Golden Sun-Rise
International Journal of Multidisciplinary on Science and Management
ISSN: XXXX-XXXX / Volume 1 Issue 1 January 2024 / Page No: 21-24
Paper Id: IJMSM-V1I1P104 / Doi:

Research Article

Smart Multiservice Rail APP for Indian Railway Passengers

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Received: 30 December 2023 Revised: 17 January 2024 Accepted: 29 January 2024 Published: 02 February 2024

Abstract - The objective of our project is to develop a smart application for train passengers utilizing QR codes. Addressing prevalent issues such as crime, sexual harassment, and poor food conditions within trains, the project aims to enhance safety and services for passengers. The application enables passengers to scan QR codes for easy reporting of crimes to police officers, placing food orders with improved hygiene standards, and providing feedback to railway authorities. By facilitating a seamless process through a mobile app, the project aims to contribute to passenger safety, satisfaction, and efficient communication with railway officers, ensuring a safer and more comfortable train journey for all travellers.

Keywords - *User Interface, Pantry, Receiver, Complaint, Feedback.*

I. INTRODUCTION

This application functions as a survey platform and a channel of communication for passengers' issues, with the goal of prioritizing their safety and security while riding the metro. Given that metro trains lack safety precautions, the app enables users to report concerns, complaints, or special needs while traveling. With the knowledge that crimes and emergencies would be handled by higher authorities and law enforcement, it gives passengers the ability to handle emergencies. The app becomes an essential tool for improving passenger safety in the setting of metro systems, where automatic door systems may enhance the risk of criminal acts. The software makes it possible for users to communicate emergency circumstances with railway police and officials, which guarantees a prompt and secure response to the passengers' needs.

II. LITERATURE REVIEW

Silva and Lopes (2013) outline the steps necessary to certify a safety-critical system in the railway industry and explain how security measures can be implemented without compromising dependability or safety. Failure Modes, Vulnerabilities and Effect Analysis (FMVEA) and fault tree analysis are used in this work to identify potential security failure events for each safety failure event.

A method for stochastic modeling of safety-critical systems that considers both malevolent attacks and random failures is presented by Popov (2015). Specifically, the method only considers assaults that have the potential to remove the device from its secure condition. It is feasible to calculate the risk associated with cyberattacks by considering probabilistic modeling of both attacks and failures.

III. EXISTING SYSTEM

Crimes are rampant these days, especially on public transportation. Every day, crimes such as murder, robbery, sexual harassment, and chain snatching were happening somewhere in our nation. Consider the following scenario: you were on a metro train. Until the next station arrives, the doors there are closed. There are numerous ways that the offenses listed above could happen. There are no designated police personnel or special agents to stop these kinds of crimes. In addition to criminal activity, there may be a possibility of mishaps like as fires, technical problems like stuck doors, and passenger emergencies. Not every time they happen will there be a technician or doctor present. Food was not supplied for passengers on trains with reserved cabins. Foods came from the area.

IV. PROPOSED SYSTEM

A. APP For Passengers

Here is a solution in the form of an application for users (train passengers). Every single traveler on board is safe with us. The passenger's ticket has a QR code that must be entered into the application (printed on tickets). This made it easier to solve crimes, crises, and food-related problems.

B. QR Scanner

The QR code provided on their ticket must be scanned by the user using their device's camera. The passenger's data was already stored in the QR code. Details like Name, Train number, Compartment number, and Seat number are contained in the QR code. Every traveler received a special QR code.

C. UI (User Interface)

The user interface was improved and made easy. Users have no trouble operating at all. The elderly and those with limited application handling experience were taken into consideration when designing the user interface.

D. Inputs from Passengers

When using this app, a user must scan the QR code and provide some information, such as the problem they are having or the food they would want to get. They can also provide comments regarding their trip experiences.

i). Emergency

A passenger might use this option to update and indicate any problems they are having while traveling. Following their update, the relevant personnel in charge received the information obtained from the passengers.

ii). Order Food

If a traveler wants to order a meal, snack, or any other food that is listed on the pantry and accessible through our app. The meal they desire will be delivered to their seats once their order has been placed. You won't have to search outside for meals. Every train with reserved compartments will have a pantry.

iii). Emergency

A user may send feedback regarding their experience on the travel. The feedback can be either positive or negative or even any suggestions too. Feedback will be used to develop the services.

V. APPLICATION FOR PASSENGERS

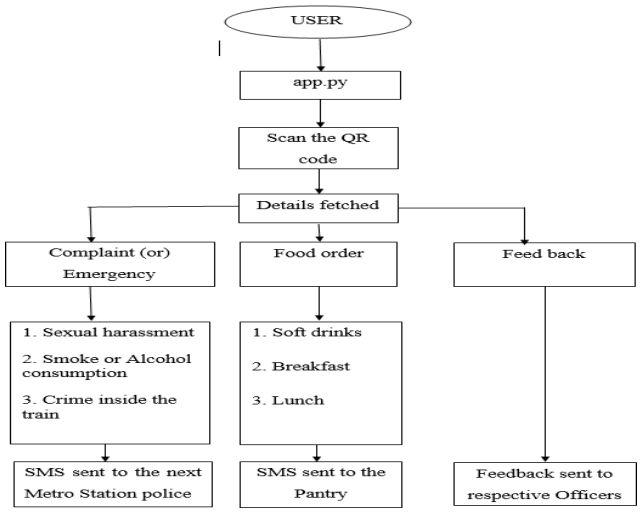

Figure 1. Flow Chart of Proposed Model

In addition to criminal activity, there may be a possibility of mishaps like as fires, technical problems like stuck doors, and passenger emergencies. Not every time they happen will there be a technician or doctor present.

Food was not supplied for passengers on trains with reserved cabins. Food was traditionally provided in unhygienic stations, which is bad for the health of elderly people or children. Timely treatment of passengers with health difficulties is imperative.

Maintenance and Diagnostics: To identify problems with equipment in real time, automation systems might include condition monitoring and diagnostic features. This increases the dependability of train operations, permits preventative maintenance, and decreases downtime.

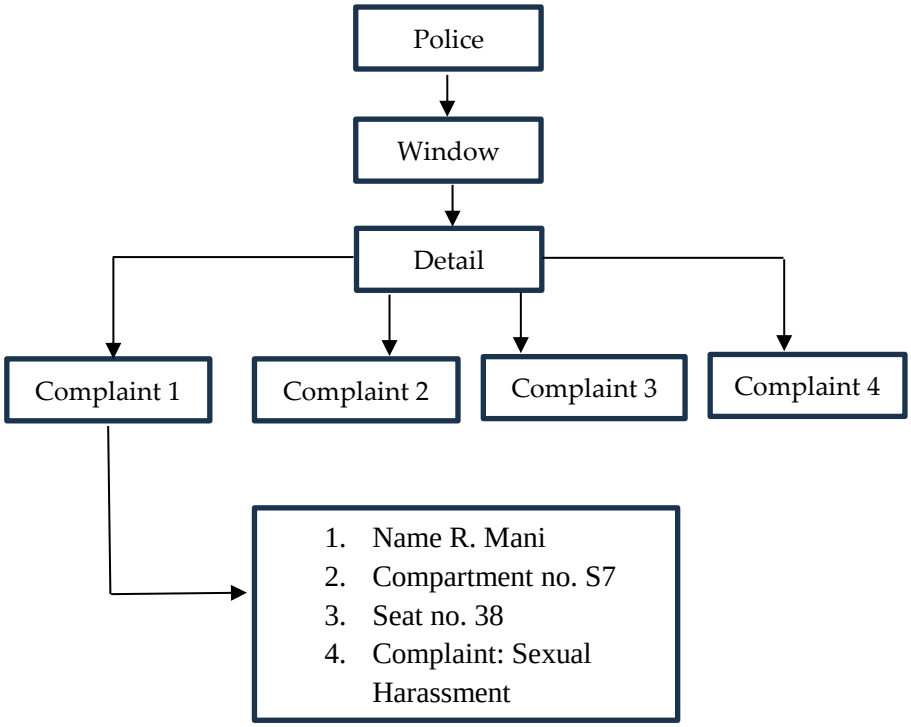

Figure 2. Receiver Side of Complaint

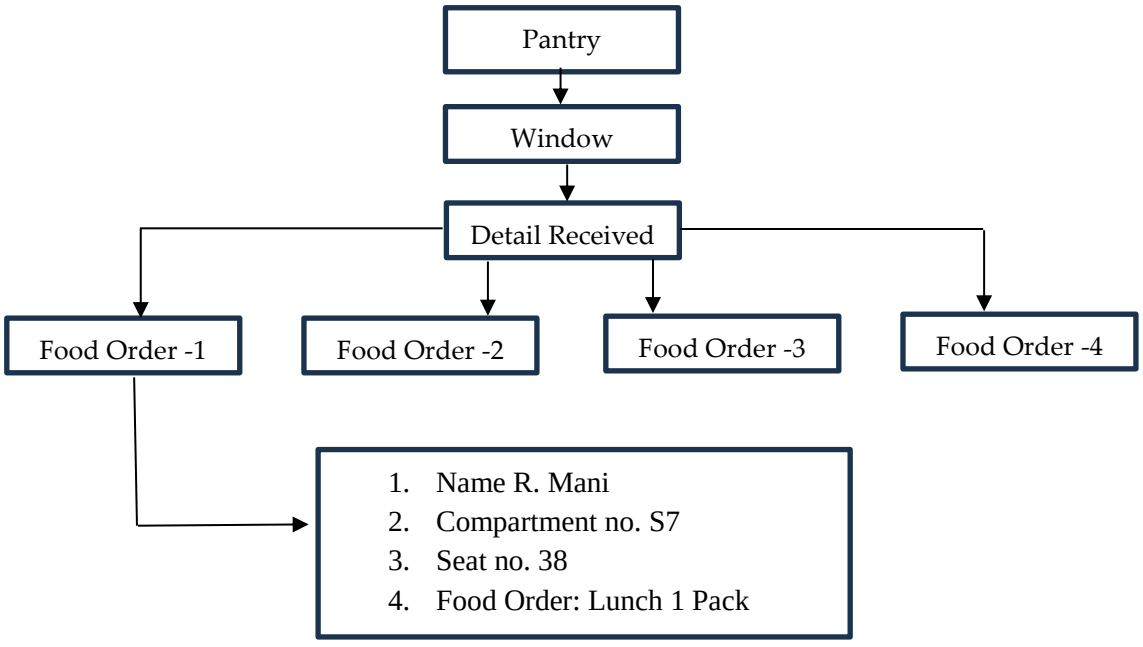

Figure 3. Receiver Side of Pantry

VI. CONCLUSION AND FUTURE ENHANCEMENT

A. Enhanced Safety

Automation systems can significantly enhance safety by continuously monitoring train operations, detecting potential hazards, and taking appropriate actions. This helps prevent accidents due to human error, signalling failures, or track obstructions, ultimately improving passenger and crew safe.

B. Accident Prevention

The automation system can stop the fire accident by implementing automatic train control methods and collision avoidance technologies. With the help of this prototype, we can put in place a safety system that prevents oxygen shortages brought on by traffic management and also protects passengers from fire incidents.

C. Reduced Energy Consumption

Automation systems can optimize train acceleration, deceleration, and speed control, leading to more efficient energy usage. This can result in reduced energy consumption, lower operating costs, and a positive environmental impact.

D. Maintenance and Diagnostics

Automation systems can incorporate condition monitoring and diagnostic capabilities to detect equipment faults and issues in real-time. This enables proactive maintenance, reduces downtime, and enhances the reliability of train operations.

E. Scalability and Future Adaptability

An automation system based on the 89S52 microcontroller can provide a scalable platform for future upgrades and integration of new technologies. As advancements in automation, communication, and control systems emerge, the existing infrastructure can be adapted to incorporate these innovations.

VII. REFERENCES

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