AUTOMATED DUAL BOOMGATE SYSTEM WITH NUMBER PLATE RECOGNITION

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***Abstract*-This paper presents the design and implementation of an automated dual boom gate system with number plate recognition and reports production for the Shamva Gold Mine. The system utilizes a combination of hardware and software components to automate the process of vehicle entry and exit into the mine's premises. The system incorporates high-resolution cameras to capture number plate information, which is then processed by an intelligent software algorithm to authenticate the vehicle and its occupants. The system also generates reports that are accessible by both the driver and security administration, providing real-time data on vehicle movements and access control. Overall, the system is designed to enhance security, improve efficiency, and streamline the vehicle entry and exit process at the Shamva Gold Mine.**

Keywords-automated,boomgate,implementation,design,recognition

I.INTRODUCTION

This paper describes the development of an automated dual boom gate system with number plate recognition and reports production for the Shamva Gold Mine. The system is designed to automate vehicle entry and exit processes,improve security, and enhance overall efficiency. The system utilizes high-resolution cameras and intelligent software algorithms to capture and process number plate information, authenticate vehicles and their occupants, and generate real-time reports. The reports can be accessed by both drivers and security administration, providing essential data on vehicle movements and access control. The system's implementation at the Shamva Gold Mine has demonstrated significant improvements in security and efficiency, making it an effective solution for managing vehicle access and control at mining sites.

II.PROBLEM STATEMENT

At the Shamva Gold Mine, the current boom gate system is outdated and inadequate.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.

III.LITERATURE REVIEW

"Design and Implementation of an Automated Toll Collection System with Boom Gates" by S. S. Shinde, et al. (2020)

This paper presents a design and implementation of an automated toll collection system with boom gates. The system uses sensors to detect the presence of a vehicle and then opens the gate if the vehicle is authorized. The system also uses RFID to identify the vehicle and deduct toll charges from the vehicle owner's account. The authors also developed a reporting system that generates reports on the vehicles that have passed through the toll

booth. The advantages of this system are its efficiency, accuracy, and ease of use. However, the system may not be suitable for areas with high traffic, and the sensors may not work in all weather conditions.

"Automated Boom Gate System with Vehicle Detection and Counting" by A. K. Singh, et al. (2021)

This paper presents a design and implementation of an automated boom gate system with vehicle detection and counting. The system uses sensors to detect the presence of a vehicle and then opens the gate if the vehicle is authorized. The system also uses a vehicle counting algorithm to determine the number of vehicles that have entered and exited the premises. The authors also developed a reporting system that generates reports on the vehicles that have entered and exited the premises. The advantages of this system are its efficiency, accuracy, and ability to count vehicles. However, the system may not be suitable for areas with high traffic, and the sensors may not work in all weather conditions.

Smart Boom Gate System with Mobile Application Integration" by M. S. Kulkarni, et al. (2021)

This paper presents a design and implementation of a smart boom gate system with mobile application integration. The system uses sensors to detect the presence of a vehicle and then opens the gate if the vehicle is authorized. The system also integrates with a mobile application that allows users to remotely control the gate and receive notifications when their vehicle enters or exits the premises. The authors also developed a reporting system that generates reports on the vehicles that have entered and exited the premises. The advantages of this system are its efficiency, accuracy, and ease of use. However, the system may not be suitable for areas with high traffic, and the sensors may not work in all weather conditions.

"Smart Parking System Using IoT and Number Plate Recognition" by R. Kumar, et al. (2020)

16.This paper presents a design and implementation of a smart parking system using IoT and number plate recognition. The system uses a camera to capture the number plate of the vehicle and then opens the gate if the number plate is authorized. The authors also developed a reporting system that generates reports on the vehicles that have entered and exited the premises. The advantages of this system are its efficiency, accuracy, and ease of use. However, the system may not be suitable for areas with poor lighting conditions, and the number plate recognition algorithm may not work for all types of number plates.

"Smart Toll Collection System using Number Plate Recognition and RFID" by S. S. Shinde, et al. (2020)

This paper presents a design and implementation of a smart toll collection system using number plate recognition and RFID. The system uses a camera to capture the number plate of the vehicle and then opens the gate if the number plate is authorized. The system also uses RFID to identify the vehicle and deduct toll charges from the vehicle owner's account. The authors also developed a reporting system that generates reports on the vehicles that have passed through the toll booth. The advantages of this system are its efficiency, accuracy, and ease of use. However, the system may not be suitable for areas with poor lighting conditions, and the number plate recognition algorithm may not work for all types of number plates.

18. "Smart Parking Management System using Image Processing and Number Plate Recognition" by M. S. Kulkarni, et al. (2020)

This paper presents a design and implementation of a smart parking management system using image processing and number plate recognition. The system uses a camera to capture the number plate of the vehicle and then opens the gate if the number plate is authorized. The authors also developed a reporting system that generates reports on the vehicles that have entered and exited the premises. .

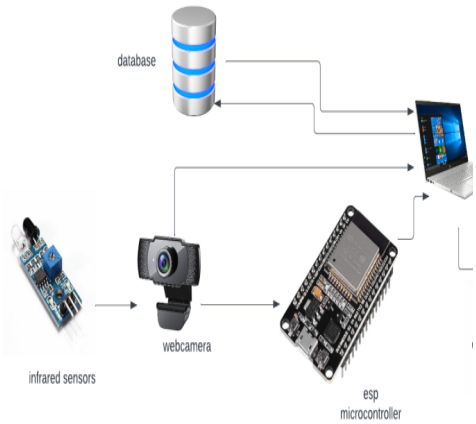
IV.SOLUTION

The solution that is to be implemented to improve the boom gate system at Shamva Gold Mine is an automated boom gate system with number plate recognition and reporting capabilities. 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.

A. SOLUTION ARCHITECTURE



B. Coding strategy

The software development methodology used in this project was agile extreme programming method.For the software php and python programming languages were used.For hardware arduino was use.

C. Experimentation and Testing

Test case	Expected outcome	Result
Park a vehicle infront of the boomgate	Sensor light should show vehicle sensing	sucess
Approach boomgate with recognized number plate	The boom gate opens automatically	sucess
Access the reporting feature from the system	Accurate data on vehicles movement should be displayed	sucess
Approach the boomgate with an unrecognized number plate	A not registered result should appear and the boomgate should not open	sucess

V.CONCLUSION

In conclusion, the automated dual boom gate system with number plate recognition and reports production is an effective solution for managing vehicle access and control at mining sites such as the Shamva Gold Mine. The system's ability to automate the process of vehicle entry and exit, coupled with its advanced security features, provides a reliable and efficient solution for managing the flow of vehicles in and out of the mine. The system's real-time reporting capabilities also provide valuable data for both drivers and security administration, enabling them to make informed decisions about access control and vehicle management. Overall, the implementation of such a system can enhance security, improve efficiency, and streamline the vehicle entry and exit process, making it an essential tool for mining sites and other high-security areas.

VI. FUTURE WORK

Integration of the dual boom gate system with other smart city technologies such as traffic management systems, parking managementsystems,and public transportation systems.Development of a mobile application that allows users to remotely access the dual boom gate system and receive real-time updates on their vehicle's entry and exit times. Implementation of artificial intelligence (AI) algorithms that can analyze data collected by the system to identify patterns and trends, which can help improve traffic flow and reduce congestion.

VII.BIBLIOGRAPHY

A. ACKNOWLEDGEMENTS

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