

**Capstone Project Report**

**Report 2 – Project Management Plan**

– Ho Chi Minh, September 2025 –

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# I. Record of Changes

|  |  |  |  |
| --- | --- | --- | --- |
| Date | A\* M, D | In charge | Change Description |
| 20/09/2025 | A\* | Minh Anh | Initial document creation |
| 21/09/2025 | A\* | Minh Anh | Section 2 and remaining sections |
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\*A - Added M - Modified D - Deleted

# II. Project Management Plan

## 1. Overview

### 1.1 Scope & Estimation

|  |  |  |  |
| --- | --- | --- | --- |
| **#** | **WBS Item** | **Complexity** | **Est. Effort**  **(man-days)** |
| ***1*** | ***Onboarding & Academic Data*** | ***Medium*** | ***5*** |
| ***2*** | ***AI Curriculum & Career Alignment*** | ***Complex*** | ***8*** |
| ***3*** | ***Skills & Stats Foundation*** | ***Complex*** | ***8*** |
| ***4*** | ***Dashboard, Skill Tree & Arsenal*** | ***Complex*** | ***7*** |
| ***5*** | ***Boss Fight & Leaderboards*** | ***Complex*** | ***9*** |
| ***6*** | ***Dynamic Quest & Notifications*** | ***Medium*** | ***5*** |
| ***7*** | ***Browser Extension Integration (FTPU & Arsenal)*** | ***Medium*** | ***3*** |
| ***8*** | ***Code Battle & Competitive Events*** | ***Complex*** | ***10*** |
| ***9*** | ***Event Management & Administrative Platform*** | ***Medium*** | ***5*** |
| ***10*** | ***Academic Integration (FPTU, Quest Memory & Recovery)*** | ***Complex*** | ***7*** |
| ***11*** | ***Admin Owned Educational Governance*** | ***Medium*** | ***5*** |
| ***12*** | ***Objective System, Knowledge Graph & Rewards*** | ***Complex*** | ***7*** |
| ***13*** | ***CI/CD Pipeline & Infrastructure*** | ***Medium*** | ***3*** |
| ***14*** | ***Observability & Monitoring*** | ***Simple*** | ***2*** |
| ***Total Estimated Effort (man-days)*** | | | ***84*** |

### 1.2 Project Objectives

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **#** | **Testing Stage** | | **Test Coverage** | **No. of Defects** | **% of Defect** | **Notes** | | |
| 1 | Reviewing | | N/A | 24 | 20% | PR-based code reviews, checklists, static analysis | | |
| 2 | Unit Test | | ≥ 70% lines/branches | 42 | 35% | .NET unit tests + React component tests | | |
| 3 | Integration Test | | Key paths ≥ 60% | 30 | 25% | API + DB + services; Postman suites | | |
| 4 | System Test | | ≥ 80% critical flows | 18 | 15% | End-to-end user journeys in staging | | |
| 5 | Acceptance Test | | 100% of AC covered | 6 | 5% | UAT against PRD acceptance criteria | | |
| ***Allocated Effort (man-days)*** | | | | | ***84*** |

### 1.3 Project Risks

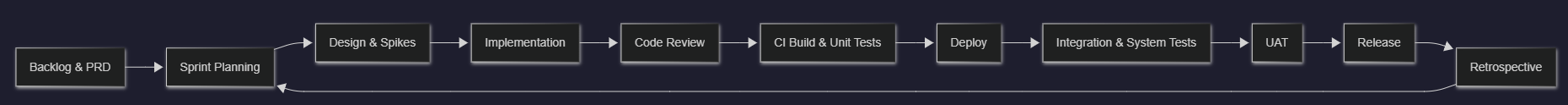
|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **#** | **Risk Description** | **Impact** | **Possibility** | **Response Plans** |
| 1 | Requirements churn or unclear acceptance criteria | High | Medium | Maintain PRD traceability; change control board; refine AC before sprint commit |
| 2 | Skill gaps in ASP.NET Core/React | High | Medium | Targeted training plan; pair programming; code review; spikes |
| 3 | Integration dependencies (OAuth, email) delayed | Medium | Medium | Mock services; feature flags; decouple integration behind interfaces |
| 4 | Performance/scalability issues in code battle module | High | Medium | Early load testing; profiling; optimize algorithms; caching |
| 5 | Data model misalignment with curriculum import | Medium | Medium | Schema review; sample imports; migration scripts |
| 6 | Schedule risk due to scope creep | High | Medium | Strict MVP scopes; backlog grooming; time boxing; communicate trade-offs |
| 7 | Team availability constraints | Medium | Low | Cross-training; buffer; reassign tasks quickly |

## 2. Management Approach

We will use an agile, sprint-based approach (Scrum-like) with one-week sprints, continuous integration, and incremental releases, Planning emphasizes MVP scope, measurable milestones, and quality gates.

* Iterations: 10 sprints (1 week each)
* Parallel workstreams: Core Player, Competitive & Events, Governance & Academic Integration
* Backlog management: PRD-derived stories prioritized by value and risk
* Definition of Ready: Clear AC, dependencies identified, designs prepared
* Definition of Done: Code + tests + review + CI green + docs updated
* Governance: Weekly steering meeting: change control for scope changes

### 2.1 Project Process

**

Key practices:

* Branching: trunk-based with short-lived feature branches; PR required
* Reviews: mandatory reviewers; linting and static analysis in CI
* Automated checks: build, unit tests, integration tests, coverage thresholds
* Releases: tagged, semantic versioning; release notes linked to PRD stories

### 2.2 Quality Management

Approach to achieve quality objectives:

* Defect Prevention: design reviews, coding standards, static analysis, secure defaults
* Reviewing: PR templates, checklists, mandatory code review for all changes
* Unit Testing: .NET xUnit, React Testing Library, minimum coverage ≥ 70%
* Integration Testing: API + DB tests using in-memory or test containers; Postman collections
* System Testing: end-to-end flows; cross-browser checks; performance smoke tests
* Test Data: deterministic fixtures and seeded data

### 2.3 Training Plan

|  |  |  |  |
| --- | --- | --- | --- |
| Training Area | Participants | When, Duration | Waiver Criteria |
| ASP.NET Core | anhphmse183496, phucunsse183483, andntse183508, tanndse183491 | Week 1-2, 8h | Mandatory |
| React & Typescript | duongndse183456, andntse183508, anhphmse183496 | Week 1-2, 8h | Mandatory |
| Git & Github (Branching, PRs) | All members | Week 1, 4h | Mandatory |
| CI/CD with Github Actions | anhphmse183496, phucunsse183483 | Week 2, 4h | Members with Devops experience |
| Google Cloud | anhphmse183496, phucunsse183483 | Week 3, 4h | Members with Devops experience |
| Test Automation (xUnit, Jest) | All members | Week 2-3, 6h | Prior automation setup |

## 3. Project Deliverables

|  |  |  |  |
| --- | --- | --- | --- |
| **#** | **Deliverable** | **Due Date** | **Notes** |
| 1 | Charter & PMP finalized; ADRs baseline; backlog established; CI/CD baseline | Week 3 | Foundations for parallel workstreams in place |
| 2 | Onboarding & Academic Data; Security baseline; Observability baseline | Week 4 | Route/Class selection; academic data intake |
| 3 | AI Curriculum & Career Alignment; Skill & Stats Foundation; Test automation baseline | Week 5 | Curriculum analysis; quest generation; scoring/XP engine |
| 4 | Dashboard & Arsenal; Dynamic Quest & Notifications; Browser Extension Integration (FPTU & Arsenal) | Week 6 | Interactive skill tree; initial notifications; extension scaffolding |
| 5 | Boss Fights & Leaderboards; Enhanced Browser Extension Integration | Week 7 | Mock exams, scoring; portal sync groundwork |
| 6 | Code Battle & Competitive Events; Event Management & Admin Platform | Week 8 | Matchmaking stub; event creation/scheduling skeleton |
| 7 | Code Battle & Competitive Events; Event Management & Admin Platform | Week 9 | Scoring, leaderboards; approval workflows complete |
| 8 | Academic Integration (FPTU verification, Quest Memory & Recovery); Admin-Owned Governance | Week 10 | Verification & continuity; electives/curriculum admin |
| 9 | Objective System, Knowledge Graph & Rewards; Performance smoke tests; Release management | Week 11 | Objectives, project verification, rewards; versioning and notes |
| 10 | System/Integration tests complete; UAT sign-off; Final release & documentation | Week 12 | Cross-epic integration; RC release; discovery artifacts for future phase |

## 4. Responsibility Assignments

*D~Do; R~Review; S~Support; I~Informed; <blank>- Omitted*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Responsibility** | **AnhPHMSE183496** | **Phucunsse183483** | **AnDNTSE183508** | **TanNDSE183491** | **DuongNDSE183456** |
| Project Planning & Tracking | D | R | S | S | I |
| Prepare Project Introduction Document | S | S | D | R | I |
| Prepare SRS Document (Overview Part) | D | R | S | S | I |
| Prepare SRS Document (User Requirements) | D | R | S | S | I |
| Front-end Specifications & Wireframes | D | I | S | R | S |
| Fullstack Architecture & API Spec | D | S | D | I | I |
| Test Plan & Test Cases | R | D | S | I | I |
| CI/CD & Infrastructure | S | D | S | I | R |
| Release Management | S | D | S | R | I |
| Documentation & Knowledge Base | D | S | S | S | R |

## 5. Project Communications

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Communication Item** | **Who/ Target** | **Purpose** | **When, Frequency** | **Type, Tool, Method(s)** |
| Daily Standup | Development Team, PM | Discuss progress, blockers and plan for the day | Daily | Discord |
| Sprint Planning | Development Team, PM | Plan the work for the upcoming sprint | Every 2 weeks | Discord |
| Sprint Review | All Stakeholders | Demonstrate the work completed in the sprint and gather feedback | Every 2 weeks | Google Meets |
| Product Demo | All Stakeholders | Showcase new features and functionality | As needed | Google Meets, Offline |

## 6. Configuration Management

### 6.1 Document Management

* Repository structure within docs/ with clear subfolders (prd, front-end-spec, fullstack-architecture, project-management)
* Versioning via Git; change history through PRs; release notes for major milestones
* Templates and checklists maintained in .bmad-core and used consistently

### 6.2 Source Code Management

* Branching: trunk-based; feature branches with PRs; protected main branch
* Versioning: semantic versioning (MAJOR.MINOR.PATCH)
* Commit convention: Conventional Commits (feat, fix, docs, chore, refactor, test)
* Code Reviews: 1–2 mandatory reviewers; CI must pass before merge
* CI/CD: GitHub Actions for build/test/deploy; environments staged → production

### 6.3 Tools & Infrastructures

|  |  |
| --- | --- |
| **Category** | **Tools / Infrastructure** |
| **Technology** | Next.js 14+ (FrontEnd), .NET 9 (BackEnd) |
| **Database** | Supabase (PostgreSQL) |
| **IDEs/Editors** | Visual Studio Code, Visual Studio |
| **Diagramming** | DrawIO |
| **Documentation** | Ms Office, Google Docs/Sheets/Slides, Canva, Github |
| **Version Control** | Github (Source Codes), Google Drive (Documents) |
| **Deployment server** | Google Cloud |
| **Project management** | Github (Repository, Projects) |