

1–2 Sentence Overview

Digital Safari is a classroom focused exploration system that generates repeatable worlds from a seed, guides students through simple interactions, and produces structured evidence for teachers. The final report details the full requirements, design, testing plan, risks, costs, deferred features, and team reflections.

What the System Is

A deterministic, tile based, educational adventure.

Students explore biomes, find markers, make choices, and produce evidence.

Teachers load presets, import rosters, launch sessions, and review summaries.

The system runs locally, works offline after launch, and supports accessibility modes.

Purpose and Audience

Designed for classrooms that need predictable, repeatable learning experiences.

Serves students, teachers, and school environments with limited network reliability.

Focuses on simple controls, accurate content, and exportable learning outcomes.

Requirements Summary

Functional: seed based world generation, marker placement rules, encounters, evidence logs, SSO login, CSV import, session summaries.

Non functional: reproducibility, performance during class load, offline operation, accessibility, desktop platform support.

All requirements link directly to acceptance tests.

Design Summary

Architecture: client only for reliability and offline use.

World model: tile grid with biome, object, and marker layers.

Interaction: marker gated encounters tied to evidence outputs.

Data: FactPacks, evidence queue, summary files.

Teacher tools: presets, SSO identification, CSV class lists, export options.

Diagrams show world generation steps, encounter flow, and summary output.

Testing Summary

Covers reproducible world outputs, marker spacing, encounter triggering, evidence accuracy, preset loading, SSO correctness, and export behavior.

Error tests address invalid seeds, missing data, and interrupted sessions.

Each requirement has a mapped test for full coverage.

Risk Summary

Technical: deterministic generation failures, LMS and SSO errors, inaccurate content, performance issues.

Schedule: gameplay loop complexity, limited time for analytics, changing teacher needs.

Operational: mixed classroom hardware, onboarding difficulty, accessibility gaps.

Security: identity mismatches and sensitive data in logs.

Mitigations include validation steps, fallback CSV workflows, caching, and strict content checks.

Cost Summary

Personnel: requirements work, modeling, gameplay logic, analytics, documentation.

Tools: Unity, GitHub, UML software, device testing time.

Complexity: deterministic grids, encounters, accessibility, reporting.

Management: multi section coordination and project alignment.

Maintenance: content updates, SSO compatibility, performance tuning.

Waiting Room Summary

Deferred gameplay: advanced animal behaviors, multi biome travel, resource tools.

Deferred education: annotations, adaptive lessons, real time content alerts.

Deferred analytics: live dashboards, long term progress tracking.

Deferred technical: mobile versions, cloud profiles, auto roster sync.

Deferred admin: district management console, kiosk mode.

Deferred accessibility: full text to speech and theme customization.

Solution Options Summary

World generation options considered: noise terrain, hybrid templates, tile grid.

Interaction options: freeform proximity or marker gating.

UI options: expanded commands or simple loop.

LMS options: deep API linking or CSV workflow.

Evidence options: real time streaming or local queue.

Architecture options: client server or client only.

Retrospective Summary

What went well: strong vision, clear requirements, improved documentation, solid teamwork.

Challenges: scoping Digital Safari to course limits, terminology consistency, deterministic logic complexity, scheduling.

Improvements: earlier shared vocabulary, more checkpoints, earlier architecture sketches, more diagrams.

Lessons: testable requirements matter, simplicity improves learning, documentation evolves, and realistic scope protects quality

Overall Wrap Up

The final report presents a complete and testable specification for Digital Safari, including full requirements, design models, tests, risks, costs, deferred features, solution alternatives, and a reflective retrospective. The team successfully translated a high level concept into a structured engineering plan suitable for future development.