VIT Vidyalankar Institute of Technology
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CODE-A-THON

TECHNICAL COUNCIL

TEAM DETAILS

- **Project Title**: Quantum-Resistant Investment Portfolio Optimiser
- **Selected Domain**: Fintech
- **Team Members**:
  - Vedant Patil SY CSE(AIML) VIT Pune
  - Parth Sardeshmukh SY CSE(AIML) VIT Pune
  - Omsai Rathod SY CS VIT Pune

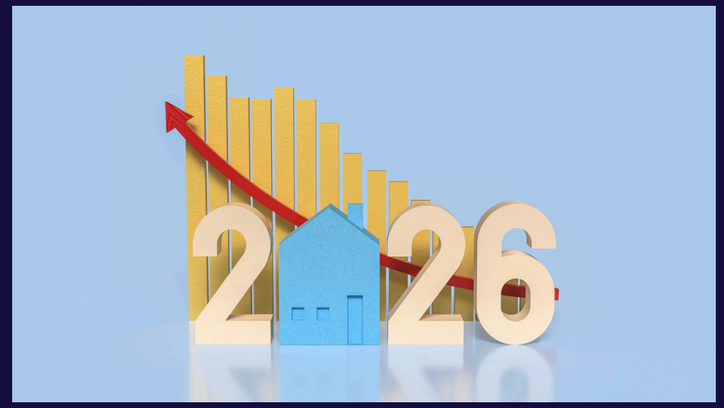
PROBLEM STATEMENT AND DOMAIN RELEVANCE

Who Is Affected

- Retail investors
- Young professionals
- Long-term financial planners

Real World Problem

- Investment apps rely on static & historical market data
- They ignore real-time news and social media sentiment
- Current encryption methods will fail against quantum computers



Why It Matters

- Missed market opportunities
- Poor risk management
- High future security risk

PROPOSED SOLUTION

OUR SOLUTION

- Smart AI-powered investment dashboard
- Continuously optimizes portfolio in real time
- Secured using quantum-resistant technologies

KEY INNOVATIONS

- Reinforcement Learning-based portfolio optimization
- Social & news sentiment analysis
- Post-quantum cryptography with blockchain logging

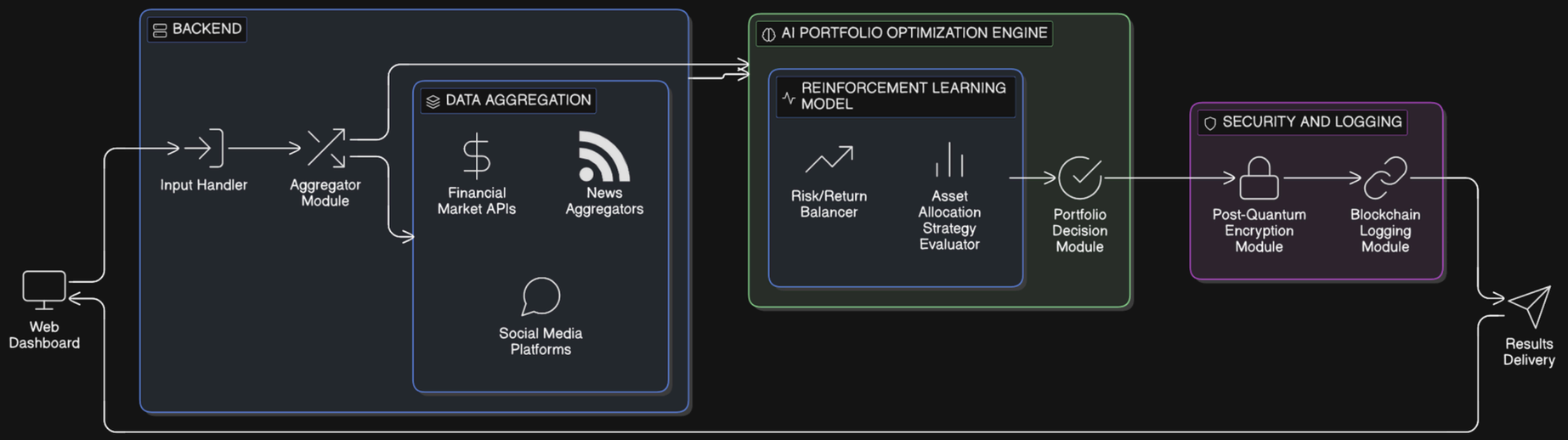
HOW IT SOLVES THE PROBLEM

- Faster market reactions
- Better risk-adjusted returns
- Future-proof data security

TECHNICAL APPROACH

TECHNOLOGY STACK

- Frontend: React.js, Interactive Charts
- Backend: Python (FastAPI)
- AI Models: Reinforcement Learning, NLP
- Security: Post-Quantum Cryptography, Blockchain



PRODUCT SCOPE & FEATURES

CORE FEATURES

- AI-driven automated portfolio rebalancing
- Real-time sentiment-based buy/sell signals
- Risk-aware asset allocation across asset classes
- Interactive “what-if” return simulations

FINAL PRODUCT OUTPUT

- Personalized investment recommendations
- Live portfolio performance tracking
- Actionable alerts for market changes

FEASIBILITY ANALYSIS

TECHNICAL FEASIBILITY

- Built using mature AI techniques such as reinforcement learning and NLP
- Post-quantum cryptographic algorithms standardized by NIST
- Modular architecture allows independent scaling of AI, data, and security layers

ECONOMIC FEASIBILITY

- Cloud-based deployment minimizes infrastructure and maintenance costs
- Use of open-source AI frameworks and APIs reduces development overhead

OPERATIONAL FEASIBILITY

- Fully automated portfolio optimization reduces manual intervention
- Intuitive dashboard designed for non-technical retail investors
- Real-time monitoring and alert system improves usability and trust

FINANCIAL FEASIBILITY

- Subscription-based revenue model with optional premium features
- High scalability with increasing users at marginal cost
- Strong ROI potential due to automation and low operational expenses

INNOVATION / DIFFERENTIATION

LIMITATIONS OF EXISTING INVESTMENT PLATFORMS

- Depend primarily on historical price data and static strategies
- Lack integration of real-time news and social sentiment
- Use traditional encryption vulnerable to future quantum computing threats
- Limited transparency in decision-making and auditability

OUR UNIQUE ADVANTAGE

- Adaptive AI-based portfolio optimization that learns continuously
- Integration of real-time sentiment signals for faster market response
- Quantum-resistant cryptographic security ensuring long-term data protection
- Blockchain-based immutable audit trail for transparency and compliance

WHY THIS MATTERS

- Enables smarter, faster, and safer investment decisions
- Builds long-term trust with investors and regulators
- Future-proofs financial portfolios against emerging technological risks