

# Final Project Report (LLD + Architecture)

Student-Teacher Booking Appointment System

Domain: Education

Technologies: HTML, CSS, JavaScript, Firebase

Difficulty Level: Easy

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## OBJECTIVE

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To create a simple, web-based Student-Teacher appointment management system that allows easy scheduling, messaging, and management between students, teachers, and admins using Firebase.

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## ACTORS

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- Admin
- Teacher
- Student

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## SYSTEM DESIGN AND FLOW

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### 1. Student Books Appointment

Student logs in -> selects teacher -> enters subject, date, time.

Appointment saved to Firestore (appointments collection).

### 2. Teacher Approval Process

Teacher logs in -> views appointments -> approves or rejects.

Firestore updates the appointment's status accordingly.

### 3. Messaging System

Student sends message -> saved in 'messages' collection with sender and receiver info.

Teacher views messages by receiverId (email).

### 4. Admin Management

Admin logs in -> adds teachers (name, email, department, subject).

Logs every admin action in 'logs' collection.

Views teachers, students, appointments, messages.

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### DATABASE SCHEMA (FIRESTORE)

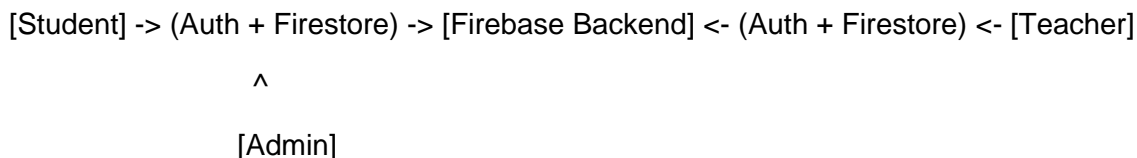
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| Collection   | Description   |
|--------------|---|
| admins       | Stores admin info   |
| teachers     | Teacher info (name, email, department, subject)                           |
| students     | Student info (name, email, department)                                    |
| appointments | Appointment details (studentId, teacherName, subject, date, time, status) |
| messages     | Communication between student and teacher                                 |
| logs         | Records admin activities  |

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### SYSTEM ARCHITECTURE (TEXT DIAGRAM)

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Frontend: HTML, CSS, JavaScript

Backend: Firebase (Auth + Firestore)

Hosting: Firebase Hosting (optional)

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## LOW-LEVEL DESIGN (LLD)

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### Entities and Functions:

Admin:

Attributes: uid, name, email

Functions: addTeacher(), viewLogs(), viewAppointments()

Teacher:

Attributes: name, email, department, subject

Functions: approveAppointment(), rejectAppointment(), viewMessages()

Student:

Attributes: name, email, department

Functions: bookAppointment(), cancelAppointment(), sendMessage()

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## TEST CASES

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| Test Case                    | Expected Result                  |
|------------------------------|----------------------------------|
| Student Login                | Redirects to dashboard           |
| Student Books Appointment    | Appointment created in Firestore |
| Teacher Approves Appointment | Status changes to Approved       |
| Student Sends Message        | Entry created in messages        |
| Teacher Views Messages       | Displays relevant messages       |
| Admin Adds Teacher           | Adds entry in teachers and logs  |

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## CONCLUSION

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This project successfully implements all modules as defined:

- Admin Management
- Teacher Appointment Approval

- Student Booking and Messaging
- Firebase Integration
- Action Logging

System is modular, maintainable, and deployment-ready.