Project Deliverable 2 – Documentation and Coding

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Module Code:	ITPJA3-34
Module Name:	Project
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Submission Date:	First Block Week 7

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Project Title	MaryAnne Hair Salon System
Submission Date	09/08/2023

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2.1 Introduction

In this subsection, you should discuss an overview of how you plan to approach the design of your system. Here we should be able to see the flow of the system as it solves the client's problem stated in Deliverable 1.

2.2 Designing Diagrams

This section will have to do with showing the system in a diagrammatical form. State all the business rules and the assumptions you have based on your client's system. These diagrams will help you know the beginning and the end of the system. Some of the diagrams to include are

Class Responsibility Collaborator (CRC) cards

Customer	Collaborators
Register an account. Log into the system. Make a booking appointment. Access booking features. View personal profile. View discounts and rewards. View personal booking history.	Booking System Customer Dashboard Rewards System

Admin	Collaborators
Add, update, delete content from the CMS database. Manage pictures displayed on the website. Add or update service offerings. Create new Employees(Stylists/Nail Techs)	CMS (Content Management System) Service Offerings Database Employee Management System

Employee (Stylist/Nail Tech)	Collaborators
View daily appointments. Set availability status. Update your own profile (e.g., specialties, services offered). Update own security login(password)	Booking System Employee Dashboard Security System,

Booking System	Collaborators
Handle customer bookings. Display available slots for customers. Notify employees about their appointments.	Customer Employee

Customer Dashboard	Collaborators
Display customer's profile. Show available discounts and rewards. Display customer's booking history	Customer

Employee Dashboard	Collaborators
Display employee's daily appointments. Show and update employee's availability. Provide interface for profile update.	Employee

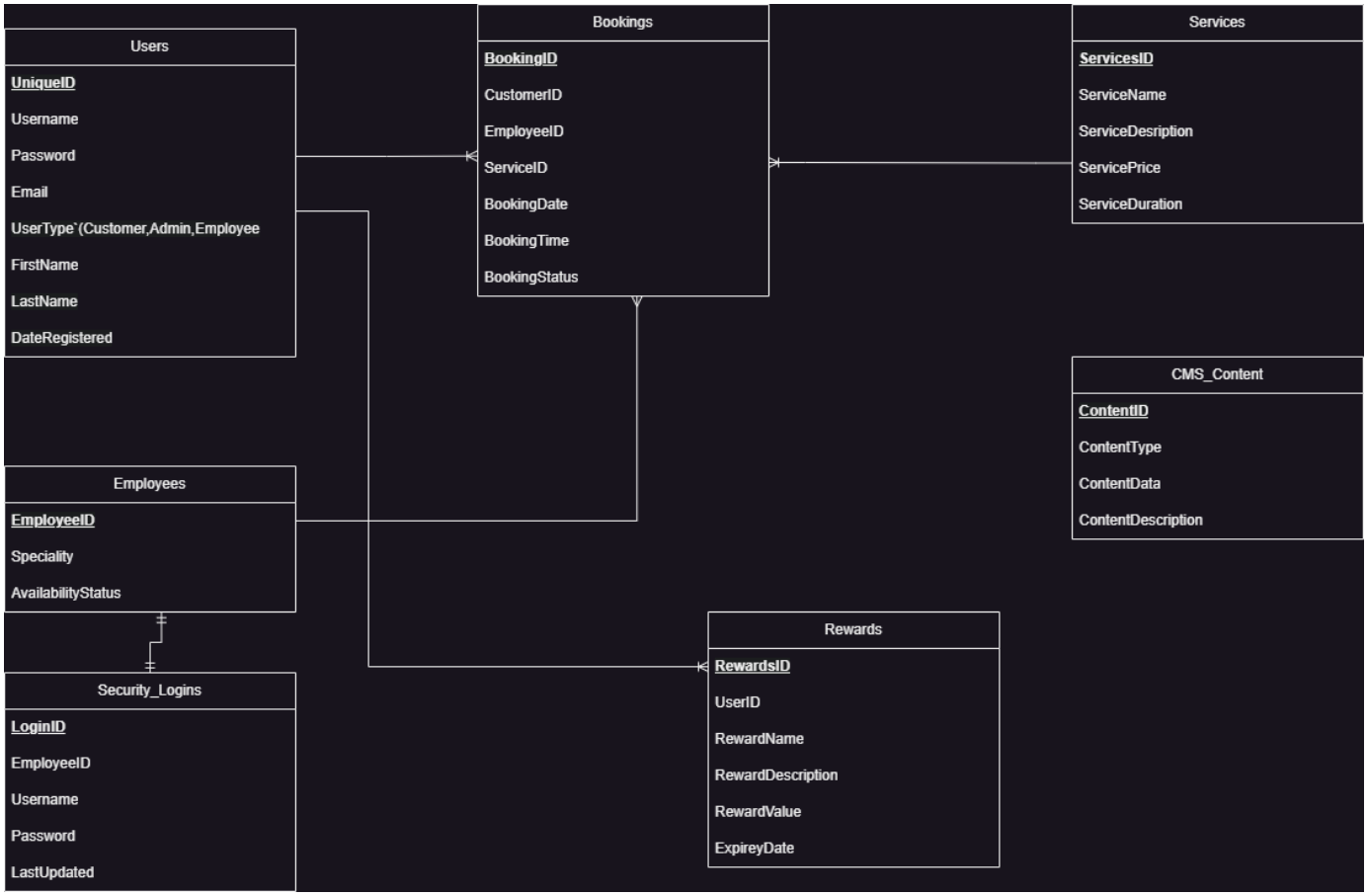
CMS (Content Management System)	Collaborators
Store and manage content for the website. Provide interface for admins to manage content.	Admin

Rewards System	Collaborators
Track customer's earned rewards and discounts. Update rewards and discounts based on customer actions.	Customer Dashboard Customer

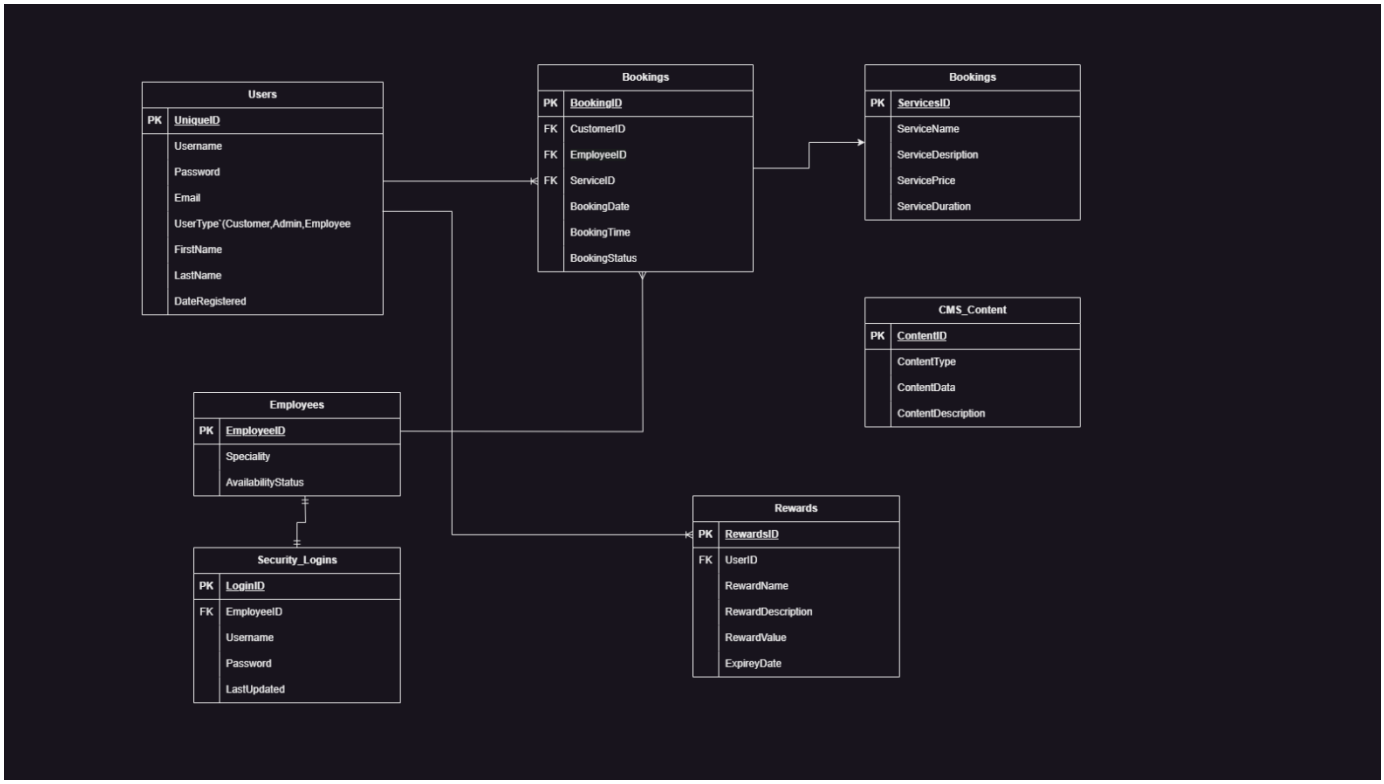
Service Offerings Database	Collaborators
Store information about available services. Provide interface for Admins to add or modify services.	Admin

Security System	Collaborators
Handle security logins Allow employees to update passwords	Employee Employee Dashboard

Database Design



Entity Relationship Diagram (ERD)



Dd

Given the use of the SingleTable Inheritance (STI) model, which is inherently a simpler model, the need for an Enhanced Entity-Relationship Diagram (EERD) is reduced. Here are few reasons as to why:

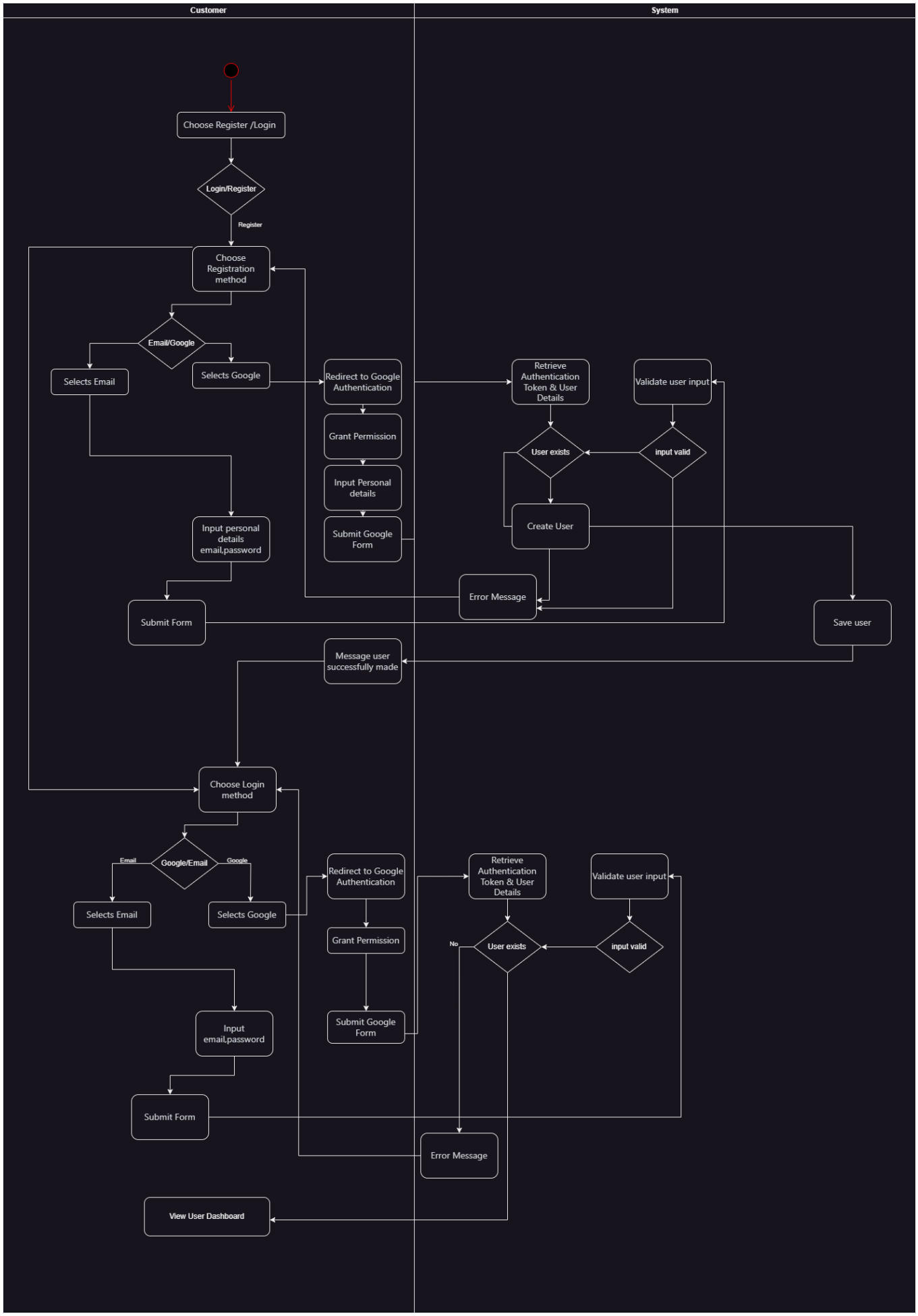
First, No Specialization/Generalization: One of the primary reasons to use an EERD is to represent specialization (subclasses) or generalization (superclasses) hierarchies, where subclasses inherit attributes and relationships from the superclass. In STI, this inheritance is implicit because all user roles are in the same table. Therefore there is no need to separate tables for each role, which might necessitate using EERD features.

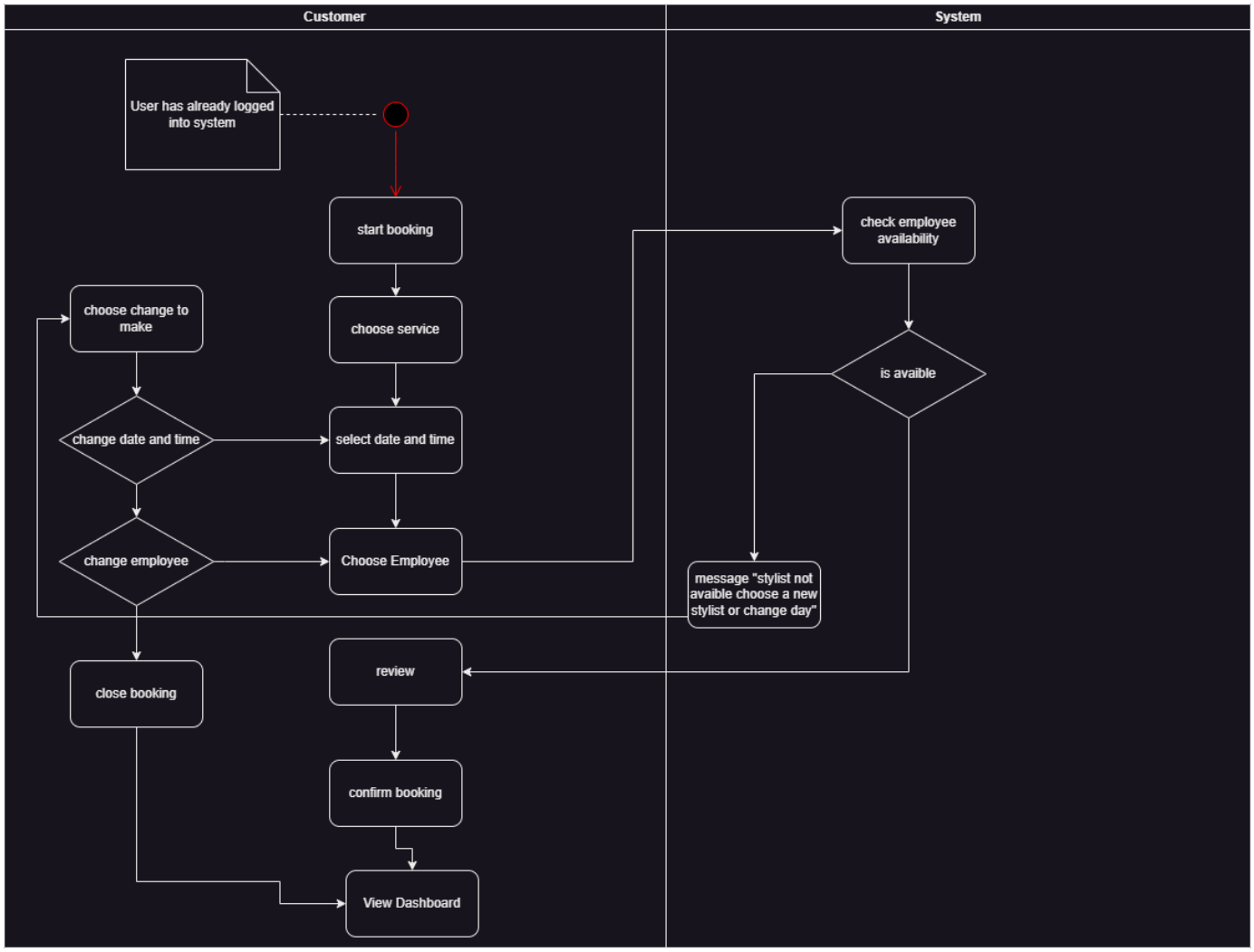
Second, No Categories/Union Types: Another feature of EERDs is the ability to represent categories or union types, where an entity can be a part of one out of several entity sets. With the STI model, the different types of users are simply different rows in the same table, represented by different values in the **UserType** field.

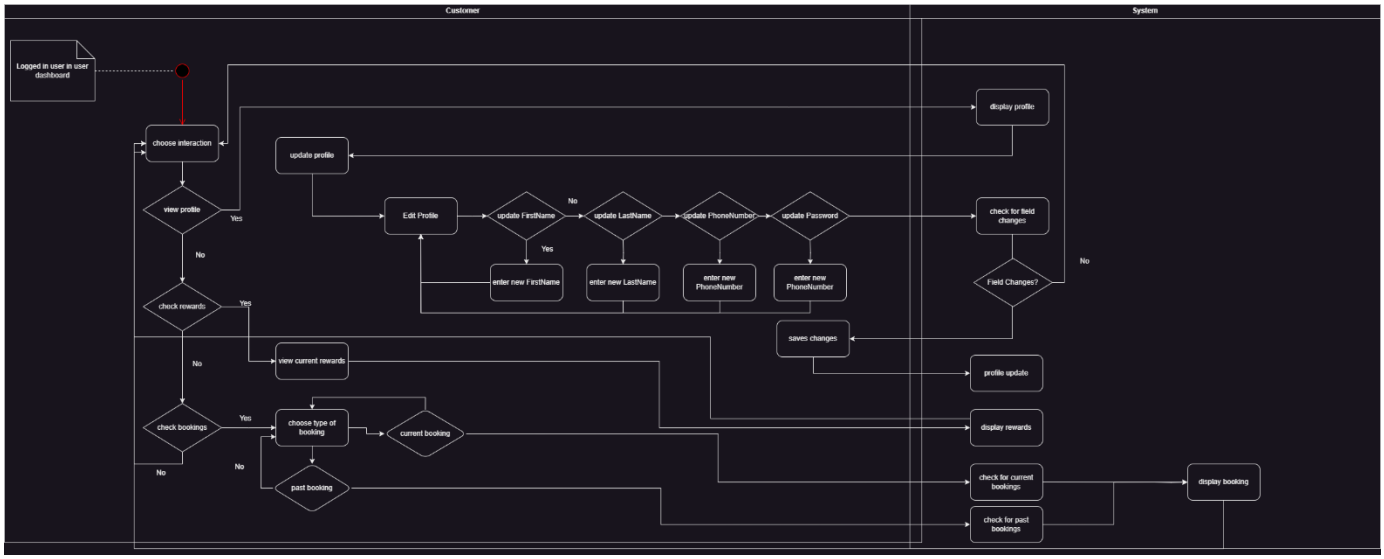
Third, No Complex Relationships: The relationships outlined so far, between users, bookings, services, etc., are straightforward.There are no relationships between relationships or other complex structures that would require an EERD construct.

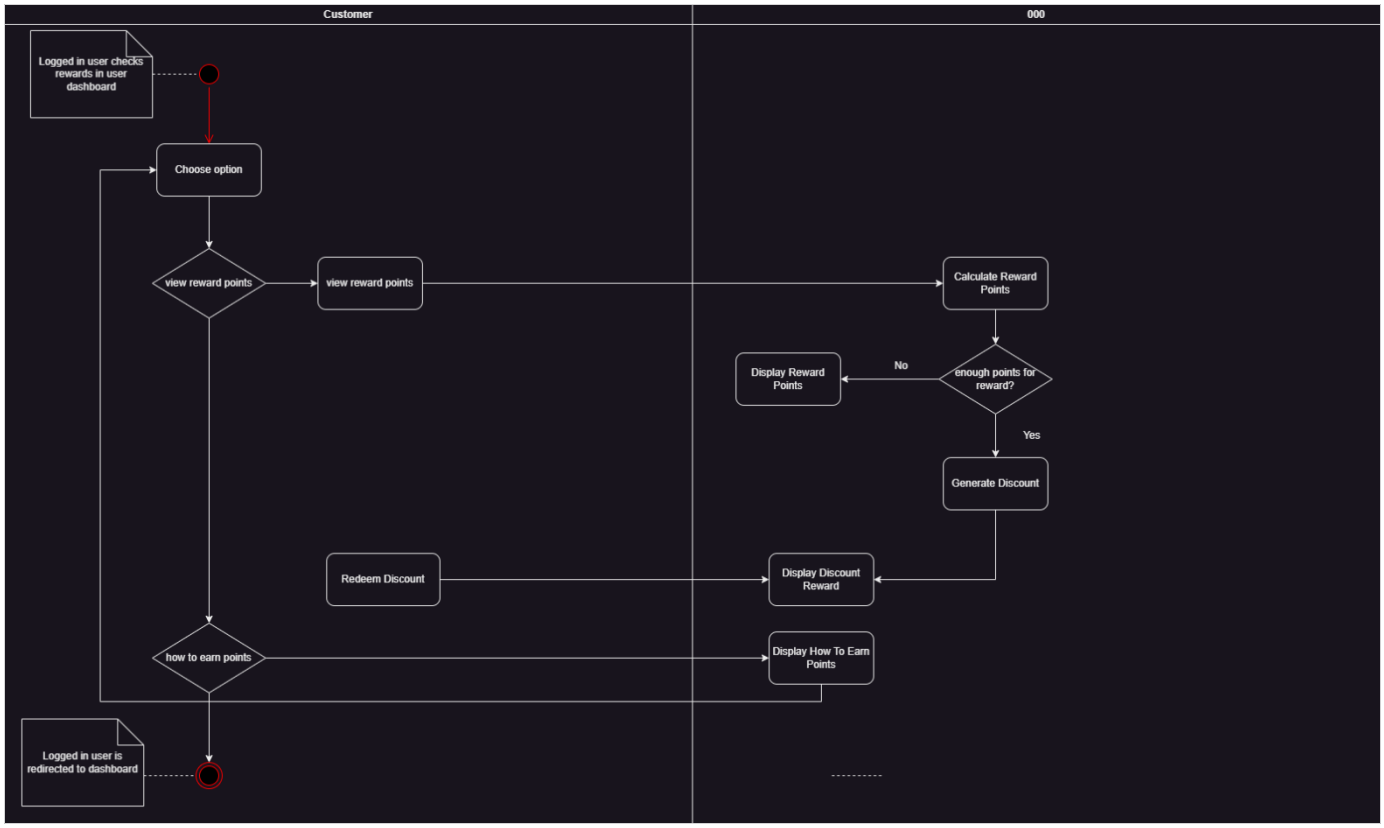
In conclusion, for the STI model and the relatively straightforward relationships that have previously been described, a standard ERD would suffice. As such we can reserve the use of the EERD for more complex scenarios where its additional constructs are necessary.

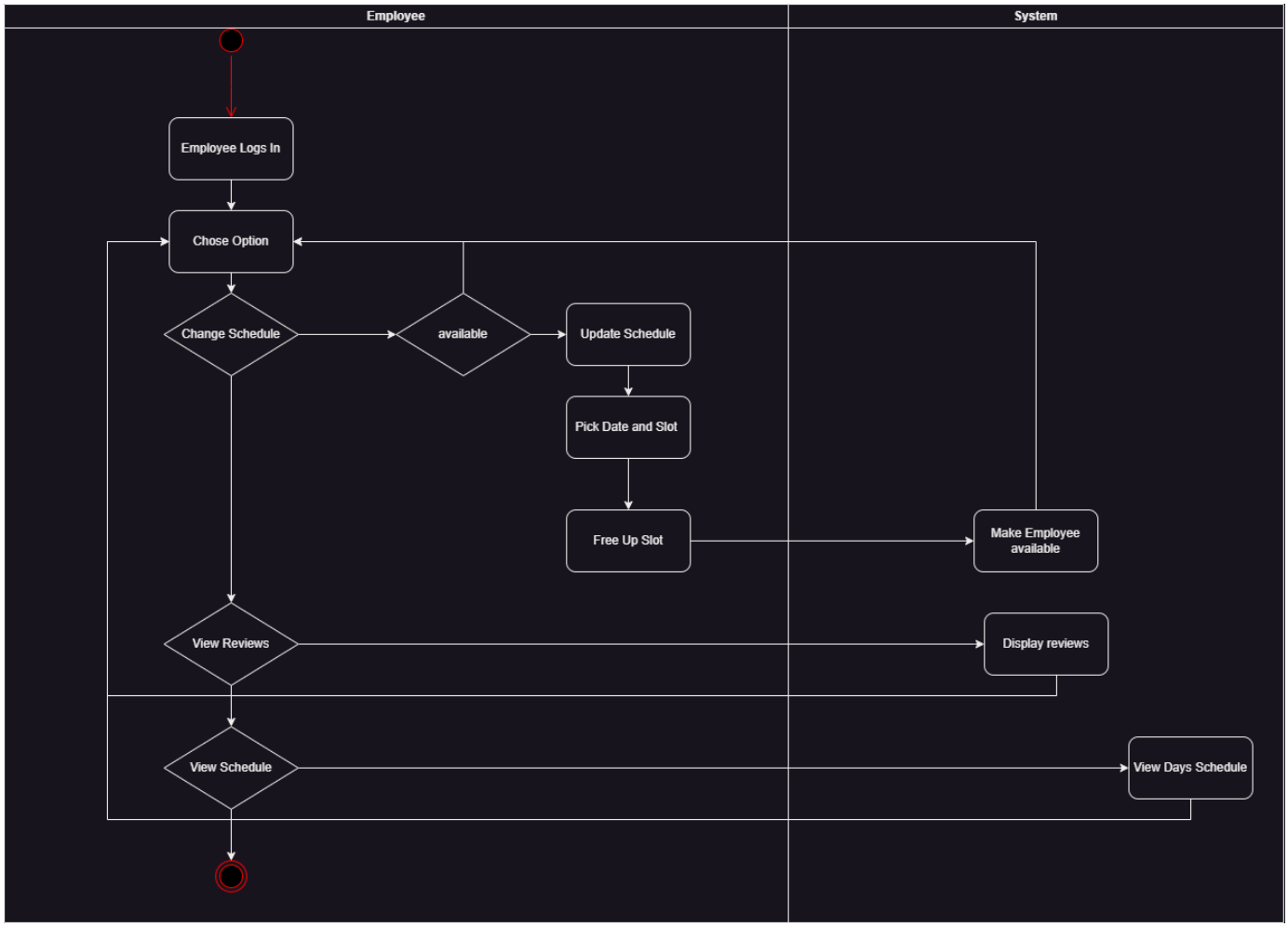
Activity Diagram:

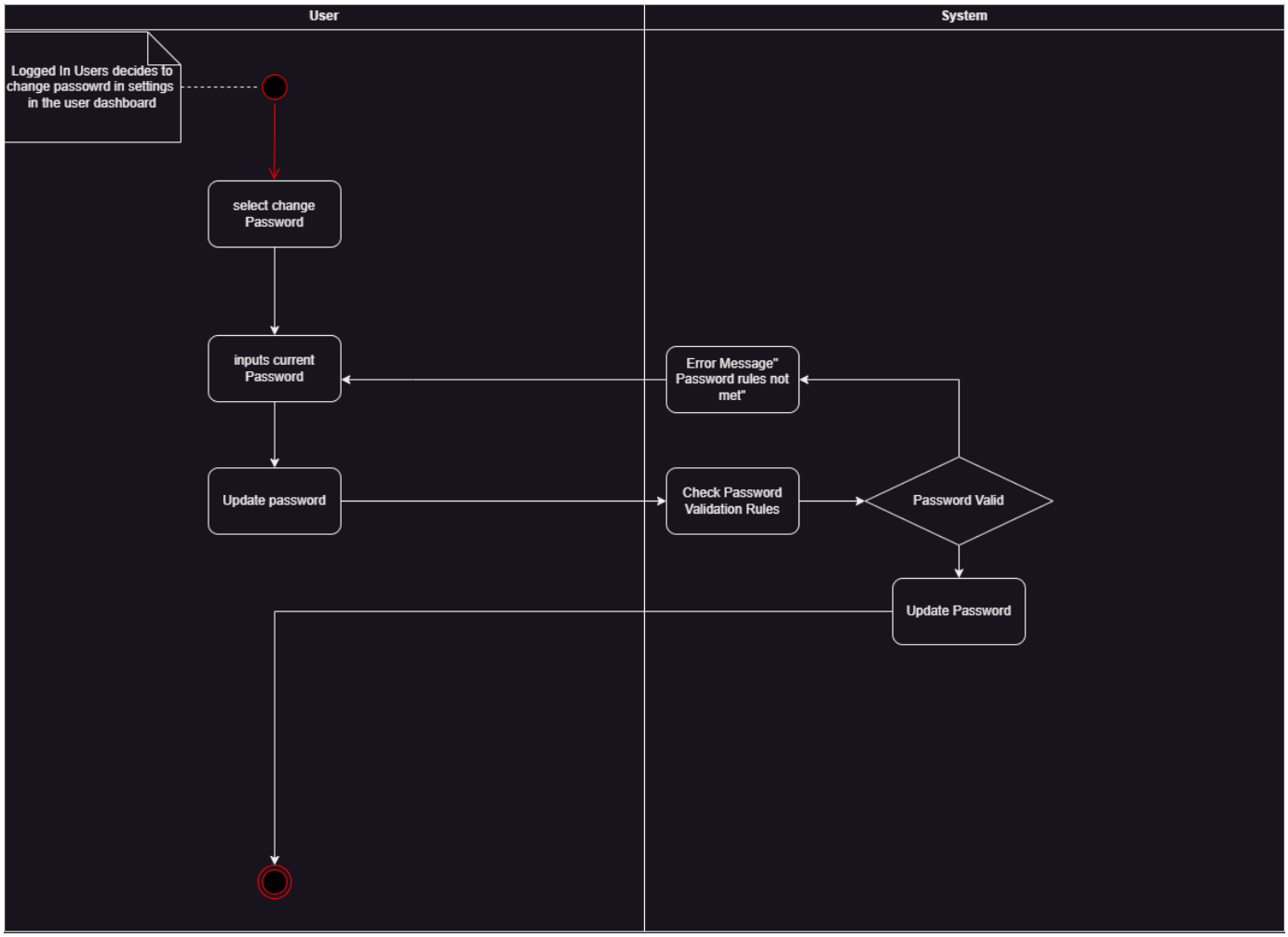

Customer
System
Choose Register /Login
Login/Register
Register
Choose Registration method
Email/Google
Selects Email
Selects Google
Redirect to Google Authentication
Grant Permission
Input Personal details
Submit Google Form
Retrieve Authentication Token & User Details
Validate user input
User exists
input valid
Create User
Input personal details email,password
Submit Form
Error Message
Save user
Message user successfully made
Choose Login method
Email
Google/Email
Google
Selects Email
Selects Google
Redirect to Google Authentication
Grant Permission
Submit Google Form
Retrieve Authentication Token & User Details
Validate user input
No
User exists
input valid
Input email,password
Submit Form
Error Message
View User Dashboard

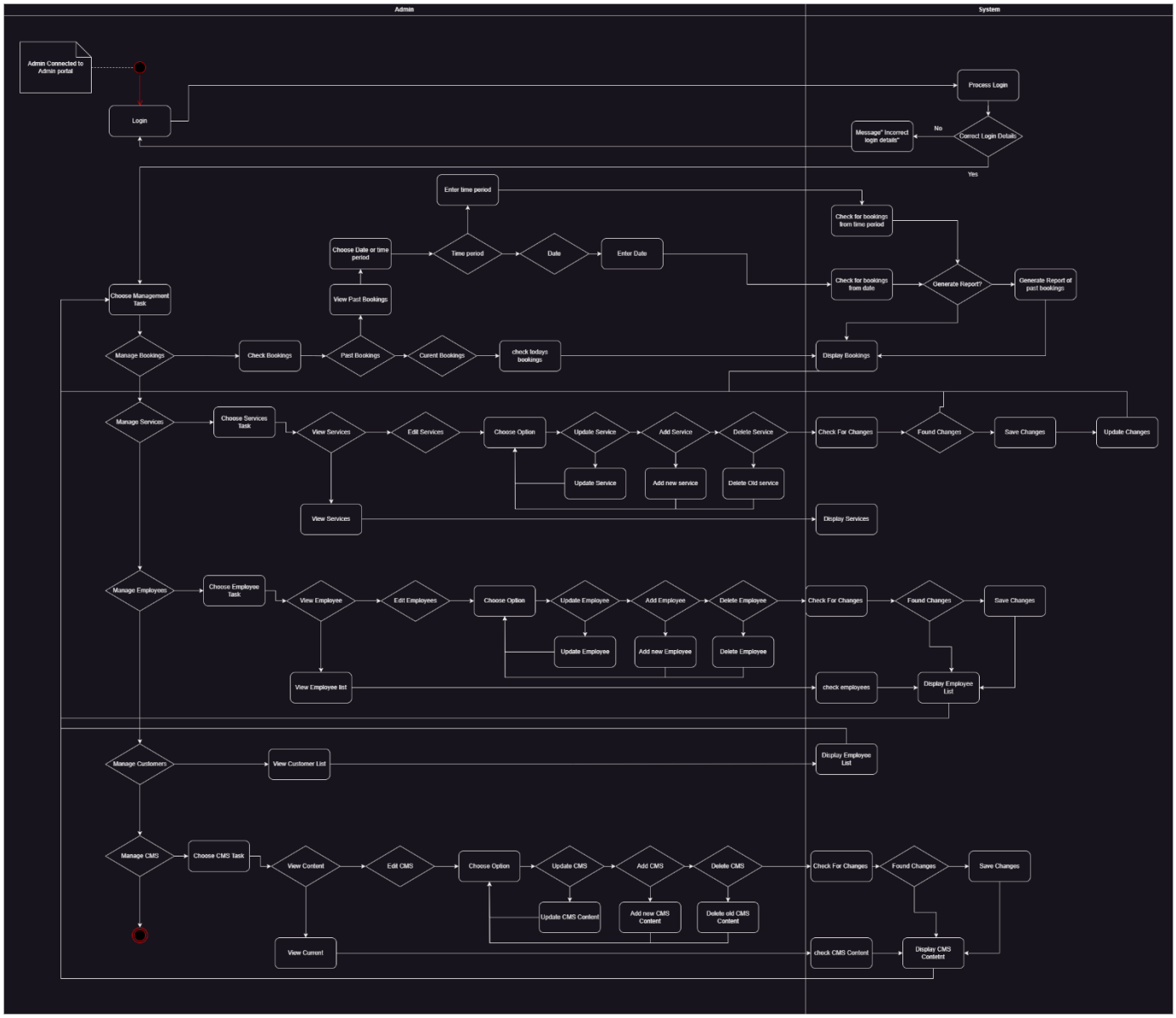

Customer
System
User has already logged into system
start booking
choose change to make
choose service
change date and time
select date and time
change employee
Choose Employee
check employee availability
is avaible
message "stylist not avaible choose a new stylist or change day"
close booking
review
confirm booking
View Dashboard


Customer
System
Logged in user in user dashboard
choose interaction
display profile
update profile
view profile
Edit Profile
update FirstName
update LastName
update PhoneNumber
update Password
check for field changes
enter new FirstName
enter new LastName
enter new PhoneNumber
enter new PhoneNumber
Field Changes?
check rewards
saves changes
view current rewards
profile update
check bookings
choose type of booking
current booking
display rewards
past booking
check for current bookings
display booking
check for past bookings

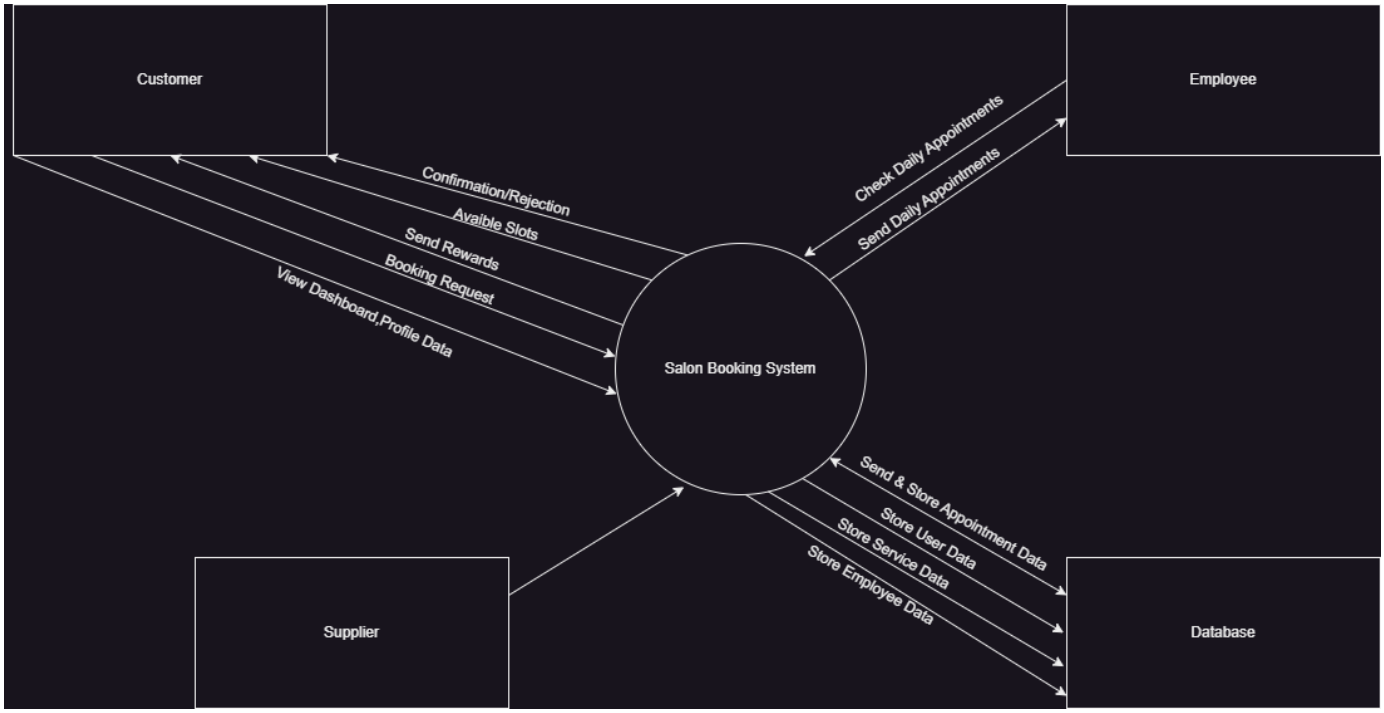

Customer
000
Logged in user checks rewards in user dashboard
Choose option
view reward points
view reward points
Calculate Reward Points
Display Reward Points
No
enough points for reward?
Yes
Generate Discount
Redeem Discount
Display Discount Reward
how to earn points
Display How To Earn Points
Logged in user is redirected to dashboard


Employee
System
Employee Logs In
Chose Option
Change Schedule
available
Update Schedule
Pick Date and Slot
Free Up Slot
Make Employee available
View Reviews
Display reviews
View Schedule
View Days Schedule

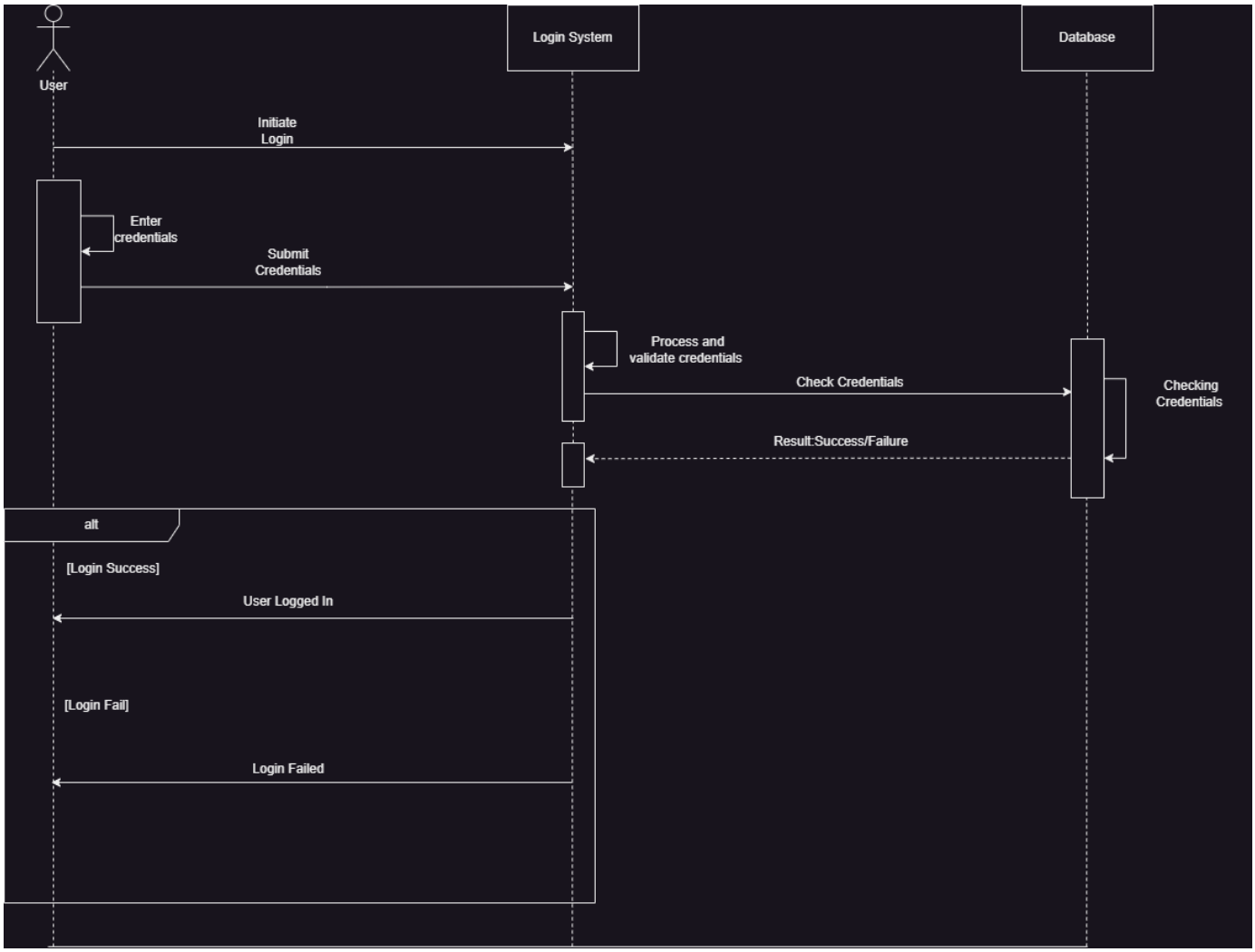

User
System
Logged In Users decides to change passowrd in settings in the user dashboard
select change Password
inputs current Password
Update password
Error Message" Password rules not met"
Check Password Validation Rules
Password Valid
Update Password

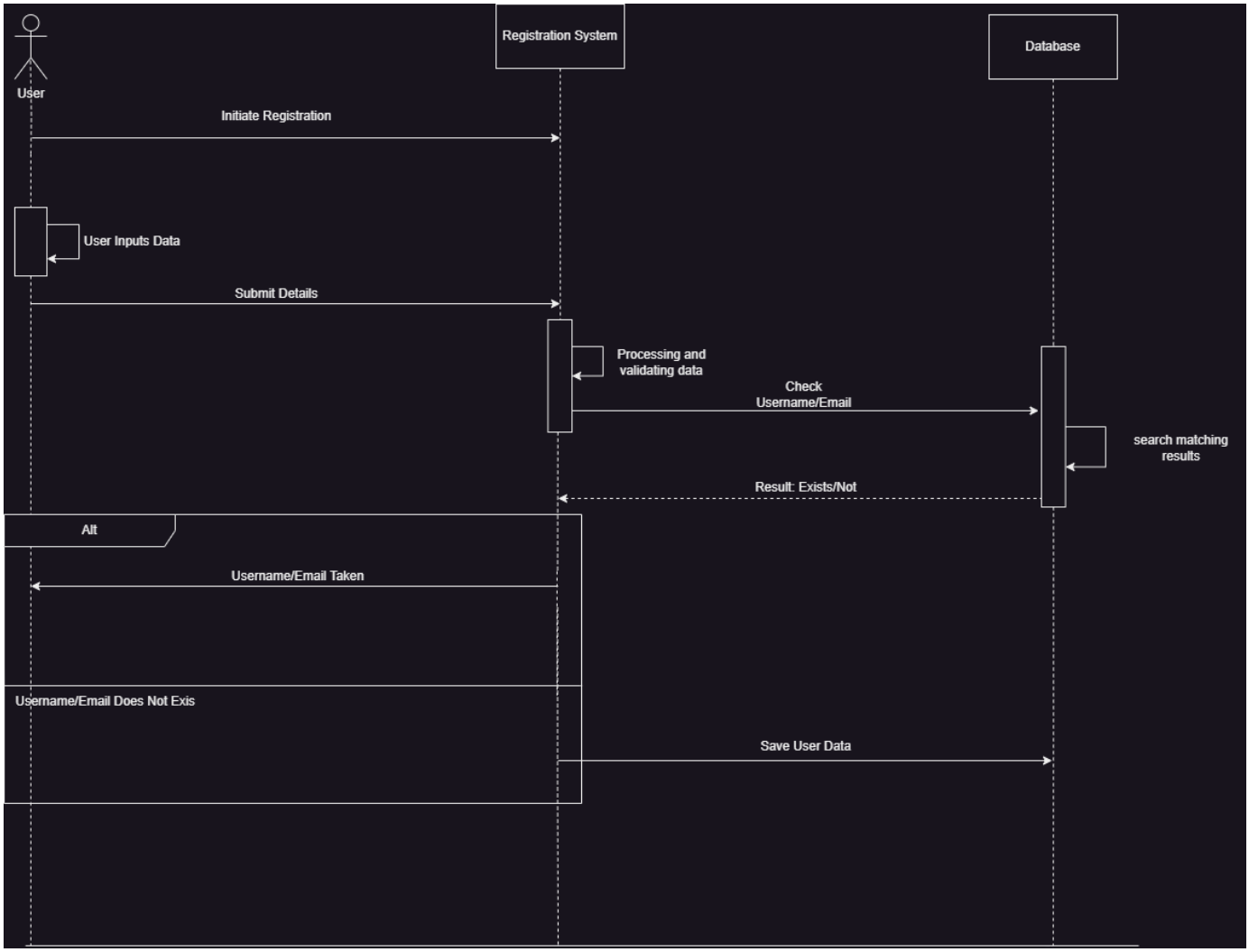

Admin
System
Admin Connected to Admin portal
Login
Process Login
Correct Login Details
No
Message" Incorrect login details"
Yes
Enter time period
Check for bookings from time period
Choose Date or time period
Time period
Date
Enter Date
Check for bookings from date
Generate Report?
Generate Report of past bookings
Choose Management Task
View Past Bookings
Manage Bookings
Check Bookings
Past Bookings
Curent Bookings
check todays bookings
Display Bookings
Manage Services
Choose Services Task
View Services
Edit Services
Choose Option
Update Service
Add Service
Delete Service
Check For Changes
Found Changes
Save Changes
Update Changes
Update Service
Add new service
Delete Old service
View Services
Display Services
Manage Employees
Choose Employee Task
View Employee
Edit Employees
Choose Option
Update Employee
Add Employee
Delete Employee
Check For Changes
Found Changes
Save Changes
Update Employee
Add new Employee
Delete Employee
View Employee list
check employees
Display Employee List
Manage Customers
View Customer List
Display Employee List
Manage CMS
Choose CMS Task
View Content
Edit CMS
Choose Option
Update CMS
Add CMS
Delete CMS
Check For Changes
Found Changes
Save Changes
Update CMS Content
Add new CMS Content
Delete old CMS Content
View Current
check CMS Content
Display CMS Content

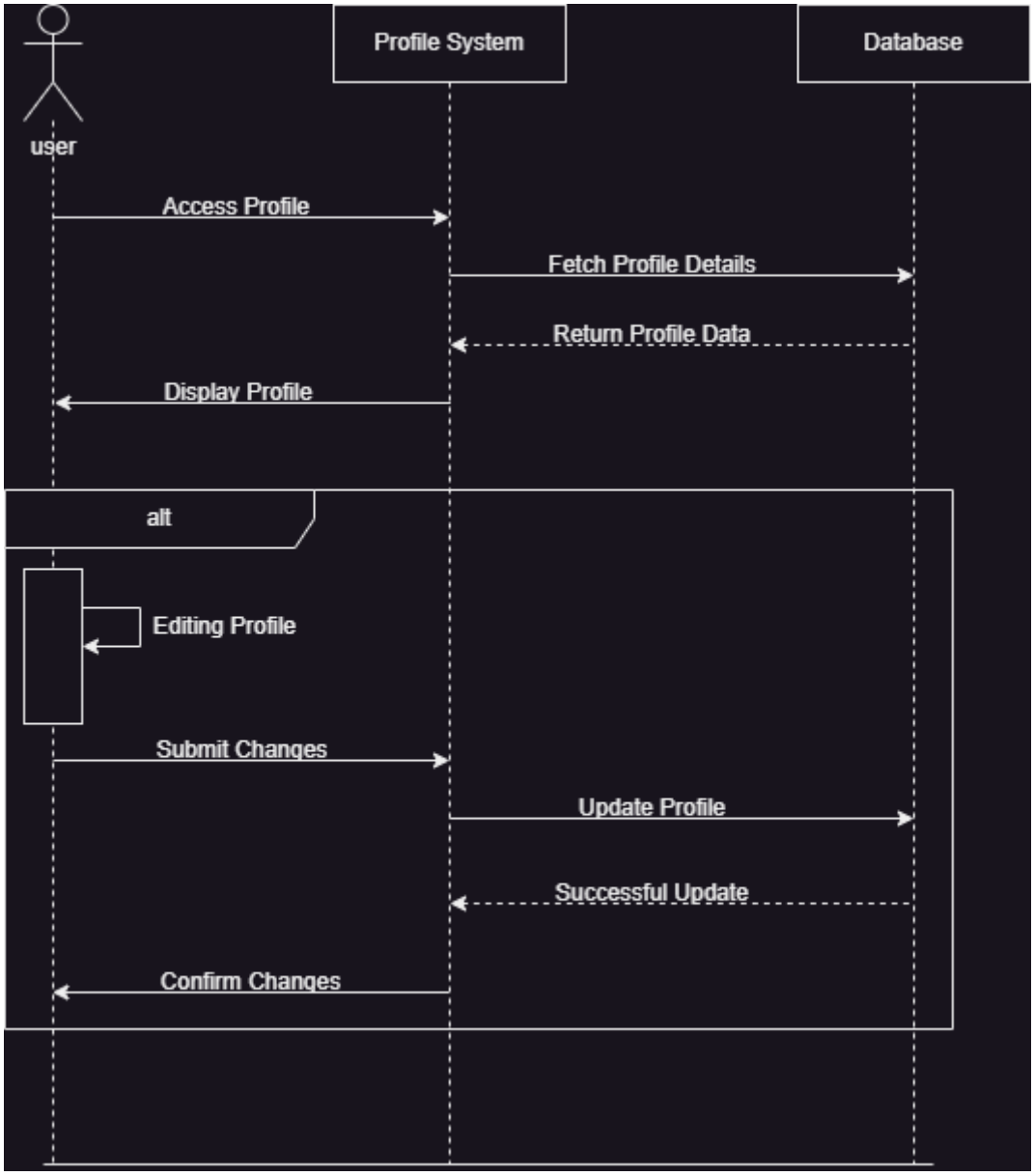
Context Diagram

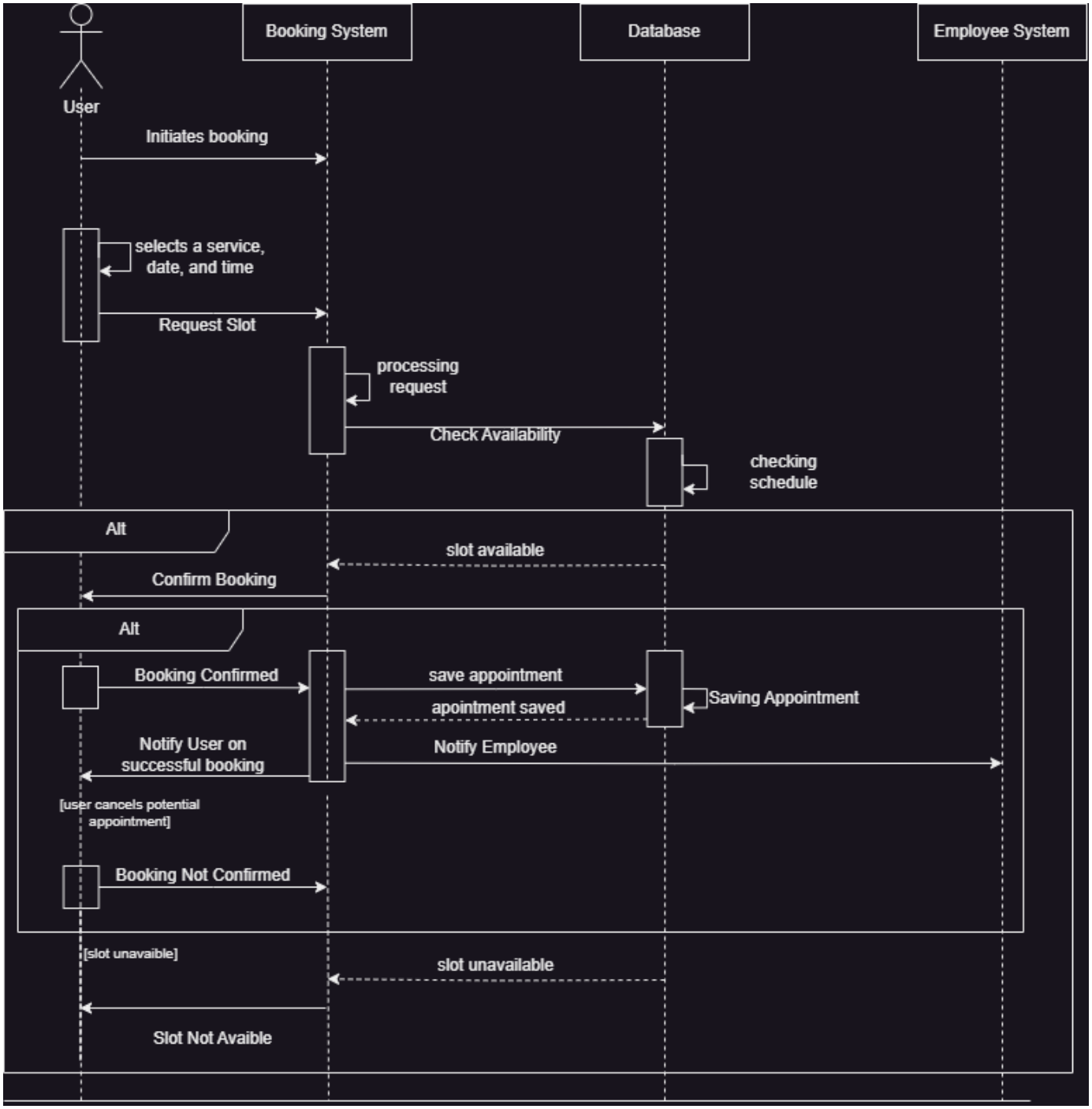


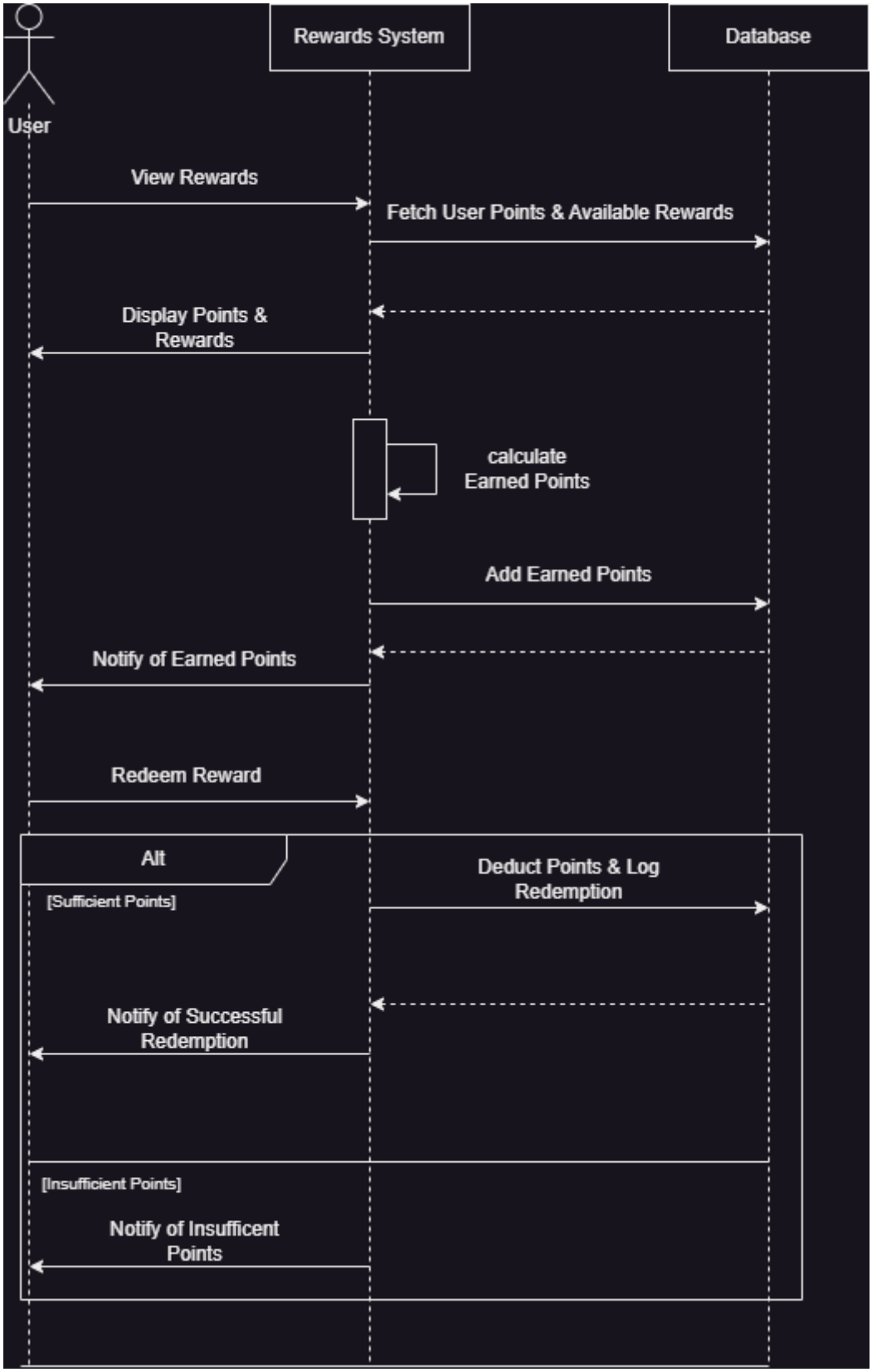
Sequence Diagram

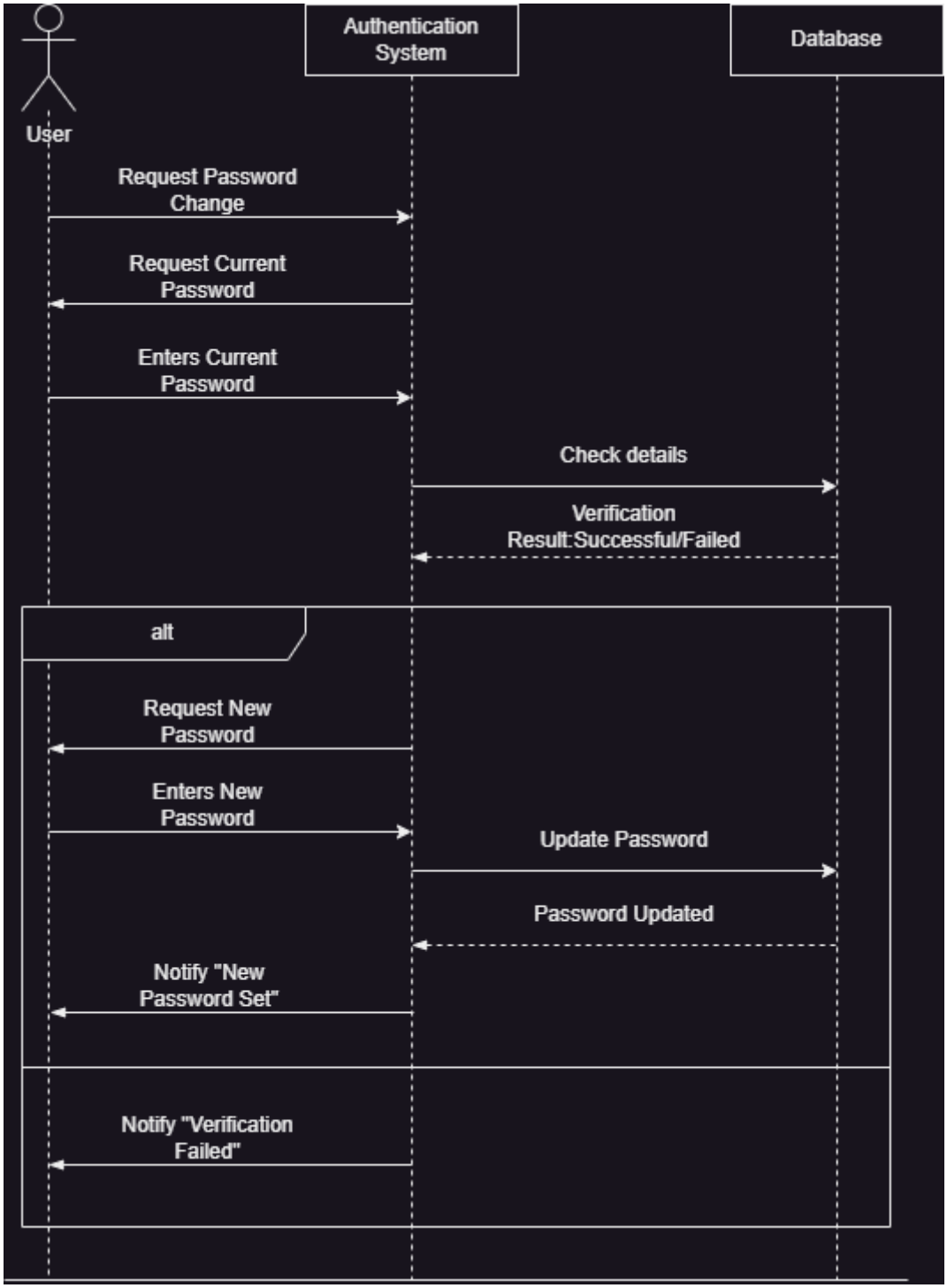


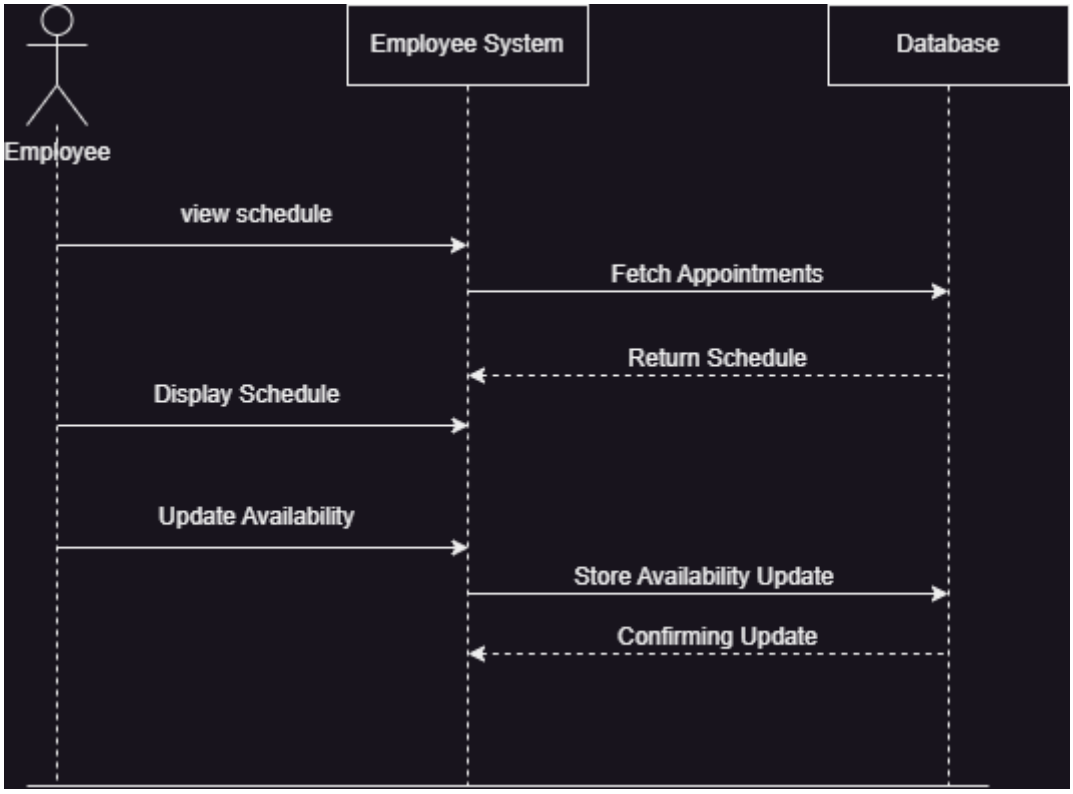

User
Registration System
Database
Initiate Registration
User Inputs Data
Submit Details
Processing and validating data
Check Username/Email
search matching results
Result: Exists/Not
Alt
Username/Email Taken
Username/Email Does Not Exis
Save User Data

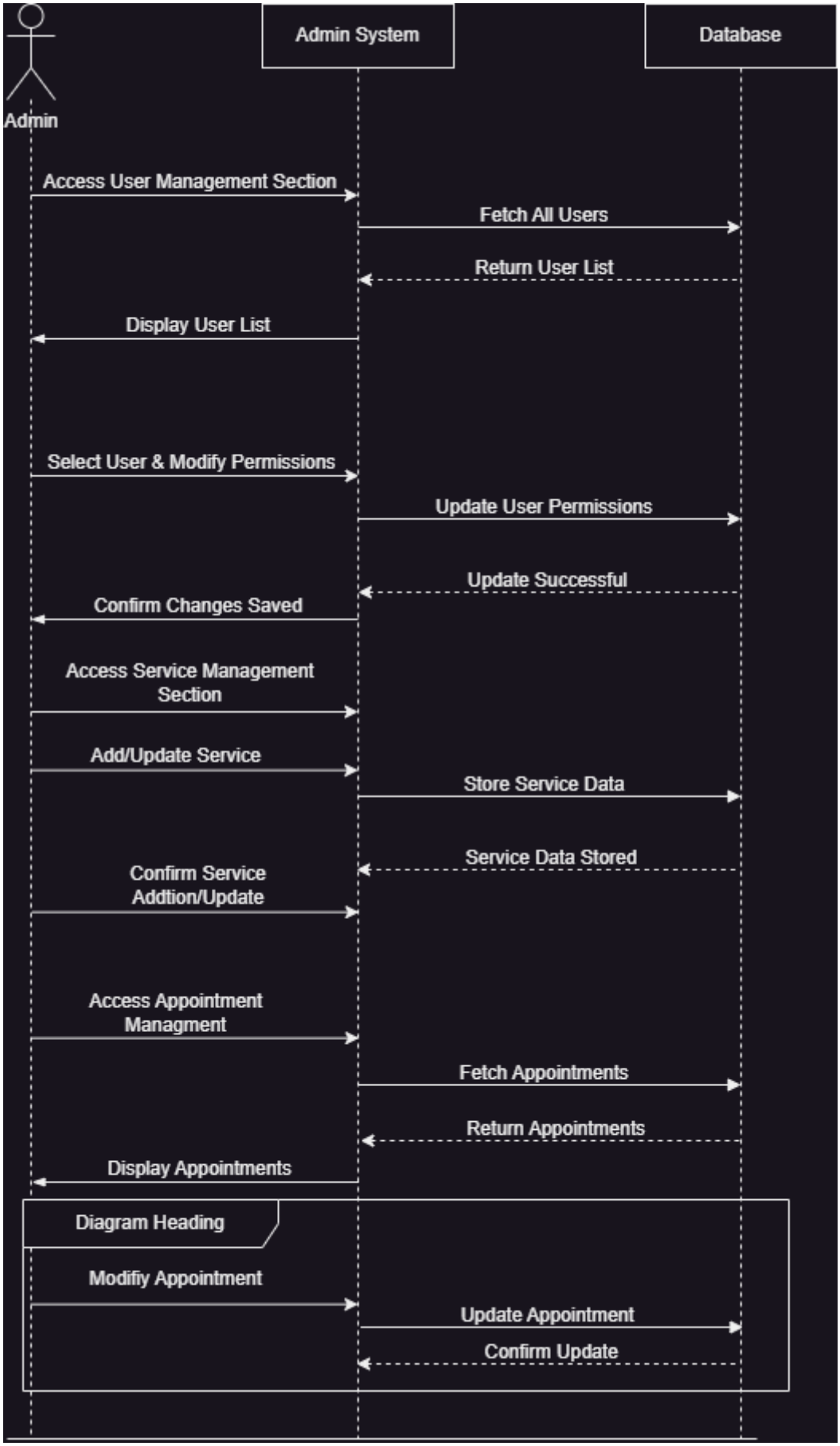

Profile System
Database
user
Access Profile
Fetch Profile Details
Return Profile Data
Display Profile
alt
Editing Profile
Submit Changes
Update Profile
Successful Update
Confirm Changes


Booking System
Database
Employee System
User
Initiates booking
selects a service, date, and time
Request Slot
processing request
Check Availability
checking schedule
Alt
slot available
Confirm Booking
Alt
Booking Confirmed
save appointment
Saving Appointment
apointment saved
Notify User on successful booking
Notify Employee
[user cancels potential appointment]
Booking Not Confirmed
[slot unavaible]
slot unavailable
Slot Not Avaible

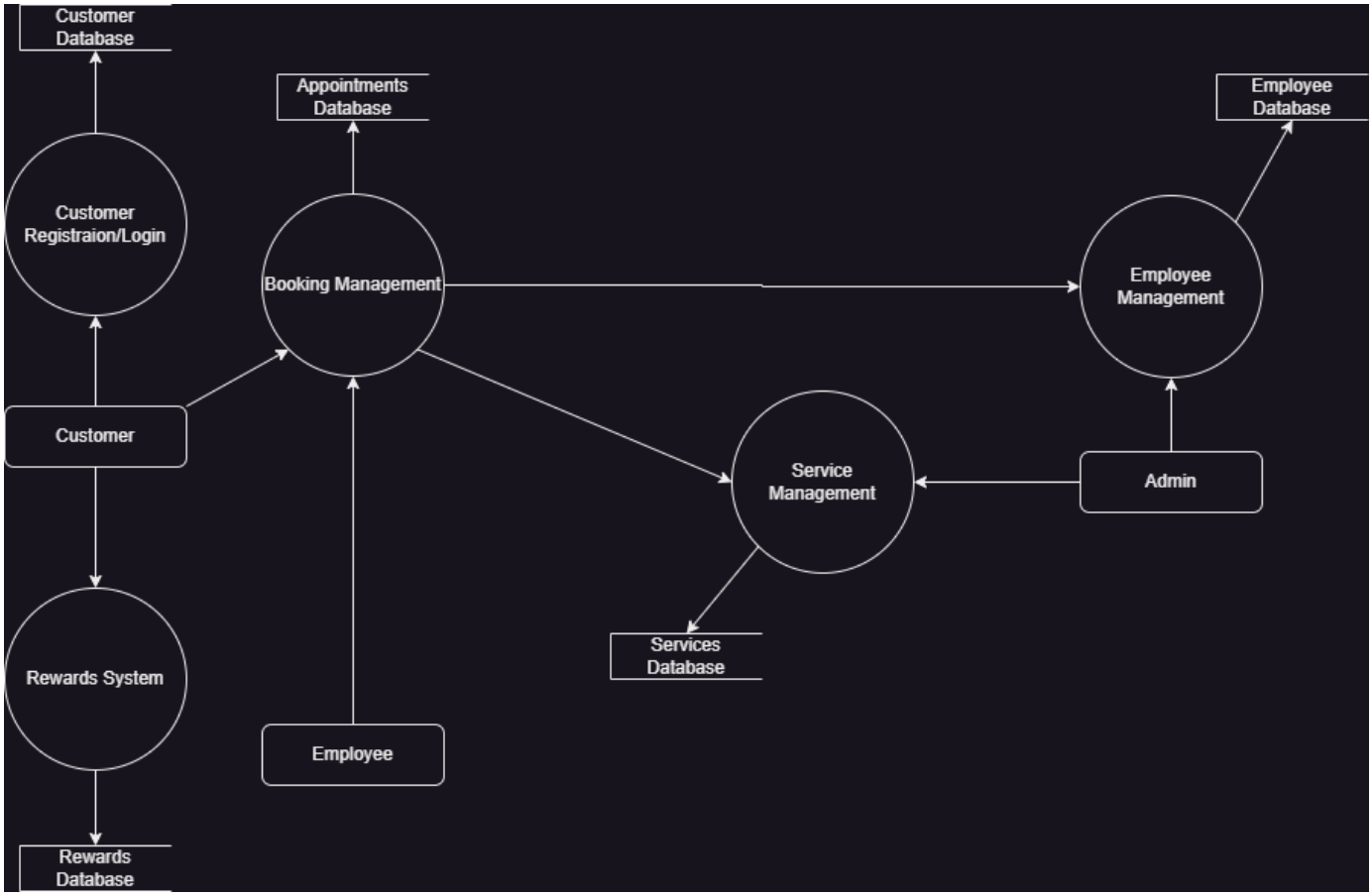

Rewards System
Database
User
View Rewards
Fetch User Points & Available Rewards
Display Points & Rewards
calculate Earned Points
Add Earned Points
Notify of Earned Points
Redeem Reward
Alt
[Sufficient Points]
Deduct Points & Log Redemption
Notify of Successful Redemption
[Insufficient Points]
Notify of Insufficent Points


Authentication System
Database
User
Request Password Change
Request Current Password
Enters Current Password
Check details
Verification Result:Successful/Failed
alt
Request New Password
Enters New Password
Update Password
Password Updated
Notify "New Password Set"
Notify "Verification Failed"


Employee System
Database
Employee
view schedule
Fetch Appointments
Return Schedule
Display Schedule
Update Availability
Store Availability Update
Confirming Update

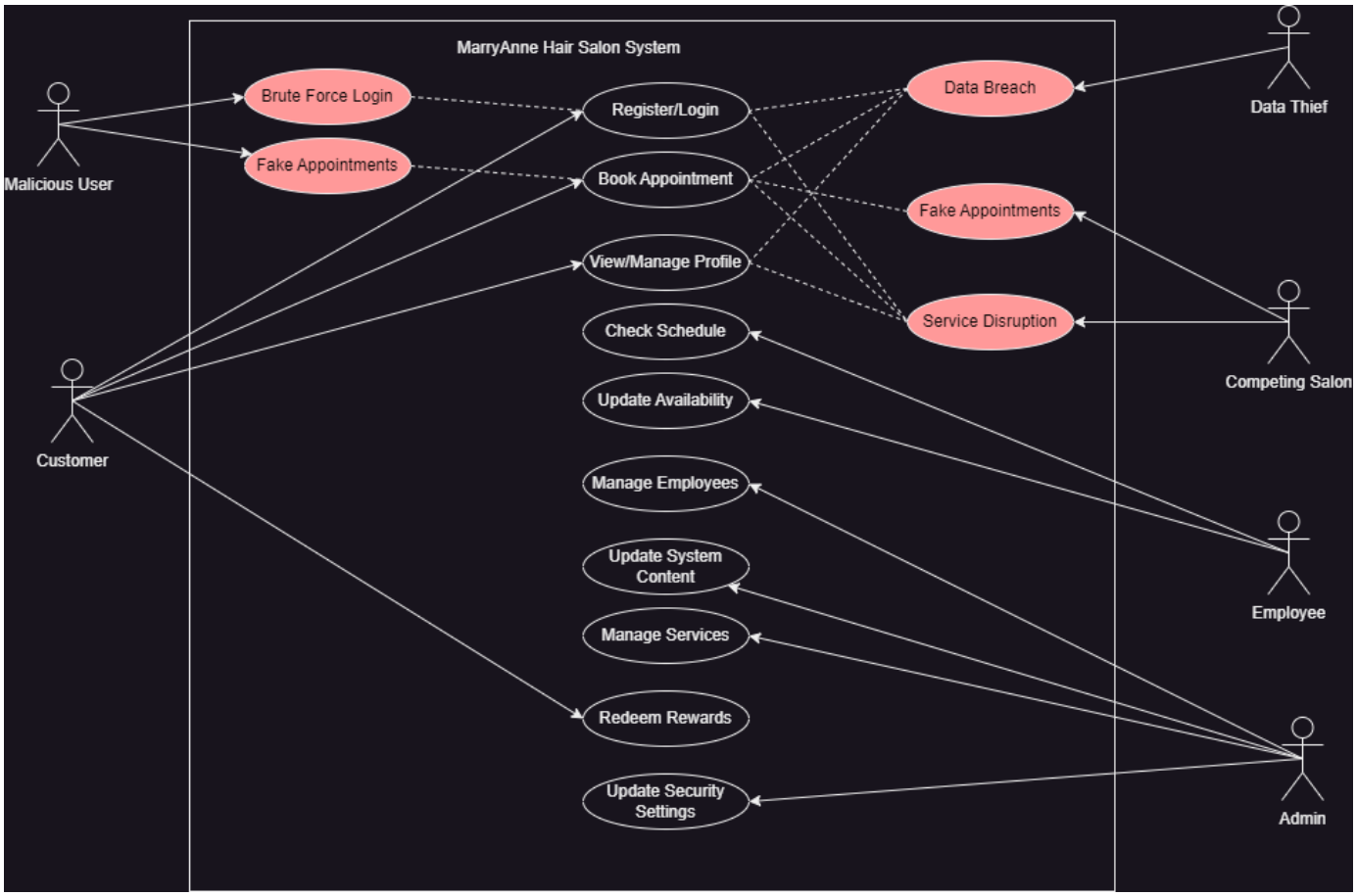

Admin System
Database
Admin
Access User Management Section
Fetch All Users
Return User List
Display User List
Select User & Modify Permissions
Update User Permissions
Update Successful
Confirm Changes Saved
Access Service Management Section
Add/Update Service
Store Service Data
Service Data Stored
Confirm Service Addtion/Update
Access Appointment Managment
Fetch Appointments
Return Appointments
Display Appointments
Diagram Heading
Modifiy Appointment
Update Appointment
Confirm Update

Data Flow Diagram (DFD)



Use Case Diagram

Misuse Case Diagram



1. Unauthorized Access / Account Hijacking

Risk: Attackers or malicious users could gain unauthorized access to an account (customer, employee, or admin) and misuse the privileges.

Mitigation:

- Implement strong password policies.
- Use multi-factor authentication (MFA) for added security, especially for admin accounts.
- Set up account lockouts after several failed login attempts.
- Monitor for unusual login patterns and set up alerts.

2. Data Breach

Risk: Confidential data (like customer personal details, appointment details, or payment info) could be exposed or stolen.

Mitigation:

- Use data encryption both in transit (with protocols like TLS) and at rest.
- Conduct regular backups and ensure backup security.
- Grant data access strictly on a need-to-know basis.
- Undertake periodic vulnerability assessments and penetration tests.

3. Injection Attacks (e.g., SQL Injection)

Risk: Attackers could exploit input fields or queries to inject malicious commands or scripts, potentially gaining unauthorized data access or causing other harmful effects.

Mitigation:

- Utilize parameterized queries and prepared statements.
- Validate and sanitize all inputs to the system.
- Use web application firewalls (WAFs) to detect and prevent suspicious activities.

4. Denial of Service (DoS) or Distributed Denial of Service (DDoS)

Risk: Attackers could flood the system with bogus requests, making the system unavailable for legitimate users.

Mitigation:

- Leverage DDoS protection and mitigation tools or services.
- Regularly patch and update systems to address known vulnerabilities.
- Monitor traffic for unusual patterns that could signal an attack.

5. Cross-Site Scripting (XSS)

Risk: Malicious scripts could be injected into web pages, which are then executed by another end user's browser.

Mitigation:

- Sanitize and validate all user inputs.
- Implement content security policies to block unauthorized script execution.
- Keep web frameworks and libraries updated.

6. Fake Appointments

Risk: Malicious users or competitors could flood the system with fake appointments, blocking genuine users and disrupting operations.

Mitigation:

- Introduce CAPTCHAs or similar verification tools during the booking process.
- Limit the number of bookings a non-verified user can make.
- Implement anomaly detection to recognize suspicious booking patterns.

7. Insider Threats

Risk: Employees or insiders with malicious intent or negligence could misuse their access.

Mitigation:

- Grant minimum required privileges (principle of least privilege).
- Monitor system usage for irregularities.
- Provide regular security training to employees.

8. Man-in-the-Middle (MitM) Attacks

Risk: Attackers could intercept and potentially alter communication between the user and the system.

Mitigation:

- Enforce HTTPS for all web traffic.
- Ensure secure and updated SSL/TLS configurations.
- Educate users about risks, especially when connecting via public or unsecured Wi-Fi.

9. Physical Security Breaches

Risk: The physical infrastructure (servers, storage devices) could be accessed, leading to data theft or system tampering.

Mitigation:

- Secure physical locations with measures like biometric access, surveillance cameras, and security personnel.
- Restrict access only to essential personnel.

10. Outdated Software and Systems

Risk: Outdated software could have vulnerabilities that attackers can exploit.

Mitigation:

- Implement a regular update and patch management process.
- Monitor for new vulnerabilities in third-party software or libraries and apply patches as soon as they're available.

2.3 Conclusion

1. Entity-Relationship Diagram (ERD):

- **System Structure**: It provided an understanding of how data is structured within the system, showcasing the relationships between different data entities.
- **Database Design**: ERD was crucial in designing the base database, ensuring that data is stored efficiently and can be queried effectively.
- **Relationships**: Demonstrated how different entities relate to one another, like how a customer relates to bookings or how services relate to employees.

2. Use Case Diagram:

- **User Interaction**: Gave a clear picture of how different users (actors) interact with the system and what functionalities are available to them.
- **Functional Requirements**: Offered a snapshot of the system's primary functions, which is crucial for both development and testing.
- **System Scope**: Helped in identifying the boundaries of the system and its interactions with external entities.

3. Misuse Case Diagram:

- **Threat Awareness**: Highlighted potential malicious activities or unintended actions that could be carried out against the system.
- **Security Planning**: By identifying areas of vulnerability, it provided direction on where to implement security measures.

4. Activity Diagram:

- **Process Flow**: Offered a step-by-step visualization of how specific functionalities or features would work from start to finish.
- **Decision Points**: Highlighted areas where decisions or choices could affect the flow of an operation, such as choosing between logging in via email or Google.

5. Sequence Diagram:

- **Interactions Over Time**: Showcased how different system components interacted with one another over time for specific operations.
- **System Responses**: Helped in understanding the system's responses or actions for user requests, providing a clear flow of events.

6. Data Flow Diagram:

- **Data Movement**: Demonstrated how data moves between different parts of the system, including external entities, data stores, and processes.

- **Data Processing**: Gave insights into where and how data gets processed or transformed within the system.

7. Context Diagram:

- **System Overview**: Presented a high-level view of the system and its interactions with the outside world, helping all the stakeholders involved get an understanding of the system's core essence without getting into deep details.

Each of these diagrams serves a distinct purpose and, when combined, offers a comprehensive understanding of the MaryAnne Hair Salon system. They did facilitate a better understanding for stakeholders, developers, designers, in our team.

2.4 Sign-off

Mary Anne Hair Salon, Project Client	Robert Njawaya, Project Manager
Date:	Date:
___09/08/2023_____	09/08/2023_____