

VEGETABLE TRACEABILITY SYSTEM BASED ON IOT AND IT'S APPLICATION

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Abstract- The Internet of Things (IoT) is a system of interrelated computing devices, mechanical and digital machines, objects that are provided with unique identifiers and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction. In this paper, we are examining about the vegetable traceability framework to acknowledge minimal effort, high productivity framework utilizing RFID and its application. Traceability is the capacity to follow the history, application or area of that which is under thought. The principal need of traceability is to ensure the shopper through quicker and more exact recognizable proof of vegetables. The framework gives the insights about vegetable data for the purchasers and a merchandise operation stage for vegetables creation administration and vegetable quality, security checking.

Keywords – Internet of Things, RFID, Vegetable Traceability, Supply chain management.

1. INTRODUCTION

In this paper we are discussing about the vegetable traceability and its applications. With the evolution of internet of things and technology, it has been applied widely in the field of agricultural production. At present most of vegetable production companies are going under the banner of the green vegetables, but the fact is that the consumer can't see vegetables are really green food. Since many fruits and vegetables are eaten raw, from the production enterprises, from farmer to retailer works diligently to protect these foods from contamination. With the use of IoT the customers can install an IoT based machine's in their kitchen, send the vegetables information to the manufacturers, after it has been received by the manufacturers then the manufacture will send freshest vegetables to the home, customers can check online barcode on the packaging of vegetables, you can understand the tree process of vegetables from seed to harvest.

- *Traceability* - Traceability is the ability to track the history or applications or location of a product in terms of documented recorded data.
 - *External Traceability* is the business forms that occur between the business process and the data/information traded to execute traceability.
 - *Internal Traceability* is the business process that happens between the trading assistants and the information/data exchanged to execute traceability.
- *Vegetable Traceability* - Vegetable Traceability is a process of tracking the vegetable from its point of origin to a retail location where it is purchased by consumers or until it reached to the customers.

The application of the IoT technology can provide consumers to order the green vegetables online and which can be delivered to the consumers of green vegetables to make sure the vegetables freshness, while enabling consumers to the internet through the product barcode information to ensure that the green and organic vegetables are not mixed, so that consumers can buy them confidently. Vegetable traceability is process that enables manufacture partners to chase the products as they shift from field to retail store or food service operator.

The traceability system works on two-dimensional code, no matter from where and how the vegetables are being sold to consumers that can be found in vegetable sources, and also the use of fertilizer and drug, so that customers can clearly consume the vegetables without any doubts. Now we will see the combination of the related research, based on the vegetable traceability system scheme by RFID (RFID stands for **Radio-Frequency Identification**), each RFID tag has a unique identification and then the IoT technology is used trace the product from its source till it reaches the consumers Therefore; in this paper we will study the following:

- Internet of things working process
- Design of RFID middleware
- RFID anti-collision algorithm

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2. SUPPLY CHAIN MANAGEMENT FOR VEGETABLES AND FRUITS

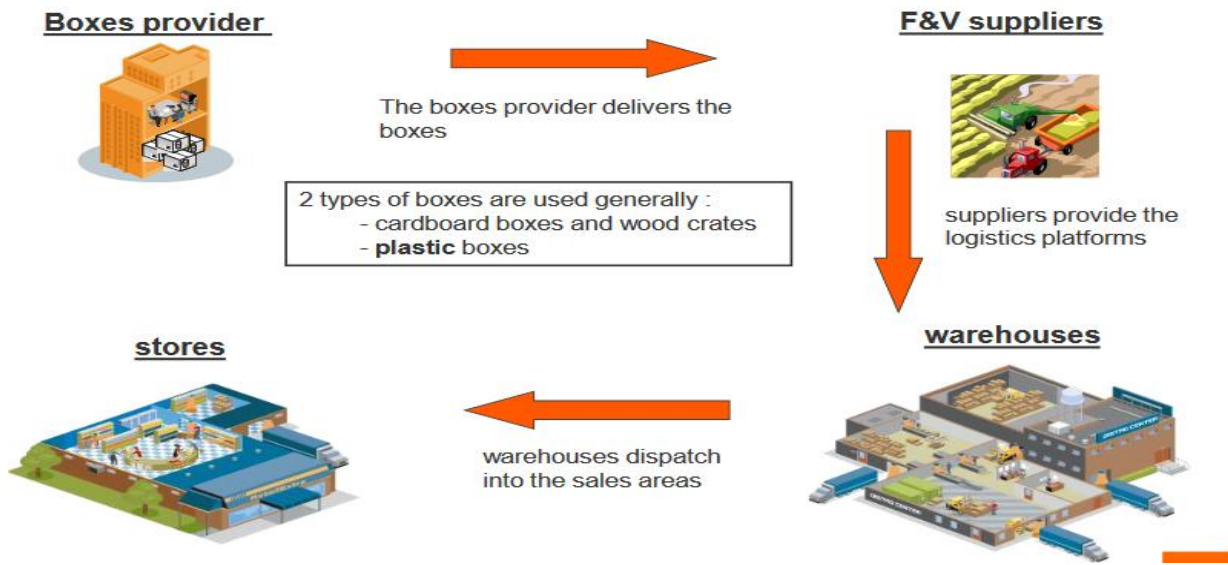


Figure 1. Supply Chain Management For Food And Vegetables

Typical supply chain involves variety of stages but mainly it includes producer (farmer), agent, central distribution system (CDS), store and consumer. In first phase producer will produce vegetables by cultivation with different treatments like soil management, pest treatment, harvesting etc. The vegetable and fruits grown in the farms are directly purchased by the collection centers of the respective vegetable supermarket that are passed on by their own vehicles which have all the facilities to keep the stuff nutritious, clean and hygienic to maintain the quality. When the farmers sell their product then the collection center will pay them their amount. Store is the final destination of a product from where it is ready to be purchased by the consumers. Here they are separated and neatly placed in a clean and hygienic ambience.

3. PURPOSE AND SCOPE OF VEGETABLE TRACEABILITY

Traceability is a business procedure that empowers exchanging accomplices to take after items as they move from field through to retail location or nourishment benefit administrator. Every Traceability Partner must have the capacity to ensure that the Traceability accomplice can recognize the immediate source (provider) and direct beneficiary (client) of item. The main need of traceability is to secure the shopper through speedier and more exact distinguishing proof of embroiled item Applies to new foods grown from the ground for human utilization. The Traceability rehearses is between the producer to retail location or foodservice administrator (i.e. outer traceability) which applies to all levels of item and delivery compartments, including beds, cases and shopper things.

4. PROBLEM STATEMENT

Identifying of a product through different phases of generation fabricating preparing taking care of transportation deals and utilization is an across the board hone in today s world. makers may expect buyers to enroll responsibility for item to encourage conceivable future review for security reasons or guarantee satisfaction. deliver traceability makes it conceivable to track create from its purpose of inception to a retail store where it is obtained by purchasers.

4.1 Defination And Working Procees Of Internet Of Things

The Internet of things is characterized as: The Radio Frequency Identification (RFID), infrared sensors worldwide situating frameworks, laser scanners and other data detecting gadget, as per the assertion consented to anything associated with the Internet, the data trade and correspondence, keeping in mind the end goal to accomplish shrewd distinguish, find, track, screen and deal with a system. Basic working of IOT consists of four parts Information Collection System. Object Name Server, PML and Business Management System.

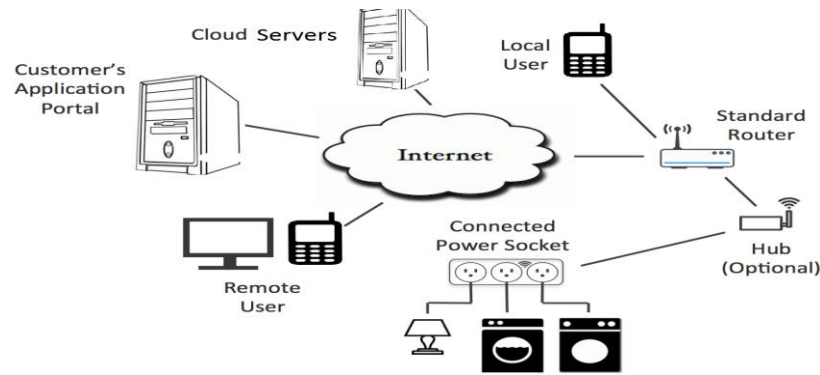


Figure 2. IoT Working Process

4.2 Information collection system:

Data accumulation framework comprises of RFID (tag), two-dimensional code peruse (Reader) and information trade and administration framework programming, the primary completed items distinguishing proof and EPC (Electronic Product Code) code gathering and preparing.

4.3 Object Name Service (ONS):

Protest name server ONS (Object Name Service) principle work is to execute the different data accumulation focuses and PML relationship between the data servers to accomplish RFID EPC codes from the things to the item mapping between PML depictions.

4.4 Physical markup dialect:

PML (Physical Markup Language) data server information definition rules made and kept up by the client, the client as indicated by foreordained standards to encode the things and utilize XML more data on the thing depiction. In the Internet of Things, PML server is for the most part utilized for in their regular model accommodates objects unique data, in order to characterize the guidelines of other server get to.

4.5 Business administration framework:

Business administration framework by getting to data gathering programming got the EPC data and through the PML ONS discover things, which can be as Web clients to the Internet, for example, data pursuit, following and different capacities, clients can likewise continuous by means of phone or remote PDA comprehension of the status of things.

5. VEGETABLE TRACEABILITY FRAMEWORK USING RFID AND BARCODE

With the development and prevalence of information industry, Internet of Things (IOT)-based traceability system has been gradually applied to agricultural products to monitor the whole process from the field to the final consumers covering production, processing, and sales. Efficiency, process control, and consumer communications are all closely related to the use of information and communication technology (ICT).

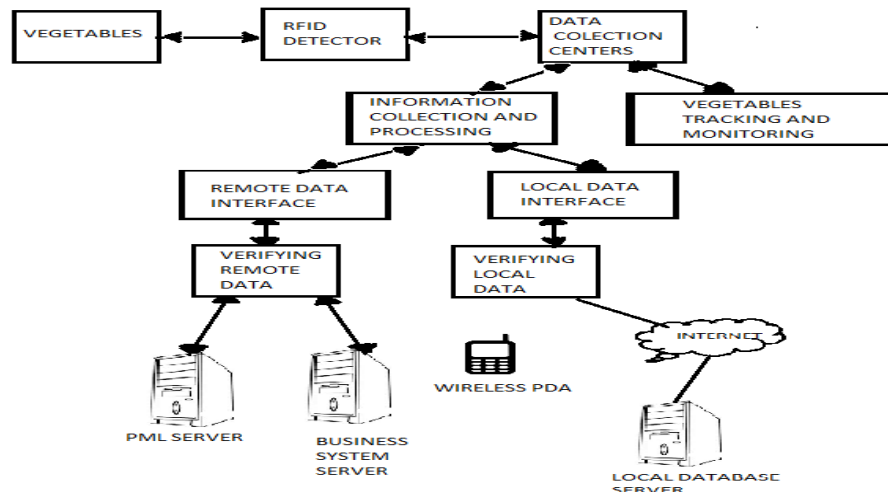


Figure 3. Vegetables Traceability Using RFID

5.1, System architecture design:

Vegetable traceability framework is based on Internet of things utilizing RFID proof and two-dimensional code innovation and each of them are named on vegetables, two-dimensional code, regardless of where vegetables sold to purchasers can be found in vegetable sources. The phases included in Vegetable Traceability System are

5.2, Vegetable Verification:

The core of vegetables verification framework is the coding and identification. Since every vegetable barcode tag has a unique coding, regardless of where vegetables sold, simply enter the quantity of vegetables to can vegetables, following and checking. Along these lines, the traceability framework in light of RFID or two dimensional scanner tag name embraces the EPC code as vegetables distinguishing proof label codes, the main by chip and Antenna arrangement, each tag has a novel electronic item code. EPC Code (Electronic Product Code) is Auto-ID look into place for each physical target d can be doled out a novel distinguishing proof code, its incorporated a progression of numbers can speak to vegetables class and vegetables ID, creation date and maker and so on data. With the move or change in the offers of vegetables, this information can be refreshed progressively. Ordinarily, EPC code can be made of silicon chips into electronic tag, with vegetables being distinguished to be the data preparing programming to recognize, exchange and check.

5.3, Data Collection Centers:

The Data Collection Centers of the framework work module, it through the information accumulation interface, data handling, vegetables following and observing interfaces to connect with other utilitarian modules, empowering programmed preparing of vegetable.

5.4, PML Servers:

PML server comprises of vegetable generation maker to make and keep up server and it with XML-based, give itemized data, for example, vegetable class and ID and place of creation data and permits the EPC code of vegetables data request.

5.5, Local Database Collection:

Local Database Collection center are principally utilized for putting away information procurement and handling interface gets vegetables message, keeping in mind the end goal to question and upkeep of business frameworks. For instance, the client can through telephone or remote PDA or Web customer whenever asks the present condition of the vegetables.

6. CONCLUSION

In this paper we proposed vegetable traceability framework by using the Internet of things, which has a high level of mechanization highlights. The program is right now building up the vegetable traceability framework has been introduced in the local utilization of a vegetable business; the future will keep on improving in light of client input

7. REFERENCES

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