



# MoonPath

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## Meilenstein 3: Pflichtenheft

**Team 8 | Apollo**

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## 1.1 Pflichtenheft

MoonPath is a web-based simulation platform designed to help IT students gain exposure to real-world workplaces. It aids in bridging the gap between academic theory and practical skills that employers value. Our platform enables students to take on different work positions in a variety of IT-fields by engaging in simulations and trying out a dreamed profession, such as software developer, business analyst, system administrator and many more.

The platform not only allows you to get a real workplace experience and outlines the vital skills, but also provides personalized feedback and guidance, making it a valuable tool for career orientation, university career centers, and entry-level professionals.

## 2.1 IST - Analyse

The current focus of IT education is largely based on theoretical knowledge. While platforms like Coursera and Udemy offer online courses, they often lack direct application of acquired skills in simulated real-world environments. Practical experience can be gained through internships, but they are limited, competitive, and often unavailable to students in the early stages of their studies.

Currently there is no widely accessible digital solution that combines guided learning, personalized feedback and job simulation in a low-stakes environment. MoonPath addresses this gap by providing scenario-based simulations that assist users in identifying their strengths and areas of interest in the IT job market.

SWOT analysis provided below has revealed significant opportunities for such a solution in both academic and corporate learning environments.

<b>Strengths</b> <ul style="list-style-type: none"><li>- Innovative approach (simulation instead of pure theory)</li><li>- Web-based, easily accessible</li><li>- Realistic representation of IT careers</li></ul>	<b>Weaknesses</b> <ul style="list-style-type: none"><li>- Initial development effort for simulations</li><li>- Need for industry knowledge for realistic scenarios</li></ul>
<b>Opportunities</b> <ul style="list-style-type: none"><li>- High demand for practical training</li><li>- Integration into universities or career platforms</li><li>- Opportunity for monetization by</li></ul>	<b>Threats</b> <ul style="list-style-type: none"><li>- Competition from new or existing platforms</li><li>- Technical effort (e.g., scaling, simulation quality)</li></ul>

companies	- Acceptance issues among students or universities
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## 3.1 Zielbestimmung

MoonPath's objective is to eventually offer simulations for multiple IT roles to help IT students gain real-world insights and boost their job readiness. Before the initial launch, we will focus on preparing three core simulations as a starting point, with additional roles to be implemented in future updates.

### 3.1.1 Must-have Goals

**1 Create three role-specific, realistic job simulations** (software developer, QA engineer, and system administrator) that replicate daily IT tasks and include integrated AI-based feedback, aiming for delivery within 3 months to support the platform's hands-on learning approach.

**2 Provide personalized, AI-powered feedback** after each simulation to help users improve technical and soft skills, with a goal of at least 80% of users feeling more prepared for IT careers, measured through post-simulation surveys within 2 weeks of testing.

**3 Incorporate feedback from at least five working IT professionals** within the first 6 weeks of development to ensure the simulations accurately reflect real-world job requirements and skill sets.

**4 Integrate visual effects, audio cues, and badge-based rewards** to increase user engagement in simulations, aiming for a 70% completion rate and 75% positive UX feedback within 1 month of MVP launch.

### 3.1.2 Optional Goals (for future updates)

**1 Develop an employer interaction module** within 2 months of MVP launch to enable employers to invite candidates, view simulation results, add private notes, and rate performance, with at least 3 employer test users participating in a demo phase.

**2 Enable PDF certificate generation** for simulation completions within 4 weeks of MVP launch, with at least 90% of completed simulations successfully creating a personal achievement record for users.

**3 Add advanced analytics features** like average completion time, error frequency, and skill trends to the user dashboard within 6 weeks of MVP launch to support self-assessment and learning.

**4 Introduce at least two additional interface languages** selectable during profile setup within 2 months of initial rollout, allowing users to complete simulations in their preferred language.

**5 Ensure full data privacy and security compliance** before MVP launch, including GDPR-compliant account deletion, encrypted storage, and explicit consent-based data sharing, with no critical privacy breaches.

### **3.1.2 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**

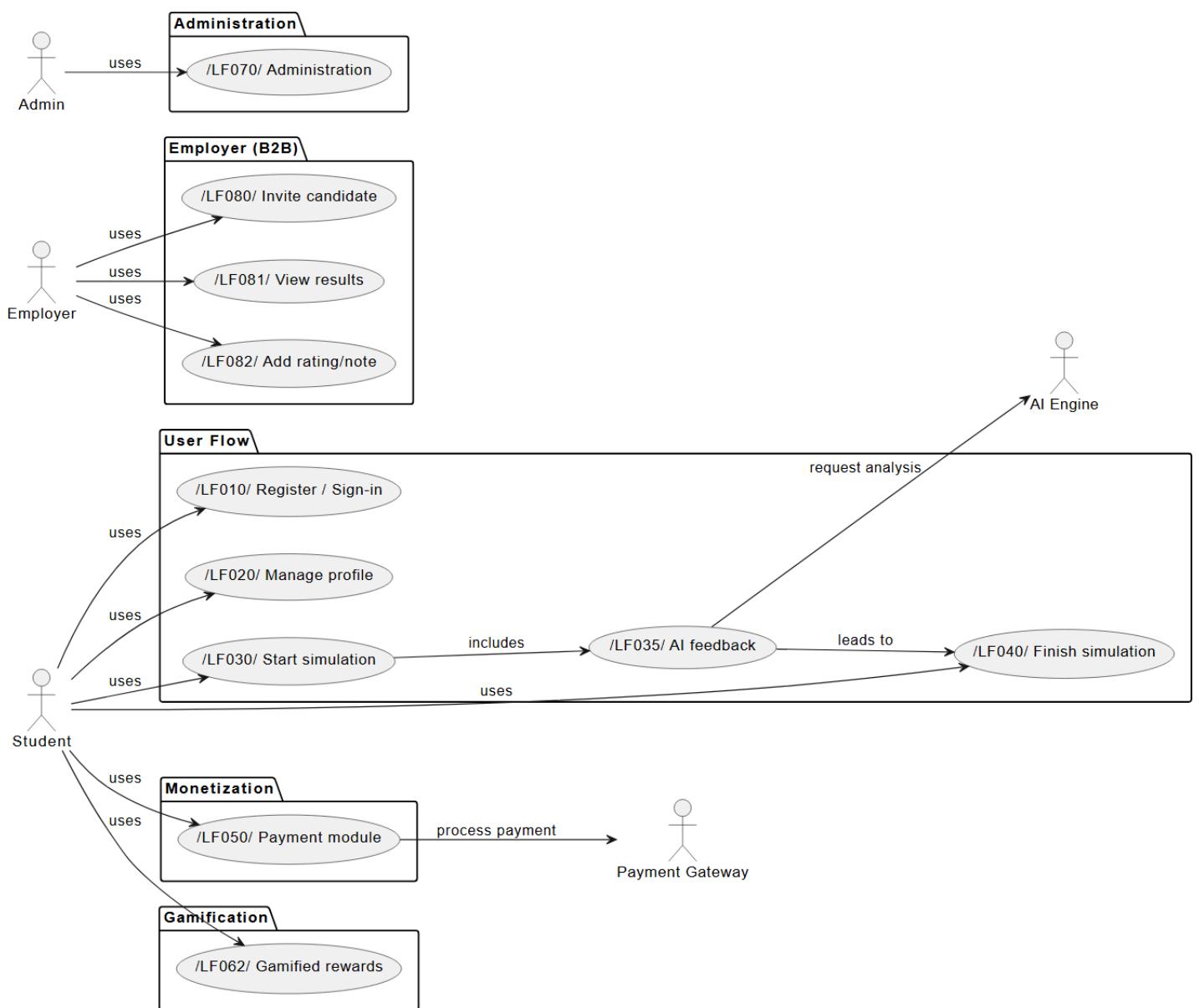
Deployment MoonPath is built for moderate usage during the pilot phase. Large-scale deployments (e.g., 100,000+ concurrent users) are not within scope.

- **No Official Accreditation**

Certificates issued upon completion are for participation only. They are not recognized by government or academic institutions.

## 4.1 SOLL - Zustand

ID	Short title	Goal of the action	Primary actor	Short flow
/LF010/	Registration & sign-in	Grant secure access to the platform	User	Create account → confirm email → sign-in / sign-out → password reset → temporary deactivation → full deletion
/LF020/	Profile management	Personalise the experience	User	Edit profile data, choose UI language, upload photo, set skill level, notification settings
/LF030/	Start simulation	Immerse into a “work-day”	Student	Pick scenario → start timer → receive tasks → submit answers
/LF035/	AI feedback	Instant coaching	AI engine	Analyse each answer → return hints & score → produce final report
/LF040/	Finish simulation	Record the result	System	Calculate total score → create certificate → store history entry
/LF050/	Payment module	Monetisation	User, Payment gateway	Subscribe, one-off purchase, invoices, refunds
/LF062/	Gamified rewards	Boost motivation	System	Grant badges, trigger visual / sound effects
/LF070/	Administration	Maintain content	Administrator	CRUD scenarios, moderate users, audit logs
/LF080–082/	B2B functions	Candidate assessment	Employer	Send invite links, view results, add private notes & ratings



#### 4.1.1 Nichtfunktionale Anforderungen / Produktleistungen

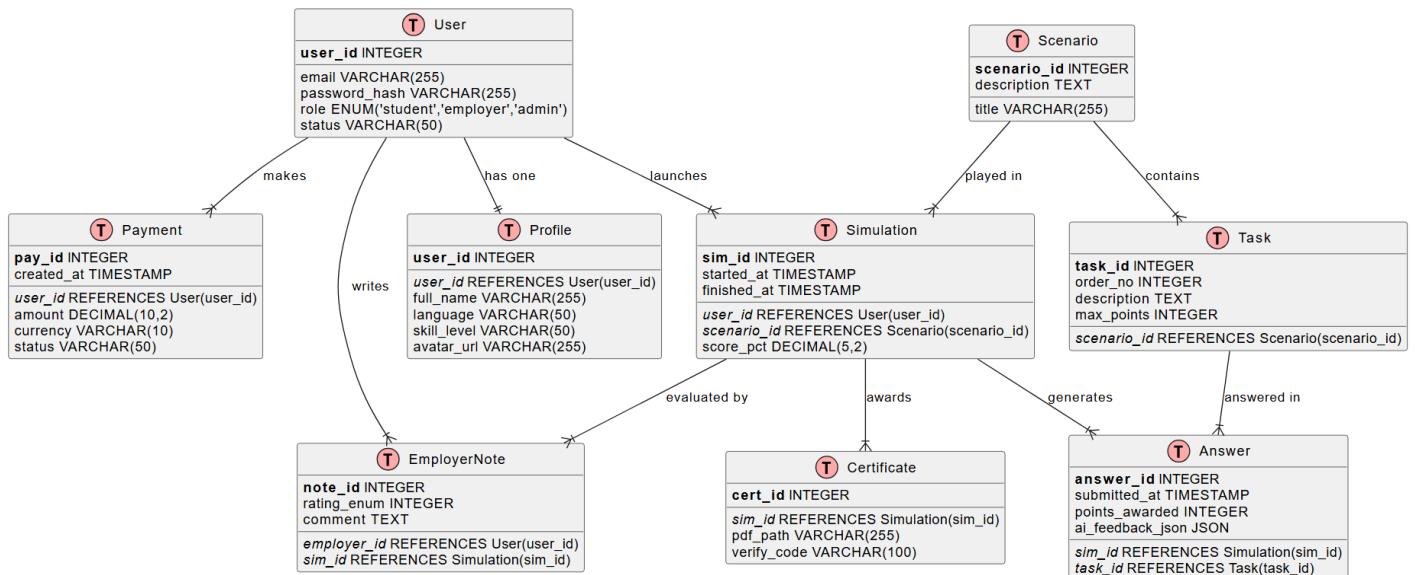
Code	Category	SMART requirement
<b>/LL010/</b> Usability		$\geq 90\%$ of users reach Start Simulation in $\leq 3$ clicks on desktop ( $\geq 1280$ px) and $\leq 5$ taps on mobile ( $\geq 360$ px). Verified by task-based usability tests each release.
<b>/LL020/</b> Performance		95-percentile API latency $< 400$ ms under 1 000 concurrent sessions (Locust benchmark, quarterly report).

<b>/LL030/ Availability</b>	Monthly uptime $\geq 99.5\%$ ; autosave every 30 s → worst-case progress loss $\leq 30$ s. Measured via uptime-robot & crash-replay tests.
<b>/LL040/ Security</b>	Zero critical / high issues per OWASP Top-10 scan; passwords → Argon2id ( $t \geq 2$ , $p \geq 1$ , $m \geq 64$ MB); all transport via TLS 1.3.
<b>/LL050/ Privacy</b>	GDPR: account deletion completed $< 24$ h; all personal data AES-256-GCM at rest; retention period $\leq 12$ months unless legal hold.
<b>/LL060/ Maintainability</b>	Code quality rating $\geq B$ in SonarQube; unit-test coverage $\geq 80\%$ for backend; lint pass before merge.
<b>/LL070/ Extensibility</b>	New simulation scenario added only by YAML + Markdown, no core-code edits; deployment $\leq 1$ hour including QA smoke test.
<b>/LL080/ Localisation</b>	Full UI in English, German, Russian; any new string translated within 5 working days after freeze.
<b>/LL090/ Compatibility</b>	Supports Chrome 112+, Firefox 122+, Safari 17+ (desktop); mobile PWA passes Lighthouse score $\geq 90$ .

#### 4.1.2 Produktdaten

Entity	PK / FK	Main attributes
User	<b>user_id</b> (PK)	email, password_hash, role {student / employer / admin}, status
Profile	<b>user_id</b> (PK, FK → User)	full_name, language, skill_level, avatar_url
Scenario	<b>scenario_id</b> (PK)	title, description
Simulation	<b>sim_id</b> (PK)	user_id (FK → User), scenario_id (FK → Scenario), started_at, finished_at, score_pct
Task	<b>task_id</b> (PK)	scenario_id (FK → Scenario), order_no, description, max_points
Answer	<b>answer_id</b> (PK)	sim_id (FK → Simulation), task_id (FK → Task), submitted_at, points_awarded, ai_feedback_json
Certificate	<b>cert_id</b> (PK)	sim_id (FK → Simulation), pdf_path, verify_code

<b>Payment</b>	<b>pay_id (PK)</b>	user_id (FK → User), amount, currency, status, created_at
<b>Employer Note</b>	<b>note_id (PK)</b>	employer_id (FK → User — role = employer), sim_id (FK → Simulation), rating_enum, comment



## 5.1 Technisches/Fachliches Lösungskonzept

### 5.1.1 Technologien

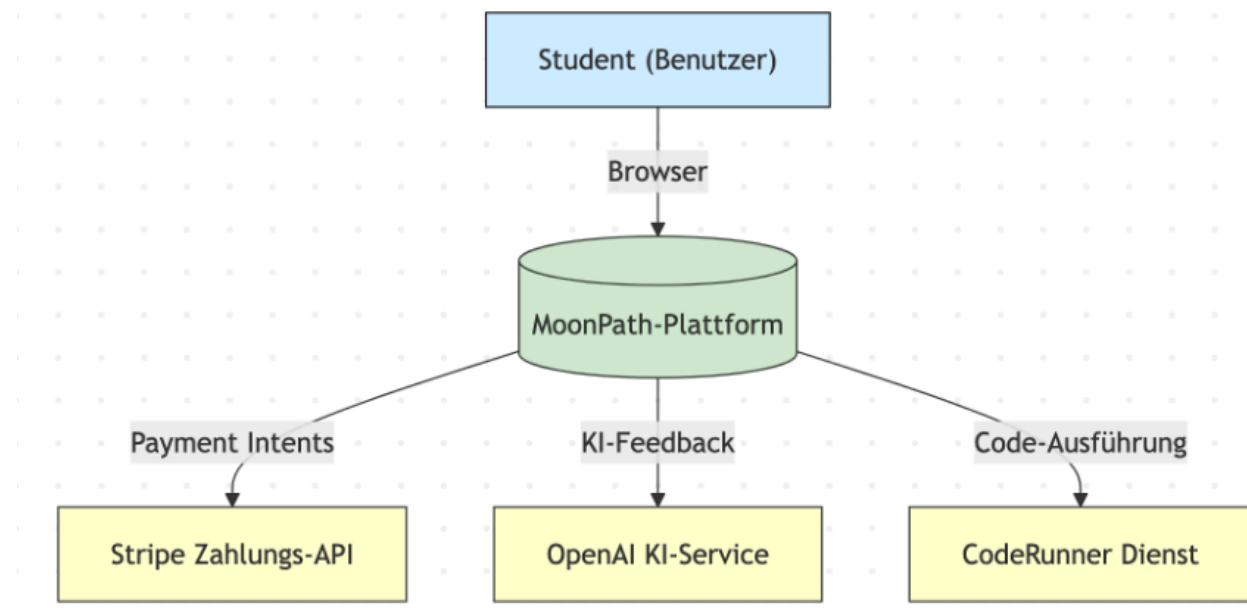
Die folgende Tabelle listet alle eingesetzten Technologien auf.

Name	Version	Kategorie	Rolle/Zweck
Python	3.11	Programmiersprache	Backend-Services, KI-Skripte
TypeScript	5.0	Programmiersprache	Frontend (React) & Node-Services
Node.js	18.x (LTS)	Laufzeit/Plattform	Serverless-Laufzeit (AWS Lambda)
React	18.2.0	Frontend-Framework	SPA-UI für Studierende
NestJS	10.0.0	Backend-Framework (Node)	REST-API & Geschäftslogik
TypeORM	0.3.x	ORM-Bibliothek	Datenzugriff PostgreSQL
Docker	24.0	Container-Plattform	Lokale Entwicklung & Deployment
AWS Lambda	–	Cloud Runtime (Serverless)	Ausführung von Functions
AWS API Gateway	–	Cloud Service (API)	HTTP-Routing & Auth
AWS S3	–	Cloud Storage	Statisches Hosting & Objektspeicher
PostgreSQL	15	Datenbank (relational)	Persistente Datenhaltung
Redis	7.x	In-Memory Store	Caching & Message Broker
Celery	5.2	Task-Queue Framework	Asynchrone Jobs/Tasks
OpenAI API	v1 (SDK 0.27)	Externe KI-Plattform	Generierung von Feedback
Stripe API	2023-08-16	Zahlungsdienst	Payment Intents, Webhooks
gRPC	1.54 (Proto3)	RPC-Framework	Inter-Service-Kommunikation
gVisor Sandbox	2023.04	Sicherheits-Sandbox	Isolierte Code-Ausführung
Git & GitHub	–	Versionsverwaltung	Source-Code & CI/CD

### 5.1.2 Architektur und Schnittstellen

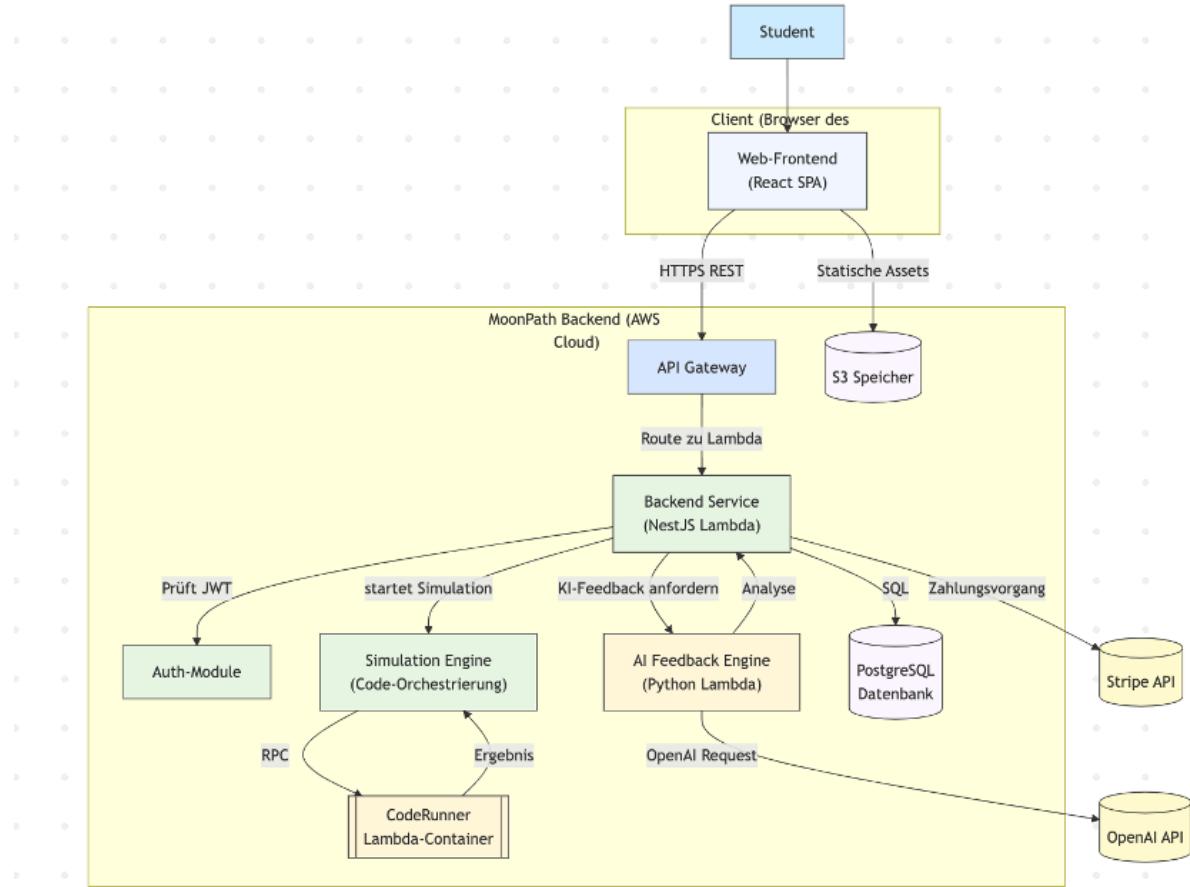
Bild der ersten 2 Ebenen des C4-Modells

Level 1 – System Context: Übersicht über Benutzer und externe Systeme.



Studierende (Hauptnutzer) interagieren über das Frontend mit der MoonPath-Plattform. Die Plattform integriert externe Dienste: Stripe zur Zahlungsabwicklung, OpenAI für KI-gestütztes Feedback und einen CodeRunner-Dienst zur Ausführung von benutzerdefiniertem Code.

Level 2 – Container-/Komponentendiagramm: zeigt interne Services und deren Kommunikation



Die internen Bausteine der MoonPath-Plattform und deren Kommunikationswege. Das React-Frontend läuft im Browser des Nutzers und kommuniziert über HTTPS mit dem Backend (API Gateway + Lambda). Das Backend beinhaltet Authentifizierungs-Module, die Simulation Engine und die Geschäftslogik, die auf Daten in der PostgreSQL-Datenbank zugreift. Bei Bedarf werden externe Dienste angebunden: Für die Codeausführung ruft die Simulation Engine den CodeRunner-Service auf; für KI-Feedback nutzt die AI Engine die OpenAI-API; für Bezahlvorgänge integriert das Backend Stripe. Statische Inhalte (Frontend-Code, Medien) werden aus einem S3-Speicher geladen, ggf. über CloudFront CDN verteilt.

## Kernkomponenten

**Frontend** Single-Page-UI in React/TypeScript für Registrierung, Simulationen und Payment. Kommuniziert ausschließlich via HTTPS-REST mit dem Backend; **(React SPA)** statische Dateien liegen auf AWS S3/CloudFront.

**Backend** Serverless-REST-API auf AWS (API Gateway + Lambda/NestJS); erledigt Auth, Geschäftslogik, Fortschrittstracking, Payments. Skalierung erfolgt automatisch, zustandsbehaftete Daten persistieren in der DB.

**Simulation Engine** Orchestrert Szenario-Ablauf, Timer und Punkte; ruft CodeRunner und AI-Engine auf und speichert jede Aktion in der DB. Entscheidet, wann nächste Aufgabe, Feedback oder Abschluss folgt.

**CodeRunner Service** Führt Benutzer-Code isoliert (Lambda-Container + gVisor) aus, liefert stdout/stderr und Exit-Code an die Simulation Engine. Unterstützt mehrere Sprachen und schützt die Plattform vor Schadcode.

**AI Feedback Engine** Sendet Lösungen an OpenAI (GPT-4) und gibt strukturiertes Feedback zurück. Läuft entkoppelt als Lambda, sodass KI-Aufrufe die Haupt-API nicht blockieren.

**Auth-Modul** JWT-basierte Anmeldung, Rollen- und Rechteprüfung; optional SSO. Beinhaltet Passwort-Reset, Account-Deaktivierung und GDPR-konforme Löschung.

**Datenbank (PostgreSQL)** RDS-Instanz speichert Nutzer, Szenarien, Ergebnisse, Zahlungen; regelmäßige Backups und Audit-Logs. Große Dateien (Zertifikate, Bilder) liegen in S3, in der DB nur die Referenz.

**Stripe-Integration** Backend erstellt Payment Intents, erhält Webhooks und aktualisiert Abo-Status. Kartendaten bleiben bei Stripe, MoonPath speichert nur Transaktions-Metadaten.

**OpenAI-In** AI-Engine nutzt HTTPS-API mit Schlüssel; keine personenbezogenen Daten  
**tegration** im Prompt. Caching reduziert Token-Verbrauch, Fehler werden dem Nutzer  
sauber gemeldet.

## Externe Schnittstellen

System	Basis-URL / Endpoint	Authentifizierung	Zentrale Endpunkte / Methoden	Rate-Limits / SLA	Bemerkungen
Stripe API	<a href="https://api.stripe.com/v1">https://api.stripe.com/v1</a>	API Secret Key (Bearer)	/payment_intents (Payment Intent erstellen); /checkout/sessions; Webhooks (/webhook/stripe)	≈ 25 req/sec (Standardlimit) ~99,9 % Uptime	Zahlungsabwicklung für Kreditkarten, Lastschriften etc.; Echtzeit-Bestätigungen via Webhook; Test- und Live-Modus getrennt.
CodeRunner Service	nicht öffentlich (internes gRPC)	Interner Token oder VPC-intern	RunCode(CodeRequest); weitere RPCs (z. B. Abbruch)	Lambda-Limit: max. 1000 gleichz. Aufrufe/Region	Interner Microservice für sichere Code-Execution ; Docker-Sandbox ; unterstützt mehrere Sprachen.
OpenAI API	<a href="https://api.openai.com/v1">https://api.openai.com/v1</a>	API Key (Bearer)	/chat/completions (GPT-4 Feedback); /completions (GPT-3)	Modell- & accountabhängig z. B. 40 k Tokens/Min , kein formales SLA	KI-Textgenerierung für Feedback; nur pseudonymisierte Daten senden.

### 5.1.3 Benutzungsschnittstelle

**The MoonPath design was created in Figma with a focus on clarity, structure, and ease of use.**

The interface uses a clean layout, modern typography, and a consistent color scheme to guide users through simulations step by step. Each screen is carefully organized — from the landing page and scenario cards to task views and AI feedback. Icons, spacing, and buttons are optimized for both readability and intuitive interaction.

*The final design is attached at the end of the file as images due to export quality limitations.*

## 6.1 Globale Testszenarien/Testfälle

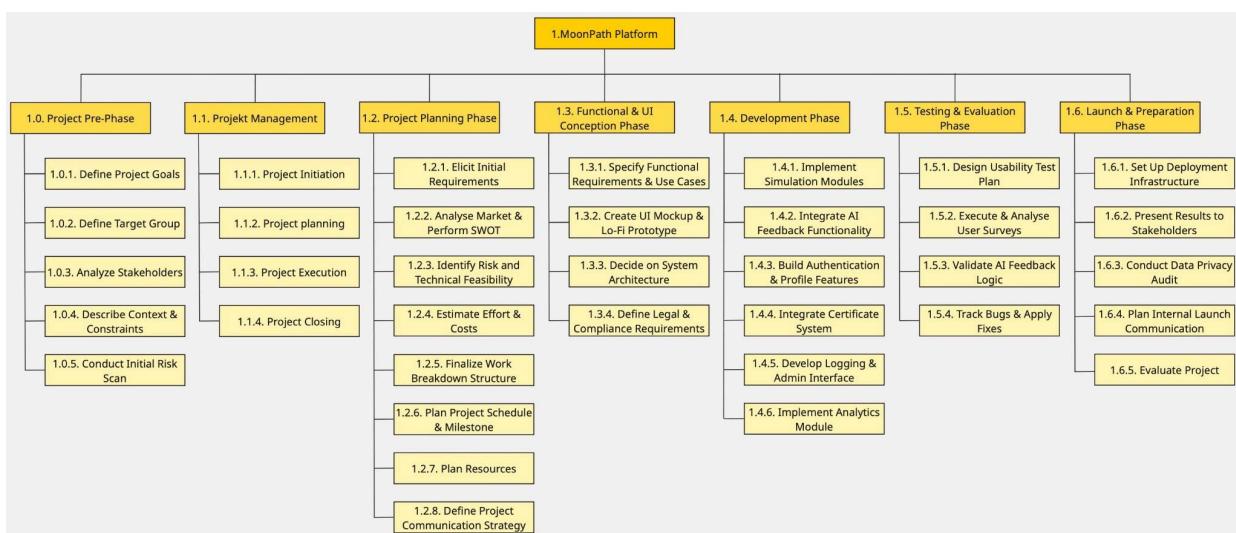
### 6.1.1 Testszenarien / Testfälle

ID	Title	Preconditions	Steps	Expected result
/T010/	New student registration	No existing account	1 Sign-up → enter <i>ivan.petrov@example.com</i> 2 Enter password <i>P@ssw0rd!</i> 3 Click <i>Create account</i> 4 Follow confirmation link	Account active; user is logged in; student dashboard displayed.
/T020/	Complete simulation & download certificate	Logged-in student, active subscription, scenario “Junior Developer” published	1 Dashboard → <i>Start Simulation</i> 2 Choose scenario 3 Solve all 10 tasks ( <i>Submit</i> each) 4 Wait for AI summary 5 Click <i>Download Certificate</i>	Timer stops; total score $\geq 0\%$ ; PDF certificate available; row in <b>Certificate</b> table.
/T030/	Pay subscription with credit card	Logged-in student, no active plan	1 Open <i>Billing</i> 2 Click <i>Subscribe</i> 3 Enter test card <b>4111 1111 1111 1111</b> / 12/30 / 123 4 Confirm	Payment status = <b>paid</b> ; profile shows next renewal date; receipt emailed.

# 7.1 Projektplanung

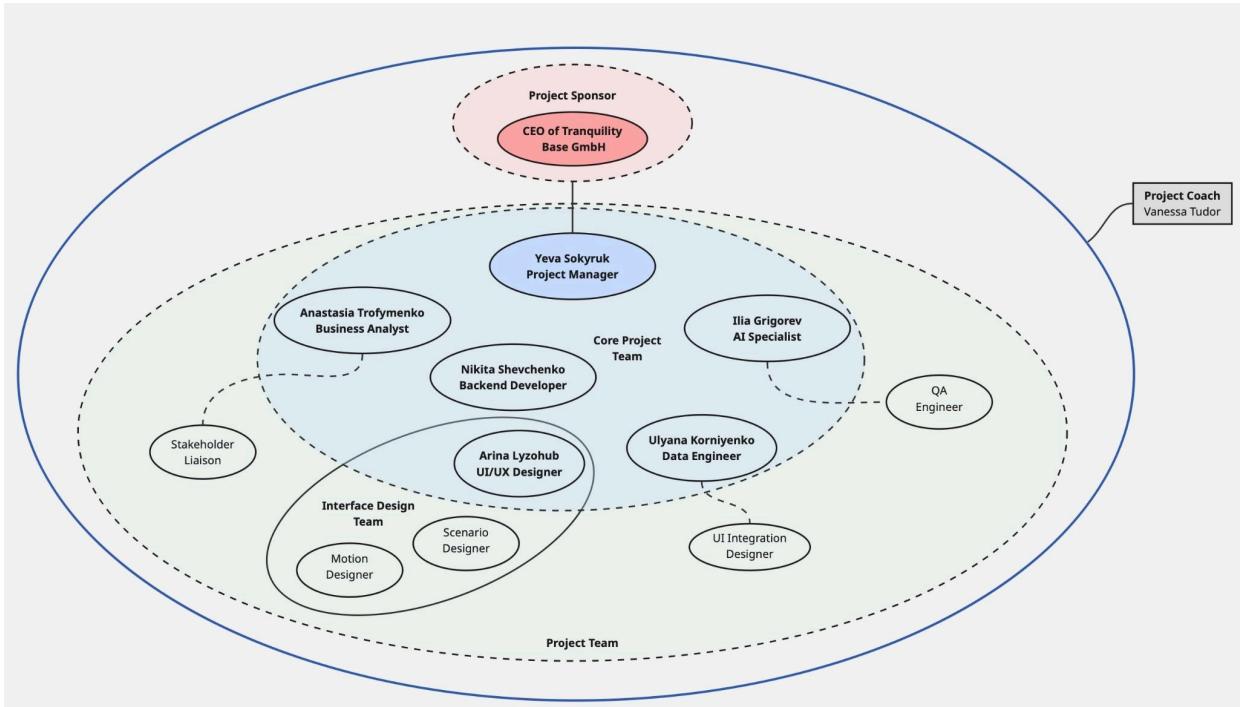
## 7.1.1 Projektstrukturplan

The new Work Breakdown Structure (WBS) establishes a clearer, more structured project flow compared to the previous version that is consistent with project management best practices. A specific Pre-Project Phase was created to establish goals, target groups, and early hazards, which were previously missing. The Project Management phase is now clearly defined and placed first to highlight ongoing coordination. Planning functions like SWOT analysis, stakeholder roles, and effort estimation were transferred to a separate Planning Phase to provide clarity. Phase names were recast with active verbs to emphasise their purpose. The new structure improves logical coherence, facilitates documentation and control, and adheres to the norms taught in project management lectures.



*Image created using Miro*

## 7.1.2 Projektorganisation



*Image created using Miro*

A detailed RACI matrix (functional diagram) has been included in the documentation, explicitly allocating duties and areas of responsibility among MoonPath crew. It includes all important project phases, from initialisation to execution and completion, and is based on the authorised project organisational structure. This diagram promotes management transparency, avoids task duplication, and establishes defined responsibilities, which is especially crucial during the testing, AI integration, and launch preparation stages. The structure is based on the RACI model (Responsible, Accountable, Consulted, and Informed), which aligns with international project management norms (PMI/IPMA).

Functions (in German): D - Durchführung, M - Mitarbeit, I - Information.

WBS Code	Work Package	External Sponsor	Project Sponsor	Project Manager	Backend Developer
1.0.1	Define Project Goals	I	A	M	
1.0.2	Define Target Group	I	A	M	
1.0.3	Analyze Stakeholders	I	A	M	
1.0.4	Describe Context & Constraints	I	A	M	
1.0.5	Conduct Initial Risk Scan	I	A	M	
1.1.1	Project Initiation		A	D	
1.1.2	Project Planning		A	D	
1.1.3	Project Execution		A	D	
1.1.4	Project Closing		A	D	
1.2.1	Elicit Initial Requirements			D	
1.2.2	Analyse Market & Perform SWOT			D	
1.2.3	Identify Risk and Technical Feasibility			D	
1.2.4	Estimate Effort & Costs			D	
1.2.5	Finalize WBS			D	
1.2.6	Plan Project Schedule & Milestone			D	
1.2.7	Plan Resources			D	
1.2.8	Define Project Communication Strategy			D	
1.3.1	Specify Functional Requirements & Use Cases			M	
1.3.2	Create UI Mockup & Lo-Fi Prototype			M	
1.3.3	Decide on System Architecture			M	

1.3.4	Define Legal & Compliance Requirements			M	
1.4.1	Implement Simulation Modules			M	D
1.4.2	Integrate AI Feedback Functionality			M	M
1.4.3	Build Authentication & Profile Features			M	D
1.4.4	Integrate Certificate System			M	D
1.4.5	Develop Logging & Admin Interface			M	D
1.4.6	Implement Analytics Module			M	D
1.5.1	Design Usability Test Plan			M	
1.5.2	Execute & Analyse User Surveys			M	
1.5.3	Validate AI Feedback Logic			M	
1.5.4	Track Bugs & Apply Fixes			M	
1.6.1	Set Up Deployment Infrastructure			M	
1.6.2	Present Results to Stakeholders			M	
1.6.3	Conduct Data Privacy Audit			M	
1.6.4	Plan Internal Launch Communication			M	
1.6.5	Evaluate Project			M	

*Image created using Excel*

### 7.1.3 Meilensteinplan

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	05.05.2025
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	-

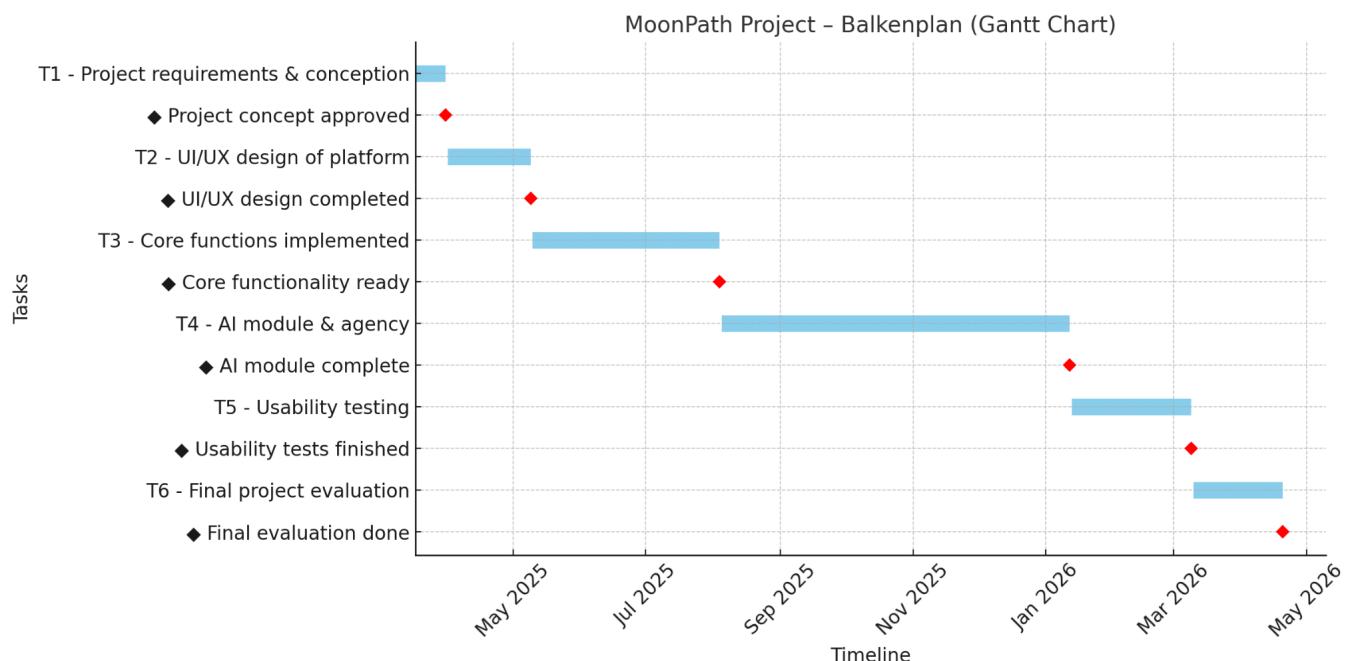
## 7.1.4 Arbeitspaketbeschreibungen

Work Package Specification	
<b>1.4.1 Implement Simulation Modules</b>	<p><b>WP Content</b></p> <ol style="list-style-type: none"> <li>1. Develop simulation logic for 2–3 predefined IT job roles</li> <li>2. Create branching task paths with decision logic (e.g. email, code review, standup tasks)</li> <li>3. Link user progress to backend state</li> <li>4. Enable reset/replay functionality</li> <li>5. Ensure data logging for evaluation phase</li> </ol> <p><b>WP Non-Content</b></p> <ol style="list-style-type: none"> <li>1. Frontend styling or animations</li> <li>2. AI-based feedback</li> <li>3. Deep content writing for scenarios</li> </ol> <p><b>WP Results</b></p> <ol style="list-style-type: none"> <li>1. 3 fully working interactive simulations in backend logic</li> <li>2. Documented logic per role</li> <li>3. Exportable progress data (JSON or DB)</li> </ol> <p><b>WP Progress Measurement</b></p> <p>30% = logic scaffolding implemented</p> <p>60% = all job paths coded &amp; functional</p> <p>90% = internal test run without blockers</p> <p>100% = handed off to frontend/API layer</p>
<b>1.4.2 Integrate AI Feedback Functionality</b>	<p><b>WP Content</b></p> <ol style="list-style-type: none"> <li>1. Define which metrics AI should evaluate (e.g. decision time, task accuracy)</li> <li>2. Train or fine-tune ML model (or connect to existing service)</li> <li>3. Build feedback logic and link to backend events</li> <li>4. Implement evaluation trigger (e.g. on task complete)</li> <li>5. Output textual feedback for user dashboard</li> </ol> <p><b>WP Non-Content</b></p> <ol style="list-style-type: none"> <li>1. Real-time feedback prediction</li> </ol>

	<ul style="list-style-type: none"> <li>2. Custom AI training pipeline from scratch</li> <li>3. UX text writing or UI rendering</li> </ul>
	<p><b>WP Results</b></p> <ul style="list-style-type: none"> <li>1. Working AI module providing feedback</li> <li>2. API interface with expected input/output</li> <li>3. Sample feedback logs for 3 roles</li> </ul>
	<p><b>WP Progress Measurement</b></p> <p>25% = logic defined &amp; dataset prepped</p> <p>50% = feedback model outputs verified</p> <p>75% = integrated in dev backend</p> <p>100% = functional tests passed in simulations</p>
<p><b>1.4.4 Integrate Certificate System</b></p>	<p><b>WP Content</b></p> <ul style="list-style-type: none"> <li>1. Define logic for when a certificate is awarded</li> <li>2. Implement backend endpoint to generate/download PDF</li> <li>3. Add security (e.g. unique user token, timestamp)</li> <li>4. Connect with user progress data</li> <li>5. Log issued certificates for tracking</li> </ul> <p><b>WP Non-Content</b></p> <ul style="list-style-type: none"> <li>1. Visual design of certificate (done in UI)</li> <li>2. Manual review/approval workflow</li> <li>3. User authentication or access logic</li> </ul> <p><b>WP Results</b></p> <ul style="list-style-type: none"> <li>1. Downloadable certificate per completed simulation</li> <li>2. Audit-proof logging</li> <li>3. Documented certificate ruleset</li> </ul> <p><b>WP Progress Measurement</b></p> <p>30% = logic structure coded</p> <p>60% = backend generates certs correctly</p>

	90% = linked to real user data 100% = test case walkthrough approved
--	---

### 7.1.5 Balkenplan



### 7.1.6 Ressourcenplan

#### 1 Selection of Resource

##### Personal Resources

- Software Developers (EDV)
  - Front-End Developers
  - Back-End Developers
  - AI Experts
- UX/UI Designers
- Project Management
  - Project Manager
  - Business Analyst
- Quality Assurance (QA) Testers

## **External Services**

To cover gaps in expertise or to ensure specific quality standards, external services might be engaged (e.g. cloud security audits, external user experience consultants).

## **Material Resources**

- Development environments (e.g., Visual Studio, Figma, Google Workspace).
- Testing environments (e.g., staging servers, sandbox instances).

## **Other Costs**

- Travel expenses (if needed for stakeholder workshops or in-person testing)
- Training for team members
- Potential certification costs for the final product.

## **2 Definition of Planning Depth**

**We have decided to use phase-level planning to allocate resources. This approach keeps the resource planning clear and easy to manage, especially for an academic project like ours. It also makes it easier to see how resources are spread across the different parts of the project and to adjust them if needed.**

## **3 Quantitative Resource Framework**

**Pre-Project & Setup:** Project Manager (2 person-days) and Business Analyst (1 person-day) handle initial planning and scoping – totaling 3 person-days.

**Simulation Development:** Front-End Developers (15 person-days), Back-End Developers (15 person-days), and AI Expert (7 person-days) develop the three job simulations – totaling 37 person-days.

**User Profile & Account Handling:** Front-End Developers (6 person-days) and Back-End Developers (5 person-days) implement core user management features – totaling 11 person-days.

**Gamification & Rewards:** Front-End Developers (2 person-days) and Back-End Developers (2 person-days) create the reward systems – totaling 4 person-days.

**Admin Panel & Monitoring:** Back-End Developer (4 person-days) and Admin/Support (2 person-days) handle system monitoring and management – totaling 6 person-days.

**Testing & Iterative Refining:** QA Testers (2 person-days), Developers (3 person-days), and Project Manager/Business Analyst (3 person-days) test and refine simulations – totaling 8 person-days.

**Final Launch Preparation:** Project Manager (3 person-days) and Business Analyst (1 person-day) ensure the final launch readiness – totaling 4 person-days.

**Total:**  $3 + 37 + 11 + 4 + 6 + 8 + 4 = 73$  person-days.

#### 4 Clarification of Availability

PSP-Code	Phase	Department/Role	Planned (PD)	Actual (PD)	Available (PD)	Forecast (PD)	Deviation (PD)
1.1	Pre-Project & Setup	Project Manager / Analyst	3	-	2	-	-
1.2	Simulation Development	EDV (Developers, AI)	37	-	3	-	-
		UX/UI Designer	0	-	0	-	-
1.3	User Profile & Account	EDV	11	-	4	-	-
1.4	Gamification & Rewards	EDV	4	-	6	-	-
1.5	Admin Panel & Monitoring	EDV	6	-	2	-	-
		Others (Admin/Support)	2	-	2	-	-
1.6	Testing & Refining	EDV	5	-	5	-	-
		Others (QA)	2	-	2	-	-
1.7	Final Launch Preparation	Project Manager / Analyst	4	-	1	-	-
	<b>Total</b>	-	<b>74</b>	-	<b>25</b>	-	-

## 7.1.7 Kostenplan

### 1 Selection of Cost Types

- **Personnel Costs:** These cover the daily rates for all project team members, including developers, AI experts, UX/UI designers, project managers, business analysts, QA testers, and admin/support roles.
- **Material Costs:** These include software licenses (e.g., Visual Studio, Figma), development and testing environments (e.g., staging servers, sandbox instances), and any other necessary digital tools.
- **External Services Costs:** These account for potential external engagements to fill gaps in expertise or ensure high-quality standards, such as security audits or external user experience consultants.
- **Other Costs:** These include travel expenses (e.g., stakeholder workshops, in-person testing), training for team members, and any potential certification costs for the final product.

### 2 Planning of Project Costs by Phase

#### Pre-Project & Setup

- Project Manager (2 days × €600) = €1,200
- Business Analyst (1 day × €600) = €600
- Material/Tool Costs (collaboration tools, documentation setup) = €200
- **Total:** €2,000

#### Simulation Development

- Front-End Developers (15 days × €500) = €7,500
- Back-End Developers (15 days × €500) = €7,500
- AI Expert (7 days × €600) = €4,200
- Material & Hardware Costs (software licenses, dev tools, partial hardware) = €6,000
- **Total:** €25,200

#### User Profile & Account Handling

- Front-End Developers (3 days × €500) = €1,500
- Back-End Developers (2 days × €500) = €1,000
- Material Costs (testing environments, licenses) = €500
- **Total:** €3,000

## Gamification & Rewards

- Front-End Developers (2 days × €500) = €1,000
- Back-End Developers (2 days × €500) = €1,000
- Material Costs (user interface tools, visual assets) = €500
- **Total:** €2,500

## Admin Panel & Monitoring

- Back-End Developer (6 days × €500) = €3,000
- Admin/Support (2 days × €600) = €1,200
- Material Costs (monitoring tools, hardware costs) = €1,000
- **Total:** €5,200

## Testing & Iterative Refining

- QA Testers (2 days × €400) = €800
- Developers (3 days × €500) = €1,500
- Project Manager / Business Analyst (2 days × €600) = €1,200
- Other Costs (travel, training, test licenses) = €1,000
- **Total:** €4,500

## Final Launch Preparation

- Project Manager (2 days × €600) = €1,200
- Business Analyst (1 day × €600) = €600
- Other Costs (final certifications, final testing, stakeholder presentations) = €1,000
- **Total:** €2,800

## Grand Total (Phases Integrated with Materials and Additional Costs):

€2,000 + €25,200 + €3,000 + €2,500 + €5,200 + €4,500 + €2,800 = **€45,200**

## Remaining Project-Wide Costs

- Server Hosting (10 months): €8,000
- Miscellaneous (office supplies, communication tools): €900
- **Total:** €8,900

## Total Project Cost

- **Grand Total (Phases + Remaining Costs): €54,100**

PSP-Code	AP/Phase	Cost Type	Planned (€)	Actual (€)	Available (€)	Forecast (€)	Deviation (€)
1.1	Pre-Project & Setup	Material	200	-	200	-	-
		Personnel	1,800	-	1,800	-	-
		External	-	-	-	-	-
		Other	-	-	-	-	-
1.2	Simulation Development	Material	6,000	-	6,000	-	-
		Personnel	19,200	-	19,200	-	-
		External	-	-	-	-	-
		Other	-	-	-	-	-
1.3	User Profile & Account	Material	500	-	500	-	-
		Personnel	2,500	-	2,500	-	-
		External	-	-	-	-	-

		Other	-	-	-	-	-
1.4	Gamification & Rewards	Material	500	-	500	-	-
		Personnel	2,000	-	2,000	-	-
		External	-	-	-	-	-
		Other	-	-	-	-	-
1.5	Admin Panel & Monitoring	Material	1,000	-	1,000	-	-
		Personnel	4,200	-	4,200	-	-
		External	-	-	-	-	-
		Other	-	-	-	-	-
1.6	Testing & Refining	Material	1,000	-	1,000	-	-
		Personnel	3,500	-	3,500	-	-
		External	-	-	-	-	-

		Other	-	-	-	-	-
1.7	Final Launch Preparation	Material	1,000	-	1,000	-	-
		Personnel	1,800	-	1,800	-	-
		External	-	-	-	-	-
		Other	-	-	-	-	-
	<b>Total</b>	-	<b>54,100</b>	-	<b>54,100</b>	-	-

### 7.1.8 Kommunikationsplan

Channel	Participants	Frequency	Format	Purpose
<b>Steering Committee</b>	<b>Project Sponsor</b> (executive client), <b>Project Manager</b> , <b>Business Analyst</b>	Every four weeks	60-minute Zoom meeting + written minutes	Strategic decisions, budget oversight, class-A risks
<b>Sprint Review (“Bazaar”)</b>	Entire project team, invited key external stakeholders	Every two weeks (Friday)	Demo booths in Miro and clickable prototype	Accept the latest increment, gather feedback
<b>Daily Stand-up</b>	Core development crew: <b>Project Manager</b> , software developers, AI engineer, quality-assurance tester	Every work-day, 09:30 CET	15-minute Google Meet	Task synchronisation, unblock issues

<b>Backlog Refinement</b>	<b>Product Owner</b> (role performed by the Business Analyst) and development crew	Weekly	45-minute session — Miro board + YouTrack	Update requirements, estimate story effort
<b>Issue Tracker</b>	Entire project team	Continuous, asynchronous	YouTrack project space	Log bugs, tasks and decisions
<b>One-to-One meetings</b>	<b>Project Manager</b> ↔ specific <b>Project Team Member</b>	As needed	Short Slack video call (huddle)	Coaching, personal work topics
<b>Project Chat</b>	All project team members	Ongoing	Slack channel #moonpath	Quick announcements, links, informal talk
<b>Monthly Newsletter</b>	All internal stakeholders of the organisation	Once per month	PDF digest via email	Project marketing, overall status, achievements

## 8.1 Projektabnahme/Inbetriebnahme

### Übergabepaket

Bestandteil	Inhalt	Zweck
Quellcode	Git-Repository + ZIP-Archiv	Weiterentwicklung & Nachvollziehbarkeit
Technische Doku	Architektur, C4-Diagramme, Deploy-Guide	Schnelles Dev-Onboarding
Benutzer-/Admin-Handbuch	Schritt-für-Schritt-Anleitungen	Effektive Nutzung
Konfiguration	.env.example, config.yaml	Leichte Erstkonfiguration
Testnachweise	System- & Abnahmetests	Erfüllung der Anforderungen belegen
Lizenzen-Ordner	MIT + Third-Party Licenses	Juristische Klarheit
Abnahmeprotokoll	Checkliste Pflichtenheft	Formaler Projektabschluss

### Installation & Inbetriebnahme

- Infrastruktur provisionieren: IaC (Terraform/SAM) legt S3, CloudFront, API Gateway, Lambdas, RDS, ElastiCache, Cognito/JWT an.
- Backend deployen: serverless deploy / CI-Pipeline, Secrets über Parameter Store.

- Datenbank migrieren: ORM-Migrations, Basisdaten importieren, Credentials in Secrets Manager.
- Frontend ausrollen: Build → S3, API-URL & Cognito-Params setzen.
- Domain & TLS: Route 53 + ACM (z. B. moonpath.example.com).
- Lokalbetrieb (optional): docker-compose up für Dev-Umgebung.
- Verifikation: End-2-End-Smoke-Test (Registrierung, Simulation, Zahlung) – erst bei Erfolg Go-Live.

## Lizenzmodell

Eigenentwicklungen stehen unter der MIT-Lizenz; Drittbibliotheken behalten ihre OSS-Lizenzen. Ein Nutzungsrechts-Addendum sichert dem Auftraggeber das Recht, MoonPath intern und kommerziell zu betreiben.

## Schulung & Knowledge Transfer

Zielgruppe	Format	Umfang
Studierende	In-App-Tour, FAQ, 3-min Video	Sofortiger Einstieg
Admins / Operator	2-h Remote-Workshop + Admin-Handbuch	Benutzer-, Szenario-, Monitoring-Funktionen
Entwickler (Betreiber)	Code-Walkthrough + Q&A	Architektur, Deploy-Pipeline, lokale Dev-Umgebung



# Step into your future. One simulation. Infinite possibilities.

Interactive, role-based simulations that feel like a real developer job. Make decisions, fix bugs, get AI-powered feedback — and grow your confidence.

[Start Your First Simulation](#)[Browse All Scenarios](#)

# 1

## Choose a Scenario

Select a realistic simulation tailored to your role and experience level. From startups to legacy systems — your journey, your pace.

# 2

## Make Real Decisions

Face daily tasks, bugs, feedback, and time pressure. Just like in a real tech job — but in a safe learning space.

# 3

## Get AI Feedback

Receive instant, intelligent feedback on every task. Understand your strengths, learn from mistakes, and level up faster.

## About us

### MoonPath is where future developers prepare for the real world.

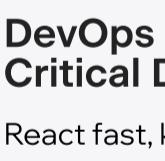
We're a passionate team of developers, designers, and educators who believe that learning should feel real—not theoretical. That's why we built MoonPath: a platform where you can experience a full workday as a developer, without leaving your browser.

#### Our Mission

To bridge the gap between tech education and real-world experience through immersive, scenario-based simulations and AI-powered mentorship.

[Read More →](#)

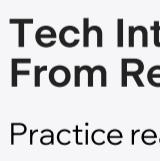
## Popular Simulations Preview



~45–60 min

### Front-End Developer at a Startup

Fix bugs, pick tools, impress the PM.



~60 min

### Junior Backend Developer on Legacy System

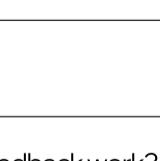
Debug and decide smartly.



~40 min

### DevOps Engineer During a Critical Deployment

React fast, keep systems running.



~30–45 min

### Tech Interview Simulation: From Resume to...

Practice real interview tasks.



## Questions - Answers

How long does a simulation take? +

Who is this for? +

How does AI feedback work? +

Are my results private? +

Can this help me get a job? +

Write your email for news and new tasks

Email

>

@2023, dotyk drifter

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moon.path@gmail.com



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## Popular scenarios



~45–60 min

### Front-End Developer at a Startup

The navigation bar disappears in iOS Safari when switching to landscape mode. The PM reported it during a demo run.

[Start simulation →](#)

~60 min

### Junior Backend Developer on Legacy System

A client app is receiving null for the user\_role field. The codebase is outdated and includes old PHP logic. Find the issue and apply.

[Start simulation →](#)

~40 min

### DevOps Engineer During a Critical Deployment

The staging server suddenly stops responding during a live deployment. You need to act fast, identify the issue, and restore service with minimal downtime.

[Start simulation →](#)

~30–45 min

### Tech Interview Simulation: From Resume to...

You're in a technical interview. Answer a real-world coding question, explain your approach, and respond to a follow-up from the interviewer. Clarity and structure matter as much as code.

[Start simulation →](#)

~40 min

### DevOps Engineer During a Critical Deployment

The staging server suddenly stops responding during a live deployment. You need to act fast, identify the issue, and restore service with minimal downtime.

[Start simulation →](#)

~30–45 min

### Tech Interview Simulation: From Resume to...

You're in a technical interview. Answer a real-world coding question, explain your approach, and respond to a follow-up from the interviewer. Clarity and structure matter as much as code.

[Start simulation →](#)

## Front-End Developer at a Startup

[Help](#) [Restart Simulation](#) [Skip](#) [Save](#)
 10 Points

### Scenario: Front-End Developer at a Startup

**Goal:** Fix UI issues fast and make decisions like in a real product team.

**Duration:** ~45–60 min

**Total tasks:** 5

#### Task 1

##### Our Mission

The nav bar disappears in iOS Safari when switching to landscape. Find the cause and suggest a quick fix.

[Submit](#)
[Edit](#)

#### Task 2

#### Task 3

#### Task 4

#### Task 5

### Attachments


[navbar\\_bug.png](#)

[navbar\\_code.html](#)
**navbar\_code.html**

```
.content {
    padding-top: 80px;
}

@media screen and (orientation: landscape) and (max-width: 768px) {
    .navbar {
        position: absolute; /* potential fix: or use sticky */
    }
}

</style>
</head>
<body>
    <div class="navbar">
        <div>MoonPath</div>
        <div>Menu</div>
    </div>

    <div class="content">
        <p>Lorem ipsum dolor sit amet. Scroll down to see the effect.</p>
        <div style="height: 1500px;"></div>
    </div>
</body>
```

### AI Feedback for: Front-End Developer at a Startup

Here will be AI feedback...

[Generate →](#)

### Want to showcase your skills?

You can choose to share this simulation result with selected employers. It includes your score, task history, and AI feedback — only if you allow it.

[Share with employers →](#)


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