Vehicle Tracking System using Tollgate Data

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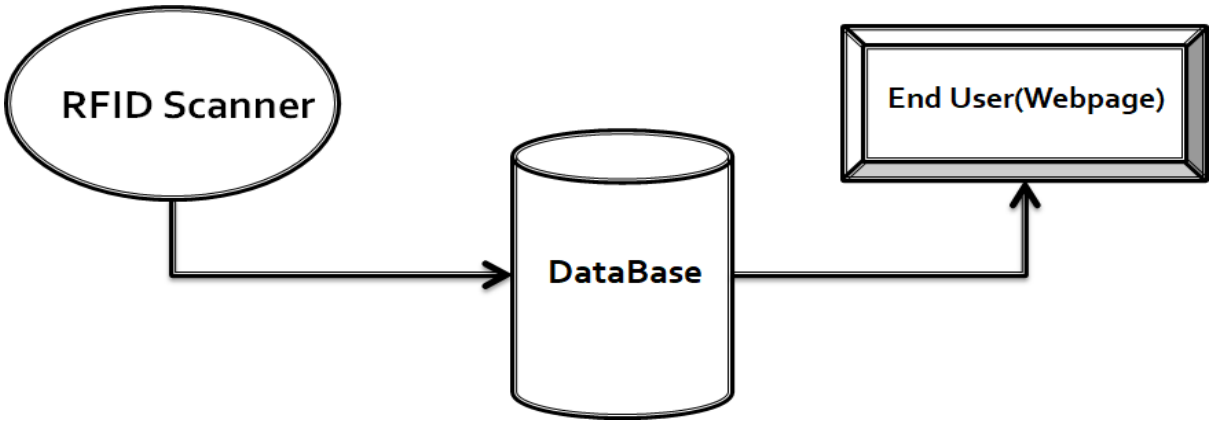
Abstract

In this fast growing world, there are approx. 253 million vehicles in India and approx. 26 million vehicles just in Tamil Nadu. The number looks huge. So to keep track of the vehicles, Vehicle Tracking using tollgate data is designed to automatically keep track of the vehicle's movement over the days, record the time and the details such as owner's name, toll gates passed, phone number, etc. So basically the admin can track the vehicle history over days by just using the Vehicle Tracking System.

Requirments

- NodeMCU (Microcontroller)
- RFID RC522
- Jumper Wires
- USB Cable (Type B)
- Arduino C
- XAMPP

Simple Flowchart



Link for the Video Demo

https://drive.google.com/file/d/1YfDmxyT6AS7W_FUqN693jXOlF_12TtN/view?usp=sharing

Code File Link:

https://github.com/Sham-ganesh/DBMS_Project_2021

Just extract the code from the above link and place in the htdocs folder in XAMPP and create the required database and tables. Nextly compile the arduino code and upload it to the RFID connected NODE-MCU.

Tools Used

- Front end of tracking system(web application) is developed using HTML,CSS, JAVASCRIPT and JQuery.
- Backend of the web application is build solely on PHP.
- Mysql is used as database management system
- Apache server is used to host the web application

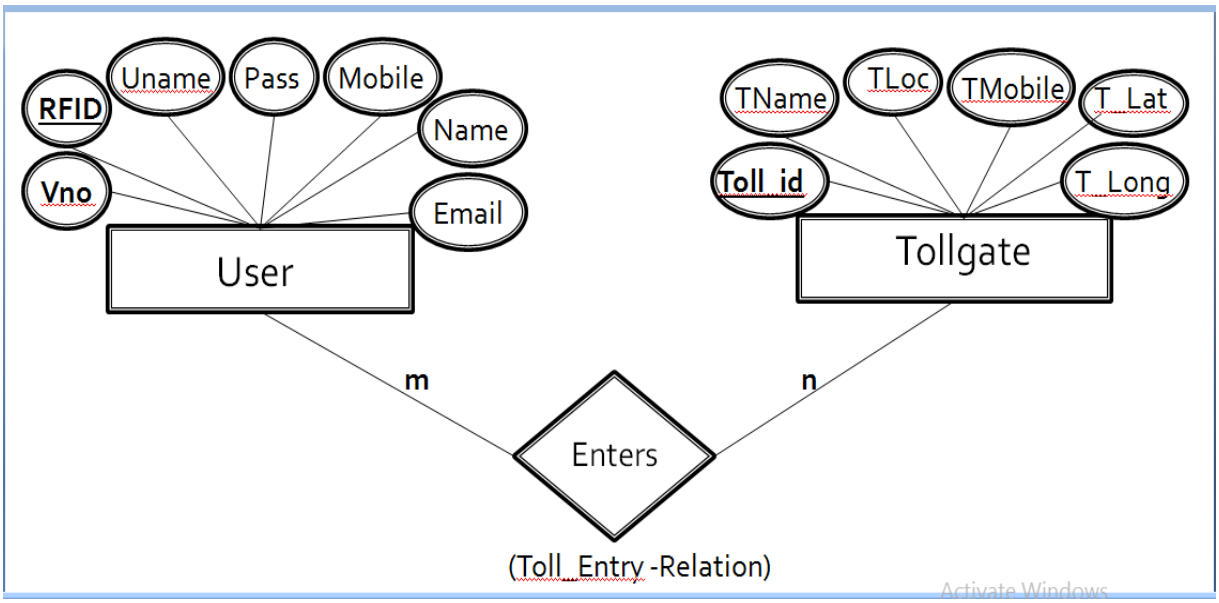
Database Design

Database: nodemcu_rfidrc522_mysql

Tables:

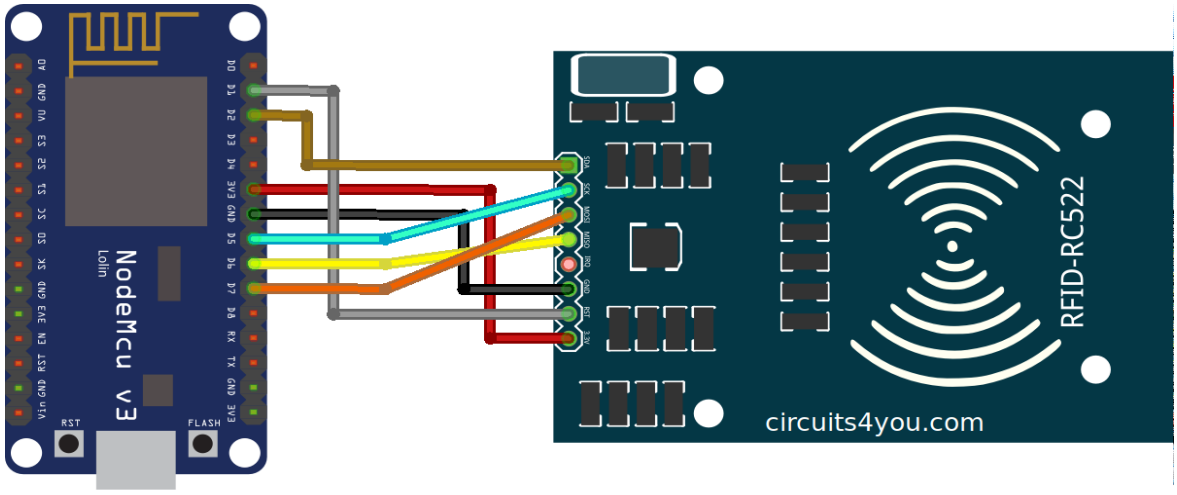
- table_nodemcu_rfidrc522_mysql(user)
  - ➔ NAME, ID, VEHICLE_NO,GENDER, EMAIL, MOBILE, UNAME, PASS
- tollgate_details(Tollgate)
  - ➔ ID, NAME, LOCATIO, MOBILE, LAT, LONG
- tbllogs(Toll_entry)
  - ➔ TOLLID, RFID, TIMESTAMP

ER Diagram



Procedure

1. Create databse and the three relation in MYSQL-XAMPP Server.
2. Now connect the rfid scanner with NODE-MCU as shown below:



3. Now compile the the code for data insertion in Arduino compiler and upload it to the NODE-MCU.
4. Now Design a website to display the details, so that the users and admin can acces it easily.

Working

Consider there are n users and m tollgates, so each user has a unique rfid and an corresponding vehicle number and each tollgate has a unique tollid. So now as the user passes through his vehicle through the tollgate, the tollid,rfid and time are noted and inserted into the logs table. So now the admin can know through which tollgate the vehicle has passed and at what time it has passed.

Features

Users:

- Signup/Signin option.
- Track their vehicle history alone.
- Edit their own details.

Admin:

- Track the vehicle history of any vehicle using vehicle number
- Edit the user details.
- Delete any user.
- Read any rfid tag and view the details stored in it.

Uses

The vehicle Tracking System helps you to monitor where your vehicles are being driven to in real time. Now higher officials can check if employees are making unauthorized trips.
It can help police officials to solve many crime cases.

Abstract Higher Vision

The project can be extended by incorporating the idea where the users can buy the tollgate tickets just by using the website, which can reduce the waiting time at tollgate. This leads to another relation with the transaction details.

Conclusion

So the project is just an solution to some of the modern day problems, we have just shown the design and implementation of a low cost, flexible and wireless solution to the vehicle tracking at an easy and optimized way. The system is also secure for access as users are expected to know the password for pairing. The system can be used wherever data entry should be automated like attendance system , library management system and many more. The project can be easily scaled up and can be modified according to the problem, so it is just a sample model of the dynamic project.