

SMART SEATING MANAGEMENT IN PUBLIC BUS TRANSPORTATION

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ABSTRACT

This paper targets the use of smart seating management in assisting the public using embedded systems and IOT. It explores the current ability and potential uses for this emerging technology. To overcome the drawbacks of currently available assistive devices, we propose a RFID technology with Amazon Web Page. Mainly here the RFID READER it reads the bus information (TAG) then process to the controller. When a person interfaces in Amazon Web Page or making use of switches then they will get intimation about buses along with its availability of seats.

Key Words: Embedded C, IoT, RFID, Application, Future Scope

1. INTRODUCTION

Out the 6.7 billion people that populate the world, large number of people struggle during travelling in public due to unavailability of seats during transport. Public Bus transport plays a predominant mode of urban transit. We present a new concept for providing information on current sitting capacity of a public bus with its current location through Amazon Web Page app in real-time. This concept uses embedded system and IOT in providing advance information through display board using RFID switches and embedded system. This enables commuters to shift from taking their own vehicles to taking public bus transport. There by, reducing pollution.

1.1 Sub Heading 1

Due to recent development of Smart-city on Digital-India project, we are urged to contribute a part of our generic cause to the country. Bus transport systems have evolved from single route to operations to large urban agglomerations. Bus transport must provide comfortable travelling, by improving seating capacity utilizations efficiently. There by, reducing socially stagnant atmosphere. Current system in buses provide information only about bus route and bus number. With rapid population growth, there is congested social-discomfort strain on public and transportation facilities.

Vehicle tracking systems have been available in the market but they are application specific and are not available in time deterministic manner. To improve the level of supervision and management for cargo transport vehicles, school buses, especially trucks carrying coal it is important to develop transport vehicles remote monitoring module. The development of vehicular design brings public many conveniences in life. The ability to track vehicles is useful in many applications including security and supervision of personal or public transportation vehicles others. The proposed system is able to obtain a vehicle's GPS coordinate and transmit it using the GSM modem to the server using GPRS connectivity. Due to use of GPRS it can give always on connection and in a low cost. VTS system is already exist in market so we are trying to replace the system with RTOS and as RTOS is useful for time deterministic behavior and multi-tasking so we introduce different sensors and send its data to server (as in existing system we just send location of vehicle) so it became the black box and as we are doing RTOS programming so the response of the system will be time predictable and and it performs multitasking.

The rapid development of cities and the increase in their population revealed the problem of transportation. The basic and solely solution for the transportation problem in the cities with big populations is popularizing the public transport systems. Although the public transport vehicles are used in the cities with big populations currently

and the efforts to broaden its scope are executed, the system still employs some handicaps. The complexity of public transportation system is the existence of more than one lines, more than one vehicles and routes causes we have difficulty in managing this system. The demand of the administrators who manage the public transportation system and the people who use this system for observing the system better, make their plans after examining the position and travel information of the vehicles and use the system more effectively is a clearly expected demand. The administrators of the big cities are seeking the ways of solutions for this problem. Using various methods of information and management and smart bus stations became a current issue and numerous applications were carried out.

In order to overcome these challenges, We propose an IOT based technology with Amazon Web Page. Mainly here the RFID READER it reads the bus information (TAGs) then process to the controller. This controller updates the Bus information to the database via GSM, and accessed through Amazon Web Page application. When a person wants to board a bus, information is available in the Amazon Web Page application.

2. BLOCK DIAGRAM

Renesas (RL78) is 16 bit architecture, it has 64 I/O pin (R5F100LE). It has 11 I/O ports, 64kB ROM, 4kB RAM, 1 watch dog timer, I2C protocol, 3 UART's, 10 bit ADC, 8 Timers, on chip debug function, high speed on-chip oscillator.

A liquid crystal display (LCD) is a flat panel display, electronic visual display, based on Liquid Crystal Technology liquid crystal display consists of an array of tiny segments (called pixels) that can be manipulated to present information. LCDs are used in a wide range of applications, including computer monitors, television, instrument panels, aircraft cockpit displays, signage, etc. They are common in consumer devices such as video players, gaming devices, clocks, watches, calculators, and telephones.

SIM900 is a Tri-band GSM/GPRS engine that works on frequencies EGSM 900 MHz, DCS 1800 MHz and PCS 1900 MHz. SIM900 features GPRS multi-slot class 10/ class 8 (optional) and supports the GPRS coding schemes CS-1, CS-2, CS-3 and CS-4.

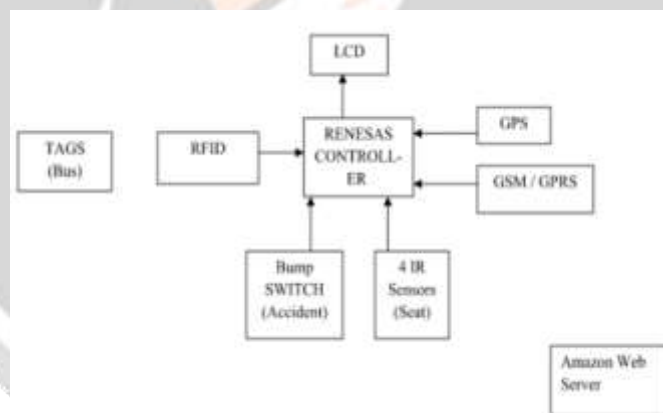


Fig -1: Name of the figure

AT Commands are used to get information in SIM card. The SIM interface supports the functionality of the GSM Phase 1 specification and also supports the functionality of the new GSM Phase 2+ specification for FAST 64 kbps SIM (intended for use with a SIM application Tool-kit). Both 1.8V and 3.0V SIM Cards are supported. The SIM interface is powered from an internal regulator in the module having nominal voltage 2.8V. All pins reset as outputs driving low.

RFID RADER: This one mainly used for to read the bus (tag) information then process to the controller, when it closer to READER.

TAG: Here Tag is nothing but Bus only (i.e. different tags having different information about buses).

GPS: It is mainly used to find out the locations by giving the values for latitude and longitude for respective location.

Bump Switch: It is used when any accident occurs. If accident occurs, emergency services will be sent to that location.

In an Amazon Web Page application an GUI is developed like when user logs to smart phone the menu will be provided, so we can easily access the bus related information through the application.

2.1 DEMO POINTS

Heart of the project is micro controller Renesas (R5F100LE), in this project each tag is nothing but different buses so it read by the RFID reader, then it process to the controller also it displaying on the respective on LCD. The whole controller unit is comes in bus unit only and Amazon Web Page unit is in public only.

The Amazon Web Page unit is having some interface in order to get information of bus location and seat vacancies. Afterwards they will get intimation about nearby buses with number of vacant seats. If the bus route changes other than the predefined area then it makes intimation to corresponding department through GSM and it also find out the location with the help of GPS.

3. SYSTEM REQUIREMENTS

We need Hardware and Software requirements for this project.

3.1 HARDWARE REQUIREMENTS

- Renesas Microcontroller
- ALCD
- RFID Reader, Tags
- IR sensors
- GSM
- GPRS
- Bump Switch
- 12V Adapter

3.2 SOFTWARE REQUIREMENTS

- Operating System : Windows 7 & above.
- Language : Embedded C, Android 4.0.
- IDE : Cube Suite+.
- Renesas Flash Programmer.
- Amazon Web Service.

4. ADVANTAGES

- Continuously instruct public.
- Good performance.
- People can access location and vacancy seat information in bus in real time.

5. APPLICATIONS

- Some part of the application can be used for tracking.
- In all transportations which has large seating capacity.

6. FUTURE SCOPE

For project demo concern, we have developed a prototype module. In future, this project can be taken to the product level. To make this project as user friendly and durable, we need to make it compact and cost effective. Going further, most of the units can be embedded along with the controller on a single board with change in technology. There by reducing the size of the system.

7. ACKNOWLEDGEMENT

The satisfaction and euphoria that accompany the successful completion of any task would be incomplete without the mention of people who made it possible .So I would like to acknowledge all those whose guidance and encouragement served as a beacon light and crowned the efforts with success. I would like to sincerely thank the project guide, Shruthi B S, Assistant Prof, Dept. of Information Science and Engineering, NIEIT for providing relevant information, valuable guidance and encouragement to complete this project.

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