IOT Based Vegetable Vending Machine

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***Abstract*-The aim of the project is to develop a machine to sell the vegetables based on the requirement of customer and to automate the vegetable vending. The recent survey suggests that 30 percent of vegetables gets rot which economically affect formers, vendors and customers too. The appearance of the Internet imagines a credit only economy by empowering monetary exchanges through advanced installments. An Internet of Things (IoT)-empowered credit only this machine which joins the distributed computing and installment entryway for requesting and buying things through advanced installment frameworks by utilizing a versatile application. This measures the weight of vegetables in loading and unloading conditions by using load cell. The work is carried out by using load cell based on load. The load cell gives the value of the amount of load present in the container. The load measured through load cell and amount will be calculated for the specific weight of vegetables.**

Index Terms*:- *Load cell, Solenoid lock, Database management.

I. INTRODUCTION

IoTconnects a variety of devices to create enhanced and intelligent services [1]. IoT, which includes smart gadgets, smart homes, smart cities, and more, has risen as a sphere of unexplained impact, power, and progress since Cisco Inc. predicted a limited number of smart devices by 2020. In the market, it will be worth $50 billion. As new technologies continue to appear at an alarming rate, current firms are attempting to boost client involvement by examining various business models and development techniques.

The vending machine is actually a self-powered IoT device that extracts veggies. A retail system can help store owners save money by means of paying a reduced chargemeant for 24 hours of operating time per day, boosting their earnings margin.By using digital payment systems and a sales machine, customers may effortlessly purchase things. In many technologically advanced environments, sales equipment is widely employed and regularly used. Countries such as the United States, the United Kingdom, China, Japan, and many others.An affordable communication solution based on Open Innovation and free Web services and technology. In short, retail machines will not only connect to the internet to get the best performance. Sales equipment will also have its own digital representation on the web for human use, expanding our IoT network into what we describe as an online marketing machine. The main goal of our cost-effectiveness approach to operating a commercial equipment business is, as a result, to attract a large number of sales users who can use this technology while, at the same time, enhancing the consumer shopping experience.

II. LITERATURE REVIEW

Solano [1] proposes a real-world deployment in the development of an IoT online trading platform and introduces a new mobile payment method for unattended trading space. The basic premise is to have a digital presentation of the online retailer and to be able to order products from smart phones in a way that cannot fully affect you, such as without having to communicate with a retailer. This method ensures that when a transaction occurs and the products are released the consumer is close to the sales machine. New open design, ubiquitous communication and full technology are key factors considered to create the most affordable solution. The main goal is to reduce the Total Cost of Ownership (TCO) for sales operators while improving consumer

purchasing information, increasing the need for mass adoption of online sales equipment.

Wahidul Alam [2] describes the emergence of the Internet as enabling financial transactions through digital payments, resulting in a cashless society. Significantly, the corona virus has disturbed our traditional cash management systems, paving the path for virtual currency payments to move to digital offline payments. Furthermore, IoT technology takes this type of payments to the next level by allowing machines to supply products and services without human interaction. The study recommended a free-to-use IoT-enables vending machine which combines cloud computing and a payment gateway, as well as the ability to purchase things using digital payment methods via a mobile app. Programmed enables a pre-installed application to scan a Quick Response (QR) code affixed to a machine's body, which then opens a web-based machine codeconnected to the body of a vending machine, opens a web-based machine code with code, allowing the user to choose and order things from a virtual machine. selling, initiating, and authorizing digital payments via IoT portal embedded within a real-time sales machine by connecting the user and the seller as well as financial institutions, and then removing the ordered items by opening the vending machine shelves after successful payment.

Chang-Jun Chen [3] describes a creative marketing machine system combining in-depth and machine learning technologies. The described system uses temperature sensors and a camera to locate the customer without revealing any personal information the data to a cloud server. To determine gender, computer combines facial recognition and in-depth reading. Collects data based upon temperature, time, pricing, and gender using a neighborly machine learning algorithm. Data collecting is used in the proposed system to alter prices in real time.

Yozo Shoji [4] uses ubiquitous marketing tools to describe the community-based IoT infrastructure. It is expected that you would set up a mesh network accompanied by high jump data activity based upon wireless IEEE802.15.4e / 4g vs MAC and PHY layer specifications, and that you will demonstrate a network design that will be used in the actual supply system, Tokyo Sumida ward. Limited RSSI is taken into account in Japan depending on distance performance in the viewing region. Several applications for disseminating IoT data based on community-based IoT infrastructure, include floodplain routes. This study explores and exhibits the restricted results of several major network performance characteristics, such as aggregation, success rate, and theoretical or impersonal delays, based on the aforesaid theories and the actual supply system.

NazerkeKulmukhanova [5] describes the current great need for first aid and medicine in the University's dormitory, especially at night, as there is no pharmacy operating all day on the Campus. Therefore, the ZhardEM1 vending machine project has been launched. The operating principles of the vending machine design will be explained in detail. In addition, a block diagram, electroniccircuit design and used components will be introduced. In addition, the limitations, problems solved and our solutions to them will be discussed. It is expected that the Zhard EM vendor project will be continuously developed, so future development ideas are also presented.

Robert Gruen [6] provides a standard sales mahine where user press a buttons andmachine response to visual signals. This makes machines inaccessible to other users like the blind. NuiVend solves this problem by combining natural voice commands and touch interaction on a vending machine; in doing so many creative, natural and other forms of communication are easily created. NuiVend use of various technologies like Microsoft Kinect, various Microsoft Cognitive Application Programming Interface (API) resources, relay boards and sensors, and general concept management software. Finally, potential developments in NuiVend and Microsoft Language Understanding Intelligent Service strategies may be used for other future NUI-based projects.

Zeeshan Ali [7] commented on the e-commerce industry, which is famous for its proliferation of wireless technology and other forms of communication. Buying and shopping in supermarkets has become a daily chore in the big cities. There is lot of rushing in such places on weekends and vacation. Human being buys various things and positioned them in the cart. After the acquisition is enter, one desires to enter the counter. The cashier prepares the invoice the use of bar code reader, that’s a time-consuming system and outcomes in an extended line of charge over- the-counter. A

brand-new idea of smart clever shopping and billing. The ultimate goal is to provide a technology-focused, economical, easy-to-use and flexible system that seeks to purchase in person. Within the de SanJuan de Letran college, researchers have built a back-selling sales machine to assist promote an effective waste management system.

Wisdom Gen P [8] provides study on Metro Manila's garbage problem. A microcontroller is at the heart of the system, directing the operation of the numerous input and output devices connected to it. Plastic bottles are accepted by the machine, which are converted into points that can be used to purchase things. The device's performance has been validated to be correct in figuring out Radio Frequency Identification Tool (RFID) money owed, discriminating between plastic and non-plastic bottles, storing or updating factors for every account and extracting gadgets. The device became able to run on both business or solar energy. A solar panel and battery not most effective provide a renewable energy supply but additionally they offer backup strength within the occasion of an industrial electricity outage. Colegio likes the concept of having a recyclable machine, according to research findings, and feels that its implementation will improve Colegio's current garbage disposal system.

Ria Singh and Satyam Verma [9] proposed a system suitable for smartshopping complex which was helpful for completing online purchases effectively.Based on the placement of different RFID code system was assigned to each product. A conveyerbelt run by engine help to move the products to specify location. operation of engines is controlled by readable RFID code. Customer can select the required product and purchase the quantity according to his requirement,as per the quantity he received the bills are automatically generated. Devices are operated with smart cart which uses Erasable Programmable Random Access Memory (EEPRAM) for storing data. Data can be modified whenever a new product is added to the cart.Zigbee module is used to make updating of products available in the cart easily.

III. PROBLEM STATEMENT

Buying groceries these days has become a chore. The client needs to constantly monitor the food being eaten at home and also have the task of managing the coupons, keeping a shopping list, stopping the food bar, reading the labels on food cans, and needing to find out which rack and line. he can see that. The vast majority of grocery buyers will be interested in the option of buying more, simpler, faster. Now everyone's daily life is very busy and time-consuming, at which point we need a smart plan in our kitchen again. Keeping records and looking at all the groceries at home is difficult. Most of the time we live in the mistaken belief that we have enough groceries in our kitchen but we have to deal with empty bottles during emergencies where what is needed should give us distractions. And to avoid this, we sometimes buy more than enough groceries and store them in our home for days, which in turn can cause groceries damage. Both of these conditions are problematic.

IV. SYSTEM DEVELOPMENT AND REQUIREMENTS

a. Node MCU

Node Micro Controller Unit (MCU) is an open source IoT platform that is low-cost and easy to use. It came with firmware that ran on Espressif Systems ESP8266 Wi-Fi System on Chip(SoC) and hardware based on the ESP-12 module at first. The ESP32 32-bit MCU was later additional to the list of reinforced devices. It is an open-source platform based on the ESP8266 that lets things to be connected and data to be transferred over the Wi-Fi protocol. Also, it may satisfy many of the project's demands on its own by providing some of the most important microcontroller functionalities and so on.

Servlets

A servlet is a Java programming language class which extends the capacities of servers hosting apps that utilize a request-response editing model to access them. Servlet can reply to any shape of request;however, they are mostly used to increase web server-hosted packages. A servlet is a Java application that runs on a web server using the Java Virtual Machine(JVM). The primary distinction between a static and dynamic web page is that the dynamic page, as the name implies, is always the same for all users, but the static web page changes in response to client requests.

The benefits of Servlet are as follows:

- Better performance: because it forms the thread of each application, not the process.
- Portability: because it uses the Java language.
- Strong: JVM owns Servlets, so there is no need to worry about memory leaks, garbage collection, etc.

b. My SQL

MySQL is a web-based affiliate program developed by Oracle based on structured query language. Website is a structured data collection. It can be anything from a simple shopping list to a photo gallery or a place to store a large amount of information in a business network. a web-based program launcher related to the end-to-end computer program, manages users, allows network access and helps assess site integrity and create backups. How to manage MySQL database and users from the command line before you start.

C. Load Cell

A loading cell is a sensor or transducer that turns an electrical signal into a load or power. When a voltage is supplied, the capacitive load cells function on a system that translates a system's ability to hold a particular amount of charge. The HX711 is an electronic scale part whose operational concept is to change measured changes in resistance value changes to output using a conversion cycle.

Advantages: Include a simple structure, ease of use, stable and dependable operation, high sensitivity and speed rating, and other features.

Applications: It is commonly used to monitor strength, pressure, migration, gravity, torque, and acceleration in aerospace, mechanical, electrical, chemical, building, and medicine, among other industries.

D. RFID Card

An RFID reader is a tool used to collect information from the RFID marker, which is used to trace individual items. RFID technology allows a few things to be scanned rapidly and permits for faster recognition of a certain product, even if you are surrounded by a few other things.Howdoes RFID work? Like barcode technology, RFID Scanner detects locations and identifies tagged objects, but instead of reading laser light on printed barcode labels, it uses low-frequency radio waves to collect and store data. 125 kHz. and 134.3 kHz. Low Frequency (LF) Passive RFID Tags - reading extent of 30 cm or less - normally10 cm without metal.

No views: RFID labels can be read without a direct view regardless of how the tag is covered, ugly or blurred in view.

Bulk reading: If accessible to the reader, multiple RFID labels can be read simultaneously.

Power limit: RFID labels can store more data than just an ID number.

Powerful Data: RFID labels with the ability to read / write data will be updated or modified on any important point.

The most frequent RFID applications in hospitals are to track directory, access control, staff and patient tracing, tracking tools, tracing tool, tracking of heavy or costly tools, tracing laundry, etc.

V.CONCLUSION

Arising IoT covers a wide range of businesses, gadgets and applications This paper introduces a real-time IoT framework for marketing equipment to enable a variety of micropayments through an open and standard system other than machine operators, financial institutions or telco regulators. Managing micropayments is a serious problem for the long tail. To address this, our solution uses new appropriate models such as distributed computer, IoT and web development. The work covers all phases that are expected to fully integrate IoT marketing equipment in a flexible, cloud-based and open-source development environment with a focus. greatly reduced costs of having distributors. The new method introduced in this paper allows access to mobile marketing, and purchase one of the most accessible web application applications on mobile phones.

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