IS2016

System Analysis and Design Project

Software Requirement Specification

Project – E-Fine System for Police Traffic Officers

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1. Introduction

1.1 Purpose

The purpose section explains why the document exists. For the e-fine system, the purpose is to outline the requirements necessary to build a system that helps traffic police issue, manage, and track traffic fines electronically. This ensures that all stakeholders understand the goals and intended outcomes of the project.

Motor traffic offenses are the most common type of violation of regulations in Sri Lanka. Due to the heavy number of violations, there has been a heavy burden on both the Government and the Police department of Sri Lanka in regulating and thwarting such violations. So, the most convenient solution identified by the Government was to impose various types of motor traffic fines. As a country which upholds and enhances Democratic values, any punishment or a fine should be of benefit to the citizens. In the context of fining process, there should be a proper and efficient way to pay a fine for an offense. Inefficient ways in upholding regulations could in fact hinder the development of a country.

On-the-spot Motor Traffic fine is the most common type of fine in Sri Lanka. Existing procedure of fine payment would be, when Traffic Police caught a person for a motor traffic violation and if it is coming under the on-the-spot fine category, the Police will issue a fine sheet while taking that person's Driver's License into Police custody. That person has 14 days to pay the fine to any post office in Sri Lanka and then go to the relevant Police station with the receipt. Finally, the person can get the confiscated Driver's License.

Based on the above-mentioned procedure, this project focuses to design and develop a digital way to settle the fine via a Mobile platform and a payment gateway. Additionally, this project especially aims to collect and visualize all the information related to offences in a centralized database, to take strategic decisions in an effective manner, rather than doing tedious paperwork. Optionally, a demerits system can be launched to reduce points from the offender, to avoid repeated violations of regulations.

Generally, this proposed project intends to create a system that can fulfil all identified requirements under the existing system of laws and regulations of Sri Lanka. Through results and evaluations, it is evident that this proposed system can fulfil many loopholes that occur in the current manual process. Thereby, a higher productivity is achieved more efficiently.

1.2 Scope

The scope defines the boundaries of the system. It clarifies what will and won't be included in the project, such as functionalities like fine issuance, payment processing, and record management. This helps manage expectations and ensures that all stakeholders are on the same page.

1.3 Definitions, Acronyms, and Abbreviations

This section provides clear definitions of terms, acronyms, and abbreviations used throughout the document. This ensures that all readers have a common understanding of key terms and concepts.

2. Stakeholder Identification

2.1 Primary Stakeholders

Primary stakeholders are those who will be directly using the system or are most impacted by it. For an e-fine system, these include:

Traffic Police Officers: The primary users who will issue and manage fines.

Traffic Department Administrators: Those who oversee the system and ensure its smooth operation.

2.2 Secondary Stakeholders

Secondary stakeholders are those who are indirectly affected or involved. These include:

General Public (Violators): Individuals who receive fines and need to pay them.

Payment Gateway Providers: Services that facilitate the processing of payments.

IT Support Team: Personnel who maintain the system and provide technical support.

3. Requirements Gathering

3.1 Functional Requirements

These are the specific behaviors and functions the system must support.

3.1.1 User Management

Registration and Login: Users (police officers and administrators) must be able to create accounts and securely log in.

Role Management: The system should define different roles (e.g., officer, admin) with specific access rights and permissions.

This object represents the individuals who interact with the system. Different types of users include:

Traffic Police Officers: Officers who issue fines and manage violations.

Administrators: Individuals who oversee the system, manage user roles, and generate reports.

Violators (Public): Individuals who receive and pay fines.

3.1.2 Fine Issuance

The fine object represents the fines issued for traffic violations. It includes:

Fine ID: A unique identifier for each fine.

Violation Details: Information about the traffic violation (type, date, time, location).

Fine Amount: The calculated fine amount based on the violation type.

Status: Current status of the fine (issued, paid, pending).

3.1.3. Violation

This object represents a traffic violation. It includes:

Violation ID: A unique identifier for each violation.

Violation Type: The type of traffic rule violated (e.g., speeding, illegal parking).

Description: Detailed description of the violation.

Penalty Points: Points associated with the violation (if applicable).

3.1.4 Payment Processing

The payment object represents the payment details for fines. It includes:

Payment ID: A unique identifier for each payment.

Fine ID: The identifier of the fine being paid.

Amount Paid: The amount of money paid.

Payment Date: The date and time the payment was made.

Payment Method: The method used to make the payment (credit/debit card, online banking, mobile wallet).

Payment Status: Status of the payment (completed, pending, failed).

3.1.5 Notifications

This object represents the notifications sent to users. It includes:

Notification ID: A unique identifier for each notification.

Recipient: The user who receives the notification.

Message: The content of the notification.

Date Sent: The date and time the notification was sent.

Notification Type: The type of notification (e.g., fine issued, payment reminder).

3.1.6 Record Management

Database Management: Secure storage and easy retrieval of fine records.

Search and Filter: Advanced options to search and filter fine records based on different criteria.

Audit Trail: Logs of all actions performed within the system for accountability and traceability.

3.1.7 Reporting

The report object represents the various reports generated within the system. It includes:

Report ID: A unique identifier for each report.

Report Type: The type of report (daily, weekly, monthly, custom).

Generated By: The user who generated the report.

Generation Date: The date and time the report was generated.

Content: The data and statistics included in the report.

3.1.8. Role

This object represents different user roles within the system. It includes:

Role ID: A unique identifier for each role.

Role Name: The name of the role (e.g., officer, admin).

Permissions: A list of permissions associated with the role, defining what actions users with this role can perform.

3.1.9. Audit Log

The audit log object represents the logs of all actions performed within the system. It includes:

Log ID: A unique identifier for each log entry.

User ID: The identifier of the user who performed the action.

Action: The action performed (e.g., fine issued, payment processed).

Timestamp: The date and time the action was performed.

Details: Additional details about the action.

3.1.10. Configuration

This object represents the system's configuration settings. It includes:

Config ID: A unique identifier for each configuration setting.

Setting Name: The name of the setting (e.g., fine calculation rules, notification templates).

Value: The value of the setting.

3.2 Non-Functional Requirements

These describe the system's operational attributes.

3.2.1 Security

Data Encryption: Ensuring all data is encrypted both at rest (stored) and in transit (while being transmitted).

Access Control: Role-based access control to protect sensitive information and restrict access to authorized users only.

3.2.2 Performance

Scalability: The system should handle increasing numbers of users and transactions without performance degradation.

Response Time: The system should provide real-time responses to user actions to ensure efficient operation.

3.2.3 Usability

User-Friendly Interface: The interface should be intuitive and easy to navigate for users of varying technical proficiency.

Mobile Compatibility: The system should be accessible and fully functional on mobile devices for officers in the field.

3.2.4 Reliability

Uptime: The system should be highly available with minimal downtime.

Backup: Regular data backups to prevent data loss and ensure recovery in case of system failures.

3.3 Technical Requirements

These outline the technical aspects and infrastructure needs.

3.3.1 Platform

Platform: The system should be web-based with support for mobile devices.

3.3.2 Integration

Integration: Seamless integration with existing systems (e.g., traffic databases) and payment gateways.

3.3.3 Technology Stack
Technology Stack: Specifications for programming languages, frameworks, and databases that will be used to develop the system.

4. Requirement Analysis

4.1 Use Case Diagrams
Visual representations of different use cases showing interactions between users (traffic police, administrators) and the system. These diagrams help in understanding user interactions and system functionalities.

4.2 User Stories
Detailed descriptions of specific scenarios and user interactions with the system. User stories help in understanding user needs and system behavior from the user's perspective.

5. Validation

5.1 Review Sessions
Regular review sessions with stakeholders to validate and refine requirements. This ensures that the requirements align with stakeholder expectations and are feasible.

5.2 Prototyping
Creating prototypes or mock-ups of the system to gather feedback and make necessary adjustments before full-scale development. Prototyping helps in visualizing the system and identifying potential issues early.

6. Documentation

6.1 Requirement Specification Document
A comprehensive document that captures all functional and non-functional requirements in detail. This serves as a reference for developers, testers, and stakeholders throughout the project lifecycle.

6.2 User Manuals
Guides and manuals for users and administrators on how to use the system. These manuals help ensure that all users can effectively interact with the system.

7. Project Planning

7.1 Timeline
A detailed project timeline with milestones and deadlines. This helps in tracking progress and ensuring timely completion of the project.

7.2 Resource Allocation

Allocation of necessary resources including team members, budget, and tools required for the project. Proper resource allocation ensures that the project is well-supported and can proceed smoothly.

8. Approval

Sign-Off

Final approval from all stakeholders, indicating their agreement with the documented requirements and readiness to proceed with development. This ensures that everyone is on the same page and committed to the project's success.