

SE 216 – SOFTWARE PROJECT MANAGEMENT
PROJECT NEEDS DOCUMENT

PROJECT NAME: ECOLIB

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#	SOFTWARE NEEDS	DESCRIPTION
1	Database Management System (PostgreSQL)	The Database Management System (PostgreSQL) will serve as the backbone of your reservation application, storing critical data such as user information, reservation details, table statuses, and library occupancy rates.
2	Mobile App Development (React Native)	The mobile application development framework (React Native) will enable the development of an application interface. This interface will allow students to easily reserve library tables, get information about table status, receive and manage notifications and manage reservations. The mobile application will interact seamlessly with backend systems, providing real-time updates on table status.
3	Image Processing Library (Open CV)	The Image Processing Library (OpenCV) analyzes camera images to verify people entering the library and determine table occupancy. It identifies empty tables, calculates the number of people and classifies table types. It works integrated with the reservation system.
4	Implementing Image Processing (Python)	Implementing Image Processing involves integrating the image processing library into the reservation system to provide dynamic updates on library occupancy and table availability. This component will involve setting up and configuring cameras strategically within the library space, processing camera feeds in real-time, and utilizing machine learning models to analyze images and extract relevant data. The goal is to provide users with live feedback on table availability and optimize the library's space utilization.
5	Testing Softwares (Jest, Pytest)	Testing Softwares (Jest, Pytest) will be used to ensure the reliability, performance, and security of the reservation application throughout its development lifecycle. This includes automated testing tools for functional testing, load testing, and integration testing to validate the application's behavior under different scenarios.

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#	HARDWARE NEEDS	DESCRIPTION
1	Cameras	Cameras are key hardware components used for surveillance and image capture in the library space. They will be placed at strategic points to monitor table occupancy, detect misuse and integrate with the image processing system. High resolution cameras can have wide angle lenses and low light capacities, which is essential to provide accurate and real-time data for the booking application.
2	Turnstiles	Turnstiles are devices that control access at the library entrance and provide data for the reservation system. They authenticate users at the entrance with card readers or QR code scanners. Turnstiles help to accurately monitor occupancy by ensuring that only students with reservations can enter the library.
3	Server	The server acts as the hub for storing and processing the data collected by the reservation system. It hosts the database management system, image processing algorithms and other software components necessary for the functionality of the application. The server must have sufficient processing power, memory and storage capacity to perform real-time data processing functions and ensure system reliability.
4	Display Screen	The screens at the library desk will reflect the images from the database of the users entering the library and the images taken from the cameras during the entrance. These screens will also enable library staff to support manual authentication.
5	Power Backup	Power backup solutions such as uninterruptible power supplies (UPS) or generators are critical to ensure system continuity during power outages. Since the reservation system operates 24/7, uninterrupted power supply is essential to prevent data loss and maintain system availability. The power backup system should be capable of supporting all critical hardware components, including servers and cameras, for extended durations if necessary.

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#	SUPPORT NEEDS	DESCRIPTION
1	End Users	Provides feedback during system development and usability testing phases.
2	IT	Assists in installing and configuring the reservation application and related hardware. Provides continuous maintenance and support for the trouble-free operation of the system.
3	Universities	Define requirements and expectations specific to the reservation system. Provide input on scalability and compatibility with other systems of university. Review and approve project phases and deliverables. Participate in user acceptance testing and provide feedback on the system.
4	Library Staff	Our library staff is essential to the successful implementation and operation of the new reservation system. They play a critical role in ensuring that the system functions smoothly, students adhere to the rules, and any issues are addressed promptly.