

# 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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[Student] -> (Auth + Firestore) -> [Firebase Backend] <- (Auth + Firestore) <- [Teacher]

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  [Admin]

Frontend: HTML, CSS, JavaScript

Backend: Firebase (Auth + Firestore)

Hosting: Firebase Hosting (optional)

## 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
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Student Login	Redirects to dashboard
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Student Books Appointment	Appointment created in Firestore
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Teacher Approves Appointment	Status changes to Approved
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Student Sends Message	Entry created in messages
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Teacher Views Messages	Displays relevant messages
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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.