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# Technical Documentation – EduHub Management System

## 1. Project Overview

**Project Name:** EduHub Management System  
**Version:** 1.0  
**Date:** 13 August 2025  
**Prepared By:** Kanyiri Ishmael

EduHub is a multi-level school management platform designed for Junior High School (JHS), Senior High School (SHS), and University institutions. It centralizes the handling of student records, courses, grades, and reports in a secure, user-friendly web interface.

## 2. System Architecture

EduHub follows a three-tier architecture:

- 1. **Frontend:** React.js + Tailwind CSS for responsive design.
- 2. **Backend:** Node.js + Express.js handling APIs and authentication.
- 3. **Database:** MySQL relational database.
- 4. **Hosting:** AWS EC2 with Nginx web server.
- 5. **Authentication:** JWT-based login system.

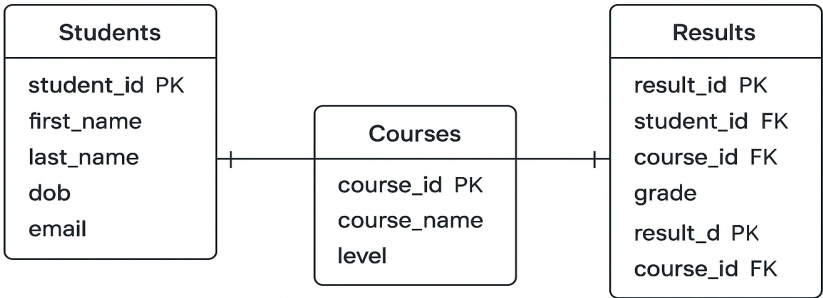
## 3. Technology Stack

Layer	Technology Used
Frontend	React.js, Tailwind CSS, HTML5, JavaScript (ES6)
Backend	Node.js, Express.js
Database	MySQL
Authentication	JWT, bcrypt
Hosting	AWS EC2, Nginx
Version Control	GitHub
Testing Tools	Postman, Jest
File Storage	AWS S3

## 4. Database Design

Below is the Entity Relationship Diagram (ERD):

## ER Diagram



## 5. Testing Logs

Test Case ID	Description	Expected Result	Actual Result	Status
TC001	Login with valid credentials	Redirect to dashboard	Works as expected	Pass
TC002	Login with wrong password	Show error	Error displayed	Pass
TC003	Add new student record	Record added	Record saved to DB	Pass
TC004	View student results	Show correct grades	Grades displayed	Pass

## 6. Project Reflections

### Challenges:

- Ensuring security across multiple school levels.
- Handling large datasets without performance issues.
- Creating a mobile-responsive interface.

### Lessons Learned:

- Frequent testing reduces bugs during deployment.
- User feedback improves system usability.
- Cloud hosting ensures scalability.

### Future Plans:

- Add role-based access control.
- Introduce push notifications for grade releases.
- Mobile app integration.