

# STUDY OF SOLAR POWERED VENDING MACHINE

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**Abstract:** In past decades, many vending machines have been made which provide different types of products within different numbers of selections. They are divided into Medic vending machines, Food vending machines, chocolate vending machines and many other forms of drinks vending machines. In the concern of medical field, up till this 21st century, we are not able to provide first aid kits at all over places like schools, stations, and many more areas which are still under up-gradation. In those circumstances we are implementing a Medic vending machine, so people can easily dispense first aid items as well as all the necessary medicines for the person who needs immediate attention. If looking to the food and beverage sector many more vending machines are there to dispense chocolate, drinks and any type of food items. Food vending machines do not include any vending machine dispensing only canned or bottled soft drinks or prepackaged food that does not require temperature control for safety. And presently, most of the vending machines started to become Automatic and Solar powered. For automatic vending machines, there is no need for manual controls. So, people can easily dispense products from these machines while working. Talking about solar powered vending machine there is not only solar energy but also electricity is used on demand.

## 1. INTRODUCTION

Vending Machines are automated machines that dispense selling products such as snacks, beverages, lottery tickets, and etc. It is vital to save time and reduce human energy. These vending machines are developed in the way of Non IoT based and IoT based methods. These Non IoT based machines are not smart and are not operated in real-time data, which are functioned when giving cash or card and inputs (vending things) of the machine. It is controlled by a microcontroller and distributed the given inputs. IoT- based machines are computerized, which have cashless payment facilities, order facility before going to the vending machine to order things, and can be identified the location of machines by the customer. These IoT-based machines are assisted to suppliers to identify the availability of the stocks. Simulation software and prototype are used to validate the machines. In this review, it is found that most of the vending machines developed are capable of operating without IoT technology, and nowadays, vending machine systems are required to implement using IoT with machine learning, and artificial technologies to satisfy the customer preferences.

This paper proposes the design of solar powered Vending machine which dispense different kinds of papers and other Stationary items like pens, which are fully Automated. This machine Supplies the needs of Students and professionals within an institution. They Can purchase the things from the machine without Standing in long queues in front of the Store.

## 2 COMPONENTS USED

### 2.1 Arduino UNO

Arduino is an open-source prototyping (hardware, software) platform with a single microcontroller board using an Atmel 32-bit ARM processor. Here UNO a variant of Arduino is employed. This platform can be divided into three categories, namely Hard-ware software, and expansion shields. Arduino UNO hardware has 6 analog pins, 14 digital GPIO pins of which 6 will provide Pulse width modulation (PWM) output. It has a 32kB of flash memory, 2kB of SRAM, 1 EEPROM, a USB connector hub, a DC power jack, reset button, ISUP pins, LEDs and many more. In software, the board is programmed using Arduino Integrated Development Environment (IDE) which bundles program writing, compilation and burning onto the chip.

### 2.2 LCD Display

A 20x4 LCD means it can display 20 characters per line and there are 4 such lines. In this LCD each character is displayed in 5x7 pixel matrix. This LCD has two registers, namely, Command and Data.

### 2.3 Motor Driver

L293D is a typical Motor driver or Motor Driver IC which allows DC motor to drive on either direction. L293D is a 16-pin IC which can control a set of two DC motors simultaneously in any direction. It means that you can control two DC

motor with a single L293D IC.

**2.4 DC Motor**

A motor is an electrical machine converting electrical energy into mechanical energy. The principle of working of an electric motor is that whenever a current carrying coil is placed in a magnetic field, it would experience a mechanical force exerted on it, thus it works on the principle of electromagnetic induction. The direction of movement of the coil is decided by Fleming’s Left Hand Rule. Motors used in the project are geared running at 30 rpm at 12V supply.

**2.5 Buzzer**

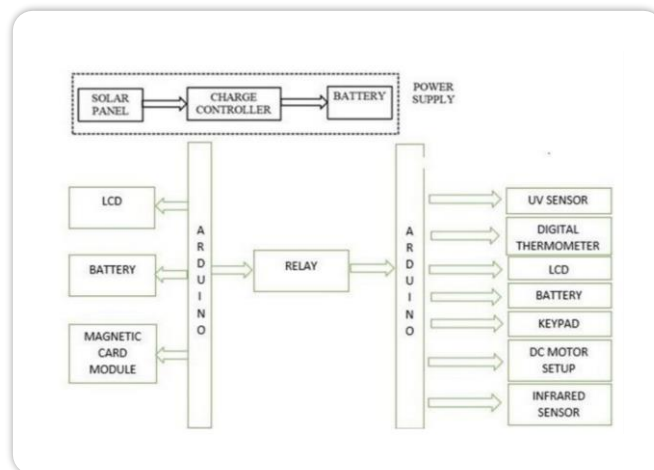
The buzzer is basically an electronic sounder with the characteristic of making a high-pitched tone like a Son Alert. This device typically makes itself usable in automobiles and household appliances like oven. This is a small 12mm round speaker that operates around the audible 2 kHz range.

**2.6 HC-05 BLUETOOTH MODULE**

HC-05 Bluetooth Module is an easy-to-use Bluetooth SPP (Serial Port Protocol) module, designed for transparent wireless serial connection setup. Its communication is via serial communication which makes an easy way to interface with controller or PC. HC-05 Bluetooth module provides switching mode between master and slave mode which means it able to use neither receiving nor transmitting data.

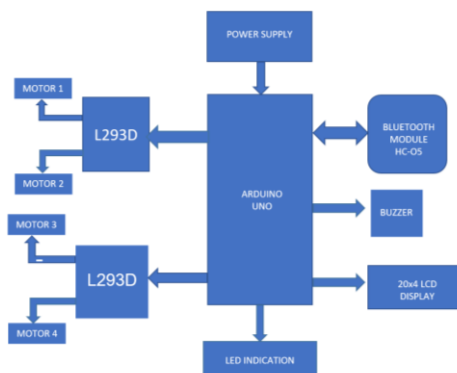
**2 EXISTING SYSTEM**

Many vending machines have been made which provide different types of products within different numbers of selections. They are divided into Medic vending machines, Food vending machine, Chocolate vending machines and many other forms of drink vending machines. These types of vending machines are designed for dispense a similar kind of things. That is solar powered and manual controlled. Foreseeing the disadvantage that comes from this we designing a new innovation



**3 PROPOSED SYSTEM**

Designing a solar powered vending machine which dispense different kinds of papers and other stationary items like pens, which are fully automated. We introducing two modes of payment Manual and QR mode of payment.



#### **4.ADVANTAGES**

This machine is user friendly and there is no need to wait for a person as assist. This machine is less time consuming and energy efficient.

#### **5. CONCLUSION**

There are different kinds of vending machines that can be seen around the globe. In the past few years technologies and upgradation have been taken place for the smooth functioning. In the concern, our projects aims to implement a vending machine which is powered by solar panel which consumes less power and eco-friendly and fully automated. This machine dispense different kinds of materials. Moreover, here there are two modes of payment manual and online.

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