Website – Based on Vehicle Traffic Monitoring System

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Abstract. This research was conducted to provide suggestions how to monitor the road traffic conditions by using data sent from cameras installed at each intersection. Literature study, observation, system design and system testing used as a method in this research. With this method we can make an accurate information system regarding traffic monitoring. The results of this study is to obtained the data such as general conditions of the road, the number of vehicles passing, the average speed of the vehicle, the travel time of the vehicle, the position of congestion and the time of congestion. The creation of a monitoring system is very important because it can provide information about the road conditions clearly. From the current problems, the authors want to make a “Website-Based Vehicle Traffic Monitoring System” which later the system becomes information for road users and the police to monitor traffic.

1. Introduction

A good traffic system is one of the most important aspects of human in daily life because it will certainly affect human activities. One factor that causes a traffic delays is congestion. It happened when the amount of vehicles are growing rapidly. Traffic congestion can cause various negative impacts such as loss of productive time, fuel waste, and pollution etc. Without a good traffic control system, the possibility of traffic congestion will be higher and hamper human life [1]. Traffic management and accident management are very important for people in cities where traffic jams often occur to provide a comfortable lifestyle and security [2].

At this present day, information technology has changed the face of the world from the real world to the cyber world [3]. The application of internet technology in the field of intelligent transportation has matured. Video processing technology based on image processing is an important part of internet technology because it provides accurate information for road users [4]. Overcrowded traffic is an important issue that must be followed up in urban centres around the world. The method that is currently running may be less accurate in terms of performance and it requires quite expensive costs to control traffic management. Urban areas have more traffic problems, especially when road users experience accidents that will cause congestion [5]. India is the second most populous country in the world. Therefore the problem of high traffic flow is found in every corner of the city. The number of requests for vehicles that increase every year will create more traffic congestion problems in the future. The negative impact of traffic congestion can be reduced by implementing a good traffic monitoring system. To overcome this problem road users must know the traffic conditions in certain parts of the road so that they can avoid the road and take other roads where the vehicle density is low. [6] The increasing level of congestion on public roads is a growing problem in many countries. One of the 2003 urban mobility reports estimated that the total annual cost of congestion for 75 regions in the United States was 69.5
billion dollars [7]. Some major cities in Indonesia such as Jakarta, Bandung and Surabaya, congestion has become the main issue at issue. Many losses occur due to this congestion, both in terms of time, cost, health and environment for road users. Not to mention if there is an accident that will increase traffic density which results in passing vehicles becoming a stack [8].

Poor management also increases the number of vehicles, there will be a number of problems, such as heavy traffic jams and traffic violations. Therefore it is necessary to make an economic and efficient traffic control system. One way is to monitor the level of passing vehicles and improve the security system [9]. There are several problems that need to be corrected in implementing a good traffic monitoring system, how to identify good traffic is to install tools that can be monitored [10]. Applying image processing techniques through computers to analyse video sequences of traffic flow and road traffic monitoring. This video sensor provides monitoring that will provide information about the measurement of vehicle speed, calculation of several points of the vehicle, and the movement of vehicle flow. Image processing is also useful to determine the relative position of the vehicle in the path for obstacle detection [11]. By implementing this system, it is expected that road users will get real-time information about the traffic conditions that are going on in order to avoid congestion and find alternative ways.

This study aims to provide advice on the use of data sent from each camera installed at each intersection to monitor road traffic conditions. The methods used in this study were literature study, observation, system design and system testing.

2. Method

The method was carried out by monitoring system used a camera assistance to observe traffic placed on each side of the traffic junction. It was located at Jalan. H. Juanda because they have four cameras mounted on traffic lights the road in four-way intersection.

3. Results and Discussion

The intersection is a junction with four feeding lanes, there are also four cameras placed in that location. The camera installed will capture the parameters of traffic on the road and send this information to the police, then processes the number of vehicles, accidents that occur, and when traffic jams and traffic violations occur [12]. Previously we made a backend design [13], we were divided into four categories, namely, data on the number of vehicles passing, accident data, traffic congestion, traffic violation data.

![Figure 1. Backend for Login Menu](image-url)
In the following picture the author describes that on the start page that is login. After logging in, there will be menus like the picture. Next there is the testing section, wherein this section is carried out in a modular and comprehensive manner on the system that has been made. And the last is observation where this observation is carried out to see the results of the monitoring system that has been installed, from which changes will occur (Figure 2).

![Login Feature](image1.jpg)

**Figure 2.** Display Login

Figure 2 is login feature, which is very important to maintain the security and confidentiality of a data on the website. To access this website, users are required to log in first to access the website (Figure 3).

![Data Display](image2.jpg)

**Figure 3.** Data Display of the Number of Vehicles Passing
In figure 3, there are menu view of the number of vehicles. We can see the data on the number of vehicles passing each day, where the results of the data received each day will vary (Figure 4).

**Figure 4. Crash Menu Display**

Figure 4 is the “accident menu” view above is divided into two tables. The first table contains data on accidents that occur every day, the data will be updated every day according to the data received. While the second table contains the accident data of each vehicle that has been accumulated every month (Figure 5).

**Figure 5. Display of the Traffic Flow Menu**
Figure 5 shows the menu image above shows data traffic flow in graphical form. From the graphic image, it provides information about road conditions every day from morning to night. Through this graph we can find out when the road conditions are empty and there are not too many vehicles passing by (Figure 6).

![Traffic Violation Data](image)

**Figure 6. Display of Traffic Violation Menu**

Figure 6 displays the data menu for traffic violations. From the table we can see the violations committed by road users of each vehicle used. The data in the table has been accumulated, and will be updated every month according to the violations that occur (Figure 7).

![Accident Picture](image)

**Figure 7. Documentation Menu Display**
In the picture above (Figure 7), it displays an additional menu. In the documentation menu there are several sub menus namely, Accident Pictures, Traffic Flow Images, and Traffic Violation Images. This menu is useful for storing several images, which are captured by a camera installed on the road. The aim is to be able to remind road users to be more careful about driving their vehicles, as well as provide accurate evidence to the police in the event of an accident (Figure 8).

![Figure 8. Documentation Sub Menu Display](image)

The picture above (Figure 8) is the view from the documentation sub menu. This picture menu of traffic flow is useful to provide information for road users about the condition of the road or the flow of passing vehicles. That way road users will get sufficient information about the condition of the road (Figure 9).

![Figure 9. Documentation Sub Menu Display](image)
Figure 9 shows a view of the documentation sub menu. The menu of images of traffic violations aims to inform road users about the violations that occur on the road. It is hoped that this will reduce the number of high traffic violations.

4. Conclusion
With this website-based traffic monitoring system, it will be very easy for everyone to get an information about the traffic conditions accurately. The information displayed on this website will also facilitate monitoring and controlling traffic for the police. It is expected that with this traffic monitoring system it can also reduce congestion, accidents, and high traffic violations.

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References
[1] Rachmadi, M. F., Al Afif, F., Ma'sum, M. A., Fajar, M., & Wibowo, A. (2012). Beagleboard embedded system for adaptive traffic light control system with camera sensor. Jurnal Ilmu Komputer dan Informasi, 5(2), 63-71.
[2] Abdullah, A., Bakar, E. A., & Pauzi, M. Z. M. (2015). Monitoring of traffic using unmanned aerial vehicle in malaysia landscape perspective. Journal Teknologi, 76(1), 367-72.
[3] Dr. Ir. Eddy Soeryanto Soegoto. (2014). Enterpreneurship Menjadi Pembisnis Ulung
[4] Cao, J. (2016). Research on Urban Intelligent Traffic Monitoring System Based on Video Image Processing. International Journal of Signal Processing, Image Processing and Pattern Recognition, 9(6), 393-406.
[5] Kumar, K., & Kaur, D. P. D. (2015). Road traffic control system in cloud computing: a review. International Journal of Grid Distribution Computing, 8(3), 201-206.
[6] Khyati Zalawadia, Helly Shah, Radhika Shringarure. 2015. Traffic Detection and Diversion System
[7] Coleri, S., Cheung, S. Y., & Varaiya, P. (2004, September). Sensor networks for monitoring traffic. In Allerton conference on communication, control and computing (pp. 32-40).
[8] Trenggono, E. P., Sukmaaji, A., & Taufiq, V. M. (2012). Rancang Bangun Sistem Informasi Kontrol Kondisi Lalu Lintas Dengan Kamera Pemantau Cctv Berbasis Gis. Jurnal JSIKA, 1(1).
[9] Prof.R.U.Yawle, Kiran.K.Modak, Parmeshwar.S.Shivshette, Shehal.S.Vhaval. 2016. Smart Traffic Control System
[10] Xiao, L., & Wang, Z. (2011). Internet of things: A new application for intelligent traffic monitoring system. Journal of networks, 6(6), 887.
[11] Bhowmik, S., & Halder, A. (2016). A Review on Automatic Traffic Monitoring System.
[12] Lende, N., & Paygude, S. S. (2014). Survey on Traffic Monitoring System using Image Processing. International Journal of Advanced Research in Computer Engineering & Technology (IJARCET), 3(12).
[13] Soegoto, E. S., & Chandra, C. (2018, August). Building Concept of High School Information Technology Based. In IOP Conference Series: Materials Science and Engineering (Vol. 407, No. 1, p. 012022). IOP Publishing.