திருவள்ளுவர் பல்கலைக்கழகம்

THIRUVALLUVAR UNIVERSITY

(State University Accredited with "B+" Grade by NAAC)

Serkkadu, Vellore - 632 115, Tamil Nadu, India.

ENFORCEMENT DIRECTORATE

Project Report Submitted to Loyola College, Vettavalam for the
Partial Fulfilment for the Award of the Degree of

BACHELOR OF SCIENCE IN COMPUTER SCIENCE

by

D. PARASURAMAN [23021U18028]

UNDER THE GUIDANCE OF

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DEPARTMENT OF COMPUTER SCIENCE

LOYOLA COLLEGE,

(Accredited with B+ by NAAC,

Affiliated to the Thiruvalluvar University)

Vettavalam-606 754, Tiruvannamalai.

March / April 2023 – 2024

BONAFIDE CERTIFICATE

Certified that this project report titled "**ENFORCEMENT DIRECTORATE**" is the bonafide work of Mr. Parasuraman D. who carried out under my supervision and guidance. Certified further, that to the best of my knowledge, the work reposted herein does not form part of any other project report or dissertation on the basic of which a degree or award was conferred on an earlier occasion on this or any other candidate

Mrs. A. MARY ASHA M.Sc., M.Phil.,

Asst Professor, Department of Computer Science

Internal Guide

Mr. N. KIRUBAKARAN M.Sc., M.Phil., [Ph.D.]

Asst Professor & HOD

Head of the Department

Submitted to the Viva Voice Examination held on **22-03-2024**

INTERNAL EXAMINER

EXTERNAL EXAMINER

DECLARATION

I hereby declare that this project work titled "Enforcement Directorate" Submitted to Loyola College, Vettavalam (Affiliated to Thiruvalluvar University), In partial fulfilment of the requirements for the award of the degree of Bachelor of Computer Science is a record of original work done by me under the guidance of Prof **Mrs. A. MARY ASHA M.Sc., M.Phil.,** Department of Computer Science, Loyola College Vettavalam, and this project work has not formed the basis for the award of any Degree/Diploma-/associate ship/fellowship or similar title to any candidate of any other university

D.Parasuraman

(Parasuraman D)

Place: vettavalam

Date: 22-03-2024

ACKNOWLEDGEMENT

I thank the almighty God for giving me physical mental strength and the ability to effectively complete this project.

I take this opportunity to express my deep sense of gratitude and respectful regards to out superior to our superior **Rev. Fr. C. Marianathan, S.J**. honourable secretary & correspondent **Rev. Fr. Dr. A. Ignacy Arockiasamy**, S.J., for various facilities provide to me. I dedicated my sincere thanks on this occasion to our respected Principal **Rev. Fr. Dr. S. Basil Xavier, S.J**.

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D. PARASURAMAN [23021U18028]

TABLE OF CONTENTS

CHAPTER-I

1.1 PROBLEM DESCRIPTION AND NEED OF THE PROJECT

The Directorate of Enforcement (Ed) Is A Domestic Law Enforcement Agency And Economic Intelligence Agency Responsible For Enforcing Economic Laws And Fighting Economic Crime In India. It Is Part of The Department of Revenue, Ministry of Finance, Government Of India.

The Enforcement Directorate Focuses on Investigating and Prosecuting Cases Related to Money Laundering, Foreign Exchange Violations, And Economic Offenses. Its Primary Objective Is to Curb the Generation and Circulation of Black Money and To Ensure Compliance With The Laws Concerning Foreign Exchange And Prevention Of Money Laundering.

The Origin Of The Ed Goes Back To 1 May 1956, When An "Enforcement Unit" Was Formed, Within The Department Of Economic Affairs, For Handling Exchange Control Laws Violations Under The Foreign Exchange Regulation Act, 1947.

In 1957, The Unit Was Renamed as The Enforcement Directorate. Main Laws in Ed Foreign Exchange Management Act, 1999 (FEMA), Prevention of Money Laundering Act, 2002 (PMLA), Fugitive Economic Offenders Act, 2018 (FEOA), Conservation Of Foreign Exchange And Prevention Of Smuggling Activities Act, 1974 (COFEPOSA).

The Existing System Is After Getting Information Through the Informer, They Took Action So That Some Money Transaction Are Not Know, Because the Informer Does Not Know The Secret Transaction

The Proposed Ed Website Can Monitor or Record Every Transaction If the Transaction Have Any Illegal Transaction Ed Take Action Against the Person.

finally, The Web Does Not Miss Any Illegal Transaction So the Accused Does Not Escape, Also It Report the Officer Profile at The Time of Transaction, So It Does Not Take The More Time To Know The Info About Transaction

CHAPTER-II

2.1 INTRODUCTION

The full form of ED is Enforcement Directorate. It is also known as the Directorate of Enforcement. It was set up in the year 1956. Basically, Enforcement Directorate (ED) is an economic intelligence organization that defends against financial crimes as well as laws of economics in the nation.

The Directorate of Enforcement has the responsibility of enforcing the FEMA (Foreign Exchange Management Act) Act of 1999, and it is also responsible for enforcement of certain provisions that fall under the Money Laundering Prevention Act. Investigation-related work and many prosecution cases that come under the PML have been entrusted or passed on to the Directorate of Enforcement.

The Directorate of Enforcement comes under the administrative control of the revenue department and Finance Ministry of the Government of India. The revenue department of India has control over ED only for operational purposes. The headquarter of the Directorate of Enforcement is located in New Delhi, but it also has many regional offices all across PAN India.

Enforcement Unit of India was formed back then to handle the violations of Exchange control laws acting under the Foreign Exchange Regulation Act (FERA Act) of 1947.

If we start tracking back the origin of the Enforcement Directorate, we have to go back to May 1st, 1956. On May 1st, 1956, the 'Enforcement Unit of India' was formed under the Department of Economic Affairs.

The enforcement Unit was headed by the chairmanship of the director of Enforcement, who is a legal service officer, and assisted by a legal officer on deputation of the Reserve Bank of India (RBI).

CHAPTER-III

3.1 PROJECT ANALYSIS

Analysing a project for the Enforcement Directorate (ED) in India involves several key steps aimed at evaluating its feasibility, impact, and potential challenges. Here's a structured approach to conducting a project analysis for the Enforcement Directorate:

3.1.1 Project Identification:

it could be aimed at improving enforcement mechanisms, enhancing investigative capabilities, or tackling financial crimes. Determine the scope of the project, including the geographical area or sectors it will cover.

3.1.2 Stakeholder Analysis:

stakeholders, government agencies, law enforcement bodies, financial institutions, legal experts, and the public. Assess their interests, influence, and potential contributions to the project.

3.1.3 Risk Assessment:

potential risks and challenges associated with the project, including legal, operational, financial, and reputational risks. Evaluate the likelihood and impact of each risk and develop mitigation strategies accordingly.

3.1.4 Legal and Regulatory Framework:

Ensure compliance with relevant laws, regulations, and international standards governing financial investigations and enforcement actions. Identify any legal constraints or limitations that may affect the project's implementation.

3.1.5 Resource Assessment:

Evaluate the human, financial, and technological resources required to execute the project effectively. Determine whether the Directorate has adequate resources internally or if partnerships with other agencies or organizations are necessary.

3.1.6 Technology Infrastructure:

Assess the existing technology infrastructure and determine if upgrades or new systems are needed to support the project's objectives. Consider technologies such as data analytics, artificial intelligence, and digital forensics to enhance investigative capabilities.

3.1.7 Capacity Building:

Evaluate the training needs of ED personnel to ensure they have the necessary skills and expertise to carry out the project. Develop training programs or partnerships with training institutions to address any skill gaps.

3.2 LITERATURE SURVEY

A comprehensive literature review underscores the multifaceted nature of enhancing enforcement mechanisms within the Enforcement Directorate (ED) of India. Scholars highlight the indispensable role of a robust legal framework, emphasizing the necessity of laws such as the Prevention of Money Laundering Act (PMLA) and the Foreign Exchange Management Act (FEMA) to fortify the ED's regulatory apparatus and facilitate effective enforcement (Ranjan, 2019; Choudhury, 2017).

The Enforcement Directorate (ED) plays a crucial role in combating financial crimes and ensuring compliance with economic laws in India. To effectively enhance enforcement mechanisms, it is essential to review existing systems and processes while drawing insights from relevant literature. This literature survey aims to provide a comprehensive overview of scholarly works, reports, and case studies pertinent to the objectives of the Enforcement Directorate project.

Moreover, recent studies accentuate the transformative potential of technology in bolstering the ED's investigative prowess, with advancements in data analytics, artificial intelligence, and blockchain technology emerging as potent tools in combatting financial crimes (Agarwal et al., 2020; Singh & Kapoor, 2021).

Concurrently, there is a growing recognition of the imperative for continuous capacity building and specialized training to equip ED personnel with the requisite expertise in forensic accounting, cyber forensics, and financial intelligence analysis, essential for navigating the intricacies of modern financial investigations (Ahmed & Manral, 2018; Sood & Bharadwaj, 2019).

Furthermore, insights gleaned from successful international cooperation frameworks and emerging trends in financial crimes offer valuable lessons for the ED, underscoring the importance of forging strategic partnerships and adopting adaptive strategies to combat the evolving landscape of illicit financial activities (Prakash, 2020; Verma & Sharma, 2021).

Importantly, fostering stakeholder engagement and public awareness emerges as a linchpin for ensuring transparency, accountability, and public trust in the ED's enforcement endeavors, highlighting the indispensable role of effective communication and collaboration in fostering a conducive ecosystem for combating financial crimes (Mishra & Roy, 2018).

3.3 SOFTER AND HARDWAR REQUIRNMENT

Software Requirements:

Operating System	: Windows 10.
Language	: Java [spring-boot], Angular.
Technologies	: Visual Studio, Intellij Idea.
Database	: MySQL

Hardware Requirements:

Processor	: intel 3
Ram	: 1 GB
Hard Disk	: 10 GB
Compact Disk	: 500 Mb
Input Device	: Standard Keyboard and Mouse
Output Device	: High Resolution Monitor

CHAPTER IV

4.1 PROJECT DESIGN STAGES

Designing a project for the Enforcement Directorate (ED) in India requires a structured approach encompassing several key stages aimed at outlining the project's objectives, scope, methodology, and implementation plan. Below are the essential stages involved in designing a project for the ED:

4.1.1 Scope Definition and Stakeholder Analysis:

Conduct a stakeholder analysis to identify relevant stakeholders, such as government agencies, law enforcement bodies, financial institutions, legal experts, and civil society organizations.

4.1.2 Research and Data Collection:

Gather relevant data, information, and research findings related to the project's objectives, including existing legal frameworks, enforcement mechanisms, technological solutions, and best practices.

4.1.3 Strategy Development and Methodology Design:

Develop a strategic plan outlining the approach, methodology, and activities required to achieve the project's objectives. Determine the specific strategies and tactics to be employed, such as capacity building initiatives, technology adoption, regulatory reforms, or partnership development.

4.1.4 Resource Planning and Budgeting:

Identify the human, financial, and technological resources required to execute the project effectively. Develop a detailed budget, allocating resources based on project priorities, timelines, and expected outcomes.

4.1.5 Risk Assessment and Mitigation:

Conduct a risk assessment to identify potential risks, challenges, and obstacles that may impact the project's success. Develop risk mitigation strategies and contingency plans to address identified risks and ensure project resilience.

4.1.6 Monitoring and Evaluation Framework:

Establish a monitoring and evaluation framework comprising key performance indicators (KPIs) to track the project's progress and impact.

4.1.7 Partnership Development and Collaboration:

Identify potential partners and collaborators, including government agencies, international organizations, academia, and the private sector. Foster collaboration and coordination among stakeholders to leverage complementary strengths, resources, and expertise.

4.2 MODULES DESCRIPTION

4.2.1 Ed-User:

The Ed-User module is designed to cater to the needs of users interacting with the Enforcement Directorate (ED) system. It provides functionalities for users to access relevant information, submit complaints or queries, and track the progress of their cases. The module offers a user-friendly interface with features such as registration, login authentication, and personalized dashboards to enhance user experience and facilitate seamless communication between the ED users.

4.2.2 Ed-Officer:

The Ed-Officer module serves as a comprehensive tool for enforcement officers within the Enforcement Directorate. It includes functionalities tailored to their specific roles and responsibilities, such as case management, evidence collection, investigation tracking, and report generation. The module is designed to streamline workflow processes, improve operational efficiency, and ensure compliance with regulatory requirements.

4.2.3 Ed-Admin:

The Ed-Admin module is a centralized administrative interface responsible for managing the overall functioning of the Enforcement Directorate system. It encompasses functionalities for user management, role-based access control, system configuration, and data administration. The module enables administrators to define user roles, assign permissions, configure system settings, and generate reports for monitoring and evaluation purposes

4.2.4 Ed-Credential:

It includes functionalities for user credential management, password policies, multi-factor authentication, and session management. The module employs robust security measures to safeguard sensitive user information and prevent unauthorized access to the system. By enforcing stringent authentication mechanisms, it helps enhance data security, privacy, and compliance with regulatory standards.

4.2.5 Ed-Payment:

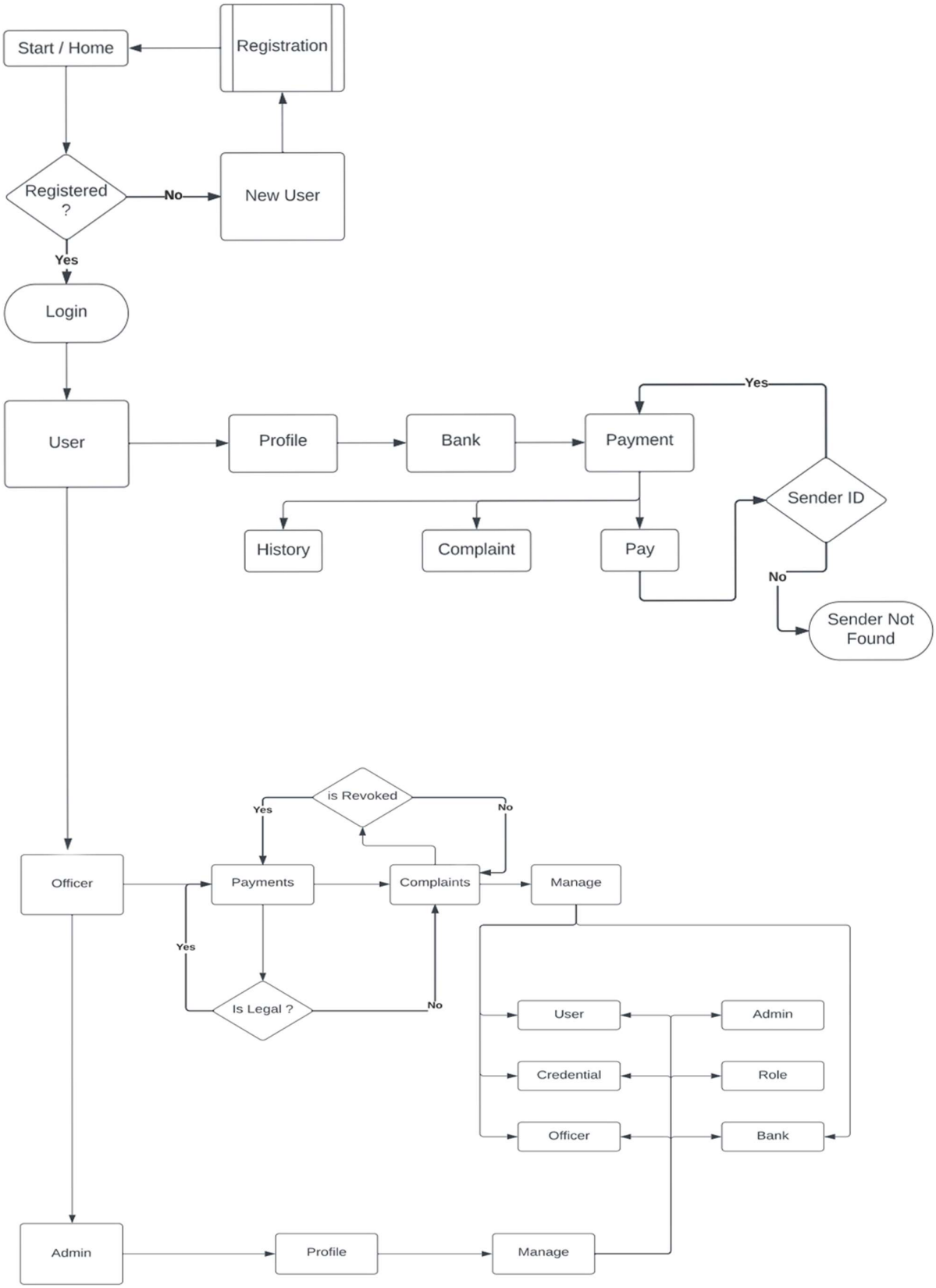
The Ed-Payment module facilitates secure and efficient payment processing for transactions related to fines, penalties, fees, or other financial obligations imposed by the Enforcement Directorate. It integrates with payment gateways and financial institutions to enable users to make online payments conveniently. The module supports various payment methods, including credit/debit cards, net banking, and digital wallets, while ensuring compliance with relevant financial regulations and data protection standards.

4.2.6 Ed-Bank:

The Ed-Bank module serves as a centralized repository for managing financial data and transactions within the Enforcement Directorate system. It includes functionalities for bank account management, fund allocation, budget tracking, and financial reporting. The module integrates with banking systems and financial management tools to facilitate seamless fund transfers, reconciliation, and monitoring of financial activities.

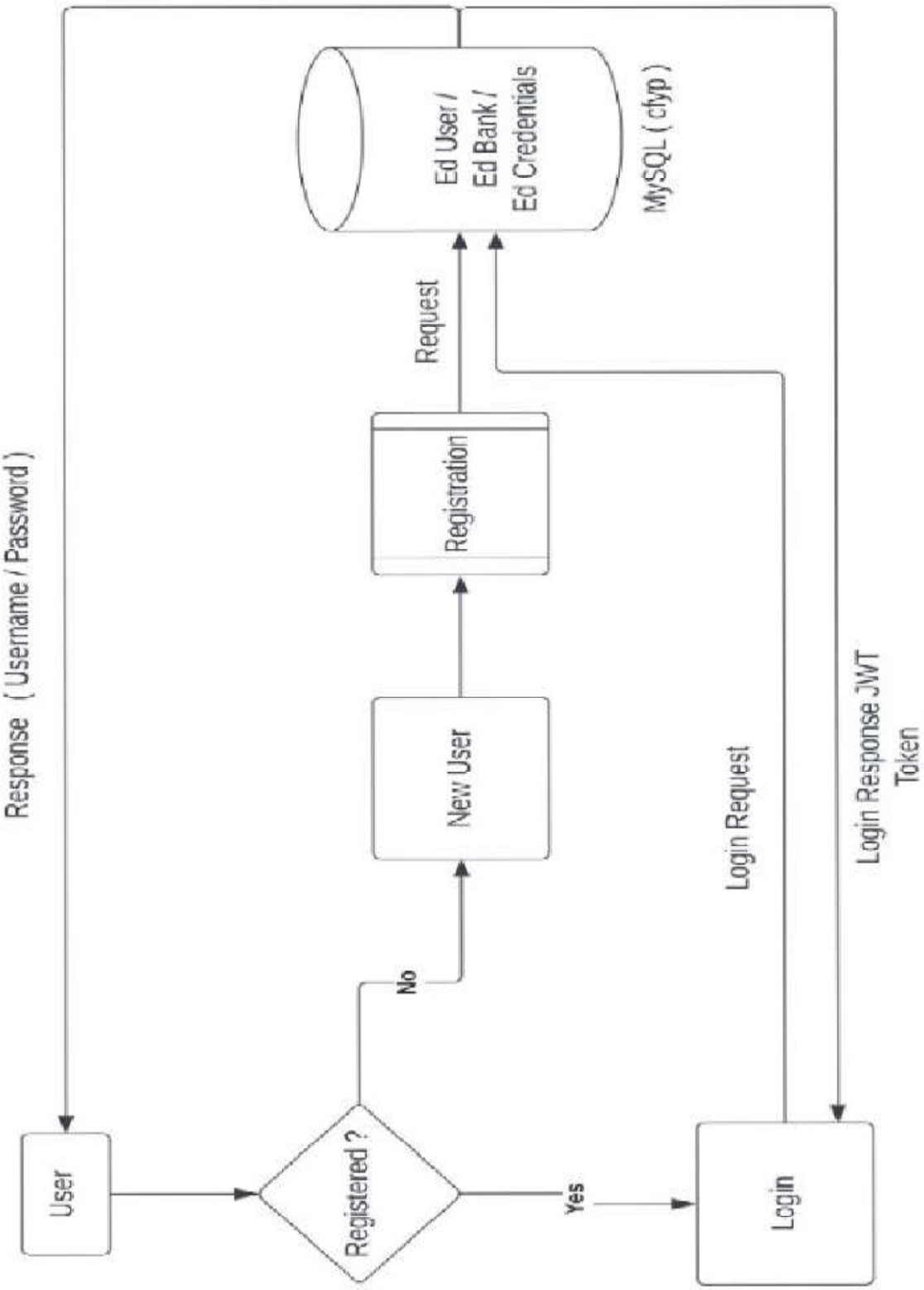
4.3 UNIFIED MODELING LANGUAGE DIAGRAM

4.3.1 System Flow Diagram

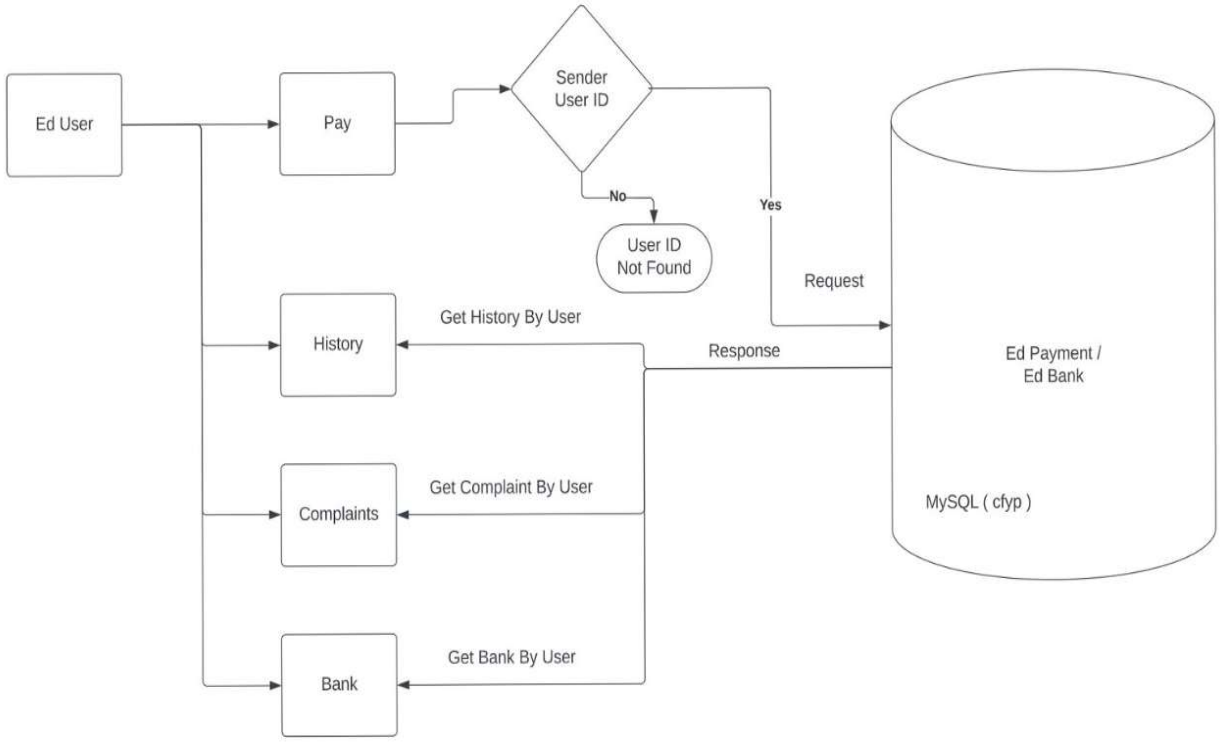


4.3.2 DATA FLOW DIAGRAM

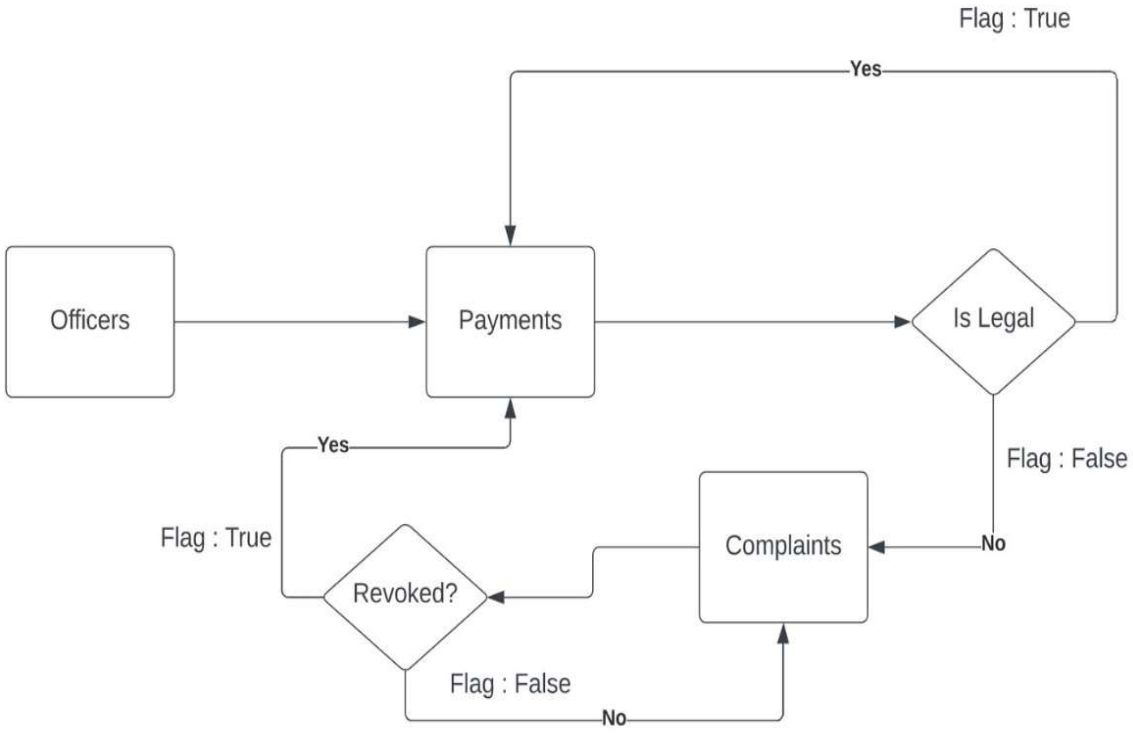
Level 0



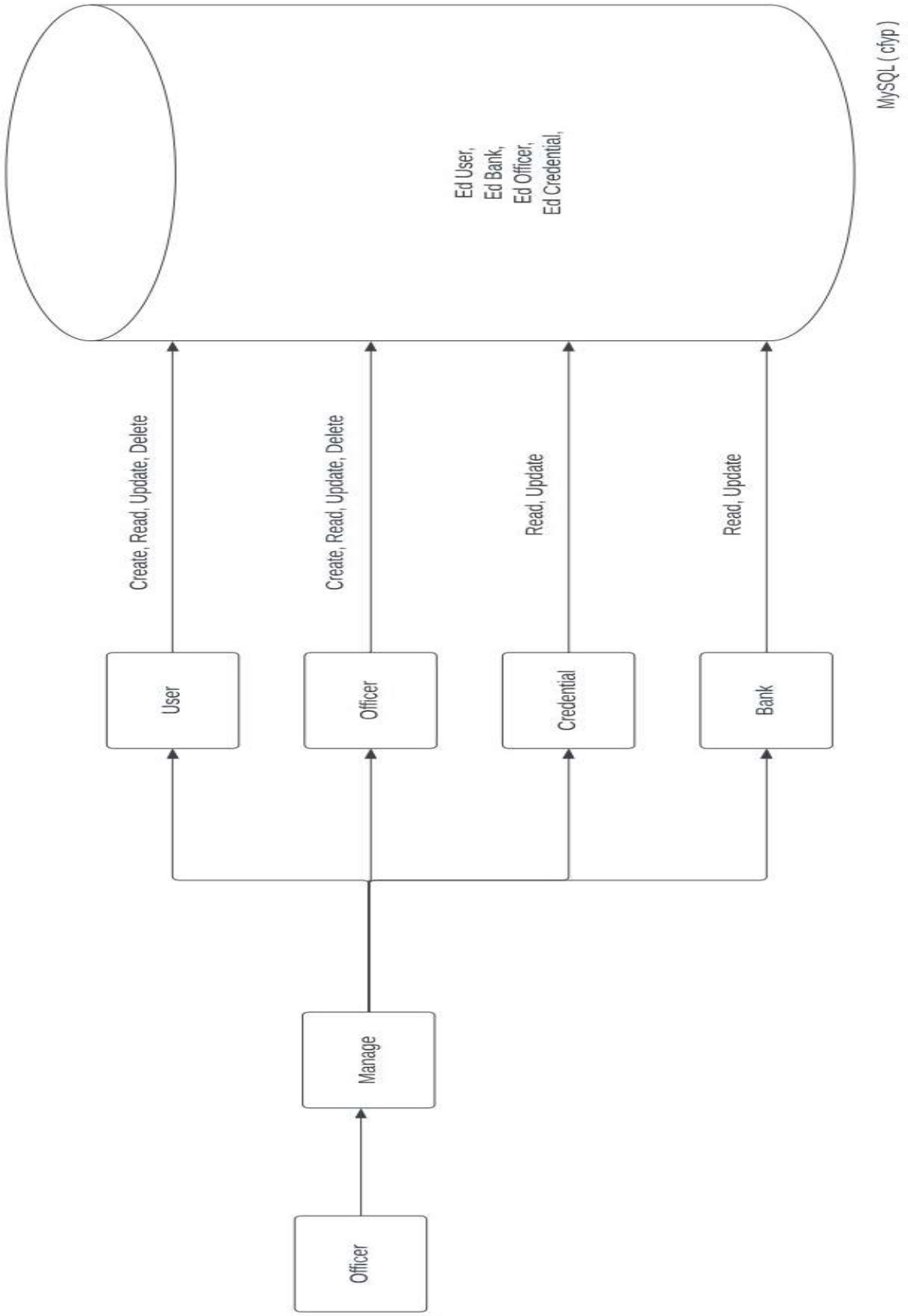
level 1



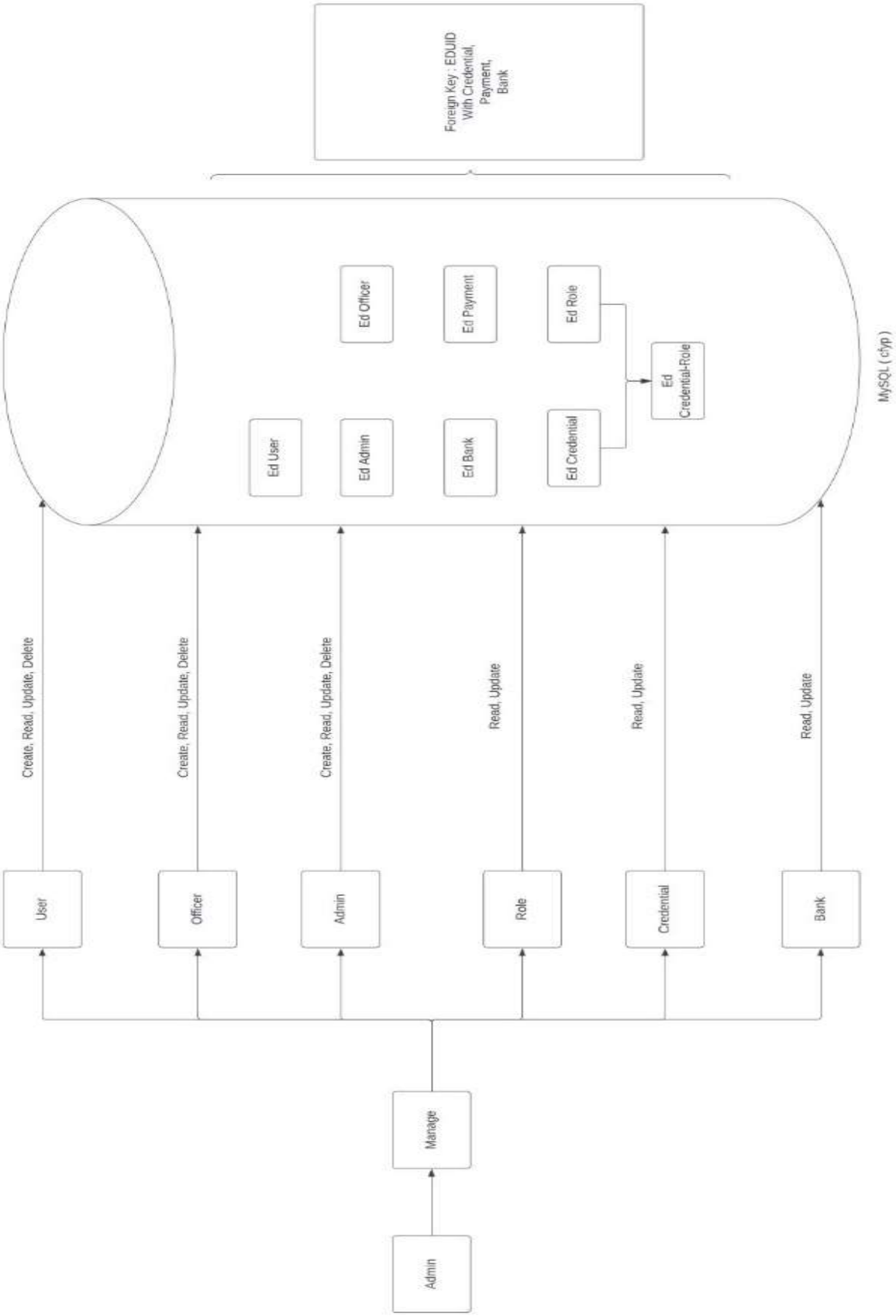
level 2.1



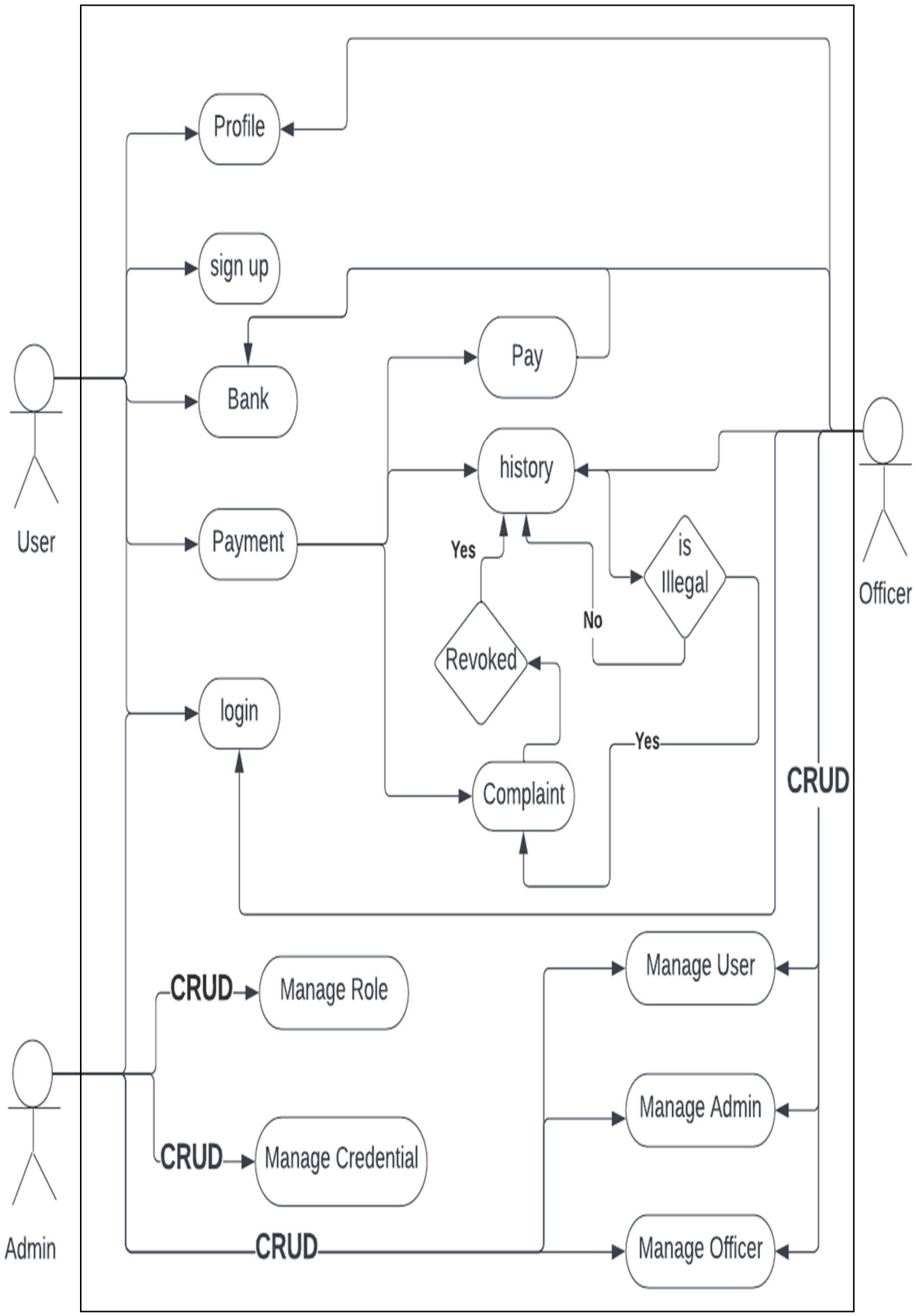
Level 2.2


MySQL (cfyp)
Ed User,
Ed Bank,
Ed Officer,
Ed Credential,
Create, Read, Update, Delete
Create, Read, Update, Delete
Read, Update
Read, Update
User
Officer
Credential
Bank
Manage
Officer

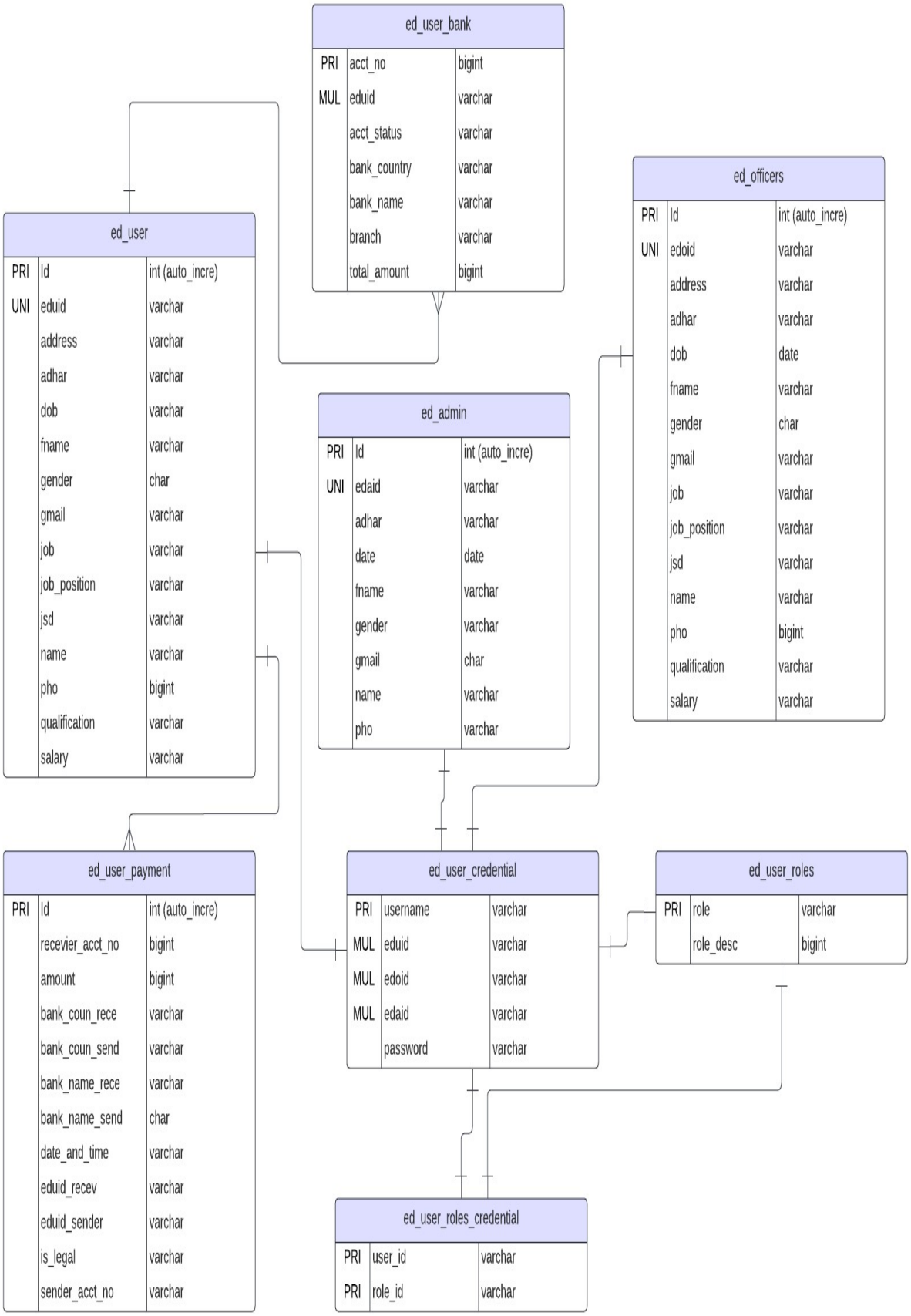
level 3


Foreign Key : EDUID
With Credential,
Payment,
Bank
MySQL (cfyp)
Ed User
Ed Admin
Ed Officer
Ed Bank
Ed Payment
Ed Credential
Ed Role
Ed Credential-Role
Create, Read, Update, Delete
Create, Read, Update, Delete
Create, Read, Update, Delete
Read, Update
Read, Update
Read, Update
User
Officer
Admin
Role
Credential
Bank
Manage
Admin

4.3.3 Use Case Diagram



4.3.4 Entity Relationship Diagram



CHAPTER-V

5.1 IMPLEMENTATION STAGES OF PROJECT

5.1.1 Back End Module Descrbtion

5.1.1.1 Java:

Java is a object-oriented, class-based programming language. The language is designed to have as few dependencies implementations as possible. The intention of using this language is to give relief to the developers from writing codes for every platform. The term WORA, write once and run everywhere is often associated with this language. It means whenever we compile a Java code, we get the byte code (.class file), and that can be executed (without compiling it again) on different platforms provided they support Java.

In the year 1995, Java language was developed. It is mainly used to develop web, desktop, and mobile devices. The Java language is known for its robustness, security, and simplicity features. That is designed to have as few implementation dependencies as possible.

The Java language has a very interesting history. Patrick Naughton, Mike Sheridan, and Jame Gosling, known as the Green team, started the development of Java in the year 1991. These people were the engineers at Sun Microsystems. In 1996, the first public implementation was released as Java 1.0. The compiler of Java 1.0 was rewritten by Arthur Van Hoff to comply strictly with its specification. The new versions have multiple different configurations that have been built for the various platforms. It is worth noting that James Gosling is also known as the father of Java.

The ISO standard body was approached by Sun Microsystems in the year 1997 to formalize Java, but the process was withdrawn soon. At one point in time, Sun Microsystems provided most of its implementation of Java available without any cost, despite having the status of proprietary software.

Java Framework is the body or platform of pre-written codes used by Java developers to develop Java applications or web applications. In other words, Java Framework is a collection of predefined classes and functions that is used to process

5.1.1.2 Java Spring-Boot:

In Spring Boot, there is no requirement for XML configuration (deployment descriptor). It uses convention over configuration software design paradigm that means it decreases the effort of the developer.

We can use Spring STS IDE or Spring Initializr to develop Spring Boot Java applications

- ✓ The dependency injection approach is used in Spring Boot.
- ✓ It contains powerful database transaction management capabilities. It reduces the cost and development time of the application.
- ✓ It simplifies integration with other Java frameworks like JPA/Hibernate ORM, Struts, etc.

Along with the Spring Boot Framework, many other Spring sister projects help to build applications addressing modern business needs. There are the following Spring sister projects are as follows:

- ✓ **Spring Data:** It simplifies data access from the relational and NoSQL databases.
- ✓ **Spring Batch:** It provides powerful batch processing.
- ✓ **Spring Security:** It is a security framework that provides robust security to applications.
- ✓ **Spring Social:** It supports integration with social networking like LinkedIn.
- ✓ **Spring Integration:** It is an implementation of Enterprise Integration Patterns.

It is a well-suited Spring module for web application development. We can easily create a self-contained HTTP application that uses embedded servers like Tomcat, Jetty, or Undertow. We can use the spring-boot-starter-web module to start and run the application quickly.

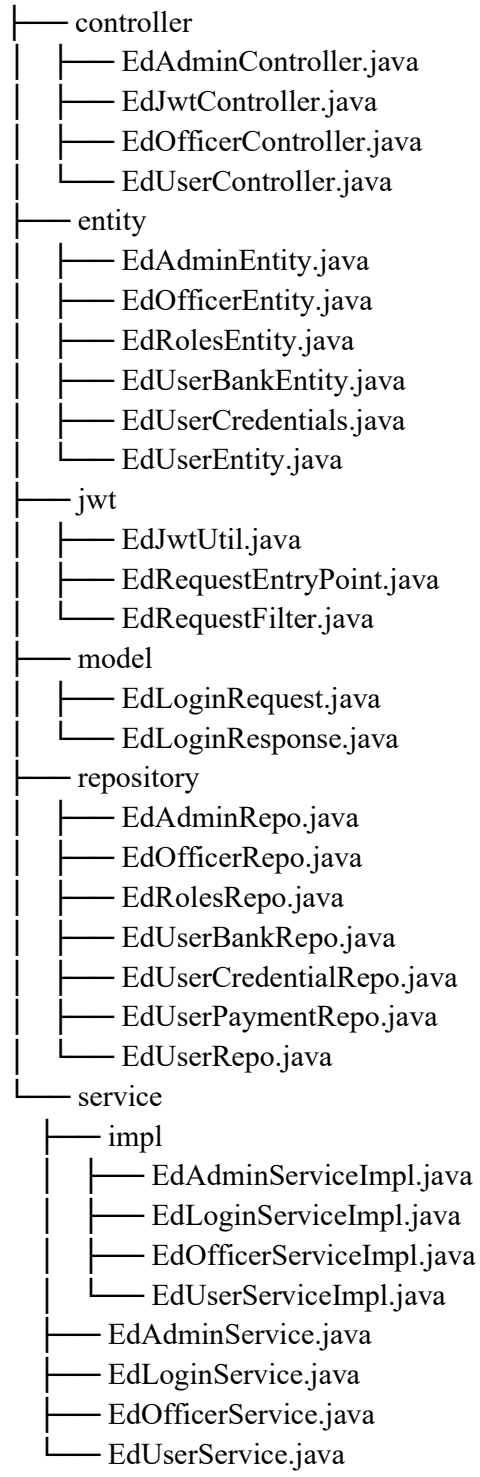
5.1.1.3 Advantages of Spring Boot:

- ✓ It tests web applications easily with the help of different Embedded HTTP servers such as Tomcat, Jetty, etc. We don't need to deploy WAR files.
- ✓ It provides opinionated 'starter' POMs to simplify our Maven configuration.
- ✓ It provides production-ready features such as metrics, health checks, and externalized configuration.
- ✓ There is no requirement for XML configuration.
- ✓ It offers a CLI tool for developing and testing the Spring Boot application.
- ✓ It also minimizes writing multiple boilerplate codes (the code that has to be included in many places with little or no alteration), XML configuration, and annotations.

5.1.1.4 Spring-Boot Features:

- ✓ Web Development
- ✓ SpringApplication
- ✓ Application events and listeners
- ✓ Admin features
- ✓ Externalized Configuration
- ✓ Properties Files
- ✓ Type-safe Configuration
- ✓ Logging
- ✓ Securit

5.1.2 Structure & Coding



5.1.2.1 Controller

EdAdminController.java

```
package com.vishnuparasu.EnforcementDirectorate.controller;

import com.vishnuparasu.EnforcementDirectorate.entity.EdAdminEntity;
import com.vishnuparasu.EnforcementDirectorate.entity.EdRolesEntity;
import com.vishnuparasu.EnforcementDirectorate.entity.EdUserCredentials;
import com.vishnuparasu.EnforcementDirectorate.service.impl.EdAdminServiceImpl;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.http.HttpStatus;
import org.springframework.http.ResponseEntity;
import org.springframework.security.access.prepost.PreAuthorize;
import org.springframework.web.bind.annotation.*;

import java.util.Collections;
import java.util.List;

@RequestMapping(value = "/ED/AdminController")
@RestController
@CrossOrigin(origins = "http://localhost:4200")

public class EdAdminController {

   @Autowired
   EdAdminServiceImpl edAdminService;

   @PreAuthorize("hasAuthority('EDA')")
   @GetMapping("/totalNumberOfRow")
   public ResponseEntity<String>getNoOfRow() {
      try {
         return new ResponseEntity<>(edAdminService.getNoRow(),HttpStatus.FOUND);
      } catch (Exception ex){
         return new ResponseEntity<>(null,HttpStatus.NO_CONTENT);
      }
   }

   @PreAuthorize("hasAuthority('EDA')")
   @GetMapping("/getAdmin")
   public ResponseEntity<EdAdminEntity> getAdmin(@RequestParam("edaid") String edaid) {
      try {
         return new ResponseEntity<>(edAdminService.getAdmin(edaid), HttpStatus.FOUND);
      } catch (Exception ex){
         return new ResponseEntity<>(new EdAdminEntity(),HttpStatus.NOT_FOUND);
      }
   }
```

```
@PreAuthorize("hasAnyAuthority('EDA','EDO')")
  @GetMapping("/getUserCredential")
  public ResponseEntity<EdUserCredentials> getUserCredential(@RequestParam("userid") String userid) {
     try {
        return new ResponseEntity<>(edAdminService.getUserCredential(userid),HttpStatus.FOUND);
     } catch (Exception ex){
        return new ResponseEntity<>(new EdUserCredentials(),HttpStatus.NOT_FOUND);
     }
  }

  @PreAuthorize("hasAuthority('EDA')")
  @GetMapping("/getRole")
  public ResponseEntity<EdRolesEntity> getRole(@RequestParam("roleName") String roleName) {
     try {
        return new ResponseEntity<>(edAdminService.getRole(roleName),HttpStatus.FOUND);
     } catch (Exception ex){
        return new ResponseEntity<>(new EdRolesEntity(),HttpStatus.NOT_FOUND);
     }
  }

  @PreAuthorize("hasAuthority('EDA')")
  @GetMapping("/getAllAdmin")
  public ResponseEntity<List<EdAdminEntity>> getAllAdmin() {
     try {
        return new ResponseEntity<>(edAdminService.getAllAdmin(),HttpStatus.FOUND);
     } catch (Exception ex){
        return new ResponseEntity<>(Collections.emptyList(),HttpStatus.NOT_FOUND);
     }
  }

  @PreAuthorize("hasAnyAuthority('EDA','EDO')")
  @GetMapping("/getAllUserCredential")
  public ResponseEntity<List<EdUserCredentials>> getAllCredential() {
     try {
        return new ResponseEntity<>(edAdminService.getAllUserCredentials(),HttpStatus.FOUND);
     } catch (Exception ex){
        return new ResponseEntity<>(Collections.emptyList(),HttpStatus.NOT_FOUND);
     }
  }

  @PreAuthorize("hasAuthority('EDA')")
  @GetMapping("/getAllRoles")
  public ResponseEntity<List<EdRolesEntity>> getAllRoles() {
     try {
        return new ResponseEntity<>(edAdminService.getAllRoles(),HttpStatus.FOUND);
     } catch (Exception ex){
        return new ResponseEntity<>(Collections.emptyList(),HttpStatus.NOT_FOUND);
     }
  }
```

```
 @PreAuthorize("hasAuthority('EDA')")
   @PostMapping("/createAdmin")
   public ResponseEntity<EdAdminEntity> createAdmin(@RequestBody EdAdminEntity edAdminEntity) {
      try {
         return new ResponseEntity<>(edAdminService.createAdmin(edAdminEntity),HttpStatus.CREATED);
      } catch (Exception ex){
         return new ResponseEntity<>(new EdAdminEntity(),HttpStatus.NOT_ACCEPTABLE);
      }
   }

   @PreAuthorize("hasAuthority('EDA')")
   @PostMapping("/createRole")
   public ResponseEntity<EdRolesEntity> createRole(@RequestBody EdRolesEntity edRolesEntity) {
      try {
         return new ResponseEntity<>(edAdminService.createRole(edRolesEntity),HttpStatus.CREATED);
      } catch (Exception ex){
         return new ResponseEntity<>(new EdRolesEntity(),HttpStatus.NOT_ACCEPTABLE);
      }
   }

   @PreAuthorize("hasAuthority('EDA')")
   @PutMapping("/modifyAdmin")
   public ResponseEntity<EdAdminEntity> modifyAdmin(@RequestBody EdAdminEntity edAdminEntity,
@RequestParam("edaid") String edaid) {
      try {
         return new ResponseEntity<>(edAdminService.modifyAdmin(edAdminEntity,edaid),HttpStatus.ACCEPTED);
      } catch (Exception ex){
         return new ResponseEntity<>(new EdAdminEntity(), HttpStatus.NOT_MODIFIED);
      }
   }

   @PreAuthorize("hasAnyAuthority('EDA','EDO')")
   @PutMapping("/modifyUserCredential")
   public ResponseEntity<EdUserCredentials> modifyUserCredential(@RequestBody EdUserCredentials
edUserCredentials, @RequestParam("userid") String userid) {
      try {
         return new
ResponseEntity<>(edAdminService.modifyUserCredentials(edUserCredentials,userid),HttpStatus.ACCEPTED);
      } catch (Exception ex){
         return new ResponseEntity<>(new EdUserCredentials(),HttpStatus.NOT_MODIFIED);
      }
   }

   @PreAuthorize("hasAuthority('EDA')")
   @PutMapping("/modifyRole")
   public ResponseEntity<EdRolesEntity> modifyRole(@RequestBody EdRolesEntity edRolesEntity, String roleName)
{
      try {
         return new ResponseEntity<>(edAdminService.modifyRole(roleName,edRolesEntity),HttpStatus.ACCEPTED);
      } catch (Exception ex){
         return new ResponseEntity<>(new EdRolesEntity(),HttpStatus.NOT_MODIFIED);
      }
   }
```

```
    @PreAuthorize("hasAuthority('EDA')")
    @DeleteMapping("/removeAdmin")
    public ResponseEntity<String> removeAdmin(@RequestParam("edaid") String edaid) {
        try {
            return new ResponseEntity<>(edAdminService.removeAdmin(edaid),HttpStatus.OK);
        } catch (Exception ex){
            return  new ResponseEntity<>(null,HttpStatus.NOT_FOUND);
        }
    }

    @PreAuthorize("hasAuthority('EDA')")
    @DeleteMapping("/removeRole")
    public ResponseEntity<String> removeRole(@RequestParam("roleName") String roleName) {
        try {
            return new ResponseEntity<>(edAdminService.removeRole(roleName),HttpStatus.OK);
        } catch (Exception ex){
            return new ResponseEntity<>(null,HttpStatus.NOT_FOUND);
        }
    }
}
```

EdJwtController.java

```
package com.vishnuparasu.EnforcementDirectorate.controller;

import com.vishnuparasu.EnforcementDirectorate.model.EdLoginRequest;
import com.vishnuparasu.EnforcementDirectorate.model.EdLoginResponse;
import com.vishnuparasu.EnforcementDirectorate.service.impl.EdLoginServiceImpl;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.http.HttpStatus;
import org.springframework.http.ResponseEntity;
import org.springframework.web.bind.annotation.*;

@RestController
@RequestMapping("/ED/EdJwtController")
@CrossOrigin(origins = "http://localhost:4200")
public class EdJwtController {

    @Autowired
    EdLoginServiceImpl edLoginService;

    @PostMapping("/login")
    public ResponseEntity<EdLoginResponse> login(@RequestBody EdLoginRequest edLoginRequest) {
        try {
            return  new ResponseEntity<>(edLoginService.login(edLoginRequest), HttpStatus.ACCEPTED);
        } catch (Exception ex) {
            return  new ResponseEntity<>(new EdLoginResponse(), HttpStatus.UNAUTHORIZED);
        }
    }
}
```

EdOfficerController.java

```
package com.vishnuparasu.EnforcementDirectorate.controller;

import com.vishnuparasu.EnforcementDirectorate.entity.EdOfficerEntity;
import com.vishnuparasu.EnforcementDirectorate.service.impl.EdOfficerServiceImpl;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.http.HttpStatus;
import org.springframework.http.ResponseEntity;
import org.springframework.security.access.prepost.PreAuthorize;
import org.springframework.web.bind.annotation.*;

import java.util.Collections;
import java.util.List;

@RequestMapping(value = "/ED/OfficerController")
@RestController
@CrossOrigin(origins = "http://localhost:4200")
@PreAuthorize("hasAnyAuthority('EDA','EDO')")
public class EdOfficerController {

    @Autowired
    EdOfficerServiceImpl edOfficerService;

    @GetMapping("/totalNumberOfRow")
    public ResponseEntity<String>getNoOfRow() {
        try {
            return new ResponseEntity<>(edOfficerService.getNoRow(),HttpStatus.FOUND);
        } catch (Exception ex) {
            return new ResponseEntity<>(null,HttpStatus.NO_CONTENT);
        }
    }
    @GetMapping("/getOfficer")
    public ResponseEntity<EdOfficerEntity> getOfficer(@RequestParam("edoid") String edoid) {
        try {
            return new ResponseEntity<>(edOfficerService.getOfficer(edoid),HttpStatus.FOUND);
        } catch (Exception ex) {
            return new ResponseEntity<>(new EdOfficerEntity(),HttpStatus.NOT_FOUND);
        }
    }

    @GetMapping("/getAllOfficer")
    public ResponseEntity<List<EdOfficerEntity>> getAllOfficers() {
        try {
            return new ResponseEntity<>(edOfficerService.getAllOfficers(),HttpStatus.FOUND);
        } catch (Exception ex) {
            return new ResponseEntity<>(Collections.emptyList(),HttpStatus.NO_CONTENT);
        }
    }
```

```
@PutMapping("/modifyOfficer")
   public ResponseEntity<EdOfficerEntity> modifyOfficer(@RequestParam("edoid") String edoid, @RequestBody
EdOfficerEntity edOfficerEntity) {
      try {
         return new ResponseEntity<>(edOfficerService.modifyOfficer(edOfficerEntity,edoid),HttpStatus.ACCEPTED);
      } catch (Exception ex) {
         return new ResponseEntity<>(new EdOfficerEntity(),HttpStatus.NOT_MODIFIED);
      }
   }

   @PostMapping("/createOfficer")
   public ResponseEntity<EdOfficerEntity> createOfficer(@RequestBody EdOfficerEntity edOfficerEntity) {
      try {
         return new ResponseEntity<>(edOfficerService.createOfficer(edOfficerEntity),HttpStatus.CREATED);
      } catch (Exception ex) {
         return new ResponseEntity<>(new EdOfficerEntity(),HttpStatus.NOT_ACCEPTABLE);
      }
   }

   @DeleteMapping("/deleteOfficers")
   public ResponseEntity<String> deleteOfficer(@RequestParam("edoid")String edoid) {
      try {
         return new ResponseEntity<>(edOfficerService.deleteOfficer(edoid), HttpStatus.OK);
      } catch (Exception ex) {
         return new ResponseEntity<>(null, HttpStatus.NOT_MODIFIED);
      }
   }
}
```

EdUserController.java

```
package com.vishnuparasu.EnforcementDirectorate.controller;

import com.vishnuparasu.EnforcementDirectorate.entity.EdUserBankEntity;
import com.vishnuparasu.EnforcementDirectorate.entity.EdUserEntity;
import com.vishnuparasu.EnforcementDirectorate.entity.EdUserPaymentEntity;
import com.vishnuparasu.EnforcementDirectorate.service.impl.EdUserServiceImpl;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.http.HttpStatus;
import org.springframework.http.ResponseEntity;
import org.springframework.security.access.prepost.PreAuthorize;
import org.springframework.web.bind.annotation.*;

import java.util.Collections;
import java.util.List;


@RequestMapping(value = "/ED/UserController")
@RestController
@CrossOrigin(origins = "http://localhost:4200")
public class EdUserController {
```

```
@Autowired
 EdUserServiceImpl edUserService;

 @GetMapping("/totalNumberOfRow")
 public ResponseEntity<String>getNoOfRow() {
    try {
       return new ResponseEntity<>(edUserService.getNoRow(),HttpStatus.FOUND);
    } catch (Exception ex) {
       return new ResponseEntity<>(null,HttpStatus.NO_CONTENT);
    }
 }


 @PostMapping("/createEdUser")
 public ResponseEntity<EdUserEntity> createEdUser(@RequestBody EdUserEntity edUserEntity) {
    try {
       return new  ResponseEntity<>(edUserService.createUser(edUserEntity), HttpStatus.CREATED);
    } catch (Exception ex) {
       return new  ResponseEntity<>(new EdUserEntity(), HttpStatus.NOT_ACCEPTABLE);
    }
 }

 @PreAuthorize("hasAnyAuthority('EDA','EDO','EDU')")
 @GetMapping("/getUser")
 public ResponseEntity<EdUserEntity>getUser(@RequestParam("eduid") String eduid) {
    try {
       return new ResponseEntity<>(edUserService.getUser(eduid),HttpStatus.FOUND);
    } catch (Exception ex) {
       return new ResponseEntity<>(new EdUserEntity(),HttpStatus.NOT_FOUND);
    }
 }

 @PreAuthorize("hasAnyAuthority('EDA','EDO')")
 @GetMapping("/getAllUser")
 public ResponseEntity<List<EdUserEntity>>getAllUser() {
    try {
       return new ResponseEntity<>(edUserService.getAllUser(),HttpStatus.FOUND);
    } catch (Exception ex) {
       return new ResponseEntity<>(Collections.emptyList(),HttpStatus.NO_CONTENT);
    }
 }

 @PreAuthorize("hasAnyAuthority('EDA','EDO','EDU')")
 @GetMapping("/getBank")
 public ResponseEntity<EdUserBankEntity> getBank(@RequestParam("eduid") String eduid) {
    try {
       return new ResponseEntity<>(edUserService.getUserBank(eduid),HttpStatus.FOUND);
    } catch (Exception ex) {
       return new ResponseEntity<>(new EdUserBankEntity(),HttpStatus.NOT_FOUND);
    }
 }
```

```
  @PreAuthorize("hasAnyAuthority('EDA','EDO')")
    @GetMapping("/getAllBank")
    public ResponseEntity<List<EdUserBankEntity>> getAllBank() {
        try {
            return new ResponseEntity<>(edUserService.getAllUserBank(),HttpStatus.FOUND);
        } catch (Exception ex) {
            return new ResponseEntity<>(Collections.emptyList(),HttpStatus.NO_CONTENT);
        }
    }


    @PreAuthorize("hasAnyAuthority('EDA','EDO')")
    @PutMapping("/modifyUser")
    public ResponseEntity<EdUserEntity> modifyUser(@RequestParam("eduid") String eduid, @RequestBody
EdUserEntity edUserEntity) {
        try {
            return new ResponseEntity<>(edUserService.modifyUser(edUserEntity,eduid),HttpStatus.ACCEPTED);
        } catch (Exception ex) {
            return new ResponseEntity<>(new EdUserEntity(),HttpStatus.NOT_MODIFIED);
        }
    }

    @PreAuthorize("hasAuthority('EDO')")
    @PutMapping("/modifyPayment")
    public ResponseEntity<EdUserPaymentEntity>modifyPayment(@RequestParam("value") String value ,
@RequestParam("id") int id) {
        try {
            return new ResponseEntity<>(edUserService.modifyPayment(value,id),HttpStatus.ACCEPTED);
        } catch (Exception ex) {
            return new ResponseEntity<>(new EdUserPaymentEntity(),HttpStatus.NOT_MODIFIED);
        }
    }


    @PreAuthorize("hasAnyAuthority('EDA','EDO')")
    @DeleteMapping("/deleteEdUser")
    public ResponseEntity<String> deleteEdUser(@RequestParam("eduid") String eduid){
        try {
            return new ResponseEntity<>(edUserService.deleteUser(eduid),HttpStatus.OK);
        } catch (Exception ex) {
            return new ResponseEntity<>(edUserService.deleteUser(eduid),HttpStatus.NOT_FOUND);
        }
    }

    @PreAuthorize("hasAnyAuthority('EDU')")
    @PostMapping("/createPayment")
    public ResponseEntity<EdUserPaymentEntity> createPayment(@RequestBody EdUserPaymentEntity
edUserPaymentEntity) {
        try {
            return new ResponseEntity<>(edUserService.createUserPatment(edUserPaymentEntity),HttpStatus.CREATED);
        } catch (Exception ex) {
            return new ResponseEntity<>(new EdUserPaymentEntity(),HttpStatus.NOT_ACCEPTABLE);
        }
    }
```

```
    @PreAuthorize("hasAnyAuthority('EDA','EDO','EDU')")
    @GetMapping("/senderDetail")
    public ResponseEntity<List<EdUserPaymentEntity>> getSenderDetail(@RequestParam("senderEduid") String
senderEduid) {
        try {
            return new ResponseEntity<>(edUserService.getSenderDetail(senderEduid),HttpStatus.FOUND);
        } catch (Exception ex) {
            return new ResponseEntity<>(Collections.emptyList(),HttpStatus.NOT_FOUND);
        }
    }

    @PreAuthorize("hasAnyAuthority('EDA','EDO','EDU')")
    @GetMapping("/reciverDetail")
    public ResponseEntity<List<EdUserPaymentEntity>> getReciverDetail(@RequestParam("reciveEduid") String
recevierEduid) {
        try {
            return new ResponseEntity<>(edUserService.getRecevierDetail(recevierEduid),HttpStatus.OK);
        } catch (Exception ex) {
            return new ResponseEntity<>(Collections.emptyList(),HttpStatus.NOT_FOUND);
        }
    }

    @PreAuthorize("hasAuthority('EDU')")
    @GetMapping("/userComplainList")
    public  ResponseEntity<List<EdUserPaymentEntity>> getUserComplaintList(@RequestParam("eduid") String eduid)
{
        try {
            return new ResponseEntity<>(edUserService.getUserComplaint(eduid),HttpStatus.OK);
        } catch (Exception ex) {
            return new ResponseEntity<>(Collections.emptyList(),HttpStatus.NO_CONTENT);
        }
    }

    @PreAuthorize("hasAnyAuthority('EDA','EDO')")
    @GetMapping("/getAllPayment")
    public ResponseEntity<List<EdUserPaymentEntity>> getAllPayment() {
        try {
            return new ResponseEntity<>(edUserService.getAllPatment(),HttpStatus.OK);
        } catch (Exception ex) {
            return new ResponseEntity<>(Collections.emptyList(),HttpStatus.NO_CONTENT);
        }
    }

    @PreAuthorize("hasAnyAuthority('EDA','EDO')")
    @GetMapping("/getAllComplaint")
    public ResponseEntity<List<EdUserPaymentEntity>> getAllComplaint(@RequestParam("trueOrFalse") String
trueOrFalse) {
        try {
            return new ResponseEntity<>(edUserService.getAllCompliants(trueOrFalse),HttpStatus.OK);
        } catch (Exception ex) {
            return new ResponseEntity<>(Collections.emptyList(),HttpStatus.NO_CONTENT);
        }
    } }
```

5.1.2.2 Entity

EdAdminEntity.java

```
package com.vishnuparasu.EnforcementDirectorate.entity;

import com.fasterxml.jackson.annotation.JsonFormat;

import javax.persistence.*;
import java.io.Serializable;
import java.sql.Date;
import java.util.HashSet;
import java.util.Set;

@Entity
@Table(name = "ed_admin")
public class EdAdminEntity implements Serializable {

    @Id
    @GeneratedValue(strategy = GenerationType.IDENTITY)
    @Column(name = "admin_id")
    private int id;


    @Column(name = "edaid")
    private String edaid;

    @Column(name = "name")
    private String name;

    @Column(name = "date")
    @JsonFormat(shape = JsonFormat.Shape.STRING,pattern = "yyyy-MM-dd")
    private  Date dob;

    @Column(name = "gender")
    private String gender;

    @Column(name = "pho")
    private String pho;


    @Column(name = "gmail")
    private  String gmail;

    @Column(name = "fname")
    private String fname;

    @Column(name = "adharNumber")
    private String adharNumber;

    @OneToMany(cascade = CascadeType.ALL)
    @JoinColumn(name = "edaid", referencedColumnName = "edaid")
    private Set<EdUserCredentials> edUserCredentials = new HashSet<>();
```

```
public String getFname() {
    return fname;
}

public void setFname(String fname) {
    this.fname = fname;
}

public String getAdharNumber() {
    return adharNumber;
}

public void setAdharNumber(String adharNumber) {
    this.adharNumber = adharNumber;
}

public int getId() {
    return id;
}

public void setId(int id) {
    this.id = id;
}

public String getGender() {
    return gender;
}

public void setGender(String gender) {
    this.gender = gender;
}

public String getPho() {
    return pho;
}

public void setPho(String pho) {
    this.pho = pho;
}

public String getEdaid() {
    return edaid;
}

public void setEdaid(String edaid) {
    this.edaid = edaid;
}

public String getName() {
    return name;
}

public void setName(String name) {
    this.name = name;  }
```

```
    public Date getDob() {
        return dob;
    }

    public void setDob(Date dob) {
        this.dob = dob;
    }

    public String getGmail() {
        return gmail;
    }

    public void setGmail(String gmail) {
        this.gmail = gmail;
    }

    public Set<EdUserCredentials> getEdUserCredentials() {
        return edUserCredentials;
    }

    public void setEdUserCredentials(Set<EdUserCredentials> edUserCredentials) {
        this.edUserCredentials = edUserCredentials;
    }
}
```

EdOfficerEntity.java

```
package com.vishnuparasu.EnforcementDirectorate.entity;

import com.fasterxml.jackson.annotation.JsonFormat;

import javax.persistence.*;
import java.io.Serializable;
import java.sql.Date;
import java.util.HashSet;
import java.util.Set;

@Entity
@Table(name = "ed_officers")
public class EdOfficerEntity implements Serializable {

    @Id
    @GeneratedValue(strategy = GenerationType.IDENTITY)
    @Column(name = "officer_id")
    private int id;
    @Column(name = "edoid")
    private String edoid;

    @Column(name = "name")
    private String name;

    @Column(name = "gender")
    private String gender;
```

```
@JsonFormat(shape = JsonFormat.Shape.STRING,pattern = "yyyy-MM-dd")
@Column(name = "dob")
private Date dob;

@Column(name = "pho")
private long pho;

@Column(name = "gmail")
private String gmail;

@Column(name = "f_name")
private String fname;
@Column(name = "adhar_number")
private String adharNumber;

@Column(name = "address")
private String address;

@Column(name = "qualification")
private String qualification;

@Column(name = "job")
private  String job;

@Column(name = "job_position")
private  String jobPosition;

@Column(name = "salary")
private String salary;

@Column(name = "jsd")
private String jsd;


@OneToMany(cascade = CascadeType.ALL)
@JoinColumn(name = "edoid", referencedColumnName = "edoid")
private Set<EdUserCredentials> edUserCredentials = new HashSet<>();


public int getId() {
   return id;
}

public void setId(int id) {
   this.id = id;
}

public String getEdoid() {
   return edoid;
}

public void setEdoid(String edoid) {
   this.edoid = edoid;}
public String getName() {
```

```
    return name;
}

public void setName(String name) {
    this.name = name;
}

public String getGender() {
    return gender;
}

public void setGender(String gender) {
    this.gender = gender;
}

public Date getDob() {
    return dob;
}

public void setDob(Date dob) {
    this.dob = dob;
}

public long getPho() {
    return pho;
}

public void setPho(long pho) {
    this.pho = pho;
}

public String getGmail() {
    return gmail;
}

public void setGmail(String gmail) {
    this.gmail = gmail;
}

public String getFname() {
    return fname;
}

public void setFname(String fname) {
    this.fname = fname;
}

public String getAdharNumber() {
    return adharNumber;
}

public void setAdharNumber(String adharNumber) {
    this.adharNumber = adharNumber; }
```

```
public String getAddress() {
        return address;
    }

    public void setAddress(String address) {
        this.address = address;
    }

    public String getQualification() {
        return qualification;
    }

    public void setQualification(String qualification) {
        this.qualification = qualification;
    }

    public String getJob() {
        return job;
    }

    public void setJob(String job) {
        this.job = job;
    }

    public String getJobPosition() {
        return jobPosition;
    }

    public void setJobPosition(String jobPosition) {
        this.jobPosition = jobPosition;
    }

    public String getSalary() {
        return salary;
    }

    public void setSalary(String salary) {
        this.salary = salary;
    }

    public String getJsd() {
        return jsd;
    }

    public void setJsd(String jsd) {
        this.jsd = jsd;
    }

    public Set<EdUserCredentials> getEdUserCredentials() {
        return edUserCredentials;
    }
     public void setEdUserCredentials(Set<EdUserCredentials> edUserCredentials) {
        this.edUserCredentials = edUserCredentials;
    }}
```

EdRolesEntity.java

```
package com.vishnuparasu.EnforcementDirectorate.entity;

import javax.persistence.*;

@Entity
@Table(name = "ed_user_roles")
public class EdRolesEntity {

   @Id
   @Column(name = "role")
   private String role;

   @Column(name = "roleDesc")
   private String roleDesc;

   public EdRolesEntity() {
   }

   public EdRolesEntity(String role) {
      this.role = role;
   }


   public String getRole() {
      return role;
   }

   public void setRole(String role) {
      this.role = role;
   }

   public String getRoleDesc() {
      return roleDesc;
   }

   public void setRoleDesc(String roleDesc) {
      this.roleDesc = roleDesc;
   }


   public void add(EdRolesEntity edRolesEntity) {
      role = edRolesEntity.getRole();
      roleDesc = edRolesEntity.getRoleDesc();
   }
}
```

EdUserBankEntity.java

```
package com.vishnuparasu.EnforcementDirectorate.entity;

import javax.persistence.*;

@Entity
@Table(name = "ed_user_bank")
public class EdUserBankEntity {

   @Id
   @Column(name = "acct_no")
   private long acctNo;

   @Column(name = "eduid")
   private String eduid;

   @Column(name = "bank_country")
   private String bankCountry;

   @Column(name = "bank_name")
   private String bankName;

   @Column(name = "branch")
   private String branch;

   @Column(name = "total_amount")
   private long totalAmount;

   @Column(name = "acct_status")
   private String acctStatus;

   public long getAcctNo() {
      return acctNo;
   }

   public void setAcctNo(long acctNo) {
      this.acctNo = acctNo;
   }

   public String getBankCountry() {
      return bankCountry;
   }

   public void setBankCountry(String bankCountry) {
      this.bankCountry = bankCountry;
   }

   public String getBankName() {
      return bankName;
   }
```

```
 public void setBankName(String bankName) {
       this.bankName = bankName;
   }

   public String getBranch() {
      return branch;
   }

   public void setBranch(String branch) {
      this.branch = branch;
   }

   public long getTotalAmount() {
      return totalAmount;
   }

   public void setTotalAmount(long totalAmount) {
      this.totalAmount = totalAmount;
   }

   public String getAcctStatus() {
      return acctStatus;
   }

   public void setAcctStatus(String acctStatus) {
      this.acctStatus = acctStatus;
   }
}
```

EdUserCredentials.java

```
package com.vishnuparasu.EnforcementDirectorate.entity;

import org.springframework.security.core.GrantedAuthority;
import org.springframework.security.core.authority.SimpleGrantedAuthority;
import org.springframework.security.core.userdetails.UserDetails;

import javax.persistence.*;
import java.io.Serializable;
import java.util.*;

@Entity
@Table(name = "ed_user_credential")
public class EdUserCredentials implements UserDetails,Serializable {

   @Id
   @Column(name = "username")
   private String userName;




 @Column(name = "password")
```

```
    private String password;

    @Column(name = "eduid")
    private String eduid;

    @Column(name = "edoid")
    private String edoid;

    @Column(name = "edaid")
    private String edaid;


    @ManyToMany
    @JoinTable(name = "ed_user_roles_credential",joinColumns = @JoinColumn(name = "user_id"),inverseJoinColumns
= @JoinColumn(name = "role_id"))
    private Set<EdRolesEntity> edRolesModels = new HashSet<>();


    public String getUserName() {
        return userName;
    }

    public void setUserName(String userName) {
        this.userName = userName;
    }

    @Override
    public Collection<? extends GrantedAuthority> getAuthorities() {
        List<SimpleGrantedAuthority> authorities = new ArrayList<>();
        for (EdRolesEntity role : edRolesModels) {
            authorities.add(new SimpleGrantedAuthority(role.getRole()));
        }
        return authorities;
    }

    @Override
    public String getPassword() {
        return password;
    }


    @Override
    public String getUsername() {
        return userName;
    }

    @Override
    public boolean isAccountNonExpired() {
        return true;
    }
```

```
 @Override
  public boolean isAccountNonLocked() {
     return true;
  }

  @Override
  public boolean isCredentialsNonExpired() {
     return true;
  }

  @Override
  public boolean isEnabled() {
     return true;
  }

  public void setPassword(String password) {
     this.password = password;
  }

  public Set<EdRolesEntity> getEdRolesModels() {
     return  edRolesModels;
  }

  public void setEdRolesModels(Set<EdRolesEntity> edRolesModels) {
     this.edRolesModels = edRolesModels;
  }

  public void addEdRole(EdRolesEntity rolesEntities) {
     edRolesModels.add(rolesEntities);
  }
}
```

EdUserEntity.java

```
package com.vishnuparasu.EnforcementDirectorate.entity;

import com.fasterxml.jackson.annotation.JsonFormat;

import javax.persistence.*;
import java.io.Serializable;
import java.util.Date;
import java.util.ArrayList;
import java.util.List;

@Entity
@Table(name = "ed_user")
public class EdUserEntity implements Serializable {

  @Id
  @GeneratedValue(strategy = GenerationType.IDENTITY)
  @Column(name = "userid")
  private int userid;

  @Column(name = "eduid")
```

```
private String eduid;
@Column(name = "name")
private String name;

@Column(name = "gender")
private String gender;


@Column(name = "dob")
private String dob;

@Column(name = "pho")
private long pho;

@Column(name = "gmail")
private String gmail;

@Column(name = "fname")
private String fname;

@Column(name = "adhar_number")
private String adharNumber;

@Column(name = "address")
private String address;

@Column(name = "qualification")
private String qualification;

@Column(name = "job")
private String job;

@Column(name = "job_position")
private String jobPosition;

@Column(name = "salary")
private String salary;

@Column(name = "jsd")
private String jsd;


@OneToMany(cascade = CascadeType.ALL)
@JoinColumn(name = "eduid", referencedColumnName = "eduid")
private List<EdUserCredentials> edUserCredentials = new ArrayList<>();


@OneToMany(cascade = CascadeType.ALL)
@JoinColumn(name = "eduid", referencedColumnName ="eduid")
private List<EdUserBankEntity> edUserBankEntities = new ArrayList<>();
```

```
public int getUserid() {
      return userid;
   }

   public void setUserid(int userid) {
      this.userid = userid;
   }

   public String getEduid() {
      return eduid;
   }

   public void setEduid(String eduid) {
      this.eduid = eduid;
   }

   public String getName() {
      return name;
   }

   public void setName(String name) {
      this.name = name;
   }

   public String getGender() {
      return gender;
   }

   public void setGender(String gender) {
      this.gender = gender;
   }

   public String getDob() {
      return dob;
   }

   public void setDob(String dob) {
      this.dob = dob;
   }

   public long getPho() {
      return pho;
   }

   public void setPho(long pho) {
      this.pho = pho;
   }

   public String getGmail() {
      return gmail;
   }

   public void setGmail(String gmail) {
      this.gmail = gmail;  }
```

```
    public String getFname() {
        return fname;
    }

    public void setFname(String fname) {
        this.fname = fname;
    }

    public String getAdharNumber() {
        return adharNumber;
    }

    public void setAdharNumber(String adharNumber) {
        this.adharNumber = adharNumber;
    }

    public String getAddress() {
        return address;
    }

    public void setAddress(String address) {
        this.address = address;
    }

    public String getQualification() {
        return qualification;
    }

    public void setQualification(String qualification) {
        this.qualification = qualification;
    }

    public String getJob() {
        return job;
    }

    public void setJob(String job) {
        this.job = job;
}

    public String getJobPosition() {
        return jobPosition;
    }

    public void setJobPosition(String jobPosition) {
        this.jobPosition = jobPosition;
    }

    public String getSalary() {
        return salary;
    }

    public void setSalary(String salary) {
        this.salary = salary; }
```

```
    public String getJsd() {
        return jsd;
    }

    public void setJsd(String jsd) {
        this.jsd = jsd;
    }

    public List<EdUserCredentials> getEdUserCredentials() {
        return edUserCredentials;
    }

    public void setEdUserCredentials(List<EdUserCredentials> edUserCredentials) {
        this.edUserCredentials = edUserCredentials;
    }

    public List<EdUserBankEntity> getEdUserBankEntities() {
        return edUserBankEntities;
    }

    public void setEdUserBankEntities(List<EdUserBankEntity> edUserBankEntities) {
        this.edUserBankEntities = edUserBankEntities;
    }
}
```

EdUserPaymentEntity.java

```
package com.vishnuparasu.EnforcementDirectorate.entity;


import javax.persistence.*;

@Entity
@Table(name = "ed_user_payment")
public class EdUserPaymentEntity {

    @Id
    @GeneratedValue(strategy = GenerationType.IDENTITY)
    @Column(name = "payment_id")
    private  int paymentId;
    @Column(name = "eduid_sender")
    private String eduidSender;

    @Column(name = "eduid_recevier")
    private String eduidRecevier;

    @Column(name = "sender_acct_no")
    private long senderAcctNo;

    @Column(name = "recevier_acct_no")
    private long RecevierAcctNo;

    @Column(name = "amount")
    private long amount;
```

```
    @Column(name = "date_and_time")
    private String dateAndTime;

    public int getPaymentId() {
        return paymentId;
    }

    public void setPaymentId(int paymentId) {
        this.paymentId = paymentId;
    }

    @Column(name = "is_legal")
    private String isLegal;

    @Column(name = "bank_name_sender")
    private String bankNameSender;

    @Column(name = "bank_name_reciver")
    private String bankNameReciver;

    @Column(name = "bank_country_sender")
    private String bankCountrySender;

    @Column(name = "bank_country_rece")
    private String bankCountryReciver;


    public String getEduidSender() {
        return eduidSender;
    }

    public void setEduidSender(String eduidSender) {
        this.eduidSender = eduidSender;
    }

    public String getEduidRecevier() {
        return eduidRecevier;
    }

    public void setEduidRecevier(String eduidRecevier) {
        this.eduidRecevier = eduidRecevier;
    }

    public long getSenderAcctNo() {
        return senderAcctNo;
    }


public void setSenderAcctNo(long senderAcctNo) {
        this.senderAcctNo = senderAcctNo;
    }
```

```
public long getRecevierAcctNo() {
        return RecevierAcctNo;
    }

    public void setRecevierAcctNo(long recevierAcctNo) {
        RecevierAcctNo = recevierAcctNo;
    }

    public long getAmount() {
        return amount;
    }

    public void setAmount(long amount) {
        this.amount = amount;
    }

    public String getDateAndTime() {
        return dateAndTime;
    }

    public void setDateAndTime(String dateAndTime) {
        this.dateAndTime = dateAndTime;
    }

    public String getIsLegal() {
        return isLegal;
    }

    public void setIsLegal(String isLegal) {
        this.isLegal = isLegal;
    }

    public String getBankNameSender() {
        return bankNameSender;
    }

    public void setBankNameSender(String bankNameSender) {
        this.bankNameSender = bankNameSender;
    }

    public String getBankNameReciver() {
        return bankNameReciver;
    }

    public void setBankNameReciver(String bankNameReciver) {
        this.bankNameReciver = bankNameReciver;
    }

    public String getBankCountrySender() {
        return bankCountrySender;  }
    public void setBankCountrySender(String bankCountrySender) {
        this.bankCountrySender = bankCountrySender;
    }
```

```
    public String getBankCountryReciver() {
        return bankCountryReciver;
    }

    public void setBankCountryReciver(String bankCountryReciver) {
        this.bankCountryReciver = bankCountryReciver;
    }
}
```

5.1.2.3 JWT – AUTHENTICATION

EdJwtUtill.java

```
package com.vishnuparasu.EnforcementDirectorate.jwt;

import com.fasterxml.jackson.databind.ObjectMapper;
import com.vishnuparasu.EnforcementDirectorate.entity.EdRolesEntity;
import com.vishnuparasu.EnforcementDirectorate.entity.EdUserCredentials;
import io.jsonwebtoken.*;
import org.slf4j.Logger;
import org.slf4j.LoggerFactory;
import org.springframework.stereotype.Component;

import java.util.ArrayList;
import java.util.Date;
import java.util.List;
import java.util.Set;
import java.util.stream.Collectors;

@Component
public class EdJwtUtill {

    private static final Logger LOGGER = LoggerFactory.getLogger(EdJwtUtill.class);

    private static final long EXPIRE_DURATION = 24 * 60 * 60 * 1000;
    private static final String SECRET_KEY =
"b1i37ZGr69mFIZcHxSqMIPN6DXUir8pVpIMn/cKpNYFFZ2mMrEAtIyrTFeDGmiOfyYMNlkldmumVFb+ZXKbKig
==";

    public String generateAccessToken(EdUserCredentials edUserCredentials) {
        Set<EdRolesEntity> setOfRoles = edUserCredentials.getEdRolesModels();
        if (!setOfRoles.isEmpty()) {
            EdRolesEntity entity = setOfRoles.iterator().next();
            return Jwts.builder()
                    .setSubject(edUserCredentials.getUserName())
                    .setIssuer("VishnuParasu")
                    .claim("roles", entity.getRole())
                    .setIssuedAt(new Date())
                    .setExpiration(new Date(System.currentTimeMillis() + EXPIRE_DURATION))
                    .signWith(SignatureAlgorithm.HS512, SECRET_KEY).compact();
        } else  {
            return "Error While create token";
        }
    }
```

```
    public boolean validateAccessToken(String token) {
        try {
            Jwts.parser().setSigningKey(SECRET_KEY).parseClaimsJws(token);
            return true;
        } catch (ExpiredJwtException ex) {
            LOGGER.error("JWT expired", ex.getMessage());
        } catch (IllegalArgumentException ex) {
            LOGGER.error("Token is null, empty or only whitespace", ex.getMessage());
        } catch (MalformedJwtException ex) {
            LOGGER.error("JWT is invalid", ex);
        } catch (UnsupportedJwtException ex) {
            LOGGER.error("JWT is not supported", ex);
        } catch (SignatureException ex) {
            LOGGER.error("Signature validation failed");
        }

        return false;
    }


    public Claims parseClaims(String token) {
        return Jwts.parser()
                .setSigningKey(SECRET_KEY)
                .parseClaimsJws(token)
                .getBody();
    }

}
```

EdRequestEntryPoint.java

```
package com.vishnuparasu.EnforcementDirectorate.jwt;

import org.slf4j.Logger;
import org.slf4j.LoggerFactory;
import org.springframework.security.core.AuthenticationException;
import org.springframework.security.web.AuthenticationEntryPoint;
import org.springframework.stereotype.Component;
import javax.servlet.ServletException;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import java.io.IOException;
@Component
public class EdRequestEntryPoint implements AuthenticationEntryPoint {
    private static final Logger LOGGER = LoggerFactory.getLogger(EdRequestEntryPoint.class);
    @Override
    public void commence(HttpServletRequest request, HttpServletResponse response, AuthenticationException
authException) throws IOException, ServletException {
        LOGGER.error("Unautherized error: {}",authException.getMessage());
        response.sendError(HttpServletResponse.SC_UNAUTHORIZED,"Error : Unauthorized");

    }
}
```

EdRequestFilter.java

```
package com.vishnuparasu.EnforcementDirectorate.jwt;

import com.vishnuparasu.EnforcementDirectorate.entity.EdRolesEntity;
import com.vishnuparasu.EnforcementDirectorate.entity.EdUserCredentials;
import io.jsonwebtoken.Claims;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.security.authentication.UsernamePasswordAuthenticationToken;
import org.springframework.security.core.context.SecurityContextHolder;
import org.springframework.security.core.userdetails.UserDetails;
import org.springframework.security.web.authentication.WebAuthenticationDetailsSource;
import org.springframework.stereotype.Component;
import org.springframework.util.ObjectUtils;
import org.springframework.web.filter.OncePerRequestFilter;

import javax.servlet.FilterChain;
import javax.servlet.ServletException;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import java.io.IOException;
import java.util.HashSet;
import java.util.List;
import java.util.Set;

@Component
public class EdRequestFilter extends OncePerRequestFilter {

   @Autowired
   private EdJwtUtill edJwtUtill;

   @Override
   protected void doFilterInternal(HttpServletRequest request,
                                   HttpServletResponse response, FilterChain filterChain)
         throws ServletException, IOException {

      if (!hasAuthorizationBearer(request)) {
         filterChain.doFilter(request, response);
         return;
      }



      String token = getAccessToken(request);

      if (!edJwtUtill.validateAccessToken(token)) {
         filterChain.doFilter(request, response);
         return;
      }

      setAuthenticationContext(token, request);
      filterChain.doFilter(request, response);
   }
```

```
    private boolean hasAuthorizationBearer(HttpServletRequest request) {
        String header = request.getHeader("Authorization");
        if (ObjectUtils.isEmpty(header) || !header.startsWith("Bearer")) {
            return false;
        }
        return true;
    }

    private String getAccessToken(HttpServletRequest request) {
        String header = request.getHeader("Authorization");
        String token = header.split(" ")[1].trim();
        return token;
    }

    private void setAuthenticationContext(String token, HttpServletRequest request) {
        UserDetails userDetails = getUserDetails(token);

        UsernamePasswordAuthenticationToken
                authentication = new UsernamePasswordAuthenticationToken(userDetails, null, userDetails.getAuthorities());

        authentication.setDetails(
                new WebAuthenticationDetailsSource().buildDetails(request));

        SecurityContextHolder.getContext().setAuthentication(authentication);
    }

    public UserDetails getUserDetails(String token) {
        EdUserCredentials edUserCredentials = new EdUserCredentials();
        Claims claims = edJwtUtill.parseClaims(token);
        String subject = (String) claims.get(Claims.SUBJECT);
        String roles = (String) claims.get("roles");
        roles = roles.replace("[", "").replace("]", "");
        String[] roleNames = roles.split(",");

        for (String aRoleName : roleNames) {
            edUserCredentials.addEdRole(new EdRolesEntity(aRoleName));
        }

        String[] jwtSubject = subject.split(",");
        edUserCredentials.setUserName(jwtSubject[0]);
        return edUserCredentials;
    }
}
```

5.1.2.4 MODEL

EdLoginRequest.java

```
package com.vishnuparasu.EnforcementDirectorate.model;

public class EdLoginRequest {


   private String Username;

   private String password;

   public String getUsername() {
      return Username;
   }

   public void setUsername(String username) {
      Username = username;
   }

   public String getPassword() {
      return password;
   }

   public void setPassword(String password) {
      this.password = password;
   }
}
```

EdLoginResponse.java

```
package com.vishnuparasu.EnforcementDirectorate.model;

import com.vishnuparasu.EnforcementDirectorate.entity.EdRolesEntity;

import java.util.HashSet;
import java.util.Set;

public class EdLoginResponse {


   private String username;

   private Set<EdRolesEntity> edRolesEntities = new HashSet<>();

   private String jwtToken;

   public EdLoginResponse(String username, Set<EdRolesEntity> roles, String jwtToken) {
      this.username = username;
      this.edRolesEntities = roles;
      this.jwtToken = jwtToken;
   }
```

```
    public EdLoginResponse() {
    }

    public String getUsername() {
        return username;
    }

    public void setUsername(String username) {
        this.username = username;
    }

    public Set<EdRolesEntity> getEdRolesEntities() {
        return edRolesEntities;
    }

    public void setEdRolesEntities(Set<EdRolesEntity> edRolesEntities) {
        this.edRolesEntities = edRolesEntities;
    }

    public String getJwtToken() {
        return jwtToken;
    }

    public void setJwtToken(String jwtToken) {
        this.jwtToken = jwtToken;
    }
}
```

5.1.2.5 REPOSITORIES

EdAdminRepo.java

```
package com.vishnuparasu.EnforcementDirectorate.repository;

import com.vishnuparasu.EnforcementDirectorate.entity.EdAdminEntity;
import org.springframework.data.jpa.repository.JpaRepository;
import org.springframework.data.jpa.repository.Modifying;
import org.springframework.data.jpa.repository.Query;
import org.springframework.data.jpa.repository.config.EnableJpaRepositories;
import org.springframework.data.repository.query.Param;
import org.springframework.stereotype.Repository;
import org.springframework.stereotype.Service;

import java.util.Optional;

@Repository
@EnableJpaRepositories
@Service
public interface EdAdminRepo extends JpaRepository<EdAdminEntity,Integer> {

    @Modifying
    @Query("DELETE FROM EdAdminEntity u WHERE u.edaid = :edaid")
    void deleteByEduid(@Param("edaid") String edaid);
```

```
@Query("SELECT u from EdAdminEntity u where u.edaid = :edaid")
   Optional<EdAdminEntity> findByEduid(@Param("edaid")String edaid);
}
```

EdOfficerRepo.java

```
package com.vishnuparasu.EnforcementDirectorate.repository;

import com.vishnuparasu.EnforcementDirectorate.entity.EdOfficerEntity;
import org.springframework.data.jpa.repository.JpaRepository;
import org.springframework.data.jpa.repository.Modifying;
import org.springframework.data.jpa.repository.Query;
import org.springframework.data.jpa.repository.config.EnableJpaRepositories;
import org.springframework.data.repository.query.Param;
import org.springframework.stereotype.Repository;
import org.springframework.stereotype.Service;

import java.util.Optional;

@EnableJpaRepositories
@Repository
@Service
public interface EdOfficerRepo extends JpaRepository<EdOfficerEntity,Integer> {

   @Modifying
   @Query("delete from EdOfficerEntity u where u.edoid = :edoid")
   void deleteOfficerByEdoid(@Param("edoid") String edoid);

   @Query("select u from EdOfficerEntity u where u.edoid = :edoid")
   Optional<EdOfficerEntity> findOfficerByEdoid(@Param("edoid") String edoid);

}
```

EdRolesRepo.java

```
package com.vishnuparasu.EnforcementDirectorate.repository;

import com.vishnuparasu.EnforcementDirectorate.entity.EdRolesEntity;
import org.springframework.data.jpa.repository.JpaRepository;
import org.springframework.data.jpa.repository.config.EnableJpaRepositories;
import org.springframework.stereotype.Repository;
import org.springframework.stereotype.Service;


@Repository
@EnableJpaRepositories
@Service
public interface EdRolesRepo extends JpaRepository<EdRolesEntity,String> {

}
```

EdUserBankRepo.java

```
package com.vishnuparasu.EnforcementDirectorate.repository;

import com.vishnuparasu.EnforcementDirectorate.entity.EdUserBankEntity;
import org.springframework.boot.autoconfigure.quartz.QuartzDataSource;
import org.springframework.data.jpa.repository.JpaRepository;
import org.springframework.data.jpa.repository.Modifying;
import org.springframework.data.jpa.repository.Query;
import org.springframework.data.jpa.repository.config.EnableJpaRepositories;
import org.springframework.data.repository.query.Param;
import org.springframework.stereotype.Repository;
import org.springframework.stereotype.Service;

import java.util.Optional;

@Service
@EnableJpaRepositories
@Repository
public interface EdUserBankRepo extends JpaRepository<EdUserBankEntity,Long> {

    @Modifying
    @Query("DELETE FROM EdUserBankEntity u WHERE u.eduid = :eduid")
    void deleteByEduid(@Param("eduid") String eduid);

    @Query("SELECT u from EdUserBankEntity u where u.eduid = :eduid")
    Optional<EdUserBankEntity>findUserBankByEduid(@Param("eduid")String eduid);
}
```

EdUserCredentialRepo.java

```
package com.vishnuparasu.EnforcementDirectorate.repository;

import com.vishnuparasu.EnforcementDirectorate.entity.EdUserCredentials;
import org.springframework.data.jpa.repository.JpaRepository;
import org.springframework.data.jpa.repository.Modifying;
import org.springframework.data.jpa.repository.Query;
import org.springframework.data.jpa.repository.config.EnableJpaRepositories;
import org.springframework.data.repository.query.Param;
import org.springframework.stereotype.Repository;
import org.springframework.stereotype.Service;

import java.util.Optional;

@Service
@EnableJpaRepositories
@Repository
public interface EdUserCredentialRepo extends JpaRepository<EdUserCredentials,String> {



    @Query("SELECT u FROM EdUserCredentials u WHERE u.userName = :userName")
    Optional<EdUserCredentials> findByuserName(String userName);
```

```
    @Modifying
    @Query("DELETE FROM EdUserCredentials u WHERE u.eduid = :eduid")
    void deleteUserByEduid(@Param("eduid") String eduid);

    @Modifying
    @Query("DELETE FROM EdUserCredentials u WHERE u.edoid = :edoid")
    void deleteOfficerByEduid(@Param("edoid") String edoid);

    @Modifying
    @Query("DELETE FROM EdUserCredentials u WHERE u.edaid = :edaid")
    void deleteAdminByEduid(@Param("edaid") String edaid);
}
```

EdUserPaymentRepo.java

```
package com.vishnuparasu.EnforcementDirectorate.repository;

import com.vishnuparasu.EnforcementDirectorate.entity.EdUserEntity;
import com.vishnuparasu.EnforcementDirectorate.entity.EdUserPaymentEntity;
import org.aspectj.weaver.ast.Literal;
import org.springframework.data.jpa.repository.JpaRepository;
import org.springframework.data.jpa.repository.Query;
import org.springframework.data.jpa.repository.config.EnableJpaRepositories;
import org.springframework.data.repository.query.Param;
import org.springframework.stereotype.Repository;
import org.springframework.stereotype.Service;

import java.util.List;
import java.util.Optional;

@Service
@EnableJpaRepositories
@Repository
public interface EdUserPaymentRepo extends JpaRepository<EdUserPaymentEntity,Integer> {
    @Query("SELECT u from EdUserPaymentEntity u where (:eduidSender IN (u.eduidSender, u.eduidRecevier)) AND
u.isLegal = 'True'")
    List<EdUserPaymentEntity> findSenderByEduid(@Param("eduidSender")String eduidSender);

    @Query("SELECT u from EdUserPaymentEntity u where u.eduidRecevier = :eduidRecevier AND u.isLegal = 'True'")
    List<EdUserPaymentEntity> findRecevierByEduid(@Param("eduidRecevier")String eduidRecevier);

    @Query("SELECT u FROM EdUserPaymentEntity u WHERE (:eduid IN (u.eduidSender, u.eduidRecevier)) AND
u.isLegal = 'False'")
    List<EdUserPaymentEntity>findUserComplaintSenderOrReciever(@Param("eduid") String eduid);

    @Query("SELECT u from EdUserPaymentEntity u where u.isLegal = :isLegal")
    List<EdUserPaymentEntity> findAllByCompliantBoolean(@Param("isLegal")String isLegal);
}
```

EdUserRepo.java

```
package com.vishnuparasu.EnforcementDirectorate.repository;

import com.vishnuparasu.EnforcementDirectorate.entity.EdUserEntity;
import org.springframework.data.jpa.repository.JpaRepository;
import org.springframework.data.jpa.repository.Modifying;
import org.springframework.data.jpa.repository.Query;
import org.springframework.data.jpa.repository.config.EnableJpaRepositories;
import org.springframework.data.repository.query.Param;
import org.springframework.stereotype.Repository;
import org.springframework.stereotype.Service;

import java.util.Optional;

@Service
@EnableJpaRepositories
@Repository
public interface EdUserRepo extends JpaRepository<EdUserEntity,Integer> {

    @Modifying
    @Query("DELETE FROM EdUserEntity u WHERE u.eduid = :eduid")
    void deleteByEduid(@Param("eduid") String eduid);

    @Query("SELECT u from EdUserEntity u where u.eduid = :eduid")
    Optional<EdUserEntity> findByEduid(@Param("eduid")String eduid);
}
```

5.1.2.6 SERVICES & IMPLEMENTATION

EdAdminService.java

```
package com.vishnuparasu.EnforcementDirectorate.service;

import com.vishnuparasu.EnforcementDirectorate.entity.EdAdminEntity;
import com.vishnuparasu.EnforcementDirectorate.entity.EdRolesEntity;
import com.vishnuparasu.EnforcementDirectorate.entity.EdUserCredentials;

import java.util.List;

public interface EdAdminService {

    EdAdminEntity getAdmin(String edaid);

    List<EdAdminEntity> getAllAdmin();

    String removeAdmin(String edaid);

    EdAdminEntity modifyAdmin(EdAdminEntity edAdminEntity, String edaid);

    EdAdminEntity createAdmin(EdAdminEntity edAdminEntity);

    EdUserCredentials getUserCredential(String userid);

    List<EdUserCredentials> getAllUserCredentials();
```

```
    EdUserCredentials modifyUserCredentials(EdUserCredentials edUserCredentials, String userid);

    EdRolesEntity getRole(String roleName);

    List<EdRolesEntity> getAllRoles();

    String removeRole(String roleName);

    EdRolesEntity createRole(EdRolesEntity edRolesEntity);

    EdRolesEntity modifyRole(String roleName, EdRolesEntity edRolesEntity);

    String getNoRow();

}
```

EdAdminServiceImpl.java

```
package com.vishnuparasu.EnforcementDirectorate.service.impl;

import com.vishnuparasu.EnforcementDirectorate.entity.EdAdminEntity;
import com.vishnuparasu.EnforcementDirectorate.entity.EdRolesEntity;
import com.vishnuparasu.EnforcementDirectorate.entity.EdUserCredentials;
import com.vishnuparasu.EnforcementDirectorate.repository.EdAdminRepo;
import com.vishnuparasu.EnforcementDirectorate.repository.EdRolesRepo;
import com.vishnuparasu.EnforcementDirectorate.repository.EdUserCredentialRepo;
import com.vishnuparasu.EnforcementDirectorate.service.EdAdminService;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.boot.CommandLineRunner;
import org.springframework.context.annotation.Bean;
import org.springframework.security.crypto.password.PasswordEncoder;
import org.springframework.stereotype.Service;

import javax.transaction.Transactional;
import java.util.*;

@Service
public class EdAdminServiceImpl implements EdAdminService {

    @Autowired
    private EdAdminRepo edAdminRepo;

    @Autowired
    private EdUserCredentialRepo edUserCredentialRepo;

    @Autowired
    private EdRolesRepo edRolesRepo;

    @Autowired
    private PasswordEncoder passwordEncoder;


@Bean
```

```
public CommandLineRunner roleCrete() {
   return args -> {
      if (!edRolesRepo.findById("EDA").isPresent()) {
         EdRolesEntity admin = new EdRolesEntity();
         admin.setRole("EDA");
         admin.setRoleDesc("ADMIN");
         edRolesRepo.save(admin);
      }
   };
}

@Bean
public CommandLineRunner rootUser() {
   return  args -> {
      if (!edUserCredentialRepo.findByuserName("root").isPresent()) {
         EdUserCredentials rootUser = new EdUserCredentials();
         Set<EdRolesEntity> roles = new HashSet<>();
         EdRolesEntity rolesEntity = new EdRolesEntity();

         rolesEntity.setRoleDesc("admin");
         rolesEntity.setRole("EDA");

         roles.add(rolesEntity);
         rootUser.setEdRolesModels(roles);
         rootUser.setUserName("root");
         rootUser.setPassword(passwordEncoder.encode("root"));

         edUserCredentialRepo.save(rootUser);
      }
   };
}
@Override
public EdAdminEntity getAdmin(String edaid) {
   Optional<EdAdminEntity> oneAdmin = edAdminRepo.findByEduid(edaid);
   return oneAdmin.get();
}

@Override
public List<EdAdminEntity> getAllAdmin() {
   List<EdAdminEntity> listOfAllAdmin = new ArrayList<>();
   edAdminRepo.findAll().forEach(listOfAllAdmin::add);
   return listOfAllAdmin;
}

@Transactional
@Override
public String removeAdmin(String edaid) {
   edAdminRepo.deleteByEduid(edaid);
   edUserCredentialRepo.deleteAdminByEduid(edaid);
   return edaid;
}


@Override
```

```
public EdAdminEntity modifyAdmin(EdAdminEntity edAdminEntity, String edaid) {
    Optional<EdAdminEntity> adminEntity = edAdminRepo.findByEduid(edaid);
    if (adminEntity.isPresent()) {
        EdAdminEntity edAdminEntity1 = adminEntity.get();
        edAdminEntity1.setDob(edAdminEntity.getDob());
        edAdminEntity1.setFname(edAdminEntity.getFname());
        edAdminEntity1.setAdharNumber(edAdminEntity.getAdharNumber());
        edAdminEntity1.setName(edAdminEntity.getName());
        edAdminEntity1.setGmail(edAdminEntity.getGmail());
        edAdminEntity1.setPho(edAdminEntity.getPho());
        edAdminEntity1.setGender(edAdminEntity.getGender());
        return edAdminRepo.save(edAdminEntity1);
    }
    return null;
}

@Override
public EdAdminEntity createAdmin(EdAdminEntity edAdminEntity) {
    EdAdminEntity entity = edAdminEntity;
    entity.setEdaid(getNoRow());
    EdUserCredentials userCredentials =  entity.getEdUserCredentials().iterator().next();
    userCredentials.setPassword(passwordEncoder.encode(entity.getDob().toString()));
    userCredentials.setUserName(entity.getEdaid());
    EdRolesEntity roles = userCredentials.getEdRolesModels().iterator().next();
    roles.setRoleDesc("ADMIN");
    roles.setRole("EDA");
    return edAdminRepo.save(entity);
}

@Override
public EdUserCredentials getUserCredential(String userName) {
    Optional<EdUserCredentials> oneUserCredential = edUserCredentialRepo.findById(userName);
    return oneUserCredential.get();
}

@Override
public List<EdUserCredentials> getAllUserCredentials() {
    List<EdUserCredentials> listOfAllUserCredentials = new ArrayList<>();
    edUserCredentialRepo.findAll().forEach(listOfAllUserCredentials::add);
    return listOfAllUserCredentials;
}

@Override
public EdUserCredentials modifyUserCredentials(EdUserCredentials edUserCredentials, String userid) {
    Optional<EdUserCredentials> userCredentials = edUserCredentialRepo.findById(userid);
    if (userCredentials.isPresent()) {
        EdUserCredentials edUserCredentials1 = userCredentials.get();
        edUserCredentials1.setPassword(passwordEncoder.encode(edUserCredentials.getPassword()));
        edUserCredentials1.setEdRolesModels(edUserCredentials.getEdRolesModels());
        return edUserCredentialRepo.save(edUserCredentials1);
    }
    return null;
}
@Override
```

```
    public EdRolesEntity getRole(String roleName) {
        Optional<EdRolesEntity> oneRole = edRolesRepo.findById(roleName);
        return oneRole.get();
    }

    @Override
    public List<EdRolesEntity> getAllRoles() {
        List<EdRolesEntity> listOfRoll = new ArrayList<>();
        edRolesRepo.findAll().forEach(listOfRoll::add);
        return listOfRoll;
    }

    @Override
    public String removeRole(String roleName) {
        edRolesRepo.deleteById(roleName);
        return roleName;
    }

    @Override
    public EdRolesEntity createRole(EdRolesEntity edRolesEntity) {
        return edRolesRepo.save(edRolesEntity);
    }

    @Override
    public EdRolesEntity modifyRole(String roleName, EdRolesEntity edRolesModel) {
        Optional<EdRolesEntity> rolesEntity = edRolesRepo.findById(roleName);
        if (rolesEntity.isPresent()) {
            EdRolesEntity modifyRole = rolesEntity.get();
            modifyRole.setRole(edRolesModel.getRole());
            modifyRole.setRoleDesc(edRolesModel.getRoleDesc());
            return edRolesRepo.save(modifyRole);
        }
        return null;
    }

    @Override
    public String getNoRow() {
        return "EDAID"+(edAdminRepo.count()+1);
    }
}
```

EdLoginService.java

```
package com.vishnuparasu.EnforcementDirectorate.service;


import com.vishnuparasu.EnforcementDirectorate.model.EdLoginRequest;
import com.vishnuparasu.EnforcementDirectorate.model.EdLoginResponse;

public interface EdLoginService {

   EdLoginResponse login(EdLoginRequest edLoginRequest);

}
```

EdLoginSerivceImpl.java

```
package com.vishnuparasu.EnforcementDirectorate.service.impl;

import com.vishnuparasu.EnforcementDirectorate.entity.EdUserCredentials;
import com.vishnuparasu.EnforcementDirectorate.jwt.EdJwtUtill;
import com.vishnuparasu.EnforcementDirectorate.model.EdLoginRequest;
import com.vishnuparasu.EnforcementDirectorate.model.EdLoginResponse;
import com.vishnuparasu.EnforcementDirectorate.service.EdLoginService;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.security.authentication.AuthenticationManager;
import org.springframework.security.authentication.UsernamePasswordAuthenticationToken;
import org.springframework.security.core.Authentication;
import org.springframework.stereotype.Service;

@Service
public class EdLoginServiceImpl implements EdLoginService {


   @Autowired
   AuthenticationManager authManager;

   @Autowired
   EdJwtUtill edJwtUtill;

   @Override
   public EdLoginResponse login(EdLoginRequest edLoginRequest) {
      Authentication authentication = authManager.authenticate( new
UsernamePasswordAuthenticationToken(edLoginRequest.getUsername(), edLoginRequest.getPassword()));

      EdUserCredentials edUserCredentials = (EdUserCredentials) authentication.getPrincipal();
      String accessToken = "Bearer "+edJwtUtill.generateAccessToken(edUserCredentials);

      return new
EdLoginResponse(edUserCredentials.getUsername(),edUserCredentials.getEdRolesModels(),accessToken);
   }
}
```

EdOfficerService.java

```
package com.vishnuparasu.EnforcementDirectorate.service;

import com.vishnuparasu.EnforcementDirectorate.entity.EdOfficerEntity;

import java.util.List;

public interface EdOfficerService {

    EdOfficerEntity getOfficer(String edoid);

    List<EdOfficerEntity> getAllOfficers();

    EdOfficerEntity modifyOfficer(EdOfficerEntity edOfficerEntity, String edoid);

    String deleteOfficer(String edoid);

    EdOfficerEntity createOfficer(EdOfficerEntity edOfficerEntity);

    String getNoRow();

}
```

EdOfficerServiceImpl.java

```
package com.vishnuparasu.EnforcementDirectorate.service.impl;

import com.vishnuparasu.EnforcementDirectorate.entity.EdOfficerEntity;
import com.vishnuparasu.EnforcementDirectorate.entity.EdRolesEntity;
import com.vishnuparasu.EnforcementDirectorate.entity.EdUserCredentials;
import com.vishnuparasu.EnforcementDirectorate.repository.EdOfficerRepo;
import com.vishnuparasu.EnforcementDirectorate.repository.EdUserCredentialRepo;
import com.vishnuparasu.EnforcementDirectorate.service.EdOfficerService;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.security.crypto.password.PasswordEncoder;
import org.springframework.stereotype.Service;

import javax.transaction.Transactional;
import java.util.ArrayList;
import java.util.List;
import java.util.Optional;

@Service
public class EdOfficerServiceImpl implements EdOfficerService {

    @Autowired
    EdOfficerRepo edOfficerRepo;

    @Autowired
    EdUserCredentialRepo edUserCredentialRepo;
```

```
@Autowired
    private PasswordEncoder passwordEncoder;


    @Override
    public EdOfficerEntity getOfficer(String edoid) {
        Optional<EdOfficerEntity> oneOfficer = edOfficerRepo.findOfficerByEdoid(edoid);
        return oneOfficer.get();
    }

    @Override
    public List<EdOfficerEntity> getAllOfficers() {
        List<EdOfficerEntity> listOfAllOfficers = new ArrayList<>();
        edOfficerRepo.findAll().forEach(listOfAllOfficers::add);
        return listOfAllOfficers;
    }

    @Override
    public EdOfficerEntity modifyOfficer(EdOfficerEntity edOfficerEntity, String edoid) {
        Optional<EdOfficerEntity> modifyOfficer = edOfficerRepo.findOfficerByEdoid(edoid);
        if (modifyOfficer.isPresent()) {
            EdOfficerEntity officerEntity = modifyOfficer.get();
            officerEntity.setAddress(edOfficerEntity.getAddress());
            officerEntity.setDob(edOfficerEntity.getDob());
            officerEntity.setName(edOfficerEntity.getName());
            officerEntity.setGender(edOfficerEntity.getGender());
            officerEntity.setFname(edOfficerEntity.getFname());
            officerEntity.setAdharNumber(edOfficerEntity.getAdharNumber());
            officerEntity.setJob(edOfficerEntity.getJob());
            officerEntity.setJobPosition(edOfficerEntity.getJobPosition());
            officerEntity.setSalary(edOfficerEntity.getSalary());
            officerEntity.setPho(edOfficerEntity.getPho());
            officerEntity.setQualification(edOfficerEntity.getQualification());
            officerEntity.setJsd(edOfficerEntity.getJsd());
            officerEntity.setGmail(edOfficerEntity.getGmail());
            return edOfficerRepo.save(officerEntity);
        }
        return null;
    }

    @Transactional
    @Override
    public String deleteOfficer(String edoid) {
        edOfficerRepo.deleteOfficerByEdoid(edoid);
        edUserCredentialRepo.deleteOfficerByEduid(edoid);
        return edoid;
    }
```

```
@Override
    public EdOfficerEntity createOfficer(EdOfficerEntity edOfficerEntity) {
        EdOfficerEntity entity = edOfficerEntity;
        entity.setEdoid(getNoRow());
        EdUserCredentials userCredentials =  entity.getEdUserCredentials().iterator().next();
        System.out.println(entity.getDob());
        userCredentials.setPassword(passwordEncoder.encode(entity.getDob().toString()));
        userCredentials.setUserName(getNoRow());
        EdRolesEntity roles = userCredentials.getEdRolesModels().iterator().next();
        roles.setRole("EDO");
        roles.setRoleDesc("OFFICER");
        return edOfficerRepo.save(entity);
    }

    @Override
    public String getNoRow() {
        return "EDOID"+(edOfficerRepo.count()+1);
    }
}
```

EdUserService.java

```
package com.vishnuparasu.EnforcementDirectorate.service;

import com.sun.org.apache.xalan.internal.xsltc.dom.StepIterator;
import com.vishnuparasu.EnforcementDirectorate.entity.EdUserBankEntity;
import com.vishnuparasu.EnforcementDirectorate.entity.EdUserEntity;
import com.vishnuparasu.EnforcementDirectorate.entity.EdUserPaymentEntity;

import java.util.List;

public interface EdUserService {

    EdUserEntity getUser(String eduid);

    List<EdUserEntity> getAllUser();

    EdUserEntity modifyUser(EdUserEntity edUserEntity, String eduid);

    String deleteUser(String eduid);

    EdUserEntity createUser(EdUserEntity edUserEntity);

    EdUserBankEntity getUserBank(String eduid);

    List<EdUserBankEntity> getAllUserBank();

    EdUserPaymentEntity createUserPatment(EdUserPaymentEntity edUserPaymentEntity);

    List<EdUserPaymentEntity> getSenderDetail(String senderEduid);

    List<EdUserPaymentEntity> getRecevierDetail(String recevierEduid);

    List<EdUserPaymentEntity> getAllPatment();
```

```
    List<EdUserPaymentEntity> getUserComplaint(String eduid );

    List<EdUserPaymentEntity> getAllCompliants(String tureOrFalse);

    EdUserPaymentEntity modifyPayment(String value, int id);

    String getNoRow();
}
```

EdUserServiceImpl.java

```
package com.vishnuparasu.EnforcementDirectorate.service.impl;

import com.vishnuparasu.EnforcementDirectorate.entity.*;
import com.vishnuparasu.EnforcementDirectorate.repository.EdUserBankRepo;
import com.vishnuparasu.EnforcementDirectorate.repository.EdUserCredentialRepo;
import com.vishnuparasu.EnforcementDirectorate.repository.EdUserPaymentRepo;
import com.vishnuparasu.EnforcementDirectorate.repository.EdUserRepo;
import com.vishnuparasu.EnforcementDirectorate.service.EdUserService;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.security.crypto.password.PasswordEncoder;
import org.springframework.stereotype.Service;

import javax.transaction.Transactional;
import java.time.LocalDateTime;
import java.time.format.DateTimeFormatter;
import java.util.ArrayList;
import java.util.List;
import java.util.Optional;

@Service
public class EdUserServiceImpl implements EdUserService {

    @Autowired
    private EdUserRepo edUserRepo;

    @Autowired
    private EdUserBankRepo edUserBankRepo;

    @Autowired
    private EdUserCredentialRepo edUserCredentialRepo;

    @Autowired
    private EdUserPaymentRepo edUserPaymentRepo;

    @Autowired
    private PasswordEncoder passwordEncoder;

   @Override
    public EdUserEntity getUser(String eduid) {
        Optional<EdUserEntity> oneUser = edUserRepo.findByEduid(eduid);
        return oneUser.get();
    }
```

```
    @Override
    public List<EdUserEntity> getAllUser() {
        List<EdUserEntity> listOfAllUser = new ArrayList<>();
        edUserRepo.findAll().forEach(listOfAllUser::add);
        return listOfAllUser;
    }

    @Override
    public EdUserEntity modifyUser(EdUserEntity edUserEntity, String eduid) {
        Optional<EdUserEntity> userEntity = edUserRepo.findByEduid(eduid);
        if (userEntity.isPresent())  {
            EdUserEntity modifyUser = userEntity.get();
            modifyUser.setName(edUserEntity.getName());
            modifyUser.setGmail(edUserEntity.getGmail());
            modifyUser.setDob(edUserEntity.getDob());
            modifyUser.setAdharNumber(edUserEntity.getAdharNumber());
            modifyUser.setAddress(edUserEntity.getAddress());
            modifyUser.setJob(edUserEntity.getJob());
            modifyUser.setJobPosition(edUserEntity.getJobPosition());
            modifyUser.setPho(edUserEntity.getPho());
            modifyUser.setEdUserBankEntities(edUserEntity.getEdUserBankEntities());
            modifyUser.setFname(edUserEntity.getFname());
            modifyUser.setSalary(edUserEntity.getSalary());
            modifyUser.setJsd(edUserEntity.getJsd());
            modifyUser.setQualification(edUserEntity.getQualification());
            return edUserRepo.save(modifyUser);

        }
        return null;
    }

    @Transactional
    @Override
    public String deleteUser(String eduid) {

        edUserRepo.deleteByEduid(eduid);
        edUserBankRepo.deleteByEduid(eduid);
        edUserCredentialRepo.deleteUserByEduid(eduid);

        return eduid;
    }

@Override
    public EdUserEntity createUser(EdUserEntity edUserEntity) {
        EdUserEntity entity = edUserEntity;
        entity.setEduid(getNoRow());
        EdUserCredentials userCredentials =  entity.getEdUserCredentials().iterator().next();
        userCredentials.setPassword(passwordEncoder.encode(entity.getDob().toString()));
        userCredentials.setUserName(getNoRow());
        EdRolesEntity roles  = userCredentials.getEdRolesModels().iterator().next();
        roles.setRole("EDU");
        roles.setRoleDesc("USER");
        return edUserRepo.save(entity);
    }
```

```
@Override
public EdUserBankEntity getUserBank(String eduid) {
    Optional<EdUserBankEntity> oneUserBank = edUserBankRepo.findUserBankByEduid(eduid);
    return oneUserBank.get();
}

@Override
public List<EdUserBankEntity> getAllUserBank() {
    List<EdUserBankEntity> listOfAllBank = new ArrayList<>();
    edUserBankRepo.findAll().forEach(listOfAllBank::add);
    return listOfAllBank;
}

@Override
public EdUserPaymentEntity createUserPatment(EdUserPaymentEntity edUserPaymentEntity) {
    LocalDateTime curentDateTime = LocalDateTime.now();
    DateTimeFormatter formatter = DateTimeFormatter.ofPattern("yyyy-MM-dd HH:mm:ss");
    String formatted = curentDateTime.format(formatter);
    edUserPaymentEntity.setDateAndTime(formatted);
    EdUserBankEntity edUserBankEntity =
edUserBankRepo.findById(edUserPaymentEntity.getSenderAcctNo()).get();
    if ((edUserBankEntity.getTotalAmount() != 0) && (edUserBankEntity.getTotalAmount() !=
edUserPaymentEntity.getAmount() && edUserBankEntity.getTotalAmount() >= edUserPaymentEntity.getAmount())) {
        edUserBankEntity.setTotalAmount(edUserBankEntity.getTotalAmount()-edUserPaymentEntity.getAmount());
        edUserBankRepo.save(edUserBankEntity);
        EdUserBankEntity recevierBankEntity =
edUserBankRepo.findById(edUserPaymentEntity.getRecevierAcctNo()).get();
        recevierBankEntity.setTotalAmount(recevierBankEntity.getTotalAmount()+edUserPaymentEntity.getAmount());
        edUserBankRepo.save(recevierBankEntity);
        return  edUserPaymentRepo.save(edUserPaymentEntity);
    }
    return null;

}
@Override
public List<EdUserPaymentEntity> getSenderDetail(String senderEduid) {
    List<EdUserPaymentEntity> senderDetail = new ArrayList<>();
    edUserPaymentRepo.findSenderByEduid(senderEduid).forEach(senderDetail::add);
    return senderDetail;
}

@Override
public List<EdUserPaymentEntity> getRecevierDetail(String recevierEduid) {
    List<EdUserPaymentEntity> recevierDetail = new ArrayList<>();
    edUserPaymentRepo.findRecevierByEduid(recevierEduid).forEach(recevierDetail::add);
    return recevierDetail;
}

@Override
public List<EdUserPaymentEntity> getAllPatment() {
    List<EdUserPaymentEntity> edUserPaymentEntityList = new ArrayList<>();
    edUserPaymentRepo.findAll().forEach(edUserPaymentEntityList::add);
    return edUserPaymentEntityList;
}
```

```
    @Override
    public List<EdUserPaymentEntity> getUserComplaint(String eduid) {
        List<EdUserPaymentEntity> userComplaintList = new ArrayList<>();
        edUserPaymentRepo.findUserComplaintSenderOrReciever(eduid).forEach(userComplaintList::add);
        return userComplaintList;
    }

    @Override
    public List<EdUserPaymentEntity> getAllCompliants(String trueOrFalse) {
        List<EdUserPaymentEntity> listOfEdUserPayment = new ArrayList<>();
        edUserPaymentRepo.findAllByCompliantBoolean(trueOrFalse).forEach(listOfEdUserPayment::add);
        return listOfEdUserPayment;
    }

    @Override
    public EdUserPaymentEntity modifyPayment(String value, int id) {
        EdUserPaymentEntity entity = edUserPaymentRepo.findById(id).get();
        entity.setIsLegal(value);
        return  edUserPaymentRepo.save(entity);
    }

    @Override
    public String getNoRow() {
        return "EDUID"+(edUserRepo.count()+01);
    }

}
```

5.1.2.7 CONFIGURATION

EdJwtConfiguration.java

```
package com.vishnuparasu.EnforcementDirectorate.configuration;

import com.vishnuparasu.EnforcementDirectorate.jwt.EdRequestEntryPoint;
import com.vishnuparasu.EnforcementDirectorate.jwt.EdRequestFilter;
import com.vishnuparasu.EnforcementDirectorate.repository.EdUserCredentialRepo;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.context.annotation.Bean;
import org.springframework.context.annotation.Configuration;
import org.springframework.security.authentication.AuthenticationManager;
import org.springframework.security.authentication.dao.DaoAuthenticationProvider;
import org.springframework.security.config.annotation.authentication.builders.AuthenticationManagerBuilder;
import org.springframework.security.config.annotation.method.configuration.EnableGlobalMethodSecurity;
import org.springframework.security.config.annotation.web.builders.HttpSecurity;
import org.springframework.security.config.annotation.web.configuration.EnableWebSecurity;
import org.springframework.security.config.annotation.web.configuration.WebSecurityConfigurerAdapter;
import org.springframework.security.config.http.SessionCreationPolicy;
import org.springframework.security.core.userdetails.UsernameNotFoundException;
import org.springframework.security.crypto.bcrypt.BCryptPasswordEncoder;
import org.springframework.security.crypto.password.PasswordEncoder;
import org.springframework.security.web.authentication.UsernamePasswordAuthenticationFilter;
```

```
@Configuration
@EnableWebSecurity(debug = true)
@EnableGlobalMethodSecurity(prePostEnabled = true, securedEnabled = true, jsr250Enabled = true)
public class EdJwtConfiguration extends WebSecurityConfigurerAdapter {

   @Autowired
   EdUserCredentialRepo edUserCredentialRepo;

   @Autowired
   EdRequestEntryPoint edRequestEntryPoint;

   @Bean
   public EdRequestFilter getJwtFilter() {
      return new EdRequestFilter();
   }

   @Override
   @Bean
   public AuthenticationManager authenticationManagerBean() throws Exception {
      return super.authenticationManagerBean();
   }

   @Override
   protected void configure(AuthenticationManagerBuilder auth) throws Exception {
      auth.authenticationProvider(authenticationProvider());
   }
   @Bean
   public DaoAuthenticationProvider authenticationProvider() {
      DaoAuthenticationProvider daoAuthenticationProvider = new DaoAuthenticationProvider();
      daoAuthenticationProvider.setUserDetailsService(username -> edUserCredentialRepo.findByuserName(username)
            .orElseThrow(() -> new UsernameNotFoundException("user "+username+" not found")));
      daoAuthenticationProvider.setPasswordEncoder(passwordEncoder());
      return daoAuthenticationProvider;
   }

   @Bean
   public PasswordEncoder passwordEncoder() {
      return new BCryptPasswordEncoder();
   }

   protected void configure(HttpSecurity http) throws Exception {
      http.cors().and().csrf().disable().exceptionHandling()
            .authenticationEntryPoint(edRequestEntryPoint).and()
            .sessionManagement().sessionCreationPolicy(SessionCreationPolicy.STATELESS).and()
            .authorizeRequests().antMatchers("/swagger-ui/**", "/swagger-resources/**", "/v2/api-docs").permitAll()
            .antMatchers("/ED/UserController/totalNumberOfRow", "/ED/EdJwtController/login",
                  "/ED/UserController/createEdUser").permitAll().anyRequest().authenticated();
      http.addFilterBefore(getJwtFilter(), UsernamePasswordAuthenticationFilter.class);
   }
}
```

5.1.2.7 ENFORCEMENT DIRECTORATE [BASE PACKAGE]

EnforcementDirectorateApplication.java

```
package com.vishnuparasu.EnforcementDirectorate;

import org.springframework.boot.SpringApplication;
import org.springframework.boot.autoconfigure.SpringBootApplication;

@SpringBootApplication
public class EnforcementDirectorateApplication {

	public static void main(String[] args) {
		SpringApplication.run(EnforcementDirectorateApplication.class, args);
	}
}
```

5.1.2 Front End Module Descrbtion

5.1.2.1 Angular:

AngularJS was developed in 2008-2009 by Misko Hevery and Adam Abrons and is now maintained by Google. AngularJS is a Javascript open-source front-end framework. It is used to develop single-page web applications (SPAs). AngularJS is an open-source, client-side framework that allows developers to build dynamic and responsive web applications.

It extends HTML with new attributes and binds data to HTML with expressions. JavaScript is single threaded, so it is common for more critical tasks like data calls to take place asynchronously. Web Workers facilitates you to run the CPU intensive computations in the background thread, freeing the main thread to update the user interface.

Web workers can also be helpful, if your application is unresponsive while processing data.If you want to outsource such a calculation to a background, we must first create the web worker using the Angular CLI. The framework is designed to make both the development and testing of such applications more accessible by providing a well-defined structure and a set of tools.

It is a continuously growing and expanding framework which provides better ways for developing web applications. In this AngularJS tutorial, we will explore the key concepts, features, and steps to kickstart your journey in creating robust and interactive web applications.

A single page application is a web application or a website which provides users a very fluid, reactive and fast experience similar to a desktop application. It contains menu, buttons and blocks on a single page and when a user clicks on any of them; it dynamically rewrites the current page rather than loading entire new pages from a server. That's the reason behind its reactive fast speed

Angular is a great framework and is very beneficial because of its features, structure, ecosystem, and support.

- ✓ **Community support:** It is developed and maintained by Google. Also, it is based on typescript which is created by Microsoft. Hence it has a big community support.
- ✓ **Free of Cost:** Since it is an open-source language, therefore developers are allowed to use its components and all methods for free.
- ✓ **TypeScript:** Angular is a typescript-based framework which is a statically typed superset of javascript.
- ✓ **Angular CLI:** Angular CLI helps in simplification processes like creating, building, and deploying the application.

5.1.2.2 Dynamic Web:

A website can be static or dynamic. A static website's information does not change automatically, which means it remains static or the same for all visitors of the site. A dynamic website or webpage has information, which is generated in real-time and altered on the basis of the viewer, the time zone, time of the day, and other aspects. For example, the Javatpoint website's home page changes daily to provide visitors latest content as it is a dynamic web page.

However, this page that you are visiting currently, its information will not be changed until it is not updated as it is a static page. The dynamic web pages have Web scripting code like ASP or PHP. The code within the dynamic web pages is analyzed at the time they are accessed by the users; consequently, HTML is forwarded to the client's Web browser.

A dynamic website can be client-side scripting or server-side scripting or can be both kinds of scripting in order to generate the changing content. In dynamic websites, HTML programming is also involved for the basic structure. The page can use any scripting language like JavaScript with client-side HTML scripting to alter the content of the page. Scripts are run on the server, which hosts the page; it is done with server-side scripting.

In server-side scripting, the parameters are defined that provide a way the process for how the page is built. While comparing with static websites, dynamic websites are easier to maintain; therefore, most large websites are dynamic type.

This is because, with static websites, whenever a change is made, they must be opened, edited, and published manually, and these site's each page has unique content. On the other hand, the information is accessed from a database by dynamic pages.

Therefore, with dynamic websites, webmasters may only need to update a database record at the time of they want to change the content. Especially, the dynamic concept is much ideal for large sites as they have hundreds or thousands of pages.

5.1.2.3 Angular Features

- ✓ **Angular supports multiple platforms:** Angular is a cross platform language. It supports multiple platforms. You can build different types of apps by using Angular.

- ✓ **Desktop applications:** Angular facilitates you to create desktop installed apps on different types of operating systems i.e. Windows, Mac or Linux by using the same Angular methods which we use for creating web and native apps.

- ✓ **Native applications:** You can built native apps by using Angular with strategies from Cordova, Ionic, or NativeScript.

- ✓ **Progressive web applications:** Progressive web applications are the most common apps which are built with Angular. Angular provides modern web platform capabilities to deliver high performance, offline, and zero-step installation apps.
- ✓ High Speed, Ultimate Performance

- ✓ **Universal support:** Angular can be used as a front-end web development tool for the programming languages like Node.js, .Net, PHP, Java Struts and Spring and other servers for near-instant rendering in just HTML and CSS. It also optimizes the website for better SEO.

- ✓ **Code splitting:** Angular apps are fast and loads quickly with the new Component Router, which delivers automatic code-splitting so users only load code required to render the view they request.

- ✓ **Code generation:** Angular makes your templates in highly optimized code for today?s JavaScript virtual machines which gives the benefits of hand-written code.

- ✓ **Productivity Angular:** provides a better productivity due to its simple and powerful template syntax, command line tools and popular editors and IDEs.

- ✓ **Powerful templates:** Angular provides simple and powerful template syntax to create UI view quickly.

- ✓ **IDEs:** Angular provides intelligent code completion, instant errors, and other feedback in popular editors and IDEs.

- ✓ **Angular CLI:** Angular CLI provides command line tools start building fast, add components and tests, and then instantly deploy.

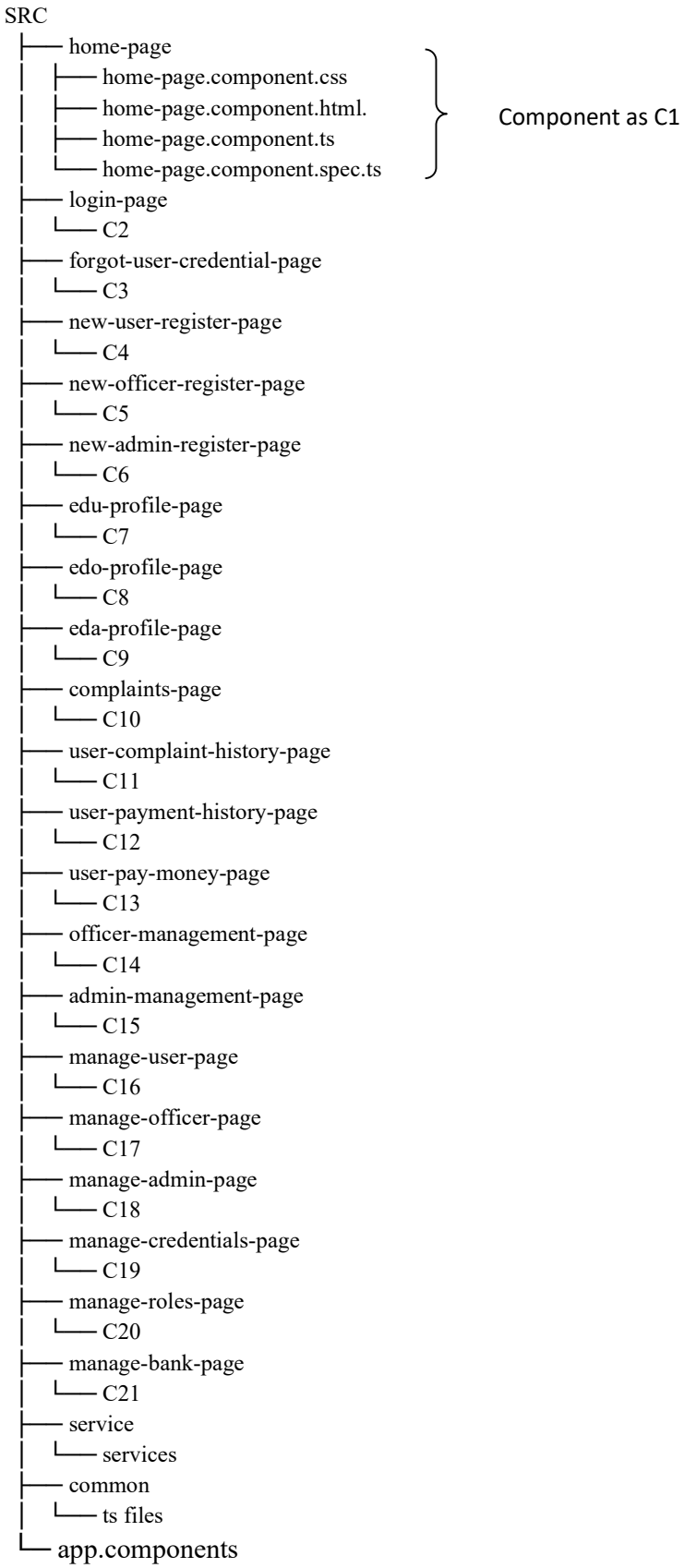
- ✓ **Full Stack Development:** Angular is a complete framework of JavaScript. It provides Testing, animation and Accessibility. It provides full stack development along with Node.js, Express.js, and MongoDB.

- ✓ **Testing:** Angular provides Karma and Jasmine for unit testing. B y using it, you can check your broken things every time you save. Karma is a JavaScript test runner tool created by Angular team. Jasmine is the testing framework form unit testing in Angular apps, and Karma provides helpful tools that make it easier to us to call our Jasmine tests whilst we are writing code.

- ✓ **Animation Support:** Angular facilitates you to create high-performance, complex choreographies and animation timelines with very little code through Angular's intuitive API.

- ✓ **Accessibility:** In Angular, you can create accessible applications with ARIA-enabled components, developer guides, and built-in a11y test infrastructure.

5.1.2.4 Component Structures



5.2 TESTING STAGES OF THE PROJECT

5.2.1 Software Testing:

The purpose of testing is to discover errors. Testing is the process of trying to discover every conceivable fault or weakness in a work product. It provides a way to check the functionality of components, sub-assemblies, assemblies, and/or a finished product It is the process of exercising software with the intent of ensuring that the Software system meets its requirements and user expectations and does not fail in an unacceptable manner. There are various types of tests. Each test type addresses a specific testing requirement.

Types Of Tests:

5.2.1.1 Unit testing:

Unit testing involves the design of test cases that validate that the internal program logic is functioning properly and that program inputs produce valid outputs. All decision branches and internal code flow should be validated. It is the testing of individual software units of the application. It is done after the completion of an individual unit before integration. This is a structural testing, that relies on knowledge of its construction and is invasive. Unit tests perform basic tests at the component level and test a specific business process, application, and/or system configuration. Unit tests ensure that each unique path of a business process performs accurately to the documented specifications and contains clearly defined inputs and expected results.

5.2.1.2 Integration testing:

Integration tests are designed to test integrated software components to determine if they actually run as one program. Testing is event-driven and is more concerned with the basic outcome of screens or fields. Integration tests demonstrate that although the components were individually satisfactory, as shown by successful unit testing, the combination of components is correct and consistent. Integration testing is specifically aimed at exposing the problems that arise from the combination of components.

5.2.1.3 Functional test:

Functional tests provide systematic demonstrations that functions tested are available as specified by the business and technical requirements, system documentation, and user manuals.
Functional testing is centered on the following items:

Valid Input : identified classes of valid input must be accepted. Invalid Input : identified classes of invalid input must be rejected. Functions : identified functions must be exercised.

Output : identified classes of application outputs must be exercised. Systems/Procedures : interfacing systems or procedures must be invoked.

Organization and preparation of functional tests are focused on requirements, key functions, or special test cases. In addition, systematic coverage pertaining to identifying Business process

flows; data fields, predefined processes, and successive processes must be considered for testing. Before functional testing is complete, additional tests are identified and the effective value of current tests is determined.

5.2.1.4 System Testing:

System testing ensures that the entire integrated software system meets requirements. It tests a configuration to ensure known and predictable results. An example of system testing is configuration-oriented system integration.

5.2.1.5 Acceptance Testing:

User Acceptance Testing is a critical phase of any project and requires significant participation by the end user. It also ensures that the system meets the functional requirements.
Test Results: All the test cases mentioned above passed successfully. No defects encountered

5.2.1.6 White Box Testing:

White Box Testing is a testing in which in which the software tester has knowledge of the inner workings, structure and language of the software, or at least its purpose. It is purpose. It is used to test areas that cannot be reached from a black box level.

5.2.1.7 Black Box Testing:

Black Box Testing is testing the software without any knowledge of the inner workings, structure or language of the module being tested. Black box tests, as most other kinds of tests, must be written from a definitive source document, such as specification or requirements document, such as specification or requirements document. It is a testing in which the software under test is treated, as a black box .you cannot "see" into it. The test provides inputs and responds to outputs without considering how the software works.

5.2.1 Test Results:

Cycle Tests : Unit Testing, Integration Testing, System Testing (White Box Testing)			
Name of Module	**Operations**	**Passed/Failed**	**Success/Error Message**
Ed-Authentication	Sign-in / Sign-Out	Passed	Good
Ed-Users	Create/Read/Update/Delete	Passed	Good
Ed-Admin	Create/Read/Update/Delete	Passed	Good
Ed-Roles	Read/Update	Passed	Good
Ed-Credentials	Read/Update	Passed	Good
Ed-Bank	Read/Update	Passed	Good
Ed-Officer	Create/Read/Update/Delete	Passed	Good
Ed-Payment	Read	Passed	Good
Describtion	**Every Module Communicating With Each Other, Wihout Any Error Or Worng Output, Also Without Bugs.** **Proof Screenshots (Page No : ref-Index)**		

All the test cases mentioned above passed successfully. No defects were encountered.

5.3 LIST OF VALIDATIONS

Verification and validation are independent procedure that are used together for checking that a product, service, or system meets requirements and specifications and that it fulfills its intended purpose. These are critical components of a quality management system such as ISO 9000. The verification and validation are sometimes preceded with "independent", indicating that the verification and validation is to be performed by a disinterested third party. "Independent verification and validation" can be abbreviated as "IV &V".

In practice, as quality management terms, the definitions of verification and validation can be inconsistent. Sometimes they are even used interchangeably.

- ✓ "Validation. The assurance that a product, service, or system meets the needs of the customer and other identified stakeholders. It often involves acceptance and suitability with extended customers. Contrast with verification".
- ✓ "Verification. The evaluation of whether or not a product, service, or system complies with a regulation, requirement, specification, or imposed condition. It is often an internal process, Contrast with validation".

5.4 OVERVIEW

Verification is intended to check that a product, service, or system (or portion thereof, or set thereof) meets a set of design specification. In the development phase, verification procedures involve performing special tests to model or simulate a portion, or the entirety, of a product, service or system,

Then performing a review or analysis of the modeling results. In the post- development phase, verification procedure involves regularly repeating tests devised specifically to ensure that the product, service, or system requirements, specifications, and regulations as time progresses.

It is a process that is used to evaluate whether a product, service, or system complies with regulations, specification, or conditions imposed at the start of a development phase. Verification can be in development, scale-up or production. This is often an internal process.

Validation is intended to ensure a product, service, or system (or portion thereof, or set thereof) results in a product, service, or system (or portion thereof, or set thereof) that meets the operational needs of the user.

For a new development flow or verification flow, validation procedures may involve modeling either flow and using simulations to predict faults or gaps that might lead to invalid or incomplete verification or development of a product, service, or system.

5.5 CATEGORIES OF VALIDATION

Validation work can generally be categorized by the following functions:

5.5.1 Prospective validation:

The missions conducted before new items are released to make sure the characteristics of the interests which are functioning properly and which meet safety standards. Some examples could be legislative rules, guidelines or proposals, methods, theories, hypothesis, model products and services.

5.5.2 Retrospective validation:

A process for items that are already in use and distribution or production. The validation is performed against the written specification or predetermined expectations, based upon their historical data/evidence/recorded. If any critical data is missing, then the work cannot be processed or can only be completed partially. The tasks are considered necessary if:

- ✓ Prospective validation is missing, inadequate or flawed.
- ✓ The change of legislative regulations or standards affects the compliance of the items being released to the public or market.

5.5.3 Partial validation

Often used for research and pilot studies if time is constrained. The most important and significant effects are tested.

5.5.4 Re-validation/Locational or periodical validation

The carried out, for the items of interest that is dismissed, repaired, integrated/coupled, relocated, or after a specified time lapse. Example of this category could be relicensing/ renewing driver's license, recertifying an analytic balance that has been expired relocated, and even revalidating professionals. Revalidation may also be conducted when/where a change occurs during the course of activities, such as scientific researches or phases of clinical trial transitions.

5.5.5 Concurrent validation

Conducted during a routing processing of services, manufacturing or engineering etc.Exams of these could be

Duplicated sample analysis for a chemical assay. Triplicated sample analysis for trace impurities at the marginalized levels of detection limit, or/and quantification limit.

Concurrent validation is a methodology used in software testing, particularly in the context of concurrent or parallel systems, to ensure the correctness and reliability of concurrent processes. This validation technique aims to verify that the software behaves as expected when multiple processes execute simultaneously.

5.6 RESULT OF VALIDATION AND VERIFICATION:

Validation Details [White Box Testing]	
No of Cycle Test	5
No of Testing	24
Passed	24
Failed	0
Result	In this Validation testing, we test whole, end point and it's operation like CRUD, Unit Testing, Intergration Testing, White box Testing, System Testing were passed successfully

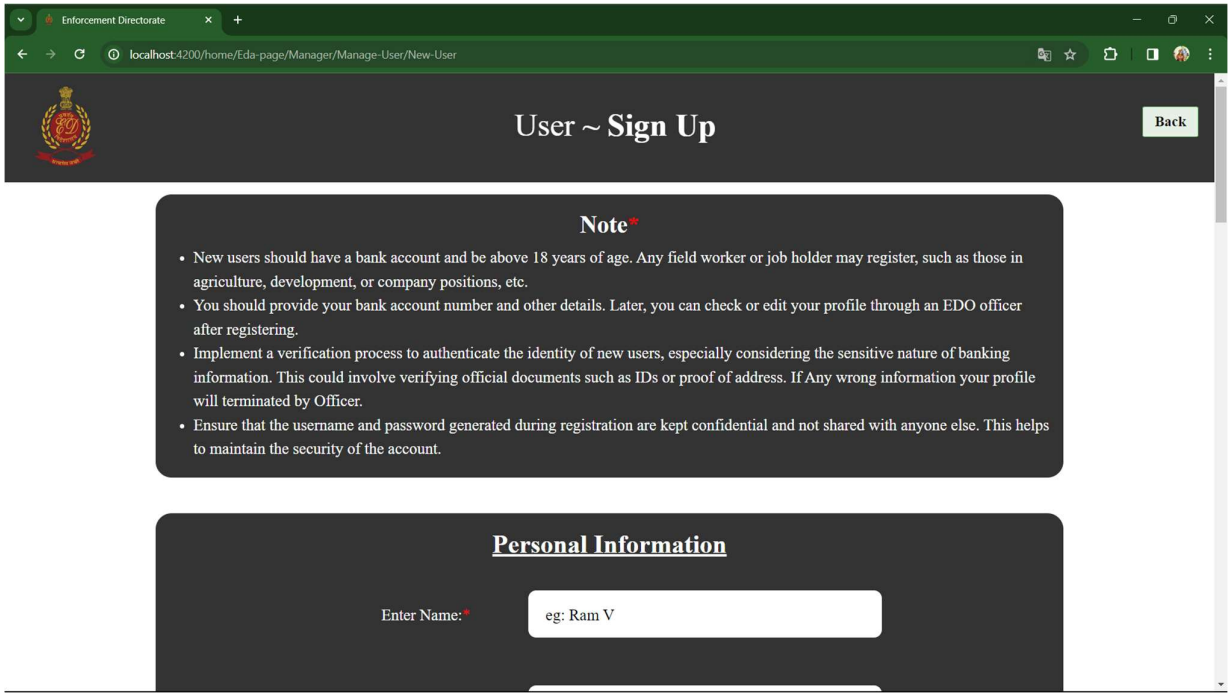
Verification Details [Black Box Testing]	
Language Back End	Java [web famework : Spring Boot]
Security in Back End	Jwt Token with role authentication
Language Front End	Angular
Database	MySQL
Database Name	Cfyp
Defects in coding	None
Defects in Database	None
Suggestion or advise	None
Describtion About Coding Review	Looks good, effective logic, without bug or data breach
Result	In this verification check the design, coding, end points, with security system. All are looks good with efficetive logic, without bug

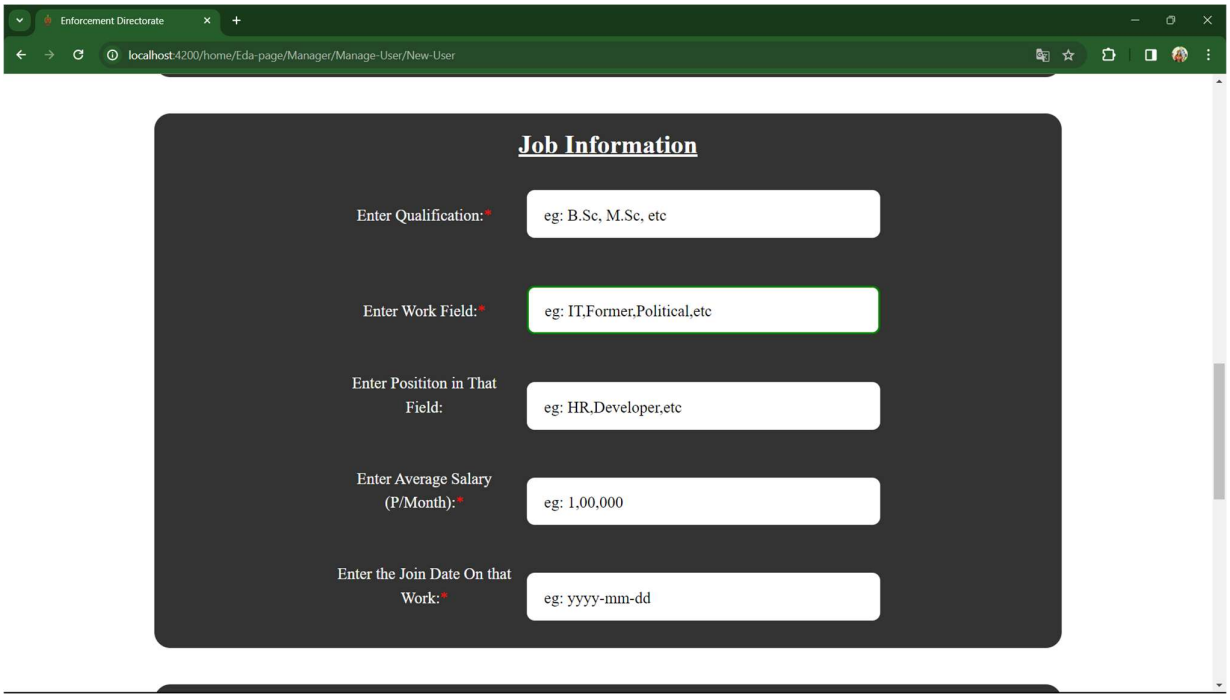
5.7 SCREENSHOT WITH VALID INPUT / OUTPUT DATA

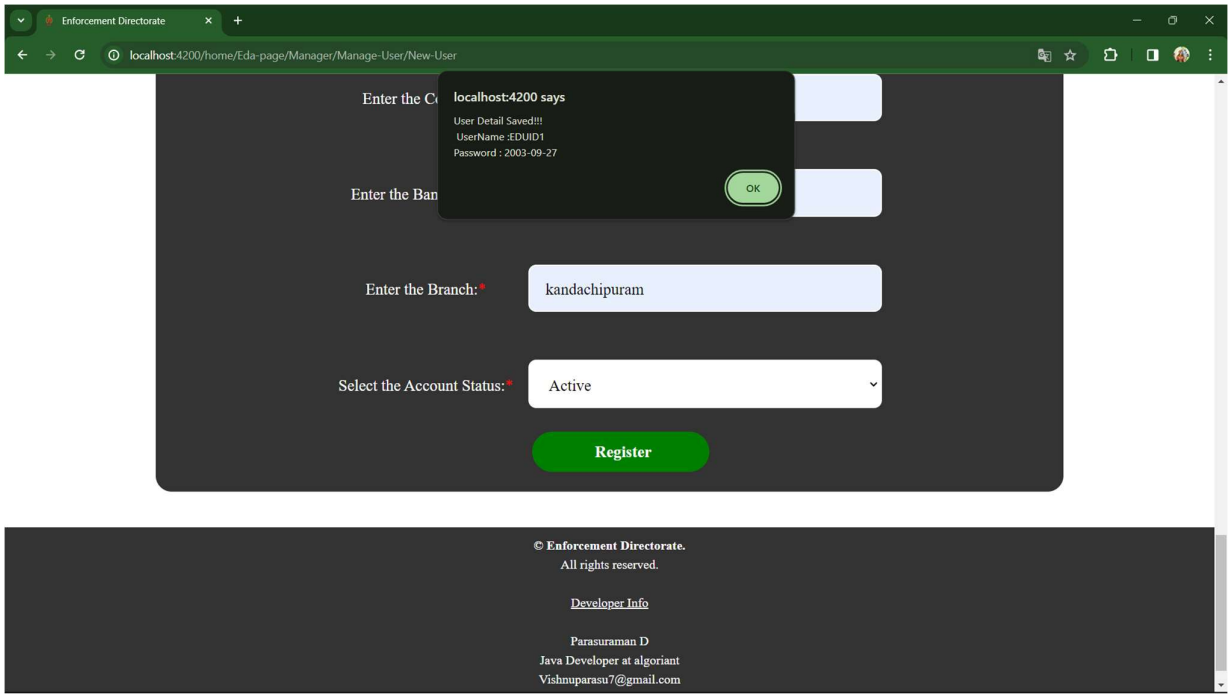
Home page

Login page

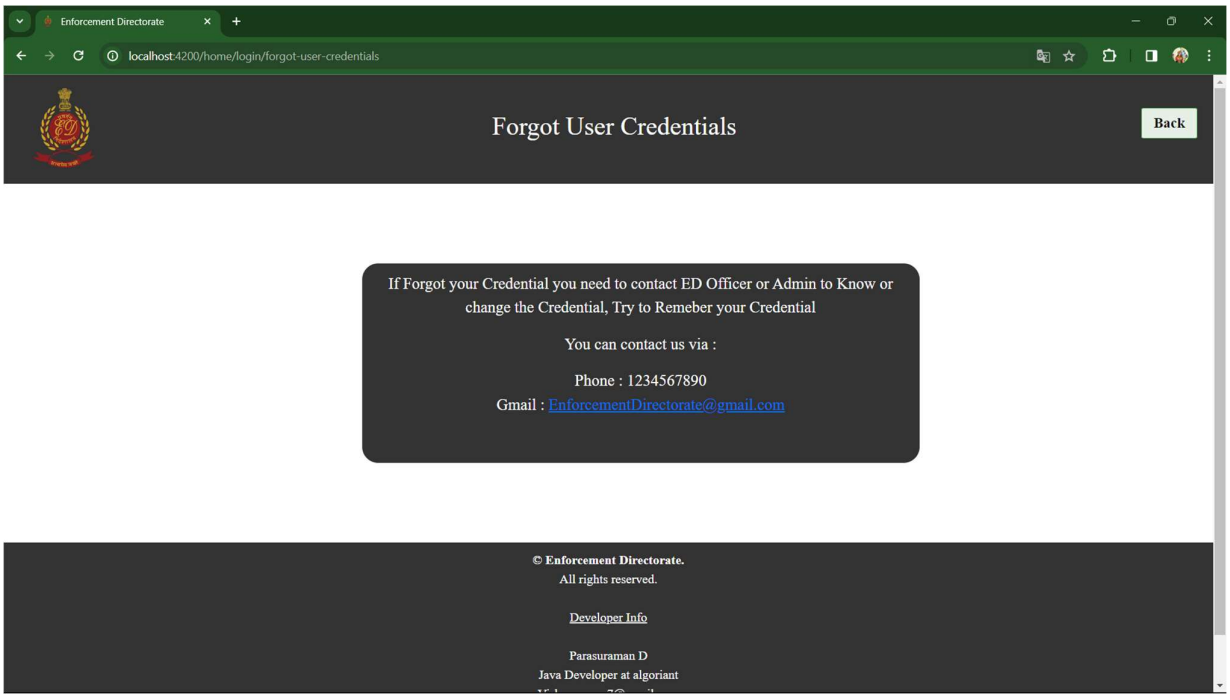
Sign up for user, officer, admin







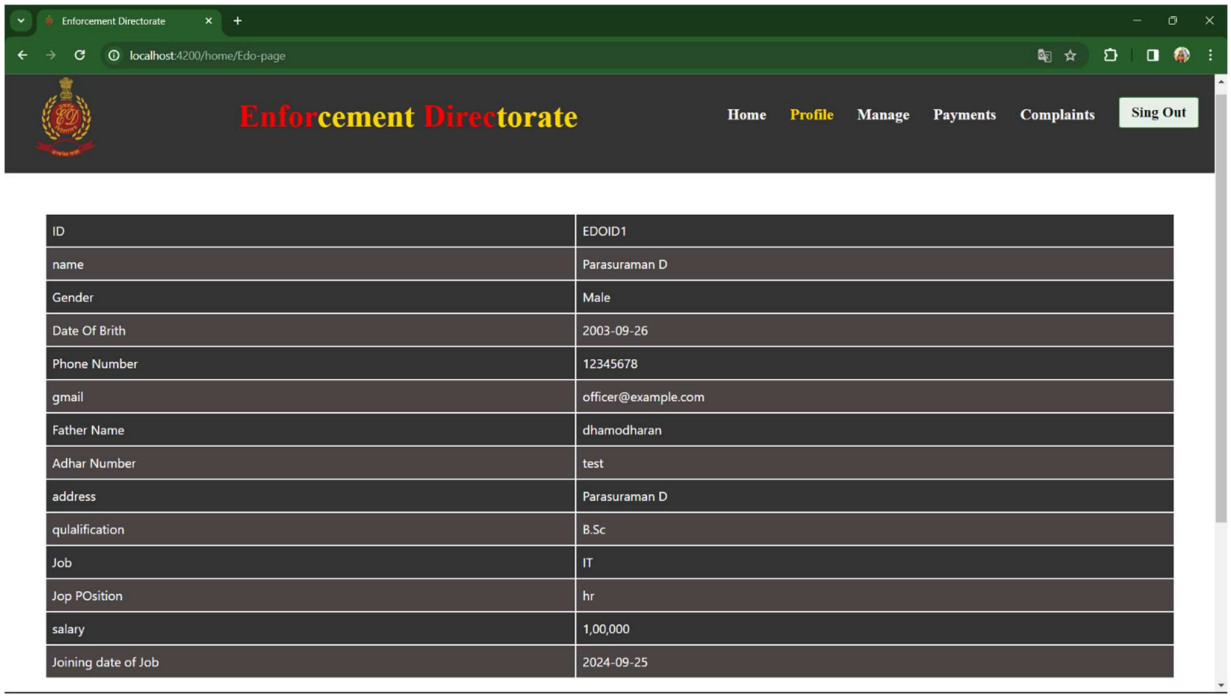
Forgot user credentials



User profile

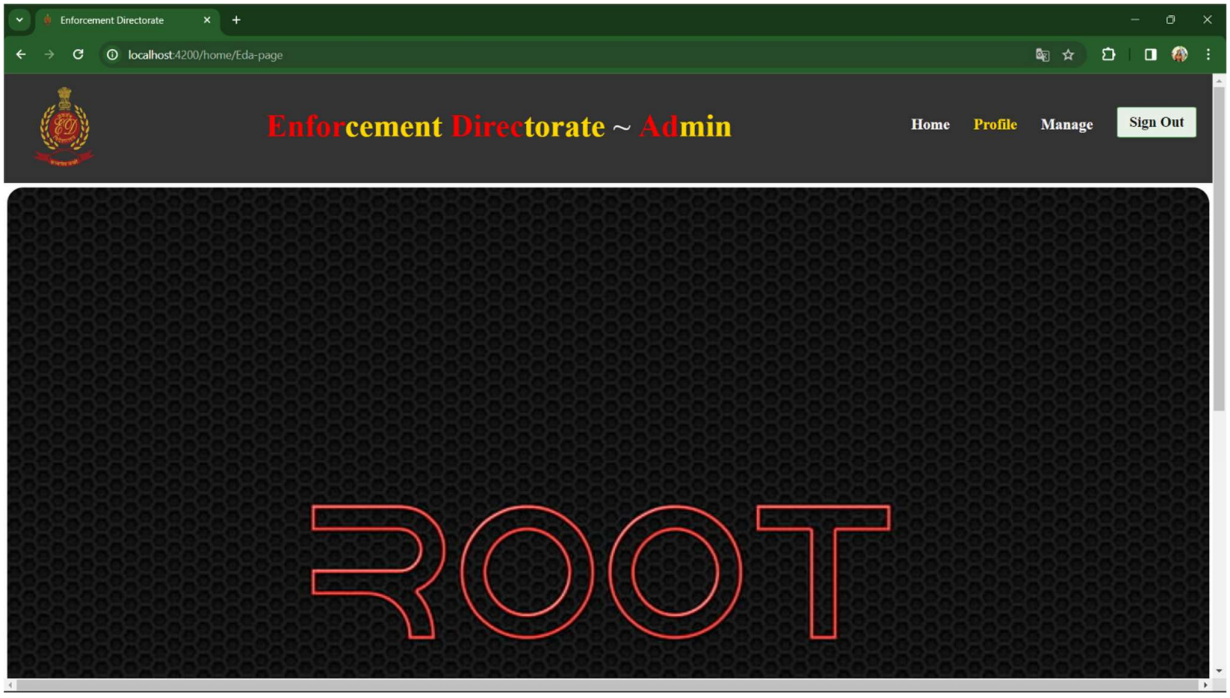
ID	EDUID1
name	Parasuraman D
Gender	Male
Date Of Brith	2003-09-27
Phone Number	123456789
gmail	vishnuparasu7@gmail.com
Father Name	Dhamodharan
Adhar Number	1234-56789-1234
address	Parasuraman D
qulalification	B.Sc computer science
Job	IT
Jop POsition	Developer
salary	1,00,000
Joining date of Job	2024-09-25

Officer profile



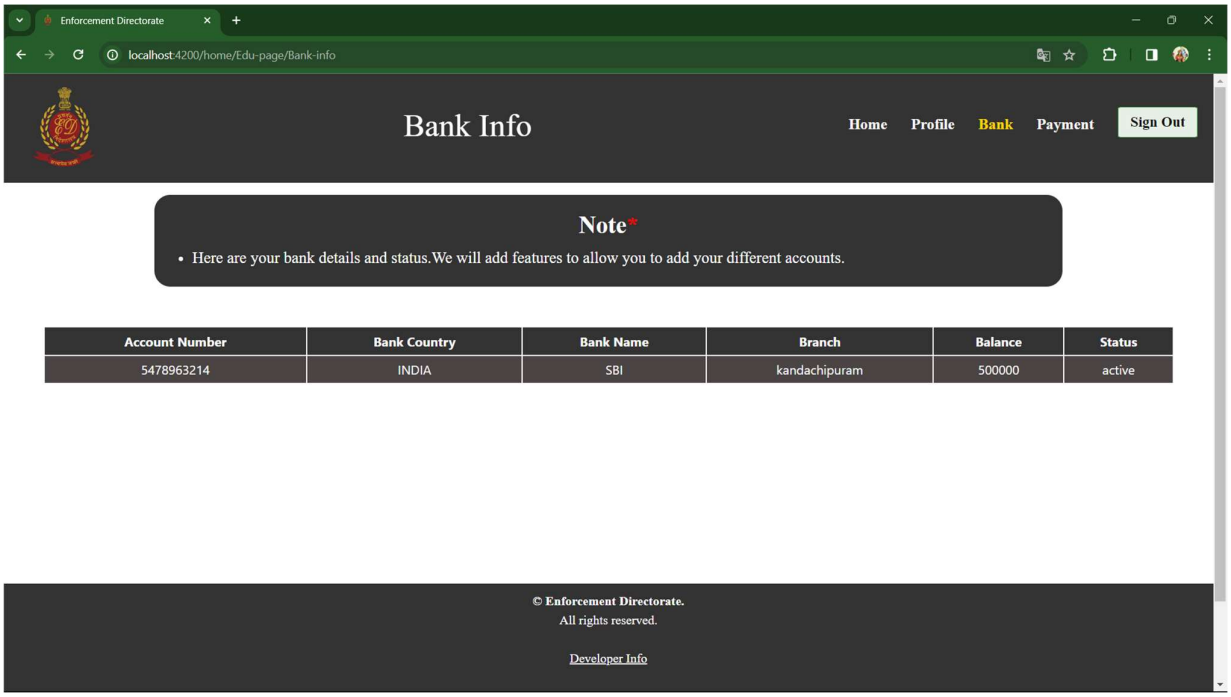
ID	EDOID1
name	Parasuraman D
Gender	Male
Date Of Brith	2003-09-26
Phone Number	12345678
gmail	officer@example.com
Father Name	dhamodharan
Adhar Number	test
address	Parasuraman D
qulalification	B.Sc
Job	IT
Jop POsition	hr
salary	1,00,000
Joining date of Job	2024-09-25

Admin profile [super admin]

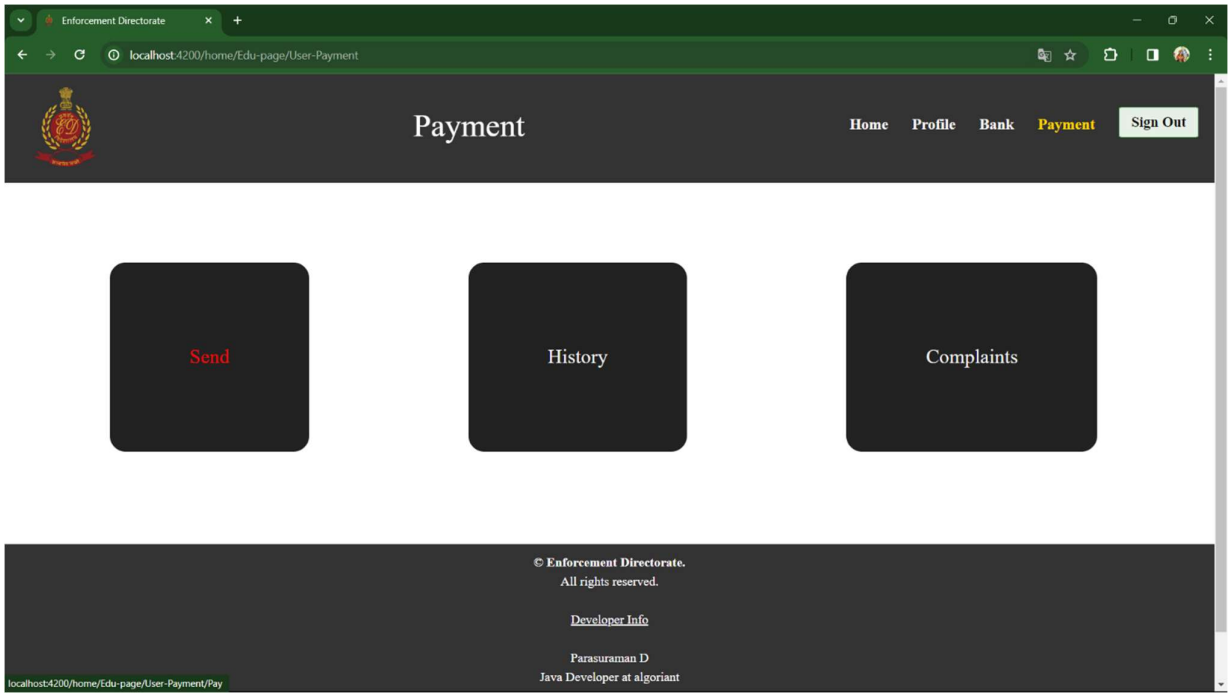


Admin profile [asst admin]

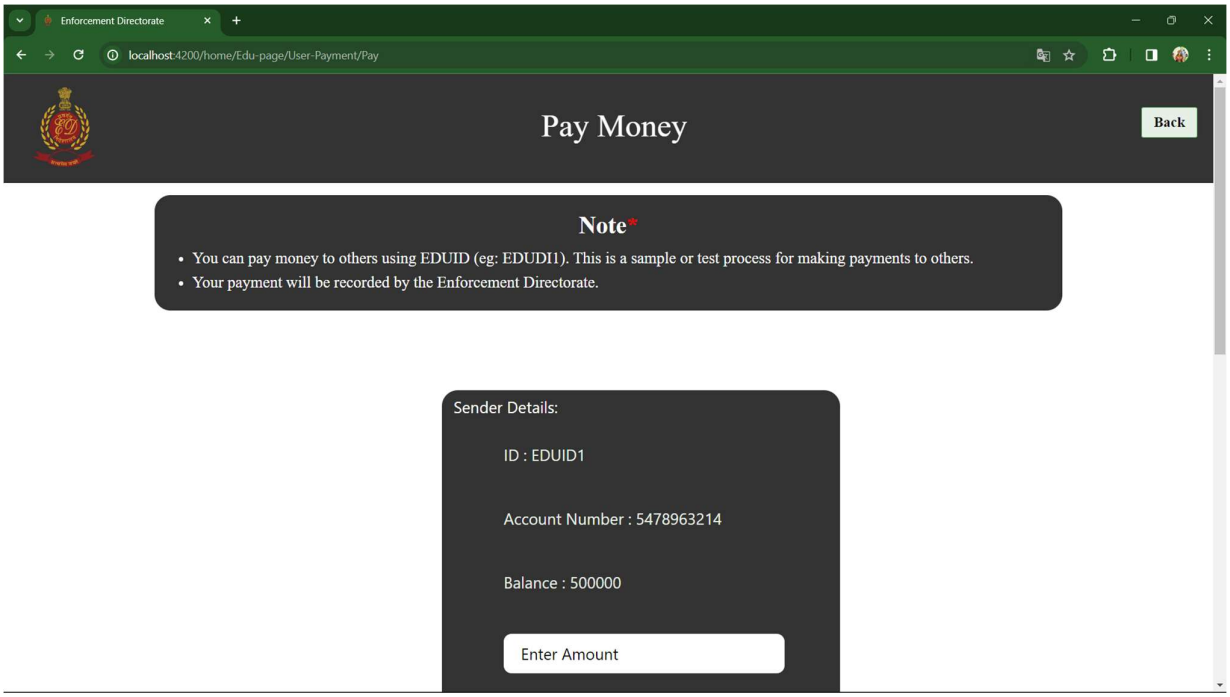
User bank information

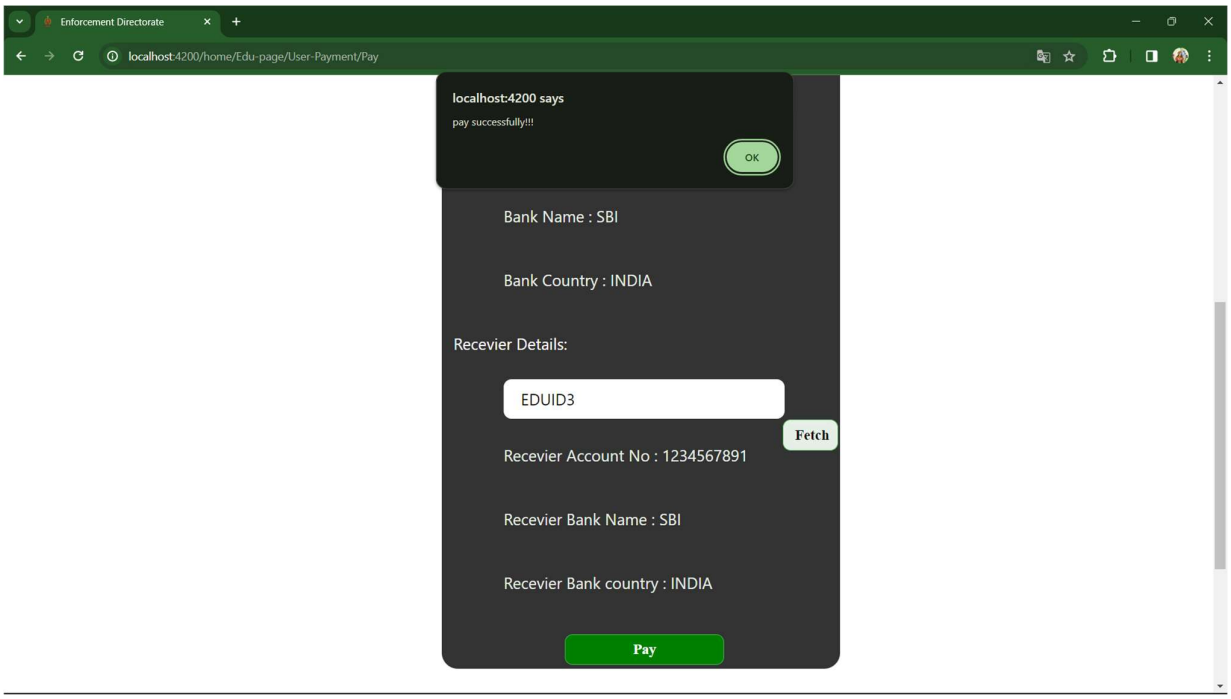


User payment

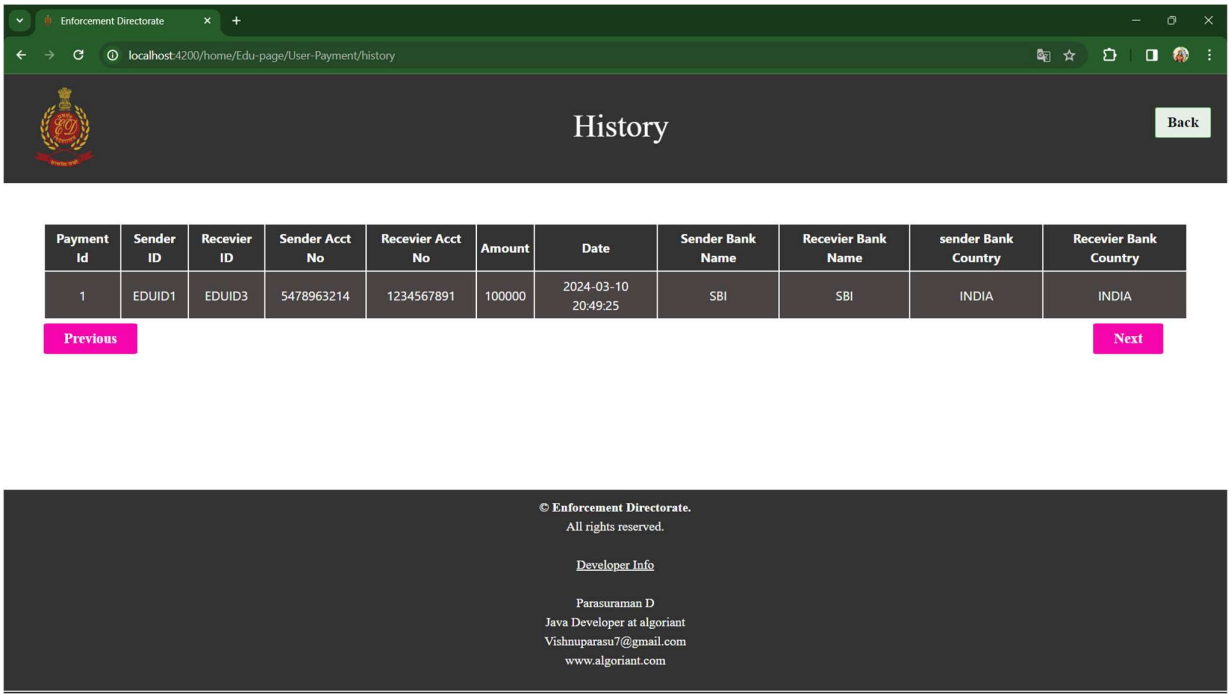


User sent money to others by EDUID

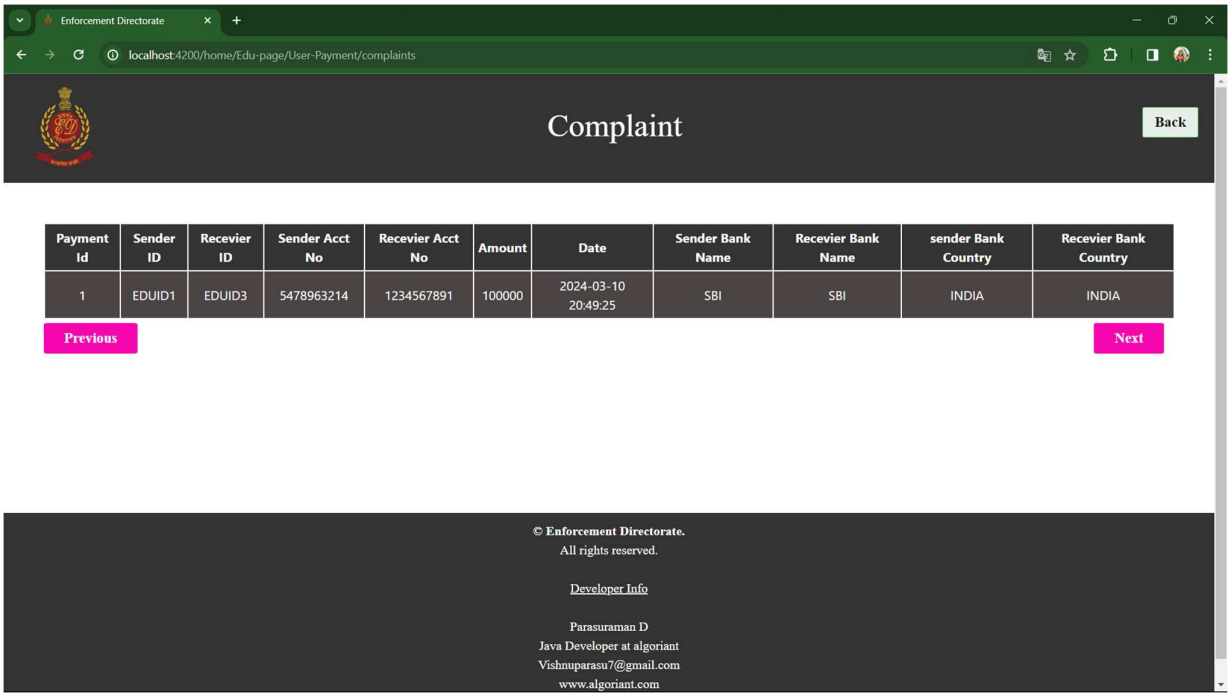




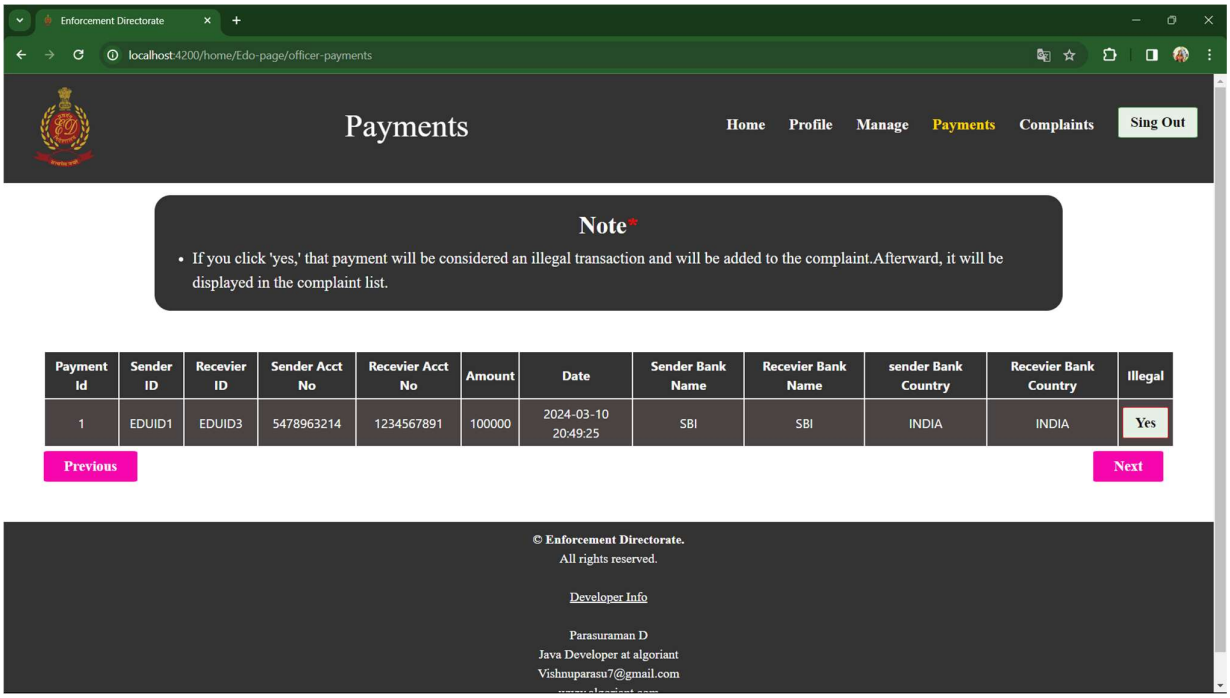
User payment history



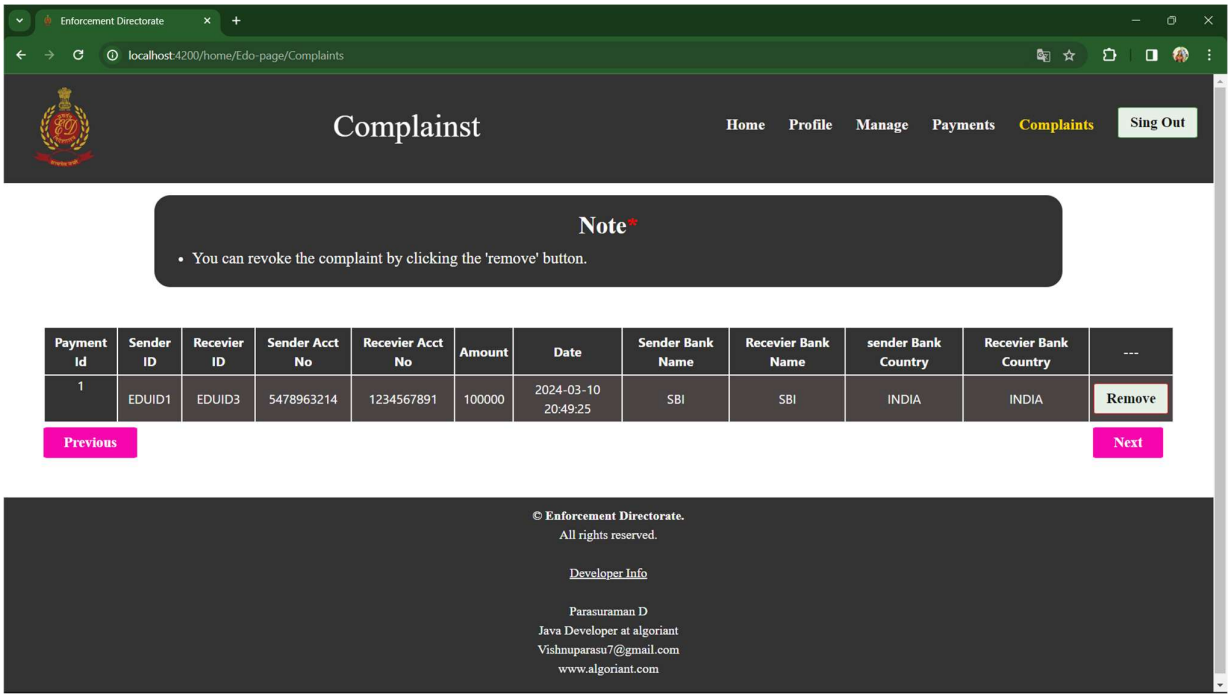
User complaint history



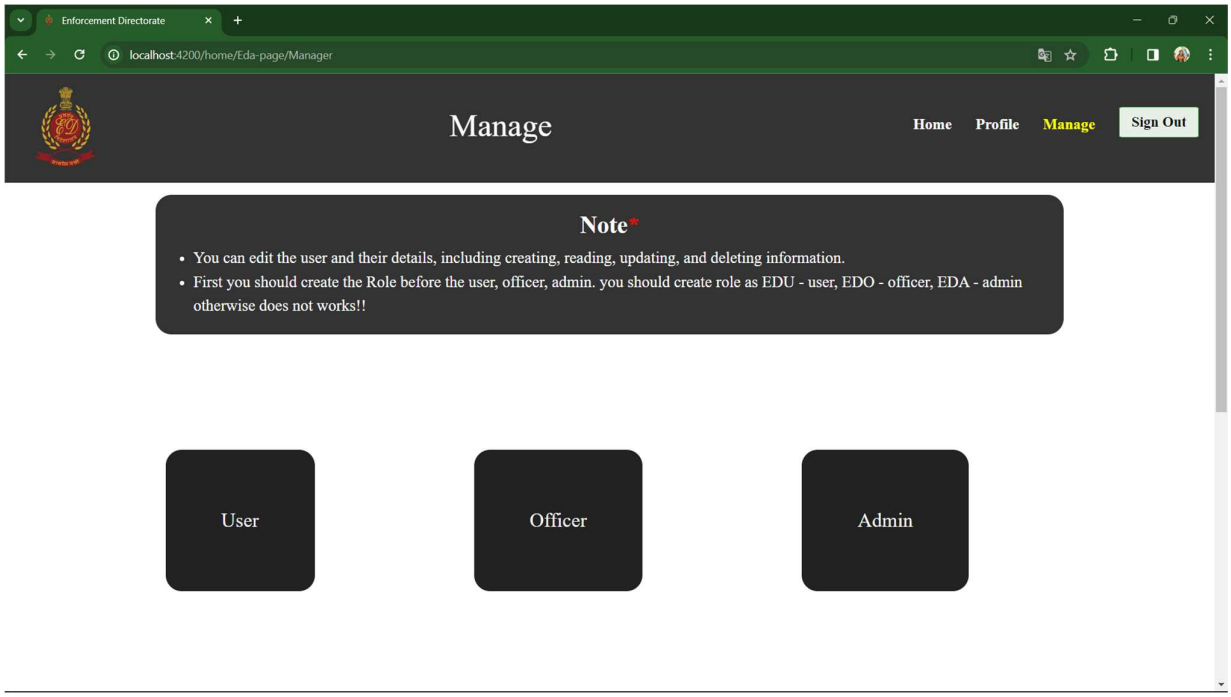
Officer manage payments [if illegal to register complaint through click “yes”]



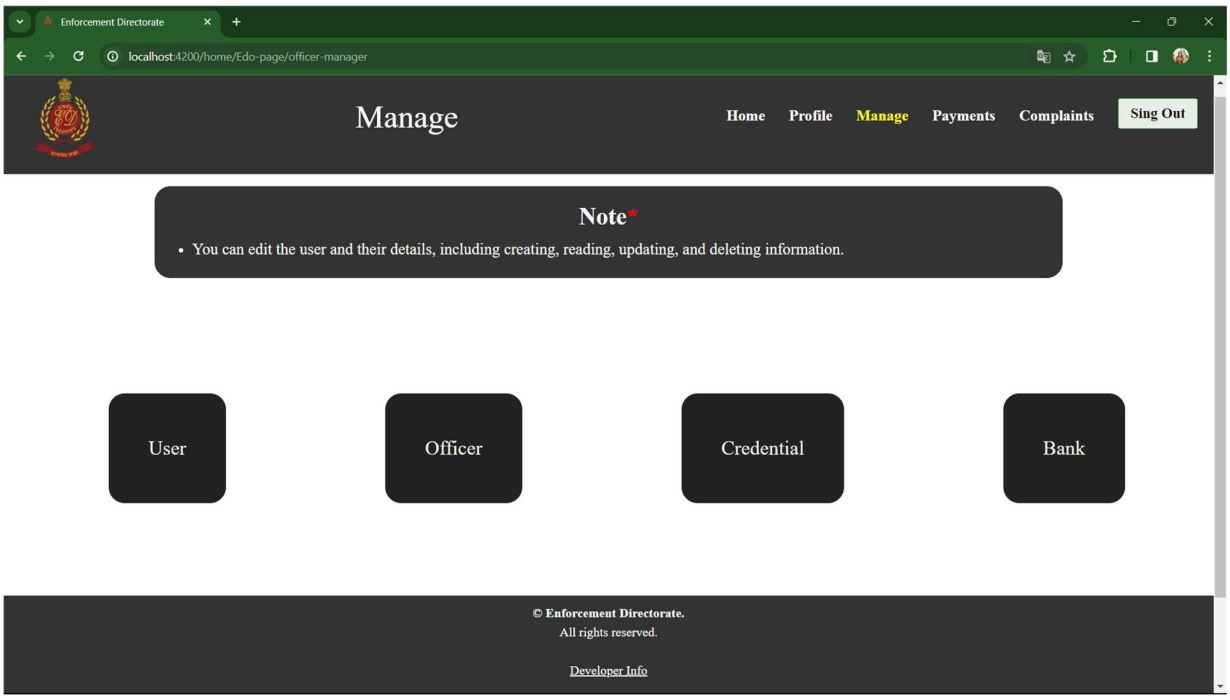
Officer manage complaints [if that case were revoked through click “yes”]



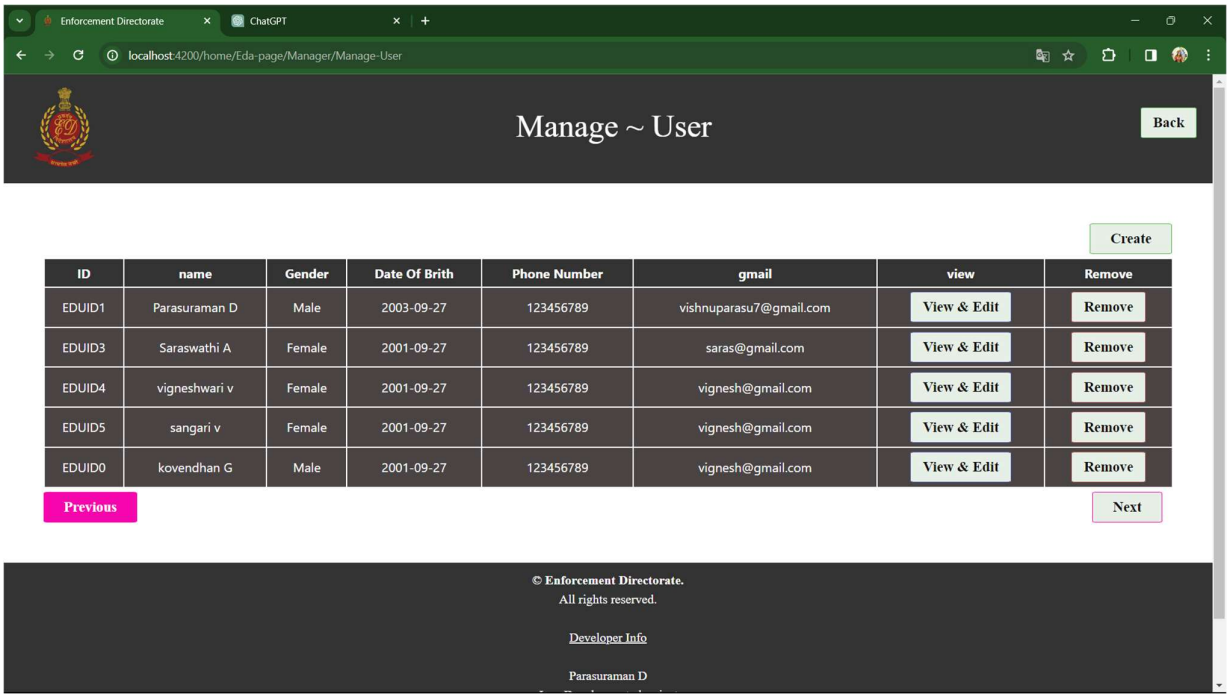
Admin manager dashboard



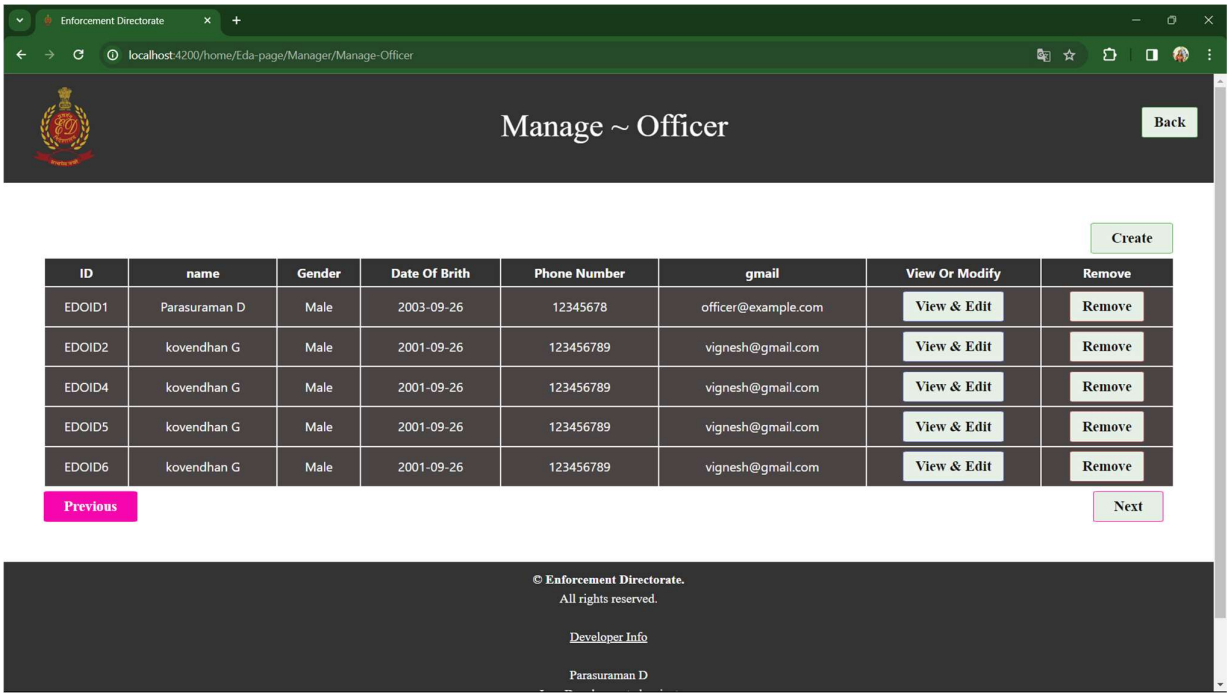
Officer manager dashboard



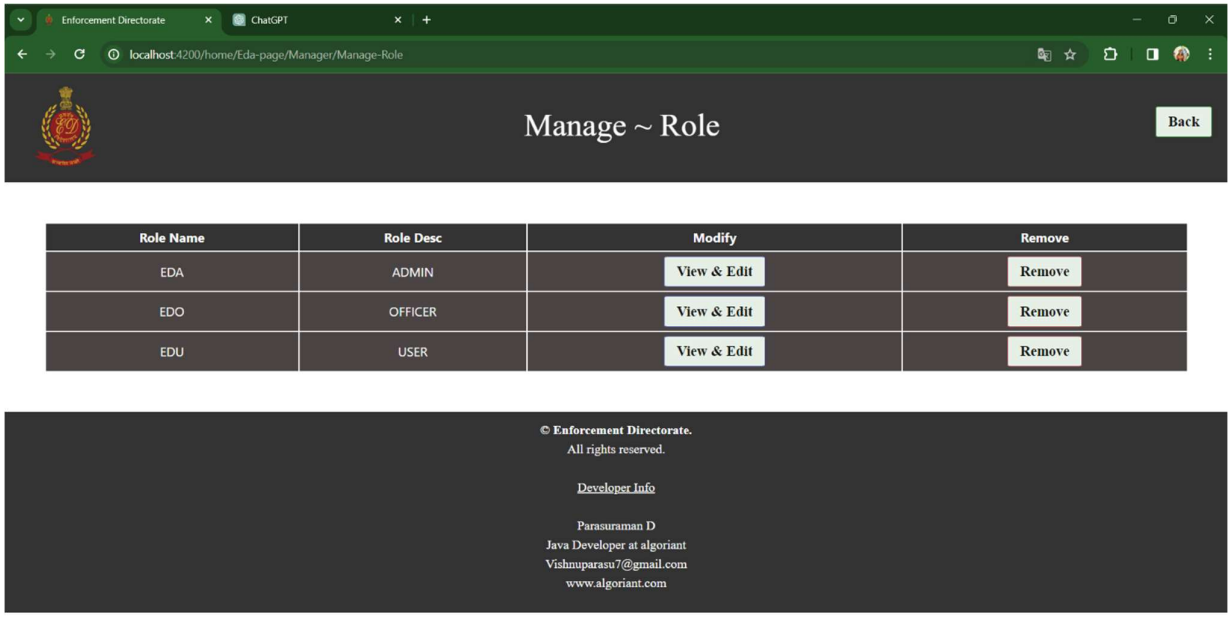
Manage user [CRUD Operations]



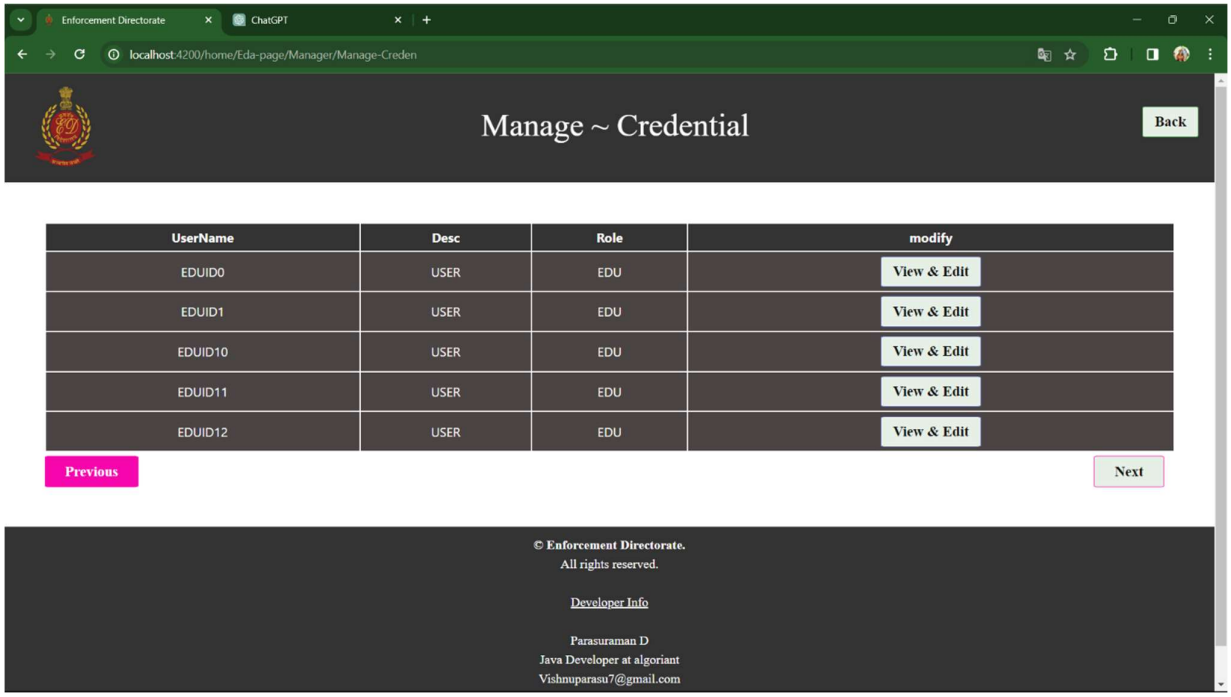
Manage officer [CRUD Operations]



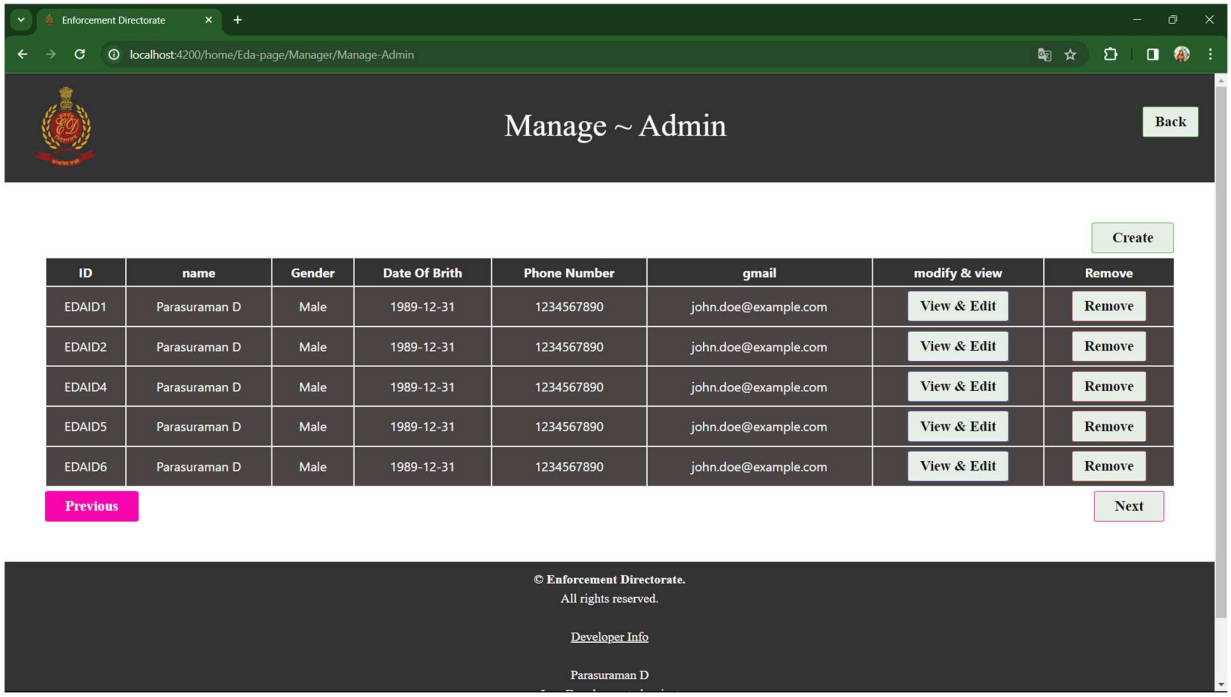
Manage roles [CRUD Operations]



Manage credential [RU Operations]



Manage admin [CRUD Operations]



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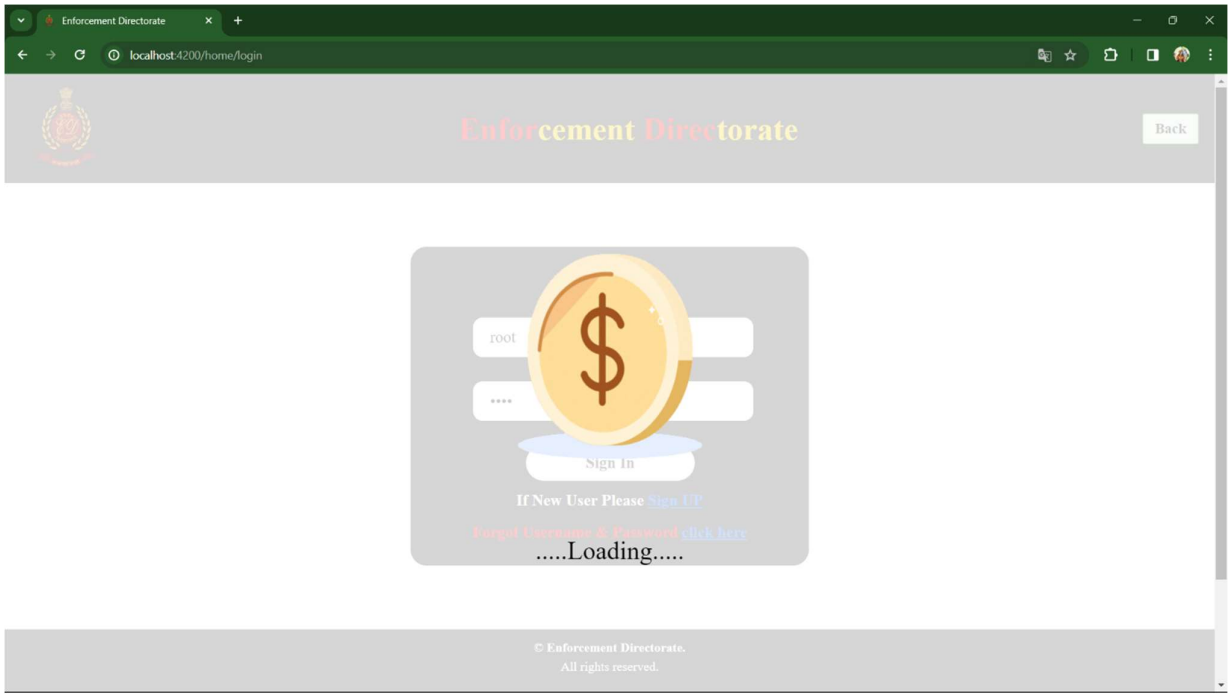

CHAPTER 6

6.1 BENEFITS OF THE PROJECT

6.1.1 Conclusion:

The Enforcement Directorate (ED) plays a pivotal role in ensuring the integrity of the financial system by investigating and prosecuting economic crimes and money laundering activities. Through its diligent efforts, the ED contributes significantly to maintaining the rule of law and preserving the integrity of the nation's economy.

The benefits of the Enforcement Directorate's projects are multifold. Firstly, these projects help in combating financial crimes, including fraud, corruption, and money laundering, thereby safeguarding the financial interests of the country. By holding perpetrators accountable, the ED creates a deterrent effect, discouraging individuals and entities from engaging in illicit financial activities.

Secondly, the projects undertaken by the ED enhance transparency and accountability within the financial sector. By conducting thorough investigations and enforcing relevant laws and regulations, the Directorate fosters an environment of compliance, where financial institutions and individuals are encouraged to uphold ethical standards and legal obligations.

Moreover, the ED's projects contribute to strengthening international cooperation in the fight against financial crimes. Through collaboration with foreign enforcement agencies and participation in global initiatives, the Directorate facilitates the exchange of information and expertise, thereby enhancing the effectiveness of cross-border investigations and prosecutions.

Furthermore, the successful outcomes of the ED's projects reinforce public trust and confidence in the financial system and law enforcement authorities. By demonstrating its commitment to upholding justice and combating economic offenses, the Directorate reinforces the credibility of the government and instills a sense of security among citizens and investors.

In conclusion, the projects undertaken by the Enforcement Directorate yield numerous benefits, ranging from combating financial crimes and enhancing transparency to fostering international cooperation and bolstering public trust.

The Enforcement Directorate (ED) embarks on projects that yield a myriad of benefits vital for preserving the integrity of the financial system and upholding the rule of law. Through its tireless endeavors, the ED effectively tackles financial crimes such as fraud, corruption, and money laundering, thus safeguarding the economic interests of the nation.

By holding wrongdoers accountable and promoting a culture of compliance, the Directorate enhances transparency and accountability within the financial sector, fostering a more resilient and ethical economic environment.

CHAPTER 7

7.1 SCOPE FOR FUTURE WORK

7.1.1 System Study:

As the Enforcement Directorate (ED) continues its efforts in combating financial crimes and preserving the integrity of the financial system, there exists a vast scope for future work in enhancing the effectiveness and efficiency of its operations. A comprehensive system study can provide valuable insights into areas where improvements can be made, processes streamlined, and resources optimized to better achieve the Directorate's objectives. This document outlines the scope for future work in conducting a system study within the Enforcement Directorate, identifying key areas of focus and potential avenues for improvement.

7.1.1.1 Current System Overview:

Before delving into the scope for future work, it is essential to provide an overview of the current system within the Enforcement Directorate. The Directorate operates within a complex ecosystem involving investigation, prosecution, and enforcement of laws related to financial crimes, including fraud, corruption, and money laundering. Key components of the current system include:

1. Investigation Processes: The ED conducts thorough investigations into financial offenses, gathering evidence, and building cases against perpetrators.

2. Legal Framework: The Directorate operates within a legal framework comprising various laws and regulations governing financial crimes and enforcement procedures.

3. Resource Allocation: The allocation of resources, including personnel, budget, and technology, plays a crucial role in the effectiveness of the Directorate's operations.

4. Collaboration and Information Sharing: Collaboration with other law enforcement agencies and international partners, as well as effective information sharing mechanisms, are essential for successful outcomes.

7.1.1.2 Scope for Future Work:

Given the complexity of the Enforcement Directorate's operations, there are several areas where a system study can provide valuable insights and recommendations for improvement. The scope for future work includes, but is not limited to, the following:

1. Process Optimization:

- ✓ Conducting a detailed analysis of investigation processes to identify bottlenecks, inefficiencies, and areas for streamlining.
- ✓ Implementing workflow automation and digitalization initiatives to improve the efficiency and effectiveness of investigative processes.
- ✓ Standardizing procedures and protocols to ensure consistency and adherence to best practices across all investigations.

2. Enhancing Technology Infrastructure:

- ✓ Assessing the Directorate's current technology infrastructure, including case management systems, data analytics tools, and cybersecurity measures.
- ✓ Identifying opportunities for upgrading existing systems or implementing new technologies to enhance capabilities in data analysis, evidence management, and information sharing.
- ✓ Integrating technology solutions to facilitate seamless collaboration with other law enforcement agencies and international partners.

3. Capacity Building and Training:

- ✓ Evaluating the skills and competencies of personnel within the Enforcement Directorate and identifying areas for capacity building and training.
- ✓ Developing specialized training programs to enhance investigators' knowledge and expertise in areas such as financial forensics, cybercrime investigation, and international cooperation.
- ✓ Promoting a culture of continuous learning and professional development to ensure that personnel are equipped with the necessary skills to effectively combat evolving financial crimes.

4. Strengthening Collaboration and Information Sharing:

- ✓ Reviewing existing mechanisms for collaboration and information sharing with other law enforcement agencies, regulatory bodies, and international partners.
- ✓ Identifying opportunities to enhance coordination and communication channels to facilitate timely exchange of information and intelligence.
- ✓ Establishing protocols and frameworks for sharing sensitive information while ensuring compliance with data protection and privacy regulations.

7.1.2 Feasibility Study:

The feasibility of the project is analyzed in this phase and the 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

7.1.2.1 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.

7.1.2.2 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 for 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.

7.1.2.3 Social Feasibility

The aspect of the 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.

References

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