Software Requirements Specifications

for

E-PARKING CHALLAN GENERATION SYSTEM

Version 1.0 approved

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11-07-2024

Software Requirements Specification (SRS)

E-PARKING CHALLAN GENERATION SYSTEM : An innovative e-Challan system harnessing ANPR technology for automated detection, issuance, and streamlined management of traffic fines, complete with integrated online payments and instant notifications.

- Task 1 : Detection and identification of traffic violations using ANPR(AUTOMATIC NUMBER PLATE RECOGNITION) technology.
- TASK 2 : Automated generation and management of fines (e-Challans).
- Task 3 : Integration of online payment methods.
- Task 4 : Notification of vehicle owners for prompt action.

1. Introduction

1.1 Purpose

The manual challan system was inefficient, prone to errors, and lacked transparency, making it difficult to track violations and payments. The e-Challan system addresses these issues by using ANPR technology to capture vehicle number plates, detect traffic violations, and automatically generate and send fines to vehicle owners via SMS or a mobile app, with options for online payment, reporting, and integration with court systems for unresolved cases. It ensures efficient, secure, and transparent traffic rule enforcement through comprehensive database integration, real-time monitoring, and robust user and system management features.

1.2 Product Scope

The project aims to revolutionize traffic enforcement by implementing ANPR technology for automated detection of traffic violations. It includes developing a sophisticated e-Challan system for seamless management of fines, integrating secure online payment solutions, generating comprehensive reports on violations and collections, and enhancing user engagement with intuitive notifications and interfaces. This comprehensive approach ensures efficient and user-centric traffic management, marking a significant advancement in enforcing road regulations.

2. Overall Description

2.1 Product Functions

- Detect traffic violations using ANPR technology.
- Generate e-Challans automatically upon violation detection.
- Manage and update the database of issued e-Challans.
- Provide secure login interface for user profile access.
- Facilitate online payments for e-Challans.
- Notify vehicle owners via SMS or email about issued e-Challans and payment status.

2.2 Operating Environment

- **Platforms**: Windows 7 and later versions.
- **Integration**: Google Wallet, Paytm (for payments), Dropbox (for cloud storage).

2.3 Design and Implementation Constraints

- **Interfacing**: ANPR systems, payment gateways.
- **Real-time Updates**: Database updates while allowing concurrent access.
- **User Volume**: Handling high volume of simultaneous users.
- **Memory Efficiency**: Ensuring smooth performance on standard hardware.

2.4 Assumptions and Dependencies

- **Reliability**: Reliable functioning of external services: Google Wallet, Paytm, Dropbox.
- **Connectivity**: Reliable internet connectivity for real-time data updates and notifications.
- **ANPR Technology**: Compatibility with ANPR technology for accurate detection and identification of traffic violations.
- **Compatibility**: Windows system compatibility with all software components.

3. External Interface Requirements

3.1 User Interfaces

- **Login Screens**: Interactive GUI with clear fonts, icons, and buttons.
- **Dashboard**: Displays user-specific information in a formatted manner.

- **Payment Interface**: Secure and intuitive for online payments.

3.2 Hardware Interfaces

- **Supported Devices**: Windows PCs/laptops.
- **Minimum Specifications**: i3 processor (1.7 GHz+), 2 GB RAM, standard peripherals.

3.3 Software Interfaces

- **Language**: Java.
- **Platform**: Windows 7 and later.
- **Development Tools**: NetBeans IDE, MySQL database.
- **External Services**: Integration with Dropbox, Google Wallet, Paytm.
- **ANPR Technology**: Ensure compatibility and seamless integration with ANPR systems for accurate violation detection.

3.4 Communication Interfaces

- **Protocols**: FTP, HTTP for data transfer and notifications.
- **Functionality**: Independent of specific browsers, uses direct network connections.

4. Functional Requirements

4.1 Automatic Number Plate Recognition (ANPR)

- Capture high-resolution images/videos of vehicle number plates.
- Process images using OCR for number plate information extraction.

4.2 Database Integration

- Match extracted data with a central database for vehicle and owner details.
- Maintain a history of previous violations associated with vehicles.

4.3 Violation Detection

- Monitor real-time traffic violations such as speeding and illegal parking.

- Collect evidence including images, time, location, and violation type.

4.4 E-Challan Generation

- Automatically generate e-Challans with offense details and fines.
- Secure e-Challans with digital signatures.

4.5 Notification System

- Send SMS/email alerts to vehicle owners for issued e-Challans.
- Integrate notifications and payment options into a mobile app.

4.6 Payment Gateway Integration

- Enable online fine payments via credit/debit cards, net banking, UPI, etc.
- Generate digital receipts upon successful payments.

4.7 User Management

- Admin interface to manage system settings, user roles, and permissions.
- User portal for viewing violation history, paying fines, and managing accounts.

4.8 Court Referral

- Dispatch unresolved or contested e-Challans to the court.
- Manage case statuses and outcomes effectively.

5. Nonfunctional Requirements

5.1 Performance Requirements

- **Network Speed**: Ensure high-speed internet for real-time updates.
- **Traffic Handling**: Optimize for high user traffic without performance degradation.

5.2Software Quality Attributes

- **Availability**: Easy access to download or install software.
- **Reliability**: Robust against power outages, system crashes; transactions on hold.
- **Portability**: Function seamlessly on desktops and laptops.
- **Maintainability**: Monthly software updates for smooth operation.
- **Security**: Strong security measures for user data and transactions.
- **Modifiability**: Modifiable by authorized developers for updates.
- **Safety**: Ensure data integrity and revert to stable state if compromised.
- **Flexibility**: Adaptable to changing environments and requirements.

6. Other Requirements

- **User Interface**: Effective, interactive, and appealing.
- **Compliance**: Adherence to copyright laws and regional regulations.

This SRS provides a comprehensive overview of the requirements and functionalities for the E-challan generation system. Adjustments can be made as needed based on further details or specific needs.