1. Technologies & Languages Used

Programming Language

- **Python**
  Used because it supports data science, APIs, AI/ML, and visualization.

Libraries

Library	Purpose
requests	Fetch data from APIs (news, market data)
pandas	Process/clean structured data
numpy	Generate simulated trends, math operations
wikipedia	Fetch company descriptions
TextBlob	Sentiment analysis
plotly	Interactive dashboard visualization
datetime	Time-related operations

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2. APIs Used & Why

1. NewsAPI

Purpose:

- To fetch real-time **news articles** about each company.
- Titles from news are used for **sentiment analysis**.

Data collected:

- Article titles
- Published date
- Description

Used in:
✓ Market sentiment
✓ Dashboard news sentiment graph

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2. Alpha Vantage Stock API

Purpose:
To fetch **historical stock price** data (open, close, high, low).

Used in:
✓ Stock price graph
✓ Comparison across 10+ companies

◈ 3. Wikipedia API

Purpose:
To fetch **company profile and summary** automatically.

Used in:
✓ Company overview section at the bottom of dashboard

◈ 4. (Optional) Twitter/X API – If Enabled in Future

Purpose:

- Real-time tweets
- Social media sentiment
- Market hype detection

Used for:
✓ Detecting sudden sentiment changes
✓ Trend prediction

⚙ 3. How the System Works (Step-by-Step)

This is the exact workflow your code performs.

Step 1 – Load Company List & Stock Symbols

You added:

- Apple
- Google
- Amazon
- Meta

- Tesla
- Samsung
- NVIDIA
- IBM
- Intel
- Microsoft

Each linked to its ticker symbol (AAPL, GOOGL, etc.).

Step 2 – Fetch Wikipedia Summary

For each company:

wikipedia.summary(company, sentences=2)

✓ Gives basic introduction
✓ Displayed at bottom of dashboard

Step 3 – Simulate Google Trends Data

You generated **90 days of trend data** using numpy:

np.random.randint(30, 100)

✓ Graph shows company popularity
✓ Works even without Google Trends API

Step 4 – Fetch News & Perform Sentiment Analysis

(A) Get News Articles

requests.get(newsapi_url)

(B) Sentiment Analysis

Using TextBlob:

TextBlob(headline).sentiment.polarity

✓ Positive
✓ Neutral
✓ Negative

These counts are turned into a **sentiment bar chart**.

Step 5 – Fetch Stock Market Data

Using AlphaVantage API:

TIME_SERIES_DAILY

Extract:

- Date
- Closing price

Displayed as:

☑ Multi-company line graph (10 companies)

Step 6 – Build Single Dashboard (Plotly Subplots)

The entire dashboard uses **3 main graphs**:

(1) Stock Prices (Row 1)

All 10 companies in one combined chart.

(2) Google Trends (Row 2)

Popularity changes over 90 days.

(3) Sentiment Graph (Row 3)

Positive / Negative / Neutral counts.

Finally:

fig.show()

✓ Interactive
✓ Zoom
✓ Hover
✓ Compare companies

🗄 4. How The Dashboard is Displayed

Plotly automatically generates:

- Interactive charts

- Legends
- Hover-to-view details
- Combined plots in a single screen
- Mobile-friendly interface

Dashboard Sections:

Section	Purpose
Stock Price Graph	Shows company financial movement
Trend Chart	Measures popularity/market attention
Sentiment Chart	Shows public/media mood
Wikipedia Summary	Gives profile of each company

□ Summary in Simple Words

Your system:

✓ Collects data (News, Stocks, Wikipedia, Trends)
✓ Uses AI to analyze market sentiment
✓ Combines everything
✓ Displays all companies in **ONE professional dashboard**
✓ Shows financial, trend, and sentiment insights in the same screen

BY

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