CASE STUDY: ROAD RISK PERCEPTION BEFORE AND AFTER IOT INTEGRATION

WILLIAM DAVE AGRAVANTE

College of Engineering and Information Technology

Department of Information Technology

Cavite State University Don Severino delas Alas Campus, Indang Cavite, Philippines

Abstract: The internet of things, or IoT, is a network of connected computing devices, mechanical and digital machinery, items, animals, or people that may exchange data across a network without requiring human-to-human or human-to-computer interaction. The main goal of the IOT is to provide information to people in which can be used to ease and improve life

Road safety is already being improved by IoT in areas like vehicle maintenance, better traffic flow, navigation, and environmental or road condition monitoring. The majority of the data used by IoT is obtained through connected vehicles. These contain a huge number of sensors that connect to the cloud, other vehicles, and equipment to establish communication. As a result, it offers data and information that are very helpful for enhancing road safety.

Keywords: *IoT, GPS, Artificial Intelligence, Telematics, Data, Sensors, Position, Communication*

I. INTRODUCTION

As of the present times, Internet of things (IOT) had become part of our daily life. From checking the current weather, news, health monitoring, foods, entertainment, etc. Most of the IOT devices were used in society which collects all possible data from daily life that will eventually use for producing improvements. Before when IOT hasn't been developed yet, sharing and receiving information and data from other people is hard.

The example of this is tracking the weather. Before, we use traditional way of gathering information about the weather by analyzing the wind, the clouds movement, and more. Through this, somehow, we didn't receive the exact or accurate information we need which results to wasting of time. Another example is the use of dash cam in which it records anything while driving on the road. This results to accurate information whenever there are accidents happens. It also became the source of evidence for proving which has fault.

If you are involved in or witness a car accident, having a dash cam in your vehicle means you will have supported documentation at your disposal.

Dash camera footage is now accepted as evidence by most UK authorities. By reporting careless and risky drivers, they can be used to stop accidents from happening in the future. Drunk driving, road rage, and other dangerous driving behaviors are all too common. However, before the worst-case scenario occurs, a dashboard camera can assist law enforcement in punishing violators.

Additionally, connectivity enables real-time flow velocity monitoring so that speed limit warnings can be displayed on a driver's car screen. They also caution the pilot

to avoid breaking the law by not parking in restricted places or engaging in other illegal activities.

Geolocation is one or more of the essential pieces of information needed to ensure linked cars are safe on the road. It enables communication between linked cars so that collisions can be avoided, such as when performing emergency braking maneuvers, depending on the speed and positioning of each vehicle. The geolocation also offers a continuous updating of traffic conditions, allowing for the sending of alerts regarding traffic accidents and the suggestion of the fastest route.

II. LITERATURE REVIEW

Dashboard-mounted cameras, sometimes known as "Dash Cams," are digital video recorders (DVRs) that can be mounted using a suction cup on the dashboard or the windscreen and constantly record the image through the windscreen glass such video recordings have improved the safety of officers working in outlying areas ever since they were first used in Texas in the 1980s . Dash Cams became available to other drivers as the technology got more affordable, and the number of vehicles with dash cams mounted rose quickly. A second camera is included in some contemporary devices known as "Dual Dash Cams" to film the interior and/or back of the vehicle.

Dash cameras capture film of the road in front of (and occasionally behind) the vehicle so that the driver will have evidence in the event of an accident. Police or insurance companies may utilize the footage to assign responsibility in cases of reckless driving or traffic accidents. The dash cam commonly stores recordings on a micro-SD card. Some dash cams feature a screen where you can watch the recorded video, but the great majority have a smartphone app that wirelessly links to the dash cam so you can view the video on your phone.

Other than dashcams, there are different IOT devices to reduce fatal accidents and casualties. M2M communication between machines is essential to the Internet of Things (IoT). The cloud's ability to feed, sift, analyze, and disseminate the information it obtains in a meaningful way and in real-time, however, is where the actual intelligence rests. The IoT is supported by sensors and the cloud. Despite this, IoT is a valuable ally for businesses managing their fleets because it may improve traffic safety. It is a helpful tool for transportation, circulation, navigation, and for providing weather and traffic information. IoT gathers its data from connected vehicles, which are equipped with several sensors and can interface with other vehicles, gadgets, and the cloud to provide data and information that is very useful for enhancing road security.

Connected cars have various benefits such as:

- Vehicle performance and maintenance monitoring help in evaluating the quality of the vehicle and need for maintenance of the vehicle. This way, pollution caused by these vehicles can be reduced, and the health of the vehicle stays closely monitored.

- Improved control and safety can be achieved through IoT-enabled cars. In case of over-speeding, the notification gets displayed on the car's windscreen alerting the driver.

- Ensuring safe driving experience with real-time assistance, navigation, and even monitoring driving patterns and any emergency. Additionally, along with the state of the traffic, IoT drivers can receive updated information on the state of the roads, i.e., potholes, ice, grade changes, black spots, etc.

Telematics is used by several transportation organizations and fleet management businesses to comprehend, control, and enhance driver behavior. In telematics, a "black box" is used in a vehicle that uses GPS. The concept is to measure cornering, braking, acceleration, and speed via the mobile phone network. The analysis of this data on servers allows for the provision of driver feedback. This promotes safer driving habits and increased supervision.

In case of emergency, connected cars send automatic messages and warnings to emergency services, assisting in providing rapid attention to reduce accident-related death rates. Raksha SafeDrive is a dedicated Internet of Things (IoT) device that is kept inside the car as an accident management system. Mr. Prasad Pillai created the device with an aim to reduce the time in which help reaches road accident victims or those stuck in some road emergency. Raksha SafeDrive can be used in all kinds of vehicles, like cars, auto-rickshaws, bikes, trucks, etc.

III. SUMMARY

Internet of things (IoT) had become part of our daily life. From checking the current weather, news, health monitoring, foods, entertainment, etc. Most of the IoT devices were used in society which collects all possible data from daily life that will eventually use for producing improvements. Before when IoT hasn't been developed yet, sharing and receiving information and data from other people is hard. The main goal of the IoT is to provide information to people in which can be used to ease and improve life

In areas like vehicle maintenance, improved traffic flow, navigation, and environmental or road condition monitoring, IoT has already enhanced road safety. Connected vehicles provide the vast majority of the data that the Internet of Things uses. They are jam-packed with sensors, and they communicate with the equipment, other trucks, and the cloud. As a result, it provides information and data that are very beneficial for raising road safety.

IV. REFERENCES

[1] Saxena, p. (2021, March). Role of IoT in road safety and traffic management. India Ai. Retrieved September 30, 2022, from https://indiaai.gov.in/article/role-of-iot-in-road-safety-and-traffic-management

[2] How can the Internet of Things improve road safety? (2021, February 15). FrotCom. https://www.frotcom.com/blog/2021/02/how-can-internet-things-improve-road-safety

[3] Baños, B. S. (2020, September 21). Road safety and IoT. Telefonica. Retrieved September 30, 2022, from https://business.blogthinkbig.com/road-safety-and-iot/

[4] Ranger, S. (2020, February 3). What is the IoT? Everything you need to know about the Internet of Things right now. ZDNET. Retrieved September 30, 2022, from https://www.zdnet.com/article/what-is-the-internet-of-things-everything-you-need-to-know-about-the-iot-right-now/

[5] What Is the Internet of Things? How Does IoT Work? (n.d.). Built In. Retrieved September 30, 2022, from https://builtin.com/internet-things

[6] msblog@admin. (2020, October 22). Advantages And Disadvantages Of A Dash Cam. Moneyshake Blog. Retrieved September 30, 2022, from

https://www.moneyshake.com/shaking-news/miscellaneous/advantages-and-disadvantages-of-a-dash-cam-moneyshake

[7] Pratt, M. (2021, December 21). How secure is the data on your dash cam? Which? Retrieved September 30, 2022, from https://www.which.co.uk/news/article/how-secure-is-the-data-on-your-dash-cam-aNTWo6A85oSp