

## Project: 3D Knowledge Network Engine

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### Vision

Build a persistent, publicly browsable 3D network connecting institutions, individuals, and concepts. The system will auto-populate authoritative information from sources like Wikipedia and allow users to add dynamic HTML overlays ("layers") to any node. Each user can create private, shared, or public perspectives on the network. Think:

- **Wikipedia + Obsidian** (linked nodes + personal annotation)
  - **Graph Commons** (relational graph)
  - **Notion/Roam** (rich user content)
  - **Google Earth/MindMap** (3D spatial zooming + navigation)
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### MVP Scope

#### Features

- Auto-populate nodes (Wikipedia, Wikidata, dictionary APIs)
- Neo4j graph database (nodes & edges)
- User HTML overlays with dynamic content
- 3D interface with zoom, rotate, pan (Three.js)
- Public/private sharing of view state via query-encoded URL
- Basic search engine

#### Stack

- **Frontend:** React + TypeScript + Three.js + TailwindCSS
  - **Backend:** Node.js + Express or FastAPI (Python)
  - **Database:** Neo4j AuraDB + PostgreSQL (layers, users)
  - **Auth:** Auth0 or Firebase Auth
  - **Cloud Infra:** Vercel + AWS (Lambda, RDS, S3) + Neo4j AuraDB
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### Future Phases

#### v1.0

- Full-text search across nodes, tags, layers
- Direct SQL-style query interface for power users
- Enhanced node visualization: clustering, filters

#### v2.0

- Real-time collaboration with WebSockets

- Time axis to navigate temporal changes
- Integration with external APIs (OpenCorporates, OpenAlex)

### v3.0

- AI-generated summaries of node networks
- Semantic recommendations
- Browser extension for instant node generation

### v4.0

- Federation support via ActivityPub or GraphQL Federation
- Offline-first PWA with IndexedDB
- Export/share layers as self-contained JSON

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## Deliverables

1. **GitHub Starter Repo** (coming next)
2. **Pitch Deck** (for collaborators or investors)
3. **Mock UI Screenshots or Wireframes**
4. **Budget Estimate** (\$2K–\$3K/year for hosting)
5. **Deployment & DevOps Scripts** (Docker + Terraform optional)

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## Next Step

- Generate GitHub starter repo with example:
- Graph schema
- React + Three.js UI boilerplate
- Node/API scaffold (Node.js or FastAPI)
- Basic authentication & user layer example