Education Management System

May Shun Lae Naing

1. Requirement Analysis (What to build)

Build a web-based Education Management System that allows:

- Admin to manage users & courses
- Teachers to manage grades
- Students to view courses & grades

Functional Requirements

Admin
- Login / Logout
- Create teacher accounts
- Create student accounts
- Create courses
- Assign teacher to course
- View all data

Teacher
- Login / Logout
- View assigned courses
- View enrolled students
- Add / update grades

Student
- Login / Logout
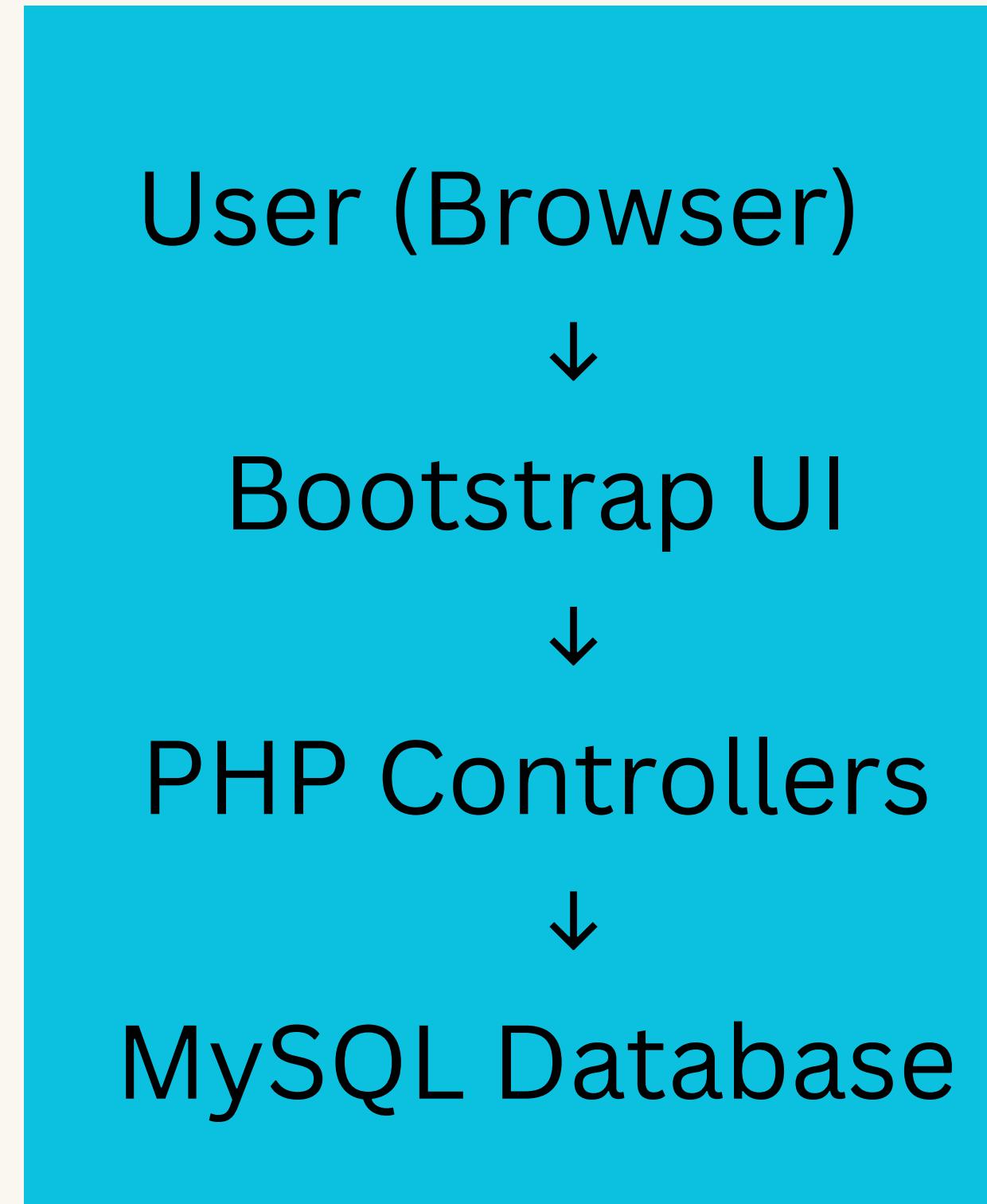- View enrolled course
- View grades

Non-Functional Requirements

- Secure login (password hashing)
- Role-based access control
- Responsive UI (Bootstrap)
- MySQL relational database
- Clean folder structure

2.System Design

- High-Level Architecture Design
- Module Design
- Data Design
- Access Control Design
- Navigation / Page Flow Design
- Error & Validation Design

High-Level Architecture Design

User (Browser)

↓

Bootstrap UI

↓

PHP Controllers

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MySQL Database

Module Design

Authentication Module

- Login
- Logout
- Session handling
- Role detection

Admin Module

- Manage users (teacher, student)
- Manage courses
- Assign teacher to course

Teacher Module

- View assigned courses
- View enrolled students
- Add / update grades

Student Module

- View enrolled courses
- View grades

Data Design

Identified Entities: The system requires four core entities:
users, courses, enrollments, grades

```
+-----------------------------+        +-----------------------------+        +-----------------------------+        +-----------------------------+
|          users              |        |          courses            |        |        enrollments          |        |           grades            |
+-----------------------------+        +-----------------------------+        +-----------------------------+        +-----------------------------+
|PK  id              |                 |PK  id              |                 |PK  id              |                 |PK  id              |
|    name            |                 |    course_code     |                 |FK  student_id      |                 |FK  student_id      |
|    email  (UNIQUE) |                 |    course_name     |                 |FK  course_id       |                 |FK  course_id       |
|    password        |                 |    description     |                 |    enrolled_at     |                 |    grade           |
|    role            |                 |FK  teacher_id      |                 +-----------------------------+                 |    updated_at      |
|    created_at      |                 |    created_at      |                                                          +-----------------------------+
+-----------------------------+        +-----------------------------+
```

Roles stored in this entity:
admin, teacher , student

users (teacher) 1 ——————< courses

users (student) 1 ——————< enrollments >——————— 1 courses

users (student) 1 ——————< grades >——————————— 1 courses

Access Control Design (RBAC)

Role	Permissions
Admin	Full system control
Teacher	Grade management
Student	Read-only academic data

Eg: Only teacher can INSERT or UPDATE grades

Error & Validation Design

Unauthorized access → redirect to login
Invalid role → access denied page
Empty input → validation error

Navigation / Page Flow Design

Admin Flow

Login → Admin Dashboard
    → Manage Users
    → Manage Courses

Teacher Flow

Login → Teacher Dashboard
    → My Courses
    → Manage Grades

Student Flow

Login → Student Dashboard
    → My Courses
    → My Grades