Faculty Of Computing
Sabaragamuwa University Of Sri Lanka

Software Development Group Project
IS2106
Group - Triad

Module leader -HMKT Gunawardana

Project - Passport expiry alert System

Student Full Name	Index Number
Mohammed Imsiyan Amhar(TL)	21CIS0094
Mohammed Ali Fathima Akeela	21CIS0079
Weerathunga Arachchige Randuni Nethmini	21CIS0066

Declaration Page

We hereby certify that this project report and all the artifacts associated with it is our own work and it has not been submitted before neither is it being submitted for any other degree programs.

Date : 30/03/2024

Full Name of the Student : Mohammed Imsiyan Amhar
Registration Number : 21CIS0094
Signature : 

Full Name of the Student: Mohammed Ali Fathima Akeela
Registration Number : 21CIS0079
Signature : 

Full Name of the Student: Weerathunga Arachchige Randuni Nethmini
Registration Number : 21CIS0066
Signature : 

Abstract

This document expresses the details of System Requirement Specifications for a Passport Expiry Alert System that includes also the Sri Lankan citizens. The system is designed to enhance the passport renewal knowledge through periodic alerts via emails, when the expiry days are extremely close. It will securely call up passport data from the government database, trigger alerts when set parameters are exceeded, and give step-by-step instructions on what to do to obtain the new one.

Acknowledgement

We've achieved a significant milestone in our challenging software project. Mr. H. M. K.T Gunawardana, leading our module, and the entire team provided valuable advice and feedback that played a crucial role in shaping our project.

Our families deserve special recognition for their unwavering support and encouragement throughout the project. Their backing was instrumental in our success.

A heartfelt thanks to everyone who participated in our interviews, contributing to our project's success. The insights gathered were pivotal, particularly in enhancing the effectiveness of our Passport Expiry alert System.

Table of Content

Abbreviations table

Abbreviation	Explanation	Use
(PEAS)	Passport Expiry Alert System	The software solution is designed to notify individuals about their passport expiration dates.
(SRS)	Software Requirement Specification	a document outlining the requirements for a software project.
Email	Electronic mail	a method of exchanging digital messages over the internet.
(DBMS)	Database Management System	Software for managing databases, ensuring data integrity and security.

1. Introduction

This document shows the composition of the PEAS targeted at the Sri Lankan community. Innovative system design to deeply implement technology to provide citizens and the government with the opportunity to achieve faster services in a short time.

Travelers are often frustrated because they had to get a new passport despite the unforeseen expiry of the previous one. When people do not know their passports are close to expiring, they could become late in their applications or suffer travel inconveniences. The goal of this plan is to describe an automated PEAS to mitigate the problems.

1.1 Purpose

The primary purpose of the PEAS is to:

- **Enhance Sri Lankan citizen awareness:** Reduce the number of inconveniences faced by Sri Lankan citizens due to expiring passports.

- **Streamline passport renewal processes:** Proactively inform citizens about their approaching expiry dates, allowing them ample time to initiate the passport renewal process.

- **Improve government service delivery:** Demonstrate a citizen-focused approach by imposing technology to provide timely and essential information.

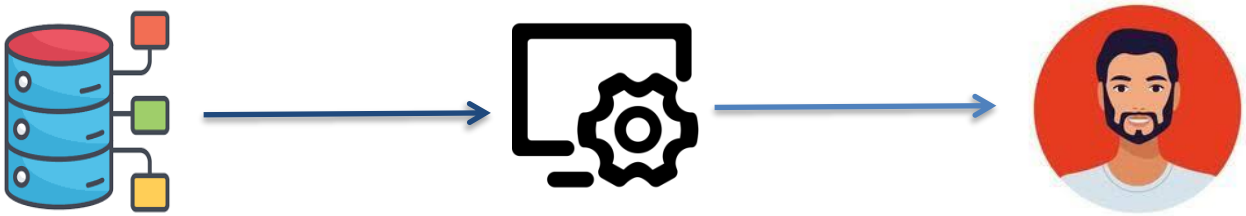
1.2 Scope

The scope of the PEAS encompasses the development of a software solution that will:

- Identify passport expiration dates accurate.
- Notify individuals about impending passport expiration through email.
- Allow customization of notification preferences.
- Maintain a secure database of passport details.
- Ensure compliance with relevant data protection regulations.
- This system will not handle passport renewal processes neither provide legal advice regarding passport expiration.

The application of the software includes enhancing individuals' awareness of their passport validity status, thereby facilitating timely renewals and preventing inconveniences associated with expired passports.

1.3 Rich Picture Diagram



Passport details Database

System

Sri Lankan Citizen

1.4 Overview

The next part of this SRS will elaborate on the details of the PEAS requirements, functions as well as constraints. Its purpose is to ensure a clearly thinking approach to the system goals, design, and policy-making procedure.

2. General Description

2.1 Product Perspective

- Target Users: The PEAS is designed for citizens of Sri Lanka who hold passports. This may be further segmented by age or professions most likely to travel internationally.

2.2 Product Functions

- The following functions fall under the main functions,
    - Securely accessing passport expiry data from the Sri Lankan government database.
    - Identifying citizens with passports nearing expiry based on predefined thresholds (e.g., 2 months before expiry).
    - Informing users through email two months before.
    - Delivering clear and concise alerts containing,
        - Citizen's name
        - Passport number
        - Current expiry date
        - Instructions for passport renewal process (link or phone number)
    - Allowing users to manage their communication channel preferences.

2.3 User Characteristics

- The system serves a diverse range of users with varying technical skills.
- The design should consider users with disabilities to ensure accessibility.

2.4 General Constraints

- The system adheres to strict data security regulations to protect sensitive passport information.
- Performance is important to ensure timely delivery of alerts, especially for a large number of user base.
- The system should be scalable to accommodate future growths in the number of users.

2.5 Assumptions and Dependencies

- The system relies on the availability and continued functionality of the Sri Lankan government's passport database and communication channels.
- Reliable internet connectivity is compulsory for email notifications and system operations.
- User consent is require for collecting and using data for sending alerts.

3. Specific Requirements

3.1 External Interface Requirements

The PEAS interacts with various external systems and users. Here's a breakdown of the interface requirements.

3.1.1 User Interfaces (UI)

- UI-1: Citizen Portal/Mobile App: A user interface (web portal) may be developed for users to,
    - View upcoming passport expiry information.
    - Manage communication though email.
    - Access passport renewal resources (link to relevant website or phone number).
- UI-2: System Administration Interface: An administration interface will be require for authorized personal to:
    - Manage system configurations (thresholds, alert content).
    - Monitor system performance and alerts delivery.
    - Generate reports on user activity and system health.

3.1.2 Hardware Interfaces (HI)

- HI-1: While technically software, a dedicated email server acts as hardware appliance in many cases. If the system do not leverage an existing enterprise email server and needs to handle email delivery itself, then the email server software running on physical machine or virtual server could be considered a hardware interface.

3.1.3 Software Interfaces (SI)

- SI-1: Government Database Interface: The system will require an exclusive software interface for the access of the passport expiry information from the Sri Lankan government database. This interface must conform to suitable security protocols and data access directives.

3.1.4 Communications Interfaces (CI)

- CI-1: Email Server: The system will utilize a software interface with an email server to send email alerts to user,This interface should ensure secure transmission and delivery of emails.

3.2 Functional Requirements

3.2.1 Introduction

This section details the functional requirements of the PEAS, outlining its inputs, processing logic, outputs, and error handling mechanisms.

3.2.2 Inputs

- IN-1: System Configuration: The system will receive pre-defined configurations including,
    - Alert threshold (e.g., number of months before expiry to trigger).
    - Alert content template for email notifications (including placeholders for dynamic data).
    - User communication channel (Email).
- IN-2: Passport Expiry Data: The system will securely access passport expiry data from the government database. data included:
    - Citizen's name
    - Passport number
    - Expiry date

3.2.3 Processing

- The system will periodically retrieve passport expiry data from the government database (e.g. daily).
- It will identify citizens with passports expiring within the predefined threshold (e.g., 2 months).
- Based on user preferences, the system will generate personalized alerts for each identified citizen.
- The alert content will be populated with dynamic data from the retrieved information (name, passport number, expiry date) using the configured template.
- The system will trigger notifications through the communication channel (email server).

3.2.4 Outputs

- OUT-1: Alert Notifications: The system will deliver personalized email to users based on their preferences. The alerts will include,
    - Citizen's name
    - Passport number
    - Current expiry date
    - Clear instructions for passport renewal process (link or phone number)

3.2.5 Error Handling

The system will implement robust error handling mechanisms to address potential issues:

- Database Connectivity Errors: If the system encounters issues connecting to the government database, it will log the error and retry after a defined interval. Additionally, alerts might be sent to system administrators for notification.
- Communication Failure: In case of email delivery failures, the system will log the error details and attempt to resend the notification after a set delay. Users may also receive a notification informing them of a temporary delivery issue.
- Invalid Data: If the retrieved passport data appears corrupt or incomplete, the system will log the error and potentially exclude the affected record from processing. Further investigation might be required to identify the source of the invalid data.

3.3 Non-Functional Requirements

3.3.1 Performance

- PR-1: Alert Delivery Timeliness: The system shall deliver alerts to users within a specified time frame (e.g., within 24 hours) after identifying an expiring passport.
- PR-2: System Response Time: The system shall respond to user interactions (e.g., on the administration interface) promptly (e.g., within 2 seconds).
- PR-3: Scalability: The system shall be scalable to accommodate a growing user base and increased alert volume without significant performance degradation.

3.3.2 Reliability

- RE-1: System Uptime: The system shall maintain a high degree of uptime to ensure consistent delivery of alerts.
- RE-2: Data Consistency: The system shall ensure the accuracy and consistency of retrieved passport expiry data.

3.3.3 Availability

- Alert Accessibility: Alerts shall be accessible to users through their Email.

3.3.4 Security

- SE-1: Data Security: The system shall implement robust security measures to protect sensitive passport data throughout its life cycle including,
    - Secure communication protocols for data access from the government database.
    - Encryption of sensitive data at rest and in transit.
    - User authentication and authorization for accessing the system administration interface.

- SE-2: Penetration Testing: The system shall undergo regular penetration testing to identify and address potential security vulnerabilities.

3.3.5 Maintainability

- MA-1: Modular Design: The system would be designed with a modular architecture for ease of maintenance and future enhancement.
- MA-2: Documentation: Complete documentation shall be provided for the system, include user manuals code documentation, and system configuration guides.

3.3.6 Portability

This portability, which is referred to as the ability to run on different platforms, is not probably the major concern for the given functionality. The environment such as a particular server infrastructure and won't be portable to different kinds of operating systems or hardware platforms.

3.4 Inverse Requirements

Inverse requirements define what the system should not do. Here are examples for the PEAS:

- IR-1: User Spam: The system shall not send excessive or unwanted alerts to users. Users should only receive alerts related to their own expiring passports.
- IR-2: Data Sharing: The system shall not share user data (names, passport information) with any third-party entities beyond this authorized for passport renewal processes.
- IR-3: False Alarms: The system shall not generate alerts for passports that are already expired or been renewed. Mechanisms may be implemented to remove processed records from future iterations.

3.5 Logical Database Requirements

The logical database design focuses on the data entities and their relationships without specify the physical storage implementation. Here is a breakdown for the system:

- Entities:
    - Citizen: (Citizen ID, Name, Email, Phone Number)
    - Passport: (Citizen ID, Passport Number, Expiry Date)
- Relationships:
    - One Citizen can have one Passport (identified by Citizen ID).

3.6 Other Requirements

- OR-1: Internationalization: If the system needs to support multiple languages for user interfaces and alerts, internationalization requirements should be defined. This may involve storing language preferences for users and designing the system to dynamically adapt content based on the chosen language.
- OR-2: User Feedback Mechanism: A mechanism for users to provide feedback on the system (e.g., reporting issues, suggesting improvements) could be implemented. This might involve a feedback form or email address for user inquiries.

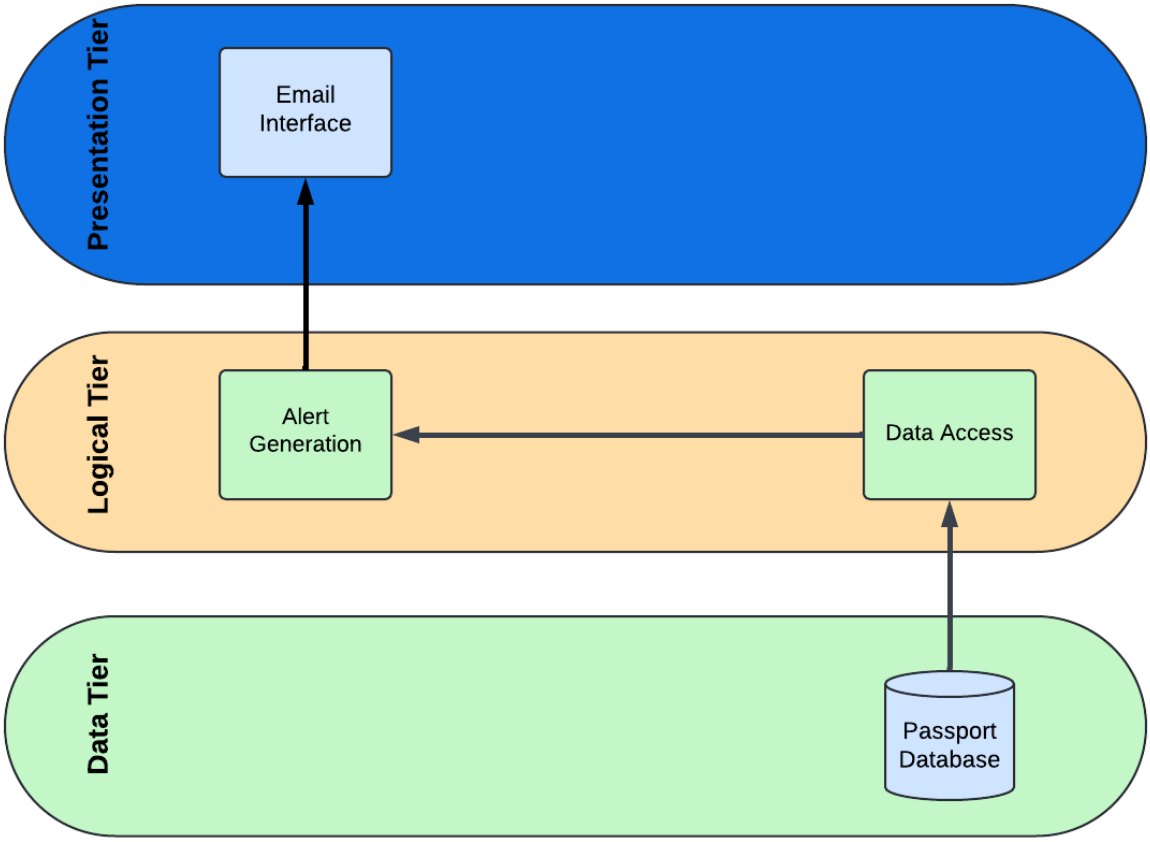
4 System Architecture & Design

This subsection will pinpoint the functional blueprint of the PEAS components to communicate with each other to bring about the set functionality that the system has been designed to do.

4.1 Chapter Overview

This chapter looks into the technicalities behind this system so as to explore its architecture and design. Here, we aim to clear up the system architecture, the interaction dynamics of its parts, and the technological elements that drive it. This part acts as a guide for the developers and architectures of the system in order for them to have an idea on the system building process and what will be the system’s functionalities.

4.2 System Architecture Design



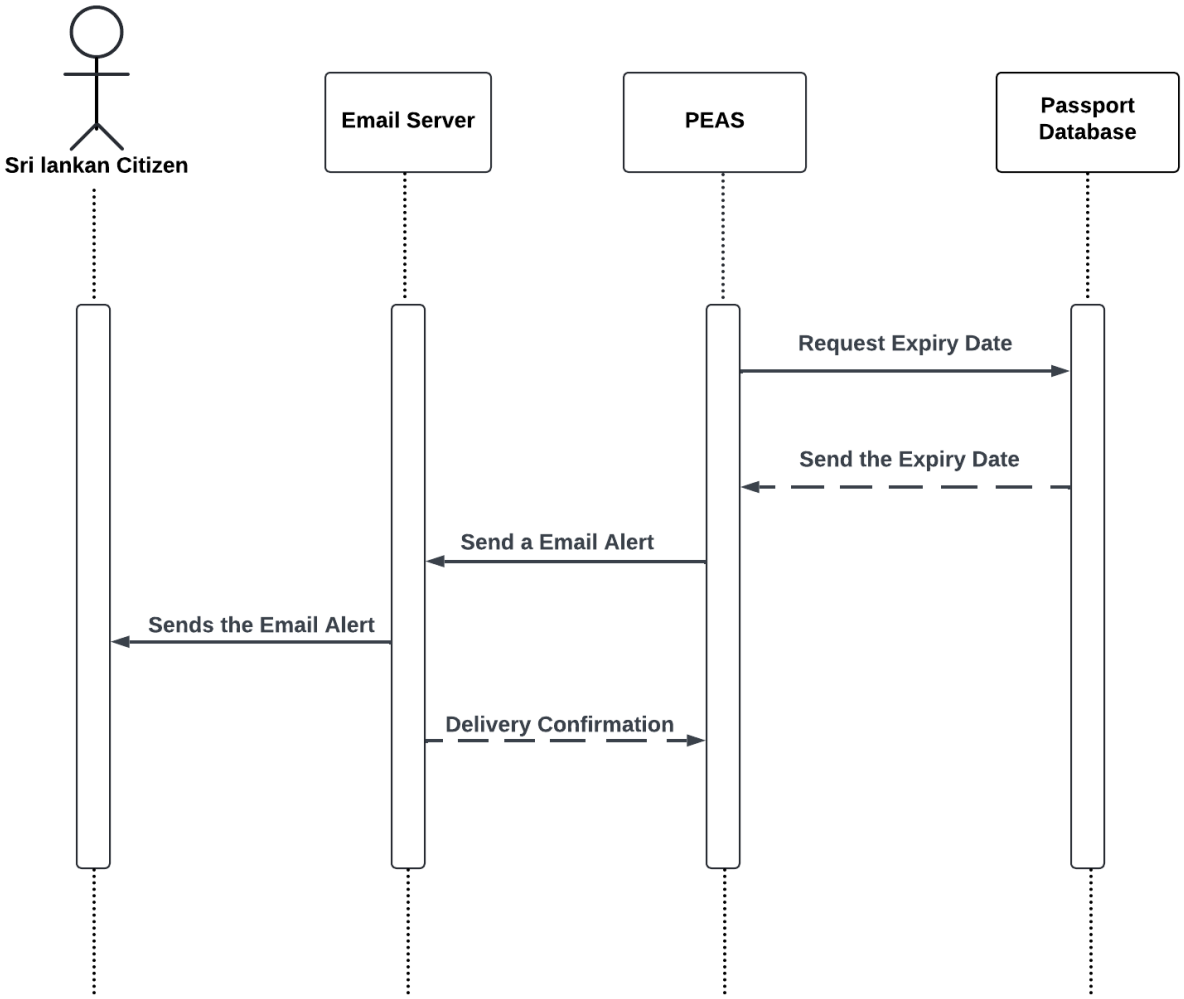
The PEAS will make use of a three-layer architecture for modularity and scalability. The tier of presentation will be composed of admin interface (Email) and web technologies such as HTML and JavaScript frameworks. The logic level, written with languages such as Python or Java, will perform the core functionality like data access and alert generation. The data tier will store and handle the information, primarily communicating with the passport database. This division of duties improves the achievability of independent development, maintainability, and operational efficiency.

4.3 System Design

Designing systems involves creating different parts like modules, architecture, elements, and their connections, while also organizing the system's data based on specified needs. It's about figuring out and crafting systems that fulfill the specific goals and expectations of a company or organization. We represent Sequence Diagrams for better understanding.

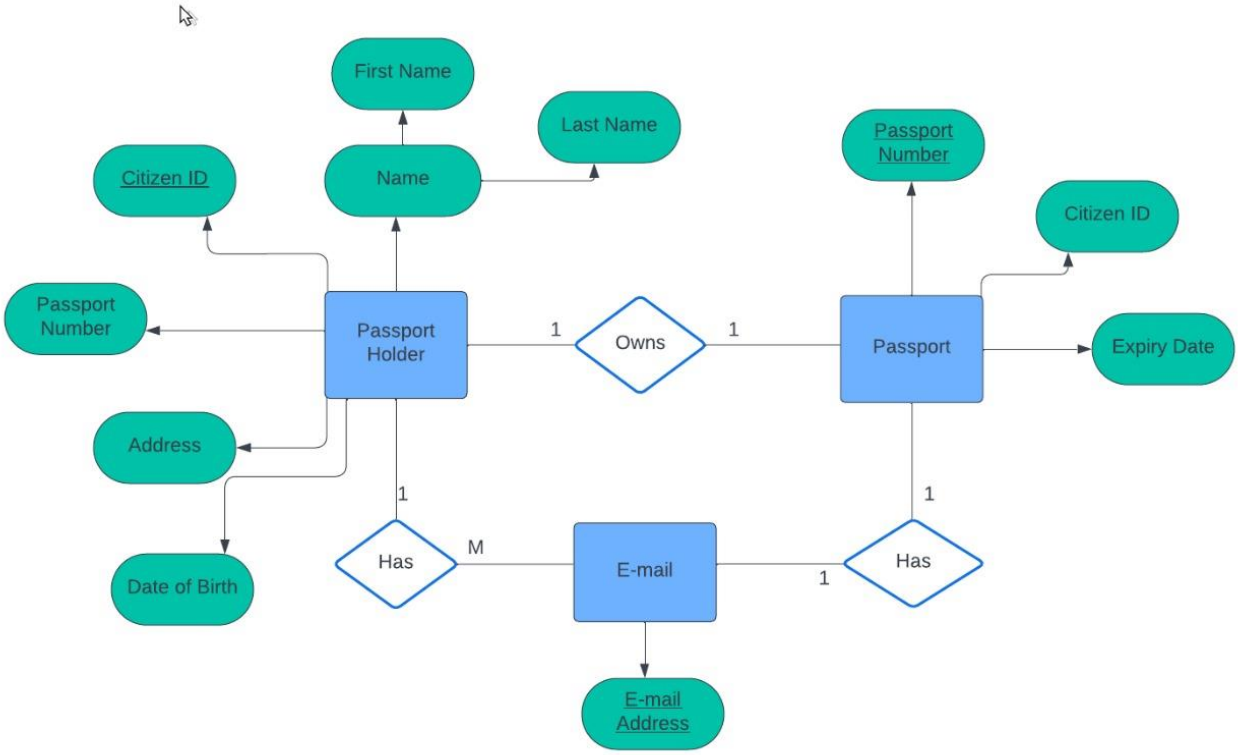
4.3.1 Sequence Diagram

This paragraph describes a Unified Modeling Language sequence diagram as a visual tool depicting the chronological relationships among objects in a system and illustrating the sequence of communication. Objects are represented as vertical lines (Lifelines), and communication is shown through horizontal lines, detailing the order and timing of messages.



4.3.1 Entity Relationship Diagram

The Entity Relationship model could be the next level of detail in data tier design for the Passport Expiry Alert System. This image schematic would be representing the system with entities Citizen, Passport and Email. The ER diagram will also reflect the connections between these entities, such as a one-to-one relationship where a Citizen can have one Passport assigned to them. This visualization supports the formation of the data model and the way data will be stored and managed inside the system.



5 References

- “Applications.” https://www.immigration.gov.lk/pages_e.php?id=24
- “General information on passports,” Aug. 15, 2015. https://www.immigration.gov.lk/pages_e.php?id=7
- “Employees Passport Expiry date alert,” *Manager Forum*, Apr. 18, 2020. https://forum.manager.io/t/employees-passport-expiry-date-alert/27827