TradeShift - Financial Portfolio Management & Trading Platform

Software Requirements Specification (SRS)

1. Introduction

Purpose: Define the goal of TradeShift as a unified platform for portfolio management & trading. Scope: Multi-brokerage integration, real-time market data, trade execution, analytics. Definitions & Acronyms: API, RBAC, JWT, P/L, etc. References: IEEE 830 SRS standard, API docs (Plaid, Finnhub, IEX Cloud), Spring Boot, React. Overview: Document structure summary.

2. Overall Description

Product Perspective: Cloud-based client-server model. Product Functions: Portfolio tracking, market data feed, trade execution, analytics. User Classes: Investor (user), Admin (system manager). Operating Environment: React (Frontend), Spring Boot (Backend), PostgreSQL (DB), APIs. Constraints: API rate limits, compliance with financial security. Assumptions & Dependencies: Brokerage APIs available, secure HTTPS connections.

3. System Features

- Authentication & Authorization
- Portfolio Management
- Market Data Integration
- Trade Execution Engine
- Analytics & Dashboard

4. External Interface Requirements

- User Interface: Responsive React-based dashboard.
- Software Interfaces: REST APIs, WebSockets, Spring Boot microservices.
- Communication Interfaces: OAuth2/JWT, HTTPS.

5. Non-Functional Requirements

- Performance: Real-time updates <2s delay.
- Security: Encrypted JWT, RBAC.
- Reliability: 99.9% uptime.
- Scalability: Supports 10K concurrent users.
- Usability: Mobile-first design.
- Maintainability: Modular microservice code.

6. System Architecture & Design

System Architecture Diagram:
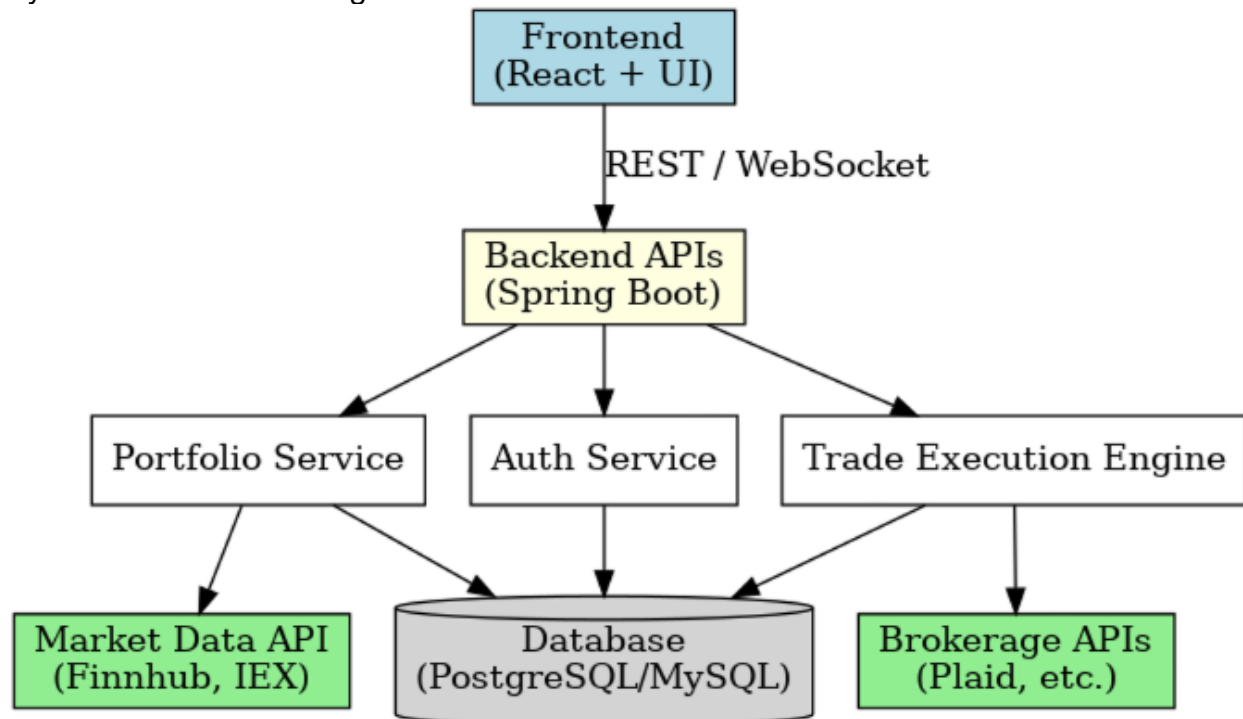
7. Data Flow Diagrams

- DFD Level 0: High-level interaction

- DFD Level 1: Portfolio, Market, Trade, Analytics flow
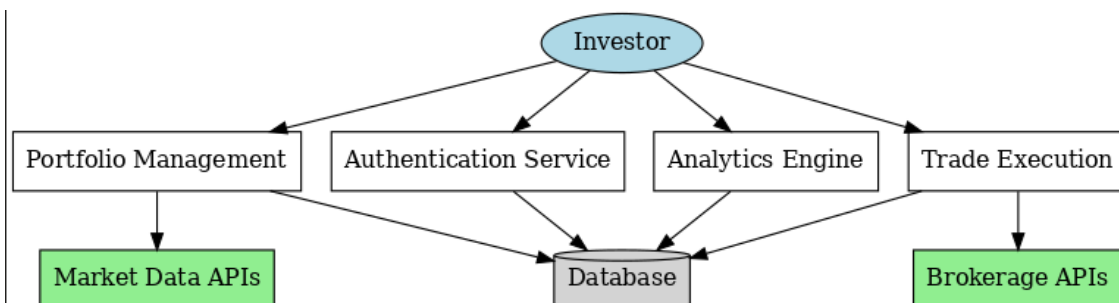
- DFD Level 2: Detailed Trade Execution + Portfolio update

```
                    ┌──────────┐
                    │ Investor │
                    └──────────┘
                     │        ▲
                     ▼        │
          ┌─────────────────┐ │
          │ Trade Request   │ │
          │ Form (Buy/Sell) │ │
          └─────────────────┘ │
                     │        │
                     ▼        │
          ┌─────────────────┐ │
          │ Order Validation│ │
          └─────────────────┘ │
              Send order      │ Status Update
                     │        │
                     ▼        │
          ┌─────────────────┐ │
          │ Brokerage API   │ │
          └─────────────────┘ │
            Execution result  │
                     │        │
                     ▼        │
          ┌──────────────────────┐
          │ Orders & Transactions│
          │ DB                   │
          └──────────────────────┘
                     │        │
                     ▼        │
          ┌─────────────────┐
          │ Trade           │
          │ Confirmation    │
          └─────────────────┘
```
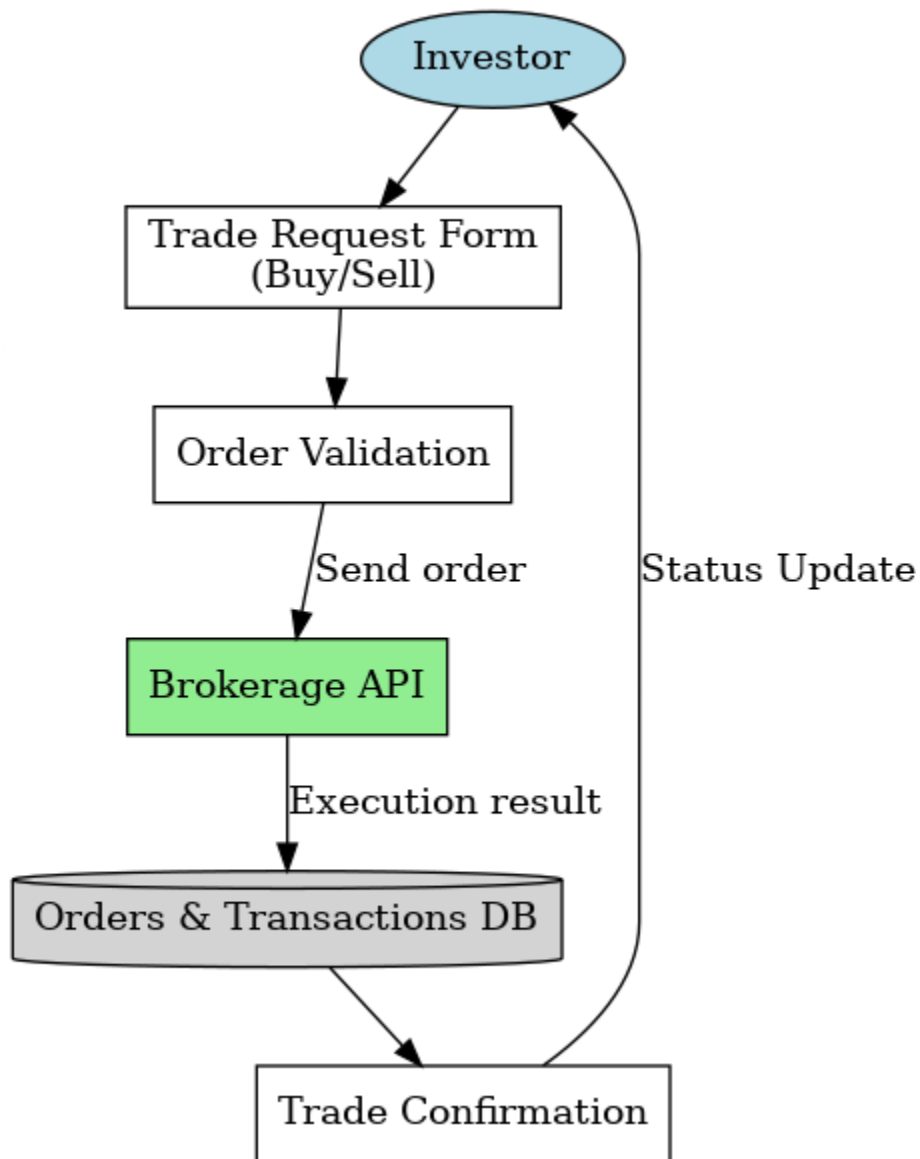
8. Flowcharts (Module-wise)

- Login Flowchart
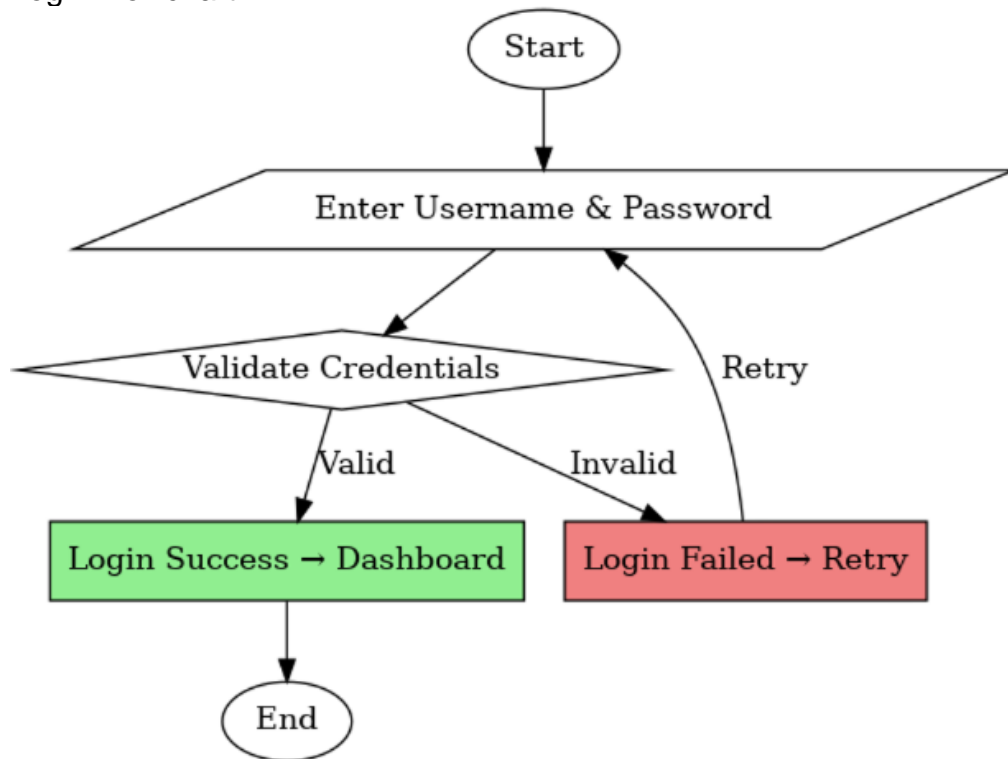
- Register Flowchart

- Portfolio Flowchart

```
                          ┌─────────────┐
                          │ User Logs In │
                          └─────────────┘
                                 │
                                 ▼
                       ┌──────────────────────┐
                       │ Request Portfolio Data │
                       └──────────────────────┘
                                 │
                                 ▼
                    ╱─────────────────────────╱
                    ╱   Fetch Holdings from DB ╱
                   ╱─────────────────────────╱
                                 │
                                 ▼
              ╱────────────────────────────────────────╱
              ╱ Fetch Real-time Prices (Market API)    ╱
             ╱────────────────────────────────────────╱
                                 │
                                 ▼
                    ┌──────────────────────────┐
                    │ Calculate Portfolio Value & P/L │
                    └──────────────────────────┘
                                 │
                                 ▼
                    ┌────────────────────────────┐
                    │  Display Portfolio Dashboard │
                    └────────────────────────────┘
```
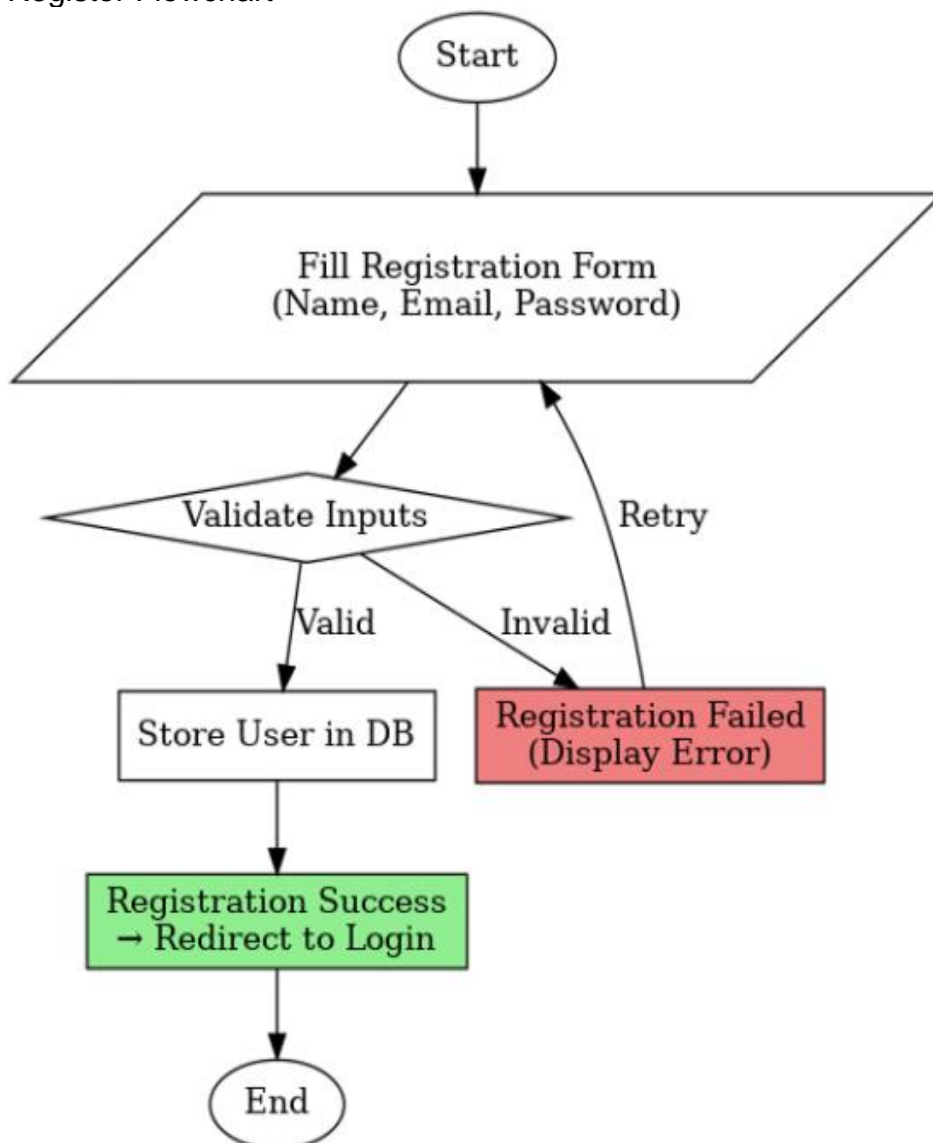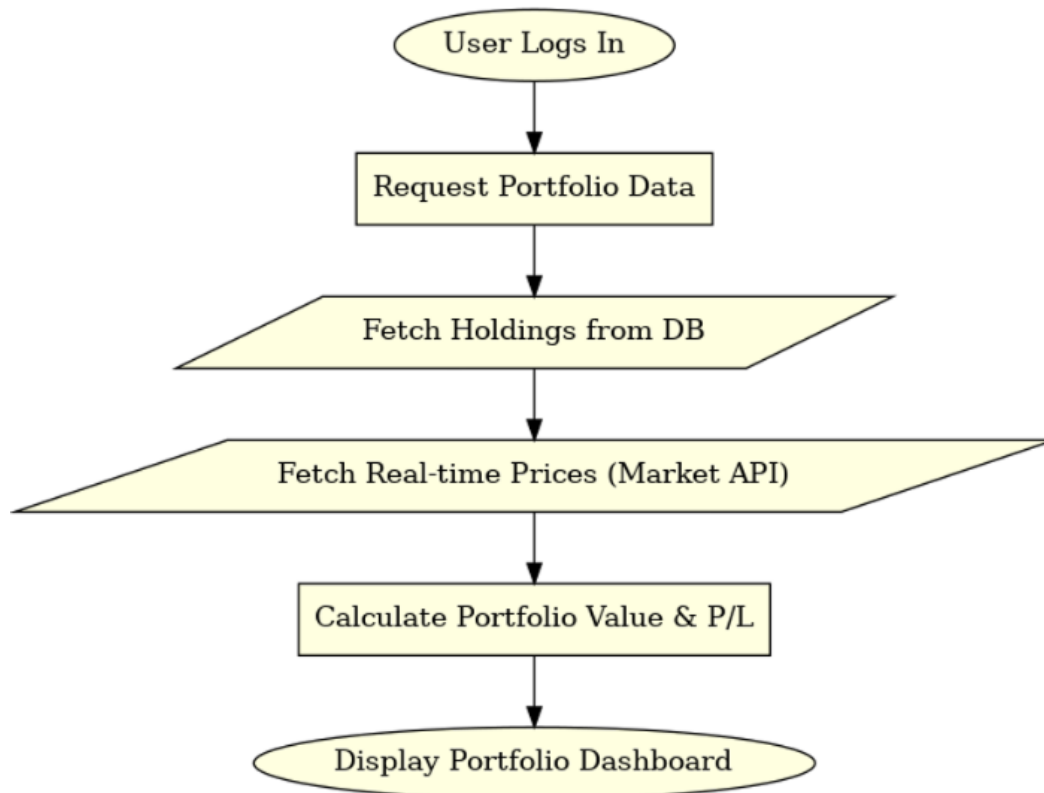
- Market Data Flowchart

```
                    ┌────────────────────────────┐
                    │   User Enters Stock Symbol   │
                    └────────────────────────────┘
                                 │
                                 ▼
                       ┌──────────────────────┐
                       │ Send Request to Market API │
                       └──────────────────────┘
                                 │
                                 ▼
              ╱────────────────────────────────────────╱
              ╱  Fetch Real-time & Historical Data     ╱
             ╱────────────────────────────────────────╱
                                 │
                                 ▼
                       ┌──────────────────────┐
                       │ Render Charts & Data Table │
                       └──────────────────────┘
                                 │
                                 ▼
                    ┌────────────────────────────┐
                    │   Display Stock Analytics    │
                    └────────────────────────────┘
```
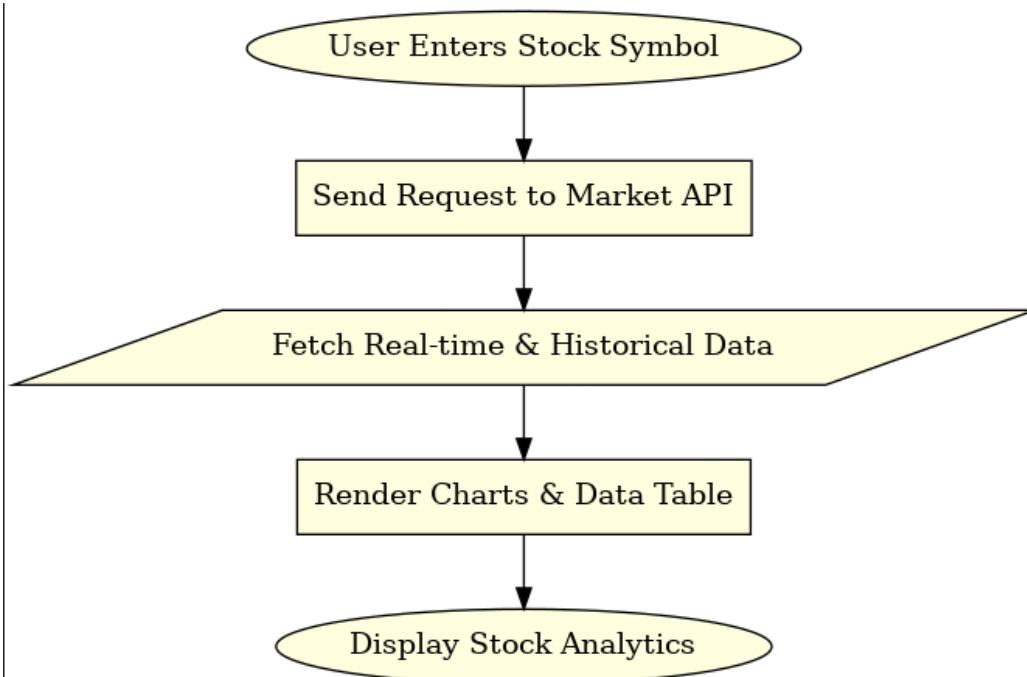
- Trade Execution Flowchart
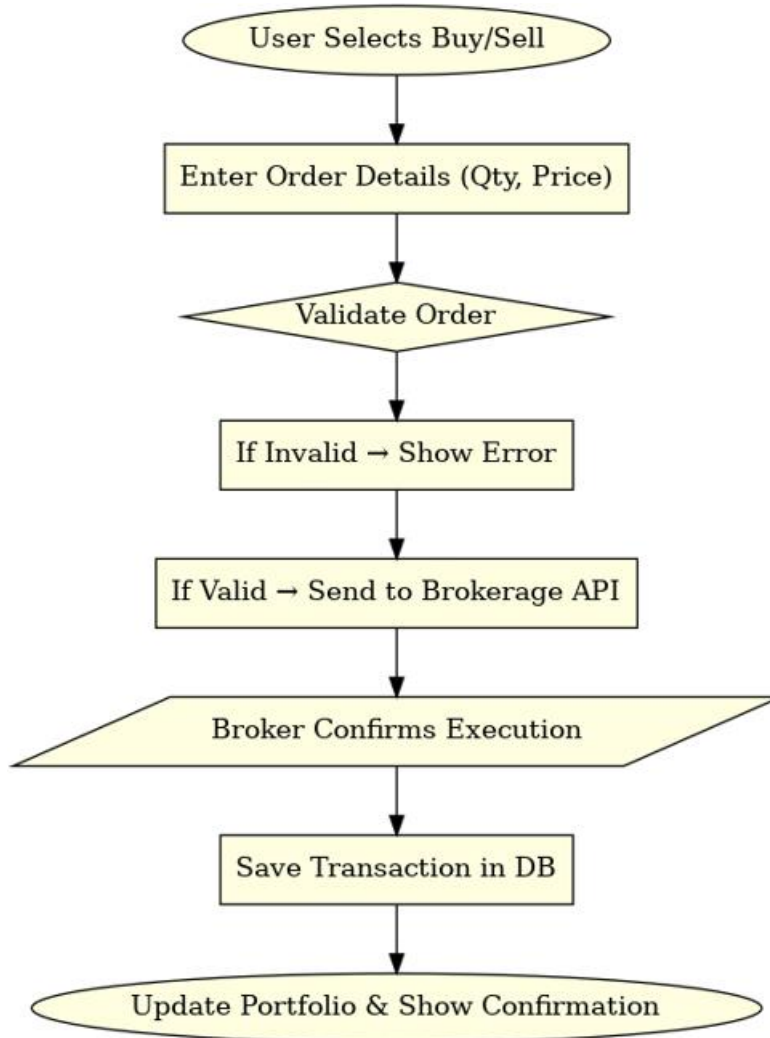
- Analytics Dashboard Flowchart (Insert analytics_flowchart.png)

```
                      ┌─────────────────────────────────────┐
                     (   User Opens Analytics Dashboard      )
                      └─────────────────────────────────────┘
                                       │
                                       ▼
                  ╱─────────────────────────────────────────╲
                 ╱        Fetch Portfolio History from DB      ╲
                ╱───────────────────────────────────────────────╲
                                       │
                                       ▼
                     ╱─────────────────────────────╲
                    ╱        Fetch Market Trends      ╲
                   ╱───────────────────────────────────╲
                                       │
                                       ▼
                       ┌─────────────────────────────┐
                       │   Generate Charts & Metrics  │
                       └─────────────────────────────┘
                                       │
                                       ▼
                      ┌─────────────────────────────────┐
                     (    Display Interactive Dashboard   )
                      └─────────────────────────────────┘
```
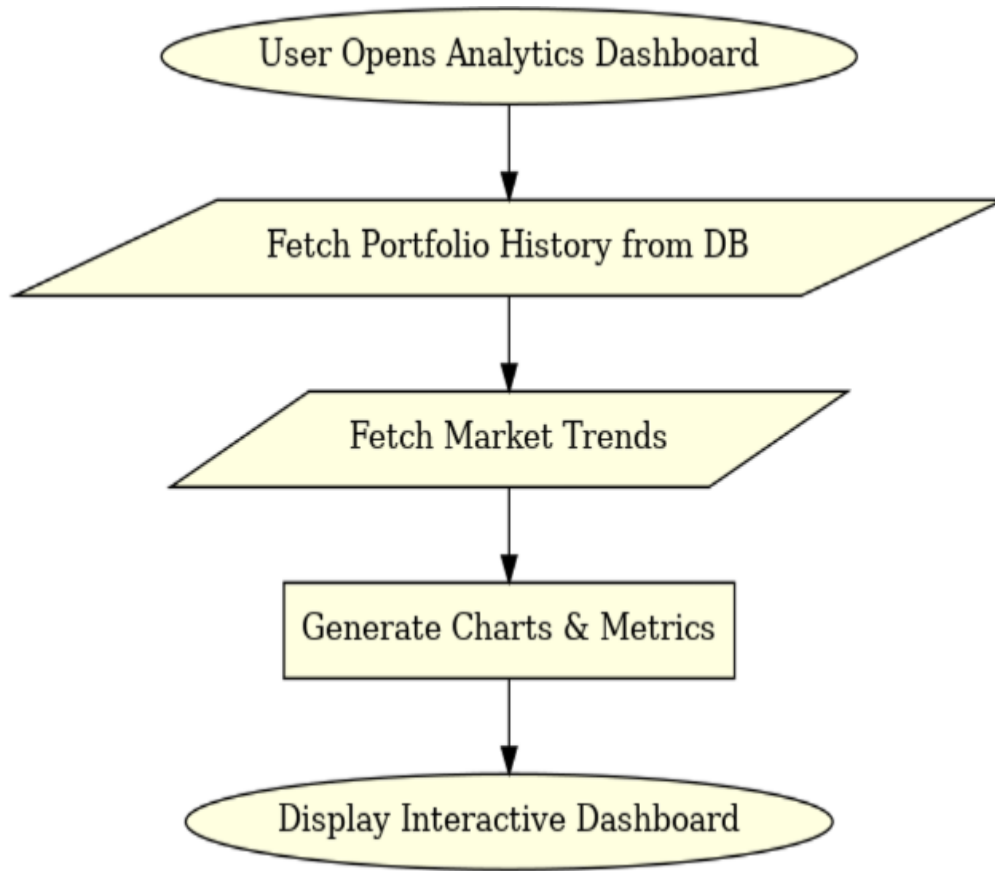
9. Other Requirements

- Legal & Compliance: Financial data security & audit trails.
- Logging & Monitoring: Track trades, API usage, error logs.
- Backup & Recovery: Daily backups, disaster recovery plan.

10. Future Enhancements

- AI-based investment recommendations.
- Multi-currency, multi-language support.
- Integration with cryptocurrency exchanges.