Smart Car Washing Center using IoT Based

Mayuri Kshirsagar[1] Karishma Inamdar[2] Anil Shinde[3] Prof. M. N. Kadam[4]
[1,2,3,4]Department of Electronic & Telecommunication Engineering
[1,2,3,4]SVPM'S COE Malegaon (BK) Baramati, Maharashtra, India

Abstract— This Paper present work on Automatic car washing using an IOT based paper. Atmega328 programmable logical controller which is a type of microcontroller. The automatic car washing using conveyer belt system is already in available market. In our project we are using pressure cylinder to lift the car. Our project is prototype in which a car enters a washing station and automatically gets clean up. We are using various motors in this project such as dc motor, water motor and motor driver. This entire component is controlled using microcontroller. The main aim of our project is use less water, more efficient washing. Internet of Things (IoT) is overturning traditional Business models. IoT and Internet of Cars compose the internet of vehicles, which is creating driverless car times. Proposes the Internet of Things-based concept about automatic car washing mode and expounds its development from the following three aspects: the deficiency of the current car wash, customers' attention to car wash and technology maturity forecast about IoT. By the IoT, this mode creates Car-wash Cloud, integrates the operators on this cloud, the car washer and excellent manufacturers of automatic car washer and reconstructs the chain of automatic car washing mode. Wherever the car is, the driver can drive to the nearest car wash to enjoy automatic car washing then make a judgment on its service. Automatic car washing mode is a new format of automotive aftermarket, which needs not only the consensus of service industry after manufacture but government guidance and market capital.

Keywords: Smart Car Washing Center, IoT, POS

I. INTRODUCTION

We have visited at car washing centre and asked them about their problems. The major problem coming up is the Fraud by workers at washing centre and overuse of water. Automatic Car Washing is a IOT based project. The first car wash using conveyer was opened in USA in 1940.This system has winch system which was used in pulling system. This was the replacement of pushing now days latest advantages in science have made it possible to achieve great reliability and efficiency in the automatic car washing system. IOT plays a very important role in the system which is used for automation.

This conveyer process is very common in developed countries. But in the conveyer process we cannot clean up the downside of the car. In our project we are using the pressure cylinder to lift the car so we can clean the downside of the car. Our project is based on cyclic process which provides more than 95.

The first automatic car washes appeared in the late 1930s. Automatic car washes consist of tunnel-like buildings into which customers (or attendants) drive. Some car washes have their customers pay through a computerized POS (point of sale unit), also known as an "automatic cashier". The mechanism inputs the wash PLU into a master computer or a tunnel controller automatically.

The stack moves sequentially, so the wash knows what each car purchased. After pulling up to the tunnel entrance, an attendant usually guides the customer onto the track or conveyor. At some washes, both tires will pass over a tire sensor, and the system will send several rollers. The tire sensor lets the wash know where the wheels are and how far apart they are. On other systems the employee may guide the customer on and hit a 'Send Car' button on the tunnel controller, to manually send the rollers which push the car through.

When the customer is on the conveyor, the attendant will instruct the customer to put the vehicle into neutral, release all brakes, and refrain from steering. Failure to do so can cause an accident on the conveyor. The rollers come up behind the tires, pushing the car through a detector, which measures vehicle length, allowing the controller to tailor the wash to each individual vehicle. The equipment frame, or arches, vary of equipment and stages of chemical application to thoroughly clean the vehicle. In number and type. A good car wash makes use of many different pieces Internet of Things and car -to-car constitute internet of vehicles [1], which started a new era of driverless car. Internet of Things and connected elevators form elevator internet [2], which realized intellectualized maintenance of elevators. To the car owners, car wash is entering an age of self-help car wash; it also benefits from Internet of Things and car wash industry. Automatic car washing refers that using some technologies For example, Mr. Wang is driving on the express way. By way of rest area, the car wash application (APP) on his phone will remind that a car wash shop registered in the cloud is available. He will click the APP to get to know how full the queues and then drives his car to the entrance of the car was port by navigating. This mode can complete all the procedures Less than one minute, like identification of vehicle plate number, car wash, air drying and charge. After that, Mr. Wang can make a judgment on this service. According to an analytic report on automatic car washing industry in 2015 [5], for car wash demands, 19.64 % owners of the cars choose to clean the body. 13.39 % chassis and 18.75% floor mat, which account for 51.78% of the whole cleaning service. Automatic car washers are exact

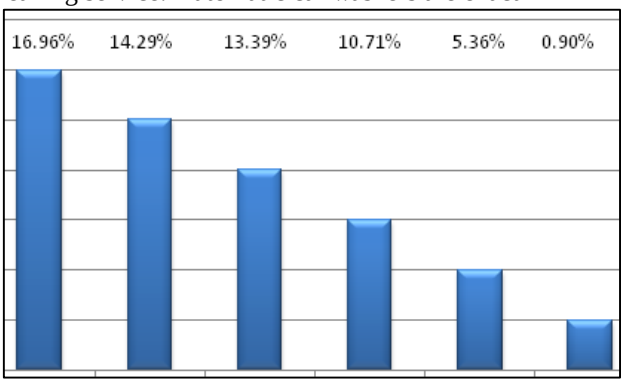


Fig. 1: Percentage of car wash items.

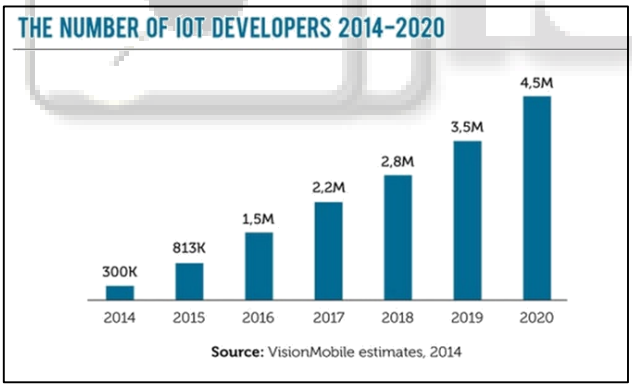
From the chart about the time spent on car wash, the receptive time of car wash is limited in ten minutes, which account for 71.43% of the owners of the car.

II. LITERATURE SURVEY

K. vidyasagar, R. Ram Prasad, P. Nagasekhar; "RFID-GSM autonomous car washing system "; in dept of ECE, SSIT sathypally, T.S, India. The paper describes the automatic car washing system by imparting the microcontroller to process the operations. GSM technology is used to send the information of the process to the car owner. This paper adopted and RFID technology for car washing system.

Zeenal Lalluwadia, Nidhi Bhati and Joyana Rana Assistant professor ; "automatic car washing system using IOT based"; 2017. [2] This paper aims to demonstrate the water resource to wash the car. water contamination water recycling system is focused for modern car washing system .this paper used a programmable logic controller for automate the car washing system. This paper also focused to reduce the cost and to improve the operating frequency. Conveyor belt mechanism is developed by using PLS for automatic car washing system.

Shigen Zong, Liangjie Zhang, Hsing-Chung Chen, Huan Zhao, Ling GUO; "study of the patterns of automatic car washing in the Era of internet of things ";2017 This paper uses we can save the water as washing center and uses water as per the car reduce time and cost. This paper proposes the internet of things based concept about automatic car washing mode and expounds its development from the following three aspects the deficiency of the current car wash, customer's attention to car wash and technology maturity forecast about IOT



III. PROBLEM DEFINATION

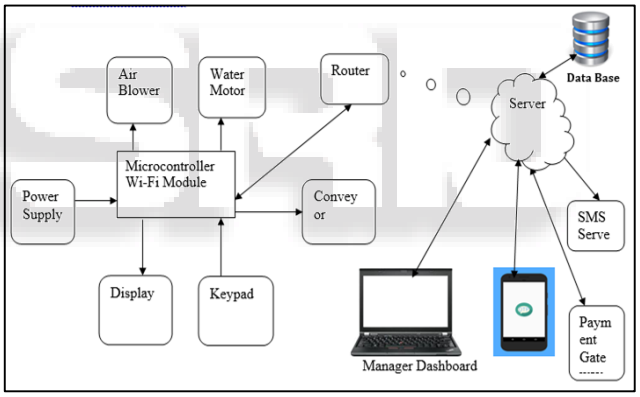
We are going to design the automation car washing system because we have following benefits from this system to save the time & save the cost save the car from rashes & to increase the efficiency. When important need of save the water.

Automatic car washing system is very common in developed countries. Car washing system is usually associated with fuel filling stations. It consists of large machines with automated brushes controlled by program logical controllers. Automatic car washing system is fully automated with different stages of foaming, washing, drying and brushing. Different types of car washing systems are discussed in this report. This system uses large quantity of water, thus water recycling plant is also an integral part of the automatic car washing system but at this level we are only presented the car washing only. We studied some of the car washing systems from Internet and decided to do this project. As compared to the foreign countries this system is used in very less no of cities in India because of its cost and complexity. But we have tried to minimize it according to the device list which will be definitely helpful for our project.

IV. PROBLEM SYSTEM

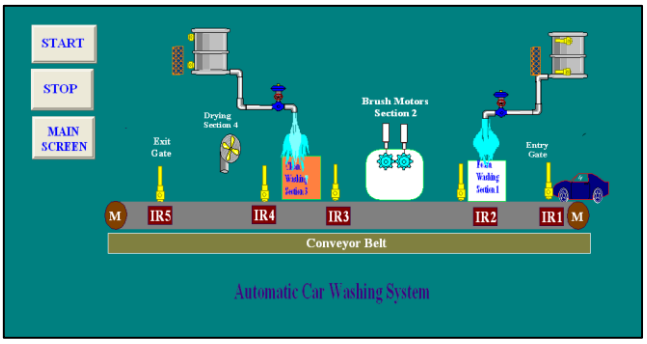
The PIC microcontroller is coded with a set of instructions that are helpful to run the process. We refer all the paper related to automatic car washing center in all that paper we had seen that all people work on. Automatic car washing uses an internet of thing of network technology. This system is autonomous system. We used reduce the memory on labor charges also we can reduce the fraud by labors. Internet of things accessible of data from industry. We have to monitor and display on dashboard for industrial or commercial. The PIC we have used in this project consists of 28 pins of which one must be grounded one must be given to the power supply. The remaining pins have their own functions. A 16*2 LCD is interfaced with the PIC microcontroller. Interfacing an LCD to a microcontroller need the special instruction set. Firstly, we have to initialize the LCD functions in an 8 bit mode.

V. BLOCK DIAGRAM



VI. DESCRIPTION

In this project we are going to automate the task which are done in car washing centers. With this project the Owner of car washing center will able to get the exact count of how many cars has been washed. Also the washing center will save the water according to the users car wash plan that has been he chosen. Initially user needs to pay online for car washing center then he will get the SMS regarding the Payment and OTP after payment he will get an unique ID for washing center with Locations. After that user needs to go here and park the car on Conveyor after the Entering unique ID that he received in phone the washing will start according to his plan. And he also gets alert after washing is done. This way we can automate the Car washing center and reduce the money on labor charges also we can reduce the fraud by labors. As labor washes many cars and shows only some car to wash owner with this project this will not happens also we can save the water as the washing uses water as per the car.



A. Design and Selection Component

1) Hardware Requirement:

– Atmega328 Microcontroller
– ESP8266 Wife Module
– L293D motor Driver
– Gear motors
– Power Supply
– 16 * 2 Display
– 4 * 4 Keypad

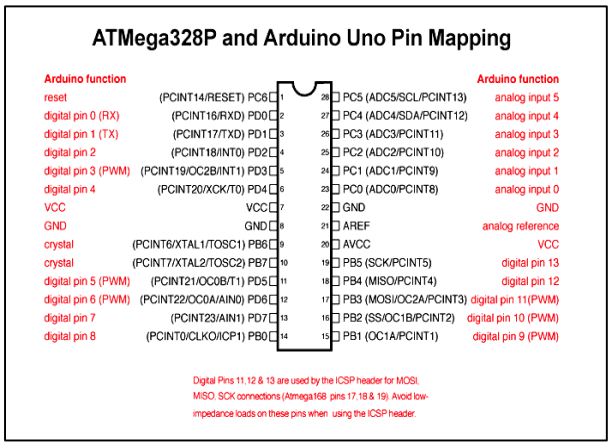
2) Software Requirement:

– PHP
– MY SQL
– Embedded C++

B. Features of the Arduino UNO

Microcontroller: ATmega328.
Operating Voltage: 5V.
Input Voltage (recommended): 7-12V.
Input Voltage (limits): 6-20V.
Digital I/O Pins: 14 (of which 6 provide PWM output)
Analog Input Pins: 6.
DC Current per I/O Pin: 40 mA.
DC Current for 3.3V Pin: 50 mA.

Arduino Uno is a microcontroller board based on the ATmega328P (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button. Applications. As of 2013 the ATmega328 is commonly used in many projects and autonomous systems where a simple, low-powered, low-cost micro-controller is needed. Perhaps the most common implementation of this chip is on the popular Arduino development platform, namely the Arduino Uno and Arduino Nano models.



Arduino is an open source platform used for building electronic projects. Arduino consists of both a physical programmable circuit board and a piece of software that runs on your computer used to write and upload computer code to the physical board. We have worked on PIC/ARM. We can work on anyone but we use Arduino because of following reason,

1) Easy development
2) It has 6 ADC channels of 10 bits.
3) Easy access for communication over PC and logging data of sensor in text file in sensor.

C. L293D Motor Driver

The L293 and L293D are quadruple high-current half-H drivers. The L293 is designed to provide bidirectional drive currents of up to 1 A at voltages from 4.5 V to 36 V. The L293D is designed to provide bidirectional drive currents of up to 600-mA at voltages from 4.5 V to 36 V. Both devices are designed to drive inductive loads such as relays, solenoids, dc and bipolar stepping motors, as well as other high-current/high-voltage loads in positive-supply applications.

All inputs are TTL compatible. Each output is a complete totem-pole drive circuit, with a Darlington transistor sink and a pseudo- Darlington source. Drivers are enabled in pairs, with drivers 1 and 2 enabled by 1,2EN and drivers 3 and 4 enabled by 3,4EN. When an enable input is high, the associated drivers are enabled, and their outputs are active and in phase with their inputs. When the enable input is low, those drivers are disabled, and their outputs are off and in the high-impedance state. With the proper data inputs, each pair of drivers forms a full-H (or bridge) reversible drive suitable for solenoid or motor applications.

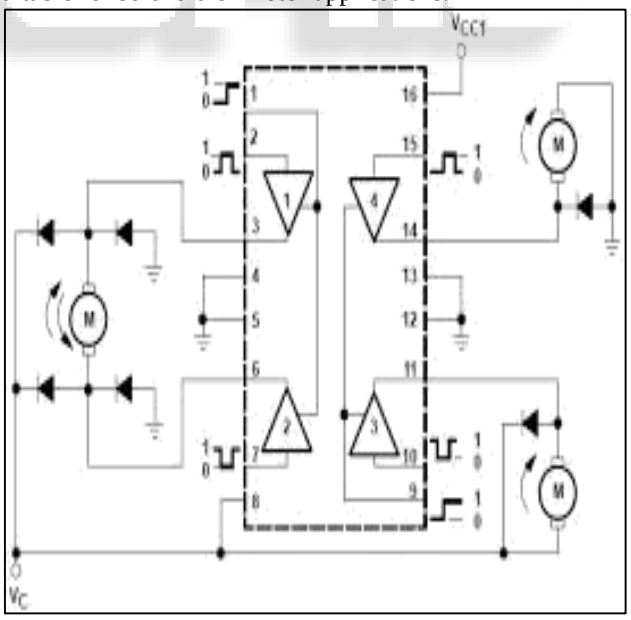


Fig. 6: Block dig L293D motor driver

a standalone application, with the lowest cost, and minimal space requirement. ESP8266EX also integrates a next version of Tensilica's L106 Diamond series 32-bit processor, with on-chip SRAM, besides the Wi-Fi functionalities. ESP8266EX is often united with external sensors and other application specific devices through its

GPIOs; a codes for such applications are provided in examples in the SDK. Smart Connectivity Platform (ESCP)

D. ATMEGA328P Microcontrolle

The high-performance Microchip Pico Power 8-bit AVR RISC-based microcontroller combines 32KB ISP flash memory with read-write capabilities, it has 1024B EEPROM, 2KB SRAM, 23 general purpose I/O lines, 32 general purpose working registers, three flexible timer/counters with compare modes. It has internal and external interrupts, serial programmable USART, a byte-oriented 2-wire serial interface, SPI serial port, a 6-channel 10-bit A/D converter programmable watchdog timer with internal oscillator, and five software selectable power saving modes. The device operates between 1.8-5.5 volts. By executing powerful instructions in a single clock cycle, the device reaches throughputs approaching 1 MIPS per MHz, balancing power consumption and processing speed.

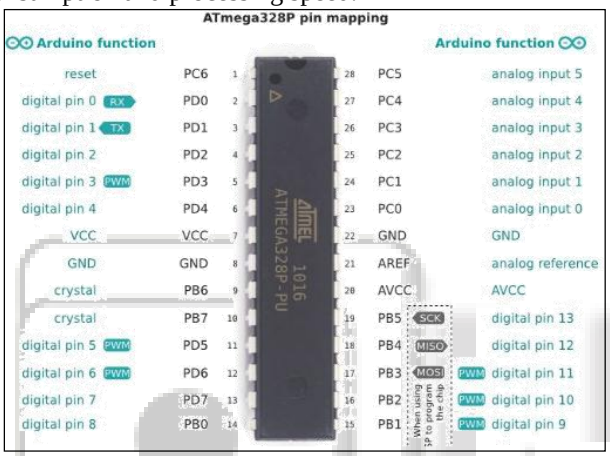


Fig. 7: ATMEGA328P

E. Wi-Fi Module

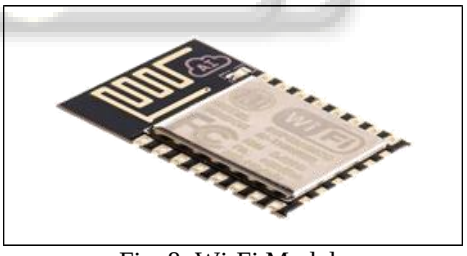


Fig. 8: Wi-Fi Module

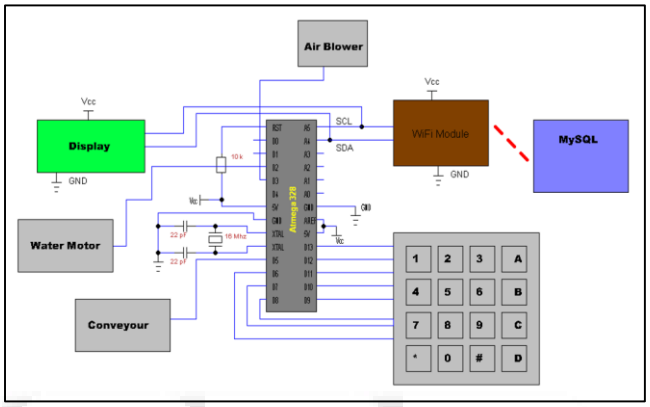
ESP 12E W-Fi module is developed by Ai-thinker Team. core processor ESP8266 in smaller sizes of the module encapsulates Tensilica L106 integrates industry-leading ultra-low power 32-bit MCU micro, with the 16-bit short mode, it has Clock speed support 80 MHz, 160MHz, it has to supports the RTOS and integrated Wi-Fi which on-board antenna.

The module supports standard 802.11 b agreement and complete TCP/IP protocol stack. Users can use the add modules to an existing device networking, or building a separate network controller.ESP8266 is high integration wireless SOCs, it designed for space and power constrained mobile platform designers. It provides unsurpassed ability to embed Wi-Fi capabilities within other systems, or to function as a standalone application, with the lowest cost, and minimal space requirement.

ESP8266EX also integrates a next version of Tensilica's L106 Diamond series 32-bit processor, with on-chip SRAM, besides the Wi-Fi functionalities. ESP8266EX is often united with external sensors and other application specific devices through its GPIOs; a codes for such applications are provided in examples in the SDK. Smart Connectivity Platform (ESCP)

Determines cultivated system-level features include fast sleep/wake context switching for energy-efficient VoIP with adaptive radio biasing. For low-power operation, advance signal processing and spur termination and radio co-existence features for common cellular, Bluetooth, DDR, LVDS, LCD interference modification.

F. Circuit Diagram



G. Algorithm

- START
- Book Washing Center
- Pay Payment Done & Get OTP
- Enter OTP Using Keypad
- Automatic Valid User Using Wi-Fi and Module and Backend database
- For Valid User Start the Conveyor
- For delay
- conveyor STOP & Air Blower ON
- For delay
- Air Blower OFF & Conveyor START
- For delay
- Conveyor STOP water motor ON
- For delay
- Water motor OFF & Conveyor START
- For delay
- Conveyor STOP &Hand brush ON
- For delay
- Hand Brush OFF & Conveyor START
- For delay
- Conveyor STOP & Shampoo + mixer ON
- For delay
- Conveyor START & shampoo + mixer OFF
- For delay 1
- Conveyor STOP & water motor ON
- For delay
- Conveyor START &water motor OFF
- For delay
- Air dryer ON & Conveyor STOP

- For delay 1
- Air dryer OFF & conveyor START
- For delay
- After Car Washing STOP Conveyor Belt
- Send SMS to user regarding END process
- END

H. Advantages

- Reduces Man Power
- Proper Utilization Of Water and Foam
- It Reduces The Time Of Washing Process
- Less Area Required
- Pollution Free
- Standard Parts And Components Are Easy Available

I. Disadvantages

- Primary cost is high
- Use of chemical shampoos are very harmful in this process.

VII. CONCLUSION

This prototype will help to perform car washing automatically results in high quality end product. Thus it will be User-friendly and capable to wash multiple cars at a time. Also require less man power, time and no pollution.

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