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Automated Crowd Management in Bus Transport Service

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ABSTRACT: With the advent in technology, the existing systems are developed to have in built intelligence. Nowadays we come across theft, terrorist attacks on public transportation systems. Many a time it becomes difficult for investigating agencies to track the cases. We are proposing a Centralized bus control system where a passenger needs to fill up the details by submitting required ID & address proof as per Know your Passenger policy and purchase a unique ID Bus pass card having unique number (RFID Tag).

We are using RFID Reader to read the RFID unique Tags. Thus the bus centralized control cell has the passenger's details in their database. Passenger has to get that card recharged in the bus stop (Centralized Cells authorized outlets) or in the bus itself by a conductor. With this proposed system the existing paper ticket system can be removed with an e-ticket by triggering an SMS to the Passenger mobile number when the conductor swipes Passenger card. Hence we are proposing a Smart Automated ETicket System for Indian transport system by using RFID & IOT technologies using Arduino.

I. INTRODUCTION

The IoT provides a platform that creates opportunities for people to link and monitor devices with Big Data technology. In day-to-day life bus services plays a major role in transport. The current bus ticketing system causes a lot of paper usage and the conductor have to manually issue the ticket to each individual. It is usually noticed that some of the buses are overcrowded and at the same time some of them have half-empty seats although they are heading towards the same destination at the same time. There is a need to develop a system that minimize the usage of paper and automatically detects the crowd density and signals the database if the bus is full or not.

II. LITERATURE SURVEY

Modified Ticketing System using Radio Frequency Identification (RFID) proposes the use of RFID technology to provide an efficient and enhanced automated ticketing system. The principle aim of the paper is to improve the efficiency of the prevailing suggested RFID ticketing system by considering and overcoming its limitations. Main drawback is maintenance of cyclometer is high and there is no crowd management.

Real Time Web Based Bus Tracking System, IEEE proposes the system that tracks the bus at any location at any time. All the current information is stored to the server and it is retrieved to remote users via web-based application. Main drawback is the cost effectiveness and its implementation have become high. The problem lies in maintaining high grade servers to backup the data for vehicle tracking and the use of internet to track these vehicles.

RFID-based Bus Ticketing System proposes the system that integrates live tracking, E-ticketing, Crowd tracking, tracking transit stops in a single deployable, tangible solution for public bus systems, in order to simplify and convenience all the parties involved. Main drawback is passenger is not aware about the seat availability and there is no crowd management.

A Smart Information system public transportation using IOT, IEEE, in this paper, the system provides real time information about arrival time of the bus, crowd density. This help public about occupancy status and upcoming buses which enables them to take better decision which in turn helps in crowd management this information also helps bus operators, to analyze patterns in public transportation usage in

different routes. Main drawback is the day progresses, such as traffic congestion, unexpected delays, randomness in passenger demand, irregular vehicle dispatching times, and incidents.

A low cost IoT based crowd management system for Public Transport, IEEE, proposes a system which demonstrate a low cost IoT based solution to the crowding problem by using smart seats that can detect and display the seat occupancy status in real time over an internet or mobile application. Main drawbacks is passengers not occupying seats (standing) will not be detected and even the setup is expensive and hard to manage.

Crowd Detection and Management using Cascade classifier on ARMv8 and OpenCV-Python, IEEE proposes the system in which the videos are recorded in the institution and using HAAR features and Adaboost algorithm to detect persons head region. Human heads are detected using optical flow concept. Predictions are only based on the present and past observations.

A Smart Bus Tracking System Based on Location Aware Services and QR Codes proposes the system which basically tracks the busses, estimates their arrival times at specific bus stops and informs the users through prevents passengers unnecessarily to wait at bus stops and enables them to use their time more efficiently.

RFID Based Bus Ticketing System proposes a system using RFID methodology through which user just have to scan their provided unique ID during travelling. The system uses hardware components to take the input from the user and validate it using the website hosted on a web server. The web server will store the details of the user and deduct amount accordingly. Main drawback is there is no crowd management in this system network which immediately updates its status to the cloud server. Main drawback is passenger doesn't get information about seat availability.

Real Time Bus Monitoring System by Sharing the Location Using Google Cloud Server Messaging paper, the system link updater, which estimates the travel time for each Link ETA calculator.

Design and Implementation of Web-Based GPS-GPRS Vehicle Tracking System, in this system general Packet Radio Service GPRS is a packet switched service based on Global System for Mobile Communications GSM, an extensively deployed voice technology. Transmission cost extremely reduced by using GPRS service instead of SMS. Main drawback is that exact location of vehicle cannot be determined and achieving accuracy is hard.

Crowd Counting: A Survey of Machine Learning Approaches proposed a system in which they survey and compare various crowd counting methods. Furthermore, it presents an enhanced deep learning-based solution for crowd counting at bus stops. Main drawback is crowd count accuracy in real life scenarios is decreased.

Automated Crowd Management in Bus Transport Service proposes a system which presents an Automated Crowd Management System using the algorithms of Machine Learning and IoT Technologies. The crowd density is detected inside the bus and is classified in to 5 different levels which will eventually displayed on LCD. Main drawback is using webcam for crowd management is not a good option and it is less efficient.

III. PROPOSED METHEDODOLOGY

IR sensors are used for detecting the crowd entering and leaving the bus. An improvised method for generation of bus ticket is implemented that no more overcharging can take place. Softcopy of the generated will be sent to the user's pre-registered mobile number, so that no more loss of ticket will occur. During any accident on the bus, the GPS location is immediately tracked and sent to the nearby hospital. The overall system can be monitored from main station.

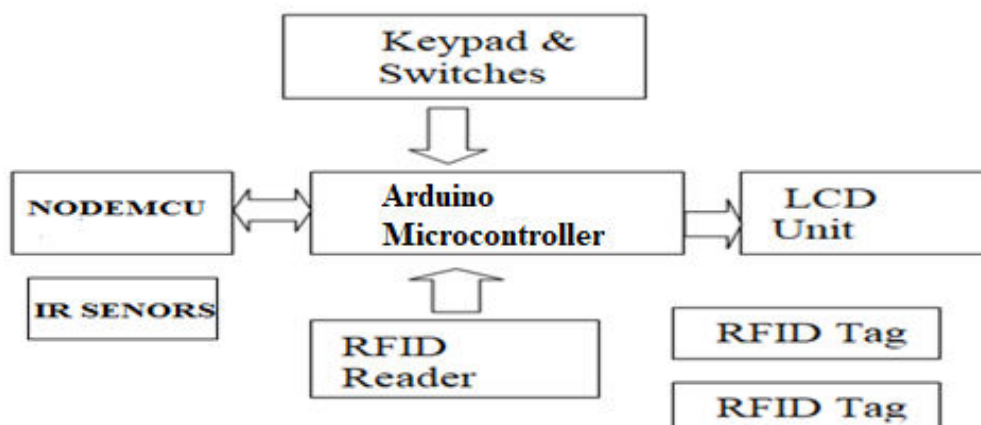


Figure 1: Component's connection

IV. RESULTS

Initially, the devices should need to be connected to the Arduino Microcontroller. After the interfacing part is completed then first the card has been scanned and it will check for the availability of seat by using IR sensors which is placed to each bus. If the seats are available then the door opens and the passenger will enter the bus otherwise it will show like no seats are available. After that the passenger journey starts by pressing the switch and the GPS location of starting point is noted and when the other switch is pressed then the destination has been reached and the GPS location of that destination is also considered. Based on the GPS positions it will calculate the distance travelled based on that the amount will be deducted. One message will be delivered to the passenger after the successful completion of journey. One vibration sensor is placed, if the vehicle has met the accident.

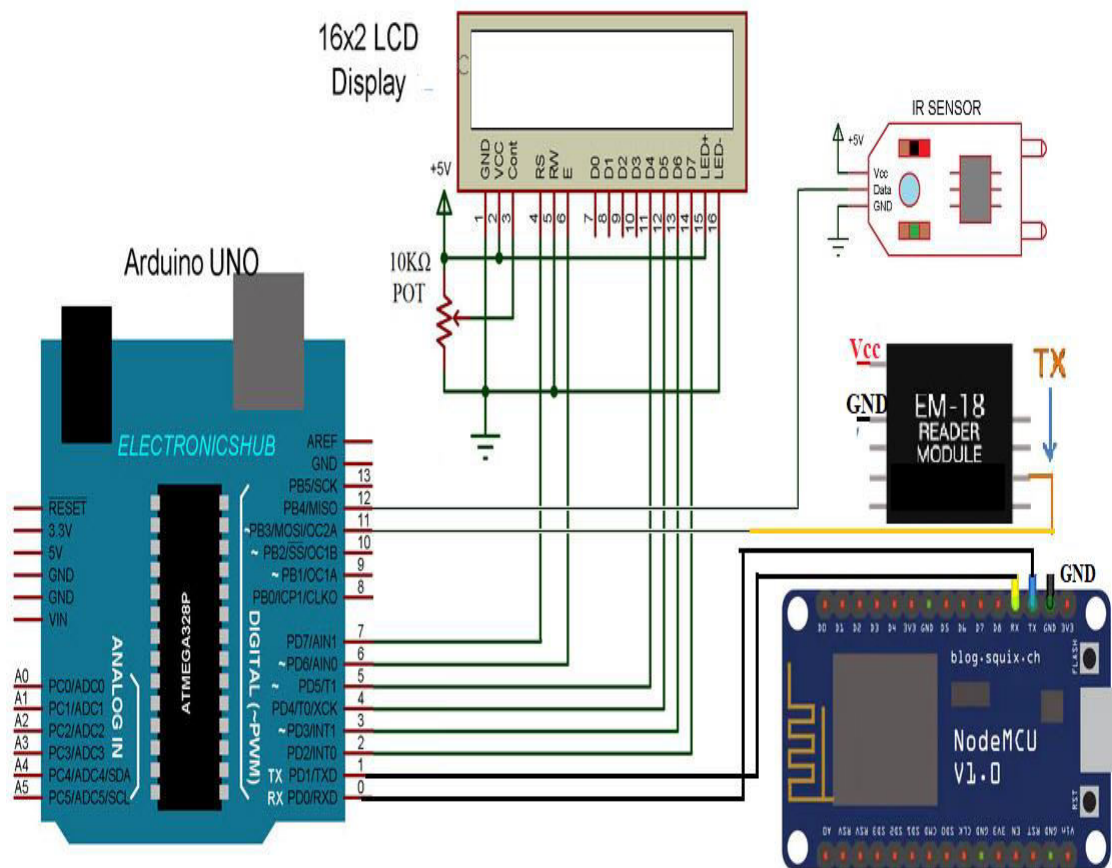


Figure 2: Interface Diagram

V. CONCLUSION

By implementing this project proposal, we greatly reduce the manpower, saves time and operates efficiently. This project puts forth the first step in achieving the desired target. This project is helpful in managing the crowd in the bus, if the bus is full, it will send a message, Deduct the amount from their smart card according to the How much KM they Travel and Message sending to the after completion of the journey. These are the major facilities which are included the project so it will helpful to avoid the spreading of the corona virus from one person to other persons.

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