Robo Advisor: Automated Portfolio Optimization

Team: Naor Barzida, Daniel Fraenkel, Guy Sananes

Supervisor: Ofer Zevin

Addressing Investment Challenges

Complex Investing

Many investors struggle with portfolio optimization and financial complexities.

High Advisor Costs

Traditional financial advisors are expensive and often inaccessible.

Automated Need

A simple, automated investment assistant is crucial for modern investors.

Our Tailored Solution

Web-Based Platform

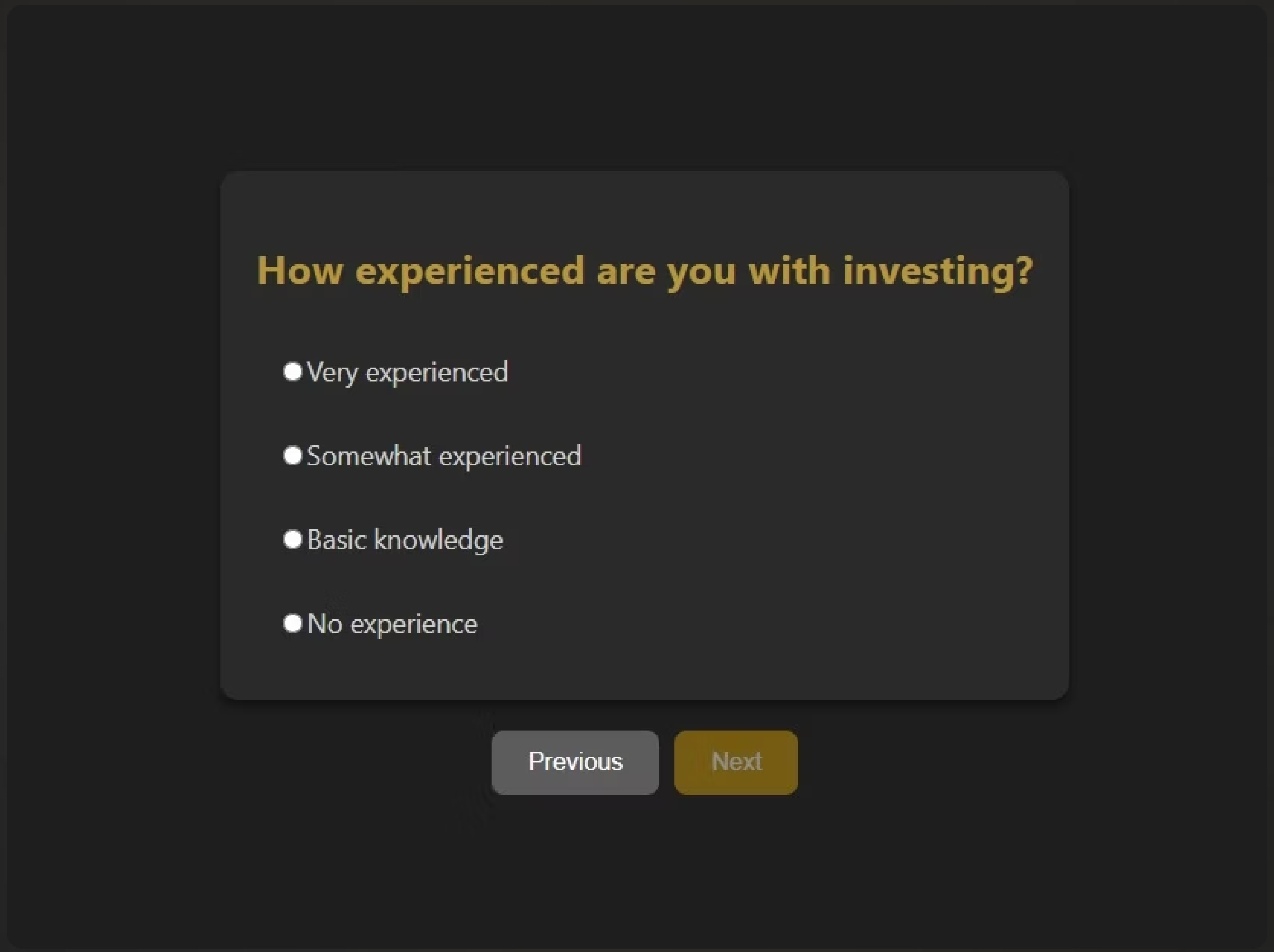
Generates personalized investment portfolios online.

Risk Questionnaire

Users complete a brief questionnaire to define risk tolerance.

Optimized Portfolios

System provides a portfolio matching conservative, moderate, or aggressive profiles.



System Architecture

Frontend: React

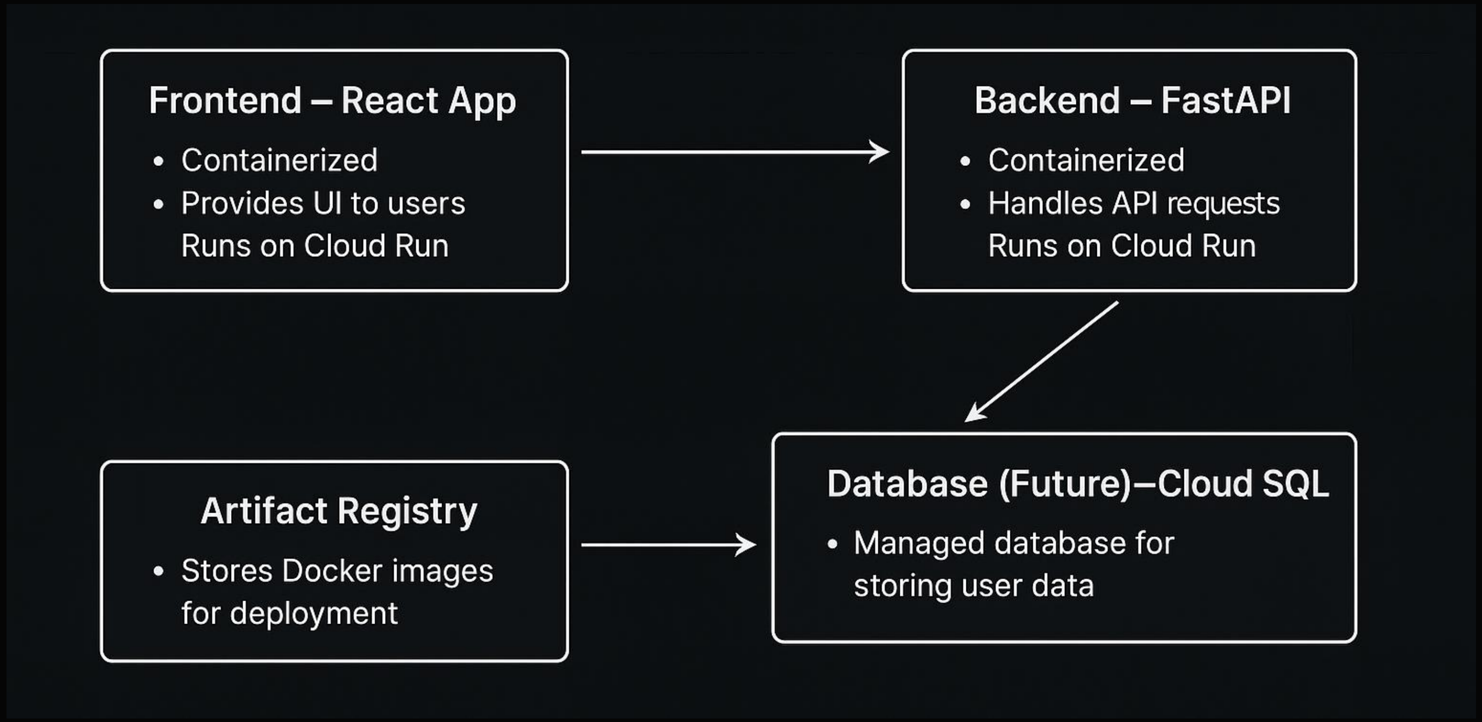
User interface, questionnaire input.

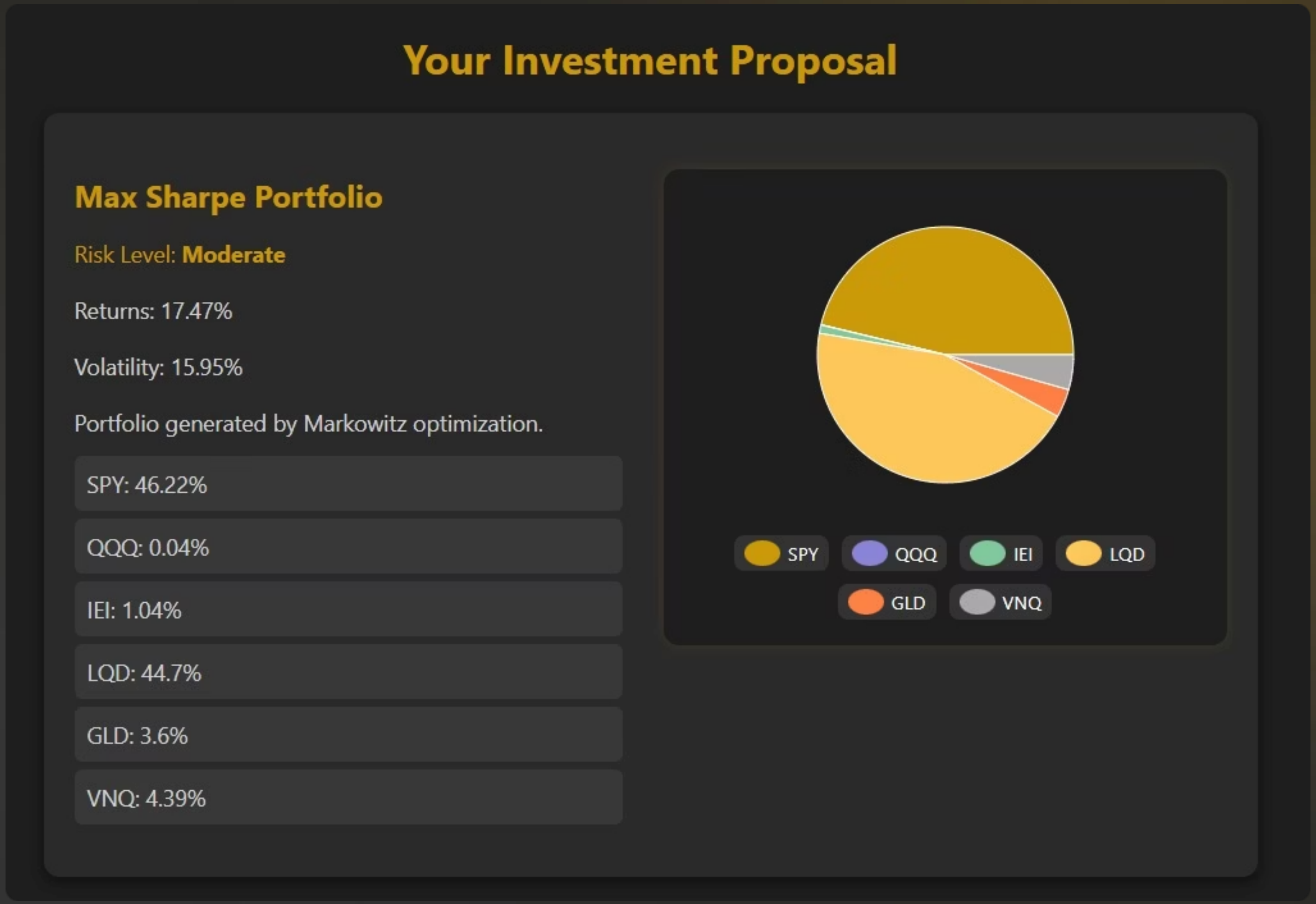
Backend: FastAPI (Python)

Processes data, runs optimization.

Optimization Engine

Markowitz model for portfolio optimization.





Seamless Data Flow

1. **User Submits**

   Questionnaire answers sent to backend.

2. **Risk Profile Determined**

   Backend analyzes answers for risk.

3. **Markowitz Optimization**

   Backend runs portfolio optimization.

4. **Portfolio Returned**

   Optimal portfolio displayed to user.

Enhancing Performance

Batch Processing

Optimize computations daily or weekly for efficiency.

Database Storage

Store precomputed portfolios in PostgreSQL or Supabase.

Instant Service

Serve precomputed portfolios quickly to users.

Portfolio Optimization Core

Historical Data

Uses past prices for return and covariance.

Simulated Portfolios

Evaluates various asset weight combinations.

Key Metrics

Calculates return, volatility, and Sharpe ratio.

Optimal Selection

Chooses portfolios for lowest risk, highest return, and max Sharpe.

Robo Advisor Advantage

Manual Investing

Lacks data-driven optimization.

Human Advisors

High cost, time-consuming consultations.

Robo Advisor

Low-cost, fast, transparent logic.

What’s Next?

- Adding Machine Learning option
- Supporting different stocks options

Thank You!

MTA
ROBO-ADVISOR