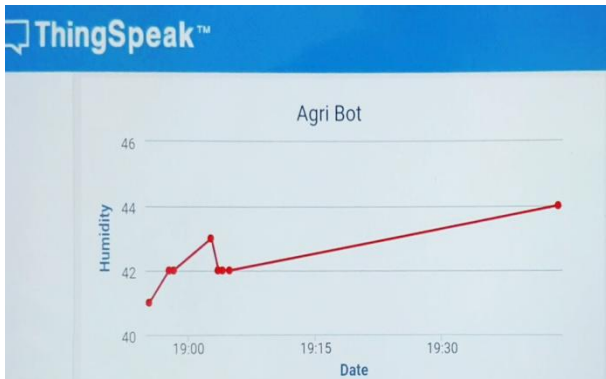


Fig. 9. Agribot result for Soil Moisture

Fig. 7, 8 and 9 shows the results for Soil moisture, temperature and humidity for the Agribot IOT part.

V. CONCLUSION

Hence, the Agribot is successfully implemented as per results. This has Reduced human participation. System can work autonomously as well as in controlled manner. It has Uniform drill depth which is good for same type of crops. Uniformity in the seed placement therefor growth in uniform manner. Increased land utilization and higher productivity can be achieved by our proposed method. Also there is Increase in yield/productivity. Human Accident Reduced and it is Easy to maintain and repair. There is no fear of poison. The method has low maintenance and cost.

VI. FUTURE SCOPE

This robot fitted with a camera can be utilized for reconnaissance reason, rather than utilizing electrical vitality to energize the battery, sun based force can be utilized. By changing the penetrating plans more profundities can be accomplished. By utilizing GPS innovation seed mapping should be possible.

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