AUTOMATED DUAL BOOM GATE SYSTEM WITH NUMBER PLATE RECOGNITION

Harare Institute of Technology
success through innovation

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1.0 Abstract

This project aims to develop an automated dual boom gate system with number plate recognition and reports production, designed for driver and security admin use. The system is equipped with advanced sensors and cameras to ensure secure and efficient access control to a premise. The dual boom gate system allows for two vehicles to enter or exit at the same time, which increases the speed and convenience of access control. The number plate recognition feature ensures that only authorized vehicles are allowed access, providing an additional layer of security. The system also includes a reporting function, allowing for the production of detailed reports on vehicle access and activity. The reports can be used by security administrators to track the movement of vehicles and identify any potential security breaches. The project covers the design and implementation of the system, including the hardware and software components. The number plate recognition and reporting features are integrated into the system, and the system is tested and evaluated for accuracy, efficiency, and security.

2.0. Introduction

Shamva Gold Mine is a busy site that requires effective traffic management to ensure the safety of workers and visitors, as well as the smooth flow of vehicles. An automated dual boom gate system with number plate recognition technology can provide an efficient solution to manage the entry and exit of vehicles. This system can automatically identify and record the number plates of vehicles entering and exiting the site, allowing for accurate tracking of traffic flow and improved security measures. Additionally, the system can produce reports that provide valuable insights into traffic patterns and offer data-driven recommendations for optimizing vehicle management. By implementing this system, the Shamva Gold Mine can enhance its traffic management capabilities and improve overall site safety and efficiency.An Automated boom gate is an automated movable barrier installed at the entrance of any infrastructure for restricted or controlled access.To be more efficient the boom gate system can have a censored platform to control two boom gates on two extreme ends and a truck number plate recognition system.

3.0. Problem definition

At the Shamva Gold Mine, the current boom gate system is outdated and inadequate. A security guard manually controls the boom gate, and vehicles entering and exiting the mine must follow a one-way traffic flow. To manage the flow of traffic, drivers sound bells to alert others to give way, creating a noisy and potentially hazardous environment. The manual system also relies on the guard to log the information of vehicles entering and exiting the mine in a book, which can be time-consuming and prone to errors. The lack of a reliable tracking system and the reliance on manual logging can limit the mine's ability to optimize traffic management and improve operational efficiency. The implementation of an automated dual boom gate system with number plate recognition technology can significantly enhance the traffic management capabilities of the Shamva Gold Mine, while reducing noise pollution and improving safety for workers and visitors.

4.0. Overview of the developed application

The boom gate can be automated to open and close automatically as vehicles enter and exit the mine, eliminating the need for a security guard to control it manually. The number plate recognition feature can capture the number plates of vehicles as they enter and exit the mine, ensuring that only authorized vehicles are allowed to enter.

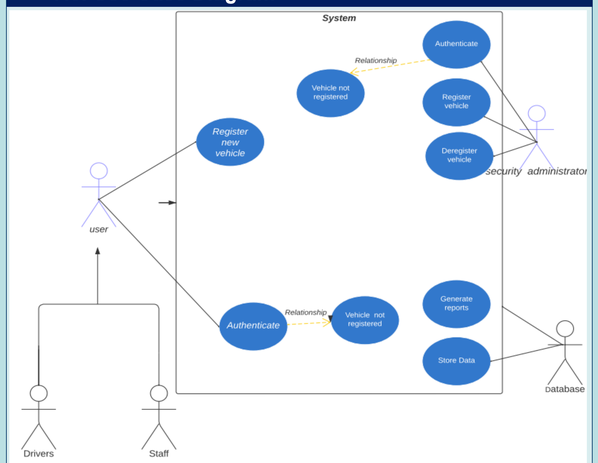
The system can also generate reports that show the number of vehicles that have entered and exited the mine, the time and date of entry and exit, and any other relevant information. This will improve the accuracy and reliability of the data compared to a manual logbook system.

5.0. Objectives

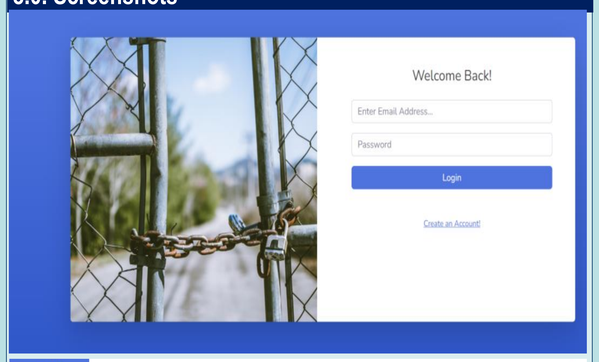
- To develop a dual automated entrance and exit barrier.
- To detect or sense approaching vehicles.
- To authenticate vehicles based on vehicle registration number
- To produce reports on vehicle movement based on the vehicle registration number.

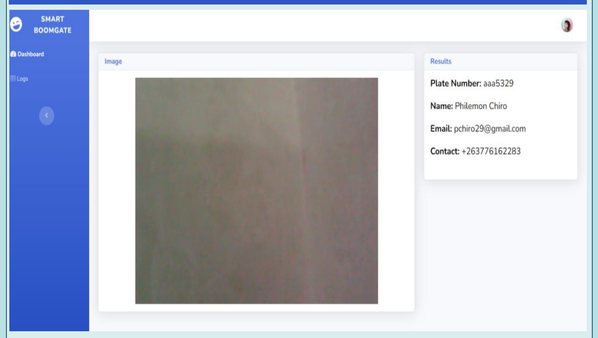
6.0. System Overview

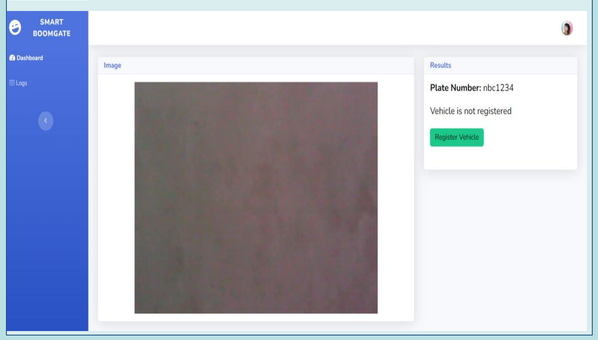
7.0. Use Case Diagram

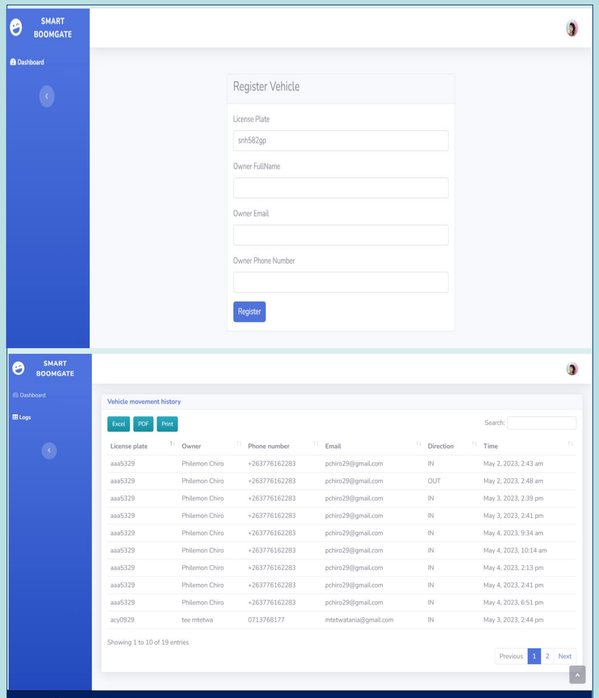


8.0. Screenshots









Conclusion

The automated dual boom gate system with vehicle registration number recognition and production of reports has been successfully implemented. The system has been tested and it has shown to be highly effective in managing the entry and exit of vehicles in a controlled environment. The system is equipped with advanced technology that allows it to recognize the registration numbers of vehicles as they approach the gate. This feature ensures that only authorized vehicles are allowed access, while unauthorized vehicles are denied entry. The system also generates reports on the number of vehicles that have entered and exited the premises, as well as their registration numbers. This feature makes it easy for management to keep track of the movement of vehicles in and out of the premise This feature ensures that there is no need for manual intervention, which reduces human error and increases efficiency. The production of reports on the movement of vehicles in and out of the premises makes it easy for management to keep track of vehicular traffic. This feature helps management make informed decisions about resource allocation, security measures, and other aspects related to vehicular traffic management. Overall, the automated dual boom gate system with vehicle registration number recognition and production of reports is an excellent solution for managing vehicular traffic in a controlled environment. It is highly effective, efficient, and reliable.

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