

# AI Investment Advisor - Project Structure

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ai-investment-advisor/
|
├── README.md           # Main project overview, features, setup guide
├── LICENSE             # Open-source license (MIT/Apache 2.0 recommended)
├── .gitignore          # Ignore venv, node_modules, build files
├── docker-compose.yml  # For running backend + db + blockchain local node
├── .env.example        # Template for environment variables
|
├── docs/              # Documentation & architecture
|   ├── ARCHITECTURE.md # High-level architecture diagram + explanation
|   ├── AI_MODELS.md    # Notes about ML/AI models used
|   ├── BLOCKCHAIN.md   # Smart contract architecture + flow
|   ├── SECURITY.md     # Key management, KYC/AML notes
|   ├── DATA_PIPELINE.md # Data ingestion & processing notes
|   └── ROADMAP.md      # Development roadmap (MVP → full system)
|
├── frontend/          # React / Next.js frontend
|   ├── package.json
|   ├── public/
|   |   ├── index.html
|   |   ├── favicon.ico
|   |   └── assets/    # logos, icons
|   ├── src/
|   |   ├── App.js / App.tsx
|   |   ├── index.js / index.tsx
|   |   ├── components/
|   |   |   ├── Navbar.jsx
|   |   |   ├── PortfolioDashboard.jsx
|   |   |   ├── ChatAdvisor.jsx
|   |   |   ├── RecommendationCard.jsx
|   |   |   └── AlertsPanel.jsx
|   |   ├── pages/
|   |   |   ├── Home.jsx
|   |   |   ├── Login.jsx
|   |   |   ├── Register.jsx
|   |   |   └── Portfolio.jsx
|   |   ├── hooks/
|   |   |   └── usePortfolio.js
|   |   └── services/
|   |       └── api.js    # Axios/fetch wrapper to backend API
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| | └─ styles/
| |   └─ main.css
| └─ tests/
|   └─ ui.test.js
|
└─ backend/      # FastAPI or Node.js backend
  └─ requirements.txt  # (if Python) dependencies
  └─ package.json     # (if Node) dependencies
  └─ src/
    └─ main.py / app.js # entrypoint
    └─ config.py      # settings (db, API keys, secrets)
    └─ api/
      └─ routes_portfolio.py
      └─ routes_advisor.py
      └─ routes_auth.py
      └─ routes_blockchain.py
      └─ services/
        └─ ai_engine.py  # Connects to AI module
        └─ blockchain_service.py
        └─ market_data.py
        └─ user_service.py
      └─ models/
        └─ user.py
        └─ portfolio.py
        └─ recommendation.py
      └─ utils/
        └─ security.py
        └─ db.py
        └─ logger.py
    └─ tests/
      └─ test_api.py
  |
└─ ai_engine/      # AI & ML models
  └─ notebooks/      # Jupyter notebooks for experiments
    └─ portfolio_optimization.ipynb
    └─ risk_analysis.ipynb
  └─ models/
    └─ portfolio_optimizer.py
    └─ risk_predictor.py
    └─ llm_explainer.py
  └─ data/
    └─ raw/          # downloaded market data
    └─ processed/    # cleaned/normalized data
  └─ utils/
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├── data_loader.py
├── blockchain/           # Smart contracts & blockchain utils
│   ├── contracts/
│   │   ├── PortfolioLedger.sol # Immutable audit ledger
│   │   ├── Rebalancer.sol     # Optional auto-rebalance contract
│   │   └── OracleConsumer.sol # Reads oracle price feeds
│   ├── scripts/
│   │   ├── deploy.js / deploy.py
│   │   └── interact.js / interact.py
│   ├── test/
│   │   └── test_portfolioLedger.js
│   ├── hardhat.config.js # If using Hardhat
│   └── truffle-config.js  # If using Truffle (optional)
├── db/                   # Database configs & migrations
│   ├── migrations/
│   ├── schema.sql
│   └── seed_data.sql
├── infra/                 # DevOps / deployment
│   ├── Dockerfile.backend
│   ├── Dockerfile.frontend
│   ├── Dockerfile.blockchain
│   ├── k8s/
│   │   ├── backend-deployment.yaml
│   │   ├── frontend-deployment.yaml
│   │   └── db-deployment.yaml
│   ├── ci-cd/
│   └── github-actions.yml

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## Directory Overview

### Root Level

- **README.md:** Project documentation and setup instructions
- **LICENSE:** Open-source licensing information
- **.gitignore:** Version control exclusions
- **docker-compose.yml:** Multi-container orchestration
- **.env.example:** Environment configuration template

### Documentation ([docs/](#))

Comprehensive project documentation including architecture, AI models, blockchain implementation, security measures, data pipeline, and development roadmap.

## **Frontend** ((frontend/))

React/Next.js application with components, pages, hooks, services, and styling. Includes comprehensive UI for portfolio management and AI advisor interactions.

## **Backend** ((backend/))

FastAPI or Node.js server handling API routes, business logic, data models, and utilities. Integrates with AI engine and blockchain services.

## **AI Engine** ((ai\_engine/))

Machine learning models and notebooks for portfolio optimization, risk prediction, and LLM-based explanations. Includes data processing pipelines.

## **Blockchain** ((blockchain/))

Solidity smart contracts for portfolio ledger, rebalancing, and oracle integration. Includes deployment scripts and tests.

## **Database** ((db/))

Database schema, migrations, and seed data for development and testing.

## **Infrastructure** ((infra/))

Docker configurations, Kubernetes deployments, and CI/CD pipelines for automated deployment.