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| **Public Transport optimization**  Sakthisri.v  723921106017  Sakthisree572003@gmail.com |  |

***Innovation***

***Introduction :***

The accident caused due to the over loading of the passenger is one of the main reasons for the bus accident caused. Carrying more passengers than capacity by bus has been a problem state. Some transportation medium squeeze people in the spaces between the seats. The road safety problem in developing countries is much worse than the official statistics projects because of widespread of underreporting road accident deaths [1]. Boarding the bus while it is in the movement also causes the death to the passenger. Around three-fourths of the annual 550 billion rupees loss from road accidents was attributed to the unorganized truck transport industry.

The main objective of our work is listed below

* To reduce the death caused by travelling in the foot board of the bus.
* To automate the ticket issue and make cashless translation for payment



**Fare Collection and Ticketing:**

* IoT-enabled ticketing systems can simplify fare collection by allowing passengers to use contactless payment methods like smartphones or smartcards.
* This data can be used for analytics to improve service planning and revenue management.
* Real-time Tracking and Monitoring:
* - GPS and RFID sensors can be installed on buses, trams, and trains to track their real-time locations.
* - This information can be relayed to a central control center, allowing operators to monitor vehicle positions and adjust schedules in real-time.

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**PROPOSED METHODOLOGY**

* In our methodology, we have a unique barcode for each and every bus stop so when the reader reads the bar code the door opens automatically.
* We can also intimate the arriving time of the bus to each stop by knowing the time at which the bus has reached to the before stop.
* This will be helpful for the passengers to know about the approximate time of arrival of the bus. The manual ticket issuing process is risky at the peak hours and with current rate of population growth with in sufficient transportation system.
* By using our smartmethodology, we reduce the time consumption for issuing the ticket to the passenger
* . 
* The block diagram for the automaticdoor open and ticket automation
* Block Diagram



**Hardware:**

o For hardware basic technology to be used is GPS/GSM technology for bus tracking and monitoring.

o Accident detection technology for vehicles is to be used for accident detection and GSM technology to be used for its monitoring.

o PIR sensors are to be used for counting of public that travelled in the bus at front and rear door. Temperature sensor is used to monitor temperature of the bus.

o Safety switches along with SMS acknowledgment to registered police station are used as indicators for rash driving, bus fail and emergency case.

o RFID authentication is used for driver, and ramp for handicap people so that it becomes convenient and easy for them to use public transport.

**Software :**

* Android application is to be developed for smart phones to make the bus tracking and monitoring easy and fast.
* For the controller i.e. for ARM7 processor Embedded C language is used for programming.

**Algorithm for hardware demonstration:**

**1.** Initialize the hardware.

**2.** Grant access to the system using RFID unit.

**3.** Initialize LCD and sensors.

**4.** LCD displays: Initial value of Temperature sensor, Value of Accelerometer in X-axis, Value of Alcohol sensor and PIR sensor count.

**5.** If system ON/OFF switch pressed, start the system moment.

**6.** When the value of MQ3 sensor changes i.e. if the value of alcohol content changes, the GSM system sends a SMS acknowledgement to the registered no. that the driver is drunk and real-time co-ordinates of the location. The alcohol contents can be changed by spraying a perfume or by taking alcohol closer to the sensor manually.

**7.** When an accelerometer is been vibrated or shocked, it detects accident when the X-axis and Y-axis changes above 300gravity and 700gravity respectively. Then, the GSM unit sends an acknowledgement SMS to the registered mobile no. containing the message of accident detection and real-time co-ordinates of the location. 

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* Traffic Management:
  + IoT can be used to manage traffic flow by coordinating traffic signals based on real-time traffic conditions.
  + Smart traffic management can reduce congestion and improve the efficiency of public transportation.
* Environmental Monitoring:
  + IoT sensors can measure air quality and pollution levels along public transport routes.
  + This data can be used to implement eco-friendly measures and inform passengers about the environmental impact of their journeys.
* . Security and Safety:
  + IoT cameras and sensors can enhance security on public transport vehicles and at transit stations.
  + They can monitor for unusual activity and provide real-time alerts to security personnel.
* . Energy Efficiency:
  + IoT can optimize the energy consumption of public transport vehicles by adjusting lighting, heating, and cooling systems based on occupancy and environmental conditions.
* . Fleet Management:
  + IoT can help transit agencies optimize their vehicle fleets by tracking vehicle usage, fuel consumption, and driver behavior.
* . Accessibility:
  + IoT can improve accessibility for passengers with disabilities by providing real-time information about accessible routes and facilities.
* Data Analytics:
  + Collecting and analyzing IoT data can provide valuable insights into passenger behavior, route optimization, and service improvements.
* . Emergency Response:
  + In case of emergencies or accidents, IoT can provide real-time location information to emergency responders, helping them reach the scene faster.
* Implementing IoT in public transport management requires a robust infrastructure, data privacy considerations, and cybersecurity measures to protect sensitive information. However, when implemented effectively, IoT innovations can significantly enhance the overall quality and efficiency of public transportation systems, making them more attractive and sustainable for urban commuters.

Work Flow

When the bus arrives to a specific stop the barcode reader in the bus reads the code and opens the door through which the passenger can get in and also get out of the bus. The opens automatically if the code matches without the help of the bus driver. The door closed automatically after 5 min delay which will be a sufficient to board and departure the bus

**Algorithm for software demonstration:**

**1.** Open the Eclipse Luna (Java IDE).

**2.** Select the main page and run as java application. Then, select com port to which system is connected through USB port.

**3.** Set all the properties i.e. baud rate, parity bits, start and stop bits accordingly.

**4.** As soon as properties are set, it displays no. of persons available and when location tracking switch pressed, it gets the location as latitude and longitude values on the main page.

**5.** Then, run the main project on run on server and then finish by selecting Tomcat v8.0 Server at local host.

**6.** Then, the application page on browser opens.

**7.** At homepage, search options are provided for bus searching.

**8.** When searched for bus, it displays the bus details and location to track the bus.

**9.** If track pressed, then on Google map displays the current real-time locat

**CONCLUSION**

The life of a human is more important. All the invention and discoveries made are to in human life. In public bus transportation accident caused due to whoever may be the problem is faced by the government and it also affects the law-and-order. We strongly believe that our methodology can reduce the death rate due to foot board travel and boarding the bus while the bus is in movement. The over loading of the bus can vanish if the methodology which we have proposed is followed. Apart from this by automating the bus ticket, we can reduce the cheating done and also reduce the loss due to the bus transportation for the government to a great extent. Using of Cloud to store data can provide much memory to store the data about the passenger and bus. The transportation smart card can also be use for passenger safety also. Since we have used the technology IoT for the communication, it will be suitable for the further upgrade of the methodology proposed.