**Project Proposal: KTI Learn Bonus Portal – Learning Management System with Native Mobile App-version 1**

**1. Project Overview**

**KTI Learn Bonus Portal** is a modern, scalable Learning Management System (LMS) developed using **Laravel** (backend & web interface) and a **Native Mobile App** (Android/iOS). It aims to provide a flexible, feature-rich platform for instructors and learners, with an emphasis on **gamification**, **personalized learning**, and **performance-based rewards**.

**🎯 2. Project Goals and Objectives**

* ✅ Build a secure and scalable web LMS using Laravel
* ✅ Develop a native mobile version for learning on-the-go
* ✅ Enable automatic and randomized quiz generation
* ✅ Integrate performance-based rewards via wallets and bonuses
* ✅ Track learner progress with rich visualizations
* ✅ Create a seamless admin dashboard for management

**🏗️ 3. System Architecture**

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| --- | --- |
| **Component** | **Technology** |
| Backend | Laravel (REST API + Web App) |
| Frontend (Web) | Blade / Vue (optional) |
| Native Mobile App | Kotlin (Android), Swift (iOS) |
| Database | MySQL |
| Charts & Progress | Chart.js (Web), MPAndroidChart / iOS Charts |
| APIs | RESTful API via Laravel Sanctum/Passport |
| Optional Add-ons | Firebase Notifications, M-Pesa/PayPal Integration |

**🔧 4. Detailed Feature Modules and Task Breakdown**

**A. User Management**

**Features:**

* User Registration/Login (Admin, Instructor, Learner)
* Role-based permissions
* Email verification and password recovery

**Tasks:**

* Setup Laravel Breeze/Jetstream authentication
* Create middleware for roles
* Mobile app login integrated via Laravel Sanctum tokens

**B. Course & Content Management**

**Features:**

* Create and manage courses, modules, and lessons
* Support for PDFs, videos, links, and external content
* Publish/unpublish functionality

**Tasks:**

* Create courses, modules, lessons tables
* Admin & instructor dashboard interfaces
* File upload system with cloud/local storage

**C. Reward System**

**C1. Performance Bonus Engine**

* Learners receive bonuses for:
  + Completing lessons/quizzes
  + High quiz scores
  + Course completions
  + Learning streaks
* Configurable reward rules

**C2. Auto-Credit System**

* Automatically credits wallet upon milestone events
* Bonus amounts managed by admin panel
* Stored in wallet\_transactions

**C3. Payout Management**

* Learners can redeem rewards:
  + As course coupons
  + Via withdrawal to M-Pesa/PayPal
* Admin approves payouts with notification

**Tasks:**

* Create wallets and wallet\_transactions tables
* Implement Laravel event listeners for triggers
* Build admin panel to define rules & manage payouts
* Develop APIs to fetch wallet data for mobile app

**D. Random Quiz Generator (Unique for Each Student)**

**Features:**

* Dynamic quiz generation from a question bank
* Shuffles questions & options
* Randomly selects from pool by difficulty
* Stores generated quizzes per user attempt

**Tasks:**

* Design questions, quizzes, quiz\_attempts, and quiz\_attempt\_questions tables
* Laravel service to:
  + Fetch random questions per difficulty
  + Store questions for each attempt
  + Auto-grade and return score
* API for mobile quiz rendering and submission

**E. Wallet & Bonus Tracking**

**Features:**

* Each user has a wallet with:
  + Earned bonuses
  + Spending history
  + Transaction log
* Real-time balance updates
* Redeem options

**Tasks:**

* Wallet creation on registration
* Bonus functions triggered via events (e.g., onQuizCompleted)
* Wallet APIs for mobile and web
* Admin tools to adjust balances

**F. Progress Visualization**

**Features:**

* Track per-user progress:
  + Course completion %
  + Module/lesson engagement
  + Quiz performance over time
* Weekly progress reports
* Leaderboards (optional)

**Tasks:**

* Create progress\_trackers table
* Use Chart.js (web) and MPAndroidChart (mobile)
* Auto-update progress after lesson/quiz completion
* Leaderboard generation script

**G. Native Mobile App (Android & iOS)**

**Features:**

* Course listing, learning modules, video/PDF viewer
* Take quizzes, see scores
* Wallet view, bonus history
* Progress graphs
* Push notifications

**Tasks:**

* Build app using Kotlin (Android) / Swift (iOS)
* Connect to Laravel APIs using Retrofit/Alamofire
* Secure data using Laravel Sanctum tokens
* Store offline progress for later sync (optional)

**H. Admin Dashboard**

**Features:**

* Course/content management
* User & instructor management
* Wallet & reward configuration
* Quiz bank management
* Reports and analytics

**Tasks:**

* Admin panel using Laravel Nova or custom Blade/Vue UI
* Role permissions
* Graphs and exportable reports

**🧮 5. Database Schema Overview (Key Tables)**

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| --- | --- |
| **Table** | **Purpose** |
| users | All platform users |
| courses, modules, lessons | Course structure |
| quizzes, questions | Assessments |
| quiz\_attempts | Stores generated quiz per user |
| wallets | Track user balances |
| wallet\_transactions | Bonus and redemption history |
| progress\_trackers | Learning progress data |
| payouts | Wallet withdrawal requests |

**6. APIs for Mobile App**

|  |  |
| --- | --- |
| **Endpoint** | **Purpose** |
| /api/login | User authentication |
| /api/courses | List available courses |
| /api/quiz/{id}/generate | Random quiz generation |
| /api/wallet | Wallet balance & history |
| /api/progress | Current progress stats |
| /api/bonuses | Bonus trigger/record |
| /api/payouts | Submit payout request |

**7. Project Timeline (Estimated)**

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| --- | --- |
| **Phase** | **Duration** |
| Requirements Gathering & Planning | 1 Week |
| Web LMS Backend & Web Interface | 3 Weeks |
| Reward System & Wallet Module | 2 Weeks |
| Random Quiz Generator Module | 2 Weeks |
| Progress Tracking & Visualization | 1 Week |
| Native Mobile App (Android/iOS) | 4 Weeks |
| Testing & QA | 2 Weeks |
| Deployment & Training | 1 Week |
| **Total** | **~3 Months** |

**💸 8. Cost Estimate**

*(To be filled based on scope, team size, and rates. Can include options for MVP vs full system)*

**🧠 9. Benefits**

* ✅ Engaging and interactive learning experience
* ✅ Financial rewards that drive motivation
* ✅ Fair assessments via randomized quizzes
* ✅ Scalable and secure Laravel backend
* ✅ Available across web and mobile platforms