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Bus Pass Management System

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Abstract: *The main objective of our project is to secure the use of bus pass in public transportation using RFID authentication. In olden days, conductor will be available in every public transportation and used to collect money for ticket and provide them printed tickets. This case is even followed in many developed cities too, in order to overcome the labour and securing ticketing system we had proposed "Bus Pass Management System Using RFID Card". In this model we will be placing RFID reader in public transportation while peoples get in and out of our system. With the help of this system, we will be capturing the RFID Card details and verify the validity of it by connecting the cloud server via GPRS System. If the RFID card is the valid one the person is allowed to get into the public transportation or else, they have to login to the ticketing portal and by the pass instantly. Admin will notify the incoming request and approve it after payment successful and if it is an old user their RFID card will be activated immediately or new user, they must get the RFID card from the depot*

Keywords: RFID card

I. INTRODUCTION

The emergence of the Internet of Things (IoT) has heralded a profound transformation across various industries, including transportation, by facilitating the seamless interconnection of devices and the exchange of data over networks. In the context of public transportation, the IoT-Based Bus Pass Management System emerges as a groundbreaking solution poised to revolutionize the antiquated mechanisms of bus pass issuance and validation. At the heart of this project lies the recognition of the myriad challenges that afflict traditional bus pass systems, ranging from cumbersome manual ticketing processes to the lack of real-time monitoring capabilities. By harnessing the power of IoT technologies, this innovative system aims to transcend these limitations, paving the way for a more efficient, secure, and passenger-centric bus pass management ecosystem.

The importance of addressing the challenges posed by existing bus pass management systems cannot be overstated. Inefficiencies inherent in manual ticketing processes often result in long queues, leading to passenger dissatisfaction and operational bottlenecks for transport authorities. Furthermore, the inability to track and manage bus pass usage in real-time hampers the ability to optimize resource allocation and address passenger demand dynamically. Moreover, the absence of a centralized system for monitoring bus pass validity and usage exacerbates administrative burdens and compromises security measures, leaving systems vulnerable to fraudulent activities. Recognizing these critical issues underscores the imperative for the development and implementation of innovative solutions such as the IoT-Based Bus Pass Management System to modernize and streamline bus pass management processes.

The purpose of this report is multifaceted: to articulate the significance of addressing the challenges faced by existing bus pass management systems, to elucidate the objectives and features of the IoT-Based Bus Pass Management System project, and to provide a comprehensive overview of the issues at hand. By delineating the key challenges inherent in traditional bus pass systems, including manual ticketing inefficiencies, real-time monitoring limitations, and security vulnerabilities, this report seeks to underscore the pressing need for transformative solutions. Moreover, by outlining the objectives, features, and benefits of the proposed IoT-based solution, this report aims to underscore the potential of innovative technologies to revolutionize public transportation infrastructure and enhance the overall passenger experience. In summary, the IoT-Based Bus Pass Management System represents a pivotal step forward in the evolution of public transportation, offering a holistic solution that addresses longstanding challenges while laying the groundwork for a more efficient, secure, and passenger-centric bus pass management ecosystem.

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At the heart of this project lies a recognition of the myriad challenges plaguing conventional bus pass management systems. From the inefficiencies of manual ticketing processes to the lack of real-time monitoring capabilities, these challenges have long hindered the efficiency and effectiveness of public transportation networks. By leveraging IoT technologies, the IoT-Based Bus Pass Management System aims to address these challenges head-on, ushering in a new era of efficiency, security, and convenience. Through automated issuance and validation processes, real-time monitoring capabilities, and seamless integration with mobile devices, this innovative solution promises to streamline bus pass management while enhancing the overall passenger experience.

The significance of this project cannot be overstated. By tackling the challenges inherent in traditional bus pass systems, the IoT-Based Bus Pass Management System has the potential to revolutionize public transportation infrastructure, driving improvements in efficiency, reliability, and passenger satisfaction. Moreover, by embracing emerging technologies such as RFID authentication and real-time data analytics, this project represents a glimpse into the future of smart, connected cities, where transportation networks seamlessly integrate with the digital world. In summary, the IoT-Based Bus Pass Management System stands as a testament to the transformative power of IoT technologies, offering a glimpse into a future where public transportation is not just efficient, but truly intelligent.

II. LITERATURE REVIEW

1) RFID BASED INDOOR LOCALIZATION SYSTEM TO ANALYZE VISITOR BEHAVIOR IN A MUSEUM

In this paper we demonstrate the possibility to use a mobile RFID reader to monitor the motion of visitors in a museum. The embedded system composed of an RFID reader, a 10-axis inertial management unit and a logger allows indoor localization based on the detection of multiple passive tags located at known geographical positions along the tour of the visitor. The design of the proposed RFID based system to localize persons in indoor environment is validated by simulations and practical measurements in a museum.

Reference Link: https://ieeexplore.ieee.org/document/9617265

2) SMART MEDICAL HEALTH CARD FOR HOSPITAL MANAGEMENT

The use of information technology has become a common place in healthcare. The increase in the number of patients in need of ongoing care is a responsibility for medical professionals. Today the patient monitoring system and wireless medical equipment are used to monitor patients, but nevertheless patients must stay inside the wireless coverage area. This real-time information presents an ongoing challenge to the emergency community. In these emergencies as unconscious and unaccompanied patients, giving emergency physicians or doctor an accurate and updated medical history of a patient can be the difference between his/her life and death [1]. In this smart health card project patient, we are tracking and monitoring of patient history. The system monitors patient's vital signs such as history, blood group, past medicine history bills. The patient data is stored in one RFID card. In this smart card project, we are using RFID technology. This RFID technology is currently very useful in health care system due to its increased performance, lower cost, high efficiency, and easy-to- use skills. Physicians can track all information about their patients using a dedicated system or model. Also, they can ask using an established web server. The integration of smart card system used in existing automation system should be important part of the hospital management as far as it benefits both the hospital management and patients.

Reference Link: https://ieeexplore.ieee.org/document/9909434

3) MINIATURIZED HF RFID ANTENNAS FOR CONTACTLESS PAYMENT DEVICES

Contactless payment systems are becoming an increasingly important part of our daily lives. With IoT applications, means of payment can have several physical representations. One of the most common is the bank card. This article presents a typology of antenna that can respond to several contactless payment device form factors (bank card, wearable, IoT device, etc.). the proposed miniaturized antenna allows, once assembled, to provide contact and contactless payment facilities without the addition of additional larger antennas which significantly reduces manufacturing costs. Modelling, integration, and validation in a normative context is presented.

Reference Link: https://ieeexplore.ieee.org/document/9740217

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4) SMART ACCESS CARD SYSTEM TO MITIGATE THE COVID-19 OUTBREAK

Diagnosing and controlling the spread of infectious diseases such as COVID-19 is crucial to managing epidemics. One common measure taken to reduce spreading is to detect infected individuals and trace their primary contacts to then isolate any individuals likely selectively to have been infected. The devices, called simply the "Smart Access Card System", aim to provide contact tracing, diagnosing early symptoms, and helping to maintain social distancing. It can continuously collect the location and contacts of their owners by using sensor tag and Internet of Things (IoT) technology. Proposed mobile gadget technology might be beneficial in any future diseases spread also.

Reference Link: https://ieeexplore.ieee.org/document/9357755

III. METHODOLOGY AND IMPLEMENTATION

3.1 EXISTING SYSTEM

In olden days, conductor will be available in every public transportation and used to collect money for ticket and provide them printed tickets. This case is even followed in many developed cities too, in order to overcome the labour and securing ticketing system we had proposed "Bus Pass Management System Using RFID Card". In this model we will be placing RFID reader in public transportation while peoples get in and out of our system. With the help of this system, we will be capturing the RFID Card details and verify the validity of it by connecting the cloud server via GPRS System.

3.2 PROPOSED SYSTEM

In this paper, we had proposed "Bus Pass Management System Using RFID Card". In this model we will be placing RFID reader in public transportation while peoples get in and out of our system. With the help of this system, we will be capturing the RFID Card details and verify the validity of it by connecting the cloud server via GPRS System. If the RFID card is the valid one the person is allowed to get into the public transportation or else, they have to login to the ticketing portal and by the pass instantly. Admin will notify the incoming request and approve it after payment successful and if it is an old user their RFID card will be activated immediately or new user, they must get the RFID card from the depot. The main objective of our project is to secure the use of bus pass in public transportation using RFID authentication.

3.3 ARCHITECTURE DIAGRAM

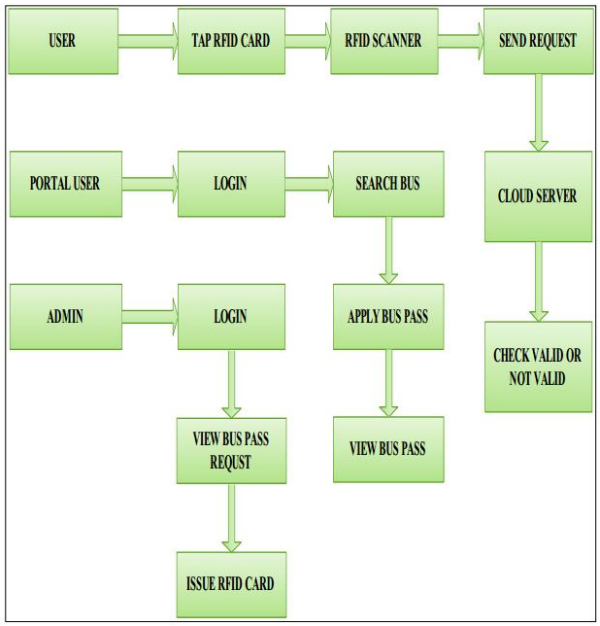

Fig 3.1: - Architecture diagram

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3.4 CLASS DIAGRAM

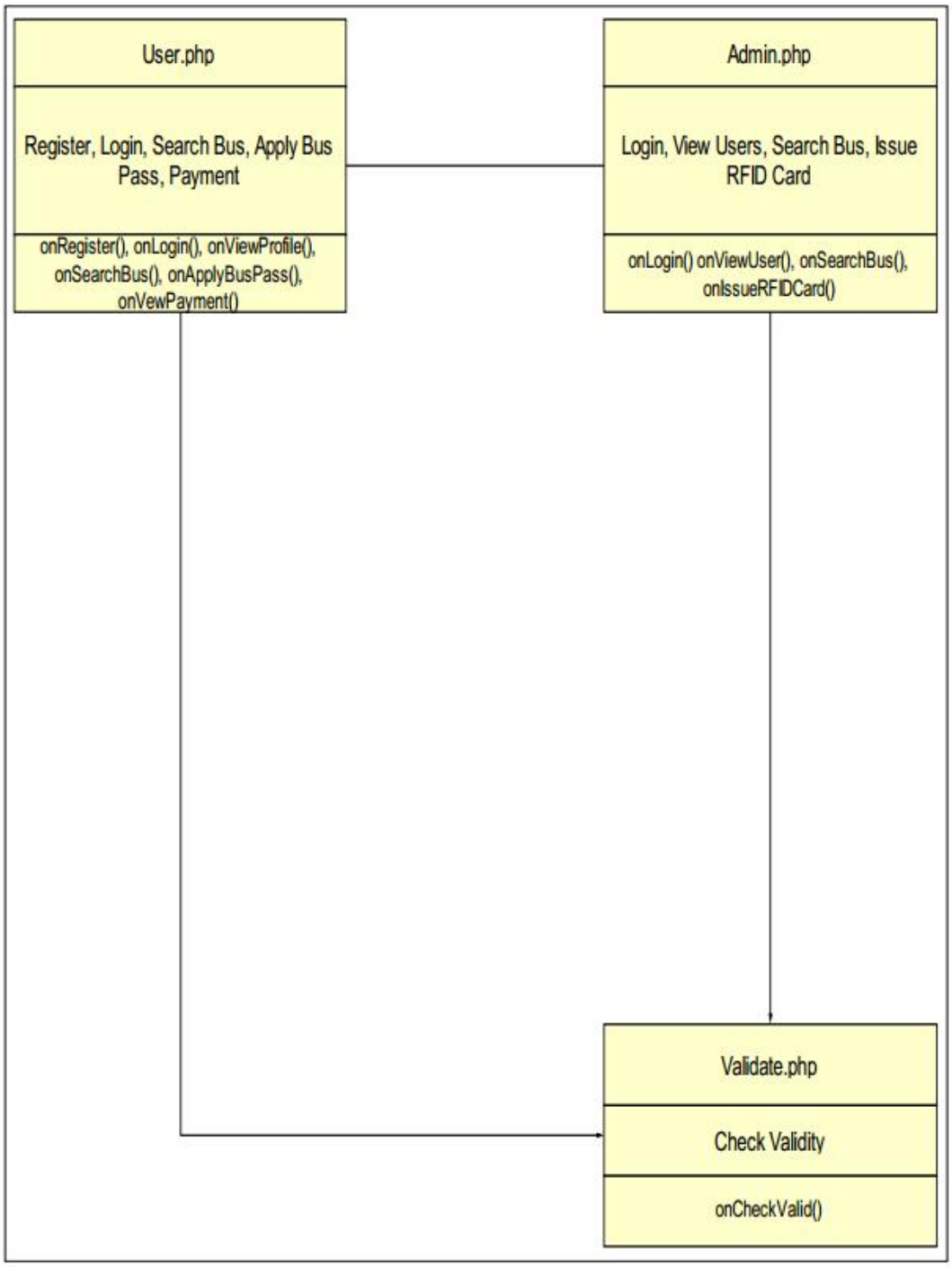

Fig No 3.2: - Class diagram

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3.5 ACTIVITY DIAGRAM

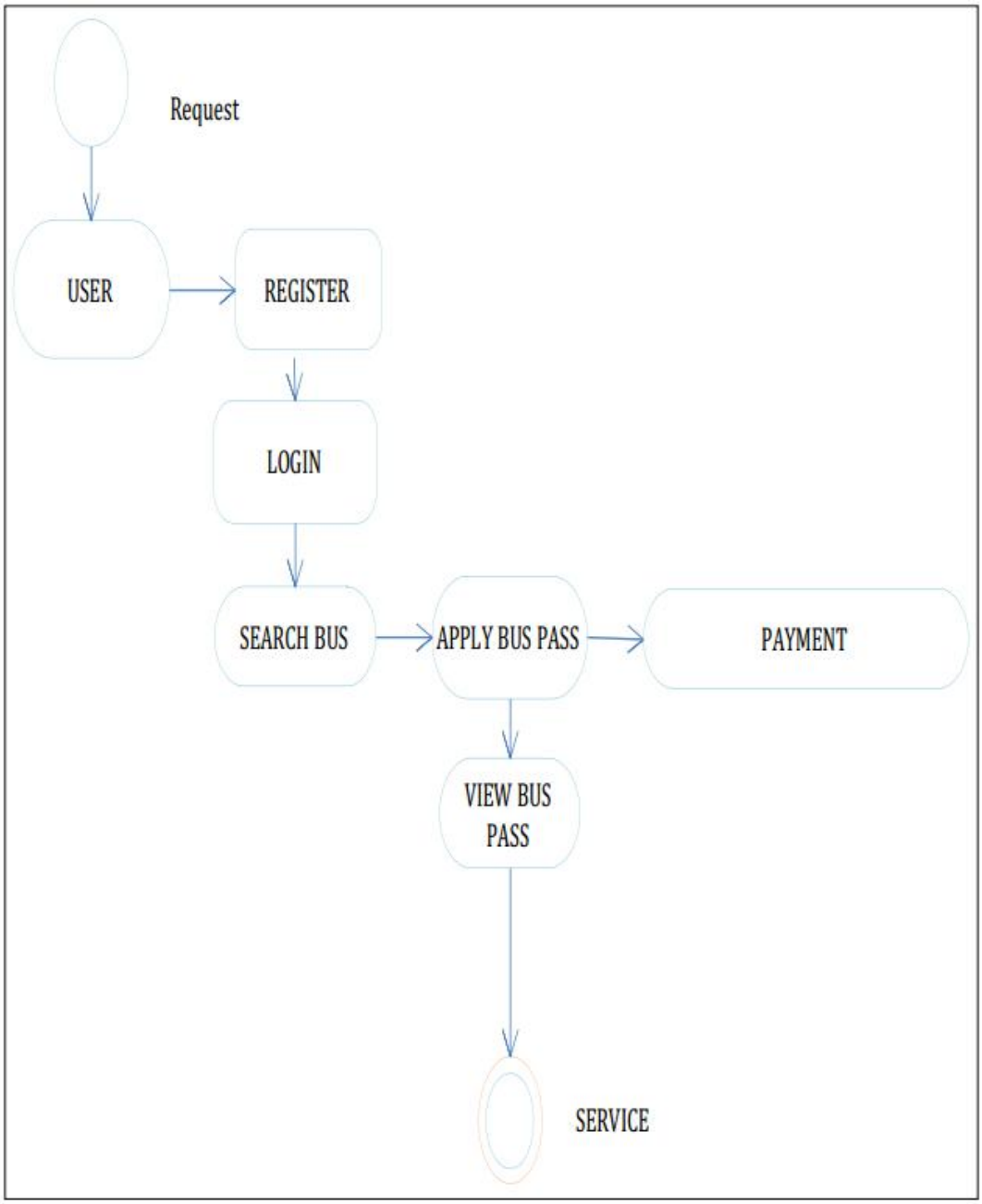

Fig No 3.3: - Class diagram

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3.6 USECASE DIAGRAM

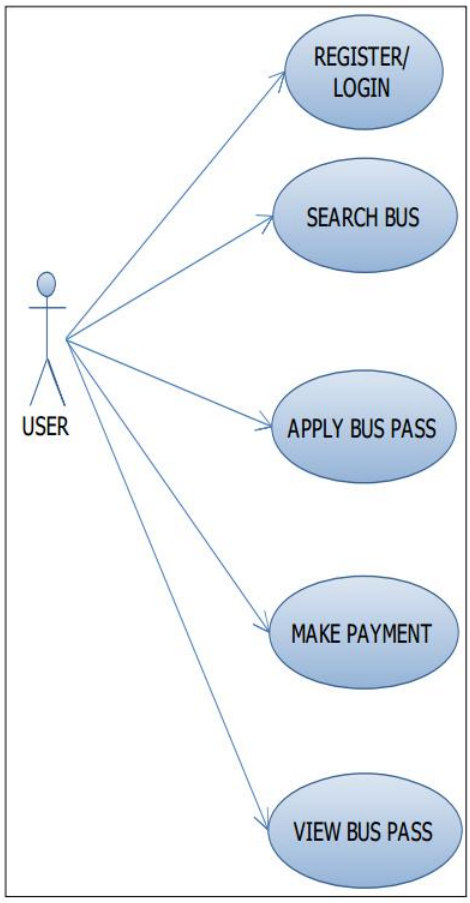

Fig No 3.4: - Use case diagram

3.7 COLLABORATION DIAGRAM

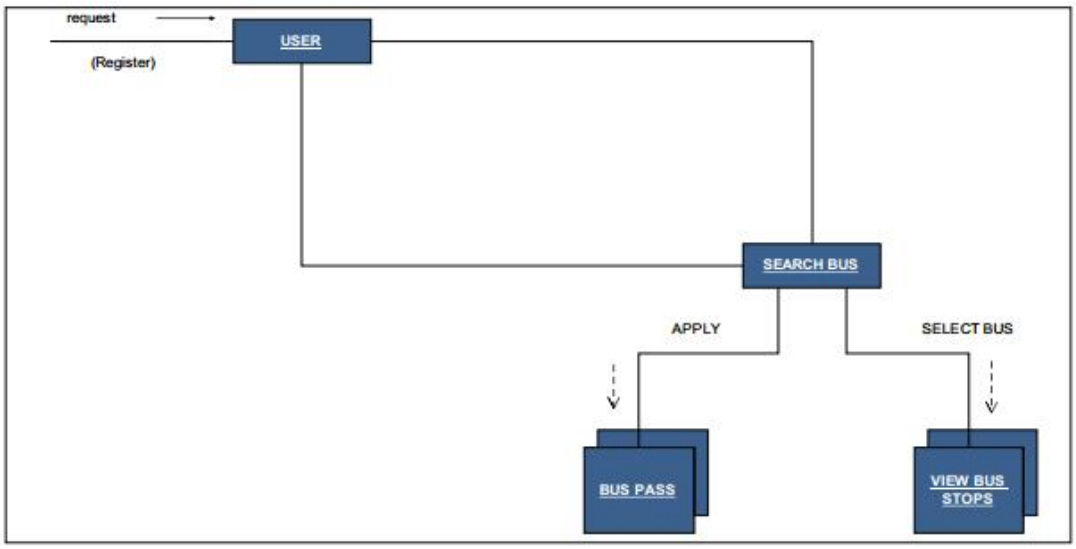

Fig No 3.5: - Collaboration diagram

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3.8 SEQUENCE DIAGRAM

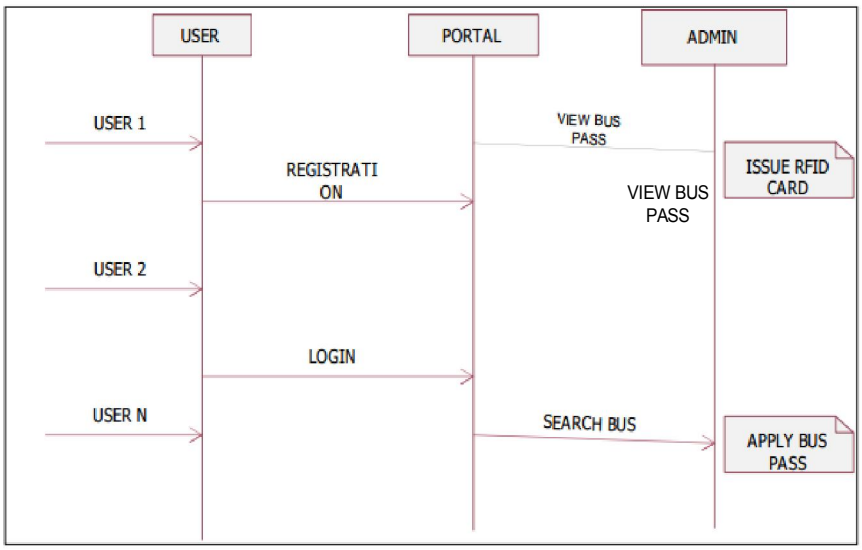

Fig No 3.6: - Sequence diagram

3.9 DATA FLOW DIAGRAM

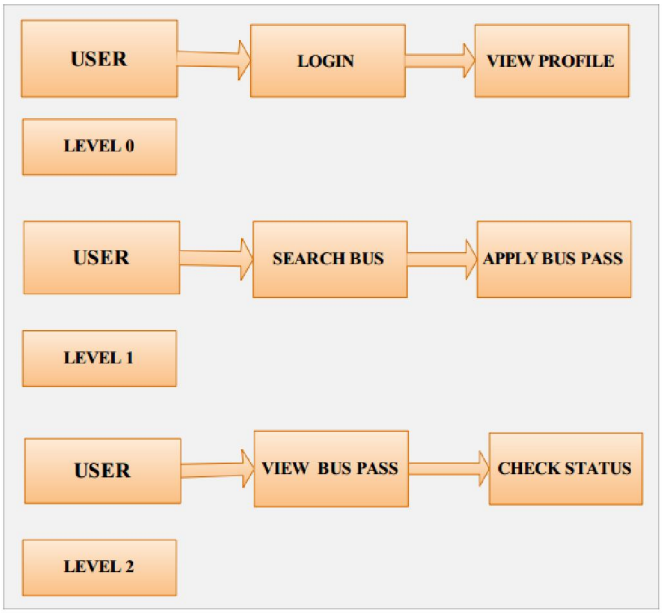

Fig No 3.7: - User Data flow diagram

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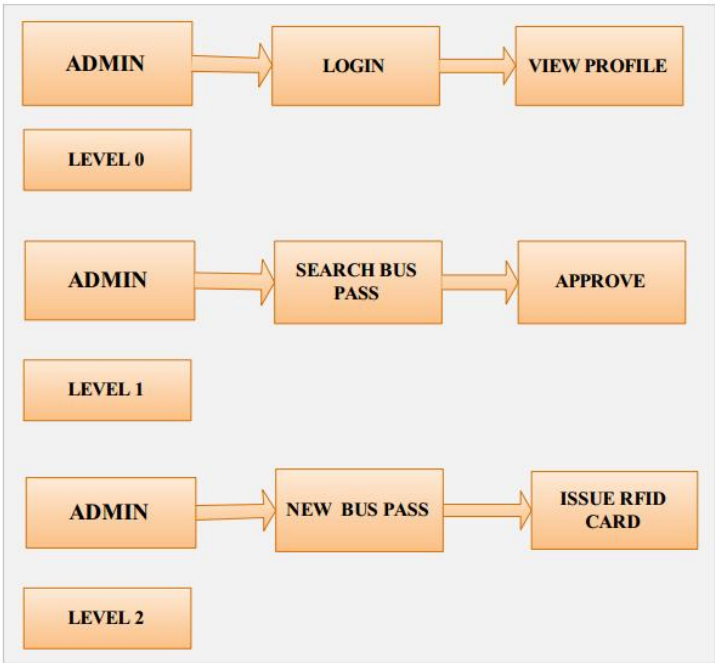

Fig No 3.8: - Admin Data flow diagram

3.10 Hardware Block Diagram:

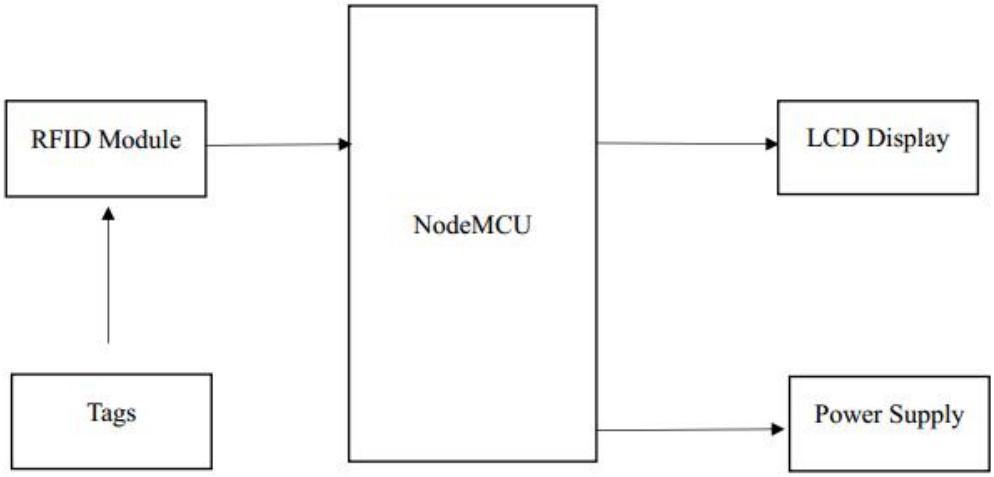

Fig No 3.9: - Hardware diagram

3.11 SYSTEM CONFIGURATION

H/W SYSTEM CONFIGURATION

- Processor - Pentium –III
- Speed - 1.1 GHz
- RAM - 256 MB (min)
- Hard Disk - 20 GB
- Floppy Drive - 1.44 MB
- Key Board - Standard Windows Keyboard

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- Mouse - Two or Three Button Mouse
- Monitor - SVGA

S/W SYSTEM CONFIGURATION

- Operating System - Windows95/98/2000/XP
- Front End - HTML, CSS, PHP
- Scripts - JavaScript.
- Server-side Script - Java Server Pages.
- Database - MYSQL

Software Requirements:

- Arduino IDE
- Embedded C
- HTML
- PHP
- MySQL

Hardware Requirements:

- NodeMCU
- LED Display
- RFID MFRC522
- RFID TAGS

3.12 COMPONENTS USED

WIFI MODULE:

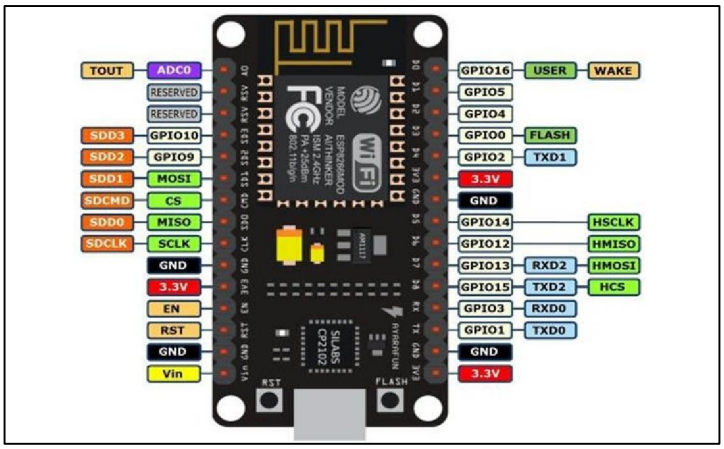

Fig No 3.10: - NODE MCU

The NodeMCU ESP8266 development board comes with the ESP-12E module containing the ESP8266 chip having Tensilica Xtensa 32-bit LX106 RISC microprocessor. This microprocessor supports RTOS and operates at 80MHz to 160 MHz adjustable clock frequency.

NodeMCU has 128 KB RAM and 4MB of Flash memory to store data and programs. Its high processing power with in-built Wi-Fi / Bluetooth and Deep Sleep Operating features make it ideal for IoT projects.

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NodeMCU ESP8266 Specifications & Features:

- Microcontroller: Tensilica 32-bit RISC CPU Xtensa LX106.
- Operating Voltage: 3.3V
- Input Voltage: 7-12V
- Digital I/O Pins (DIO): 16
- Analog Input Pins (ADC): 1
- UARTs: 1
- SPIs: 1
- I2Cs: 1
- Flash Memory: 4 MB
- SRAM: 64 KB
- Clock Speed: 80 MHz
- USB-TTL based on CP2102 is included onboard, Enabling Plug n Play
- PCB Antenna
- Small Sized module to fit smartly inside your IoT projects

Applications

- Prototyping of IoT devices
- Low power battery operated applications
- Network projects
- Projects requiring multiple I/O interfaces with Wi-Fi and Bluetooth functionalities

LCD DISPLAY

LCD display is used to display the sensor output. An LCD screen is an electronic display module that uses liquid crystal to produce a visible image. The 16×2 LCD display is a very basic module commonly used in DIYs and circuits. The 16×2 translates a display of 16 characters per line in 2 such lines. In this LCD, each character is displayed in a 5×7-pixel matrix. The term LCD stands for liquid crystal display. It is one kind of electronic display module used in an extensive range of applications like various circuits & devices like mobile phones, calculators, computers, TV sets, etc. These displays are mainly preferred for multi- segment light-emitting diodes and seven segments. The main benefits of using this module are inexpensive; simply programmable, animations, and there are no limitations for displaying custom characters, special and even animations, etc.

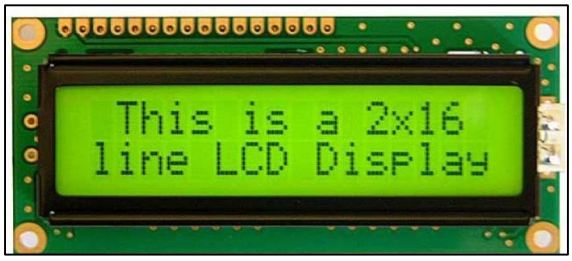

Fig No 3.11: - 16x2 LCD display

Brief Data:

- Compatible with Arduino Board or other controller board with I2C bus.
- Display Type: Negative white on blue backlight.
- I2C Address:0x38-0x3F (0x3F default)
- Supply voltage: 5V
- Interface: I2C to 4bits LCD data and control lines.

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- Contrast Adjustment: built-in Potentiometer.
- Backlight Control: Firmware or jumper wire.
- Board Size: 80x36 mm

Setting up:

HD44780 based character LCD are very cheap and widely available, and is an essential part for any project that displays information. Using the LCD piggy-back board, desired data can be displayed on the LCD through the I2C bus. In principle, such backpacks are built around PCF8574 (from NXP) which is a general purpose bidirectional 8 bit I/O port expander that uses the I2C protocol. The PCF8574 is a silicon CMOS circuit provides general purpose remote I/O expansion (an 8-bit quasi-bidirectional) for most microcontroller families via the two-line bidirectional bus (I2C-bus). Note that most piggy-back modules are centred around PCF8574T (SO16 package of PCF8574 in DIP16 package) with a default slave address of 0x27. If your piggy-back board holds a PCF8574AT chip, then the default slave address will change to 0x3F. In short, if the piggy-back board is based on PCF8574T and the address connections (A0-A1- A2) are not bridged with solder it will have the slave address 0x27.

Power Supply:

The board can be supplied with power either from the DC power jack (7 - 12V), the USB connector (5V), or the VIN pin of the board (7-12V). Supplying voltage via the 5V or 3.3V pins bypasses the regulator, and can damage your board.

RFID:

RFID stands for Radio Frequency Identification. It used to transfer data through radio frequency waves. Scanning items with RFID card allows users to automatically and uniquely identify and track inventory and assets. It has a reading range between a few centimetres. RFID's first application was of identifying airplanes as friend or foe in World War II. The cost of implementation of RFID and using an RFID system continues to decrease, making RFID cheaper and more efficient and users.

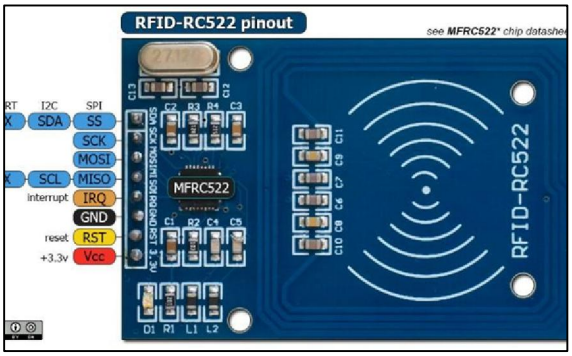

Fig No 3.12: - MFRC 522 RFID MODULE

3.13 METHODOLOGY

User Registration:

- The user registers for a bus pass on the website provided by your system.
- During registration, the user provides necessary details such as name, contact information, and possibly some form of identification.
- The system assigns a unique RFID number to the user's bus pass and associates it with the user's account.

RFID Bus Pass Assignment:

- After registration, the system generates an RFID bus pass for the user.
- The RFID bus pass contains an RFID tag that stores the unique RFID number associated with the user's account.
- The user receives the RFID bus pass, either physically or digitally.

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Boarding the Bus:

- When the user boards the bus, they tap their RFID bus pass on the RFID reader placed near the entrance of the bus.
- The RFID reader reads the unique RFID number stored on the RFID tag of the bus pass.

Verification Process:

- The RFID reader sends the read RFID number to the system for verification.
- The system receives the RFID number and looks up the corresponding user account in the database.
- If the RFID number is valid and matches an active user account, the system marks the bus pass as valid.
- If the RFID number is invalid or does not match any user account, the system marks the bus pass as invalid.

Feedback to the User:

- The system sends the verification result back to the RFID reader.
- The RFID reader displays the verification result on an output device such as an OLED display.
- If the bus pass is valid, the user is allowed to board the bus.
- If the bus pass is invalid, the user is denied entry, and appropriate action may be taken (e.g., notifying the user or bus driver).

Logging and Reporting:

- The system logs each bus pass verification event, recording details such as the RFID number, verification result, timestamp, and user information.
- The system may generate reports or alerts for administrators to monitor bus pass usage and identify any suspicious activities.

By following these steps, the system ensures that only authorized users with valid bus passes are allowed to board the bus, enhancing security and efficiency in managing bus pass operations.

3.14 SOFTWARE DESCRIPTION

PHP

What is PHP?

- PHP is an acronym for "PHP: Hypertext Pre-processor"
- PHP is a widely-used, open-source scripting language
- PHP scripts are executed on the server
- PHP is free to download and use

What Can PHP Do?

- PHP can generate dynamic page content
- PHP can create, open, read, write, delete, and close files on the server
- PHP can collect form data
- PHP can send and receive cookies
- PHP can add, delete, modify data in your database
- PHP can be used to control user-access
- PHP can encrypt data
- With PHP you are not limited to output HTML. You can output images or PDF files. You can also output any text, such as XHTML and XML.

Why PHP?

- PHP runs on various platforms (Windows, Linux, Unix, Mac OS X, etc.)

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- PHP is compatible with almost all servers used today (Apache, IIS, etc.)
- PHP supports a wide range of databases
- PHP is free. Download it from the official PHP resource: www.php.net
- PHP is easy to learn and runs efficiently on the server side

What is Database?

A database is a separate application that stores a collection of data. Each database has one or more distinct APIs for creating, accessing, managing, searching, and replicating the data it holds.

Other kinds of data stores can be used, such as files on the file system or large hash tables in memory but data fetching and writing would not be so fast and easy with those types of systems.

So now days we use relational database management systems (RDBMS) to store and manager huge volume of data. This is called relational database because all the data is stored into different tables and relations are established using primary keys or other keys known as foreign keys.

A Relational Database Management System (RDBMS) is software that:

Enables you to implement a database with tables, columns, and indexes.

Guarantees the Referential Integrity between rows of various tables.

Updates the indexes automatically.

Interprets an SQL query and combines information from various tables.

RDBMS Terminology:

Before we proceed to explain MySQL database system, lets revise few definitions related to database.

Database: A database is a collection of tables, with related data.

Table: A table is a matrix with data. A table in a database looks like a simple spreadsheet.

Column: One column (data element) contains data of one and the same kind, for example the column postcode.

Row: A row (= tuple, entry, or record) is a group of related data, for example the data of one subscription.

Redundancy: Storing data twice, redundantly to make the system faster.

Primary Key: A primary key is unique. A key value cannot occur twice in one table. With a key you can find at most one row.

Foreign Key: A foreign key is the linking pin between two tables.

Compound Key: A compound key (composite key) is a key that consists of multiple columns, because one column is not sufficiently unique.

Index: An index in a database resembles an index at the back of a book.

Referential Integrity: Referential Integrity makes sure that a foreign key value always points to an existing row.

MySQL Database:

MySQL is a fast, easy-to-use RDBMS used being used for many small and big businesses. MySQL is developed, marketed, and supported by MySQL AB, which is a Swedish company. MySQL is becoming so popular because of many good reasons.

MySQL is released under an open-source license. So, you have nothing to pay to use it.

MySQL is a very powerful program. It handles a large subset of the functionality of the most expensive and powerful database packages.

MySQL uses a standard form of the well-known SQL data language.

MySQL works on many operating systems and with many languages including PHP, PERL, C, C++, JAVA etc.

MySQL works very quickly and works well even with large data sets.

MySQL is very friendly to PHP, the most appreciated language for web development.

MySQL supports large databases, up to 50 million rows or more in a table. The default file size limit for a table is 4GB, but you can increase this (if your operating system can handle it) to a theoretical limit of 8 million terabytes (TB).

MySQL is customizable. The open-source GPL license allows programmers to modify the MySQL software to fit their own specific environments

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Setting Up the Arduino IDE to Program ESP8266:

To program the NodeMCU using Arduino IDE first we need to install the NodeMCU ESP8266 library.

Steps to install library:

Click on File.

Go to Preferences and Click on it.

Go to settings.

Select the sketchbook location as per your convenience.

Select editor language as System default.

Select editor font size as 12.

In Additional board manager URL's copy the below link

http://arduino.esp8266.com/stable/package_esp8266com_index.json

Click on OK

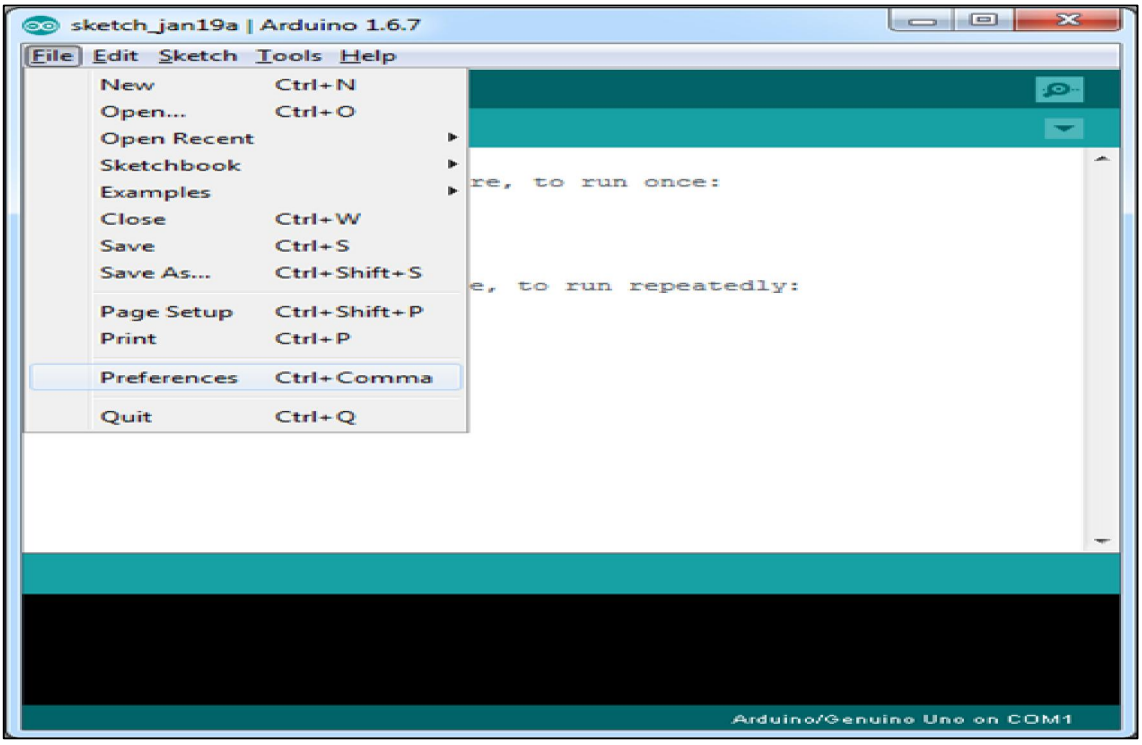

Fig No 3.13: - File Tab

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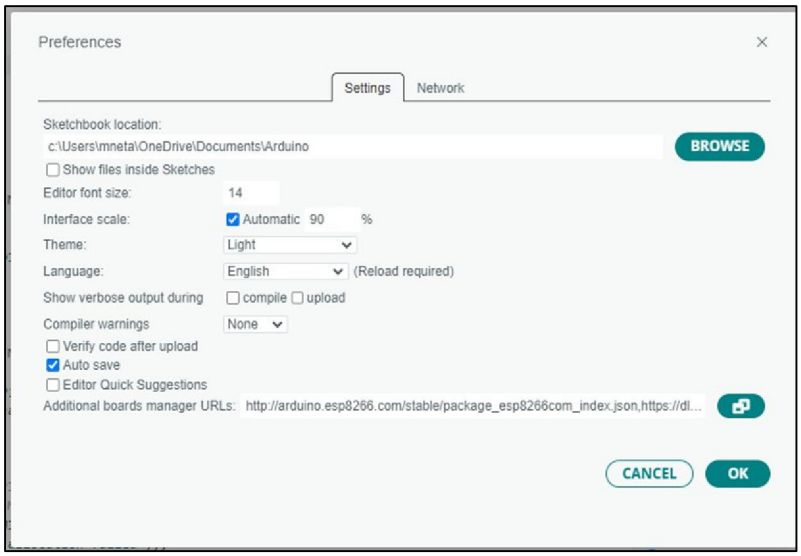

Fig No 3.14: - Preferences Tab

Steps to Install the ESP8266 Board Libraries and Tools:

Click on Tools in Arduino IDE.
In that go to Board: Arduino Uno.
In that go to Board Manger Click on it.
In Board manager search bar type ESP.
Then select esp8266 by ESP8266 community.
Click on Install.
After installation Click on close.

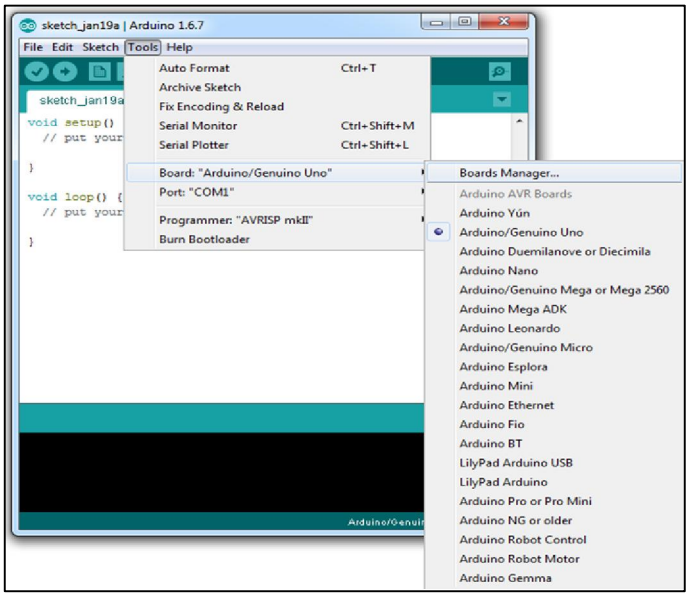

Fig No 3.15: - Tools Tab

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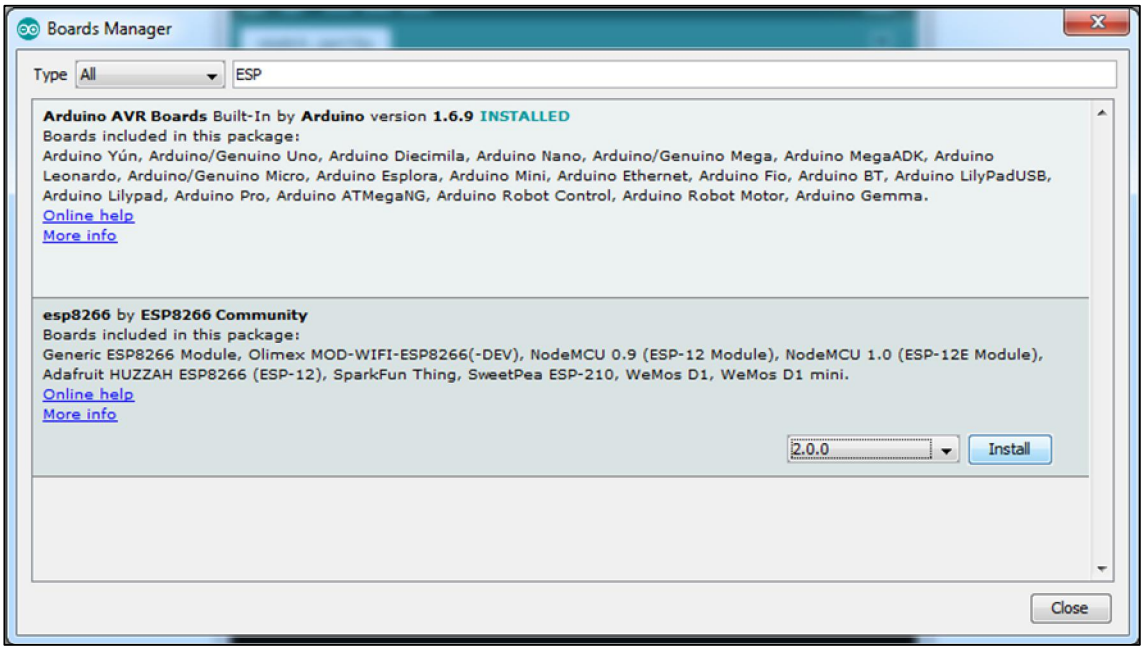

Fig No 3.16: - Boards Manager Tab

Steps to Test the ESP8266 With Arduino Project:

Steps to select the microcontroller:

Click on Tools

In that go to Board.

In that select the microcontroller board as NodeMCU 0.9(ESP-12 Module) or NodeMCU 1.0(ESP-12E Module).

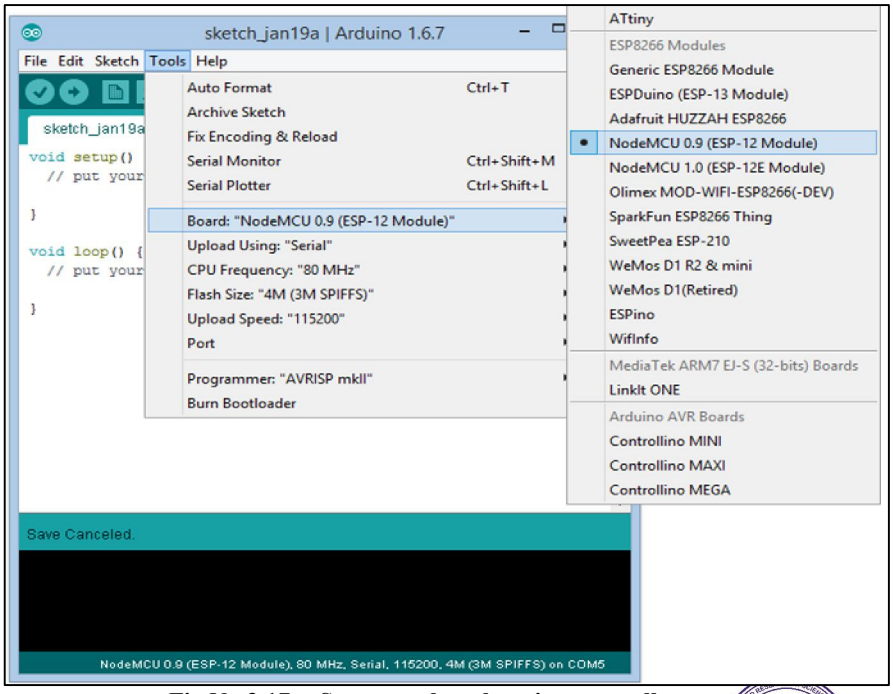

Fig No 3.17: - Steps to select the microcontroller

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Steps to select the Port (to upload):

Click on tools.

Go to port, select the port in which you have connected between microcontroller to PC.

Write the program or code on Arduino IDE.

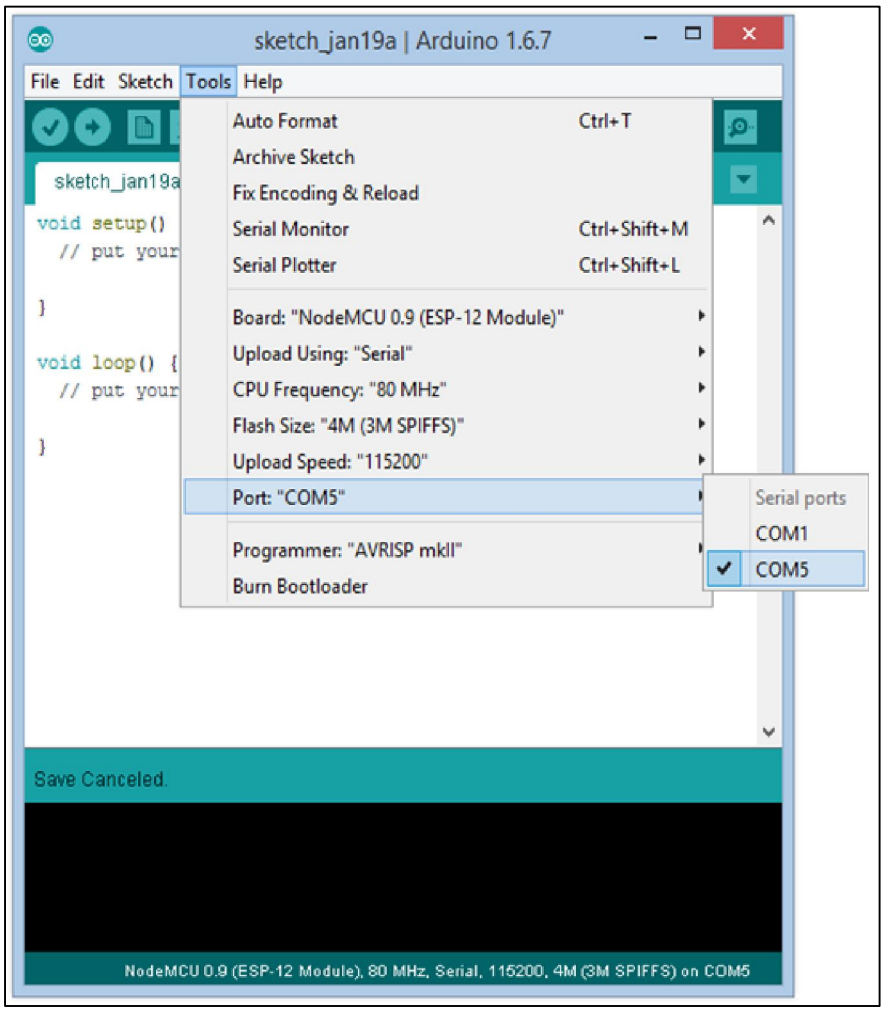

Fig No 3.18: - Steps to select the Port

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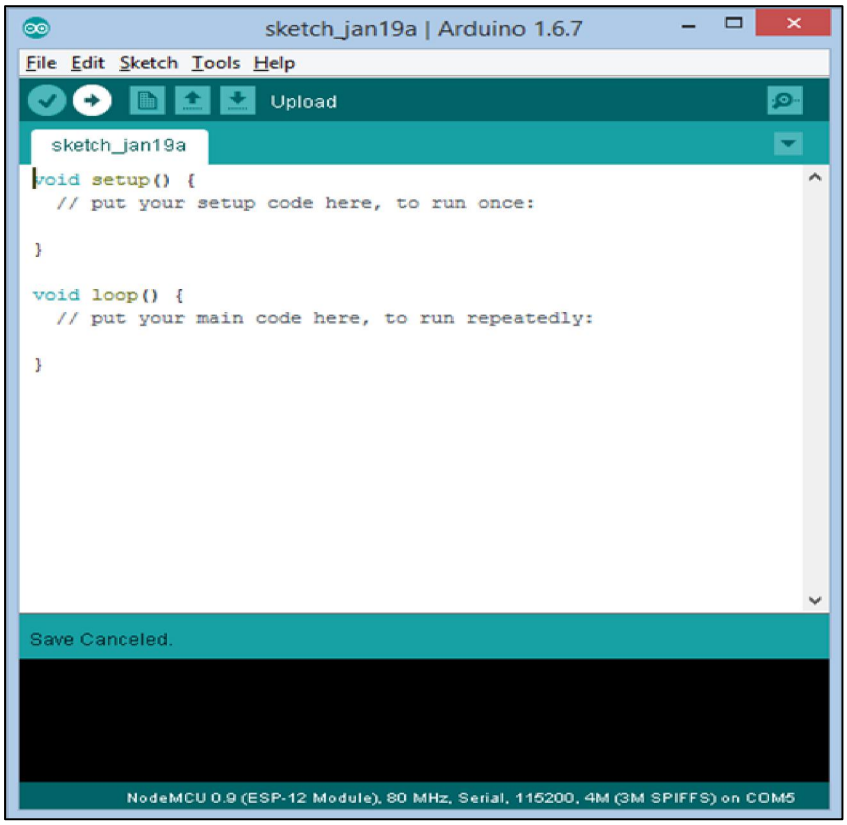

Fig No 3.19: - Steps to select the Port and upload

3.14 SOFTWARE FEASIBILITY

FEASIBILITY STUDY:

The feasibility of the project is analysed in this phase and business proposal is put forth with a very general plan for the project and some cost estimates. During system analysis the feasibility study of the proposed system is to be carried out. This is to ensure that the proposed system is not a burden to the company. For feasibility analysis, some understanding of the major requirements for the system is essential.

Three key considerations involved in the feasibility analysis are

- ECONOMICAL FEASIBILITY
- TECHNICAL FEASIBILITY
- SOCIAL FEASIBILITY

ECONOMICAL FEASIBILITY

This study is carried out to check the economic impact that the system will have on the organization. The amount of fund that the company can pour into the research and development of the system is limited. The expenditures must be justified. Thus, the developed system as well within the budget and this was achieved because most of the technologies used are freely available. Only the customized products had to be purchased.

TECHNICAL FEASIBILITY

This study is carried out to check the technical feasibility, that is, the technical requirements of the system. Any system developed must not have a high demand on the available technical resources. This will lead to high demands on the available technical resources. This will lead to high demands being placed on the client. The developed system must have a modest requirement, as only minimal or null changes are required for implementing this system.

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Volume 4, Issue 2, May 2024

SOCIAL FEASIBILITY

The aspect of study is to check the level of acceptance of the system by the user. This includes the process of training the user to use the system efficiently. The user must not feel threatened by the system, instead must accept it as a necessity. The level of acceptance by the users solely depends on the methods that are employed to educate the user about the system and to make him familiar with it. His level of confidence must be raised so that he is also able to make some constructive criticism, which is welcomed, as he is the final user of the system.

FUNCTIONAL REQUIREMENTS:

Functional requirements specify which output file should be produced from the given file they describe the relationship between the input and output of the system, for each functional requirement a detailed description of all data inputs and their source and the range of valid inputs must be specified.

NON-FUNCTIONAL REQUIREMENTS:

Describe user-visible aspects of the system that are not directly related with the functional behaviour of the system. Non-Functional requirements include quantitative constraints, such as response time (i.e., how fast the system reacts to user commands.) or accuracy ((i.e., how precise are the systems numerical answers.)

PSEUDO REQUIREMENTS:

The client that restricts the implementation of the system imposes these requirements. Typical pseudo requirements are the implementation language and the platform on which the system is to be implemented. These have usually no direct effect on the user's view of the system**.**

IV. RESULTS AND DISCUSSIONS

SYSTEM TESTING

For testing purpose, we use "Logcat" along with normal testing as mentioned below.

4.1 WEBSITE SCREEN SHOTS

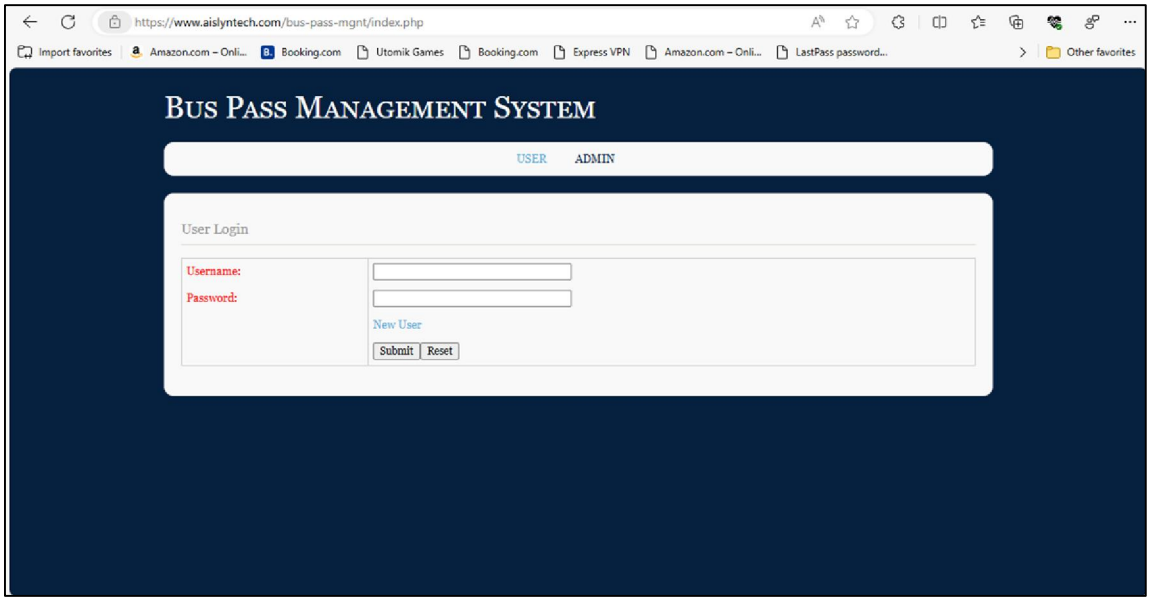

Fig No 4.1: - User Window

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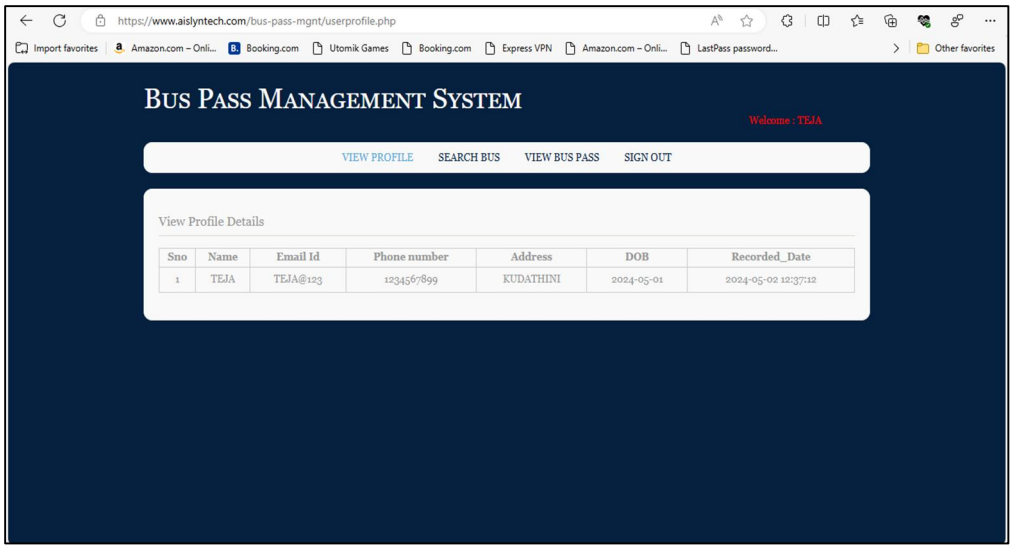

Fig No 4.2: - View Profile window

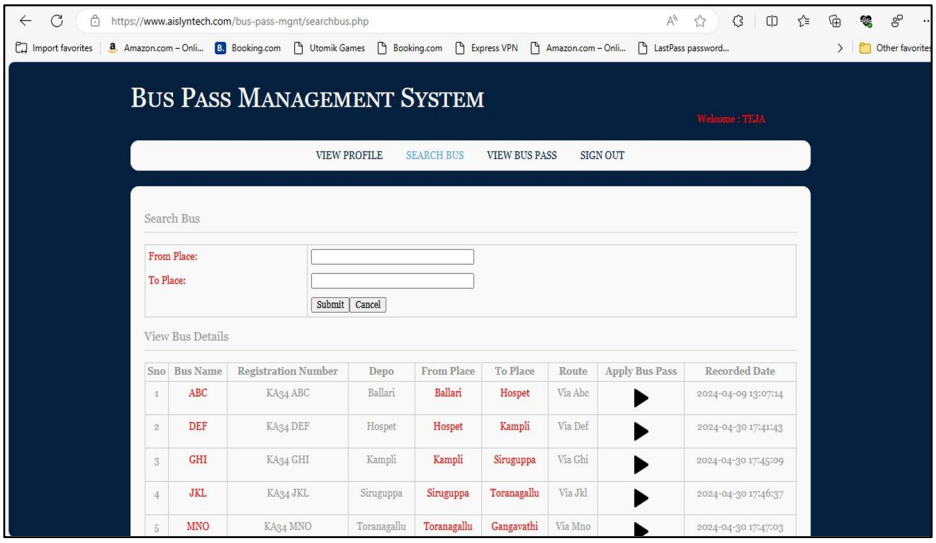

Fig No 4.3: - Search Bus window

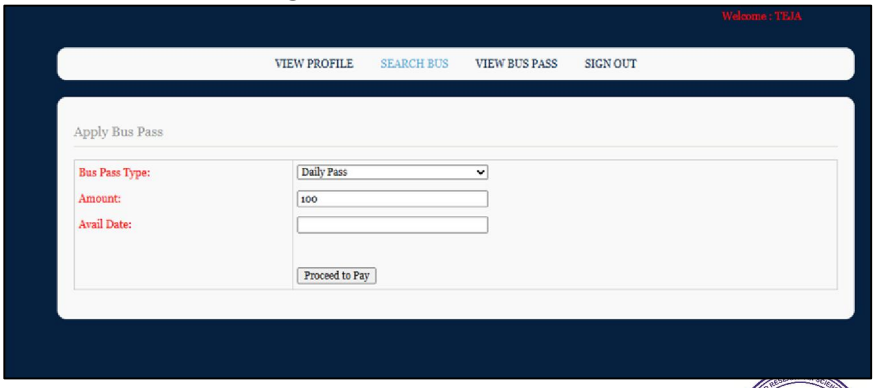

Fig No 4.4: - Apply Bus Pass window (Daily)

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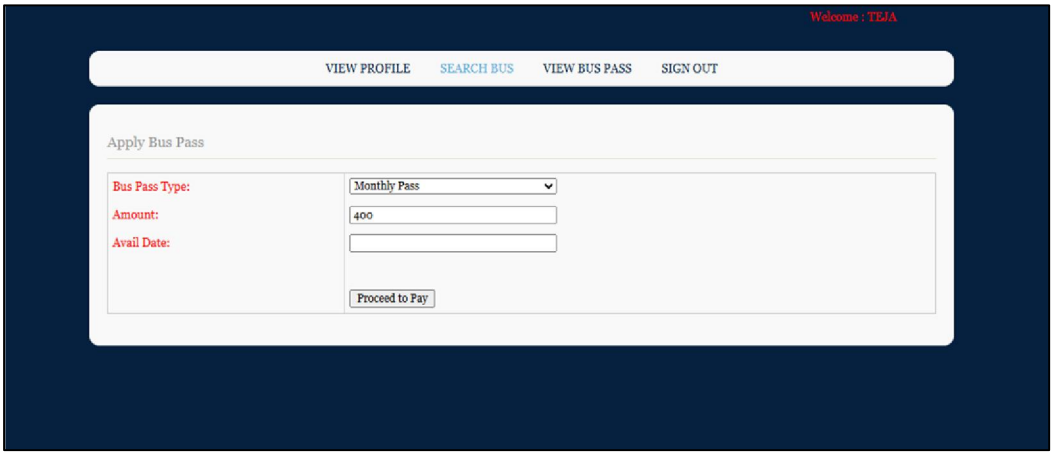

Fig No 4.5: - Apply Bus Pass window (Monthly)

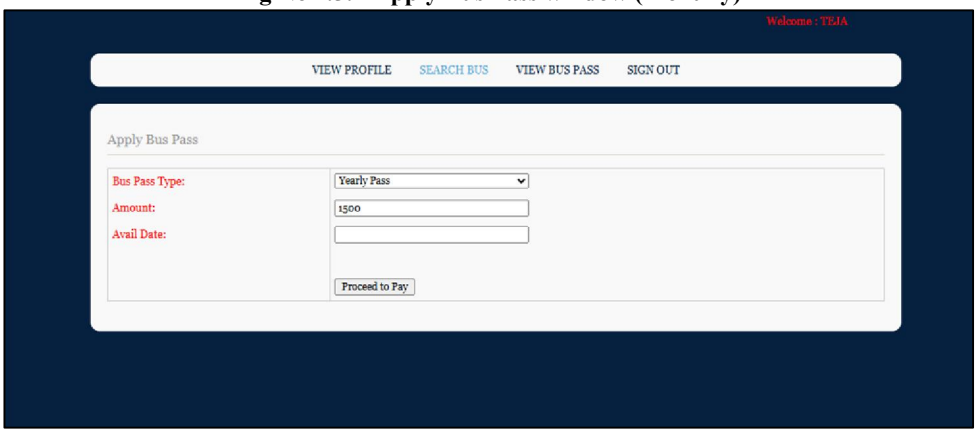

Fig No 4.6: - Apply Bus Pass window (Yearly)

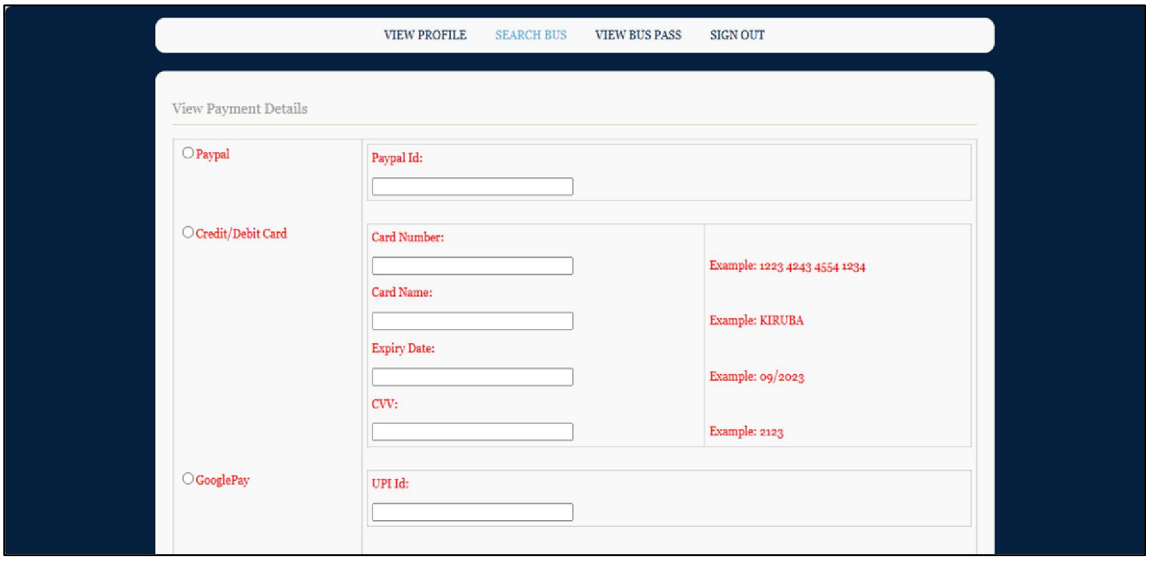

Fig No 4.7: - Payment window

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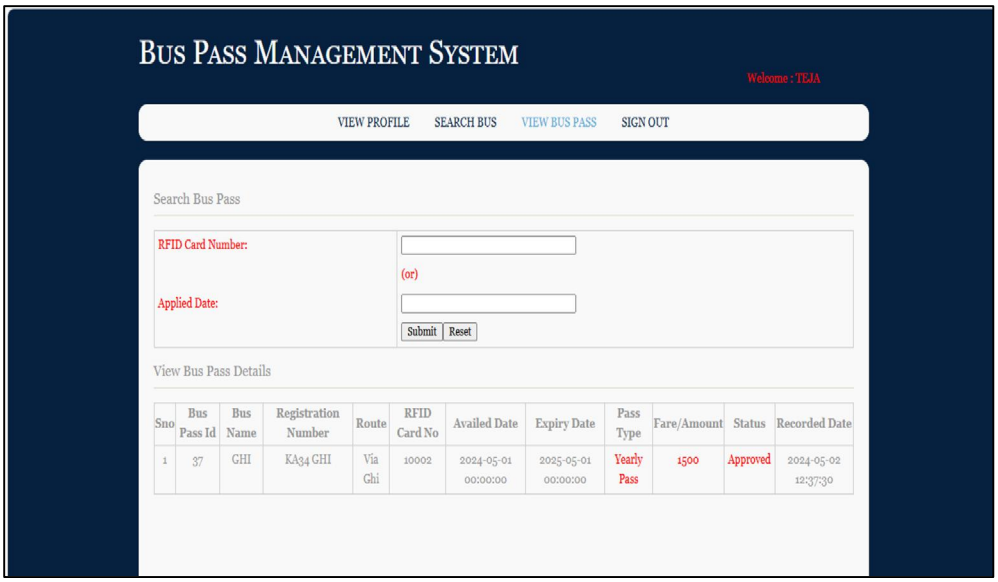

Fig No 4.8: - View Bus Pass window

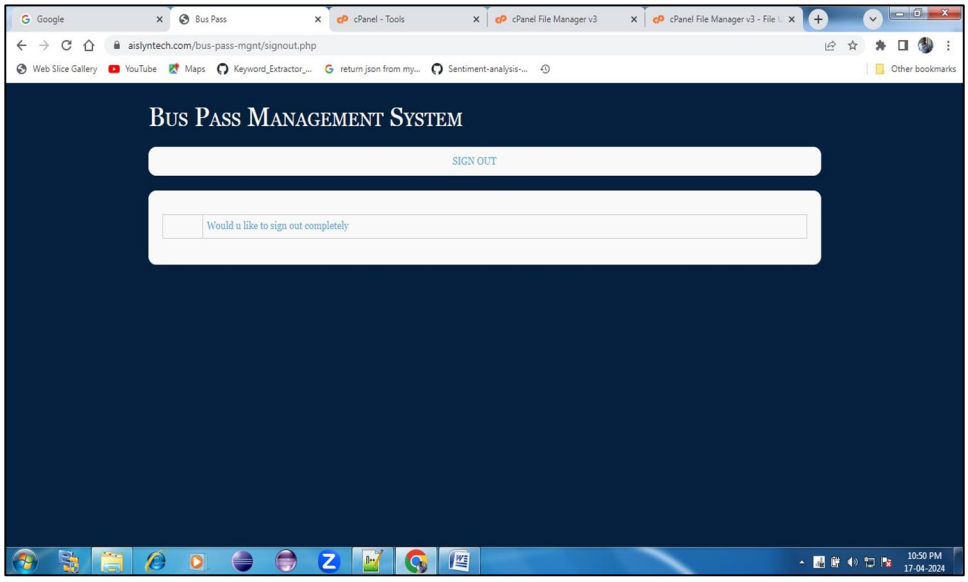

Fig No 4.9: - Sign-out window

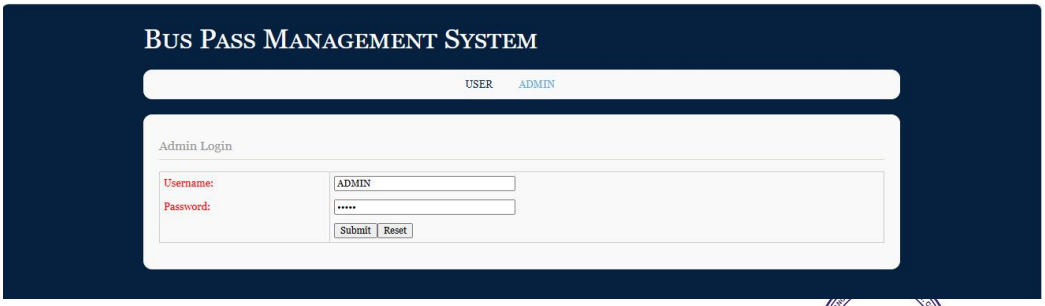

Fig No 4.10: - Admin window

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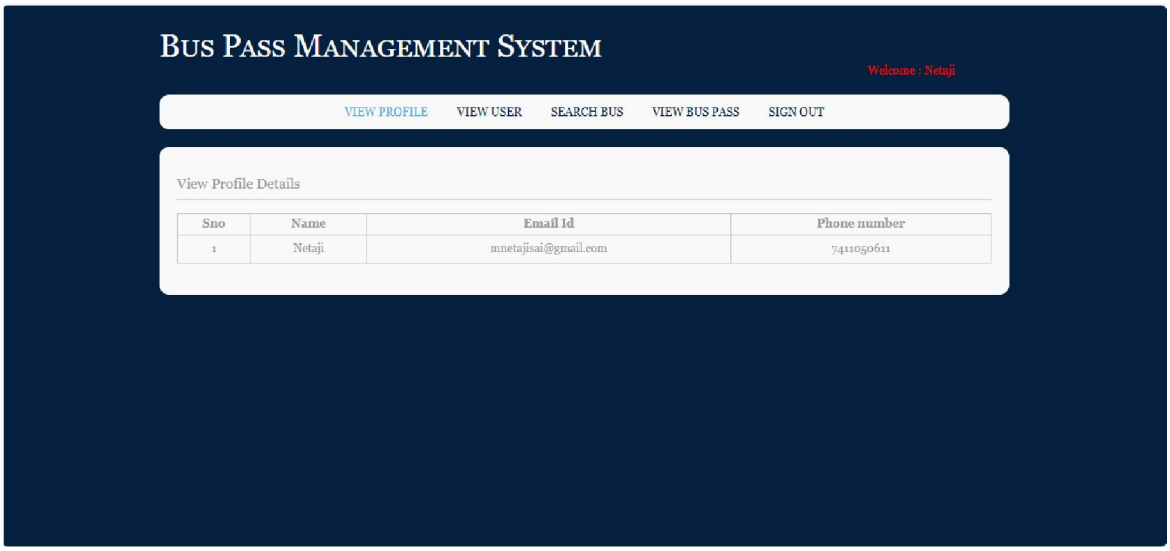

Fig No 4.11: - View Profile window

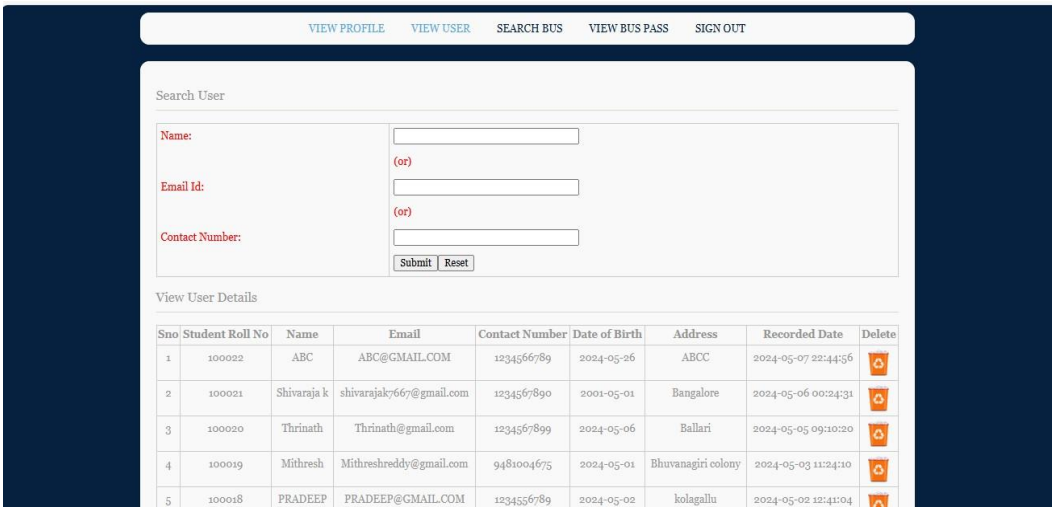

Fig No 4.12: - View Users window

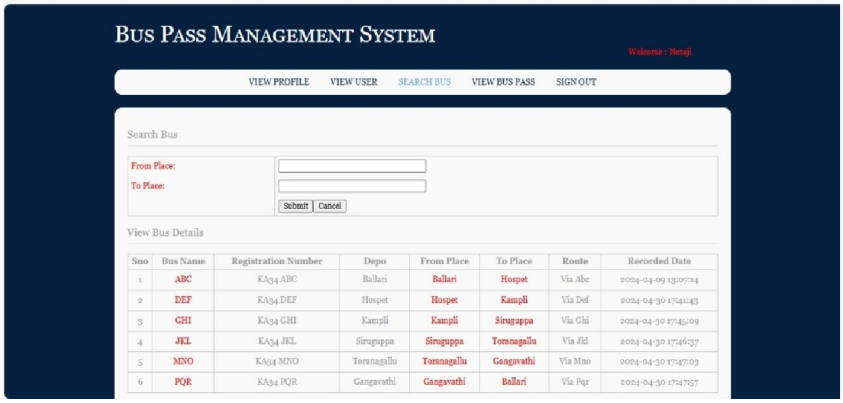

Fig No 4.13: - Search Bus window

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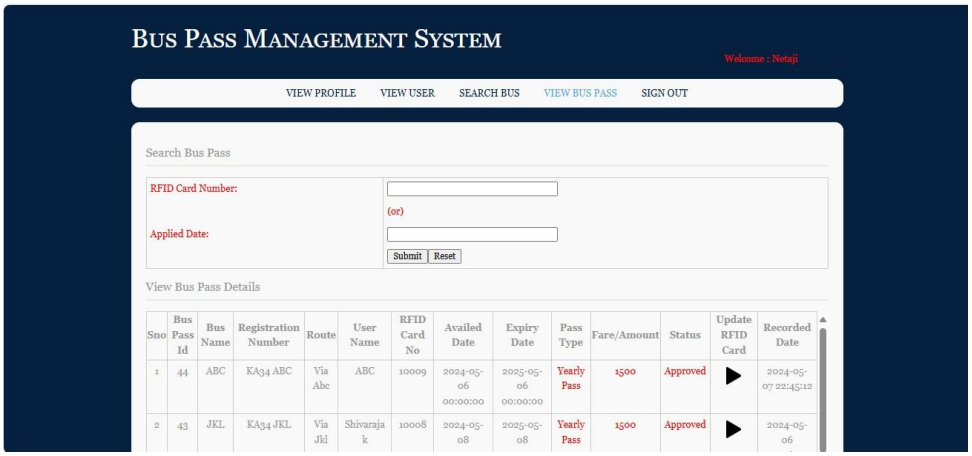

Fig No 4.14: - View Bus Passes window

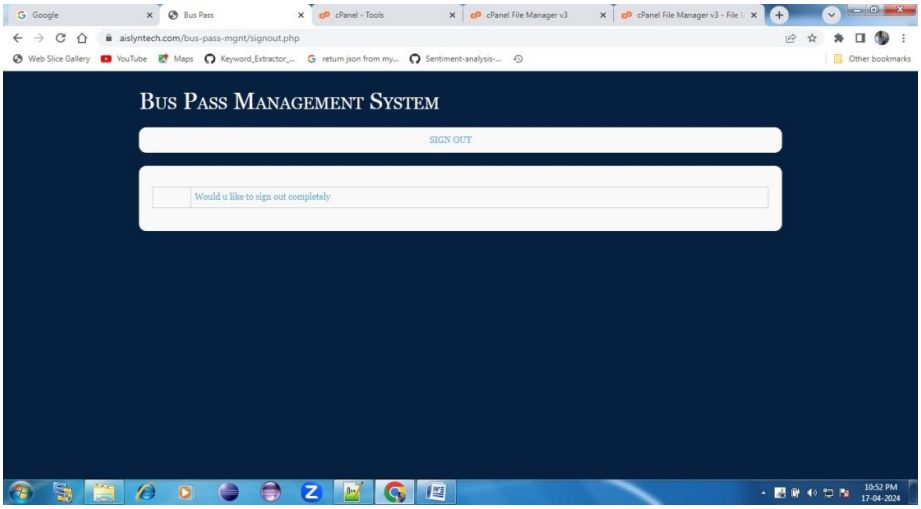

Fig No 4.15: - Sign-out window (ADMIN)

4.2 HARDWARE OUTPUTS

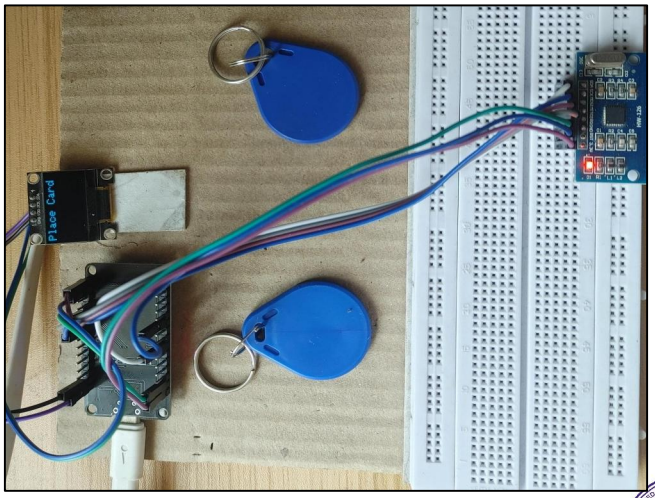

Fig No 4.16: - Before tapping the PASS

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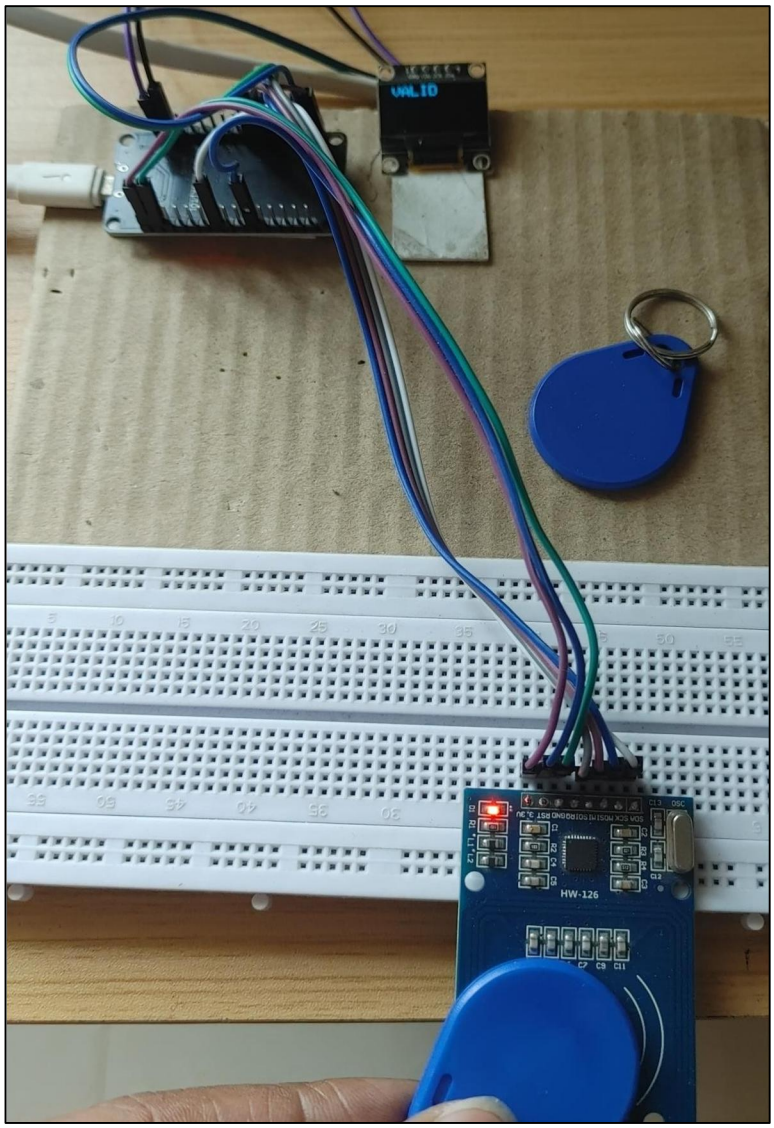

Fig No 4.17: - If Pass is VALID

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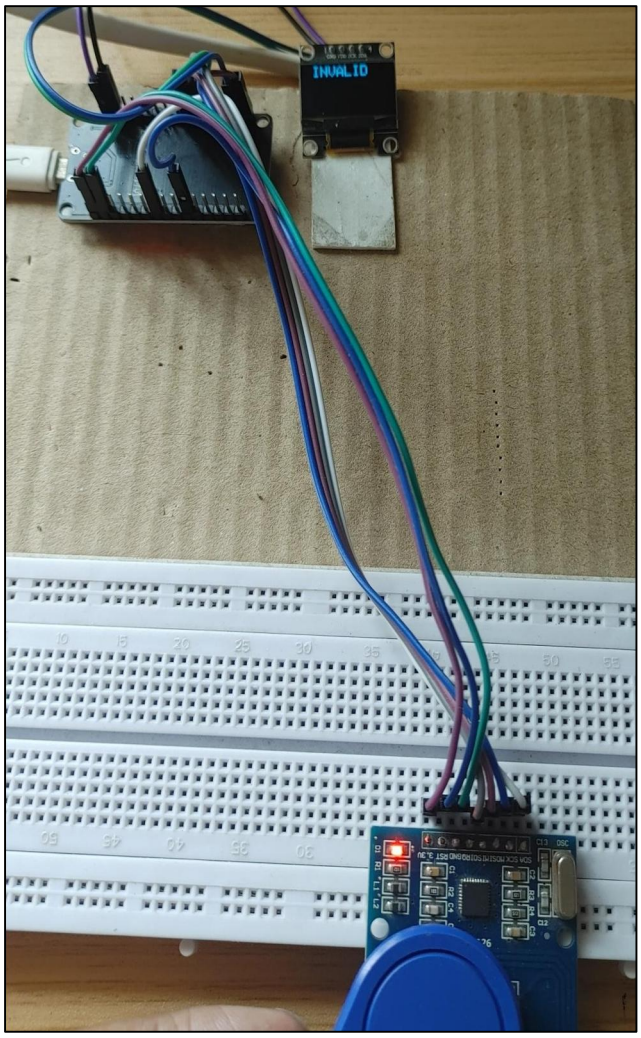

Fig No 4.18: - If Pass is INVALID(expired)

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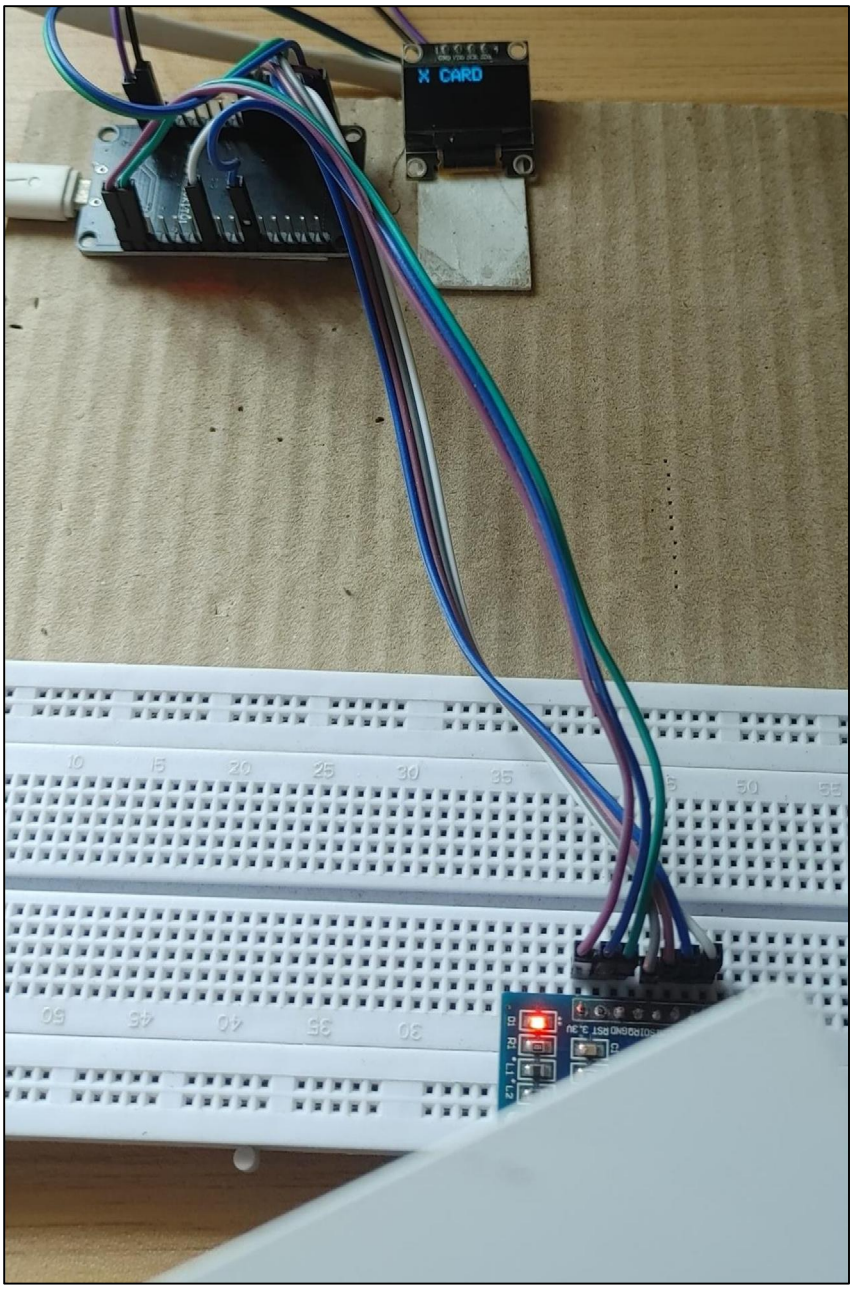

Fig No 4.19: - If PASS is Not registered

Outputs:

1. Valid: This output indicates that the RFID tag is recognized and mapped to a valid RFID number in the code. It means that the RFID tag is authorized, and the associated action can proceed.
2. Invalid: This output indicates that the RFID tag is recognized but is not mapped to a valid RFID number in the code. It means that the RFID tag is not authorized, and the associated action cannot proceed.
3. X card: This output indicates that the RFID tag is not recognized or is not functioning properly. It means that the RFID tag cannot be identified, and further troubleshooting or replacement may be necessary.

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These outputs are determined based on the response received from the server after sending the RFID number for verification. The server responds with a status code, which is then interpreted and displayed on the OLED display to provide feedback to the user.

Each of these outputs serves as a form of feedback to the user, indicating whether the RFID tag is authorized and whether the associated action can proceed. They help in understanding the status of the RFID tag and ensuring the security and integrity of the system.

V. CONCLUSION AND FUTURE SCOPE

CONCLUSION

In this paper, we had proposed "Bus Pass Management System Using RFID Card". In this model we will be placing RFID reader in public transportation while peoples get in and out of our system. In conclusion, the IoT-Based Bus Pass Management System represents a monumental leap forward in the realm of public transportation infrastructure. By harnessing the power of Internet of Things (IoT) technologies, this innovative solution addresses the longstanding challenges inherent in traditional bus pass systems, such as manual ticketing inefficiencies and the lack of real-time monitoring capabilities. Through automated issuance and validation processes, coupled with seamless integration with mobile devices, the system streamlines bus pass management while enhancing security and convenience for passengers and transport authorities alike.

With its ability to provide real-time monitoring of bus pass usage, the system empowers transport authorities to make data-driven decisions, optimize resource allocation, and enhance overall operational efficiency. Furthermore, the implementation of RFID authentication ensures robust security measures, mitigating the risk of fraudulent activities and enhancing passenger trust. The project's scalability and flexibility ensure adaptability to evolving transportation needs, while its potential for integration with emerging technologies sets the stage for a future where public transportation is not just efficient, but truly intelligent.

In essence, the IoT-Based Bus Pass Management System signifies a paradigm shift in the way bus pass systems are managed and operated. It sets a new standard for efficiency, reliability, and passenger experience in public transportation, laying the groundwork for smarter, more connected cities of tomorrow.

FUTURE SCOPE

Looking forward, there are many ways we can make the IoT-Based Bus Pass Management System even better. One idea is to use fancy math and computer smarts to look at all the data the system collects. By doing this, we can figure out things like when buses are busiest, where people are going most often, and when we might need more buses. This could help make bus rides smoother and more reliable for everyone.

Another thing we could do is make it easier to pay for bus rides. Instead of needing a physical bus pass, we could use things like phones or special cards that you can just tap on a reader. This would be more convenient for passengers and could help speed up getting on and off the bus.

We could also make it so you can see where buses are in real-time on a map. This would help you know exactly when your bus is coming, so you don't have to wait as long at the bus stop.

Lastly, we could team up with other city systems, like traffic lights or environmental sensors. By working together, we could make cities more efficient and better for everyone who lives there. Overall, there are lots of ways we can make the IoT-Based Bus Pass Management System even better in the future.

REFERENCES

[1] Li, Cheng, et al. "An RFID-Based Attendance System Using Passive Tags." IEEE Transactions on Education, vol. 60, no. 4, pp. 296-302, 2017.

[2] Wang, Hua, et al. "Design and Implementation of an RFID-Based Metro Pass System." IEEE Transactions on Vehicular Technology, vol. 66, no. 11, pp. 10347-10357, 2017.

[3] Chen, Wei, et al. "RFID-Based Bus Pass System: Implementation and Performance Evaluation." Transportation Research Part C: Emerging Technologies, vol. 88, pp. 67-81, 2018.

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International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
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[4] Kumar, Anil, et al. "RFID-Based Authentication for ATM Security: A Comparative Study." Journal of Network and Computer Applications, vol. 85, pp. 92-104, 2017.
[5] Zhang, Xin, et al. "An RFID-Based Smart Parking System for Urban Environments." IEEE Transactions on Intelligent Transportation Systems, vol. 19, no. 12, pp. 4001-4013, 2018.
[6] Song, Yan, et al. "RFID-Based Inventory Management System for Retail Stores: A Case Study." International Journal of Production Economics, vol. 204, pp. 108-118, 2018.
[7] Liu, Shuai, et al. "RFID-Based Real-Time Locating System for Asset Tracking in Hospitals." Journal of Medical Systems, vol. 41, no. 2, pp. 25-32, 2017.
[8] Xu, Xiaofeng, et al. "Design and Implementation of an RFID-Based Library Management System." Journal of Librarianship and Information Science, vol. 50, no. 1, pp. 45-57, 2018.
[9] Wang, Lei, et al. "RFID-Based Automated Toll Collection System for Highways." IEEE Transactions on Intelligent Transportation Systems, vol. 20, no. 4, pp. 1305-1317, 2019.
[10] Sharma, Rajesh, et al. "RFID-Based Supply Chain Management: A Comprehensive Review and Future Directions." Computers & Industrial Engineering, vol. 128, pp. 1067-1087, 2019.
[11] Zhang, Ming, et al. "RFID-Based Animal Tracking System: A Case Study in Wildlife Conservation." Journal of Wildlife Management, vol. 82, no. 6, pp. 1203-1215, 2018.
[12] Lee, Seung-Hwan, et al. "RFID-Based Access Control System for Secure Building Management." IEEE Access, vol. 6, pp. 78921-78934, 2018.
[13] Chen, Jian, et al. "RFID-Based Asset Management System for Manufacturing Facilities." International Journal of Advanced Manufacturing Technology, vol. 94, no. 5-8, pp. 1955-1967, 2018.
[14] Yang, Dong, et al. "RFID-Based Smart Agriculture: A Comprehensive Review." Computers and Electronics in Agriculture, vol. 161, pp. 272-289, 2019.
[15] Park, Min-Jeong, et al. "RFID-Based Passenger Identification System for Improved Security in Airports." IEEE Transactions on Intelligent Transportation Systems, vol. 20, no. 7, pp. 2521-2534, 2019.