

IOT BASED GRASS CUTTER POWERED BY SOLAR ENERGY

MANOJ S B¹, VINAY K², SUMAN M³, UMESH KUMAR CK⁴, MR.SYED SALIM⁵

^{1,2,3,4}Students, ⁵Professor, Department of Computer Science and Engineering
Vidya Vikas Institute of Engineering and Technology, Mysuru, Karnataka, India.

Abstract -20th century is known for a century full of automation and development. We see day-to-day life automation become a Habit of every field like manufacturing industries, automobile industries, farming, etc. introduced IoT-based solar grass cutter. IoT is a system of the interconnected digital mechanical machine and people that are efficiently used to data. In IoT-based solar cutter, controls are made by the smartphone which is become used by everyone. In this device, we used Arduino software and all the programming is done on it. The Ultrasonic sensor detects a problem and the DC motor becomes a useful part providing a move upward or downward. Solar panels become a source of solar energy given the energy to the system. This renewable source of energy is used in summer and other seasons also. latest features and technology used in Smart IoT based GRASS CUTTER which is based on IOT (INTERNET OF THINGS) and ROBOTICS. A Special feature of this grass cutter is that it can be managed from any part of the world because it is connected to the internet. We can even control it from our cell phone which is a very common gadget installed in everyone's pockets. In this device, we use ARDUINO IDE software to do all the programming of this device even the slide movement of a wheel. For the up side and down ward motion of grasscutter device named SERVO MOTOR is being introduced. An IR & ULTRASONIC SENSOR is used to detect the location of the obstacle and to inform the arm to respond. Finally, we can see the energy used in this device. We have used a BATTERY of capacity 12V also SOLAR PANELS which will come in handy on sunny days and are ENVIRONMENT FRIENDLY.

Key Words: Arduino IDE software, Ultrasonic sensor, DC motor, IR, Servo motor, 12V battery, Solar panels.

I. INTRODUCTION

Green is the color of the beauty of nature. The Same goes for the grasses. But their beauty can be enhanced by the proper cutting and adjusting their length. has we can decorate grass in a garden or lawn by using this compact device without any manual effort. Many technical gadgets are used for this job. Our project (IOT BASED GRASS CUTTER POWERED BY SOLAR ENERGY) is introduced to do the same job but in a technical style by the use of our cell phone which is very compact and in daily use. The device is installed with many features such as a robotic arm to remove obstacles in its path, ultrasonic sensors to sense an obstacle, solar panels to charge a battery, and many more. Knowledge of IoT and ROBOTICS programming is being used in this project. Working on this is as easy and smart. We can move it by inputs given in the software. Movement in any direction is controlled easily also cutter is not fixed which is also movable, for security purposes.

I.1 MOTIVATION

Automated grasscutters(Lawn Mower) have been made available to the general public for over 30 years (Georges 1999,p.195); their widespread or public use on the other hand has been limited due to the high costs of such devices. Existing technology sell at around £899 or more (Lawn Mower Reviews, 2011) and because the manual versions of these devices mowers, sell at around £86 (Lawn Mower Reviews, 2011) although the cost of labor to be added to that of the equipment, the latter is still a current viable and affordable option for most consumers. There are many real-world benefits of having a machine that automatically cuts grass, these included elderly users or those with disabilities who are unable to fulfill this task themselves for users with a busy schedule and rarely find time to work, etc. It is a device that can make a smart into just about everyone's lifestyle, therefore having a device that costs less, although successful in the same task as the higher-end models is a great advantage to compete with the current market where the end consumer will benefit from.

I.2 EXISTING TECHNOLOGY

The approach Robomow although successful is to a certain degree inefficient and contributes to an expensive end product. The main advantages of their blueprint include, virtually any size or shape of garden can be specified, it is flexible and it can work without requiring the user involvement at any stage, can operate at superficial areas with slopes, these points can also constitute a disadvantage.

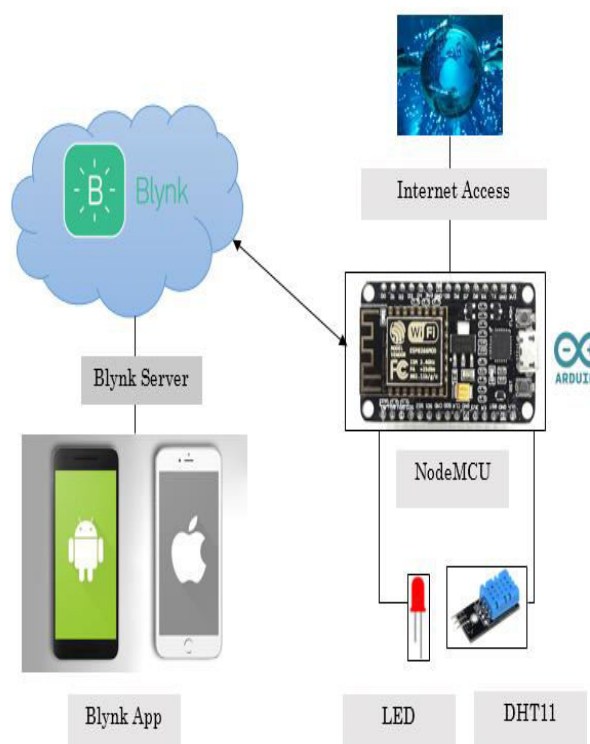
II. LITERATURE SURVEY

1. Title: IOT BASED GRASS CUTTER POWERED BY SOLAR ENERGY Author: Srishti Jain, Amar Khalore, and ShashikantPatil Findings: Designed a robot using solar power which will help the user to cut the grass with minimum effort. Designing part ensures that it does not stay up to the lawn area but freely moves anywhere. Sensors were also built that will make it move anywhere. The main disadvantage is that the response time of the system is slow in real-time practical situations. 2. Title: Smart Solar GRASS CUTTER Author: Ms. Rutuja A. Yadav, Ms. Nayana V. Chavan, Ms. Monika B. Patil, Prof. V .A. Mane Findings: Designed a robot which will have some automation work which erasure human interaction. The system has an infrared sensor that helps to compare between, cut and uncut grass. Thus, the grasscutter continuous until it cut the grass. Obstacle sensors are inbuilt to get the direction and move freely. 3. Title: IOT BASED GRASS CUTTER POWERED BY SOLAR ENERGY Author: Tushar Baingane Findings: The journey of development made us curious to get everything automated. In modern life, automation is a necessary part of the invention. A solar grass cutter is a machine that cuts grass at any length with management that uses cutting blades or threads. The main adjective is to move the grass cutter in all directions to make different designs as per requirement. By using a link mechanism, the height of the gars' cut can be adjusted. The unskilled labor can easily operate the device. IOT BASED GRASS CUTTER POWERED BY SOLAR ENERGY Dept. of CSE, VVIET 2020-21 Page 7. 4. Title: IOT BASED GRASS CUTTER POWERED BY SOLAR ENERGY Author: Ms. Bhagyashri R. Patil, Mr. Sagar S. Patil Findings: discussed that human involvement is necessary for every field of the working area. The purpose is to show how to use solar energy which is a renewable form to move the robot with minimal effort of human interaction. 5. Title: Smart Solar GRASS CUTTER Author: Siddharth Wadhwani, Uday Singh, Prakash Singh, Shraddha Dwivedi Findings: In the evolution of technology where people deal most of the work with smartphones, can solve their daily life task with it. IT weight about the use of IoT in various applications. It collaborates with Arduino which senses

the world and IoT which deals with the embedded technologies.

III. METHODOLOGY

The project is provided in a modular approach. Each module is coded as per the requirements and tested and this process is repeated till all the modules have been thoroughly provided to design a Smart Solar Grass Cutter, some parameters need to be used such as the components to be used in the project, the position of the components,



the structure of the main body, the advantages and disadvantages of the design and the factor of safety. The Smart Solar Grass Cutter can operate autonomously or non-autonomously. Other than that, the important factor is efficiency. The materials and components selections including the positions are crucial to achieving better efficiency. This Smart Solar Grass Cutter is a simple design that adjusts the usage of materials. The overall dimension of the grasscutter is depending on the size or the dimensions of the solar panel. Three motors are used for the rear tires and the blade. The height of the roof is based on the height of the battery. The rubber rotating wheel is used as the front tires as it will change the direction automatically depending on the rear tires. One motor is spontaneously for each rear tire. The design is cost-effective and compatible with the main objectives. Starting from the hand sketch, the prototypes were designed in multidimensional using Solid Works software. measurement of the design is very important and needs to be accurate and precise to enhance the safety factor.

IV. FUTURE ENHANCEMENT

The project was successful with the available origin. But the results and changes are not up to the expectations. This can be further improved by build in the following modifications to obtain better results. The mechanism which we used i.e. scotch yoke mechanism does not give excepted order. This order can be increased by using some other mechanism. and the speed of the motor is reduced because we have used heavy material and this material can be replaced by using lightweight material .and design of blades can be done based on different types of grass is used to cut. The project which we have done surely reaches the average families because the grass can be trimmed with minimum cost and with minimum time Finally this project may give an encouragement to the people who can modify and can obtain better results.

V. CONCLUSION

A workable smart solar grass cutter prototype is focusing on renewable energy as the primary source of energy has been successfully fabricated with high working efficiency. Therefore, it can be concluded that the developed design of the proposed Smart Solar Grass Cutter has achieved the main objectives and it can be further developed by industry. Smart Solar Grass Cutter can reduce air pollution and also it is a user-friendly device. The grasscutter is suitable to be used for small applications due to the shortest operating time, but it is not suitable for tall height grasses. For future work, a few recommendations can be made to develop a better device. Instead of using a polycrystalline solar panel, it is better to a higher monocrystalline solar panel due to the high efficiency. The motor for the blade should have both high speed and torque. The higher capacity of rechargeable batteries can lead to more operating time. Lastly, few types of blades to be considered to cut different types of grasses.

V. REFERENCE

[1] Tao Liu, Bin Zhang, Jixing Jia, Electromagnetic navigation system design of the greenhouse spraying robot, IEEE(2014). [2]. Gholap Dipak Dattatrayal, More Vaibhav Mhatarde, Lokhande Manojkumar Shrihari, Prof. Joshi S.G Robotic Agriculture Machine, International Journal of Innovative Research in Science, Engineering and Technology, Volume 3, Special Issue 4, April 2014. [3] Sajjad Yaghoubi, Negar Ali Akbarzadeh, Shadi Sadeghi Bazargani, Sama Sadeghi Bazargani, Marjan Bamizan, Maryan Irani AS1, Autonomous Robots for Agricultural tasks and farm assignment and future trends in Agro Robots, IJMMEIJENS Vol.13 No.03(2013). [4] Srishti Jain,

Amar Khalore, Shashikant Patil. Self-Efficient and Sustainable Solar Powered Robotic Lawn Mower in International Journal of Trend in Research and Development(IJTRD). Vol.2(6), December 2015. [5] Ms. Rutuja A. Yadav, Ms. Nayana V. Chavan, Ms. Monika B. Patil, Prof. V .A. Mane. Automated Solar Grass Cutter in International Journal of Scientific Development and Research(IJSDR). Vol.2, February 2017. [6] Biggar Pravin Dilip, Nikhil Bapu Pagar, Vickey S. Ugale, Sandip Wani, Prof. Sharmila M. Design and Implementation of Automatic Solar Grass Cutter in International Journal of Advanced Research in Electrical(IJARE). Vol.6, April 2017. [7] Ms. Bhagyashri R. Patil, Mr. Sagar S. Patil. Solar Based Grass Cutting in International Journal of Electrical and Electronics Engineers (IJEET). January-June 2017.