AutomaSpec

Intelligent Test Management System

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Date: 2026

The Problem: Testing Fragmentation

Who suffers?

QA Engineers, Developers, and Product Managers in fast-paced teams.

The Reality:

- ❌ **Disconnected Workflows:** Requirements live in docs, tests live in code. Links are manual and fragile.
- ❌ **Visibility Black Holes:** Stakeholders cannot verify if a specific requirement is actually covered by a passing test.
- ❌ **Stale Documentation:** Test cases often lag behind code changes, leading to false confidence.
- ❌ **Manual & Slow:** meaningful reporting requires manual spreadsheet updates.

> *"We don't know if we broke the feature until users tell us."*

The Solution: Unified Test Lifecycle

How AutomaSpec solves it:

AutomaSpec acts as the **central nervous system** for quality assurance, syncing code, tests, and requirements.

Key Capabilities:

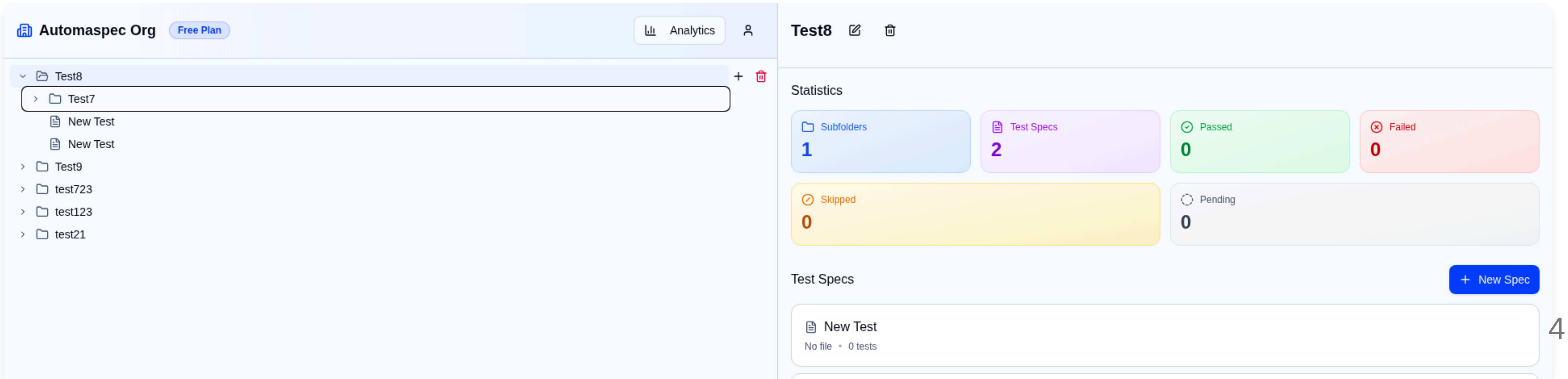
- 🔗 **Deep Integration:** Automatically syncs Playwright & Vitest execution results to requirements.
- 📋 **Live Traceability:** Requirement ↔ Test Spec ↔ Execution Result. All linked.
- 🤖 **AI Assistant:** Chat with your test suite to generate cases or explain failures.

Why it's different:

Unlike erratic spreadsheets or siloed Jira plugins, AutomaSpec represents the **state of truth directly from CI/CD**.

Demo: Core Workflow

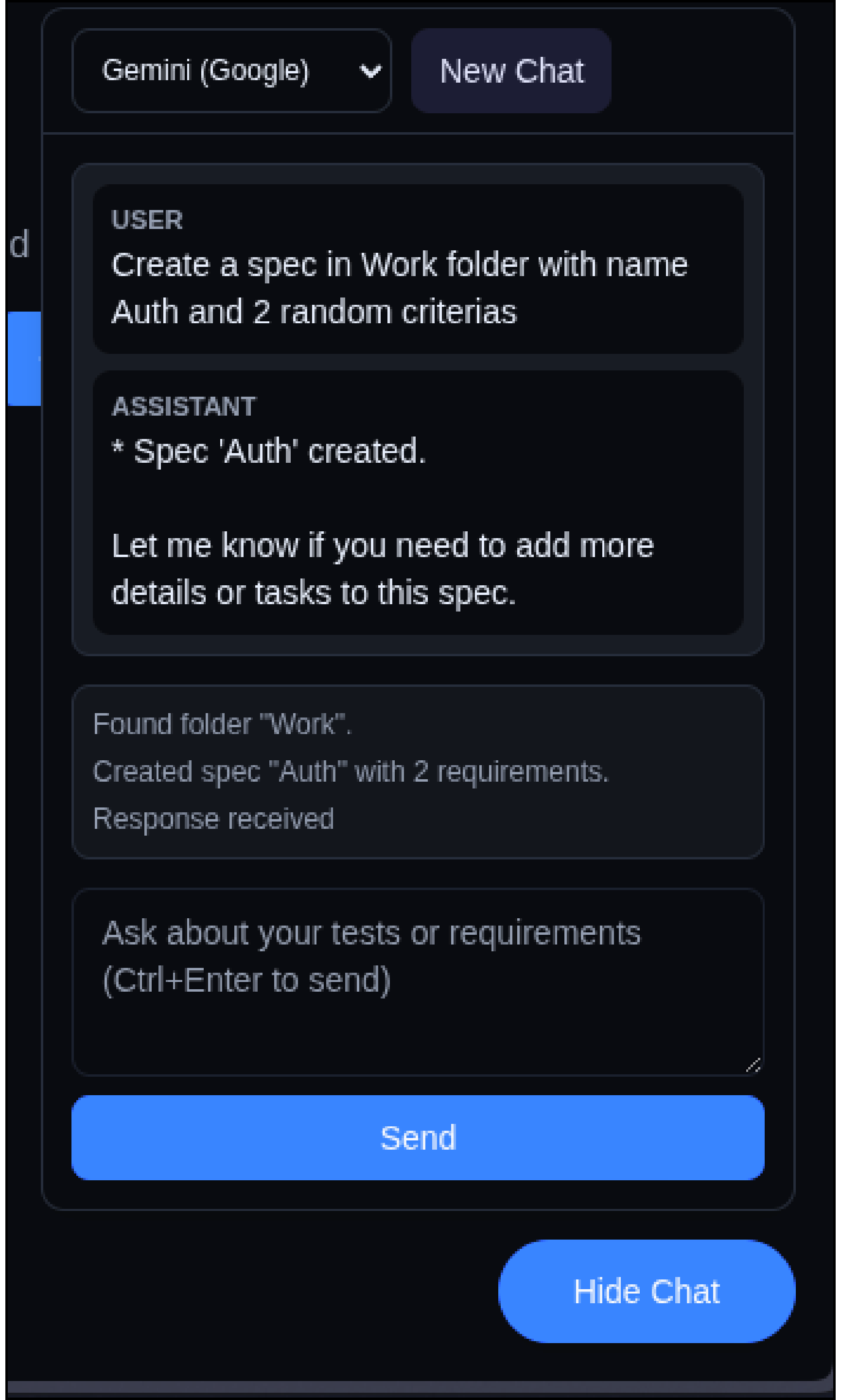
1. **Define Requirements:**
   Users create requirements linked to specs.
2. **Sync Execution:**
   CI pipeline pushes results; coverage updates instantly.
3. **Trace & Audit:**
   Drill down from a business goal to the specific test.



Demo: AI Assistance

Interactive Intelligence:
Asking the system to generate a test case for a new login requirement.

- **Context Aware:** AI knows existing schema.
- **Immediate Feedback:** Apply code direct to specs.



USER
Create a spec in Work folder with name Auth and 2 random criterias

ASSISTANT
* Spec 'Auth' created.

Let me know if you need to add more details or tasks to this spec.

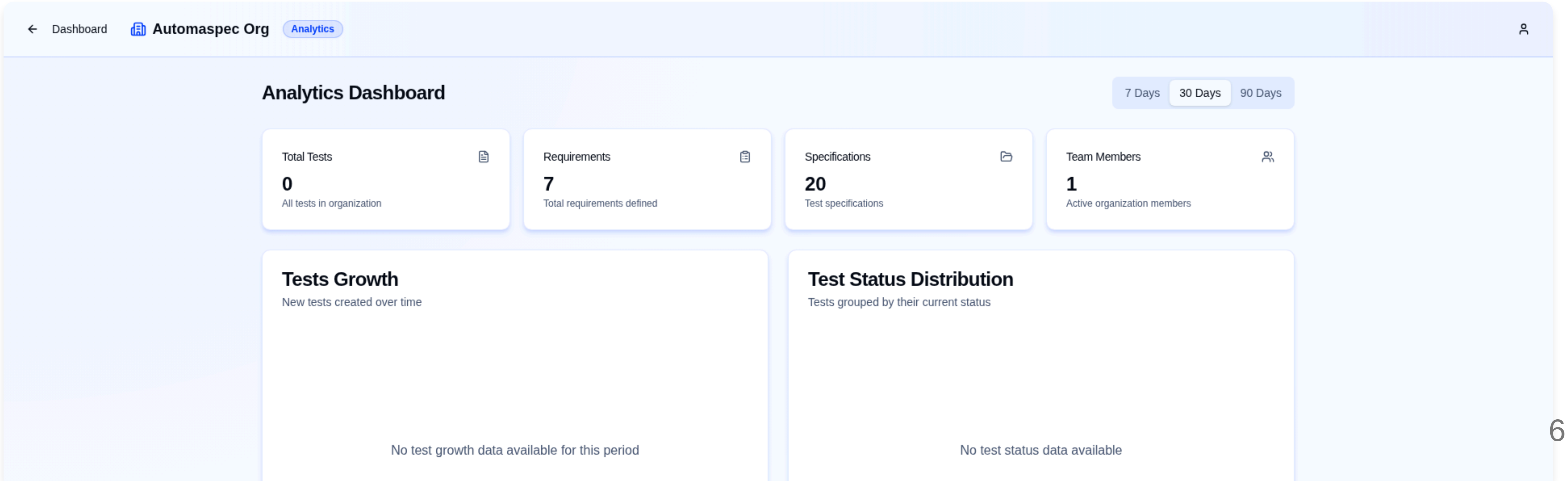
Found folder "Work".
Created spec "Auth" with 2 requirements.
Response received

Demo: Analytics Dashboard

Real-Time Insights:

Comprehensive metrics and visualizations for test coverage and execution trends.

- **Coverage Metrics:** Track requirement coverage over time.
- **Execution Trends:** Visualize test pass/fail rates.
- **Period Selection:** Analyze performance across different timeframes.



Analytics Dashboard

Total Tests
0
All tests in organization

Requirements
7
Total requirements defined

Specifications
20
Test specifications

Team Members
1
Active organization members

Tests Growth
New tests created over time

No test growth data available for this period

Test Status Distribution
Tests grouped by their current status

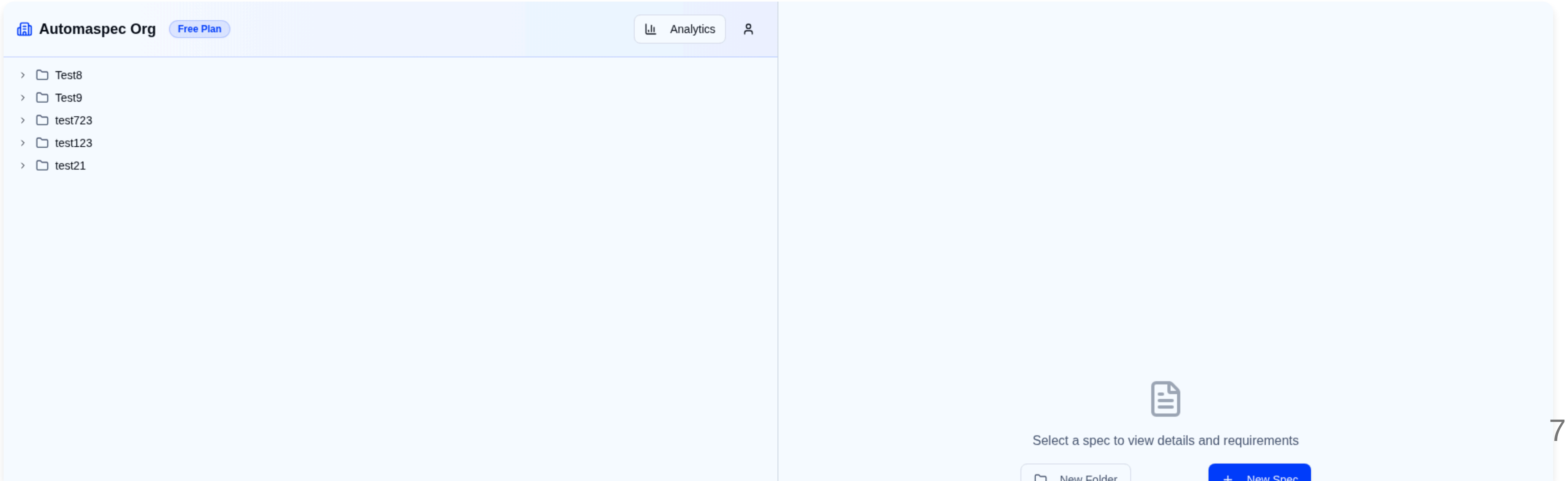
No test status data available

Demo: Main Dashboard

Centralized Test Management:

Organized view of projects, folders, and test specifications.

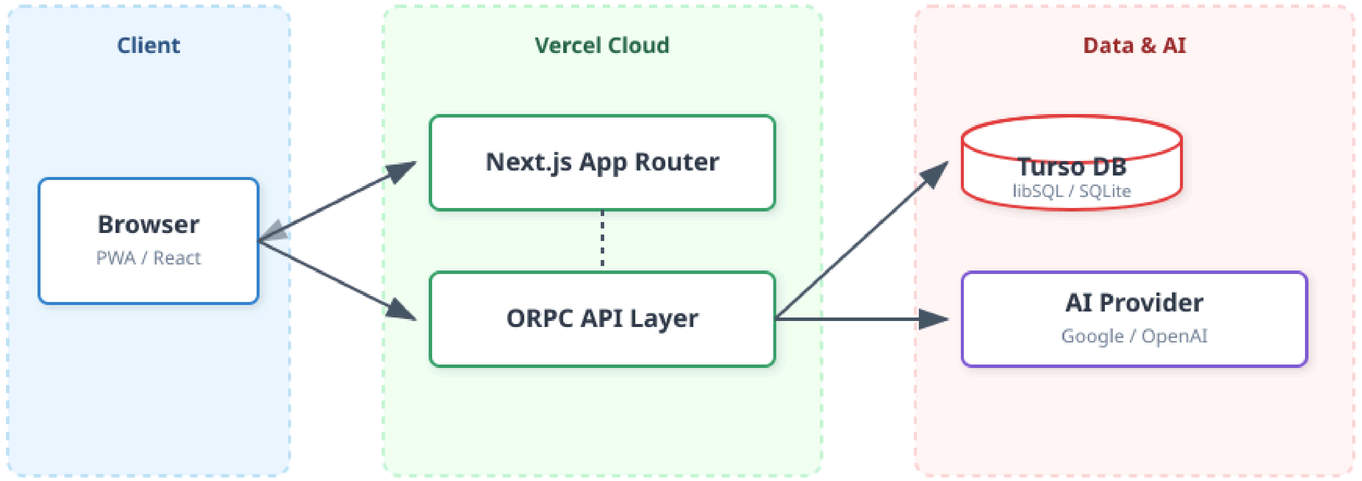
- **Hierarchical Structure:** Navigate through organizations and projects.
- **Quick Access:** Direct links to requirements and test specs.
- **Status Overview:** Visual indicators for test execution status.



High-Level Architecture

Key Components:

- **Frontend:** Next.js 16 (React 19), Tailwind CSS, Framer Motion.
- **Backend:** Serverless Functions via Vercel, ORPC for type-safe contracts.
- **Database:** Distributed SQLite (Turso) managed via Drizzle ORM.
- **AI Integration:** Vercel AI SDK into Google/OpenAI.



Technology Stack

Category	Technology	Purpose
Framework	**Next.js 16**	Full-stack React framework with App Router
Language	**TypeScript**	Strict type safety across full stack
Database	**Turso (LibSQL)**	Edge-compatible distributed SQLite
ORM	**Drizzle ORM**	Type-safe SQL builder and schema management
API	**ORPC**	End-to-end type-safe API contracts
Testing	**Playwright + Vitest**	E2E and Unit testing frameworks
AI	**Vercel AI SDK**	Integration with LLM providers (Google/OpenAI)

Front-End Architecture

WHY:

Needed a scalable, SEO-friendly SPA with robust server integration for a complex dashboard.

WHAT:

- **App Router:** Hierarchical routing for Organizations/Projects.
- **Server State:** TanStack Query for caching & optimistic updates.
- **Type Safety:** End-to-end typed API calls via oRPC.
- **Components:** Modular UI using Radix Primitives.

TECH: Next.js 16, React 19, TanStack Query, Radix UI

```
// Type-safe reactive data fetching with TanStack Query
const [period] = useState<AnalyticsPeriod>('30d')
const { data } = useQuery(orpc.analytics.getMetrics.queryOptions({
    input: { period }
}))
```

Adaptive User Interface

WHY:

To provide a seamless experience for QA engineers across Desktop (4K), Tablet, and Mobile devices.

WHAT:

- **Mobile-First:** Styles defined for small screens, scaling up via breakpoints (`sm`, `md`, `lg`).
- **Responsive Navigation:** Sidebar on desktop -> Drawer on mobile.
- **Theme Support:** System-aware Dark/Light mode integration.
- **Accessibility:** WCAG 2.1 AA compliance via Radix UI.

TECH: Tailwind CSS v4, Lucide Icons, next-themes

> *Verified support for 16:9, 21:9, and mobile portrait aspect ratios.*

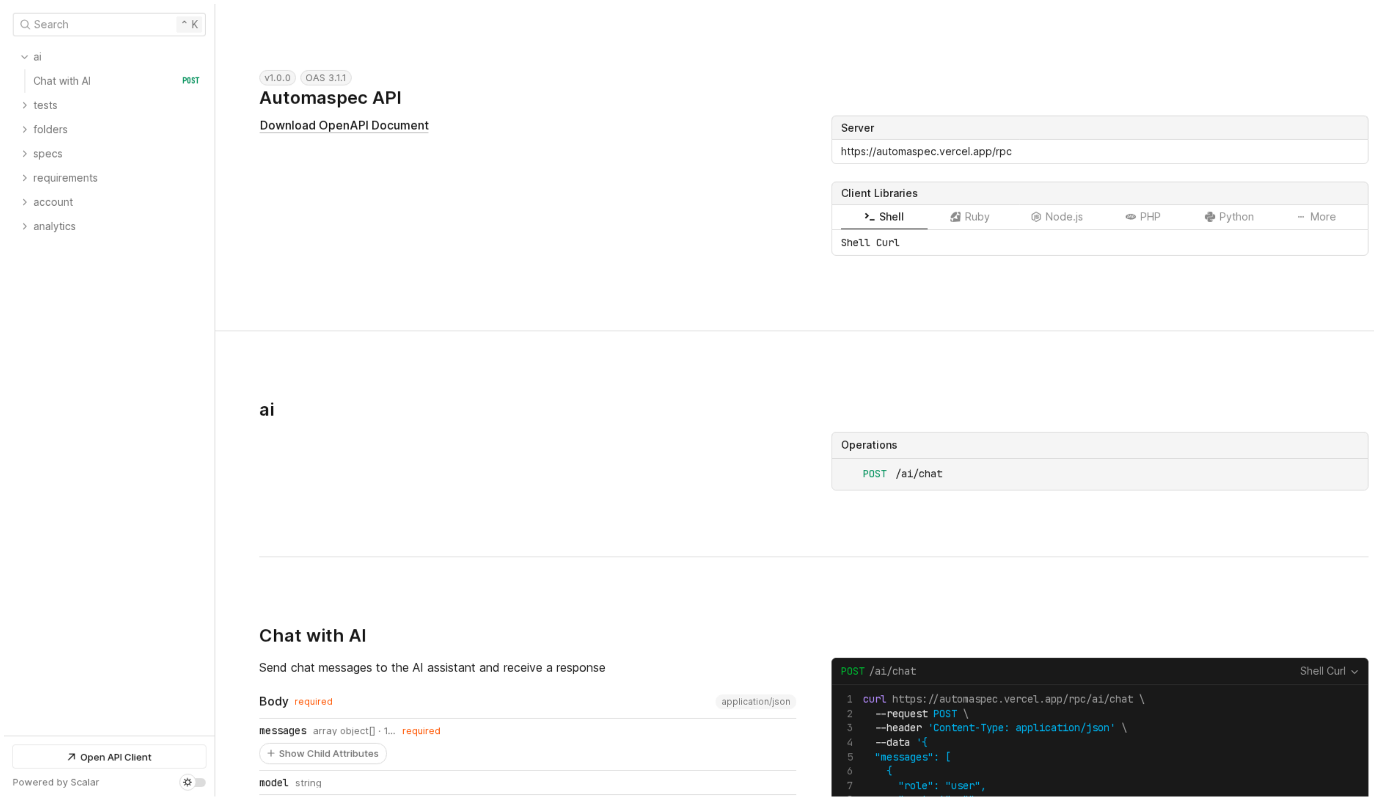
API Documentation

WHY:
Ensure external integrations and developers have an accurate source of truth.

WHAT:

- **Auto-Generated:** Docs derived from Zod schemas.
- **Interactive:** Scalar UI for in-browser testing.
- **OpenAPI:** Exports valid 3.0 spec.
- **Zero Drift:** Docs update with code.

TECH: oRPC, Scalar UI, Zod, OpenAPI



Automaspec API

Download OpenAPI Document

Server
https://automaspec.vercel.app/rpc

Client Libraries

Shell Curl

ai

Operations
POST /ai/chat

Chat with AI

Send chat messages to the AI assistant and receive a response

Body required application/json

messages array object[] · 1... required

model string

POST /ai/chat Shell Curl

```
curl https://automaspec.vercel.app/rpc/ai/chat \
  --request POST \
  --header 'Content-Type: application/json' \
  --data '{
  "messages": [
    {
      "role": "user",
```

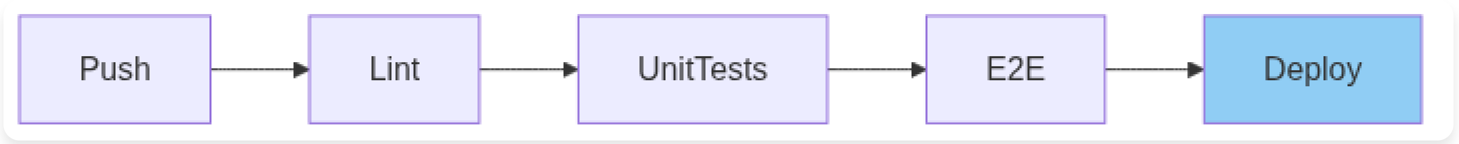
CI/CD Pipeline

WHY:
To automate quality control and ensure safe, frequent deployments to production.

WHAT:

1. **Quality Gate:** Lint (`oxlint`), Format, Typecheck before merge.
2. **Security:** Automated `pnpm audit` for dependencies.
3. **Test Automation:** Unit (Vitest) + E2E (Playwright) execution.
4. **Delivery:** Auto-deploy to Vercel (Preview/Prod).

TECH: GitHub Actions, Vercel CLI, Docker, Lefthook



Containerization

WHY:

To guarantee environment consistency ("works on my machine") and enable portability.

WHAT:

- **Multi-Stage Build:** `deps` → `builder` → `runner` (Optimized layers).
- **Standalone Mode:** Trims `node_modules` for ~100MB final image.
- **Security:** Runs as non-root user (`nextjs`).
- **Orchestration:** Docker Compose profiles for Dev vs. Prod.

TECH: Docker, Docker Compose, node-alpine

```
# Final Stage
FROM base AS runner
USER nextjs
COPY --from=builder /app/.next/standalone ./
CMD ["node", "server.js"]
```

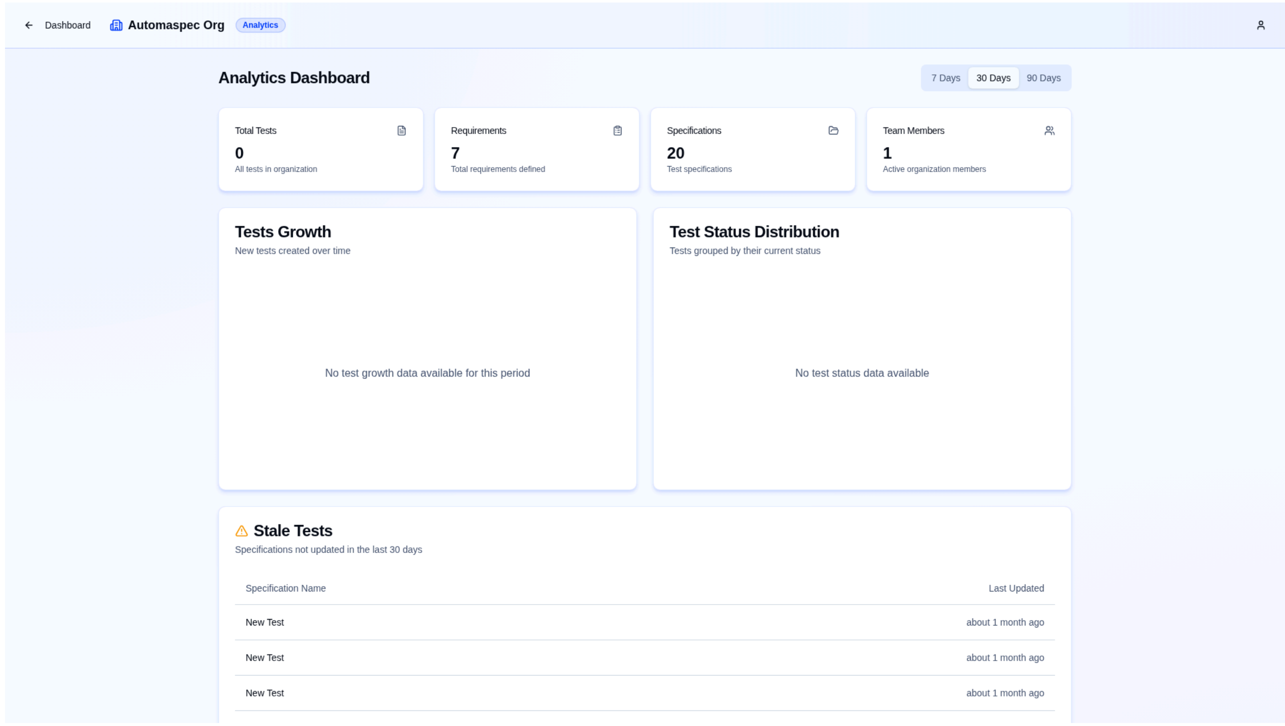
Challenges & Solutions

Challenge	Solution
Vercel vs Docker	*Problem:* Vercel doesn't run Docker. *Fix:* Used Hybrid strategy—Docker for local dev/testing reliability, Vercel for scalable Serverless production.
Type Synchronization	*Problem:* Keeping API and Frontend types in sync. *Fix:* Implemented **oRPC** to infer frontend types directly from backend Zod schemas.
Complex State	*Problem:* Managing real-time spec updates. *Fix:* Utilized **TanStack Query** for efficient server-state caching and optimistic UI updates.

Results

✅ Project Checklist

- [x] **Core MVP:** Requirement management & Test syncing.
- [x] **Architecture:** Scalable Next.js 16 + Serverless setup.
- [x] **Quality:** CI/CD pipeline with 100% E2E critical flow coverage.
- [x] **Documentation:** Auto-generated API Reference.



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Stale Tests
Specifications not updated in the last 30 days

Specification Name	Last Updated
New Test	about 1 month ago
New Test	about 1 month ago
New Test	about 1 month ago

Q&A

Production: automaspec.vercel.app

Repository: github.com/qweered/automaspec

Documentation: `/rpc/docs` (Scalar)

Thank You!

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