Product Requirement Document (PRD)

Product Name: Portfolio Tool v1

Version: 1.0

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Owner: Dark Matter Labs

1. Purpose

The Portfolio Tool v1 is a strategic thinking and management platform that enables portfolio managers, practitioners, and investors to **design, analyse, and navigate complex portfolios** of interconnected actions, actors, and assets—particularly in urban contexts.

The tool's first release focuses on:

- Analysing portfolio data to reveal systemic gaps and dependencies.
- Generating scenarios to inform implementation plans.
- Providing a navigable dashboard to track and evaluate progress.

2. Scope

In Scope for v1

- **Portfolio data input:** Accepts structured portfolio data in a database form (e.g. CSV, API import, or manual entry).
- **Gap, dependency and synergy analysis:** Identify missing actions, assets, stakeholders and potential synergies.
- **Scenario generation:** Generate "what-if" scenarios based on selection of actions/clusters.

- **Basic impact visualisation:** Direct impacts, indirect impacts, and co-benefits.
- **Dashboard for navigation:** Filter, sort, and search across actions, actors, and assets.
- **Status tracking:** Ability to update and view progress of actions.
- **Basic portfolio impact metrics:** Aggregation of impacts and synergies at portfolio level.

Out of Scope for v1

(future versions)

- Dynamic modelling of political/cultural shifts.
- Full financial modelling.
  Advanced impact visualisation (network diagrams, spatial mapping).
- Automated ingestion from multiple live data sources.

3. Intended Users & Needs

User type: Portfolio Managers (city-level, municipal budget holders)
Needs: Design and implement city-wide portfolios, monitor progress, ensure synergy across actions
Value from tool: Quickly see gaps, dependencies, and synergies to inform funding allocation and policy decisions

User type: Practitioner Communities
Needs: Cluster initiatives for better funding and implementation chances
Value from tool: Identify natural clusters and co-benefits, present stronger collective cases to funders

User type: Portfolio Investors (philanthropic, private, public)
Needs: Identify investment opportunities with risk-hedging and co-benefit potential
Value from tool: See systemic impacts, diversity of actors, and potential for cross-sector benefits

4. Core Features for v1

4.1 Portfolio Data Input

- **Manual upload** via CSV or form-based entry.
- **Data model** includes:
    - **Actions** (initiative name, description, target outcomes, status, timeline)
    - **Actors** (organisation name, type, sector, role in portfolio)
    - **Assets** (funding, infrastructure, data, knowledge)
    - **Connections** (which actions share actors/assets)

4.2 Gap, Dependency, Synergy Analysis

- Highlight actions missing key stakeholders, assets, or dependencies.
- Suggest possible linkages (synergies) based on existing data.
- Provide a **“gap report”** export for planning meetings.

4.3 Scenario Generation

- Allow users to select a cluster of actions and generate a scenario.
- Scenario parameters for v1:
    - Chosen actions
    - Associated actors and assets
    - Timeline adjustments
    - Conditions and limitations
- Output: summary of projected direct impacts, indirect impacts, and co-benefits.

4.4 Basic Impact Visualisation

- Display direct impact metrics (from action-level data).
- Show indirect impacts and potential co-benefits in list or simple chart form.

4.5 Dashboard for Navigation

- Interactive view of all portfolio elements (actions, actors, assets).
- Filters by sector, actor type, status, outcome area.
- Search function for quick access.

4.6 Status Tracking

- Simple progress states: **Not Started / In Progress / Completed / On Hold**.
- Ability to update status inline from the dashboard.

4.7 Portfolio Impact Metrics (Basic)

Aggregate measures for:

- Number of synergistic solutions.
- Diversity of actors and cross-sector collaborations.
- Funding metrics:
    - Amount allocated
    - Amount pooled (amplified through the portfolio)
    - Number of actions receiving funding that otherwise wouldn't have had funding (unlikely actions or actors)

5. Technical Architecture & Stack

5.1 Frontend

- **Framework:** Next.js (React + TypeScript)

- **Styling/UI:** Tailwind CSS + shadcn/ui
- **Data fetching:** TanStack Query (React Query)
- **Tables:** TanStack Table (large dataset support)
- **Charts:** ECharts (impact/co-benefit visualisation)
- **Graphs:** Cytoscape.js for dependency maps (kept minimal in v1)
- **Auth:** NextAuth.js or Auth0 (with OAuth + magic link)
- **Exports:** SheetJS (CSV/XLSX), React-PDF (Gap Report)

5.2 Backend Services

- **Core API:** NestJS (TypeScript) for CRUD, RBAC, imports, exports
- **Analysis Service:** FastAPI (Python) for:
    - Gap detection algorithms
    - Clustering suggestions
    - Scenario scoring & impact heuristics
- **Communication:** REST (short term), gRPC or message queues for async analysis

5.3 Datastores

- **Relational DB:** PostgreSQL (managed, EU region)
    - Core tables: actions, actors, assets, links, impacts, status_updates, funding_events, governance_checks, tags
    - Row-Level Security for multi-tenant isolation

- **Graph DB:** Neo4j (managed: AuraDB) for:
  Fast dependency queries
    - “What’s missing?” detection
    - Cluster similarity search

- **Cache/Jobs:** Redis for async tasks (imports, recomputes, nightly metrics)

5.4 Infrastructure

- **Hosting:**
    - Vercel (frontend)
    - Fly.io/Render (backend services)
    - Managed Postgres (Supabase/Neon)
    - Managed Neo4j AuraDB (EU region)

- **Monitoring:** Sentry (frontend & backend), OpenTelemetry for tracing
- **CI/CD:** GitHub Actions
- **Product Analytics:** PostHog (self-hosted/EU cloud)

5.5 Security & Compliance

- Role-based access control (Admin / Editor / Viewer)
- Multi-factor authentication for Admin roles
- Encryption at rest & in transit
- Audit logs for data edits
- GDPR-compliant hosting & data handling (EU)

6. Non-Functional Requirements

- **Usability:** Intuitive UI for non-technical users.
- **Accessibility:** WCAG 2.1 AA compliance where possible.
- **Security:** Role-based access (view, edit, admin).
- **Performance:**
    - Load portfolios up to 200 actions with sub-3s response
      Graph queries <1s for up to 1,000 nodes (via Neo4j)
- **Scalability:** Horizontal scaling for backend services, DB indexing for high-volume queries

7. Constraints

- Limited to manual or CSV upload in v1 (no live integrations).
- Visualisations limited to basic bar/line charts and tabular outputs.
- Scenario generation limited to action clusters (no complex modelling).

8. Assumptions

- Portfolio data is relatively clean and structured before being uploaded.
- Users will manually maintain status updates.
- First version will be web-based, desktop-optimised.

9. KPIs for v1 Success

- Number of portfolios created and analysed in first 6 months.
- Average number of scenarios generated per portfolio.
- Percentage of users who report tool improved decision-making (target >70%).