

System Requirement Analysis

Project FaceID

Group 08
Information Systems

Group Project I (SCS2202/IS2102)

Project FaceID

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1. Introduction

1.1 Domain Description

Recently Sri Lanka faced many unexpected tragedies that left us with a large number of unidentified bodies. Upon such occurrences, many Sri Lankans face difficulties in finding their relatives' bodies by having to go to a number of police divisions in order to find the body of the missing person. As a solution for this , Project FaceID will be developed.

Project FaceID will be developed to be the National missing persons' Database in Sri Lanka. It is a project related to Forensic Science and once developed , it will be a web platform that connects the Forensic Department , Police and the public of Sri Lanka.

Main facilities available in the system are storing information about unidentified dead bodies, publishing about unidentified dead bodies, allowing the public to inform about missing persons, the public searching for missing bodies and publishing reconstructed 3D models of unidentified bodies.

The system will generate matching results when a public user provides necessary information upon searching for a missing body.

The proposed system will be the first and the only web platform that connects the Forensic Department , Police and the public of Sri Lanka.

1.2 Current System

Currently , the Forensic Department and the Police store data about unidentified bodies manually in documents which has forms to fill different fields about them. One of the pages of the form is given below.

P _{ost} M _{ortem} (pink)		VICTIM IDENTIFICATION FORM		B		
		DEAD BODY		No: _____		
		Nature of disaster : _____		<i>Barcode</i>		
		Place of disaster : _____		Male <input type="checkbox"/> Female <input type="checkbox"/> Sex unknown <input type="checkbox"/>		
		Date of disaster : <input type="text"/> <input type="text"/> Day <input type="text"/> <input type="text"/> Month <input type="text"/> <input type="text"/> Year				
a = Data not available b = Photo c = Further information on page G						
RECOVERY OF BODY FROM SCENE						
20	Apparent age	Min _____	Max _____	Txt: _____	a b c	
21	Date - and place where the body was found					
		<input type="text"/> <input type="text"/> Day <input type="text"/> <input type="text"/> Month <input type="text"/> <input type="text"/> Year				
	01 Map reference/GPS	Coordinates: _____ / _____				
	02 Photographs	1 <input type="checkbox"/> No	2 <input type="checkbox"/> Yes	3 <input type="checkbox"/> Digital	4 <input type="checkbox"/> Film	5 <input type="checkbox"/> Other /Specify: _____
22	State of the body					
		Complete <input type="checkbox"/>	Incomplete <input type="checkbox"/>	Presentable <input type="checkbox"/>	No <input type="checkbox"/> Yes <input type="checkbox"/>	Body part(describe) <input type="checkbox"/> _____
		1 <input type="checkbox"/> Damaged	2 <input type="checkbox"/> Burnt	3 <input type="checkbox"/> Decomp.	4 <input type="checkbox"/> Skelet.	5 <input type="checkbox"/> Missing
	01 Head					
	1A Neck / Throat					
	02 Right arm					
	03 Left arm					
	04 Right hand					
	05 Left hand					
	06 Body front					
	07 Body back					
	08 Right leg					
	09 Left leg					
	10 Right foot					
	11 Left foot					
22 A	Important ID information					
23	Person - finding the body					
	If an ID-team is involved - name officer in charge					
	Any other person - Name Address Phone/E-mail Occupation					
Registered by		Duty Title : Name : Address : Phone/E-mail :		Signature / Date		

This process takes time as they have to write down everything and also needs physical space to store the documents. Also, if a person comes in search of a missing person, the police have to go through all the documents to find the right person.

Another drawback of the current system is that all the police divisions in the country are not interconnected. Therefore, if a person who lives in one police division dies in another, they face difficulty in communicating about the unidentified body to the correct police division.

Currently, there is no such platform for the public to search for missing persons and they have to come to police stations and describe the person verbally and the police has to go through the documents trying to match the features described by them.

Therefore, it is clear that the current system has a number of drawbacks and Project FaceID is a potential solution to this problem.

1.3 Objectives & Goals

The goal of the proposed project is to develop a platform interconnecting police, Forensic division and the public with the intention of communicating details about missing persons and unidentified dead bodies.

Objectives

- To provide a web-based platform to inform the public about unidentified dead bodies
- To provide a means of communication for the public and the Forensic Department
- To provide an information portal on 3D facial reconstruction

1.4 Scope

Considering the scope of the project FaceID, the deliverables include a user-friendly online platform for the public to search for missing persons and a shared database to store information about unidentified bodies, which can be managed by the admin i.e. The Forensic Department and also the Police. The public can view basic information about the unidentified bodies while they have to register with their National Identity Card number, name, contact number and email address in order to view detailed information on them. They are able to

search by district , police division or using the other fields given, for which the system will display the matching results. Once they view, they get the option to respond if they have logged in. This web platform also includes an information portal which provides information about different Forensic activities, Forensic Facial Reconstruction etc. Notifications will be sent to the admin once the registered users respond or inquire about missing persons. There is also a 'contact us' page for the public to contact The Forensic Department for further inquiries or requests.

Out of Scope

- Finding bodies , examining them and collecting data
- Creating 3D models
- Responding to inquiries or requests

1.5 Assumptions, Constraints & Limitations

Assumptions

- The 3D models created display correct and similar features of that particular person.
- The authorities and the public enters correct information about missing persons.
- The police division of the missing person given is correct.

Constraints & Limitations

- The output of the 3D model will be a dial down version of the original model(in terms of quality and size).
- The matching results given by the system will depend on the information stored by the admin and that given by the registered user although there is a possibility that the right model will not be displayed due to their mismatch.

2. Feasibility Study

2.1 Technical Feasibility

The following section focuses on the technical resources available and it also involves evaluation of the hardware, software and other technology requirements of the proposed system.

The project is a complete web based application. It is designed as the National missing persons' database in Sri Lanka. Considering the multi-tier architecture of this system, different technologies that are freely available will be used. We intend to use CSS, HTML and Javascript which is the most popular programming language. PHP will be used for the server side and MySQL for the database as it is an open source technology. Three.js is to be used to render and upload 3d models. Also, the developing team is willing and able to learn new technologies in order to create a user friendly and effective platform.

Therefore it is clear that the technologies and tools that are associated with this project are freely available and the technical skills required are manageable.

Therefore this project is technically feasible.

2.2 Resource Feasibility

The resources required for the project FaceID are

- Programming device (Laptop) - Freely Available
- Hosting space - Since project FaceID is a government funded project, the hosting space is already taken.
- Programming tools - Freely available
- Programming individuals - The programming group consists of four members who are willing and able to learn new technologies. The individuals are committed to spend their time and effort in making the project a success

Therefore the project FaceID can be completed within the given time frame due to the availability of these resources.

2.3 Ethical and Legal Feasibility

It is the study to know that the proposed project conform the legal and ethical requirements.

Project FaceID is a government recognized project. It has been recognized and accepted by both medical and legal parties in local and international communities. The sensitive information in the system are accessible only to the authorized persons and permission is granted to display the details of the unidentified dead bodies to the public. The user requests can be accessed only by authorized personnel of the Forensic Department.

Therefore, project FaceID is ethically and legally feasible.

2.4 Operational Feasibility

Operational Feasibility refers to the measure of solving problems using the new proposed system.

The proposed system , FaceID which is an online platform which will be used as the National Missing persons' database of Sri Lanka can be taken as the right solution to the client's requirements as it will let the public and the Forensic Department to connect conveniently.

With the different functionalities to be developed , it will introduce Forensic Facial reconstruction to the public. nForensic facial reconstruction is still at its infancy in Sri Lanka and is yet to utilize the advanced technologies of other countries. Hence introducing a more efficient multimedia based technique to the local forensic officials in order to improve the efficiency and the accuracy of the reconstruction is one of the aims of this project FaceID.

Since the proposed system is a complete web based application, it will be accessible by any public user with internet once published.

The proposed system will have a user friendly interface which is convenient for both public users and the Forensic Department. Hence the project will be accepted by end users. Hence ,it can be said that the proposed system has the required operational feasibility.

2.5 Cultural Feasibility

Cultural Feasibility is the compatibility of the proposed project with the cultural environment of the project .

Upon the occurrence of natural or man-made disasters, a large number of unidentified bodies are left. For example, in the recent past, Sri Lankans faced difficulties in identifying their relatives' bodies after the Easter Attack and Tsunami as well.

This proposed system is the best solution for this as people can inform about the missing bodies and the Forensic department can display the found bodies through this platform. At the same time, the police can log records on missing persons or found dead bodies. It will be convenient as people will not need to go to the Department to inform and there is a single platform containing all the information.

Therefore the proposed system has the required cultural feasibility.

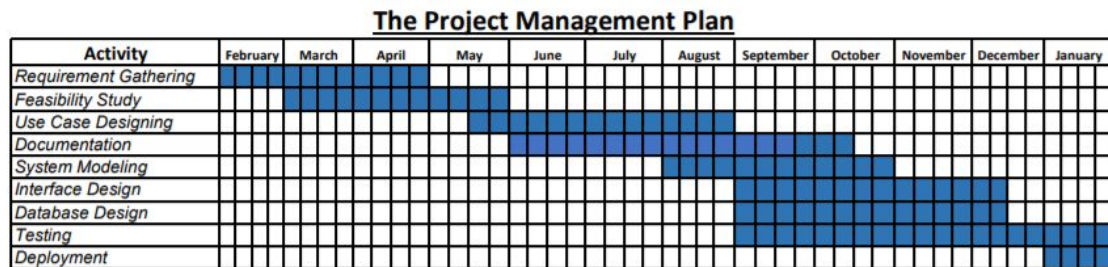
2.6 Economic Feasibility

The system is to be developed using free and open source software languages and tools , therefore the development cost will be very low. For example , the development will be carried out using HTML , CSS, JavaScript , PHP etc. Since project FaceID is a government funded project , the client is willing and able to handle the deployment cost. Also , there will be less or no hardware cost as the project to be developed is an online platform and the persons who intend to respond to the inquiries or responses from the public and the users are authorized individuals. And those who intend to update the database only need a computer with internet access.

2.7 Schedule Feasibility

The project FaceID is expected to be completed in less than a year from the time of project approval to the launch of the website. The following time frame explains the distribution of the workload throughout this time period.

Ganntt Chart



Hence the project is feasible under scheduling.

3. Requirements

3.1 Stakeholders

The project FacelID has the following main stakeholders.

1. Public Users

Public users are the individuals who visit the website but not register by making an account. They cannot interact with the Forensic Department or view detailed information about the unidentified dead bodies. They can sign up to register using the relevant details.

2. Registered Users

The users who have already signed up using the relevant details. They have access to all the privileges given to the users such as viewing detailed information , responding to the displayed unidentified dead bodies , etc.

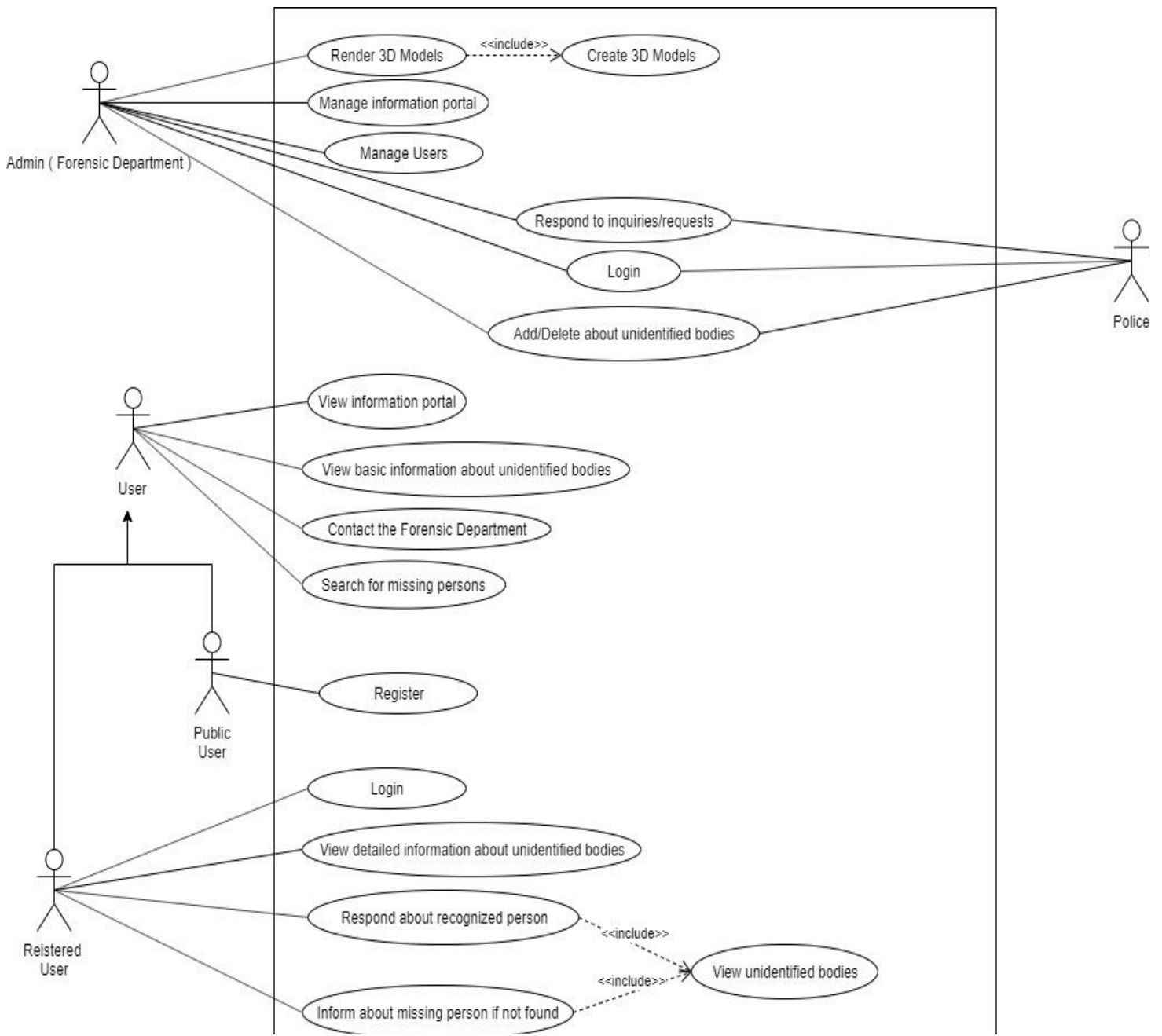
3. Admin

The Admin , the Forensic Department is the most dominant actor of this system. The admin is able to manage the users , and the accounts of the police divisions. The responses and inquiries are accessible by the admin. The information portal is also handled by the admin. The admin can perform the CRUD operations to the system.

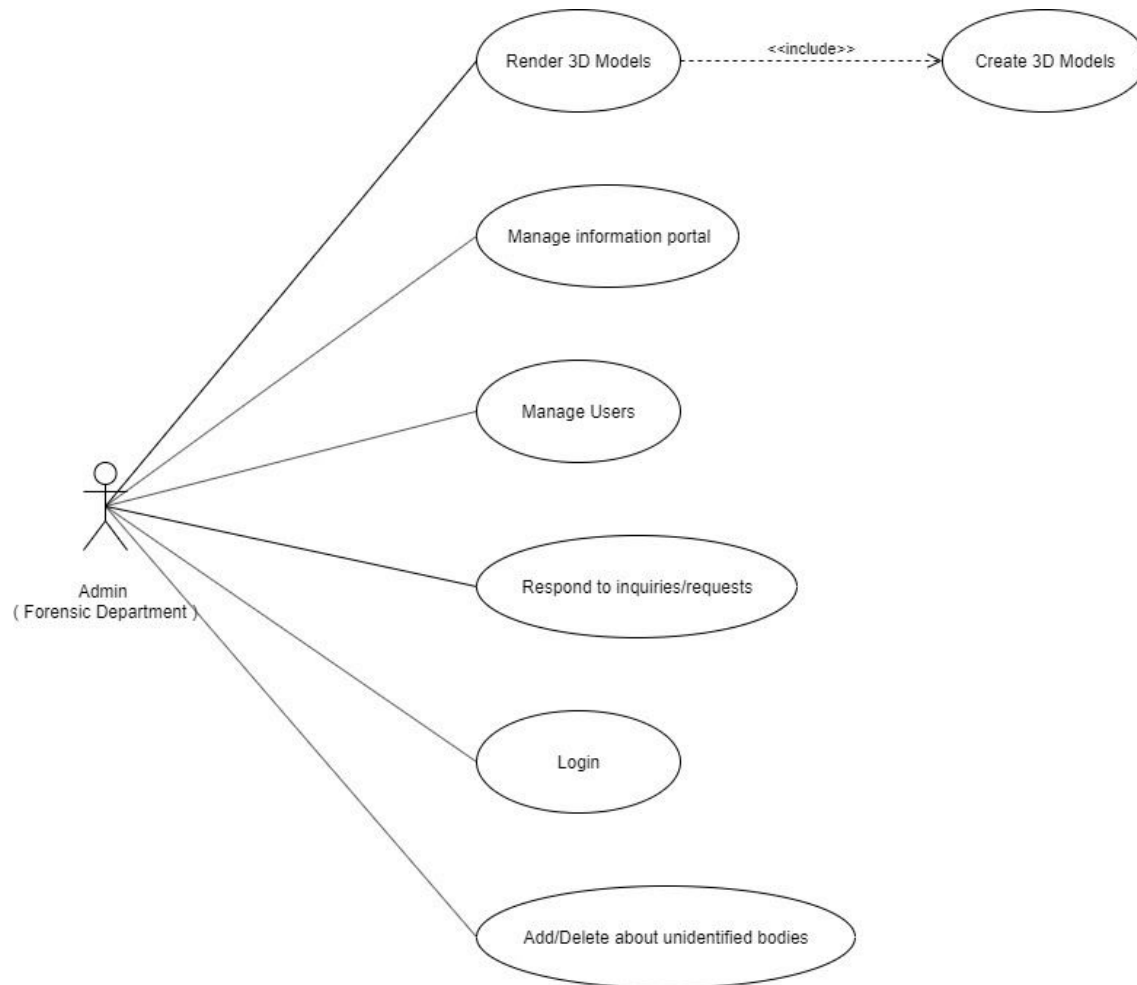
4. Police

An account per police division is created by the admin and they are able to add or delete information on unidentified dead bodies. The responses and inquiries are accessible by the Police as well.

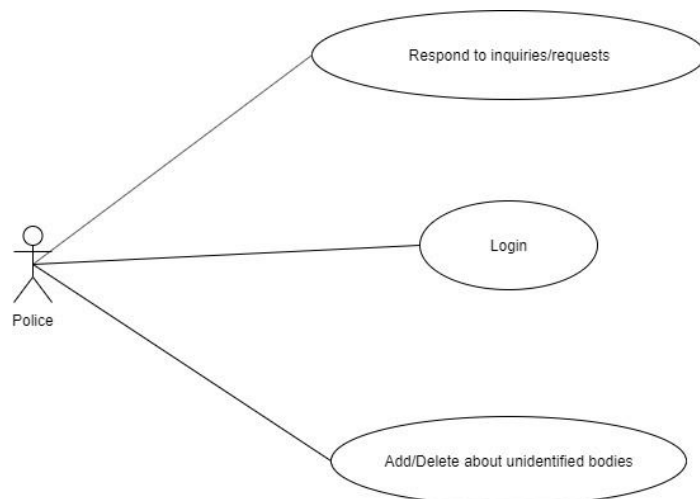
3.2 Use Case diagram



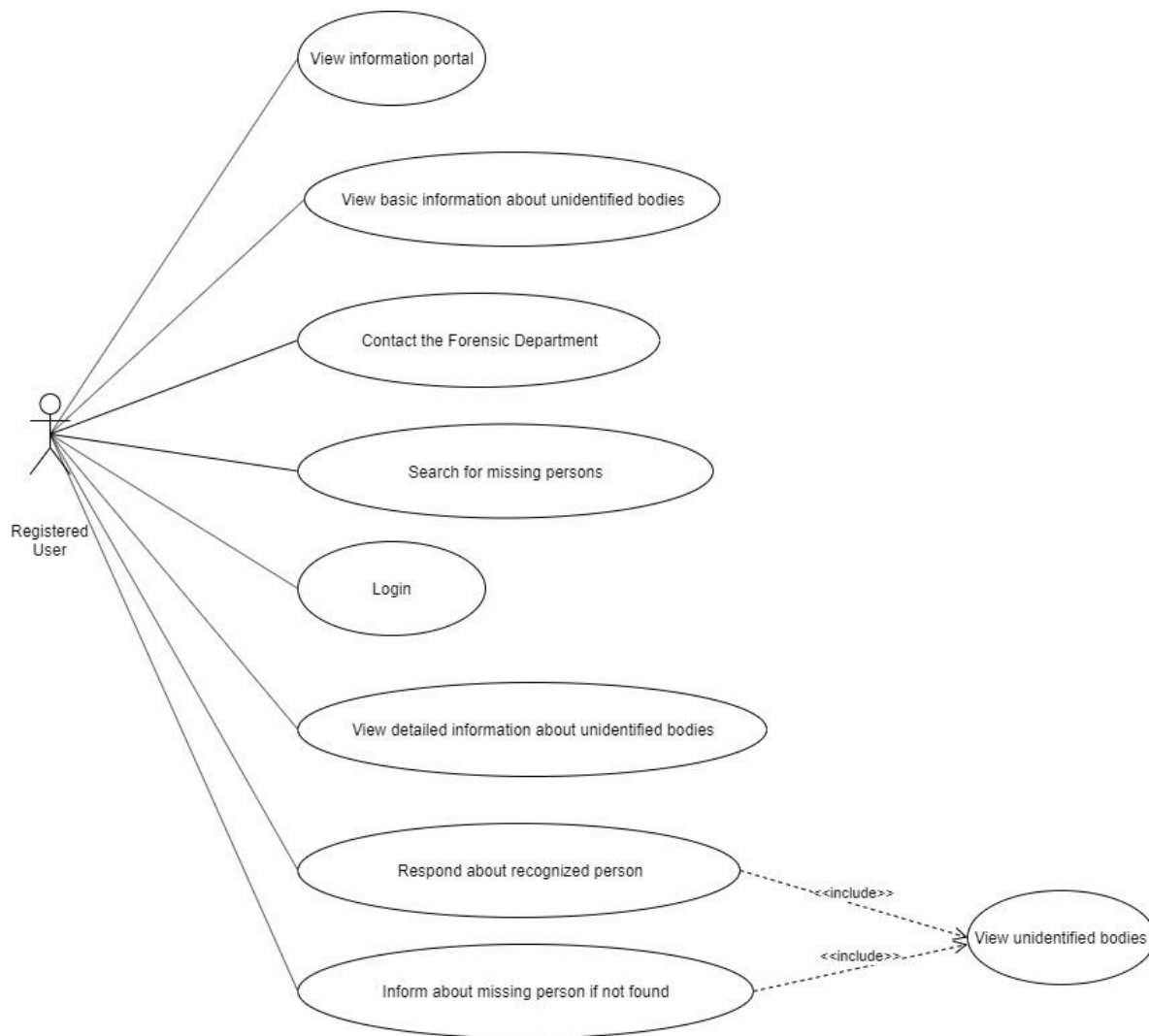
Usecase - Forensic Department (Admin)



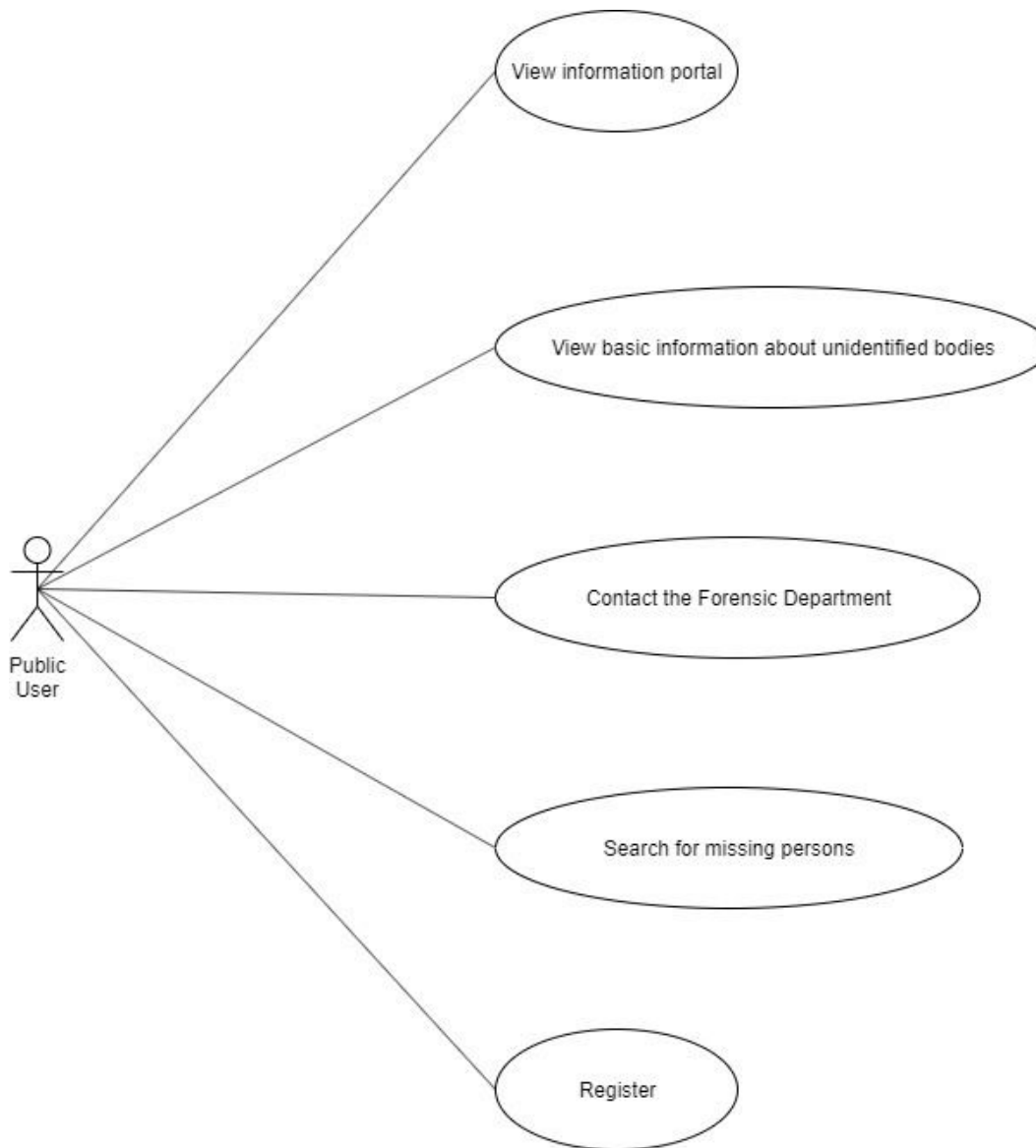
Police



Registered User



Public User



3.3 Use Case Narratives

Use Case Name	User Registration	Use case type System requirement
Use Case ID	UC-01	
Source	Web Interface	
Primary Business actors	Public User	
Other participating actors		
Trigger	The user decides to respond or inquire from the Forensic Department	
Course of Events	<ul style="list-style-type: none">• Public user submits the NIC number , contact number , name , password and email address• All the inputs are validated• A new account is created and the details are stored in the system	
Pre-conditions	User should not be registered before with the same NIC number	
Post-conditions	An account is created with the NIC number	
Alternative scenarios	An error message is shown if there’s an issue with the details entered	

Use Case Name	User Login	Use case type System requirement
Use Case ID	UC-02	
Source	Web Interface	
Primary Business actors	Registered User	
Other participating actors		
Trigger	The user decides to respond or inquire from the Forensic Department	
Course of Events	<ul style="list-style-type: none">• User submits form with NIC and password• Check the username with the corresponding password in the database• User logs in	
Pre-conditions	User should be registered before and should not be already logged in	
Post-conditions	User is logged in with the relevant user privileges	
Alternative scenarios	An error message is shown if there's a mismatch with the NIC and password entered	

Use Case Name	Admin Login	Use case type System requirement
Use Case ID	UC-03	
Source	Web Interface	

Primary Business actors	Admin , Police
Other participating actors	
Trigger	The admin/Police decides to log in
Course of Events	<ul style="list-style-type: none"> • Admin submits form with username and password • Check the username with the corresponding password in the database • Admin logs in
Pre-conditions	Admin should have a registered account and should not be logged in
Post-conditions	Admin is logged in with the relevant admin privileges
Alternative scenarios	An error message is shown if there's a mismatch with the username and password entered

Use Case Name	Admin Logout	Use case type System requirement
Use Case ID	UC-04	
Source	Web Interface	
Primary Business actors	Admin	
Other participating actors		
Trigger	The admin decides to log out	
Course of Events	<ul style="list-style-type: none">• Confirm whether the admin wants to log out• Admin logs out	
Pre-conditions	Admin should be logged in before	
Post-conditions	Admin is logged out	
Alternative scenarios	Admin remains logged in if he/she declines the log out verification	

Use Case Name	Upload 3D models	Use case type System requirement
Use Case ID	UC-05	
Source	Web Interface	
Primary Business actors	Admin	
Other participating actors	Forensic Department -University of Sri Jayewardenepura	
Trigger	Receiving 3D models created by the Forensic Department -University of Sri Jayewardenepura	
Course of Events	<ul style="list-style-type: none">• Admin logs in to the website• Check for the relevant S/R number• Upload the 3D model	
Pre-conditions	Admin should be logged in to the web site	
Post-conditions	The dead body’s information is updated with the 3D model	
Alternative scenarios	If information about the relevant S/R Number is not added , add the information and the 3D model both	

Use Case Name	Update the information portal	Use case type System requirement
Use Case ID	UC-06	
Source	Web Interface	
Primary Business actors	Admin	
Other participating actors		
Trigger	Admin finds new relevant articles or writes new articles about findings and other important facts about Facial reconstruction and other forensic activities	
Course of Events	<ul style="list-style-type: none">• Admin logs in	

	<ul style="list-style-type: none"> • Admin attaches the article • Admin clicks update
Pre-conditions	Admin should be logged in
Post-conditions	Information portal is updated
Alternative scenarios	

Use Case Name	Respond to the requests/inquiries	Use case type System requirement
Use Case ID	UC-07	
Source	Web Interface	
Primary Business actors	Admin , Police	
Other participating actors	Registered user	
Trigger	The registered user sends an inquiry or request through the web-site	
Course of Events	<ul style="list-style-type: none">• Admin/Police log in to the web site• Check for requests and inquiries• Respond to the given email address	
Pre-conditions	Admin/Police should be logged in	
Post-conditions	The registered user receives a reply and the request/inquiry gets removed from the list	
Alternative scenarios	Admin/Police will not be able to respond if the given email address is invalid	

Use Case Name	Request for 3D models	Use case type System requirement
Use Case ID	UC-08	
Source	Web Interface	

Primary Business actors	Admin , Police
Other participating actors	Forensic Department
Trigger	Receiving information about unidentified bodies without any images
Course of Events	<ul style="list-style-type: none"> • Admin/Police log in to the web site • Add the relevant field of information about the unidentified body • Click on 'request for a 3D Model'
Pre-conditions	Admin/ Police should be logged in and Information about an unidentified body should be received
Post-conditions	Forensic Department receives an email requesting to create a 3D model
Alternative scenarios	An error message is shown if the compulsory fields are not filled

Use Case Name	Add details about unidentified bodies	Use case type System requirement
Use Case ID	UC-9	
Source	Web Interface	
Primary Business actors	Admin/ Police	
Other participating actors		
Trigger	The Admin/Police receives details about unidentified bodies	
Course of Events	<ul style="list-style-type: none">• Admin/Police login to the website• Check if details under the particular S/R number is already added• Add details about unidentified bodies in the correct fields• Click submit	

Pre-conditions	The details that is to be added should not be uploaded to the web site before
Post-conditions	The details of the unidentified bodies are added to the web site
Alternative scenarios	An error message is shown if the compulsory fields are not filled

Use Case Name	Delete details about unidentified bodies	Use case type System requirement
Use Case ID	UC-10	
Source	Web Interface	
Primary Business actors	Admin ,Police	
Other participating actors		
Trigger	Admin/Police wants to delete details that are related to identified bodies (Mostly when the person is recognized)	
Course of Events	<ul style="list-style-type: none">• Admin or police login to the website• Search the relevant record• Verify deletion• Delete the details	
Pre-conditions		
Post-conditions	The record that is relevant to that unidentified body is deleted from the website	
Alternative scenarios	Information about the particular unidentified body remains in the web site if the admin/ Police declines the deletion verification	

Use Case Name	View information portal	Use case type System requirement
Use Case ID	UC-11	
Source	Web Interface	
Primary Business actors	Public User/ Registered user	
Other participating actors		
Trigger	User decides to learn more about the Forensic activities	
Course of Events	<ul style="list-style-type: none">• User goes to the web site• Go to the information portal tab	
Pre-conditions		
Post-conditions		
Alternative scenarios		

Use Case Name	Contact the forensic department	Use case type System requirement
Use Case ID	UC-12	
Source	Web Interface	
Primary Business actors	Public User / Registered user	
Other participating actors	Admin	
Trigger	User wants to get more details from forensic department	
Course of Events	<ul style="list-style-type: none">• User visits the web site	

	<ul style="list-style-type: none"> • Go to the contact us page • Fill the form with relevant details • Submit the form
Pre-conditions	
Post-conditions	The message is sent to the forensic department
Alternative scenarios	An error message shown when compulsory fields are not filled

Use Case Name	Respond under unidentified body	Use case type System requirement
Use Case ID	UC-13	
Source	Web Interface	
Primary Business actors	Registered User	
Other participating actors	Admin	
Trigger	User recognizes an unidentified body	
Course of Events	<ul style="list-style-type: none">● User login to the web site● View unidentified body details● Details about an unidentified body match with information he/she knows● Click 'respond'● Confirm verification● Send response	
Pre-conditions	User should be registered to the web site.	
Post-conditions	A message is sent to the admin	
Alternative scenarios	No response is sent if the user declines verification	

Use Case Name	Inform about missing person if not found	Use case type System requirement
Use Case ID	UC-14	
Source	Web Interface	
Primary Business actors	Registered User	
Other participating actors	Admin	
Trigger	The registered user being unable to recognize the person he/she is looking for	
Course of Events	<ul style="list-style-type: none">• User login to the web site• Go to 'Inform about missing persons' tab• Fill the relevant fields with correct details• Submit form	
Pre-conditions	The user should be logged in	
Post-conditions	A message is sent to the Forensic Department (admin)	
Alternative scenarios	An error message is shown if the compulsory fields are not filled	

Functional Requirements

Admin

- Log in to the system

- Manage police division accounts
- Add/Delete details about unidentified bodies
- Respond to inquiries/requests
- Request for and upload 3D models
- Manage information portal

Police

- Log in to the system
- Add/Delete details about unidentified bodies
- Respond to inquiries/requests sent by the registered users
- Request for 3D models

Public User

- View Information portal
- View basic details about unidentified bodies
- Contact the Forensic Department
- Search for missing for persons
- Register by making an account

Registered User

- Log in to the web site
- View Information portal
- View details about unidentified bodies
- Respond under unidentified bodies
- Contact the forensic department
- Search for missing persons
- Inform about missing persons if the matching results are not found

Non-Functional Requirements

Security

- Only the admin and the Police are authorized to access the information about unidentified dead bodies.
- Considers authorization and authentication levels across different user roles.
- Only the admin has the ability to manage users including the Police division accounts.

Performance

- The website shall be loaded without any delays.

- Results shall be displayed in less than 2 seconds when searching for unidentified dead bodies.

User-friendliness

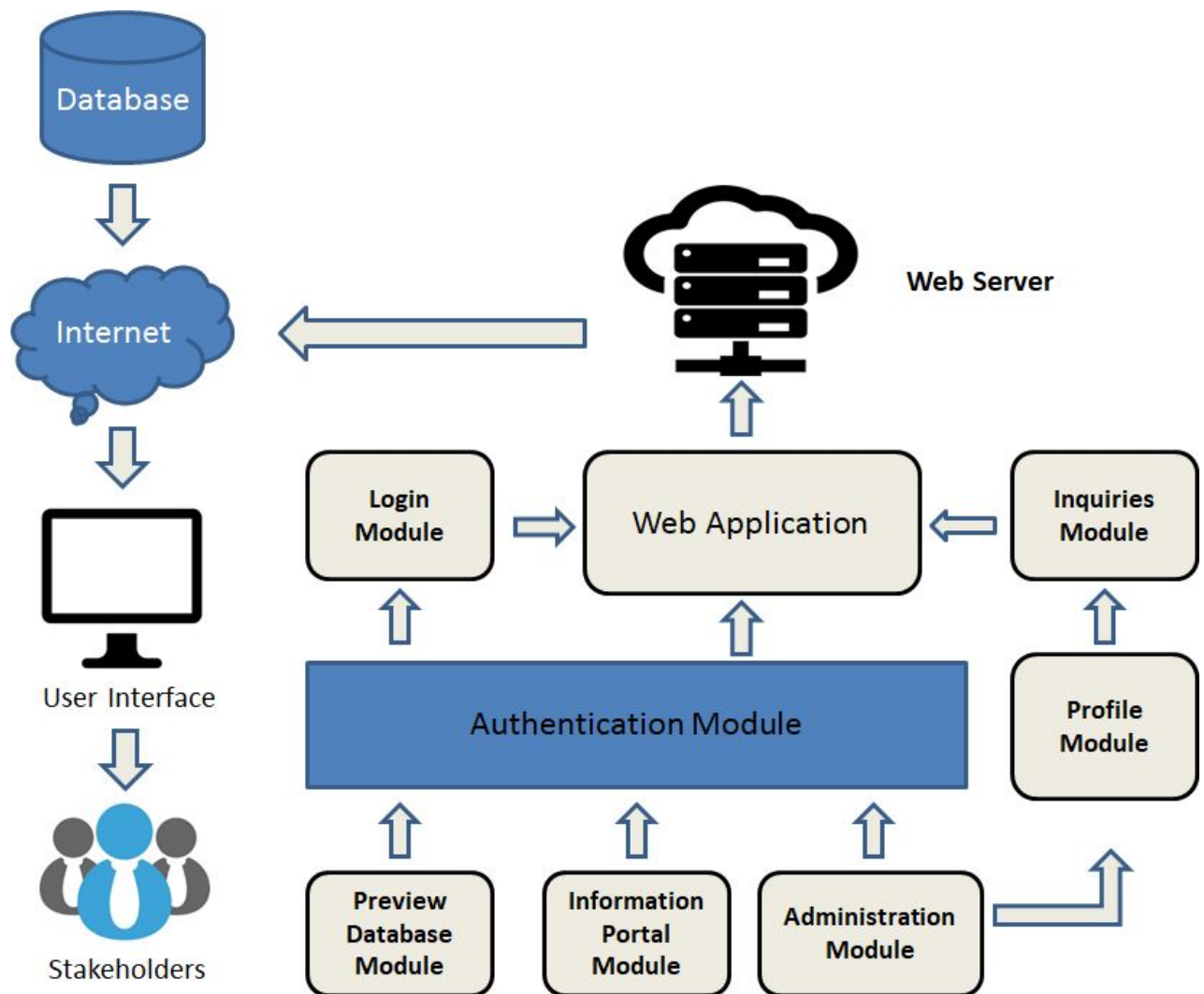
- The system facilitates easy navigation through the interfaces by having simple and clear instructions

Proposed System's Architecture

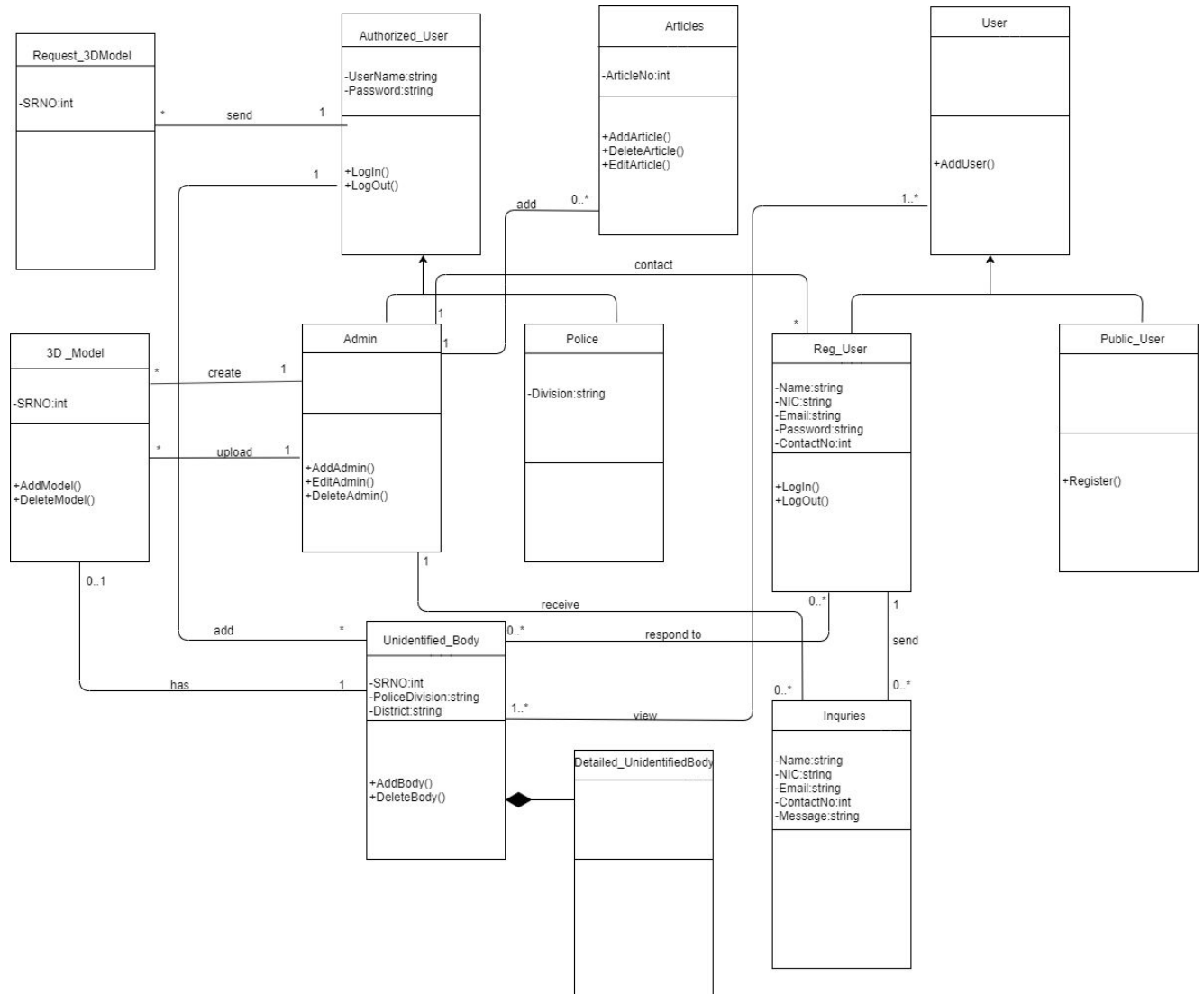
Components and their responsibilities

Component	Responsibilities
Authentication Module	<ul style="list-style-type: none"> • Validate usernames and passwords • Proceed according to the user type
Login Module	<ul style="list-style-type: none"> • Allows users to login to the system as the relevant user type
Information Portal Module	<ul style="list-style-type: none"> • Consists of news , articles, videos etc. uploaded by the admin
Preview Database Module	<ul style="list-style-type: none"> • Displays all the unidentified bodies including their pictures/3D models
Administration Module	<ul style="list-style-type: none"> • Provides the relevant privileges to the admin
Inquiries Module	<ul style="list-style-type: none"> • Allows the registered user to interact with the authorized users

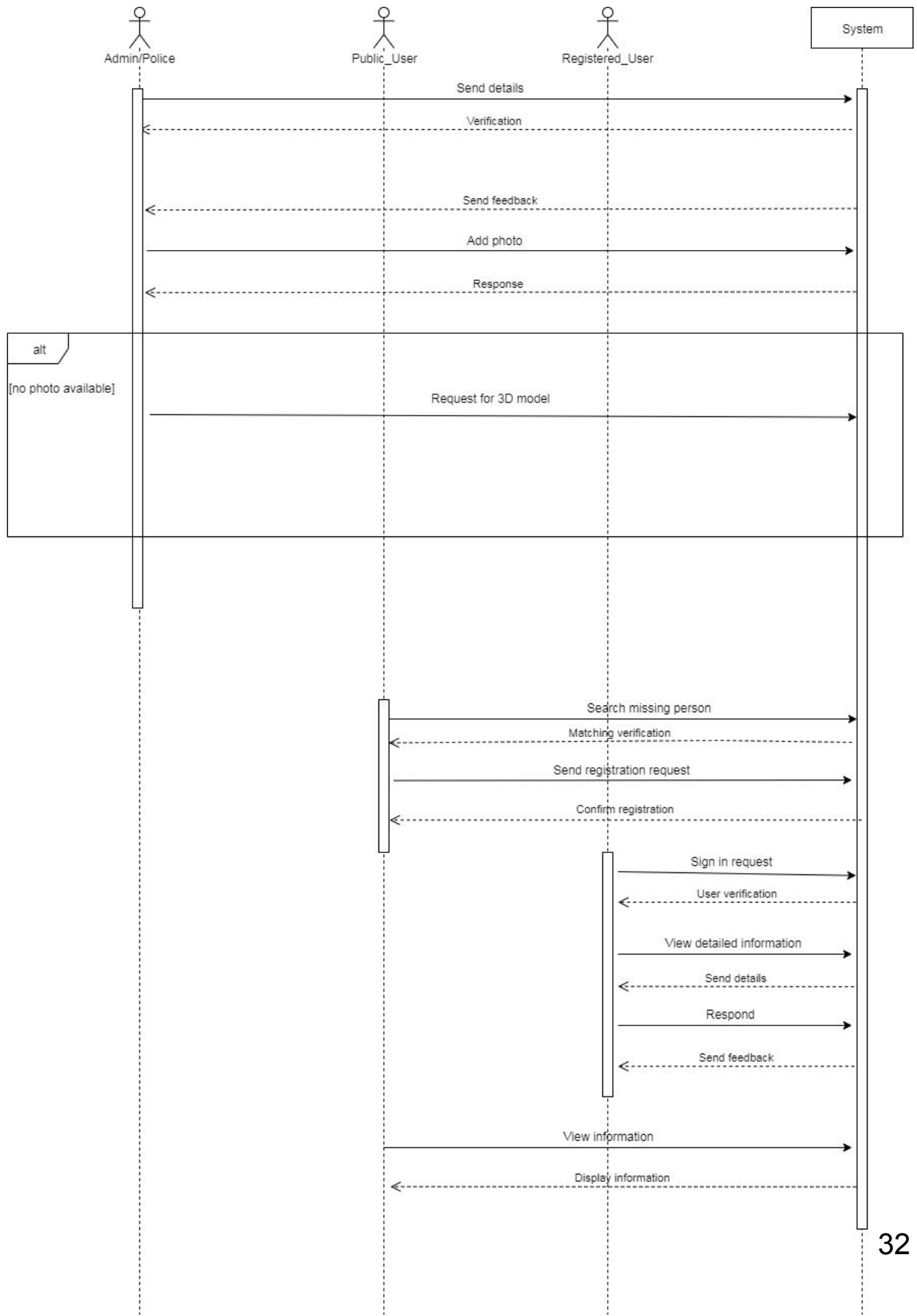
Component interaction

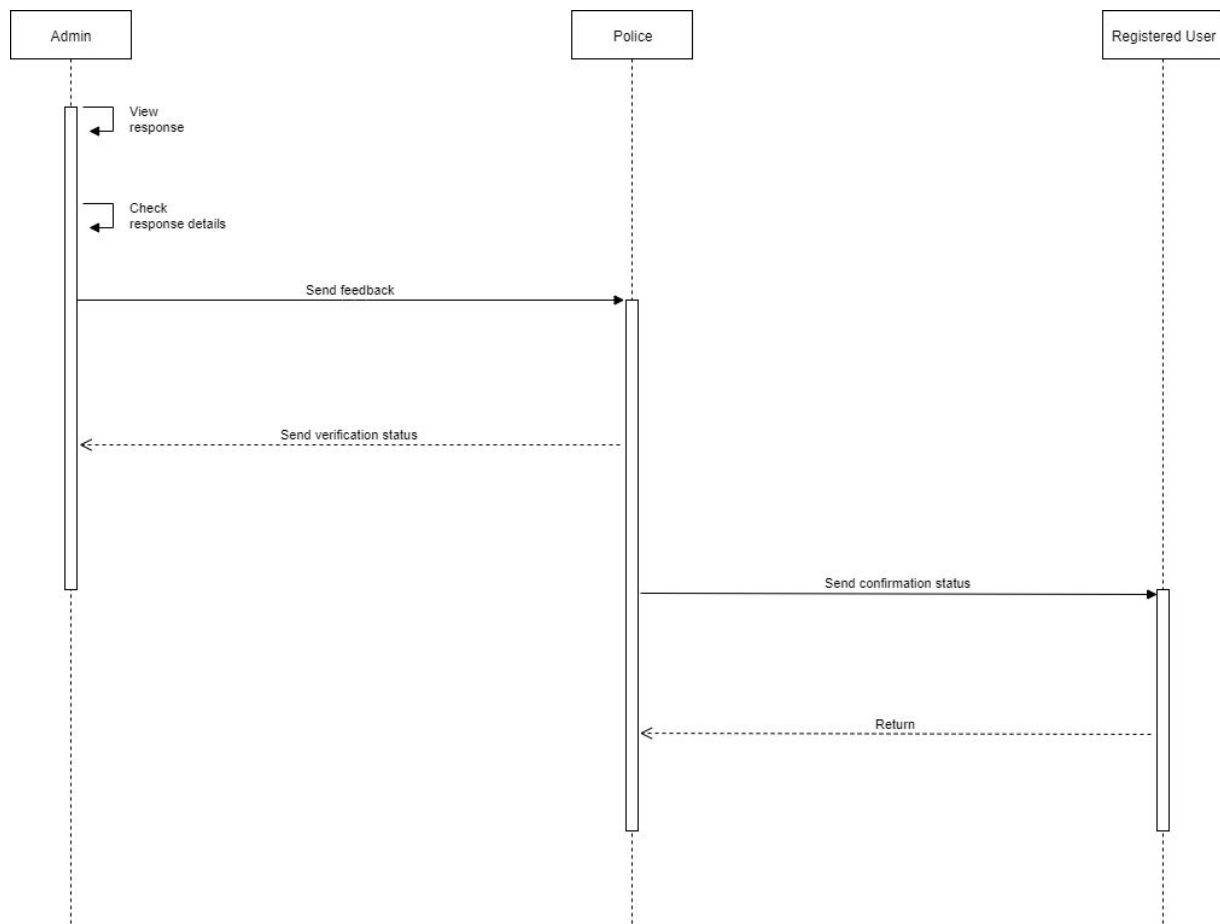


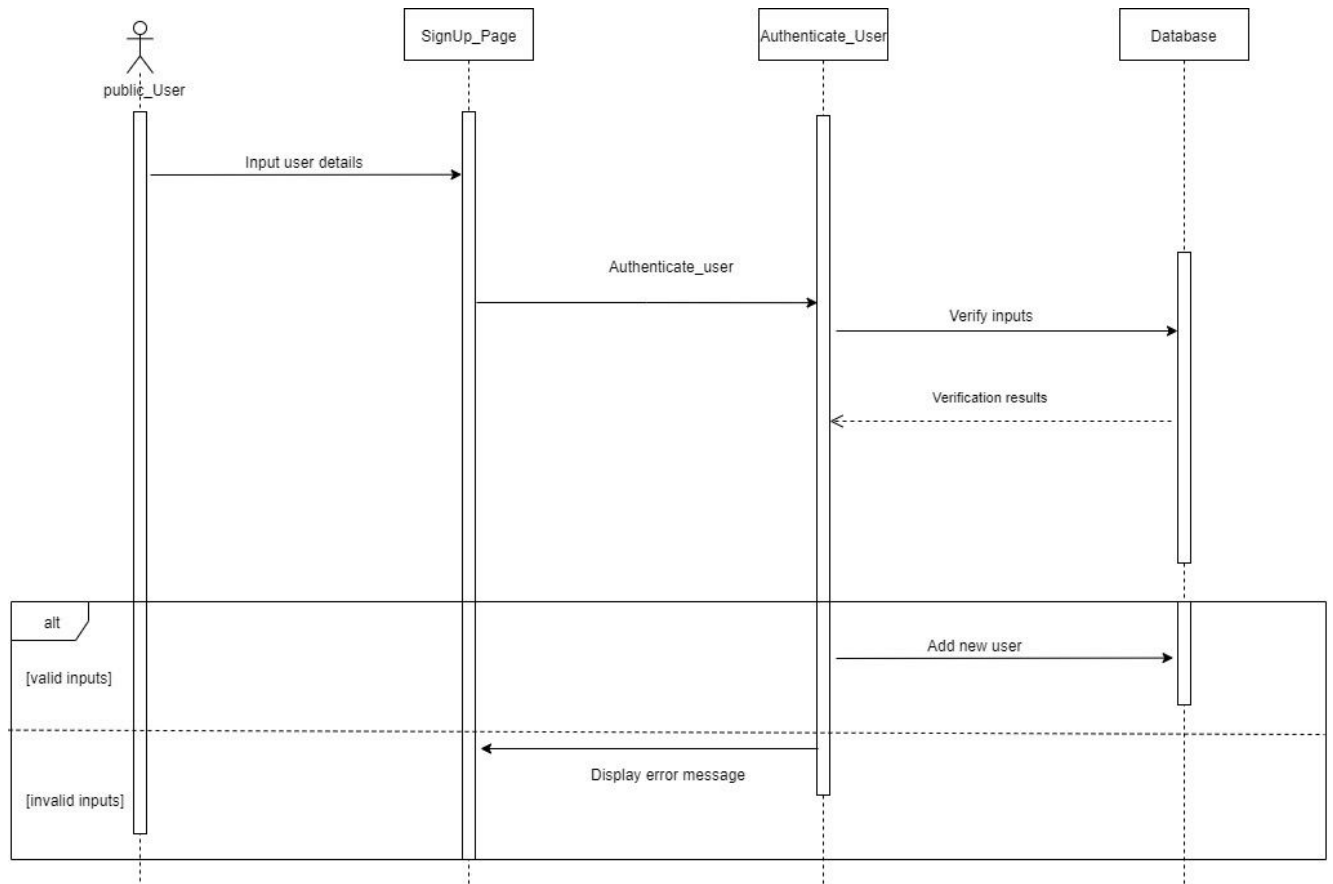
Class Diagram

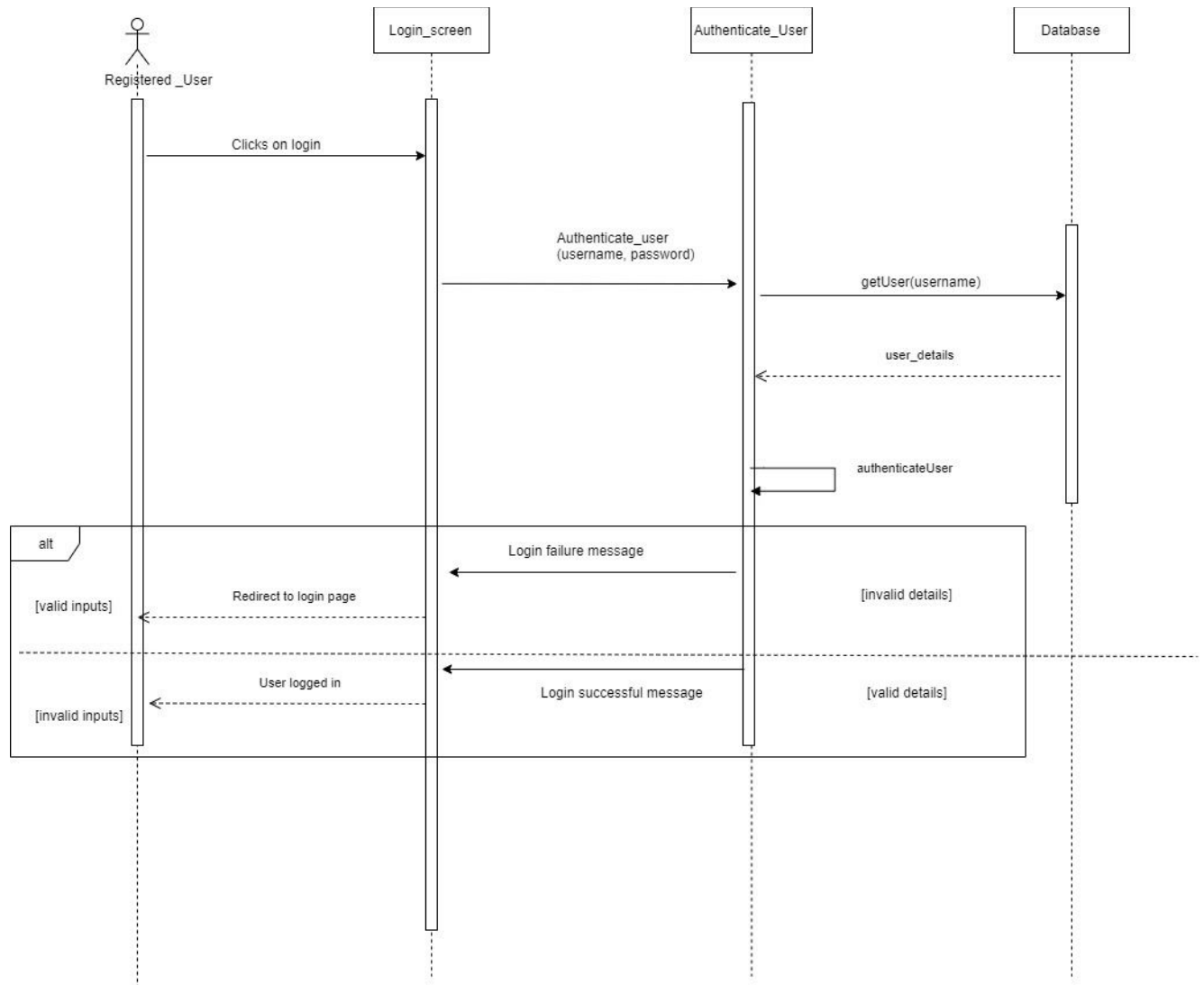


Sequence Diagrams

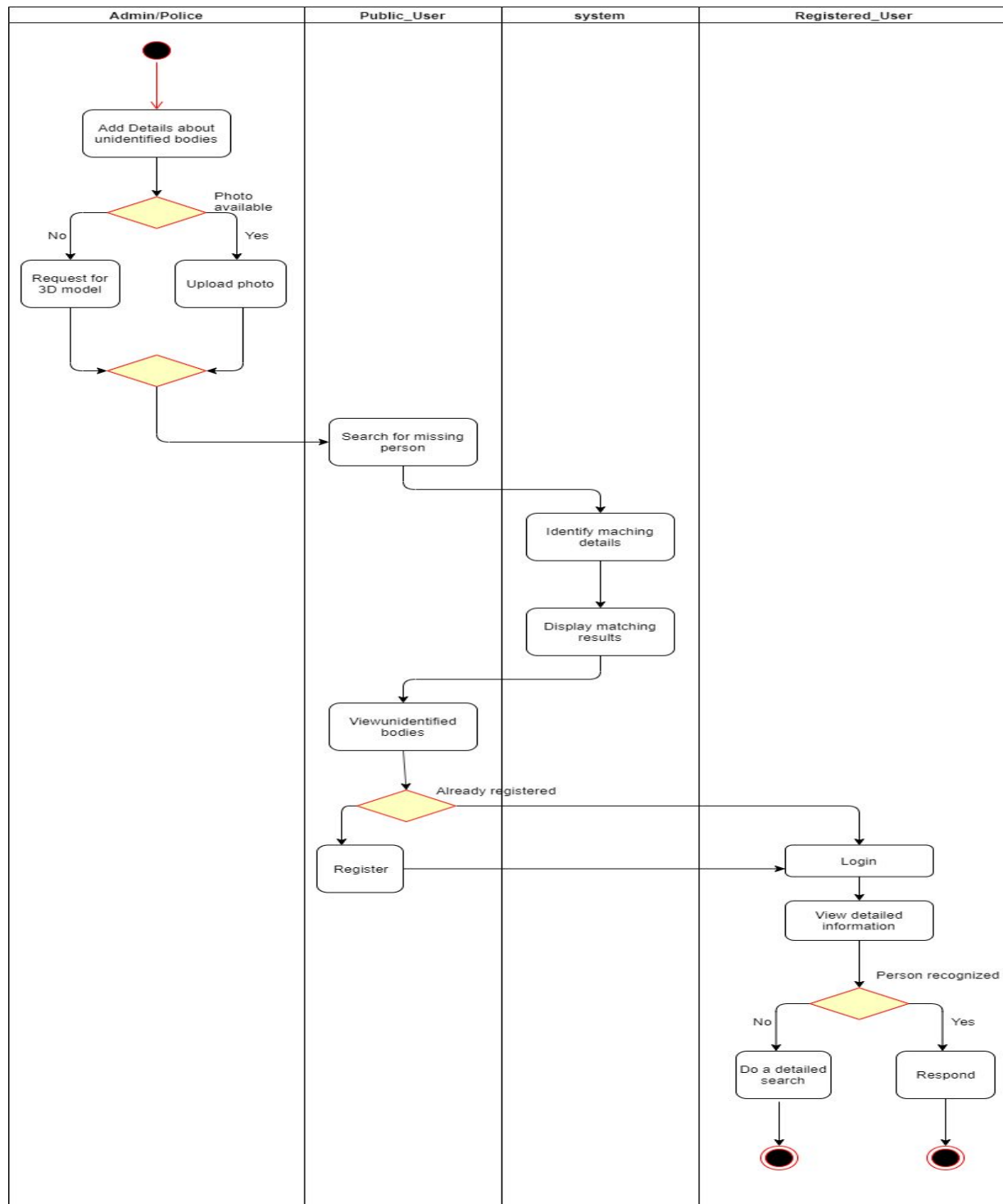


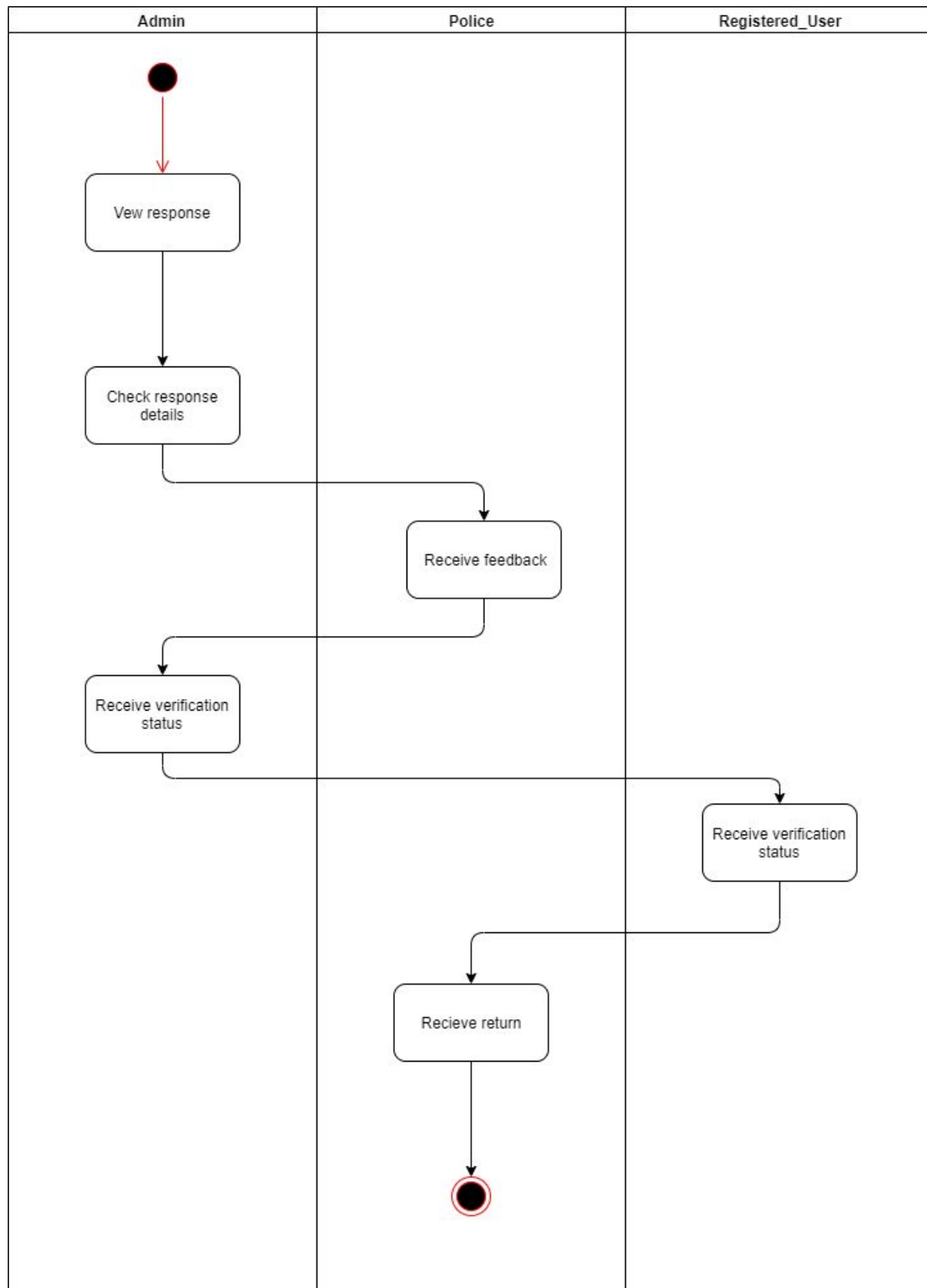






Activity Diagrams





User Interface Flow Diagram

