MoonPath

Meilenstein 2: Machbarkeitsstudie

Team 8 | Apollo

Sokyruk Yeva, Lyzohub Arina, Korniyenko Ulyana, Grigorev Ilia,
Shevchenko Nikita, Trofymenko Anastasiia

09.05.2025

Change Directory

Version	Date	Changes	Initiators
1.0	02.05.2025	Initial draft of the feasibility study	Yeva Sokyruk
1.1	03.05.2025	Current state analysis and goals refined	Anastasia Trofymenko Ulyana Korniyenko
1.2	04.05.2025	Target state functionality described	Nikita Shevchenko
1.3	05.05.2025	Technical and economical feasibility analysed	Ilia Grigorev Arina Lyzohub
1.4	07.05.2025	Project planning charts and descriptions added	Yeva Sokyruk
2.0	10.05.2025	Final version created	Arina Lyzohub

2.1 Introduction

- **Project description**

  MoonPath is a web-based platform that enables students, who want to pursue a career in IT, to experience short-term workday simulations of different IT job roles. It is designed to help them get a realistic insight into various IT careers.
- **Motivation**

  A lot of students struggle with transition from their theoretical studies to real-world practice. The lack of practical experience becomes an obstacle in choosing their IT career path and entering the job market with confidence.
- **Problem Statement**

  Current IT-education often focuses mainly on building theoretical knowledge among students, leaving out practical aspects of this field that are required by employers. We want to help bridging this gap by allowing the students to experience real-life work scenarios, and have an insight into what skills, both technical and soft, are vital in the work environment.

2.2 Current analysis

2.2.1 Market / Trend Analysis

- **Target Group:** The target group of MoonPath are students of computer science and related IT courses, especially in the early semesters, who are still exploring their career options and lack practical experience.
- **Market Overview**
    - E-learning platforms (e.g., Udemy, Coursera) offer specialized courses but lack practical scenarios.
    - Internships provide real-world experience, but are rare, selective, and often require prior experience.
    - Coding bootcamps focus on pure programming skills without the context of real-life roles.
- **Trends:** There is a growing emphasis on practical skills, career preparation, and the development of soft skills. Simulation-based training is gaining increasing importance in fields such as medicine and aviation – but is not yet widely established in IT training.
- **MoonPath's Value Proposition:** MoonPath closes this gap with short-term, job-specific simulations that replicate a realistic IT workplace. Unlike traditional online courses or internships, it offers role immersion, task-based experiences, and competency assessments tailored to the student's chosen IT role.

2.2.2 SWOT Analysis

Strengths - Innovative approach (simulation instead of pure theory) - Web-based, easily accessible - Realistic representation of IT careers	**Weaknesses** - Initial development effort for simulations - Need for industry knowledge for realistic scenarios
Opportunities - High demand for practical training - Integration into universities or career platforms - Opportunity for monetization by companies	**Threats** - Competition from new or existing platforms - Technical effort (e.g., scaling, simulation quality) - Acceptance issues among students or universities

3.1 Must-have Goals

3.1.1 Build 3 Realistic IT Job Simulations

- **Specific:** Develop three role-specific simulations (e.g., software developer, QA engineer, system administrator) that replicate daily IT tasks.
- **Measurable:** All three simulations should be functional and tested with task flow, role context, and AI feedback.
- **Achievable:** Based on current team size and scope, one simulation can be delivered every 4–5 weeks.
- **Relevant:** Core to the platform's goal of providing hands-on IT experience.
- **Time-bound:** Complete all three simulations within 3 months from the start of development.

3.1.2 Improve Career Readiness Through Feedback

- **Specific:** Provide personalized technical and soft-skill feedback using AI after each task and simulation.
- **Measurable:** Post-simulation survey responses should show at least 80% of users feel better prepared for IT careers.
- **Achievable:** AI feedback modules are already part of the planned system; surveys can be integrated with completion flow.
- **Relevant:** Aligns with the platform's mission to bridge theory and practice.
- **Time-bound:** Collect survey data and reach 80% satisfaction within 2 weeks of user testing phase (post-MVP).

3.1.3 Align Simulations with Real Industry Needs

- **Specific:** Consult at least five working IT professionals to shape tasks and scenarios.
- **Measurable:** Incorporate expert feedback into simulation design and document changes.
- **Achievable:** Outreach and consultation can happen in parallel with design phase.
- **Relevant:** Ensures simulations reflect real-world expectations and skills.
- **Time-bound:** Conduct and apply expert consultations within the first 6 weeks of development.

3.1.4 Increase Engagement via Gamification

- **Specific:** Add visual effects, audio cues, and badge-based rewards to simulations.
- **Measurable:** Achieve at least a 70% simulation completion rate and 75% positive UX feedback.
- **Achievable:** Gamification elements are scoped and align with current tech stack.
- **Relevant:** Keeps users motivated and invested in completing simulations.
- **Time-bound:** Reach engagement targets within 1 month after MVP launch.

4.1 Optional Goals

4.1.1 Implement Employer Interaction Module

- **Specific**: Allow employers to invite candidates, view simulation results, add private notes, and rate performance.
- **Measurable**: At least **3 employer test users** should complete candidate reviews in a demo phase.
- **Achievable**: Features are scoped for post-MVP and align with current backend capabilities.
- **Relevant**: Enhances platform value for hiring and real-world evaluation.
- **Time-bound**: Deliver functional employer module **within 2 months after MVP launch**.

4.1.2 Enable Certificate Generation

- **Specific**: Auto-generate a PDF certificate upon simulation completion with name, date, scenario, and verification code.
- **Measurable**: At least **90% of completed simulations** should trigger successful certificate creation.
- **Achievable**: PDF and user data integration is low-complexity.
- **Relevant**: Gives users proof of effort and skill development.
- **Time-bound**: Implement certificate flow **within 4 weeks of MVP**.

Disclaimer: This certificate is not an official accreditation or diploma.

It simply summarizes your simulation performance, the skills you demonstrated, and what you've learned. Think of it as a personal achievement record — not a formal qualification.

4.1.3 Provide Advanced Analytics

- **Specific**: Offer users insights such as average completion time, error frequency, and skill trends.
- **Measurable**: At least **3 distinct analytics features** should be available in the user dashboard.
- **Achievable**: Based on already collected simulation and task data.
- **Relevant**: Supports user self-assessment and iterative learning.
- **Time-bound**: Launch analytics features **within 6 weeks after MVP**.

4.1.4 Offer Multilingual Support

- **Specific**: Add at least **2 additional interface languages** selectable during profile setup.
- **Measurable**: Users should be able to switch language from account settings and complete simulations in their preferred language.
- **Achievable**: UI text is modular and prepared for localization.
- **Relevant**: Increases platform accessibility for non-English speakers.
- **Time-bound**: Release multilingual version **within 2 months** of initial rollout.

4.1.5 Ensure Data Privacy & Security Compliance

- **Specific**: Apply GDPR-compliant account deletion, encrypted storage, and consent-based data sharing.
- **Measurable**: **0 critical privacy breaches** and full compliance checks before public launch.
- **Achievable**: Security features are part of existing architecture (e.g., password hashing, access control).
- **Relevant**: Protects user trust and legal standing.
- **Time-bound**: Full compliance and testing **completed before MVP launch**.

Disclaimer: Your simulation data and personal information are private by default.
We only share your results with employers if you **explicitly give consent**.
You're in full control of what gets shared — nothing is public unless you say so.

5.1 Non-Goals

- **Not a Multi-Level Educational Program**
  The platform is limited to short, one-day simulations. It does not include long-term learning tracks or multiple modules.

- **No Live Mentorship**
  There is no human guidance or expert mentorship. All support is delivered via automated AI-based feedback.

- **Not a Full Recruitment Platform**
  While employers can view candidate results (with consent), the platform does not replace end-to-end HR or job application systems.

- **No Offline Functionality**
  A stable internet connection is required. The platform does not support offline access or usage.

- **Not Designed for Enterprise-Scale Deployment**
  MoonPath is built for moderate usage during the pilot phase. Large-scale deployments (e.g., 100,000+ concurrent users) are not within scope.

- **No Official Accreditation**
  Certificates issued upon completion are for participation only. They are not recognized by government or academic institutions.

6.1 Functional Requirements

6.1.1 Detailed Description of Selected Functions

/LF010/ Create User Account

Use Case Name: Create User Account
Primary Actor: Prospective User (Student or Employer)
Preconditions:

- The prospective user has not yet registered on the platform.

- Internet connection and compatible web browsers are available.

Trigger:

- The user navigates to the registration page and initiates the account creation process.

Main Flow:

- The user clicks on “Sign Up” or “Create Account.”
- The system displays a registration form requesting minimal personal data (name, email) and a secure password (or SSO option).
- The user fills out and submits the form.
- The system validates the input (email format, password complexity).
- The system stores the new account data in the database (password in hashed form).
- The system confirms successful registration and optionally sends a verification email.

Alternate Flow:

- If the user chooses a social login (SSO), the system redirects to the SSO provider and, upon success, returns the user’s verified data.

Postconditions:

- A new user record is created in the database.
- The user can proceed to log in or update profile details.

Possible Exceptions:

- Invalid email format or password strength: The system shows an error and asks for correction.
- Email already in use: The user must choose a different email or log in if it is their existing account.

/LF030/ Start Simulation

Use Case Name: Start Simulation
Primary Actor: Registered Student User

Preconditions:

- The student is logged into the system.
- At least one simulation scenario is available in the platform.

Trigger:

- The user clicks “Start Simulation” on the dashboard.

Main Flow:

- The system prompts the user to select a role or scenario (e.g., Software Developer).
- The user confirms the selection.
- The system loads the chosen scenario, including tasks, resource points, and a countdown timer (up to four hours).
- The system displays the “workday” introduction with context details.
- The simulation begins, and the countdown starts.

Alternate Flow:

- If no paid subscription or valid payment is available (where relevant), the system may prompt for payment before allowing the simulation start.

Postconditions:

- The simulation is now active, and the user can proceed through tasks.
- The system logs the simulation’s start time.

Possible Exceptions:

- No scenarios available: The user is informed that no simulation is currently accessible.
- Network issues: The simulation may fail to load; the user can retry once the connection is restored.

/LF032/ Provide Task Sequence

Use Case Name: Provide Task Sequence
Primary Actor: Registered Student User (actively in a simulation)
Preconditions:

- The user has started a simulation (/LF030/) and is viewing the initial task or scenario introduction.
- The system has a predefined set of tasks associated with the chosen scenario.

Trigger:

- The user begins the simulation or moves from one completed task to the next.

Main Flow:

- The system retrieves the next appropriate task (or set of subtasks) from the scenario data.
- The system displays this task to the user, including any relevant instructions, code snippets, or multiple-choice prompts.
- The user reviews the task details and proceeds to solve or respond.
- After the user submits a response (if applicable), the system records the user's response and updates internal progress tracking.
- If there are more tasks remaining, the system queues up the next task.

Alternate Flow:

- If the task depends on a previous incomplete or failed task, the system may prompt the user to revisit that earlier task before proceeding.
- If the user lacks the necessary permissions (e.g., subscription level) to proceed, the system may require an upgrade/purchase.

Postconditions:

- The system updates the user's simulation progress (e.g., which tasks are completed, which remain).
- The user is either taken to the next task or informed that the simulation is nearing completion if no tasks remain.

Possible Exceptions:

- Task data not found or corrupted: The system shows an error, and the user may have to restart or select a different scenario.

- Connectivity issue or server error: The user may need to reload the page or resume the simulation once the connection is stable.

/LF035/ Provide AI Feedback (Per Task)

Use Case Name: Provide AI Feedback for Task
Primary Actor: Registered Student User (actively in a simulation)
Preconditions:

- The user is in the middle of a simulation and has completed or submitted at least one task's answer.

Trigger:

- The user submits the solution for a given task.

Main Flow:

- The system captures the user's solution (code, multiple-choice response, or text).

- The AI module analyzes the solution against defined rules/test cases.

- The system generates immediate feedback, which may include:

    - Hints for improvement.

    - Identification of errors or missing elements.

    - Positive reinforcement if the solution is correct or well-structured.
    - Evaluation of correctness and excellence of user's solution in percentage

- The user reviews the feedback and decides whether to revise the task (if time/resources allow) or move on.

Alternate Flow:

- If the AI engine fails to process the request (technical glitch), the system shows a generic message to try again or proceed without AI hints.

Postconditions:

- The user sees automated feedback, stored with the task's record.
- The user can mark the given evaluation as saved to remember the correct solution.

Possible Exceptions:

- AI service timeout: The system logs the issue and returns partial or no feedback.
- Malformed user input: The system notifies the user that the submission was invalid.

/LF037/ Pause/Resume Simulation

Use Case Name: Pause/Resume Simulation
Primary Actor: Registered Student User (actively in a simulation)
Preconditions:

- The user has an active simulation in progress.
- The platform allows pauses (depending on policy or subscription level).

Trigger:

- The user clicks a "Pause" button or initiates a pause through the simulation's interface.

Main Flow:

- The user chooses to pause the simulation (e.g., for a short break).
- The system records the exact task where the user paused and the elapsed time.
- The simulation interface switches to a "Paused" state, indicating the user cannot currently submit new answers.

Resume Flow:

- When the user is ready to continue, they click "Resume."
- The system verifies that the user is within the allowed pause limit (if there is one).
- The system restores the simulation state (the current task, progress, resources).
- The user proceeds from the last confirmed point in the simulation.

Alternate Flow:

- For the completion of the simulation a 24-hour limit is given, thus the pause will automatically end after exceeding the limit and the simulation will be inactive.

Postconditions:

- The user's simulation progress remains intact.
- If the time countdown is not paused, the user will have less remaining time upon return.
- The user can continue solving tasks normally once resumed.

Possible Exceptions:

- Technical errors (server or network) during pause/resume: The system might lose track of the last recorded state, forcing the user to restart or resume from an older checkpoint.
- Policy violation (e.g., multiple consecutive pauses beyond allowed threshold): The system may disallow further pauses or automatically terminate the session.

6.1.2 Listing of the Remaining Functions

User Management

- **/LF011/ Log In**
    - **Keywords**: Authentication, Session
    - **Description**: Registered users can log in with their credentials (email + password or SSO). Upon successful login, a secure session is established.
- **/LF012/ Log Out**
    - **Keywords**: Session Management, Security
    - **Description**: End the current user session and clear any authentication tokens.
- **/LF013/ Recover Password**

    - **Keywords**: Reset Mechanism, Email Verification
    - **Description**: Provide a secure password reset process via email link or token.

- **/LF014/ Delete Full Account**
    - **Keywords**: Account Removal, GDPR Compliance
    - **Description**: Permanently remove the user account and all associated personal data.

- **/LF015/ Deactivate Account Temporarily**
    - **Keywords**: Temporary Suspension, Data Retention
    - **Description**: Allow users to suspend their account for a predefined period while retaining data.

User Profile

- **/LF020/ Create Profile**
    - **Keywords**: Personalization, Onboarding
    - **Description**: When registering, users may set up a basic profile (e.g., full name for certificates, role, skill interests).

- **/LF021/ Upload Profile Picture**
    - **Keywords**: Visual Personalization, Profile Customization
    - **Description**: Users can upload a profile picture to personalize their account further.

- **/LF022/ Edit Profile**
    - **Keywords**: Profile Update, Customization
    - **Description**: Users can edit profile details at any time (e.g., education level, interests). Critical changes impacting simulation settings are validated.

- **/LF023/ Remove Partial Profile Data**

    - **Keywords**: Profile Cleanup, Privacy
    - **Description**: A user can remove optional elements of their profile (e.g., interests or nonessential personal info) without deleting the entire account.

- **/LF024/ Indicate Skill Level**
    - **Keywords**: Skill Assessment, Self-Reporting
    - **Description**: Users can self-assess and set their skill level (e.g., beginner, intermediate, advanced) in various IT areas.

- **/LF025/ Set Notification Preferences**
    - **Keywords**: Alerts, Communication
    - **Description**: Users can customize notification methods (email, push, etc.) to receive updates/reminders.

- **/LF026/ Set Language Preferences**
    - **Keywords**: Localization, Multilingual Support
    - **Description**: Users select preferred UI language to better suit their needs.

Platform Usage

- **/LF031/ Track Simulation Timer**
    - **Keywords**: Countdown, Time Tracking
    - **Description**: Displays the real-time countdown until simulation ends.

- **/LF033/ Revisit Tasks**
    - **Keywords**: Task Revision, Iteration
    - **Description**: Allows users to revise incomplete or incorrect tasks before proceeding (time permitting).

- **/LF034/ Send Task Reminder**

    - **Keywords**: Task Revision, Notifications, Reminder
    - **Description**: If a user leaves a task incomplete, the system can remind them to finalize it.

- **/LF036/ Generate Final AI Summary**
    - **Keywords**: Global Analysis, Comprehensive Review
    - **Description**: Provides overall AI assessment of the user's performance at the end of the simulation.

- **/LF038/ Track Resource Usage**
    - **Keywords**: Points, Budget, Time
    - **Description**: Updates resource metrics after each task (time, budget usage) to reflect progress.

Evaluation & Completion

- **/LF040/ Complete Simulation**
    - **Keywords**: End of Simulation, Task Finalization
    - **Description**: The simulation ends automatically when the time limit is reached or tasks are finished.

- **/LF041/ Assess Performance**
    - **Keywords**: Scoring, Recommendations
    - **Description**: Rates the user's performance based on correctness, speed, resource usage.

- **/LF042/ Generate Certificate**
    - **Keywords**: PDF, Verification Code, Proof of Participation
    - **Description**: Produces a PDF certificate upon completion with user's name, date, scenario title, and a unique code.

- **/LF043/ Export Certificate**
    - **Keywords**: Download, Share, Archive
    - **Description**: Users can download or share their certificates; the system can store them for reference.
- **/LF044/ Provide Detailed Final AI Overview**
    - **Keywords**: AI Insights, Global Feedback
    - **Description**: An AI-generated end-of-simulation overview highlighting user patterns, strengths, and weaknesses.

Payment

- **/LF050/ Set Up Payment**
    - **Keywords**: Billing Info, Payment Options
    - **Description**: Allows users to input billing details (credit card, PayPal, etc.) if required for advanced simulations.
- **/LF051/ Process Payment**
    - **Keywords**: Transaction, Secure Checkout
    - **Description**: Integrates with payment gateways; on success, users gain access to paid features.
- **/LF052/ Display Payment History**
    - **Keywords**: Transaction Records, User Dashboard
    - **Description**: Shows users a history of all completed payments and corresponding scenarios.
- **/LF053/ Store Payment Information**
    - **Keywords**: Payment Data, Convenience, Security

    - **Description**: Securely retains user payment details for faster checkouts. Users can manage or delete them.

- **/LF054/ Generate Invoice**
    - **Keywords**: Invoice, Tax Details, Payment Summary
    - **Description**: Users can generate or download a detailed invoice containing payment summary, tax details, and discounts.
- **/LF055/ Notify Payment Failure**
    - **Keywords**: Payment Failure, Notification, Retry
    - **Description**: Alerts user if a payment fails, providing instructions to retry or update payment details.
- **/LF056/ Apply Discounts and Promotions**
    - **Keywords**: Discounts, Promotional Codes, Special Offers
    - **Description**: Allows discount codes or promotional deals; applies them during payment.
- **/LF057/ Request Refund (optional)**
    - **Keywords**: Reversal, Customer Support
    - **Description**: If users cannot access their simulation or face technical issues, they may request a refund under platform policy.

Gamification

- **/LF060/ Display Visual Effects**
    - **Keywords**: Animations, UI Enhancements
    - **Description**: Trigger short visual animations to reward correct answers or achievements without distracting from learning.
- **/LF061/ Play Sound Effects**

- **Keywords**: Audio Cues, Engagement
- **Description**: Brief sounds signal successful tasks or achievements. Users can disable or adjust volume.

- **/LF062/ Grant Rewards**
  - **Keywords**: Badges, Achievements, Motivation
  - **Description**: Users earn badges (“Fast Debugger”) for meeting specific performance criteria.

Administration & Logging

- **/LF070/ Manage Scenarios (Admin Panel)**
  - **Keywords**: Task Editing, Content Updates
  - **Description**: Administrators can add or modify tasks, code checks, feedback logic.
- **/LF071/ Manage Users (Admin Panel)**
  - **Keywords**: Role Assignments, Moderation
  - **Description**: Admins can update user roles, handle reported issues, or suspend accounts.
- **/LF072/ Log and Monitor System**
  - **Keywords**: Logs, Security, Diagnostics
  - **Description**: The system records key events (logins, admin actions) for auditing and troubleshooting.
- **/LF073/ Monitor System in Real Time**
  - **Keywords**: Performance, User Activity, System Health
  - **Description**: Admins can track performance metrics and user activities, enabling proactive interventions.

Employer Features

- **/LF080/ Invite Candidates**
    - **Keywords**: Unique Links, Candidate Onboarding
    - **Description**: Employers create invite links for candidates; with candidate consent, employers can view simulation results.
- **/LF081/ Add Employer Comments**
    - **Keywords**: Candidate Assessment, Private Notes
    - **Description**: Employers can add personal notes about candidate results, invisible to the candidate.
- **/LF082/ Rate Candidates**
    - **Keywords**: Candidate Evaluation, Rating
    - **Description**: Employers assign ratings (e.g., “Excellent,” “Needs Improvement”) based on simulation performance.

Repeated Simulation & Advanced Analytics

- **/LF090/ Repeat Simulation**
    - **Keywords**: Replay, History, “One-Day” Format
    - **Description**: Users can retake simulations for practice. The system may restrict frequent replays to maintain challenge.
- **/LF091/ Provide Advanced Analytics**
    - **Keywords**: Statistics, Leaderboards, Comparative Data
    - **Description**: Generates in-depth reports (average completion times, top errors, resource usage) for user self-review or institutional oversight.

6.2 Non-Functional Requirements / Product Performance

- **/LL010/ Ensure System Usability**

    - **Keywords**: User-Friendly Interface, Navigation

    - **Description**: The platform must offer a clear, intuitive UI for both students and employers, including concise instructions, help features, and an FAQ section.

- **/LL020/ Guarantee Performance & Scalability**

    - **Keywords**: Response Time, Scalability

    - **Description**: AI checks and feedback should occur within a few seconds. Support for at least several hundred concurrent users. A queue may be used during high load.

- **/LL030/ Maintain Reliability & Availability**

    - **Keywords**: Autosave, High Uptime

    - **Description**: The system saves progress after each task and aims for 99%+ uptime. Planned downtime is announced.

- **/LL040/ Enforce Security**

    - **Keywords**: HTTPS, Password Hashing, Sandbox

    - **Description**: All communication uses HTTPS; passwords are hashed. User-submitted code is sandboxed to prevent malicious exploits.

- **/LL050/ Preserve Privacy & Confidentiality**

    - **Keywords**: GDPR, Consent, Data Retention

    - **Description**: Store personal data only as long as necessary. Share results solely upon explicit consent.

- **/LL060/ Provide Ethical & Accurate AI**

    - **Keywords**: Non-Discriminatory, Prompt Correction of Errors

    - **Description**: AI feedback must avoid bias/offensive output; logic mistakes should be corrected promptly.

- **/LL070/ Support Extensibility**

    - **Keywords**: Modular Architecture, Future Role Support
    - **Description**: The architecture allows new scenarios or expanded AI rules with minimal code changes.

- **/LL080/ Ensure Cross-Platform Compatibility**
    - **Keywords**: Modern Browsers, Responsive Design
    - **Description**: Works on major OS and browsers. Optimized for desktop but responsive for mobile/tablets as feasible.

- **/LL090/ Comply with Legal & Licensing Requirements**
    - **Keywords**: Copyright, Third-Party Licenses
    - **Description**: Adhere to all relevant licenses and legal regulations, including disclaimers for certificate validity.

- **/LL100/ Maintain Comprehensive Project Documentation**
    - **Keywords**: Version Control, GitHub, Roles
    - **Description**: Store code and documentation in version-controlled repositories. Use separate branches/folders for each team role.

6.3 Product Data

- **/LD010/ User-Related Data**
    - **Keywords**: Credentials, Roles, Profile
    - **Description**: Includes email, hashed password, user role (student/employer). May also include optional info like name, skill interests.

- **/LD020/ Simulation Scenario Data**
    - **Keywords**: Tasks, Test Cases, AI Feedback Logic
    - **Description**: Defines tasks, solutions, and scenario content. Editable via admin panel.

- **/LD030/ Simulation Records**
    - **Keywords**: Submissions, Time Stamps, Results
    - **Description**: Logs user answers, usage of resources, and final performance for analytics.
- **/LD040/ AI Feedback Data**
    - **Keywords**: Automated Hints, Analysis, Recommendations
    - **Description**: Stores AI-generated feedback and evaluations per user submission.
- **/LD050/ Certification Data**
    - **Keywords**: PDF Files, Verification Codes
    - **Description**: Holds info (scenario name, date, user ID) needed for generating and verifying completion certificates.
- **/LD060/ Employer Notes**
    - **Keywords**: Private Comments, Skill Assessments
    - **Description**: Employers' private notes on candidates. Invisible to the candidate.
- **/LD070/ System Internals**
    - **Keywords**: Auditing, Security Logs
    - **Description**: Stores logs of user sign-ins, admin actions, system errors for troubleshooting and compliance.
- **/LD080/ Analytical Insights**
    - **Keywords**: Aggregated Statistics, Anonymization
    - **Description**: Collects anonymized usage data (errors, completion times) to improve scenarios and produce internal analytics.
- **/LD090/ Billing & Payment Data**

- **Keywords**: Transactions, Payment Status, Secure Storage
- **Description**: Contains payment records, receipts, invoices, and subscription details. Must be securely stored to meet industry standards.

7.1 Technical feasibility (3 options):

Monolithic Architecture	Microservices Architecture	Serverless Architecture
Core: Django + Django REST Framework	API Gateway: Node.js	Frontend: React on S3 + CloudFront
Frontend: React + TypeScript	User & Simulation API: NestJS + TypeORM + PostgreSQL	API Layer: AWS API Gateway → AWS Lambda (Node.js)
Tasks: Celery + Redis	AI Service: Python + FastAPI + OpenAI SDK	AI Processing: Python Lambda calls OpenAI
Database: PostgreSQL	Code Runner: Go + Docker SDK + gVisor	Code Execution: Lambda container (Docker) in Firecracker
Sandbox: Docker-in-Docker	Orchestration: Kubernetes	Orchestration: AWS Step Functions
AI: Python + OpenAI SDK		Storage: DynamoDB + S3
Deploy: Docker + Nginx on AWS		

Criterion	Monolithic	n/5	Microservices	n/5	Serverless	n/5
Scalability	Entire app	2	Per service	5	Instant scale	5
Performance	Low latency	4	Network overhead	4	Cold start	3
Isolation	App sandbox	2	Isolated services	5	Platform sandbox	5
Complexity	Low complexity	5	High complexity	1	Medium complexity	3
Extensibility	Some modularity	1	Highly modular	5	Modular functions	3
Cost-efficiency	Easy pilot	4	Efficient scaling	4	Pay-per-use	5

7.1.1 Total Scores (our subjective assessment):

- Monolithic Architecture: **18**
- Microservices Architecture: **24**
- Serverless Architecture: **24**

7.1.2 Conclusions:

- **Monolithic** is ideal for a rapid MVP with minimal operational overhead, but will face scaling and maintenance challenges long-term.
- **Microservices** and **Serverless** both lead in total score; microservices delivers robust control, clear service boundaries and predictable performance under load, while serverless excels in resource efficiency and on-demand scaling.

8.1 Stakeholder Analysis

Stakeholder	Interest	Expectation	Influence
Student	Gain practical IT experience and career clarity through simulations	- Realistic tasks - Gamified learning - Personalized AI feedback	High – primary users; satisfaction drives platform success and iteration.

Team Members	Successfully develop and deliver a high-quality, impactful product.	- Clear task distribution - Healthy team communication - Timely feedback from stakeholders.	High – responsible for execution, scope decisions, and product quality.
Board Members	Strategic oversight and success of the project in alignment with company goals.	- Regular updates - Risk mitigation, market potential, and alignment with long-term vision.	High – decision-makers for funding, direction, and future scaling

9.1 Risk Analysis

Risk Name	Risk Description	Priority	Risk Cost	Occurrence Probability	Expected Risk Cost	Delay (Weeks)	Preventive / Corrective Measures
AI Compliance Issues	Legal or ethical limits on AI feedback (e.g., GDPR, bias concerns)		€5,000	20%	€1,000	1.0	Ensure GDPR compliance, avoid personal data in AI, document AI use clearly
Robotization of IT Roles	Simulated jobs may become outdated due to automation trends		€3,000	10%	€300	0.5	Monitor job market, create flexible scenarios, refresh content annually
Strong Market Competitor	A better-funded competitor launches a similar platform		€7,000	25%	€1,750	1.5	Focus on gamification, career alignment, and user experience to build niche

Privacy Breach / Data Leak	User data exposed or misused due to weak security practices		€10,000	10%	€1,000	2.0	Enforce encryption, consent-based data sharing, security reviews
Low User Engagement	Users don't finish simulations due to low motivation or unclear instructions		€6,000	30%	€1,800	2.0	Add gamification, engaging UI/UX, and user onboarding
Technical Downtime	Platform crashes, freezes, or data is lost during simulation		€5,000	20%	€1,000	1.0	Use a stable tech stack, add autosave, perform regular testing
Unrealistic Scope / Burnout	Team overestimates capacity, causing delays or low quality		€4,000	30%	€1,200	1.5	Define strict MVP, balance workload, hold weekly check-ins
Total Mitigation Cost	**Total sum of all mitigation costs**						€5,800

10.1 Effort Estimation

10.1.1 Work Breakdown Structure (WBS)

The MoonPath project involves several key work packages, which will be estimated in terms of person-days. Below is a breakdown of the major components of the project based on the product features and functional requirements.

- **User Management**
  - **User Account Creation**: Implementing user registration (LF010).
  - **Login/Logout and Session Management**: User authentication and session management (LF011, LF012).

    - **Password Recovery and Account Deletion**: Handling account recovery and deletion (LF013, LF014).
- **Profile Management**
    - **Profile Creation and Customization**: Creating and customizing user profiles (LF020, LF021).
    - **Skill Level Indicators and Notification Preferences**: Adding skill assessments and setting up notifications (LF024, LF025).
- **Simulation and Task Management**
    - **Simulation Setup and Execution**: Setting up tasks, managing simulation timers, and handling task sequences (LF030, LF031, LF032).
    - **AI Feedback and Task Revision**: Integrating AI feedback after task submissions and enabling revisiting tasks (LF035, LF033).
- **Payment Processing (If Required)**
    - **Payment Setup and History**: Implementing payment systems for access to full features (LF050, LF052).
    - **Invoice Generation and Failed Payment Notifications**: Managing payment failures and generating invoices (LF054, LF055).
- **Gamification and Rewards**
    - **Reward System**: Implementing a system of badges and achievements for simulation performance (LF062).
- **Admin Panel and Monitoring**
    - **Admin Panel for Scenario Management and User Management**: Developing tools for admins to manage tasks, scenarios, and users (LF070, LF071).
    - **System Logging and Real-Time Monitoring**: Implementing logs and real-time system health monitoring (LF072, LF073).

10.1.2 Effort Estimation Method

We will apply a combination of **Expert Estimation** and **Analogous Estimation** to estimate the effort in person-days.

Expert Estimation will be used for tasks that require specialized knowledge, such as integrating AI feedback, implementing user account management, and designing complex simulations.

Analogous Estimation will be used for tasks that are similar to those completed in previous projects or systems. For example, user login and session management is a standard task that we can estimate based on previous similar platforms.

We will also use **Scenario-Based Estimation** for uncertainty, especially for tasks involving AI feedback integration and gamification. This method allows us to estimate best-case, most likely, and worst-case scenarios for the effort required.

10.1.3 Effort Estimation (Person-Days)

Using the **Expert Estimation** method, we estimate the following efforts for each work package:

Work Package	Estimated Effort (Person-Days)
User Account Creation	3 person-days
Login/Logout & Session Management	2 person-days
Password Recovery & Account Deletion	2 person-days
Profile Creation & Customization	4 person-days
Skill Level & Notification Preferences	3 person-days
Simulation Setup & Execution	8 person-days
AI Feedback & Task Revision	10 person-days
Payment Processing	5 person-days
Reward System	4 person-days
Admin Panel & Monitoring	6 person-days

10.1.4 Total Estimated Effort

The total estimated effort in person-days for the MoonPath project is the sum of the efforts for each work package:

- **Total Effort (Person-Days)** = 3 + 2 + 2 + 4 + 3 + 8 + 10 + 5 + 4 + 6 = **47 Person-Days**

10.1.5 Documentation of Effort Estimation

The above estimations are based on the following assumptions and methodology:

1. **Expert Estimation**: Based on input from the development team, considering the complexity of tasks such as integrating AI feedback and creating user management systems.
2. **Analogous Estimation**: For common tasks such as login/logout management and payment processing, we drew on estimates from previous projects with similar functionalities.

3. **Scenario-Based Estimation**: For tasks with inherent uncertainty (like AI feedback integration and gamification), we estimated three scenarios (optimistic, realistic, and pessimistic) and used the most likely scenario for our effort estimates.

The breakdown of work packages ensures that every aspect of the platform development is accounted for, and the effort is aligned with the complexity of each task. This effort estimation can be used for planning resources, managing timelines, and evaluating progress throughout the project.

8.1 Cost Estimation

8.1.1 Project Labor Costs

The labor costs are calculated based on the estimated person-days for each work package and the updated project timeline of **10 months**. The following roles and daily rates are assumed:

- **Developer/Technical Staff**: €500 per day
- **Project Manager/Coordinator**: €600 per day
- **UI/UX Designer**: €450 per day
- **QA Tester**: €400 per day

Additionally, we specify the timeline and total duration (in months) for each role. The cost table below reflects the updated estimates for **10 months**:

Work Package	Estimated Effort (Person-Days)	Role	Daily Rate (€)	Labor Cost (€)	Timeline	Total Duration (Months)
User Account Creation	3	Front-End Developer	500	1,500	4 months	4
Login/Logout & Session Management	2	Front-End Developer	500	1,000	4 months	4
Password Recovery & Account Deletion	2	Back-End Developer	500	1,000	4 months	4
Profile Creation & Customization	4	Front-End Developer	500	2,000	4 months	4
Skill Level & Notification Preferences	3	Front-End Developer	500	1,500	4 months	4

Simulation Setup & Execution	8	Full-Stack Developer	500	4,000	5 months	5
AI Feedback & Task Revision	10	AI Expert, Back-End Developer	600	6,000	6 months	6
Payment Processing	5	Back-End Developer	500	2,500	2 months	2
Reward System	4	Front-End Developer	500	2,000	2 months	2
Admin Panel & Monitoring	6	Back-End Developer, Admin	600	3,600	10 months	10

Total Labor Cost: €1,500 + €1,000 + €1,000 + €2,000 + €1,500 + €4,000 + €6,000 + €2,500 + €2,000 + €3,600 = €24,100

8.1.2. Additional Project Costs

These costs are based on the extended project timeline of **10 months** and additional resources required for the project:

Cost Category	Description	Cost (€)
Materials	Software tools, development environments	2,000
Hardware	Computers, devices, servers for testing & deployment	4,000
Server Hosting	Monthly server cost for running simulations (for 10 months)	20,000
Licenses	Software licenses (AI tools, databases)	3,000
Miscellaneous	Office supplies, communication tools, etc.	1,000
Total Additional Costs		€30,000

8.1.3. Total Project Costs

Now, let's calculate the total project costs by adding the **labor costs** and the **additional costs** based on the **10-month duration**:

Cost Type	Amount (€)
Labor Costs	24,100
Additional Costs	30,000
Total Project Cost	€54,100

8.1.4. Expected Benefits

- **Revenue from Paid Users**: With a subscription fee of €50 per user and an expected user base of 2,000 users in the first year, the revenue would be €100,000.
- **Value to Students and Employers**: The platform provides career-ready skills, increasing employability, and offering employers access to a skilled talent pool.
- **Future Revenue**: Future monetization strategies (premium certifications, employer recruitment services) could generate additional income.

8.1.5. Economic Feasibility

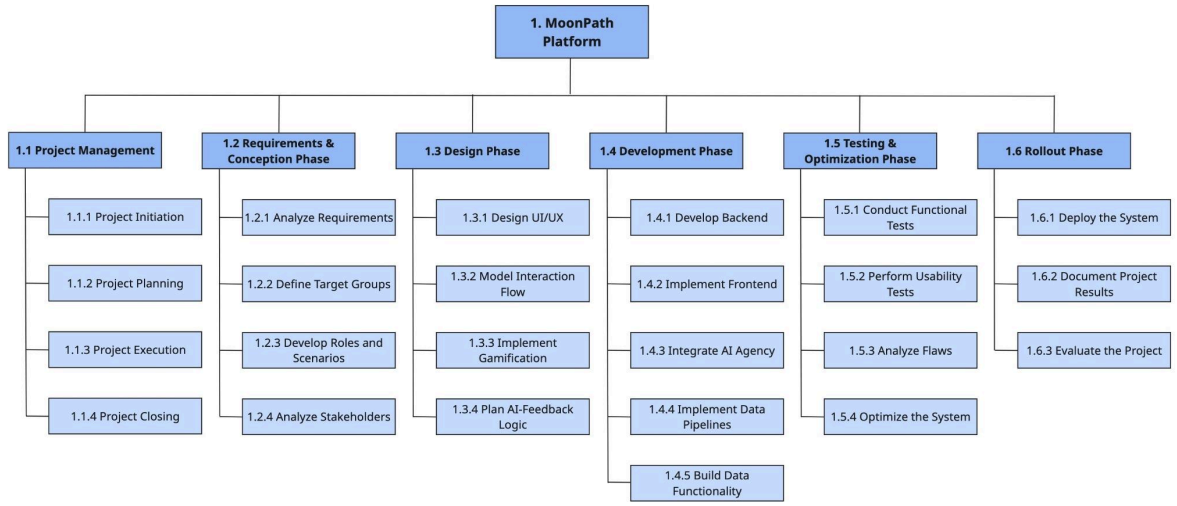
- Total Project Cost: €54,100
- Expected Revenue from 2,000 Users in First Year: €100,000

The expected revenue significantly exceeds the project costs, indicating a strong return on investment (ROI).

8.1.6. Conclusion

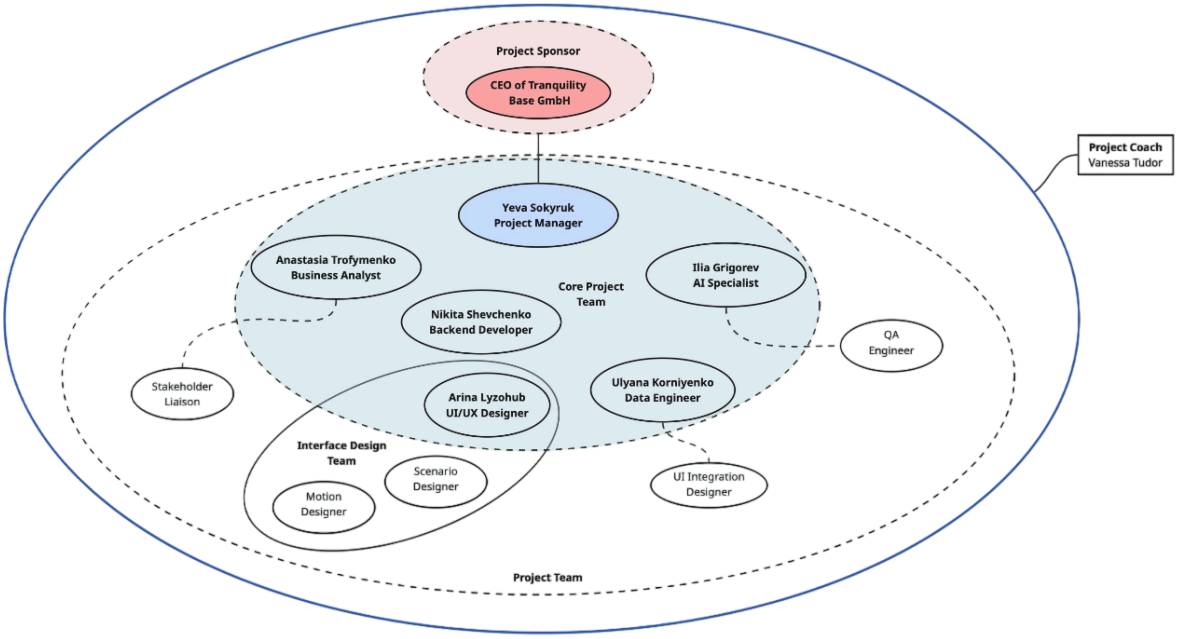
The **MoonPath** project is **economically sensible** and **feasible**. With a total project cost of **€54,100** and an expected revenue of **€100,000** from the first 2,000 users, the project is set to deliver a **strong financial return**. The extended timeline and clear team member involvement ensure a more realistic and manageable approach to meeting the project's goals, with high potential for growth and scalability in the growing IT career readiness market.

9.1. Project Planning - Work Breakdown Structure



9.2. Project Organization

9.2.1. Organizational Chart



9.2.2. Rolles and Responsibilities

Core Project Team Member	Role	Primary Responsibilities (WBS)
Yeva Sokyruk	Project Manager	1.1 Project Management 1.6.3 Evaluate the Project
Anastasia Trofymenko	Business Analyst	1.2.1 Analyze Requirements 1.2.2 Define Target Groups 1.2.4 Analyze Stakeholders
Nikita Shevchenko	Backend Developer	1.4.1 Develop Backend 1.4.5 Build Data Functionality
Arina Lyzohub	UI/UX Designer	1.3.1 Design UI/UX, 1.3.2 Model Interaction Flow
Ilia Grigorev	AI Specialist	1.3.4 Plan AI-Feedback Logic, 1.4.3 Integrate AI Agency
Ulyana Korniyenko	Data Engineer	1.4.4 Implement Data Pipelines 1.4.5 Build Data Functionality

9.3. Milestone Plan

WBS-code	Milestone	Baseline Date	Current Planned Date	Actual Date
1.2	Project requirements and conceptions defined	24.03.2025	31.03.2025	03.04.2025
1.3.1	UI/UX design of the platform completed	26.04.2025	09.05.2025	-
1.4.1	Core functions implemented	28.07.2025	04.08.2025	-
1.4.3	AI integration module and agency implemented	15.12.2025	12.01.2026	-
1.5.2	Usability testing performed	23.02.2026	09.03.2026	-
1.6.3	Project successfully evaluated	06.04.2026	20.04.2026	-

10.1 Management Summary

MoonPath is a web-based platform designed to bridge the gap between theoretical IT education and practical career readiness by offering students realistic, short-term simulations of various IT job roles. Market analysis shows a clear demand for hands-on, scenario-based training in IT education, differentiating MoonPath from traditional e-learning platforms, internships, and coding bootcamps.

The feasibility study demonstrates strong technical viability. Initial implementation will use a modular monolithic architecture due to its simplicity and speed of deployment. With growth, a transition to microservices architecture leveraging Kubernetes is planned for scalability and robust performance. Serverless solutions are recommended selectively for event-driven tasks.

Economically, the project is highly feasible with estimated total costs of approximately €40,100, covering labor, materials, hardware, server hosting, and licenses. Expected revenues from initial user engagement (2,000 users at €50 per user) are projected at €100,000, indicating a strong return on investment.

Key risks identified include potential AI compliance issues, data privacy breaches, technical downtime, and user engagement. These risks have well-defined and achievable mitigation strategies, including strict GDPR adherence, robust security measures, regular system testing, and gamification to maintain user motivation.

In conclusion, the MoonPath project is technically sound, economically attractive, and strategically aligned with current educational trends. It is recommended for immediate implementation with phased scaling based on initial success metrics.

References

Diagrams in 9.1-9.2 were created with the help of Miro: https://miro.com/app/dashboard/

Functional requirement were refined based on: Functional Requirements and Use CasesBredemeyer Consultinghttps://www.bredemeyer.com › pdf_files › functreq