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Car Parking and Booking System Based on IOT

Dr. N C A Boovarahan

Assistant Professor, Dept of EIE, Sri Chandrasekharendra Saraswathi Viswa Mahavidyalaya.

ABSTRACT

Due to the lack of accurate information about whether the available parking space is full or empty, large cars are now having difficulty locating a spot to park. This might result in a blockage, contamination, and fuel failure all at once. These circumstances may make it difficult to regulate the halting of the board as well. Stopping problems are frequently resolved by using a microcontroller-based smart stopping system (provided IoT). The Web of things may be a novel topic that plays a significant role in our daily life. Because of human negligence, IoT reduces human work, effort, time, and blunders. An embedded Internet of Things (IoT) smart parking system is then suggested in order to make it easier for halting clients to encourage data on the stockpile of vacant spaces and filled parking places and may also reserve parking spaces using digital tools. A microcontroller-based Smart Parking System must go through a number of stages, including frameworks for prerequisites, prototype development, prototyping evaluation, writing, testing, and assessment framework. This approach makes use of tools like the Arduino-UNO, Wi-Fi module, LCD to display available stopovers and confirmation of reservations, and infrared sensors that are used at each press stop and indicate the space accessibility. In order to make the Smart Parking Application more effective as intended and to better manage stopping the board, it is anticipated to assist administration customers in finding information and void stopping opportunities by booking inside the application.

INTRODUCTION

It is expected that the operator has a smartphone, has downloaded the Android app, and has access to the internet. The transition to smart parking is indeed a great illustration for the ordinary individual of how the IOT can be employed successfully and efficiently in daily life. It offers various benefits to various users. The car parking lot gateway control and payment system is where RFID is most frequently employed. Billing automatically.

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Because of human negligence, IoT reduces human work, effort, time, and blunders. An embedded IoT smart parking system is then suggested, which is made to make it easier for stopping customers to encourage information on the stockpile of empty and full stopping spaces and can also book stopping openings using electronic applications. A microcontroller-based Smart Parking System must go through a number of stages, including frameworks for prerequisites, prototype development, prototyping evaluation, writing, testing, and assessment scale.

This approach makes use of tools like the Arduino-UNO, Wi-Fi module, LCD to display available stopovers and confirmation of reservations, and infrared sensors that are used at each press stop and indicate the space accessibility. In order to make the Smart Parking Application more effective as intended and to better manage stopping the board, it is anticipated to assist administration customers in finding information and void stopping opportunities by booking inside the application.

BLOCK DIAGRAM

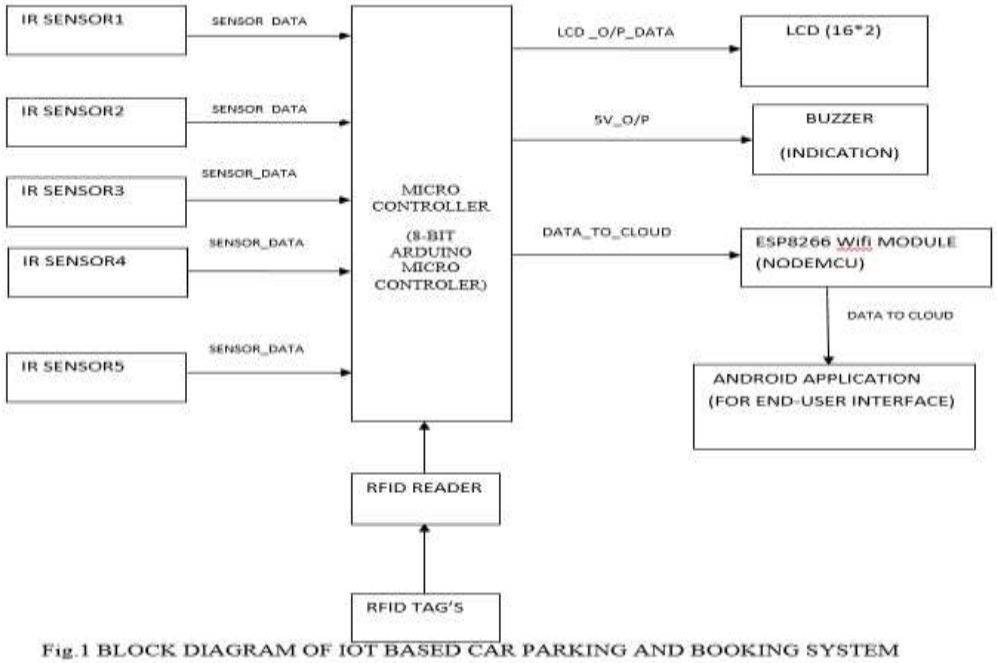


Fig.1 BLOCK DIAGRAM OF IOT BASED CAR PARKING AND BOOKING SYSTEM

OVERALL VIEW OF THE SYSTEM

Several standards groups started operating on MTC in order to promote integrity change across these numerous partners. This essay briefly discusses a few of the varied exercises, focusing mostly on those related to the Third Era Organization Venture. It is expected that the driver has a smartphone, has downloaded the Android app, and has access to the internet. The transition to smart parking is a good demonstration for the average person of how the IOT can be implemented successfully and efficiently in daily life. It offers various benefits to various users. The car parking lot gateway control and payment system is where RFID is most frequently employed.

In this case, we're utilizing elements like three IR sensors, an LCD, and an IOT module. It can operate at frequencies as low as 300GHz and as high as 430THZ. There are two types of IR sensors: thermal and quantum, and their operating voltage spans from 0 to 5 volts. The IR sensor has a 1 to 5 meter range and is an extremely sensitive sensor. Sensor detection is reduced if the sensor screen is dark. Before entering the parking garage, the user must verify the availability of spaces. Based on the outcomes of the processing, the IR sensor may identify the vehicle and produce and save a recognition template.

The template is modified in response to how a car is parked. The internet of things, or IOT, is a network of reticulated computing devices, mechanical and digital equipment, items, animals, and those having the potential to send information over a network without needing human-to-human or human-to-computer contact. A flat panel display called a liquid crystal display makes advantage of the light-modulating capabilities of liquid crystals. It doesn't emit light directly; instead, it creates images in color or monochrome via a backlight or reflector. The car parking lot gateway control and payment system is where RFID is most frequently employed.

PROGRAMMING

The Arduino Software may be used to program in the Arduino/Genuino Uno (IDE). From the Tools > Board menu, choose "Arduino/Genuino Uno" (according to the microcontroller on your board).

The Arduino/Genuino Uno's ATmega328 comes pre - programmed with a bootloader that enables you to add new code to it without to use an external hardware programmer. It uses the original STK500 protocol for communication.

- In-Circuit Serial Programming (ICSP) header using Arduino ISP or a similar tool is another way to programme the microcontroller without utilising the bootloader; refer to these instructions for details.
- The Arduino repository contains the firmware source code for the ATmega16U2 (or 8U2 in the rev1 and rev2 boards). A DFU bootloader is pre-installed on the ATmega16U2/8U2, and it may be triggered by:
- For Rev1 boards, you must first connect the solder jumper located underneath the Italy map before resetting the 8U2.

- The 8U2/16U2 HWB line is pulled to ground by a resistor on Rev2 or later boards, making it simpler to enter DFU mode.
- To load updated firmware, use the DFU programmer (Mac OS X and Linux) or Atmel's FLIP software (Windows). Instead, you might utilise an outside programmer and the ISP header (overwriting the DFU bootloader). For further details, see this user-contributed instructional.

Warnings

- The Arduino/Genuino Uno contains a resettable polyfuse that guards against shorts and overcurrents at the USB ports on your computer. The fuse offers an additional layer of safety even though the majority of computers have their own inbuilt safeguards. The fuse will immediately cut off the connection if more than 500 mA is applied to the USB port until the short or overload is resolved.
- Disparities from other boards. The FTDI USB-to-serial driver chip is not used by the Uno, which is how it differentiates from all earlier boards. In its place, a USB-to-serial converter built using the Atmega16U2 (or Atmega8U2 up to version R2) is included.

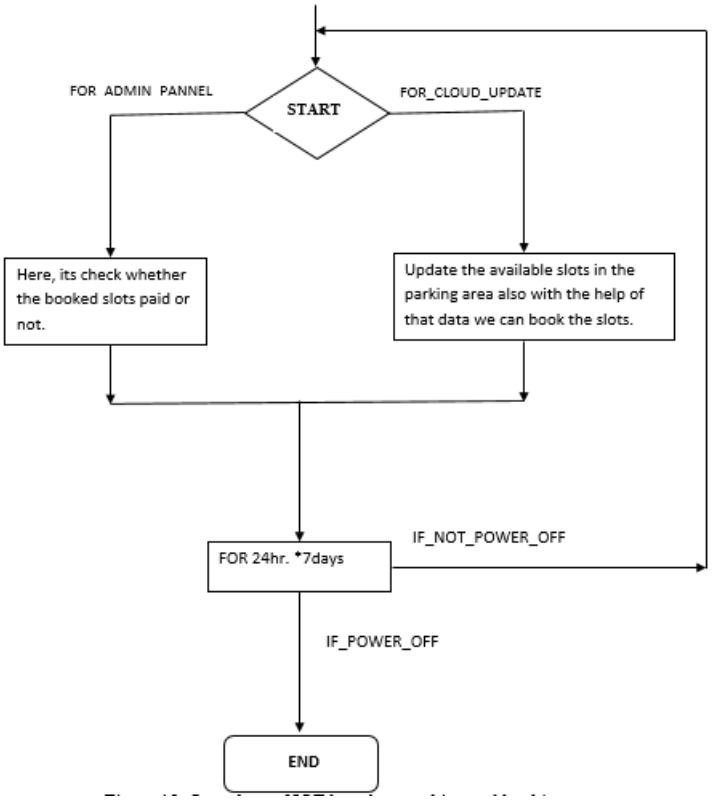
Power

- The Arduino/Genuino Uno board may be powered by an external power source or by a USB connection. The power source is automatically chosen.
- Either a battery or an AC-to-DC converter (wall wart) can provide external (non-USB) power. A 2.1mm center-positive plug may be used to connect the adapter by inserting it into the board's power connector. Battery leads may be placed into the POWER connector's

GND and Vin pin headers.

The board may run from an external source ranging in voltage from 6 to 20 volts. The 5V pin, however, may deliver less than five volts if supplied with less than 7V, and the board may become unstable. The voltage regulator might overheat and harm the board if more than 12V is used. The suggested range is between 7 and 12 volts.

FLOWCHART OF THE SYSTEM



CONCLUSION

This work locates vacant spaces and aids drivers in finding parking in a strange city. This technique significantly reduces the time that people typically wait to park their cars. The suggested technique offers the best option, ensuring that the majority of cars successfully locate a vacant parking place. The

performance of the Arduino UNO-based system may successfully meet the demands and requirements of existing automobile parking difficulties, consequently lowering the time needed to discover vacant parking lot and real-time information rendering, according to our first test findings. Better performance, cheap cost, and an effective large-scale parking system are all provided by this smart parking system.

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