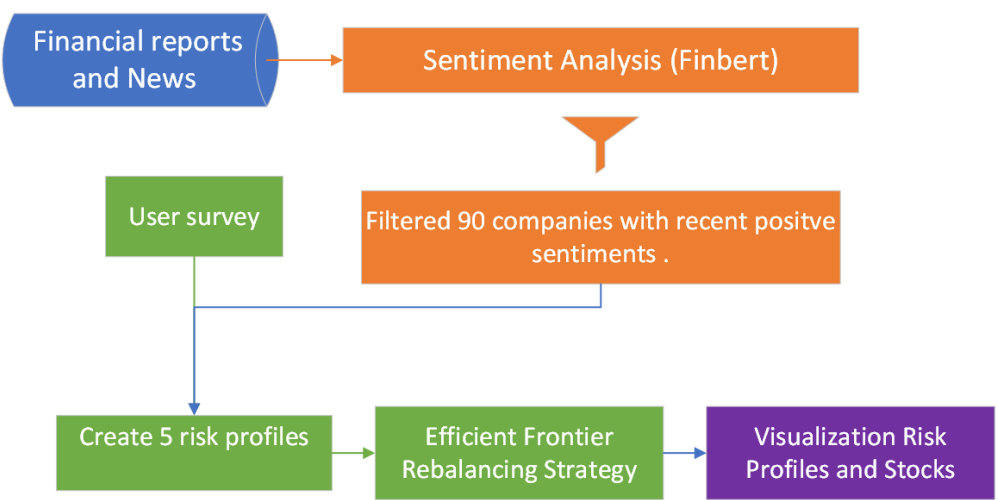# FinSight: Your Vision for Financial Insights

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INTRODUCTION

- **Problem**: Investing in the stock market has become increasingly complex due to the vast amounts of data and various factors that influence stock prices and investor sentiment.
- **Goal**: Assist investors in making informed decisions by building a smart portfolio optimizer web app.
- **Importance**: Mitigate the risks of losses, potentially increase their ROI, automate analysis of various market factors, ultimately leading to more improved financial outcomes for individuals based on their risk surveys.

APPROACHES

Sentiment Analysis

- FinBERT, a pretrained model with a tokenizer specifically made for financial text, was used to perform sentiment analysis
- We used the rich Financial reports like 10-K (Annual report) and 10-Q (Quarterly report) and recent financial news for 613 tickers comapanies and ranked sentiment analysis using Net-positive score

Sentences	Sentiment
Apple is a great stock.	Positive
Apple revenues have increased by 15%.	Positive
The stock market opened at 8 am.	Neutral
Exxon laid off 10% of staff.	Negative
Below is the summary of our quarterly report.	Neutral
Verizon profit margins are declining due to competition.	Negative

Portfolio Management

- An optimal, balanced and well risk-managed portfolio is achieved by applying the Efficient Frontier Rebalancing Strategy to pick securities that find the balance between maximized returns and minimized risks.

- Returns and risk are calculated using a compound annual growth rate and annualized standard deviation, and the efficient frontier plots the risk and returns for the number of assets

- Once the ideal portfolio is generated, the appropriate weights are applied to the 18 securities fmo the chosen batch and the final portfolio is generated
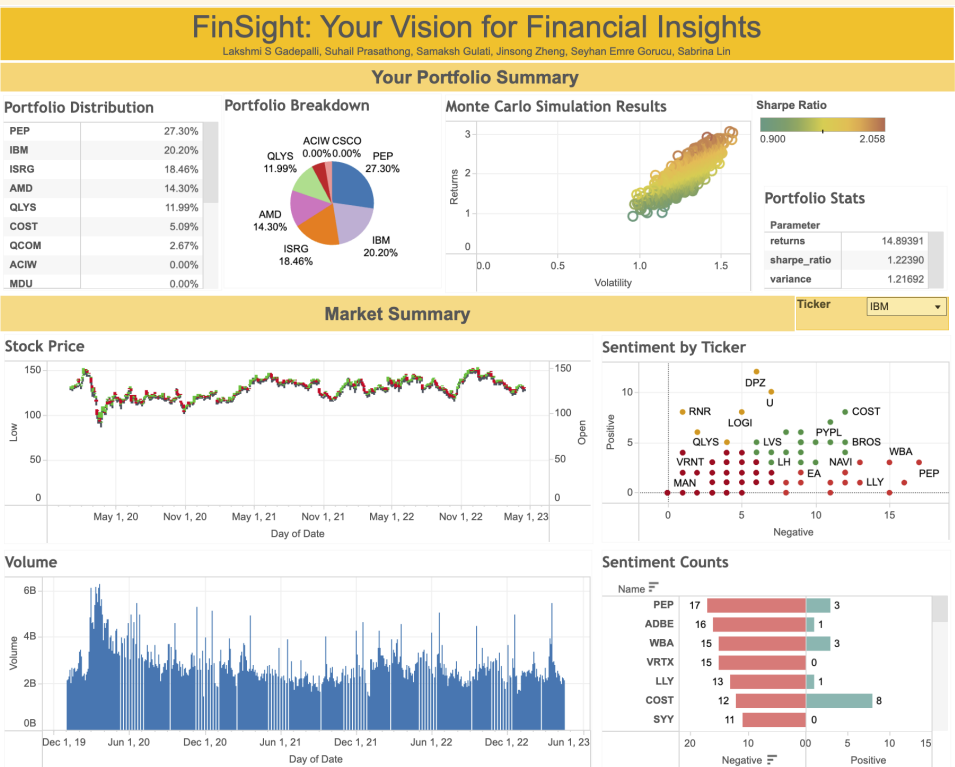
DATA

- Data Scraping: Data was scraped using using BeautifulSoup, urllib, HTML parser, and Seeking Alpha.
- **1**0-K 10-Q dataset: The file is 2.2 Gb. Includes 613 publicly traded stocks and consists of quarterly (10-Q) and annual (10-K) financial reports for the past 4 years. Information such as CIK code, filing type, and start date were collected from the SEC filings.
- **Financial news:** Includes financial articles from Motley Fool and Market News for the top 90 publicly traded companies in the U.S.

Visualization

For each portfolio, we visualize how the investment is broken down in various stocks and deep dive into health metrics of the portfolio like Sharpe Ratio, Expected Returns etc.

In the market summary section, we show historical performance of the company using its price and volume charts as well as sentiment analysis results.

EXPERIMENTS & RESULTS

We compared our FinBert sentiment analysis on a sample data containing 450 sentences from 90 stock tickers which was manually labeled. FinBert could get us the correct label **93%** of the time. Additionally, we ran **15,000 Monte Carlo simulations** to pick the best portfolios based on risk assessment survey.

Monte Carlo Simulation Results

Parameter	
returns	14.89
sharpe_ratio	1.22
variance	1.21

Sharpe Ratio