

Software Requirements Specifications

On Smart Campus Surveillance and Guidance System



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Group No: 6
The Team

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CHAPTER 1

INTRODUCTION

1.1 Introduction

(1) **Purpose:**

The purpose of the Smart Campus Surveillance-Based Guidance System is to enhance security and efficiency on university campuses by integrating smart technology with existing infrastructure. The system is designed to monitor student activities and provide guidance, ensuring students reach their classrooms promptly and safely. By tracking only students with verified identities, the system enhances campus security and prevents unauthorized access. In the event that an unauthorized person is detected, the system immediately alerts campus guards to ensure a swift response. This proactive approach not only strengthens campus safety but also supports informed decision-making and optimizes resource allocation. Additionally, the system contributes to a more sustainable campus environment by efficiently managing the use of physical and technological infrastructure.

(2) **Scope of Project:**

User Profiles: The system will enable administrators to create and manage profiles for students, including personal details, photos, and class assignments.

Classroom Management: Admins will have the ability to input and update class details, including classroom locations, wing and floor information, and directions to each class.

Student Management: The system will allow admins to add, update, and delete student information, including assigning classes and managing student schedules.

Camera Management: Admins will be able to configure and manage details about the campus cameras, including their placements and operational status.

Surveillance Operations: The system will facilitate real-time surveillance by selecting and monitoring camera feeds, using facial recognition to

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identify students, and providing audio guidance if students are found outside their designated areas.

Guidance System: The system will guide students to their classrooms using audio instructions if they are not in the correct location, based on class schedules and camera inputs.

Log Management: Admins will have access to detailed logs of surveillance activities, including student movements and system interactions.

Localization: The system could be adapted to support different languages and cultural contexts to enhance accessibility and user experience across diverse campus populations.

(3) **Overview:**

User-Friendly Navigation: The system offers easy navigation and real-time guidance to help students find their classrooms and other campus locations.

Real-Time Monitoring: Monitors student movements and provides directions if they are in unauthorized areas.

Comprehensive Information: Requires detailed student information, including verified identities, to ensure accurate monitoring.

Verified Access: Only students with authenticated identities are tracked, ensuring campus security.

Class and Break Management: Provides instructions based on class and break times, helping students adhere to their schedules.

Fixed Location Guidance: Utilizes fixed camera positions for guidance, without relying on GPS or indoor navigation.

Security and Efficiency: Enhances campus security and orderliness by deterring unauthorized activities and guiding students appropriately.

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(4) References // end

- ✓ https://www.researchgate.net/publication/353446198_Smart_Video_Surveillance_System_for_University_Campus
- ✓ https://www.researchgate.net/publication/226687136_Smart_Cameras_Technologies_and_Applications
- ✓ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7207122/>
- ✓ https://www.academia.edu/27153909/A_Research_on_Implementation_of_Smart_Surveillance_Systems_on_Kenyan_Schools
- ✓ <file:///C:/Users/NEVON/Downloads/25871827.pdf>

(5) Key features

Admin Profiles: Admins can create profiles to manage the system, including student and class information, camera placements, and surveillance activities.

Student Information Management: Admins can input and update student details, including photos and class assignments, to ensure accurate monitoring and guidance.

Classroom Management: The system allows admins to define class details, locations, and schedules, ensuring students receive the correct guidance.

Camera Integration: The system integrates with campus cameras to monitor student movements and provide real-time feedback.

Face Recognition and Guidance: Utilizes facial recognition to identify students and guide them to their classes if found in unauthorized areas.

Automated Announcements: The system can make automated announcements through speakers to direct students to their proper locations.

Log and Activity Tracking: Maintains logs of student movements and system interactions, providing a detailed record of surveillance activities.

Localization and Customization: The system can be customized to support different languages and regional requirements, making it adaptable to various cultural contexts.

1.2 Challenges:

Understanding User Needs: Capturing diverse requirements from students, faculty, and staff can be difficult, risking the development of a system that isn't user-friendly.

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User Involvement: Engaging users in the development process is time-consuming and expensive, yet crucial for gathering accurate feedback.

Feedback Challenges: Users may be reluctant to provide feedback or may struggle to clearly articulate their needs, leading to misaligned expectations.

Privacy Concerns: The system's constant monitoring can make students feel surveilled, raising issues of privacy and discomfort.

Perception Issues: The feeling of being watched may lead to resistance or negative perceptions, affecting user acceptance and satisfaction.

1.3. Glossary:

TERMS	DEFINITION
Admin	The main user responsible for managing system operations and data.
Database	A structured collection of data related to students, classes, and surveillance activities.
Editor	The role responsible for inputting and updating data in the system.
Viewer	Any user who accesses the system for monitoring or data retrieval.
Users	Registered entities, primarily students, whose data is managed by the system.
Scope of Work	The detailed description of tasks and deliverables for the system.

CHAPTER-2

HW/SW REQUIREMENTS AND TECHNOLOGY

2.1 Software and Hardware specifications

(1) Software requirements

- Eclipse IDE (Editor)
- XAMPP Server
- Spring Tool Suite (STS) (Application Build tool)
- Visual Studio Code (Editor)
- Tomcat server (Server) 10.1

(2) Hardware requirements

- Operating system: windows 10 & 11
- Hard Drives
- IP Cameras
- Speakers

2.2 Technologies used

- (1) Front-End: Html, Css and Angular.
- (2) Back-End: Spring boot and Django.
- (3) Language Used: Java, Python and JavaScript.
- (4) Database : MYSQL
- (5) Server: Tomcat 10.1

CHAPTER-3

ABSTRACT & ADDITIONAL FEATURES

Abstract

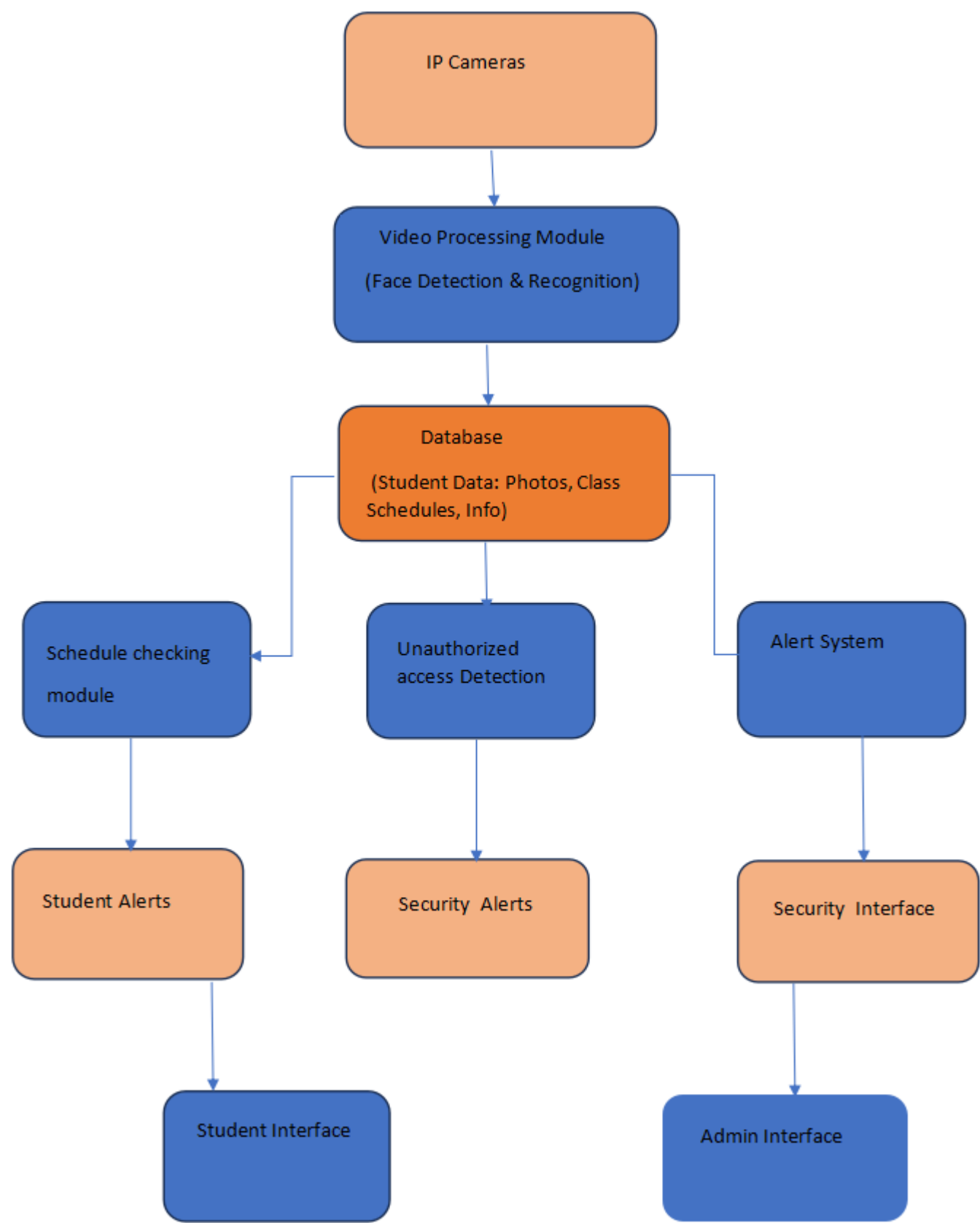
In the rapidly evolving landscape of educational institutions, maintaining a secure and well-organized campus environment is paramount. This project, titled "Smart Surveillance and Guidance System for Campus Security", aims to enhance campus security and student management through the integration of advanced technologies such as facial recognition, real-time video processing, and automated alert systems. The system is designed to monitor and analyze student activities in real-time, ensuring that students are attending their scheduled classes and identifying any unauthorized access or suspicious activities within the campus premises.

The core functionality of the system involves capturing video feeds from strategically placed IP cameras across the campus. These feeds are processed by a Video Processing Module that utilizes facial detection and recognition algorithms to identify students. The identified faces are then cross-referenced with a centralized database containing student photos, class schedules, and essential information. If a student is detected outside their classroom during class hours, the system will alert them via a text-to-speech notification, guiding them back to their scheduled class with specific details such as room number and floor.

Furthermore, the system includes an Unauthorized Access Detection Module to monitor entry points and detect any unauthorized access, promptly alerting security personnel to potential security breaches. The Alert System is designed to provide real-time notifications to students and security staff, ensuring a swift response to any incidents. The system also features various user interfaces tailored for administrators, students, and security personnel, enabling efficient data management, incident reporting, and communication.

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Block Diagram



CHAPTER-4 MODULES

Modules and Functionalities

There are two actors of the application which are going to interact directly with the application they are Admin, User(Security Person) who are the indirectactors of the application.

They will interact with following Modules

4.1 Login Module :

The login system will be on the username. Where the Admin will give the username and password to the security person to login into website.

Login through username and password will be Verified.

4.2 Home Module :

A navigation bar will contain browsing access to other modules. On the page, it should contain sections:

1. There will be a live streaming panel for video stream
2. A another section have the list of unauthorized persons.
3. Another section which contain the list of students who are not following the guidance

4.3 Admin:

Admin will be responsible to manage the details of all the Users(Security Person) and Students. Like admin can add new students as well as securiy person, Admin can Approve the order from the user, Admin can check the Availability of the services in the application.

- Admin can ADD/DELETE/UPDATE/VIEW User and Students details.
- Admin can ADD/DELETE/UPDATE the Services.
- Admin can ADD/DELETE/APPROVE the Requests from the User.
- Admin can VIEW the number of User and Students.

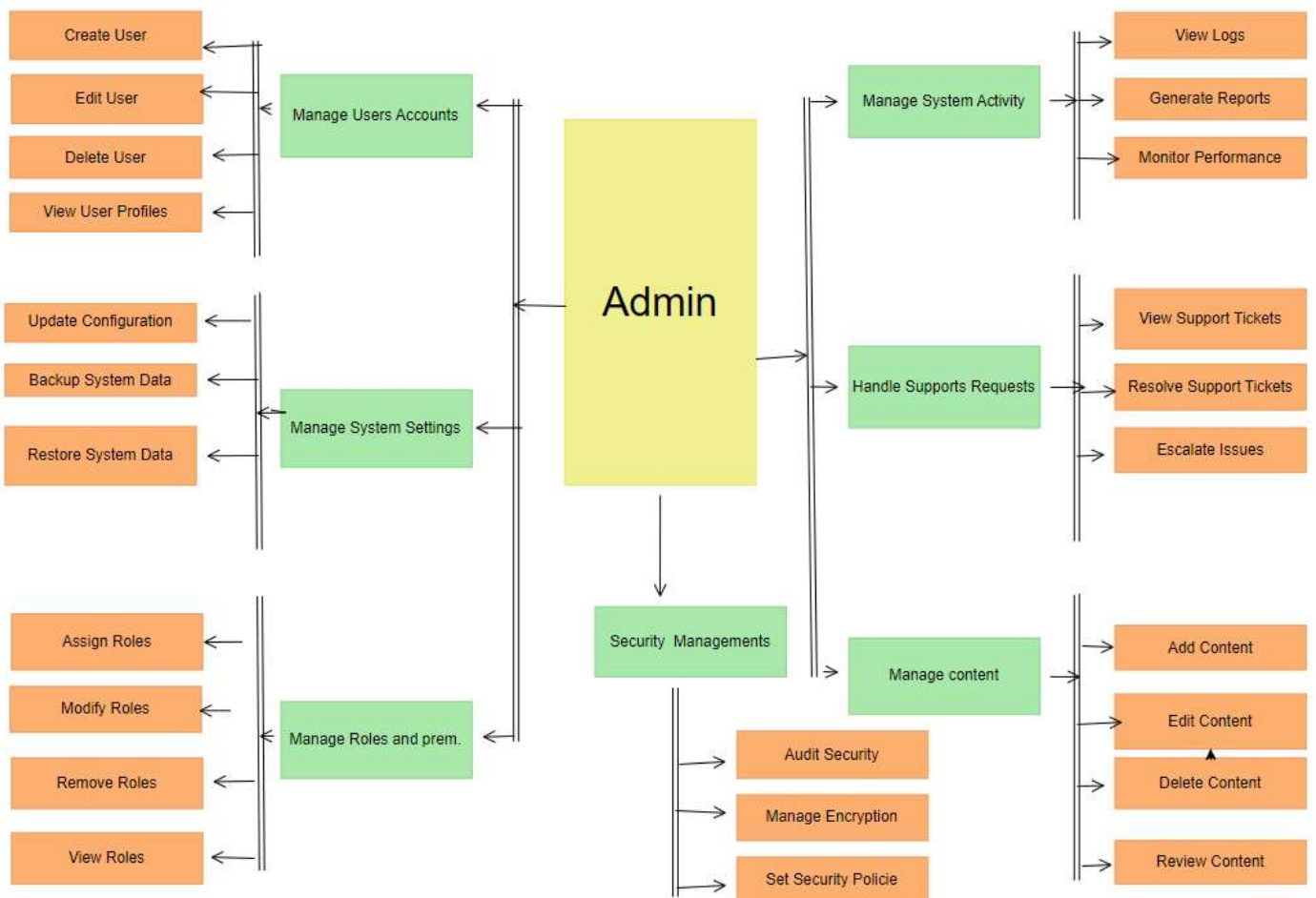
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The Administrator can do the following actions

1. Login
2. Admin Actions
 1. Number of Users in a graphical form
 2. Number of Students in a graphical form
 3. Views/Update/Delete personal details of User and Students.
 4. Views/Update/Delete Student details
3. Logout

ADMIN

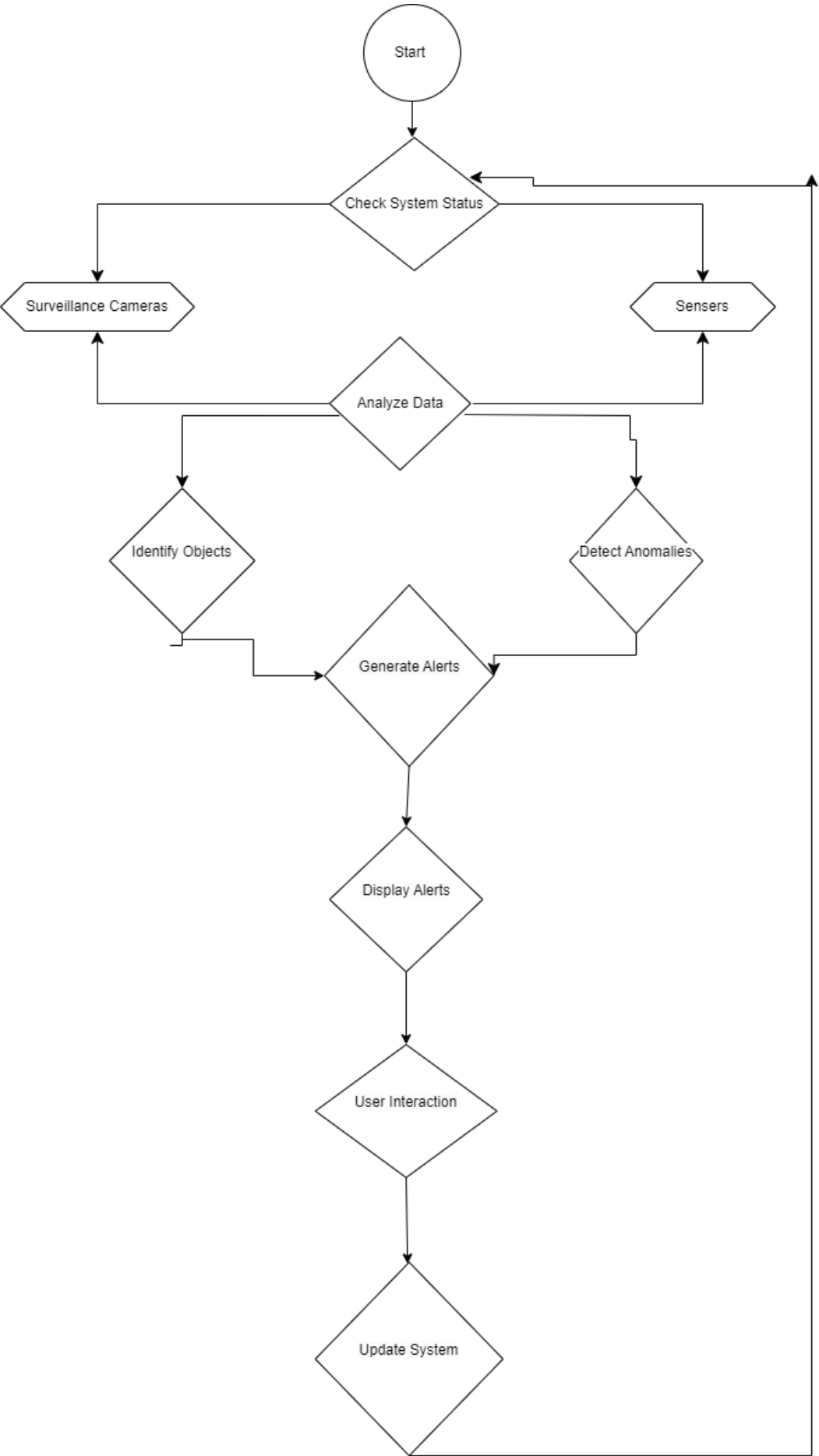
– Use Case Diagram for Admin



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Use Case ID:	Use Case Name: Admin
Description	Admin can login into the Application with valid credentials. After entering the dashboard, update and manage services, update reports.
Actor	Admin
Preconditions	Admin, should have a valid account
Post conditions	Admin, will be logged in.
Events	The admin opens the website and it will direct to the login page. The admin can add/update/delete Alerts. The admin can manage Services. Admin can update reports.
Exceptions	If admin enters wrong user ID and Password, they cannot login to the system it will show login failed.

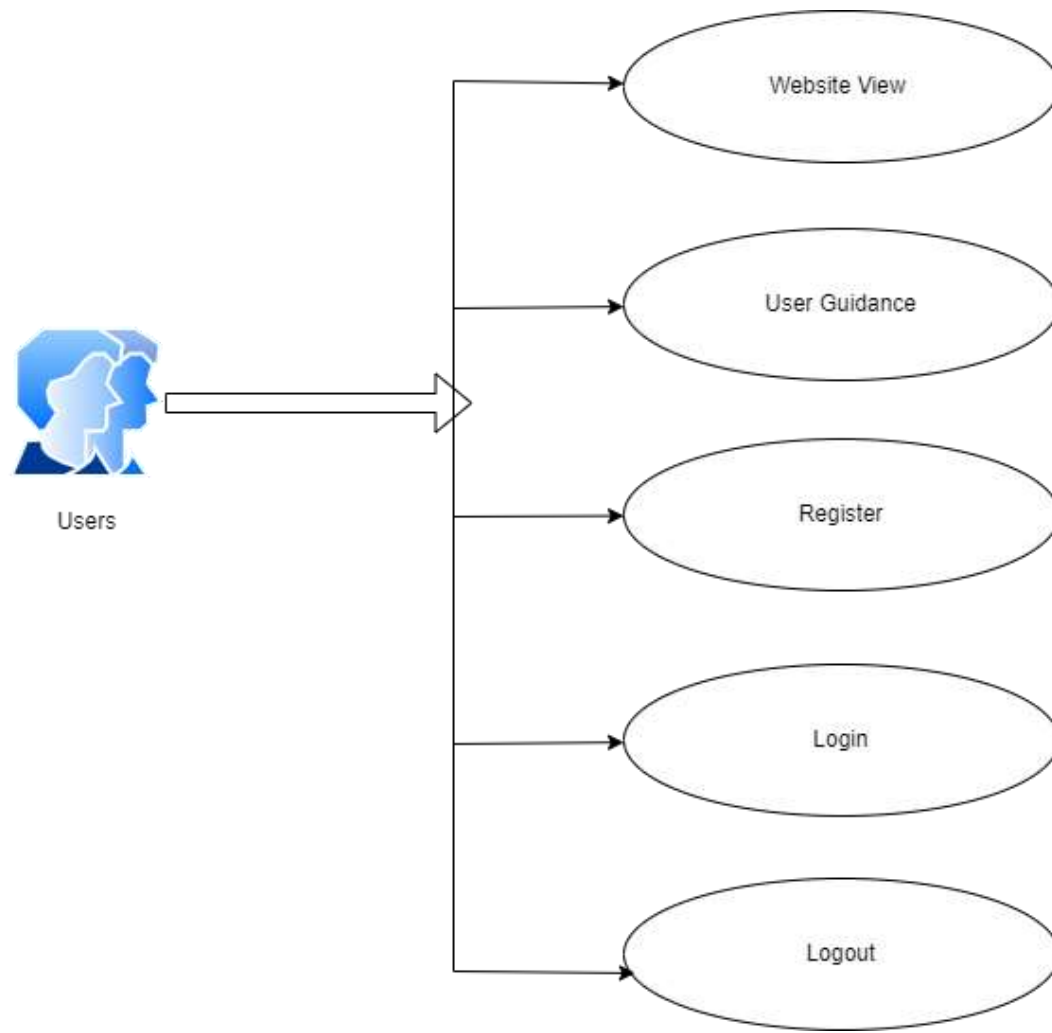
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USER (Student)

- User can visit the Website for Details.
- User can Access to Book a service through website.
- User can manage his/her free time for Services.
- User can make payment through website.
- User can register as Employee in the Need in website if his/her have skill.
- User can use the Need in support system to Contact us.
- User can search for Local part time jobs in the job service section.

– Use Case Diagram of User :-



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Use Case ID:	Use Case Name: User
Description	User can see services if he want any service, then login and book, the service. After that An alert message generate, it reaches to nearby employee.
Actor	User
Preconditions	User must have a valid account
Post conditions	User have to login.
Normal Course of Events	The User opens the website and he can view the services.

Overview:

This SRS document contains many use case diagrams and descriptions about all use case diagrams have been included in this document. It also gives the functional and non-functional requirements.

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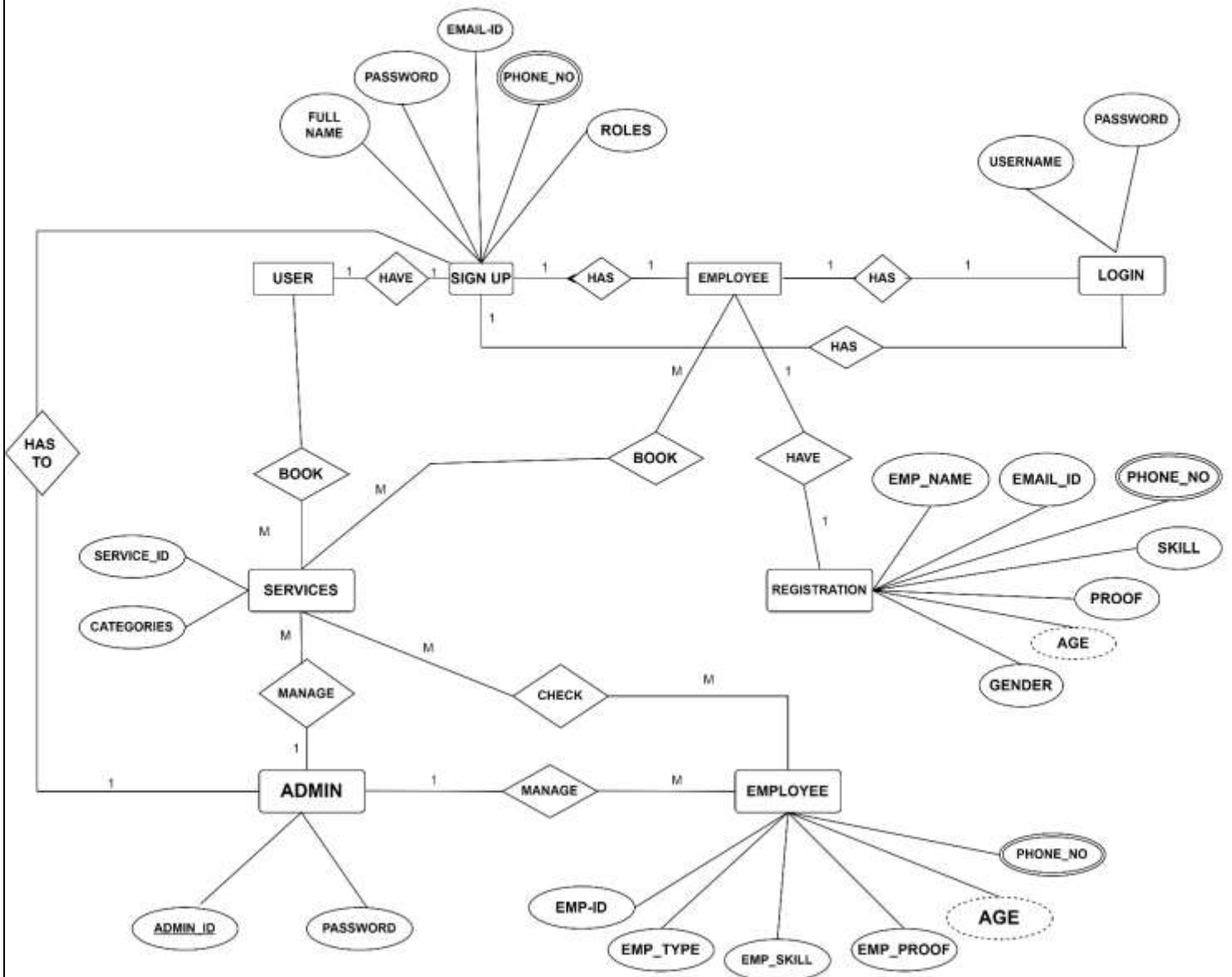
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GATE – 1 (DESIGN PROCESS)

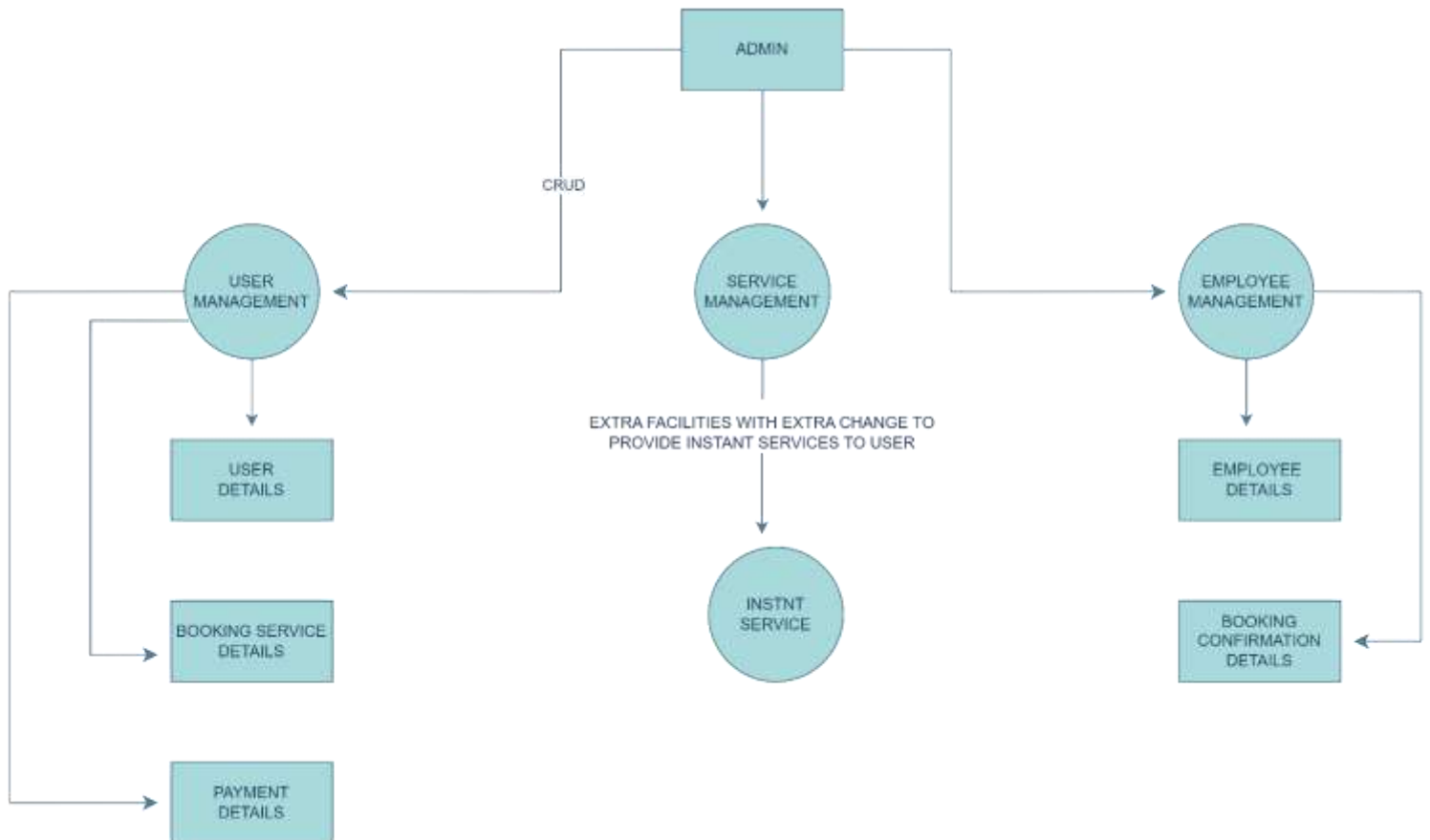
ER diagram of the website



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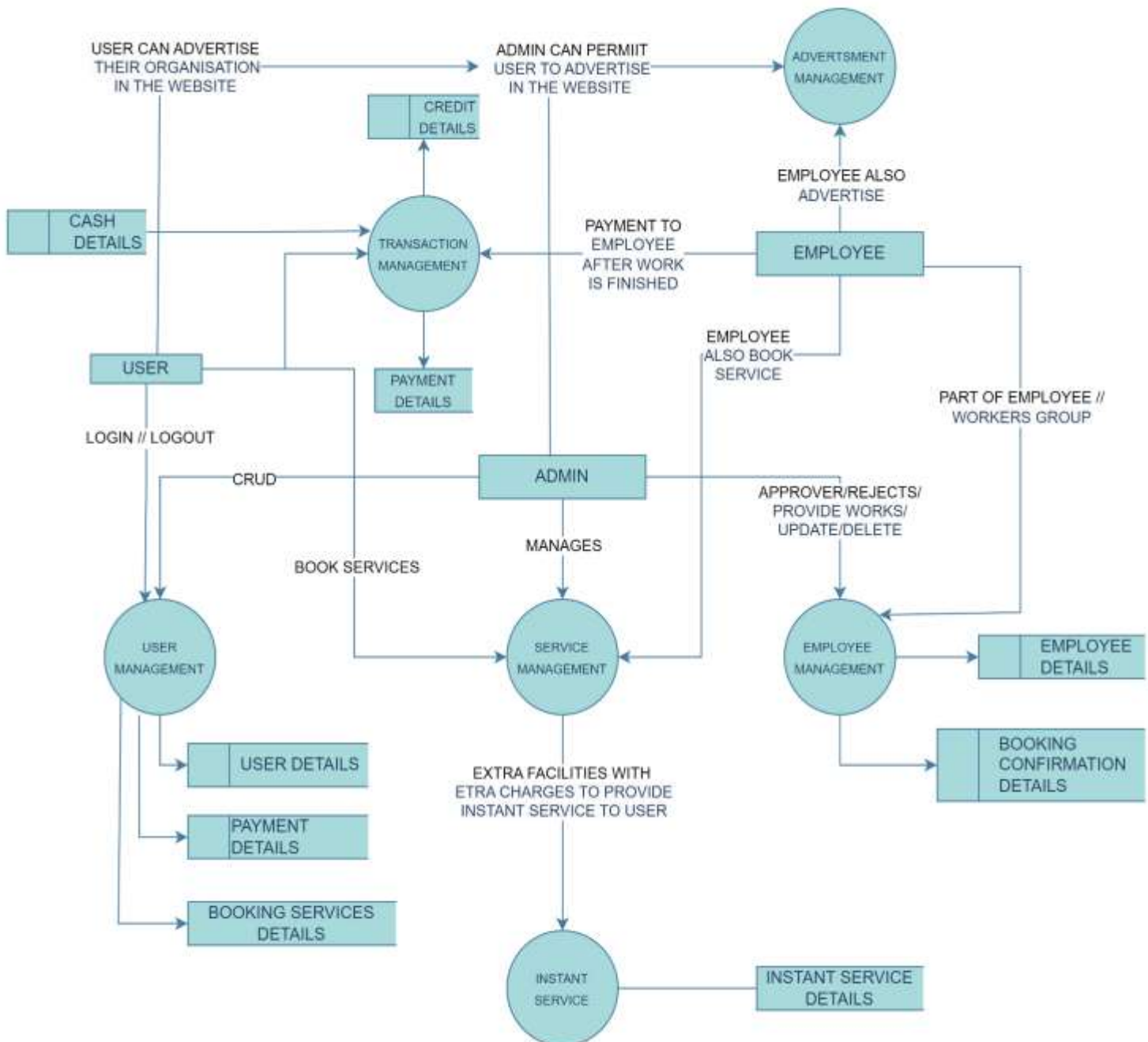
DFDS FOR NEEDIN WEBSITE

LEVEL 0 :-



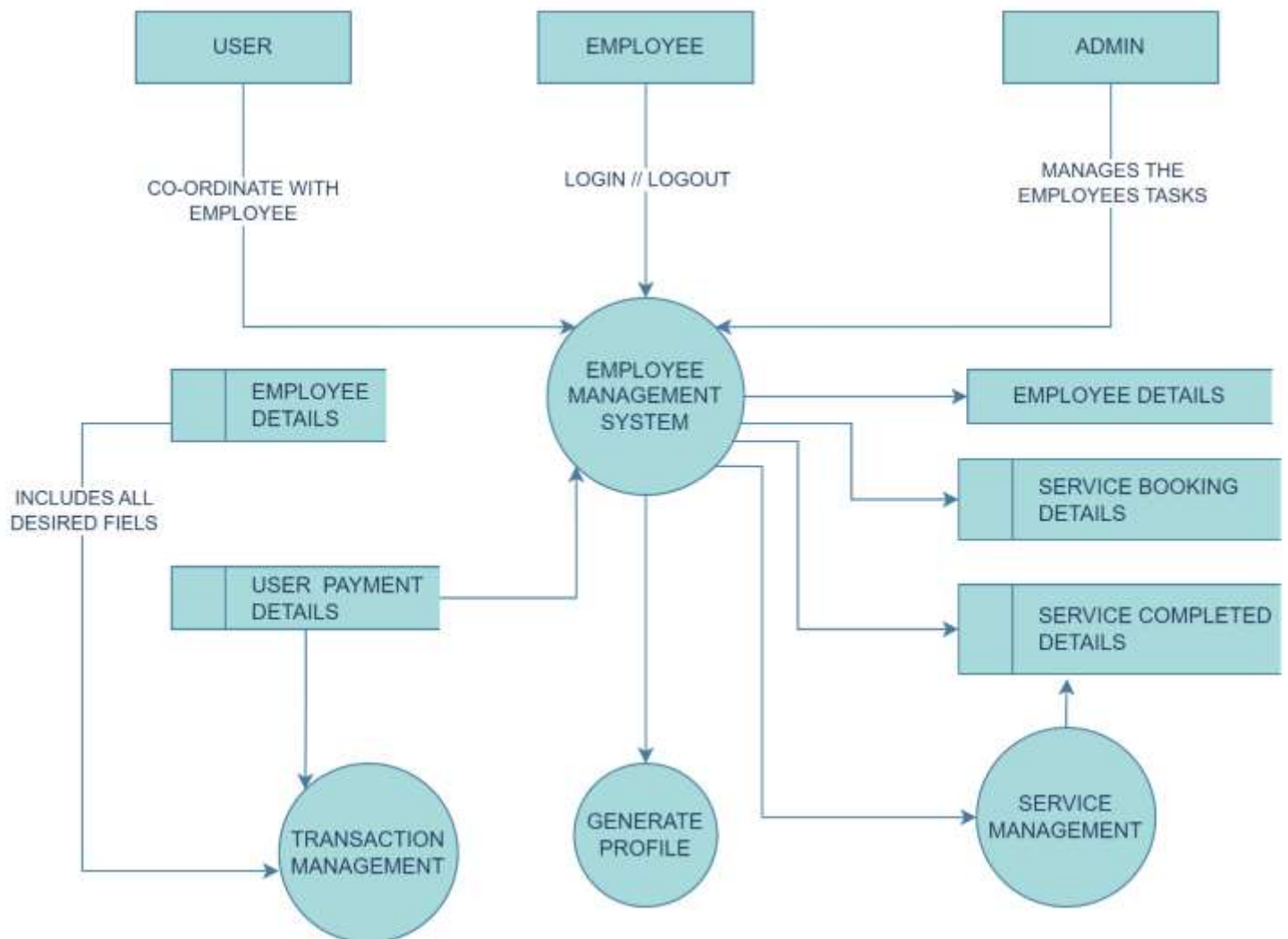
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LEVEL 1 :-



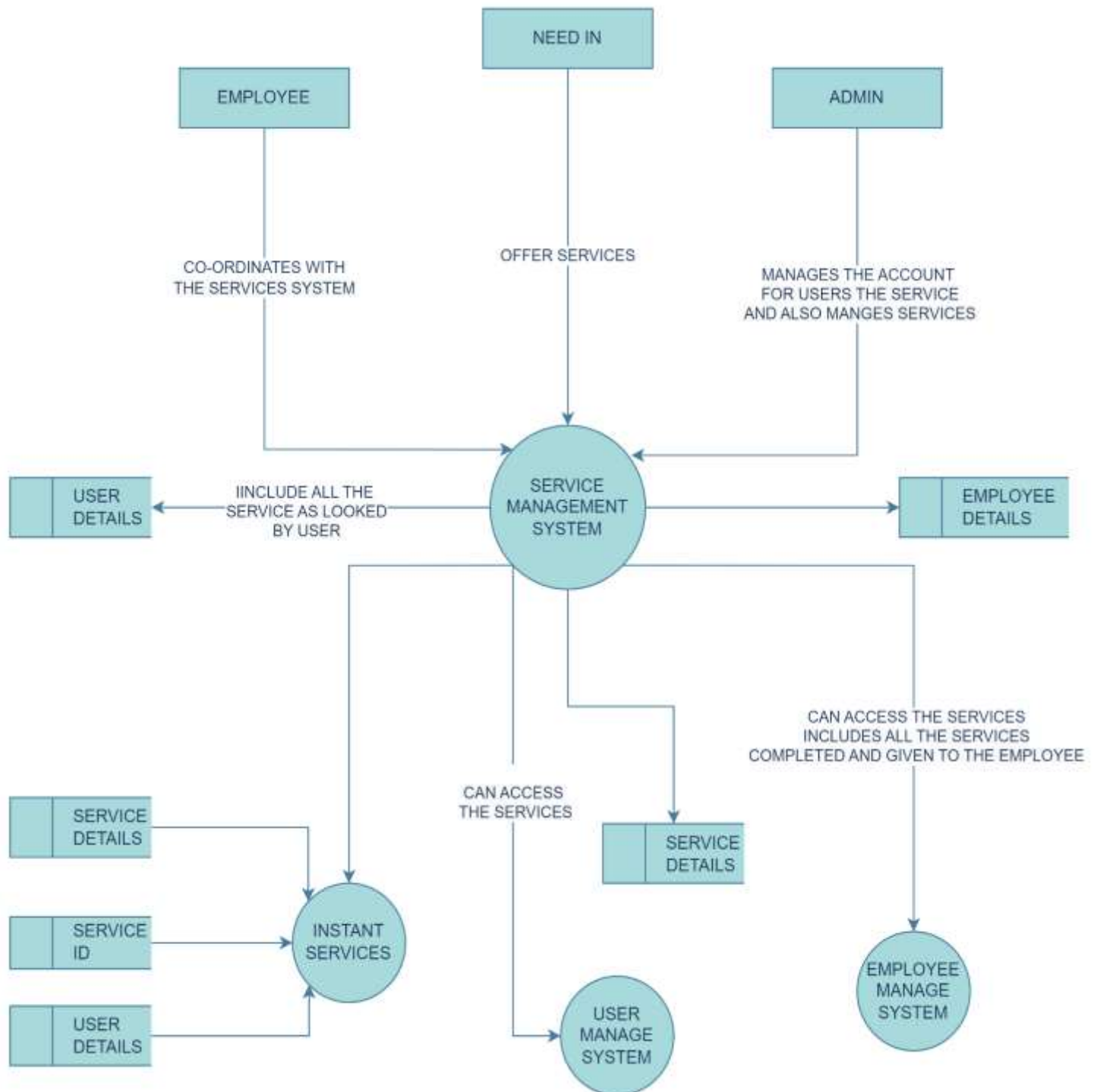
LEVEL 2 :-

DFD for Employee Management System



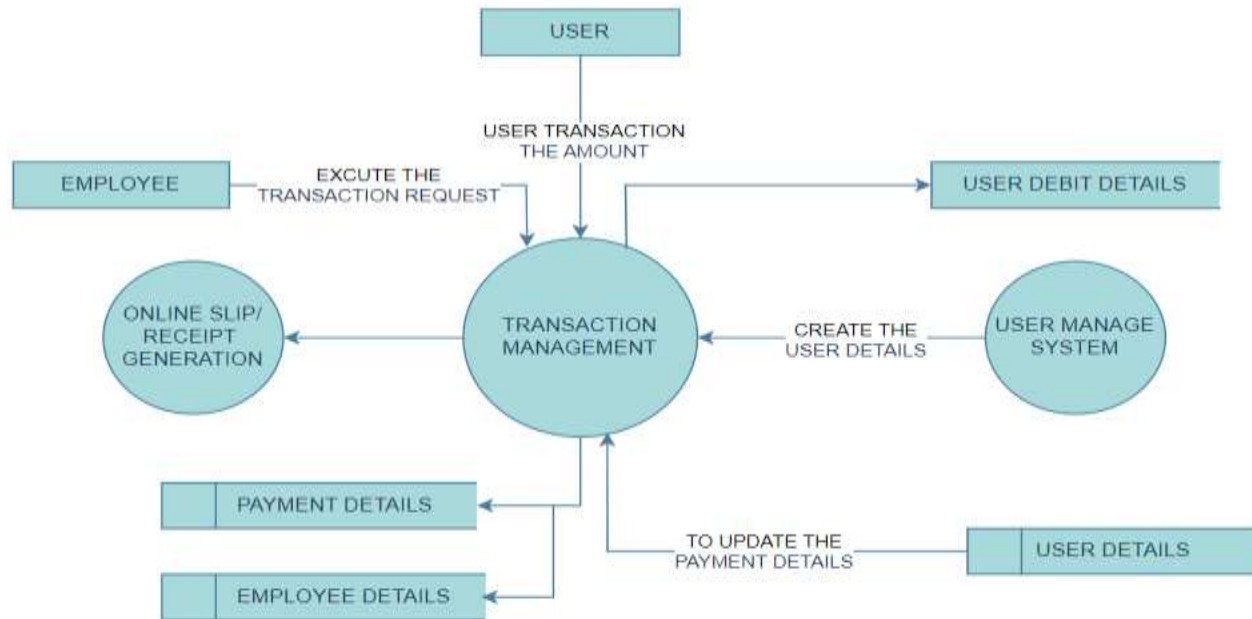
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DFD for Service Management System



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DFD for Transaction Management



DFD for User Management System

