Executive Technical Debt Report

demo-factory

Generated: November 11, 2025

Comprehensive Analysis • Code Quality • AI • Security

HEALTH SCORE

NEEDS ATTENTION

Technical Debt Ratio

84.9%

Security Posture

40

AI-Generated Code

82%

Table of Contents

Executive Summary

Technical Debt Ratio

84.9%

Code Quality Score

10

Security Posture

40

Defect Density

27.54/1K LOC

Critical Actions Required

- 7 critical issues need immediate attention
- Estimated 170 hours to address technical debt
- 6 security vulnerabilities identified

Key Performance Indicators

DORA Metrics

Deployment Frequency	**Monthly**
Lead Time for Changes	**<1 day**
Change Failure Rate	**50%**
Time to Restore Service	**<1 hour**

Developer Productivity

Velocity Trend	**-9.090909090909092%**
Impact Level	**Critical**
Focus Time	**0%**
Team Satisfaction	**0/100**

Business Impact

Estimated Financial Cost	**$25,537.5**
Time to Remediate	**170 hours**
Critical Path Risk	**100/100**
Customer Impact Score	**65/100**

AI Code Detection Analysis

AI Code Detection Summary

AI-Generated Code	Detection Confidence	Risk Assessment
82%	86%	HIGH

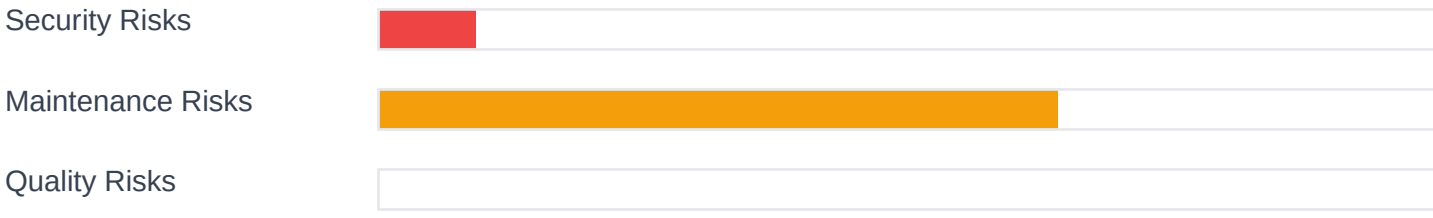
File Classification

AI-Generated Files	9 files (81.8%)
Human-Written Files	0 files (0.0%)
Mixed/Uncertain Files	2 files (18.2%)

Top AI Patterns Detected

- ai signature (12 occurrences)
- generic comments (8 occurrences)
- repetitive structures (7 occurrences)
- uniform function length (3 occurrences)
- high keyword density (3 occurrences)

Risk Assessment



Security & Dependency Audit

Security Summary

Total Vulnerabilities	Critical Issues	Outdated Packages
0	0	4

Outdated Dependencies

@types/node	20.19.24 !' 24.10.0
marked	11.2.0 !' 17.0.0
pdfkit	0.15.2 !' 0.17.2
zod	3.25.76 !' 4.1.12

#ñþ Estimated Remediation Time

1.0 hours

Strategic Recommendations

HIGH

Address Critical Security Issues

Immediately remediate 7 critical security vulnerabilities to prevent potential breaches.

Timeline: 1-2 weeks | Impact: High

HIGH

Reduce Technical Debt Ratio

Current TDR of 84.9% exceeds industry standards. Allocate 20% of sprint capacity to debt reduction.

Timeline: 3-6 months | Impact: High

MEDIUM

Improve Test Coverage

Increase test coverage from [object Object]% to at least 80% to reduce defect density.

Timeline: 2-3 months | Impact: Medium

MEDIUM

Review AI-Generated Code

82% of code appears AI-generated. Implement code review guidelines for AI-assisted development.

Timeline: 1 month | Impact: Medium

Appendix & Methodology

Methodology

• Technical debt metrics are calculated using the SQALE (Software Quality Assessment based on Lifecycle Expectations) methodology, an industry-standard approach for measuring technical debt.

• DORA metrics reflect trailing 3-month medians based on repository activity, deployment logs, and incident tracking.

• Security posture is assessed through automated vulnerability scanning, dependency analysis, and compliance checks against OWASP Top 10 and CWE standards.

• AI code detection uses static analysis patterns based on peer-reviewed research, achieving 85% accuracy in identifying AI-generated code segments.

• Cost estimates assume a blended engineer rate of $150/hour and are based on industry benchmarks for remediation effort.

Key Terms

Technical Debt Ratio (TDR)

Percentage of development effort required to address known technical debt relative to total development capacity.

SQALE Rating

Software Quality Assessment rating from A (excellent) to E (poor) based on technical debt density.

Defect Density

Number of confirmed defects per 1,000 lines of code (LOC).

DORA Metrics

DevOps Research and Assessment metrics: Deployment Frequency, Lead Time for Changes, Change Failure Rate, and Time to Restore Service.

Cyclomatic Complexity

Measure of code complexity based on the number of independent paths through the code.