Asian Journal of Research in Social Sciences and Humanities

Asian Research consortium
www.aijsh.com

ISSN: 2249-7315
Vol. 11, Issue 10, October 2021
SJIF –Impact Factor = 8.037 (2021)
DOI: 10.5958/2249-7315.2021.00108.8

A REVIEW ON SMART PUBLIC TRANSPORT SYSTEM BASED ON IOT

Dr. Priyank Singhal*

*Faculty of Engineering, Teerthanker Mahaveer University,
Moradabad, Uttar Pradesh, INDIA
Email id: priyanksinghal1@gmail.com

ABSTRACT

Intelligent Transportation Systems (ITS) includes a subsystem called Smart Public Transportation (SPT) (ITS). It has the ability to intelligently manage public transportation systems in order to maintain their operation and to provide customers with information about excursions and system operating conditions (travelers and leaders). Rapid advancements in equipment, programming, and communication technologies have aided the development of Internet-connected gadgets that provide perceptions and data collecting from the current world. This article examines the survey approach for IoT-based smart public transportation and different methods for intelligent transportation systems. The findings of this study show that while IoT has prioritized safety in preventing road accidents, it has yet to be addressed how an intelligent vehicle system can be implemented by integrating bus work schedules, bus presence detection, and passenger disbursement efficiency through a booking seat process to minimize congestion as well as passenger waiting time. This study proposes breakthroughs that combine the Internet concept with the integration of systems of industrial actors required in order to harness the energy of IoT for various conveniences, particularly in the field of public transportation, as well as produce an intelligent transportation system, and is one of the smart urban concept indicators. The purpose of this article is to look at various ITS designs and models, as well as survey them to learn more about their architecture. It will reveal knowledge gaps that may be investigated further. The article includes studies into a variety of frameworks, as well as potential extensions in the area to make it simpler to use.

KEYWORDS: *Public Transport, GPS, Android, Web Server, ITS, Network, ICT, RFID, Intelligent System*

1. INTRODUCTION

Travelers utilize public transit to go about on a regular basis. Passengers use this area to share the network. Other advantages of this scheme include less road-driving private cars and reduced fuel usage. As a result, emissions are reduced and the environment is protected. It is mostly for financial reasons. In large cities, it is a readily accessible and necessary method of transportation. Wireless Sensor Networks have become the critical hotspot for IoT development since they have advanced faster and more capably in logical terms. They find applications in a variety of areas, including intelligent matrix, intelligently transportation network, smart homes, intelligent emergency clinics, and so on[1].

As our Indian Prime Minister said, achieving the aforementioned resulted in spectacular city development. Establishment WSNs were used to build up the potential of the Internet of Things (IoT). Kevin Ashton developed the articulation web of things, which depicts clearly discernible objects and associated PC-generated displays in a "web-like" layout. These objects may range from massive advancements, such as airplanes, cars, and motors, to humans, animals, and plants, as well as their unexpected bodily parts. WSNs will see significant advances if they are integrated with IoT.

The goal of this article is to create a smart car network. Future highways should be able to direct traffic congestion much more effectively than current designs. It was envisioned that the new traffic framework would enable cars to communicate with one another without the need for human intervention in order to manage traffic in 20 to 30 years. As a result, traveling may become less debilitating and more pleasurable. Sensors will be installed in cars, and these vehicles will be used on highways[2]. This will monitor traffic and transmit data to a "focal traffic signal network," a central location where data is processed before being resent to and from cars. For example, if there is a massive congestion, the central traffic signal system will be notified through Wi-Fi, and it will respond by imposing speed limits that the cars will accept in the area where the jam has occurred. Because a significant amount of money is spent on streets gridlocks on a regular basis, it has been decided that the money spent will be utilized by providing intelligent vehicle frameworks. The direction of the halting is one of the additional advantages[3].

Rather of driving the whole region looking for a parking spot, vehicles will be notified through Wi-Fi of empty spots near their ebb and flow area. Furthermore, the drivers will be given the shortest possible route to the target location, with the aim of directing carbon dioxide outflows. This framework may also warn drivers about nearby schools where there may be a large number of students out and about, as well as suggest the optional course. As a consequence, telecommunications join Wi-Fi in this innovation, resulting in improved results for consumers and purchasers at their workplaces and elsewhere. The establishment of a smart assistance network for public transportation. City Bus is the predominant mode of public transit. Government transportation issues are being examined and evaluated. Bus arrival time expectations, bus number accessibility, accident reporting as well as prevention, driver alcohol detecting, or bus responsiveness to passengers are all available as web/non-internet options. The fundamental technique makes use of GPS/GSM. The PIR sensors will be used to count persons entering and exiting the bus at the front and rear doors[4].

Actually, the MQ3 liquor identification sensor is used to calculate the driver's alcohol level; if alcohol is detected, transportation will be halted, and a message will be sent from PMT through the GSM network requesting a driver replacement. At this point, an accelerometer is used to detect episodes, and a message is sent to PMT, the assigned clinic, and the registered police central command, allowing them to provide appropriate assistance to passengers in the event of an accident. A notification will be sent from the enrolled police central command at the location where the switch is pressed, including the vehicle details and the location of the incident[5], [6].

It is made up of microcontrollers as well as sensors. Furthermore, the ease with which these solutions are implemented is often at odds with the complexity of integrating the many components into a single physical system. Electrical noise, repair, maintenance, and other factors all affect hardware-dependent techniques. The author demonstrated a novel Android or Internet of Things method for delivering complicated bus tracking numbers to both bus stops and passengers. We propose an architecture that is divided into three distinct sections[7].

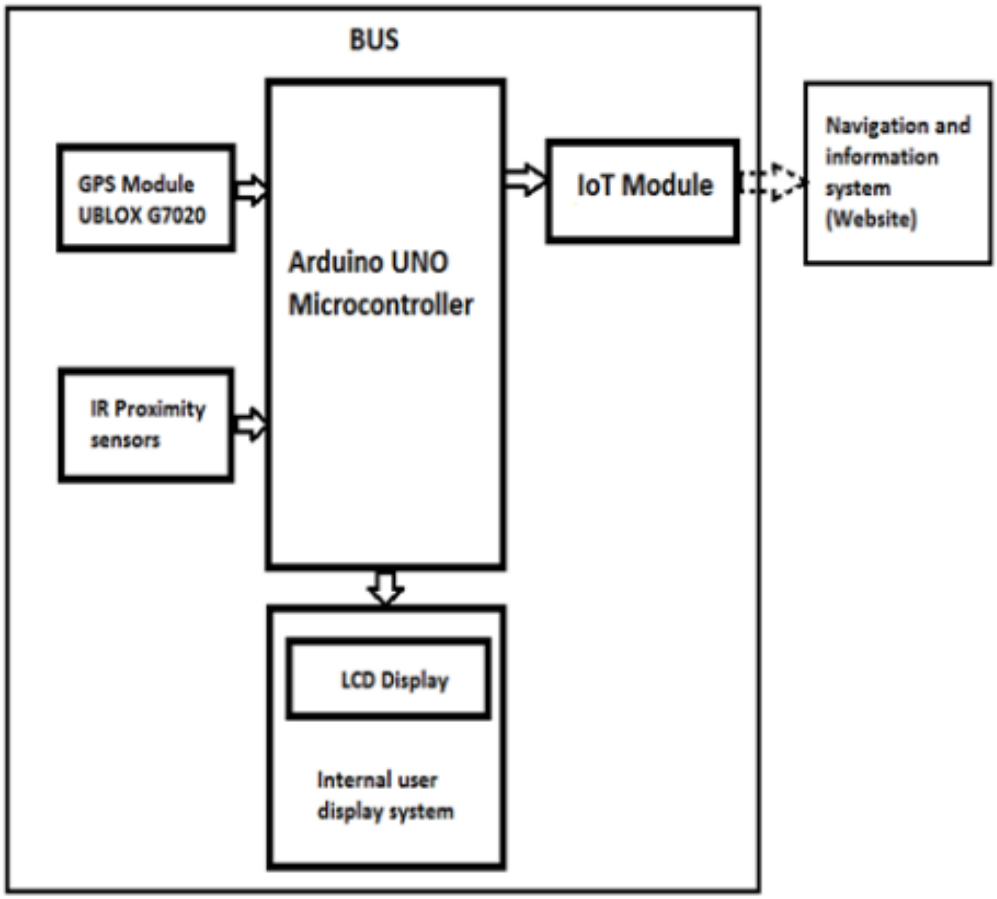

Figure 1: illustrate the Block diagram of IOT

The on-board module, which consists of a transport-ready Android smartphone, was used to track the transit area using the phone's implicit GPS. The gathered location data is subsequently sent to a worker through the phone's 3G network. A worker module in the backend collects consistent data from the on-board device. The information gathered will be used to compile significant data, which will then be used to answer various queries. The client module consists of an Android application as well as an SMS-based software that employees may use to track the transport's progress while also planning their trips ahead of time. Aside from that, the author proposes the installation of static QR codes at each transportation station. Arcades seem to be a useful tool for informing passengers about the many modes of transportation available at the bus station. In a theoretical way, Figure 1 depicts the whole square chart of the suggested design. It provides a better grasp of how the whole system works in general. We demonstrate an incredibly simple implementation of the suggested strategy using Android OS. We tested the Android Studio form on an Android phone with at least API 15 capability (Ice-cream Sandwich). The application would operate on approximately 90.45% of the dynamic gadgets in the Google Play Store if it focused on API 15 and above. As the Web Server, we used My Admin's PHP version 4.0.10[8].

That means that things can be both living and non-living, such as individuals, creatures (dairy cattle, calf, pooch, and pigeons, rabbits, etc.), plants (mango tree, jasmine, banyan, and so on), and home machines or industry mechanical assembly (seat, ice chest, tube light, blind, plate, and so on). As a result, things in our real or material world are now actual questions. Figure 2 shows how IoT may be used in a variety of ways[9], [10].

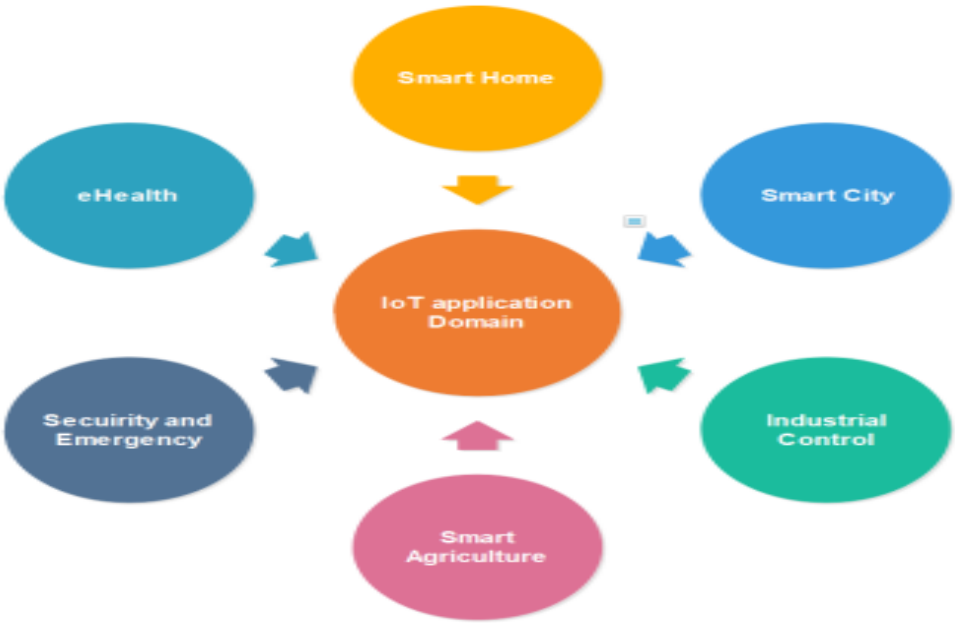

Figure 2: Illustrate the different IoTof applications Domain.

1.1.Agents of the Internet of Things (IoT)

- Traffic Mobile Agent: Sends/receives various types of data to/from various devices via the Internet; deciphers data from various objects (RFID, sensors, clients), and provides a unified view of the situation; communicates with various experts in the system to complete a specific task. All communications provided by this expert will be sent to the traffic administration framework, which will be used to debate the proposed use of the traffic administration framework with a static operator.
- User-Agent: provides customers with up-to-date information about the substances that reside inside the framework. The client expert is a fixed operator who works with the customer. It is necessary to make use of adaptable operators.
- Monitor Agent: scans the system for potential situations and initiates a series of actions to react to the perusing events for the purpose of a well-timed traffic protest, such as in a crisis.
- RFID Agent: responsible for reading or creating RFID labels. This expert executes appropriate actions in managing a single undertaking for the benefit of a shrewd inquiry of the associated RFID and to move to different stages at runtime when reading a tag, as indicated by the information recovered from it.
- Sensor Agent: collects, organizes, and saves information gathered from the associated sensor (or send it someplace).
- Traffic Light Agent: identifies unexpectedly high traffic levels and quickly improves traffic control directions.
- Camera Agent: is in charge of photograph collecting. The system layer directs all communications between the camera agent and the video Web server. Camera agents may take use of the existing structure of camera-based activity monitoring frameworks that are already available in a number of cities.

2. DISCUSSION

This study examines a variety of smart public transport options. The lack of an interconnected solution in the platform is a drawback of prior study. Public transit monitoring systems have been developed and recommended in all studies. Their study objectives and emphasis are limited to the safety of using public transportation. The future of this study will

be expanded by adding other features, such as a bench locking system, which would require passengers to first registered or pay online, and then scan the obtained code while making a transaction using RFID technology while on the bus. The model to be created is platform integration using IoT technology, which will allow passengers to search through public transportation schedules, choose a route, select a bus, and select a destination. A bench or other location that is still available until the payment procedure is completed prior to boarding the bus. Passengers will be more comfortable and have less time to wait. Passengers may wait for the bus using the predicted arrival time. IoT technology, RFID, bus presence detection, bus schedule monitoring, and seat booking with online payment will be combined in future study. Future possibilities might include combining location data with expected routes to create a complete adventure map guide that uses IoT to direct cars around potential bottlenecks. This innovation may substantially reduce blockage, resulting in monetary and environmental benefits. Applications for the Internet of Things are critical in this environment. Mechanizing transportation modes under certain circumstances, such as highways and metropolitan areas, may be beneficial. In densely populated metropolitan areas, these processes may eventually become fully automated. Nonetheless, the product anticipated to resolve the challenges of comprehensive mechanization for a large number of cars is very complex.

3. CONCLUSION

This study examines a variety of smart public transportation options. The lack of an interconnected solution in the platform is a drawback of prior study. Public transportation surveillance systems have been developed and recommended in all studies. Their study objectives and emphasis are limited to the safety of using public transportation. The future of this study will be expanded by adding other features, including a bench locking system, which would require passengers to the first register as well as pay online, and then scan the obtained code while making payment using RFID technology while on the bus. The model to be created is platform integration using IoT technology, which will allow passengers could search for public transit schedules, choose a route, select a bus, and select a destination. This article provided a strong Intelligent Public Transportation Management System engineering that continuously analyzes all transport locations and forecasts the arrival season of the next transport at the transport terminus. If the transport makes a request to the server, the computations are updated on a regular basis. It sends this information to passengers who make on-demand requests through a mobile application or SMS. The traffic problems can be addressed since a growing number of people are relying on successful and reasonable public transit as a method of mobility. With the data-on-request administration, suburbanites may plan their trip ahead of time, saving time and making the person more lucrative. The transport display module, which will offer nuances of the route at regular stretches, also addresses the disruption of the next arriving transport terminal. Furthermore, this software is very useful for passengers, drivers, but even transportation network administrators.

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