

Smart Bus Automation using Cloud Sensing Technology

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Article Info

Volume 83

Page Number: 4347-4350

Publication Issue:

May - June 2020

Abstract

The goal of this paper is to issue tickets using Android device and a wise token for the public transit program. Typically each Bus includes a driver who is going to collect money and give tickets to each passenger. It will still take a lot of your time as manual error formation. A brand new framework is proposed to beat this issue. The IR sensor is used during this experimental program to count the amount of passengers entering the bus. Positive authentication worked here is a rechargeable RFID. It includes database name, mobile phone, and password. Inside the RFID Tag, the RFID user must interpret the information. A notification is sent smartphone to the parties concerned. The consumer will sign in to the destination. The resulting sum of the correct detection is removed. A message is sent to the checker within the nearby station via GSM in case of any accidents or misuses. The condition is being observed using GPS.

Article History

Article Received: 19 November 2019

Revised: 27 January 2020

Accepted: 24 February 2020

Publication: 12 May 2020

Keywords: Android mobile, IR Sensor, RFID, RFID reader, GPS.

1. Introduction

India is that the second largest country in population with 1.2 billion folks. Both emerging countries face several challenges, such as carbon degradation, sound, road deaths and injury, traffic jams, and efficiency issues. Severe among them is transportation facility. Developing economies share several elements which lead to the nature of their transportation problems. Total development and rising urbanisation provide a junction rectifier to a specific zoom of big towns that are helpless due to the rapid leap in demand for transportation. By contrast, the delivery of public networks and facilities have underperformed so greatly behind request. Consequently, financial sector budgets, in particular, are limited through the deplorable inadequacy of support for infrastructure upgrades. Most transportation services utilise their design flexibility too far on the other side. Rapid prosperity, low wages and severe inequality are some of the key fundamental triggers of developed countries transport problems. While the essence and scale of transportation problems are distinctly different from one nation to another, Just about all developed countries are struggling as a result:

- Unscheduled, chaotic growth on the outskirts of the residential area despite lacking sufficient public utilities, transit or complementary facilities.
- Small road network, usually thin, badly managed, and chalky-topped.
- Highly full routes with related inconsistent combination of through trimotored and un-motorised vehicles driving at dramatically different rates.
- Possession and usage of personal vehicles and motorcycles increasingly growing.
- Unsatisfactory bus and non-motorised road facilities.
- Control and administration are rudimentary or non-existent, usually with lacking having the most simple arrangement of streets.
- Traffic fatalities which are extremely high and rapidly rising, particularly between commuters and bikers.
- The transport is overpopulated, cramped, inflexible, sluggish, disorganised, unreliable and risky.
- Exceptionally high rates of travel-related waste, sound & alternative impacts on the atmosphere, particularly throughout huge cities.

The main resolution for the transportation downside in cities with massive populations is popularising, change and modernising with technologies. Although the event within the transport sector is kind of sensible, it experiences several hurdles within the path of progress.

2. Related Work

According to the Auto-ID quoted from **Xian**, to gain intelligent identification and network control, the Network RFID (Radio Frequency Identification). The Auto- laboratory at MIT (Massachusetts Institute of Technology) first suggested this in 1999. Our primary Wireless Service Software. Sensor networks use equipment for radio frequency identification [1].

Smart transportation is one aspect which is an essential part of an intelligent community, as per Mazhar. Some views suggest sufficient knowledge regarding traffic in cars is among the most relevant tools for sustainable cities[2].

John Puchera, Nisha Korattyswaropama, Neha Mittala, NeenuIttyerah[3] wrote an article about Urban transport crisis in India, which outlines important developments in India's transportation infrastructure and traveling behaviour, analyses the magnitude and sources of its most critical issues, and proposes nine changes in policy that will help alleviate India's public transportation crisis.

S. P. Manikandan, P. Balakrishnan[4] presented, The actual-time transportation service application program utilising Zigbee and RFID is ideal for customer demand and provides significant-time information such as bus -region as well as number of individuals within the bus. This network offers both effective and minimal-cost transportation program.

G. Raja, G. V. Karthik[5], Implemented sys-tem for monitoring the bus position to facilitate passenger traffic. Wireless connectivity systems such as GSM and GPS are being used to transmit details on both the amount of seats free throughout the bus to bus station and actual bus position, respectively, on the route.

Actual-time commuter software system utilises a range of technology to map bus position in significant-time and produce bus arrival forecast at stops across the roads.

3. Objectives

The main aim of the project is to adopt the modern existing communication and networking technologies to develop smart Public Transport System (PTS). It includes

- To learn the details of above devices and IoT services.
- Smart card for each passenger for fare collection, passenger information and seat availability.
- IoT languages like java, Embedded C for implementation.

4. Problem Statement

Due to its commitment to national and state financial, manufacturing, political, and social development, transport in developing nations are of nice significance. Transport managers in developing nations encounter a range of challenges needing creative solutions. Wide would grow urban density and emissions has severely jeopardised current transport networks and created the question of creating potential transport networks. Insufficient transport services hinder the socio-economic growth process in a world that is exceptionally so. Especially for an over- inhabited country like Bharat, it can be a tough job to handle entirely different facets of transport. Public transit bus administration is the big drawback today. There is no program sponsored by the new government that offers details about the buses (waiting and delivery time), the number of passengers within the bus. Conductors face issues in collection fares yet as info regarding seating accessibility. different issues associated with the bus transportation within the existing sys-tem area unit waiting amount, no real time bus schedule info, fixity, transport inadequacy, centralised bus dispatch and dominant, bus bunching, fare assortment, seating info and bus buffer space info within the bus stand.

5. Methodology

The planned sensible Bus System (SBS) with its elements and necessary offered services are concisely portrayed in Fig 1. sensible Bus System can encompass 3 basic elements specifically sensible Bus stand, sensible Buses and Interactive Citizen Interface (Web portal based mostly and sensible phone App based). Through of these components must be linked to a high-information calculation net connection through broadband-optic. Again each of the primary 2 components will contain many counts of wireless and integrated heterogeneous sensors. Using Wi- Fi hubs, these system networks can be linked to the infrastructure of the city by bus stations, depots and taxis. That feature may include smart autonomous devices connected up to or installed in the network that can feel the user's desires and travel along them, sharing data with each other in addition because decisions are made with no human interference.

Smart Bus services are responsive bus network non-stationary components. Modern buses became born-again with the introduction of sophisticated sensors and IoT apps into sensible buses. Responsive buses should be powered by batteries, so named the greener environment e- bus of negligible greenhouse gas emissions. Both buses should have multinational Positioning Units hooked up to it, and the positioning is real-time caterpillar-tracked. Delicate bus may even provide Wi-Fi hub at the commuters to generate net properties for the integrated sensors. Main entrance can contain open-end credit based mostly identification module. Exclusive sensible cards provided for the aim of motion at intervals town by

transport authorities. Just in case of open-end credit, which can have price recharge facility is wont to pay the fare, or it is motorcar subtracted from the registered bank ex-ploitation Aadhar variety. Full bus path will be shown on slightly activated monitor within the bus at every pause. After open-end payment authentication, passengers may have the power to decide on the location that breaches the bus stop or can get down where they need to by switching their open-end credit system to unlock the access lock. In each the cases carfare are going to be mechanically calculated and subtracted from either open-end credit or Aadhar-linked checking account. Just in case of minors, if they're in the middle of folks, their truthful is paid by the oldsters as through Aadhar information, members of the family is known. The transport system must have additional open-end compensation for college students until identification checking is carried out. Another non-bit show-only screen positioned just behind driving seat can also display the bus current location as the time taken to complete it. This would also have a public address device that in several languages will declare consecutive exits. Beside each chair, there will be Fast charging points. Further- more, drivers cabin will provide a show as live contact with management workplace anywhere passengers stay inside the vehicle. Driver receives regular notifications on traffic situation, fire warnings, variety of commuters advancing to get out at nearest station, and calculable variety of commuters waiting for that bus at next halt.

The IoT systems are linked to the city's cloud infrastructure via a broadband-optic network at a critical bus terminal. Wi-Fi hub and Fast charging services may also be required at the bus stand. This bus stop is steam operated by stars with side panels at the end. Public buses will halt all along the route at specific bus stands gift. A bus stand struggles on an completely different route. Totally separate display boards are put at excellent positions for each of the routes via a transfer. In a map with a whole route displayed in another colour, each of the show displays will view live responsive bus positioning. All buses on the road with their current positions are seen within the map. Like an additional function commuter Sat sensitive bus stand can read information of the dynamically spaced buses that will depart via sensitive bus stands. What proportion of seat is empty during an overt bus may even be enquired on-line. At these stops, responsive queue facilities are offered any-where, as long as the passenger reaches at the bus station, he can use the open-end credit or responsive Aadhar pass, NFC software to mark his existence on a device-based network anywhere he wants to select the location as a route if there are several routes linking these two bus shelters. For each route a mechanically sensible list is created. This list of waiting commuters should hit the drivers management screen, as well as in live time as a responsive bus depots control hub. With the most computers and ports with technical assistance, the central room can manage the full city bus services. Buffer room includes storage housing, related repair services in

conjugation with a body control system to track and handle feet. Smart bus warehouses for responsive buses should provide recharging services (refuelling). But typical timetable management can be paid heed by the automated controlled bus maintenance program. Just in case of any accident, fireplace or associate other mishap emergency services are mechanically alerted: close hospitals are informed; car services can get alert messages concerning an accident etc.

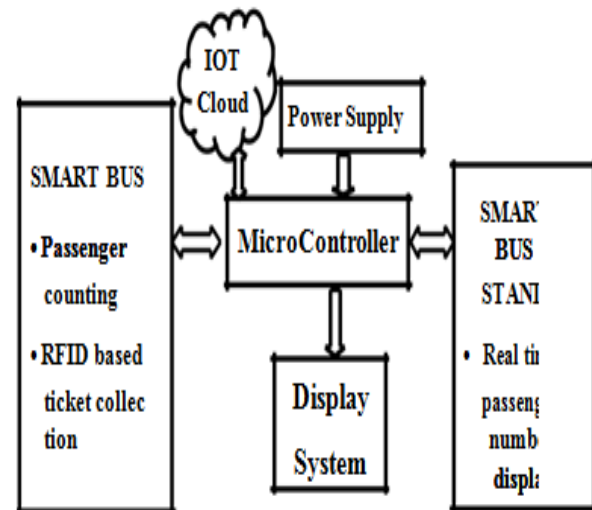


Figure 1: Conceptual System block diagram of IOT based smart bus system

6. Results and Discussions

The online watching of waiting traveler queue at to-tally different bus stops together with vacant seats within the on-road buses, this facilitate to utilise resources expeditiously. Bus capability usage is improved drastically.

One important facet of SBS is that it'll create whole method money free. All cash transactions are done on-line through bank. Thus it's way more clear and possibilities of corruption cut back considerably.

Throughout any emergency scenario good buses is sent to affected space or is exhausted quickly from central facility at bus stand by watching accessible best routes for them. If any accident happens to any good buses, management operator straight off gets update and additionally emergency services like hospital, police, fire brigade is alerted at the same time with precise location coordinates, range of affected passengers.

Good Bus Stops and good Buses have potential for providing advertisement house to industrial par-ties. furthermore public address systems also can be used for advertising in spare time (during gaps between 2 announcements). thus a locality of the upkeep value are recovered.

7. Conclusion

- In brief, this initiative intends to provide the passengers with an efficient and seamless ticketing interface and an coordinated system for seat placement.
- If introduced, it would offer riders a fresh ticketing interface and lead to a role of a cashless society.
- With increasing prevalence of phones and mobile payments, now might be the best time to adopt these technology and familiarise people with it and boost overall passenger facilities.

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