

PROJECT 1 – STOCK TRADING SYSTEM

1. Summary of Problem Description: (Nouns and Verbs Highlighted)

In recent years, the number of self-directed traders/investors, particularly day traders, has seen a dramatic increase, with a year-over-year (YoY) growth of around 4 percent. This growth, driven by easier access to trading platforms, lower transaction costs, and the increasing popularity of retail trading, has created a pressing need for an efficient database management system to handle trader profiles, their transactional data, and portfolio performance. As the volume and complexity of trades grow, keeping track of individual trader performance metrics, behavioral analysis, and portfolio risk assessments becomes increasingly challenging.

To tackle these issues, a comprehensive database system is created to store, organize, and analyze real-time trading data, including details on stocks, such as Stock Name, Market Share Percentage, and Sector. The system also manages traders' watchlists, including the trader's identity and the stocks included in their watchlist. Additionally, the database tracks portfolio performance, with a focus on transactions (buy/sell), holding value, and PnL (Profit and Loss) values.

By integrating analytical tools and predictive algorithms, traders can gain deeper insights into their trading patterns, profitability trends, and risk exposures, enabling them to optimize their risk management strategies, make more data-driven investment decisions, and improve their overall financial performance.

2. Rules and Narratives:

- Each Trader can only have one trading account used to buy stocks.
- Traders can only buy a whole stock. This does not include fractions of stocks.
- No trader can buy stocks worth more than the input account balance data.
- Transactional Data should be either a buy or sell.
- Traders can only sell stocks which they own.
- Traders cannot transact in a stock which is not present in the stock list.
- Stocks held by traders are stored in the portfolio data until they are sold.
- Trader ID and Stock Symbols are unique.
- The stocks which are bought but not yet sold are kept in the holdings/portfolio table.

- PnL is defined by the profit/loss calculated after a certain stock has been sold by a trader.
- Watchlist can only include stocks from the stock list.

3. Nouns and Verbs:

Nouns:

- Trader
- Investor
- Trading Platform
- Transactional Data
- Trades
- Stock
- Stock Name
- Market Share Percentage
- Sector
- Watchlists
- Trader's Identity
- Watchlist Stocks
- Portfolio
- Transactions (Buy/Sell)
- Holding Value
- PnL (Profit and Loss)
- Trading Patterns
- Profitability
- Risk Management strategies
- Overall Financial Performance

Verbs:

- Seen a dramatic increase
- Driven
- Created a pressing need
- keeping track of individual trader performance metrics
- tackle these issues
- analyze real-time trading data
- optimize their risk management strategies
- make more data driven investment decisions
- and improve their overall financial success
- buy stocks
- sell stocks
- transact
- stored

4. Summarize Nouns:

- Goal: Overall Financial Performance
- Users: “Trader”, “Investor”
- Trader/Investor:
 - Name
 - Trading Platform
 - Trading Pattern
 - Profitability
 - Risk Management Strategies
- Transactional Data:
 - Trades
 - Trading Platform
 - Stock Symbol
 - Trades
 - Stocks
- Stocks
 - Stock Name
 - Sector
 - Market Share Percentage

- Watchlists
 - Trader's Identity
 - Watchlist Stocks
- Portfolio
 - Holding Value
 - PnL

5. Challenge Questions:

- Can a trader sell without buying first?
- Can a trader partially sell stocks? How will that add up in the database and holding stocks table?
- Can traders see their ranks in the holding tables based on the Profit and Loss? If yes, how will the team ensure data privacy of not showing more than necessary.

6. Creative Addition:

Creative Addition which is added to this is to show the holding data and profitability margin of the traders. This will allow Traders to have an analytical view as supposed to just limiting them to a transactional view. Another creative addition will be to add ranks to the table, to enable traders to see their position in comparison to other traders of their area.