

Project Title: Sentiment Analysis of Reliance Industries Using Stock Price and News Data (2024)

Overview:

The aim of this project was to study the correlation between news sentiment and the stock price behavior of **Reliance Industries Ltd.**, India's largest conglomerate. We merged manually curated news data with official stock prices and performed a 360-degree analysis using Python and Power BI.

Data Collection:

1. Stock Price Data

- **Source:** NSE (National Stock Exchange of India) official website.
- **Duration:** 1st January 2024 to 31st December 2024
- **Stock:** Reliance Industries
- **Fields:** Date, Open, High, Low, Close, Volume
- **Format:** Excel CSV format : Reliance Stock Price

2. News Data

- **Collected Manually** from verified sources (MoneyControl, Investing.com, etc.)
- **Fields:** Date, Headline, Link
- **Saved into an Excel file:** Reliance News with Sentiment

Step-by-Step Methodology:

Part 1: Sentiment Analysis (Python)

We used a Python script to process news and compute sentiment.

Output Columns Added:

- **Sentiment Score:** Range -1 to +1
- **Sentiment Category:** Positive, Neutral, Negative.

Part 2: Merging with Stock Data

We joined the sentiment data with daily stock data by date.

- **Missing dates** filled with 0 sentiment.
- **Exported the result** to Merged_Data.csv

Power BI Visualization:

We loaded the Merged_Data.csv into Power BI and created the following insights dashboard:

✔ Column 1: News Count by Quarter & Sentiment Category

Chart Type: Clustered Column Chart

X-axis: Quarter (Q1, Q2, Q3, Q4)

Y-axis: Count of News

Legend: Sentiment Category

Insight: Shows Reliance received more positive news in Q1 and Q3.

✔ Column 2: Close Price vs Sentiment Score (Dual Axis Line Chart)

X-axis: Quarter

Y-axis 1: Sum of Close Price

Y-axis 2: Sum of Sentiment Score

Insight: Price and sentiment trends are positively correlated.

✔ Column 3: Pie Chart of Sentiment Category

Chart Type: Pie Chart

Value: Count of Sentiment Category

Insight: Majority news was Neutral (~80%), with ~16% Positive.

✔ Column 4: Volume vs. Sentiment Score (Scatter Plot)

Chart Type: Scatter Plot

X-axis: Sentiment Score

Y-axis: Volume

Details (Legend): Sentiment Category

Insight: High trading volume is slightly linked with strong sentiment extremes.

✅ **Column 5: Close Price vs Moving Average (Line Chart)**

DAX Used:

Moving Avg 7D =

AVERAGEX(

LASTN(7,

FILTER(Sheet1, [Date] <= EARLIER([Date]))),

[Close]

)

X-axis: Date

Y-axis 1: Close Price

Y-axis 2: Moving Avg 7D

Insight: Smoothed trends align with actual Close values, confirming validity of short-term market behavior.

Project Outcomes:

This project successfully demonstrates how sentiment influences stock behavior using a real-world case of Reliance Industries. Below are the core outcomes:

- **Stock Price reacts to sentiment in specific quarters:** Price rose in Q1 and Q3, which aligned with spikes in positive sentiment.
- **Most news is neutral:** Over 75% of news articles carried a neutral tone, suggesting market noise is often sentiment-neutral.
- **Negative sentiment links to volatility:** In quarters where negative sentiment appeared, stock volatility was slightly higher.

- **Volume correlates with sentiment spikes:** Some of the highest trading volumes occurred on days of strongly positive or negative sentiment.
- **Moving average confirms trend direction:** 7-day moving averages helped visualize clean trends, validating daily price sentiment correlation.