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COSBAS Functional Requirements Documentation

Git: <https://github.com/undecidables/Requirements-Documentation>

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1 Introduction

In this section of the document we will identify and address a high level overview of the COSBAS (Computer Science Biometric Access System) system. The reason for building this system is because currently it is too difficult for students to gain authorized access to the department when they have a meeting with a lecturer. There is also no means of gathering data on who is entering or leaving the department and there is no easy means of creating or requesting appointments with a specific lecturer.

2 Vision and Objectives

2.1 Vision

The vision of the COSBAS system is to create a biometric access control system that makes use of different biometric devices and the latest mobile technologies to grant access to visitors and staff members. The system will also serve as an appointment system between lecturers, visitors and students.

2.2 Objectives

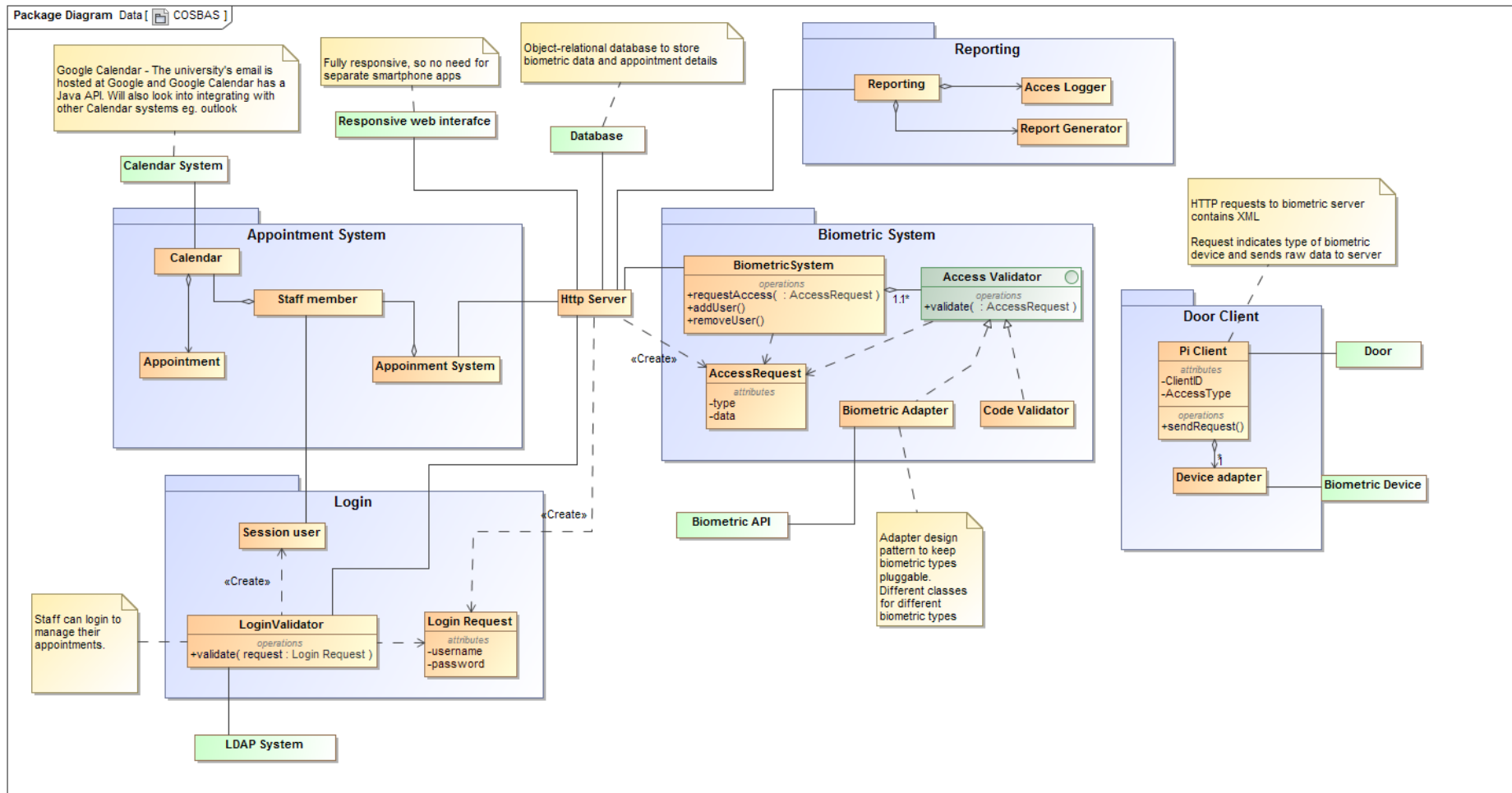
The main objectives of the COSBAS system is:

- to provide secure biometric access to not only staff members of the department, but visitors as well.
- to provide the ability to make appointments by means of a web interface.

2.3 Terminology/Clarifications

- A **booking** is when a user, either a guest or a staff member, requests an appointment with a staff member.
- An **appointment** is when the particular staff member, with whom the booking is made, approves the booking.

4



4 Appointments

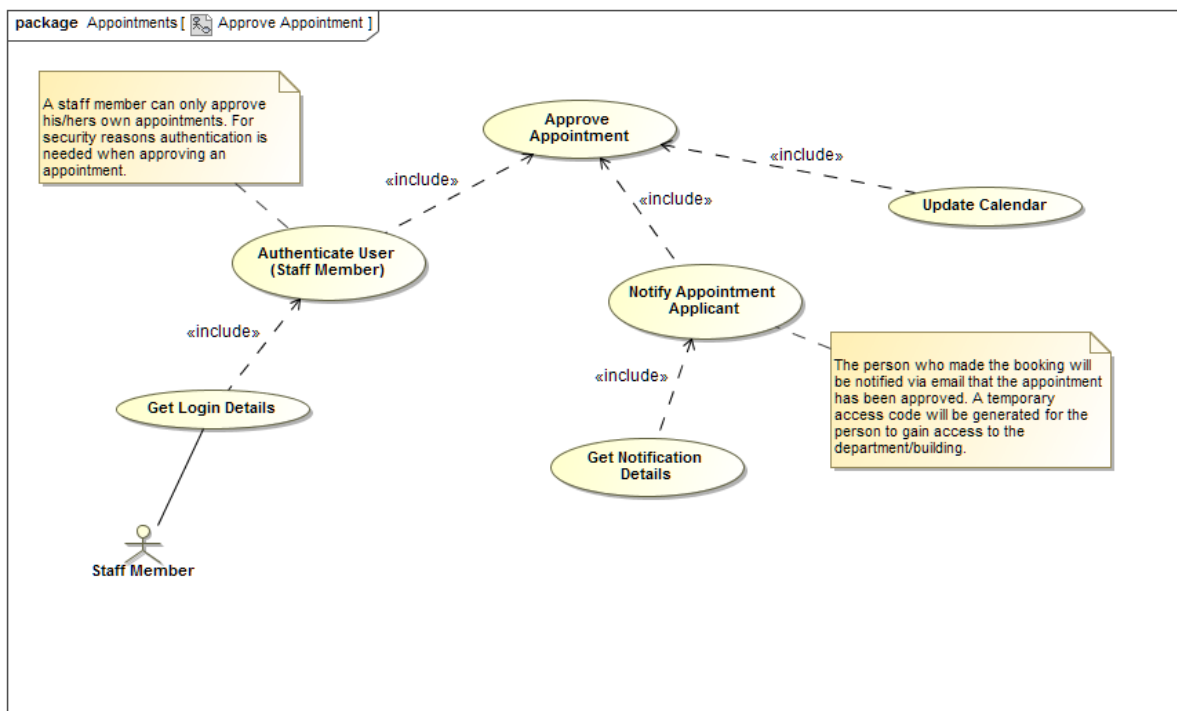
4.1 Approve Appointment

Priority: *Important*

4.1.1 Description

A person can make a booking with one of the staff members in the department/building. The particular staff member needs to approve such an appointment. A booking needs to be approved first by a staff member before the guest/visitor can gain access to the department/building.

4.1.2 Use Case diagram



4.1.3 Pre-/Post-Conditions

Pre-conditions:

- Staff member needs to be logged into the COSBAS System to approve his/her own appointments.
- There should be a booking before an appointment can be approved.

Post-conditions:

- The staff member will become unavailable during that time, which will be updated on the staff member's corresponding calendar.
- An email notification with a temporary access code is sent to the user(s) who made the booking.

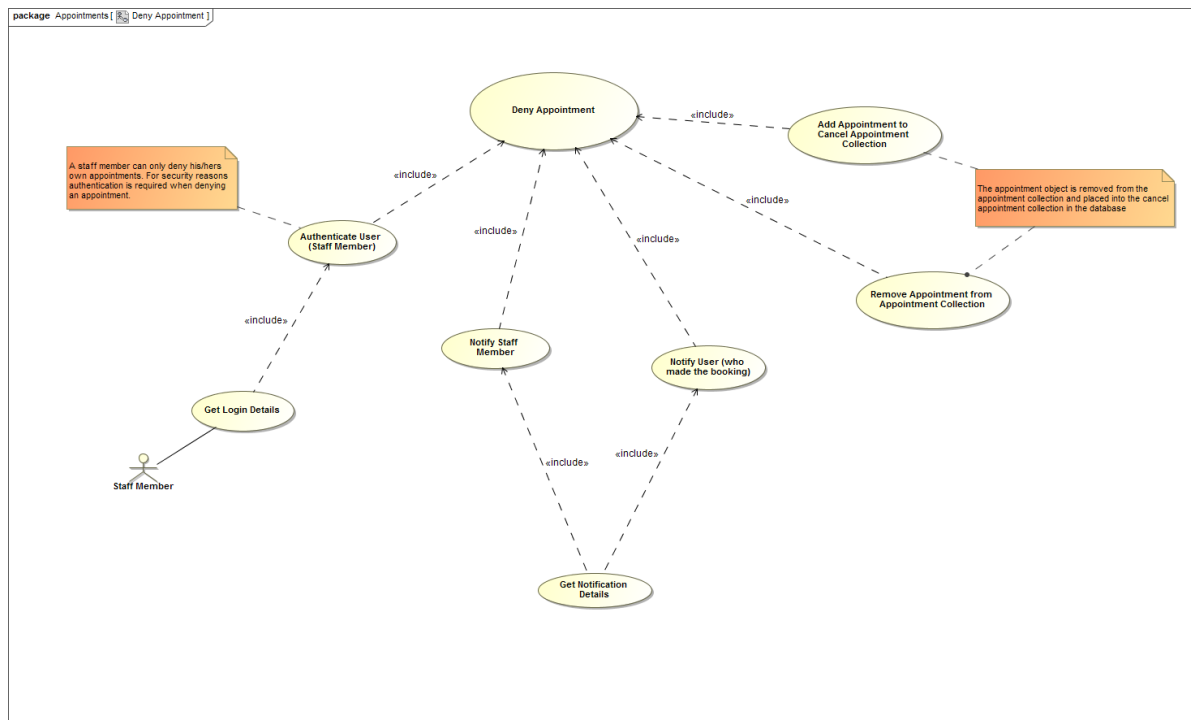
4.2 Deny Appointment

Priority: *Important*

4.2.1 Description

A booking can be denied by a staff member. The user who made the booking and the staff member will be notified that the appointment has been denied.

4.2.2 Use Case diagram



4.2.3 Pre-/Post-Conditions

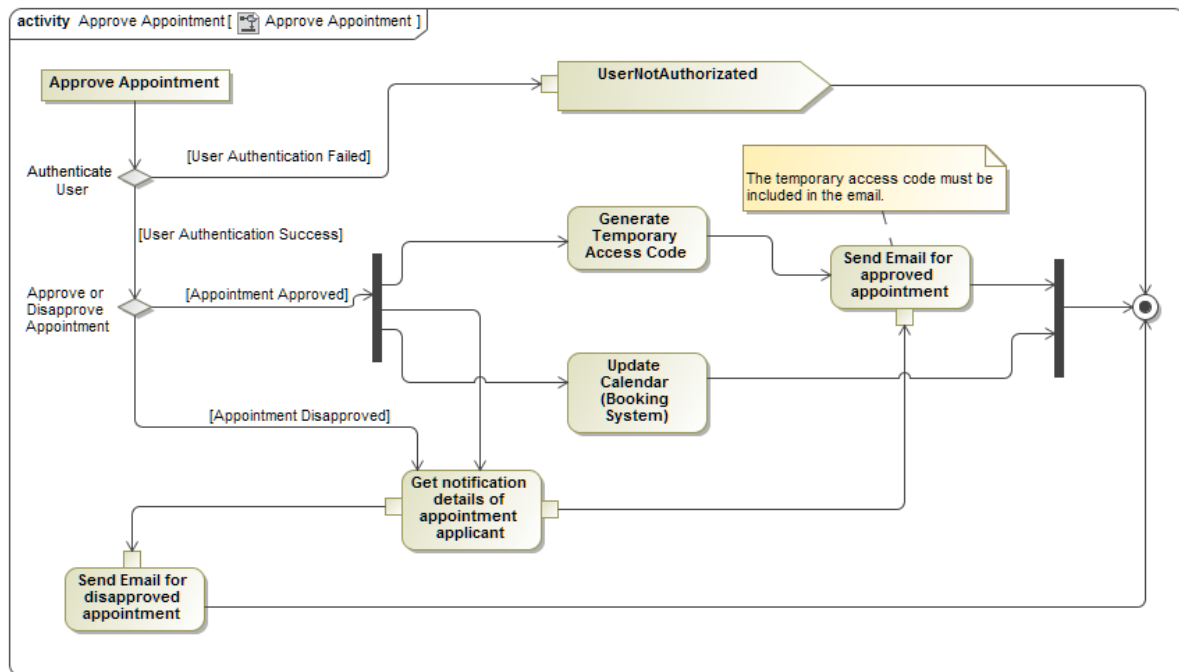
Pre-conditions:

- There should be a booking before an appointment can be denied.
- Staff member needs to be logged into the COSBAS System to deny his/her own appointments.

Post-conditions:

- An email notification informing the user(s), who made the booking, that the booking has been denied.
- An email notification informing the staff member that he/she has denied the booking.
- The appointment object on the database and third-party calendar client must be removed.
- The appointment object in the database needs to be moved to the Cancel Appointment Collection in the database.

4.3 Process Specification for Approve and Deny Appointment



4.4 Requesting Appointment/Making a booking

Priority: *Important*

4.4.1 Description

This functionality allows a user(s) of the system to request an appointment (book an appointment) with a staff member that is also using system.

4.4.2 Pre-/Post-Conditions

Pre-conditions:

- Staff member must exist on the system.
- Date and time of the requested appointment must be valid entries, that is the staff member must be available at that time.

Post-conditions:

- The appointment will be saved for the staff member to approve or deny later on.
- The user(s) will receive an notification email with an appointment identifier.
- The staff member is notified of the requested appointment.

4.5 Cancelling Appointment

Priority: Important

4.5.1 Description

This function allows the user to cancel an appointment they have made, or in the case of a staff member, that has been made with them. The user who made the booking will make use of the link in the first email, that is the email that informed the user that the appointment has been approved, to cancel the appointment.

4.5.2 Pre-/Post-Conditions

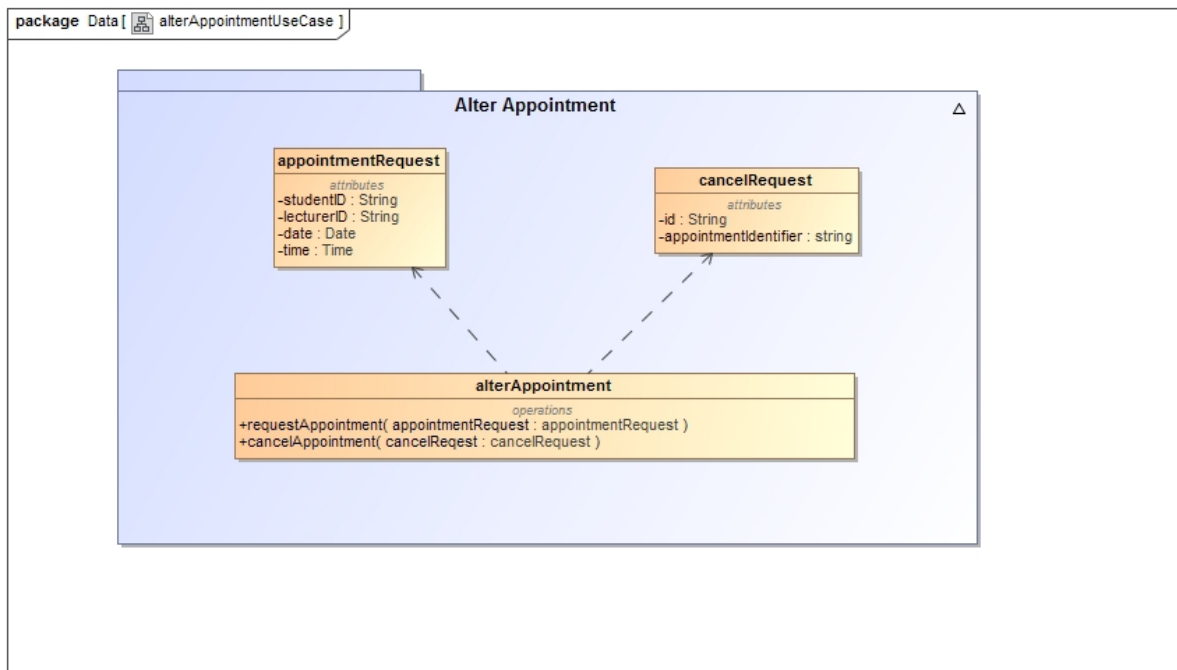
Pre-conditions:

- The appointment must exist on the system.
- The user cancelling the appointment has to be the staff member that the appointment is with or the user who made the booking.

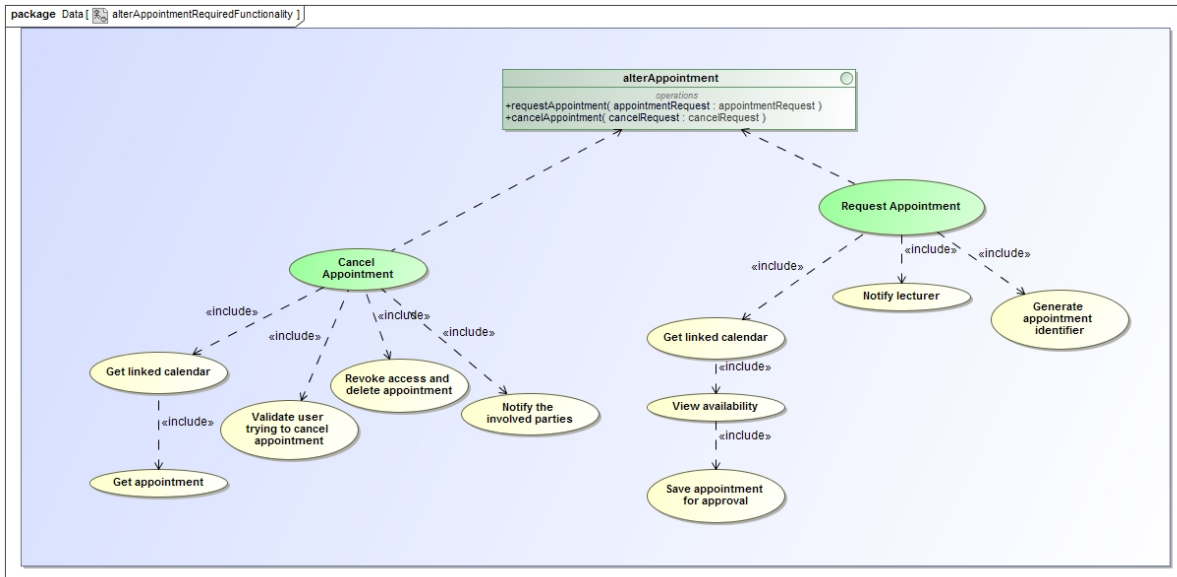
Post-conditions:

- The appointment will be cancelled, that is removed from the appointment collection and moved to the cancel appointment collection in the database and third-party calendar services.
- Both parties are notified via email (But pluggable with other notifier mediums).
- Access that was granted for the appointment is revoked, that is the temporary access key will be revoked.

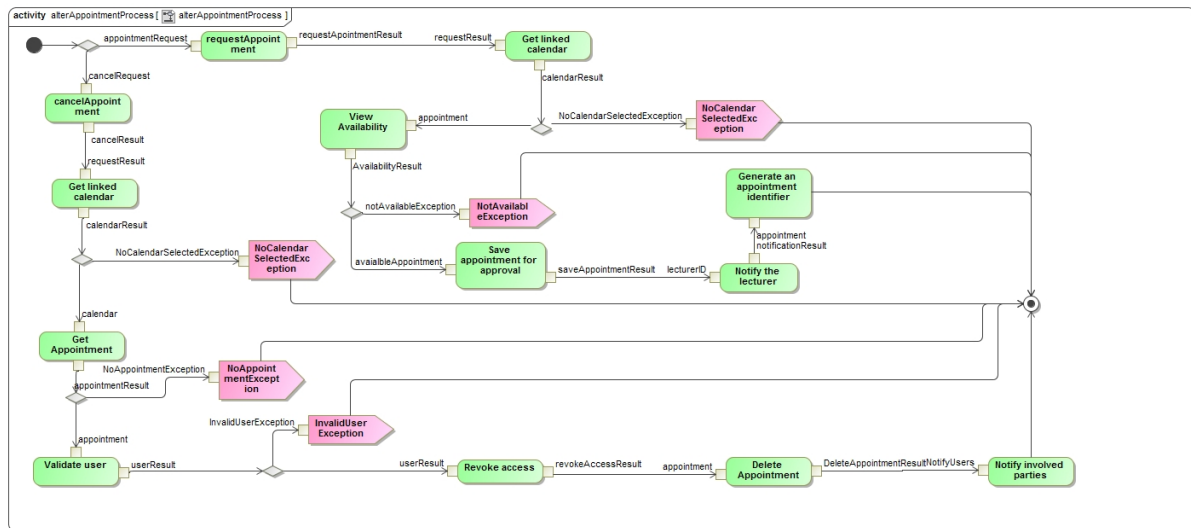
4.6 Use Case diagram for Requesting Appointment and Cancelling Appointment



4.7 Functionality for Requesting Appointment and Cancelling Appointment



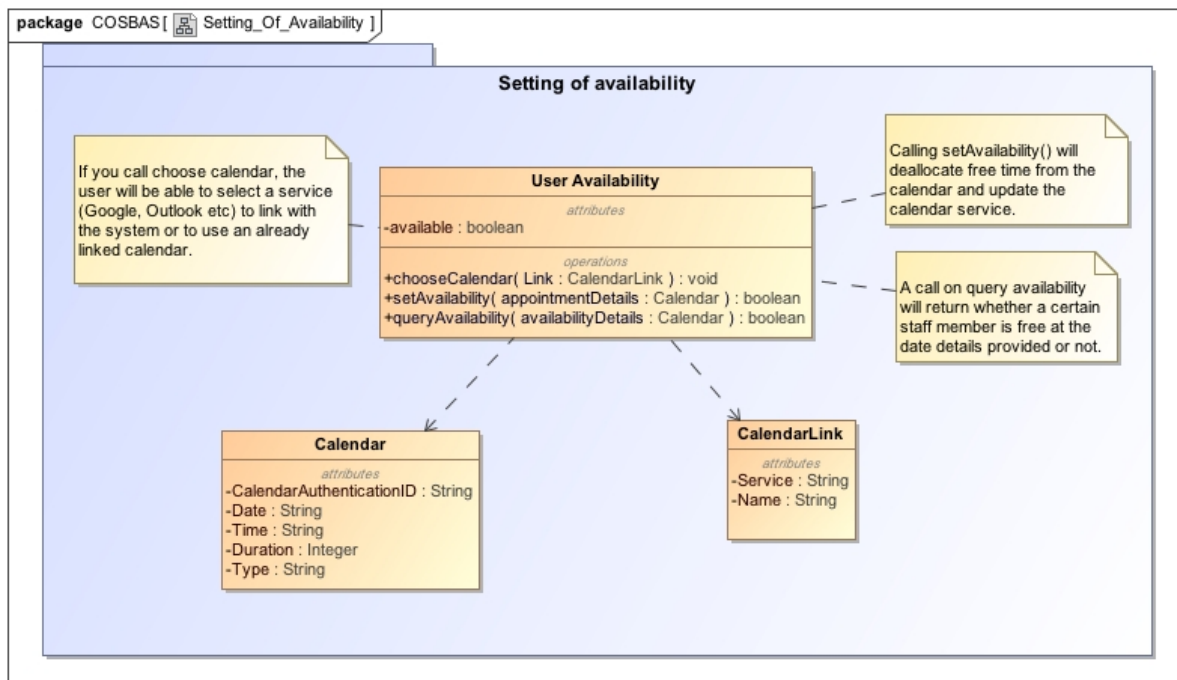
4.8 Process Specification for Requesting Appointment and Cancelling Appointment



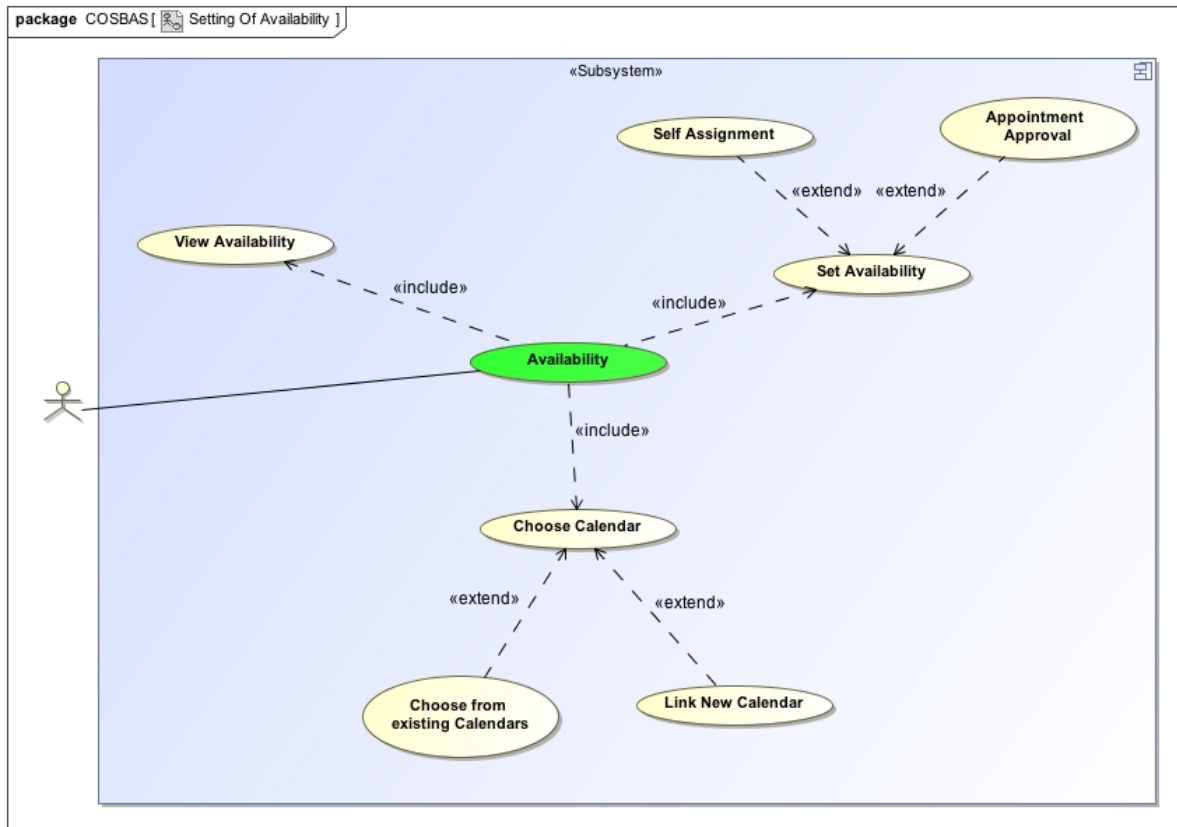
5 Availability

The following functionality of creating and setting availability will only be available to staff members. Users who are not authorised by the system will be granted read-only privileges.

5.1 Use Case Diagram



5.2 Module Functionality



5.3 Choose Calendar

Priority: *Important*

5.3.1 Description

An authorised user of the system should be able to select which calendar account to associate with the system. If the user chose a linked service, then that service needs to be authenticated.

5.3.2 Pre-/Post-Conditions

Pre-conditions:

- The user should be logged into the system
- The user should already have a calendar account from the linked services (Google & Outlook).

Post-conditions:

- Once the user has chosen the calendar to associate with the system, all updates in availability will be amended in that specific calendar.

5.4 View Availability

Priority: *Important*

5.4.1 Description

The COSBAS system should be able to have functionality of viewing the availability of the associated staff member on their calendar.

5.4.2 Pre-/Post-Conditions

Pre-conditions:

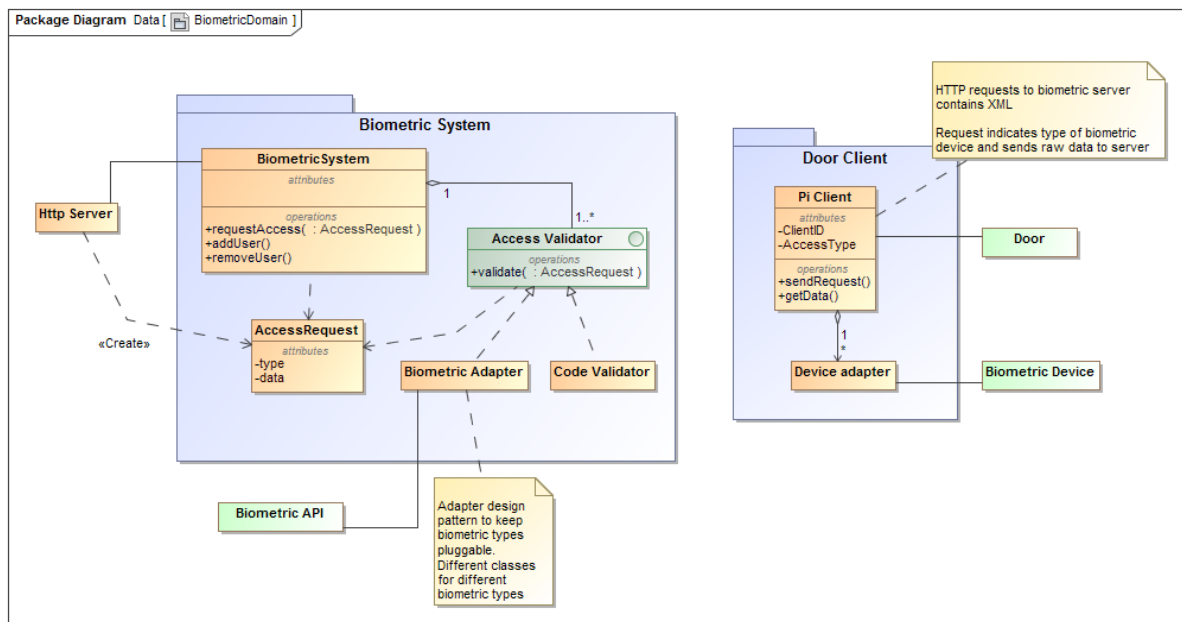
- An associated calendar for the staff member should exist on the system.

Post-conditions:

- Be able to see whether the associated staff member has an appointment at a certain date and time or if they are free for appointments.

6 Biometric Access

This module encapsulates functionality regarding validating biometric data or temporary access code to give staff members or visitors access to the Computer Science Department



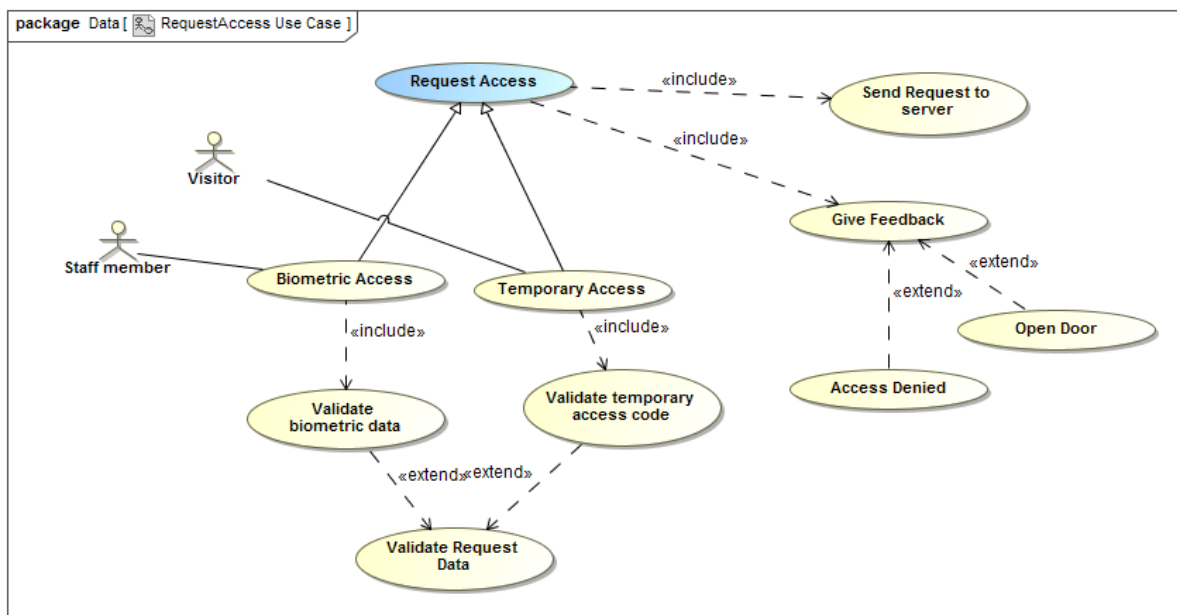
6.1 Request Access

Priority: *Critical*

Staff Access A staff member can gain access at a door using biometrics.

Visitor Access A visitor can enter the department by entering their temporary access code at the door.

6.1.1 Use Case diagram



6.1.2 Pre-/Post-Conditions

Staff Access Pre-conditions:

- Staff member must be registered on the system.
- Staff member must stand correctly on the pressure mat for authentication to be activated.
- Biometric data must validate correctly.

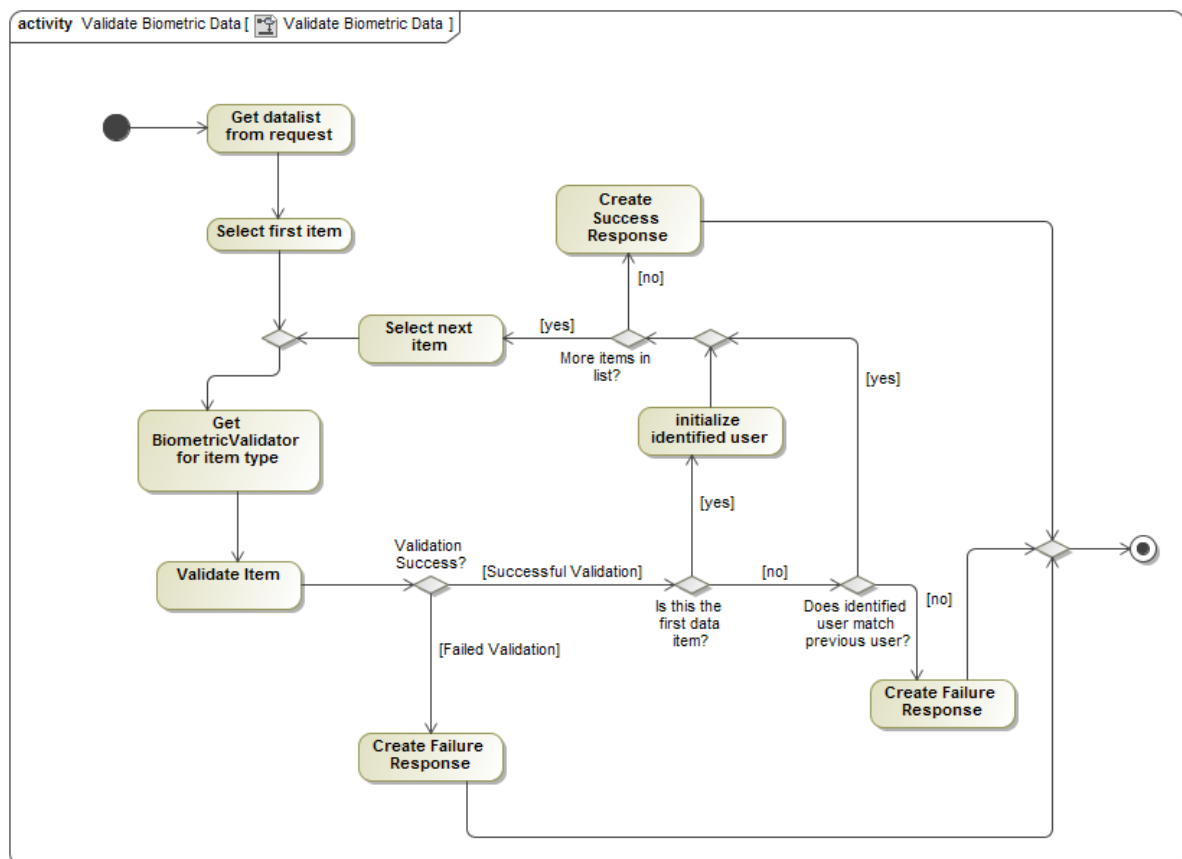
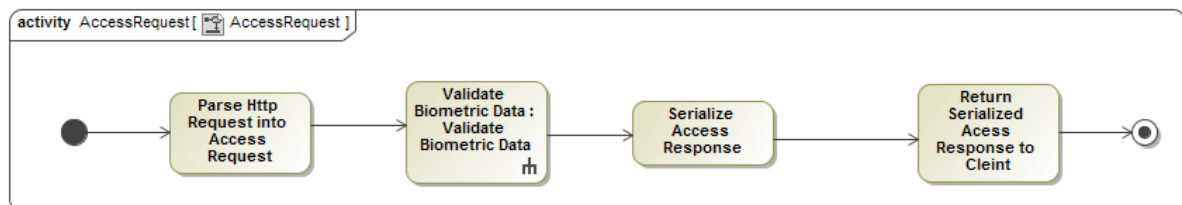
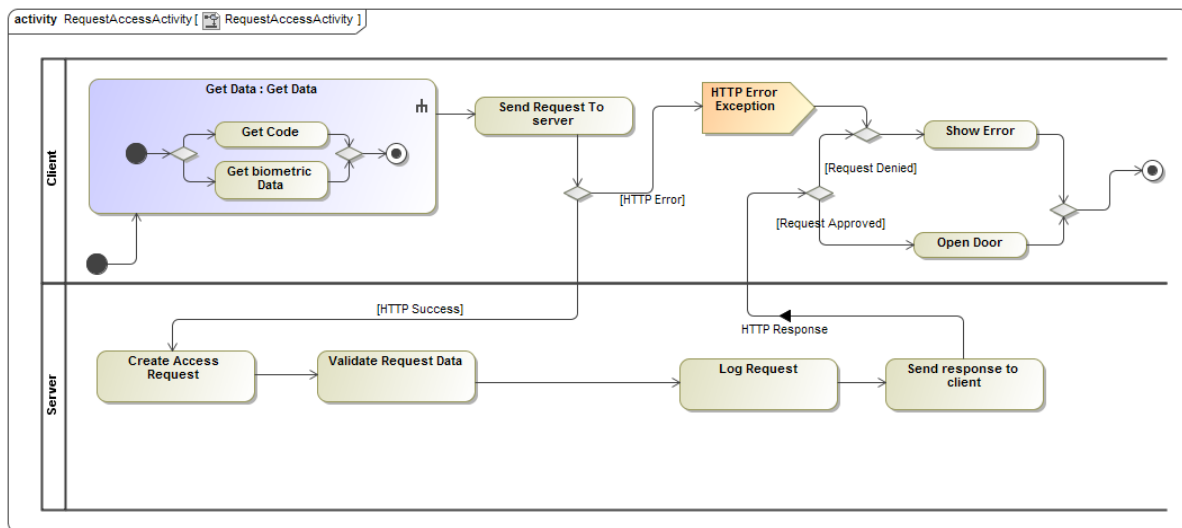
Visitor Access Pre-conditions:

- Visitor needs to have an appointment.
- Temporary access code should be valid.

Post-conditions:

- User gains access (building door will be opened)
- Access logged

6.1.3 Process Specification



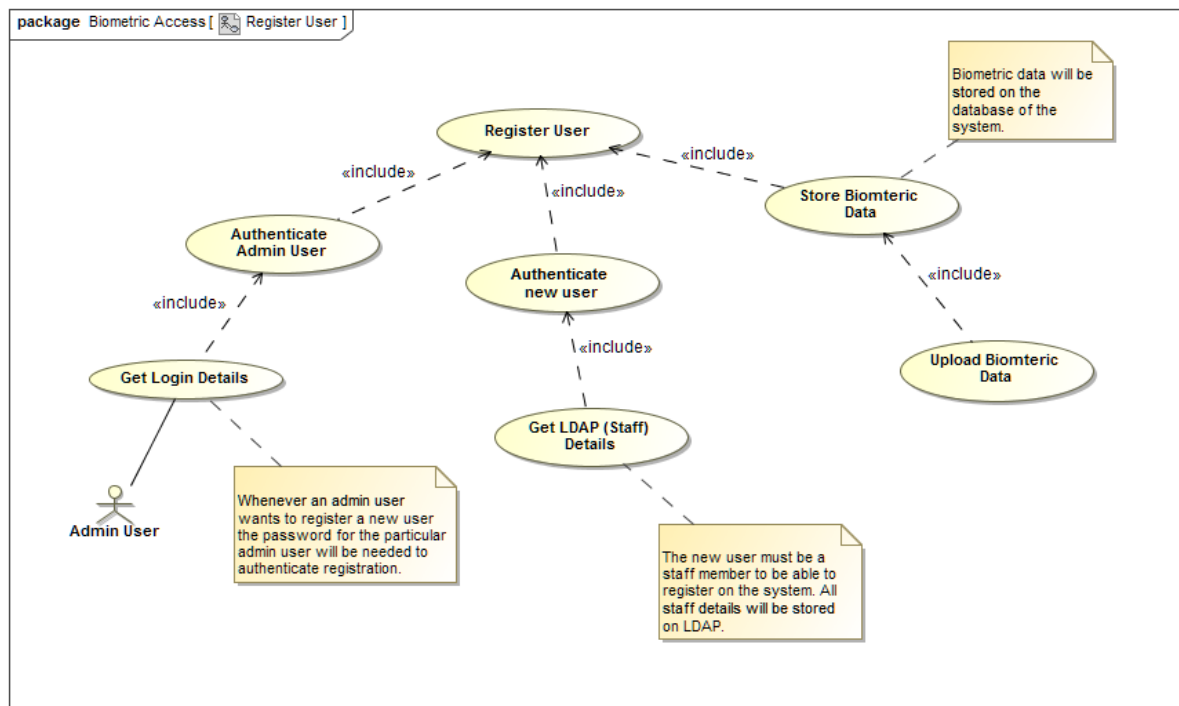
6.2 Register User

Priority: *Critical*

6.2.1 Description

To register a user on the system is the same as to store biometric data of the user in the database. Staff members needs to store their biometric data to gain access to department/building. There will be an administrator (admin user) that will handle all the registration of users on the system.

6.2.2 Use Case diagram



6.2.3 Pre-/Post-Conditions

Pre-conditions:

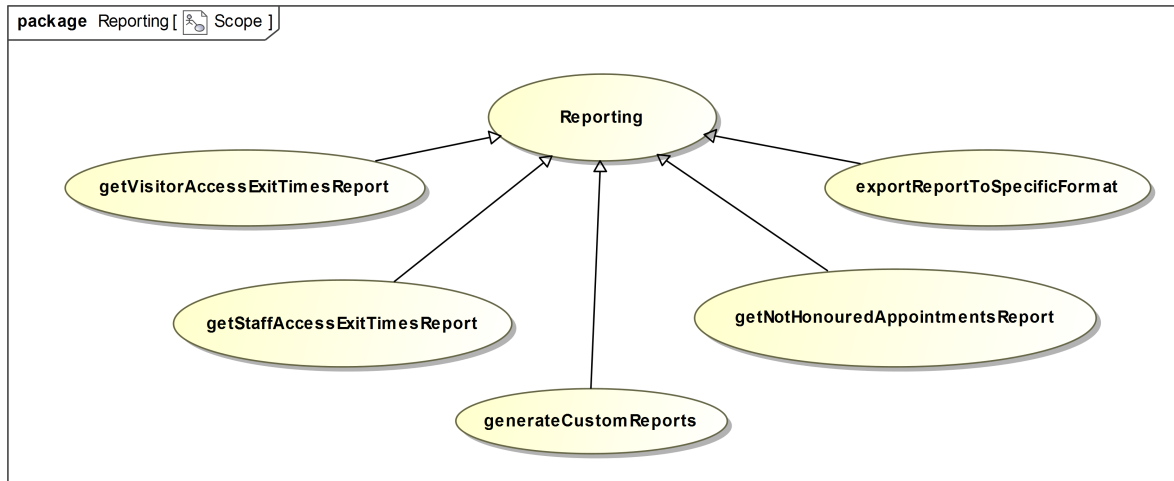
- Administrator (admin user) needs to be logged into the registration application to register a user.
- The user being registered must be a staff member.

Post-conditions:

- The biometric data will be stored in a temporary collection on the database for authentication by another Admin User (not the same the admin user as the one whom made the registration).
- After the other admin user approved the registrations for that particular day each staff member,

- is registered on the system with his/hers own biometric data.
- will be able to gain access to department/building by means of the biometric device.

7 Reporting



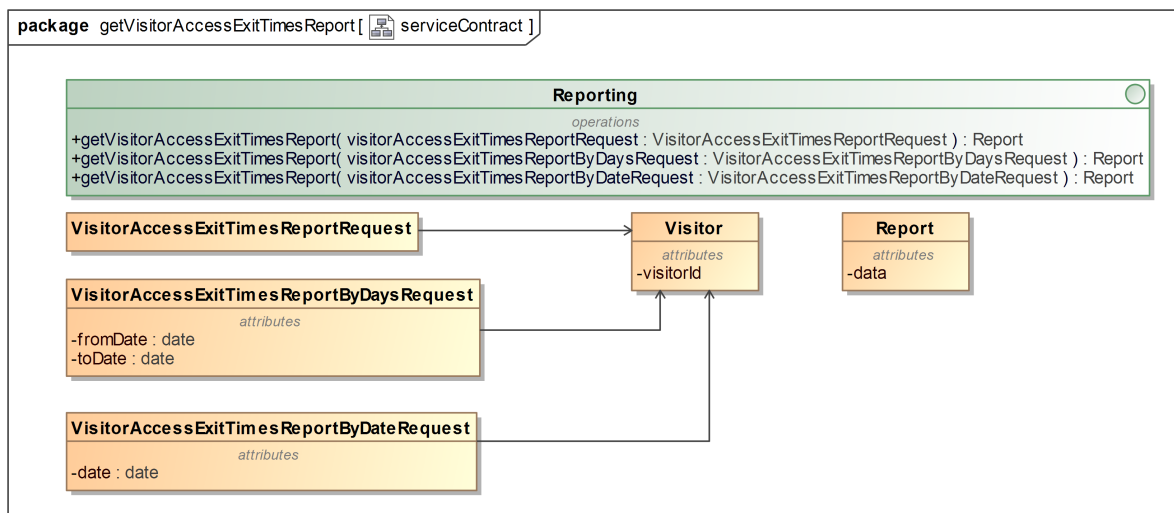
7.1 Get Visitor Access Exit Times Report

Priority: *Important*

7.1.1 Description

The `getVisitorAccessExitTimes` function allows a user to query the access and exit times of a specific visitor.

7.1.2 Service Contract



7.1.3 Pre-/Post-Conditions

Pre-conditions:

- User must be logged in.
- User must have the correct authorization to make use of this function.
- Visitor must exist.
- Date must be valid.

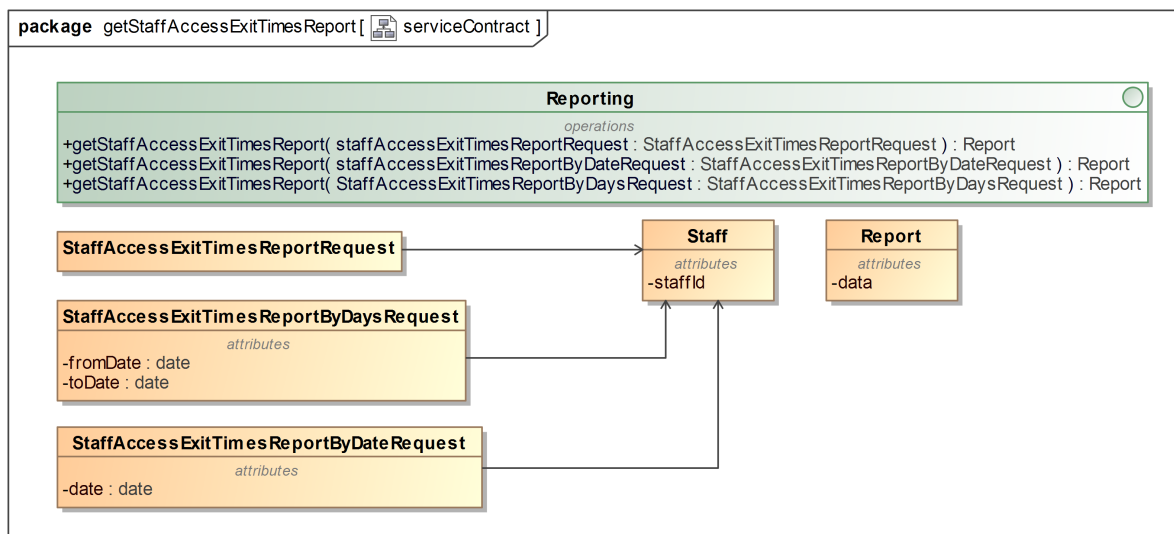
7.2 Get Staff Access Exit Times Report

Priority: *Important*

7.2.1 Description

The getStaffAccessExitTimes function allows a privileged user(e.g: Head of Department) to query the access and exit times of a specific staff member.

7.2.2 Service Contract



7.2.3 Pre-/Post-Conditions

Pre-conditions:

- User must be logged in.
- User must have the correct authorization to make use of this function.
- Date must be valid.
- Staff member must exist.

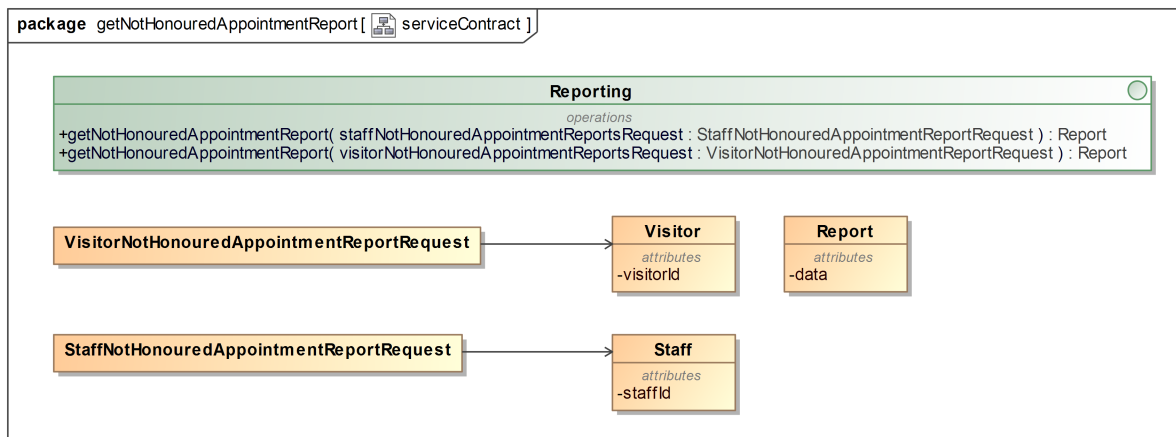
7.3 Get Not Honoured Appointments Report

Priority: *Important*

7.3.1 Description

The getNotHonouredAppointments function provides the user with a means of querying a visitor's or staff member's not honoured appointments.

7.3.2 Service Contract



7.3.3 Pre-/Post-Conditions

Pre-conditions:

- User must be logged in.
- User must have the correct authorization to make use of this function.
- Visitor or Staff must exist.

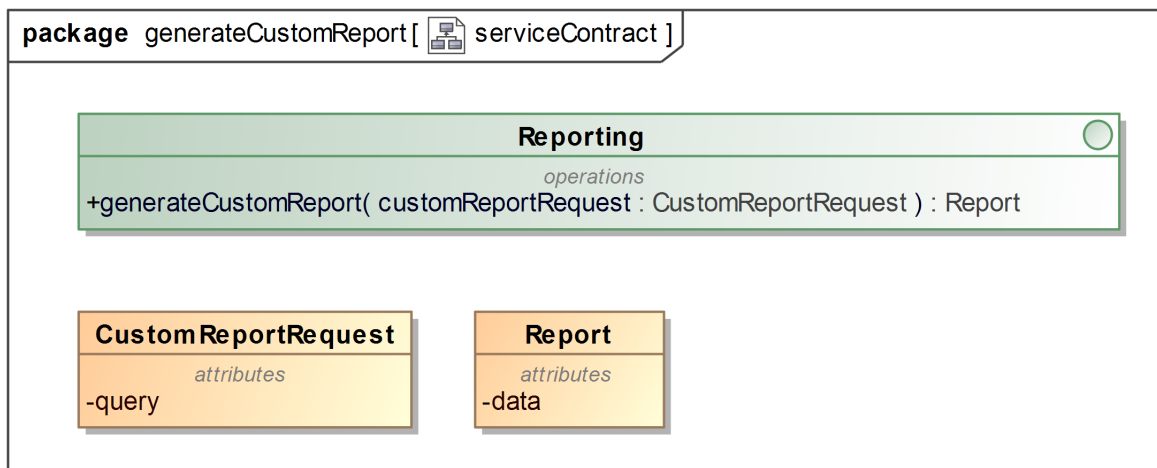
7.4 Generate Custom Reports

Priority: *Nice to have*

7.4.1 Description

The generateCustomReports function allows the user to create a custom report based on a query provided by the user.

7.4.2 Service Contract



7.4.3 Pre-/Post-Conditions

- User must be logged in.
- User must have the correct authorization to make use of this function.
- Query must be valid.

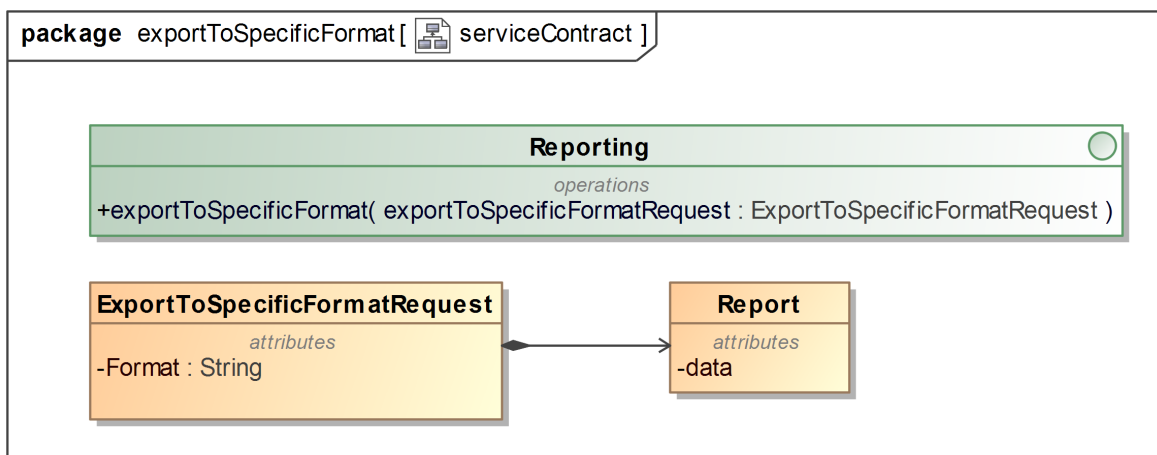
7.5 Export Report To Specific Format

Priority: *Nice to have*

7.5.1 Description

The `exportReportToSpecificFormat` function will allow the user to export a report to a specific format which will be specified by the user.

7.5.2 Service Contract



Pre-conditions:

- The format specified by the user is supported by the system.
- User must be logged in.

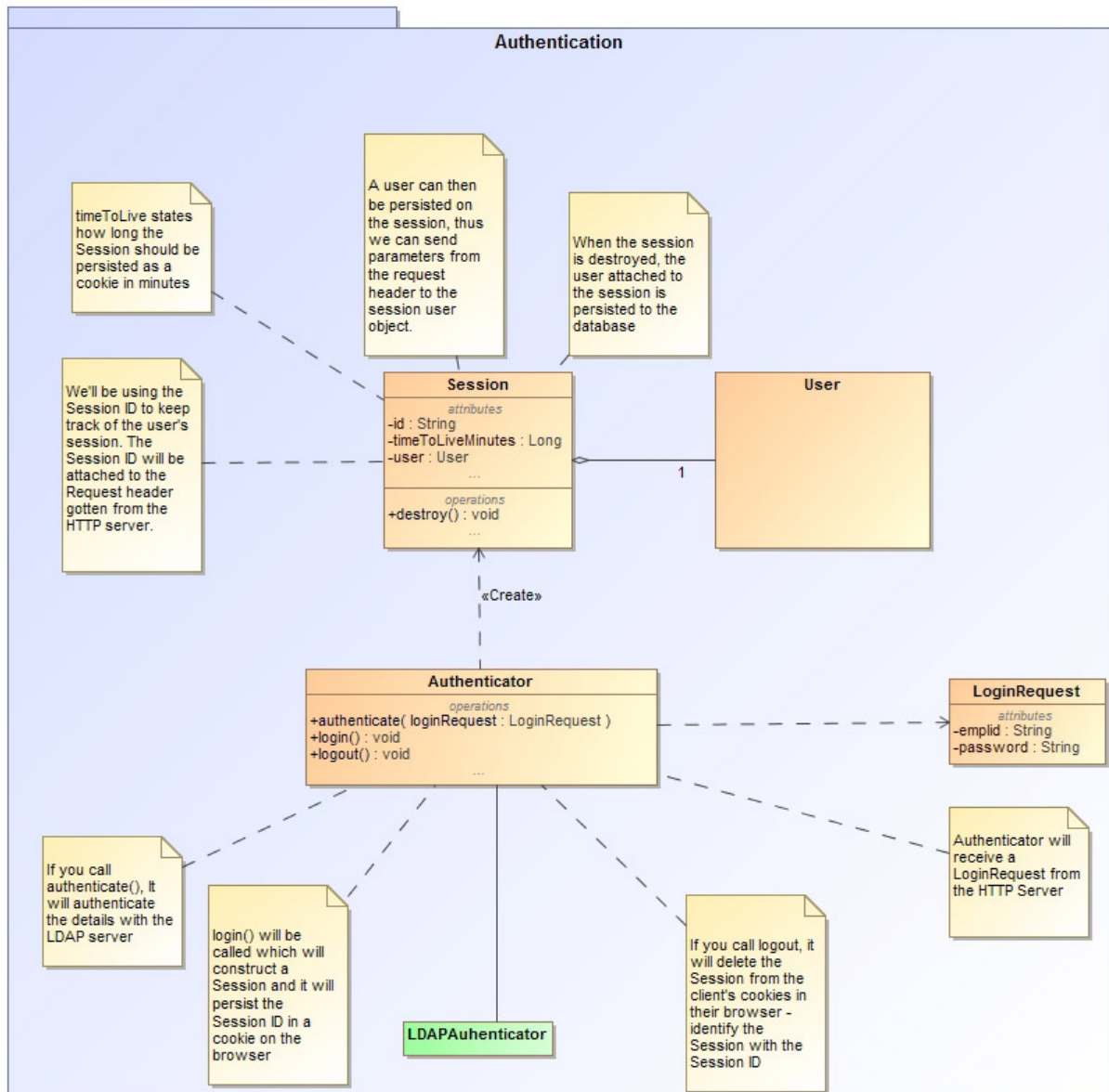
8 Authentication

8.1 Authenticate

Priority: *Critical*

8.1.1 Description

The following section will describe functionality around logging staff members in and out of the web-portal. Note: The use case, process specification and data structure requirements posted in Authenticate encapsulates all use cases under the authentication functionality.



8.1.2 Pre-/Post-Conditions

Pre-conditions:

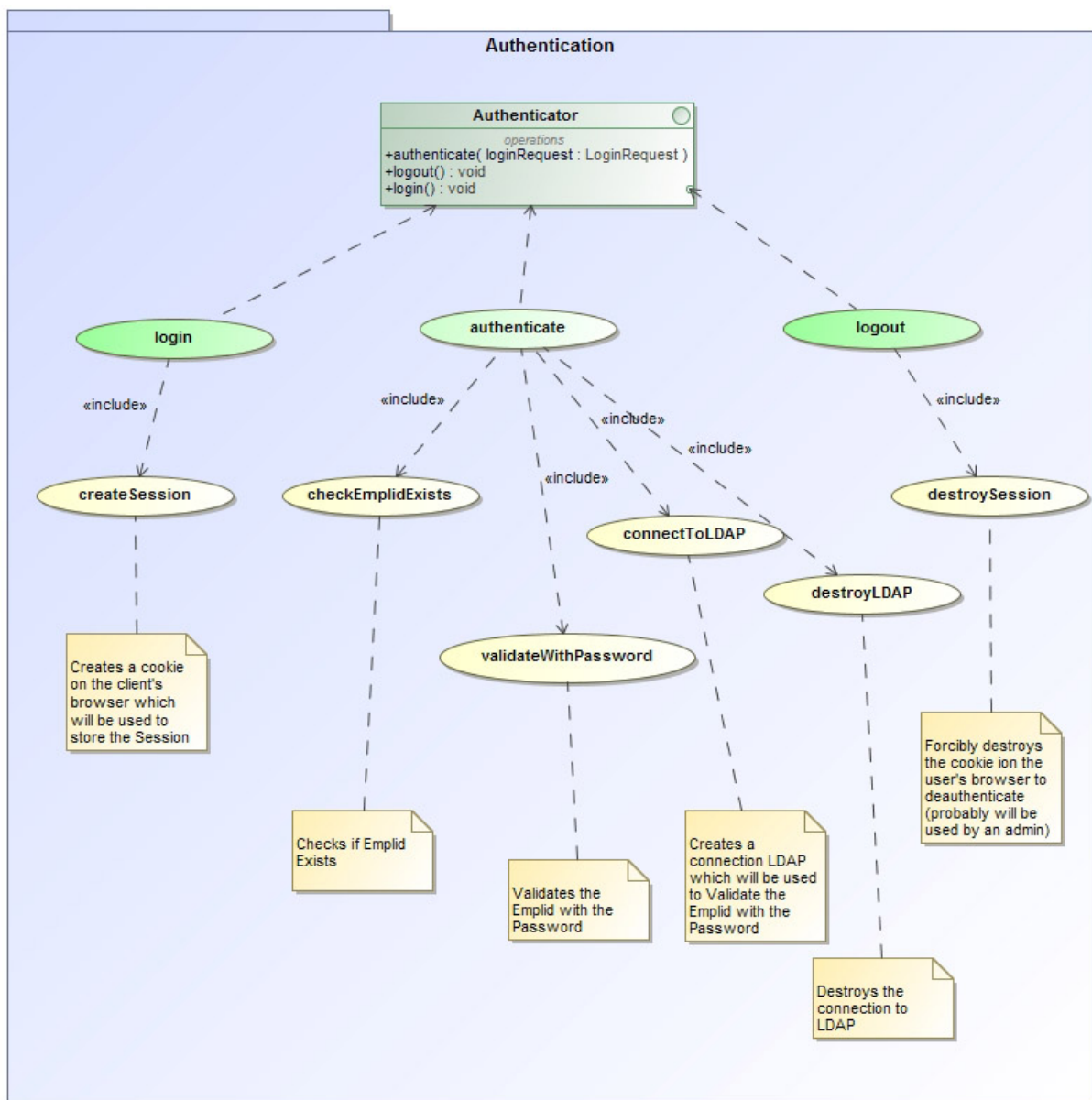
- A user must have an EMPLID from the University of Pretoria

- A user must have an associated password for their EMPLID from the University
- A successful connection to LDAP is important
- A user must be registered as a staff member on LDAP
- A successful validation response after an LDAP authentication is needed to authenticate a user

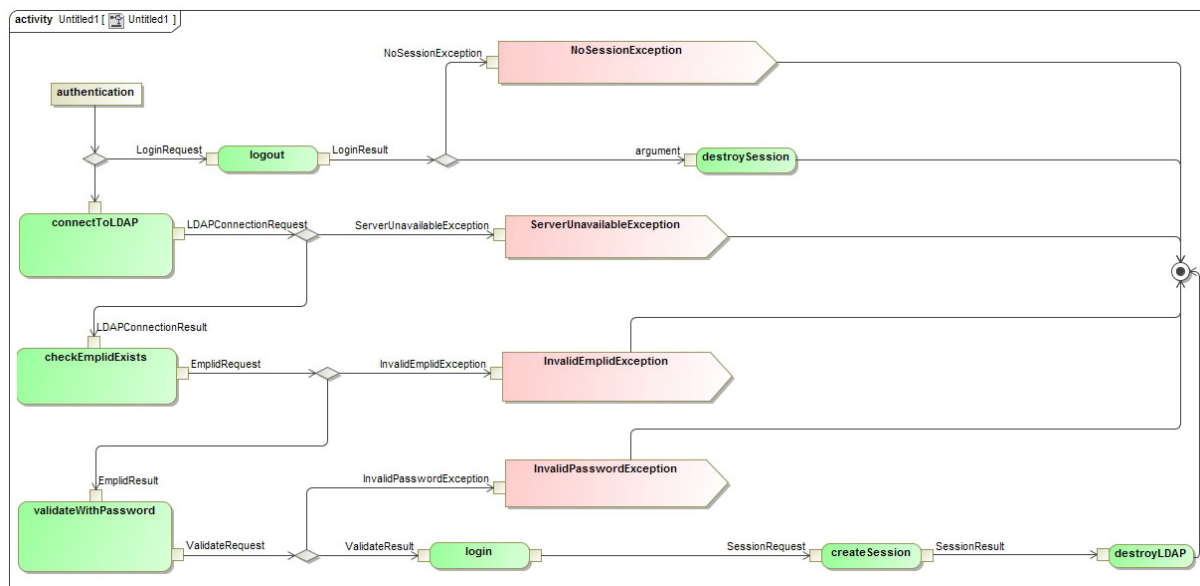
Post-conditions:

- A user is successfully authenticated on the server

8.1.3 Functionality



8.1.4 Process Specification



8.2 Log In

Priority: *Critical*

8.2.1 Description

A user must be logged into the system once they have been authenticated. A user is logged in by creating a cookie containing the session ID.

8.2.2 Pre-/Post-Conditions

Pre-conditions:

- A user must have been successfully authenticated by the system to be logged in.

Post-conditions:

- A user is successfully logged in and can thus access features which require authentication.
- A user is taken to the booking management page on the website

8.3 Log Out

Priority: *Critical*

8.3.1 Description

The system must be able to log a user out. A user is logged out by destroying the cookie containing their session ID.

8.3.2 Pre-/Post-Conditions

Pre-conditions:

- The user must be logged in.

Post-conditions:

- A user is successfully logged in and can thus access features which require authentication.
- A user is taken to the make an appointment page on the website