CHAPTER 3

TECHNICAL BACKGROUND

System Requirements

To ensure the smooth operation of the system, specific hardware, software, and peopleware requirements have been established. These requirements define the minimum specifications necessary to support the development and deployment of the system.

The system architecture consists of three main layers. The **Presentation Layer (Frontend)** is developed using React Native to create a cross-platform mobile application, providing users with a graphical interface to interact with the system. It communicates with the backend through API calls to ensure smooth data flow. The **Application Layer (Backend)** is implemented using Laravel to handle business logic, authentication, authorization, and data processing. It securely connects with the database and efficiently processes QR code scanning requests. Finally, the **Data Layer (Database & Storage)** utilizes MySQL for structured data storage, maintaining user credentials, attendance records, and system logs. It ensures data integrity and security through encryption and Laravel Sanctum.

A. Hardware

Aspect	Minimum Specification
System Unit	Intel Core I5 8 gen 8 Gb Ram 64 GB Storage
Peripherals	QR Code Scanner
Mobile Phone	Android 10

B. Software

Aspect	Minimum Specification
Operating System	Windows 10, Android
Integrated Development Environment	Visual Studio Code

Programing Language	TypeScript, PHP
Cross Platform Mobile Application Framework	React Native
Back-end Framework	Laravel
Software Package	Expo, Expo-camera, Expo-notification, Axios, Sanctum

C. Peopleware

Aspect	Role
Guard	Responsible for scanning QR code
Student	Responsible in attending school and providing QR code to be scanned
Parent	To view and track child attendance and performance
Admin	Responsible for verifying parent, managing records and monitoring system