

Design and Implementation of Row or Column wise Banana Tree Cutter using IoT

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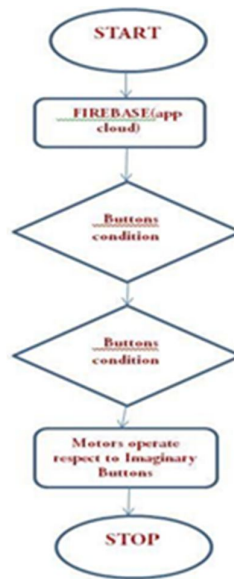
Abstract—This paper intends to design a Row or Column wise Banana Tree Cutter for formers who cultivate banana. The Formers cultivate the banana in large area of field. After a cultivation, the banana tree need to cut. Nowadays, the banana trees cut by two ways, in first way by the people by manually using weapons. In second way, it is done by truck which totally convert the whole tree into mixture. There is no use of mixture. In this module, which has mechanical system and electrical system. Fire base system is adopted for cultivation process control and IoT integration. Two motors are connected and one for cutting and another for transfer. Node MCU control the over all operations of the system. The programming is developed and executed as per the farmer premises.

Index Terms— DC motors, Internet of Things(IoT),Frictional Wires, Cloud computing , Firebase,etc.

I. INTRODUCTION

This system can cut the Banana tree with help of frictional wire using IoT buttons through the imaginary buttons in IoT. Now a days, the communication and technology, the dramatic growth of electronics, smart phones and internet. Through those things, the communication can be done communicated physically or wirelessly and become the fundamental tool of human life. The future generation of connected world is Internet of Things (IoT). It consists of devices, sensors, appliances, vehicles in the world. The devices or objects may include the tablets, smart phones, sensors, etc.

By using IoT, The system can connect anything, access from all the places at any time, with high performance access any service and information about all the objects. The IoT objective is to improve the benefits of Internet with remote control skills, data spreading, constant connectivity and so on. Using an embedded sensors, those are always on condition and collect the data, the entire equipment's will be integrated to local and global networks. The word 'IoT' always called Internet of all things, which was introduced by Kevin Ashton in 1999. The IoT technology controls the big amount of data about living things, non-living things, time and area. When combining the Internet concepts and IoT, which deliver a large amount of space and innovative things based on minimal cost of sensors and wireless technology. Cloud computing and IPv6 accelerate the improved and



Flow chart of Proposed System

buttons pressed it sends signal Moving motor relay where it is Forward or Backward. When the cutting button is pressed then it send signal to the cutting motor's relay. The Movement of module developed by using faraday's law in motors. The cutting method is based on the frictional motion of Newton's Law and Energy conversion of Thermodynamics law. The frictional force creates the Heat energy which helpful in cutting the tree and frictional wire the makes the tear in banana tree sheath. Hence the tree to be cut.

IV. COMPONENTS REQUIRED

A. ESP32(Controller)



Node MCU is a series of minimal cost, low-power consuming on a microcontroller with integrated wire less technology and dual-mode Bluetooth. The ESP32 series require a TensilicaXtensaLX6 microprocessor in both dual-core and single-core variations. It can be incorporated with built-in switches of antenna, RF balun, and power amplifier, high quality receiving amplifier, filters, and power-management modules. ESP32 is created and developed by a Shanghai-based Chinese company, and is manufactured by Cussing their 40 nm process.

B. Relay



A relay is an electronic switch. It consists of input terminals set for a single, and operating contact terminal set. The switch has two number of contacts in multiple contact formation such as make contacts, break contacts, or combinations.

C. Motors



The electrical motor is used to convert electric energy into kinetic energy. Generally, electric motors operate by means of the relation between the stator magnetic field and current flow in the rotor. To generate force by means of rotation of a rotor shaft. Electric motors can be operated by direct current(DC) sources, such as from DC sources, motor vehicles or rectifiers, or by alternating current(AC) sources, such as a power grid, inverters electrical generators. An electric generator is physically coupled to an electric motor, but which operates in the reverse direction, converting mechanical energy into electrical energy.

D. Frictional Wires



The frictional that can able to cut the banana tree of sheath. It is made iron steel. These are inner cable is very important for the bicycle brake or gear shifting control systems. The primary aim of providing best quality products lies upon the capability to incorporate and master each manufacture processes. The structure and properties of steel is the very important factor for tensile, and surface treatment is the most critical factor to reduce the friction. As a result, a straighten-processed and seal processed inner cable provide the longest service life.

V. PROGRAMMING

In this system ESP IDF programming is used to control measurement and display the outputs. Codes are installed in ESP32 controller to control and monitoring the devices used and battery system. This same system can also be designed for Arduino nano for compactness. Embedded C or C++ language based programming is used in this system with loops and conditions for repeated operations. The embedded system based devices has miniature controller based in which device ESP32 controller and it is programmed by embedded C language to control the all components used in this device.

A. Firebase

Firebase is a platform for development of mobile and web application. Which had developed by Firebase, Inc. in 2011, then acquired by Google in 2014. In 2018, the Firebase platform had 18 products, which were accessed by 1500000 apps.

B. Firebase Cloud Messaging

At initially, It was known as Google Cloud Messaging(GCM), Firebase Cloud Messaging(FCM) was a cross-platform solution for messages and notifications for Android,iOS and web applications, which as of 2016 can accessed at free of cost.

C. Firebase Realtime Database

Firebase deliver a real-time database and back-end as a service routine. This platform provides application developers an API that permit application data need to synchronized across clients and stored on Firebase's cloud. The company provides client libraries that enable integration with Android,iOS, JavaScript, Java,

Objective-C Swift and Java applications. The database has accessible through a REST API and bindings for several JavaScript frame works such as Angular JS, React and Backbone.js. The REST API uses the Server-Sent Events protocol, which is an API for creating HTTP connections for receiving push notifications from a server. Developers using the real time database can secure their data by using the company's server-side-enforced security rules.

D. Cloud Firestore

In 2019, Cloud Fire store was officially brought out of beta, making it an official product of the Firebase line up. It is the successor to the actual data of firebase is basing system, Real-time system, and allows for nested documents and fields rather than the tree-view provided in the Real-time systems.

E. Firebase Hosting

Hosting of Firebase system is a static and dynamic web hosting service which launched in 2014. That supports hosting static files such as CSS,HTML, JavaScript and other files, as well as support through Functions of cloud. The system delivers the contents over a content delivery network(CDN) through HTTP Secure(HTTPS) and Safety Sockets Layer encryption (SSL). Partners of firebase with quickly response, a CDN, to provide the CDN backing Firebase Hosting.

VI. ADVANTAGES

Due to the Integration of Sensors, The system become a Portable system .The process of cutting trees will quickly done because row wise cutter. Reduction of analog components make the system is affordable system. With the help of Implementation of Row or Column wise Banana Tree Cutter using IoT, the tree can be converted into useful bio-product.

VII. CONCLUSION

The Row wise banana cutter is designed to reduce the farmers work after cultivation. Because farmers are the backbone of every country. This system helpful in cutting a banana tree.In many areas Banana cultivation is most thing done in acres range. This device will helpful and reducetheir time and work. And also after cutting it can be used in making of Bio-products.

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