## Business Request

Subject: Automation of Report Generation for Market Insights using Power BI

Dear Prathamesh,

I hope this message finds you well. I am reaching out to discuss an important requirement for automating the process of generating market insights reports. Currently, I spend around 35-40 minutes each day manually downloading files from the NSE website, cleaning and combining them in Excel, and using various Excel functions to filter the data and obtain the desired insights. This process is time-consuming and can be prone to human errors.

To streamline and automate this task, I am looking for your expertise in developing a Power BI dashboard that will provide the required market insights in a visual and interactive format. The goal is to eliminate the manual effort involved in data preparation and report generation, allowing me to access the insights quickly and efficiently.

Here are the key requirements for the Power BI dashboard:

1. Top 5 Gainers and Losers: The dashboard should display the top 5 gainers and losers of the market session based on the latest data available.
2. Top 3 Gaining and Losing Sectors: The dashboard should highlight the top 2 sectors that experienced the highest gains and losses.
3. Snapshot of Percentage Change: The dashboard should provide a snapshot of the percentage change for stocks and market indices, allowing me to quickly assess the overall market performance.
4. Number of Gaining and Losing Stocks: The dashboard should include the count of stocks that gained and lost value during the market session.

By automating this process and utilizing the capabilities of Power BI, I aim to significantly reduce the time and effort required to obtain the daily market insights. This will enable me to make informed decisions quickly and stay updated on market trends.

I kindly request your assistance in developing the Power BI dashboard and setting up the necessary data pipelines to ensure the reports are generated with up-to-date data daily.

Please let me know if you require any further information or clarification regarding this project. I am excited about the possibilities that automation can bring, and I look forward to collaborating with you to achieve this goal.

Thank you for your attention, and I await your response.

Best regards,

[Client's Name]

## Step 1: Project Scope and requirements gathering

### Defining the goal of the project

To automate the process of generating market insights reports using Power BI. By developing a Power BI dashboard and setting up the necessary data pipelines, the project aims to streamline and automate this process.

The specific goals of the project can be summarized as follows:

1. Eliminate Manual Effort: The project should aim to completely remove the need for manual downloading, cleaning, and data manipulation in Excel. By automating these tasks, the time and effort spent on generating market insights reports should be significantly reduced.
2. Enhance Efficiency: The Power BI dashboard should provide quick and efficient access to market insights. Users should be able to retrieve the required information promptly, without the need for extensive manual data preparation.
3. Ensure Data Accuracy and Reliability: The project should establish reliable data pipelines that fetch up-to-date data from the NSE website. The Power BI dashboard should display accurate and consistent market insights, allowing users to make informed decisions based on reliable information.
4. Provide Visual and Interactive Reports: The Power BI dashboard should present market insights in a visual and interactive format. It should include visually appealing charts, tables, and other relevant visualizations to effectively communicate the top gainers and losers, sector performance, percentage changes, and stock counts.
5. Enable Quick Assessment of Market Performance: The dashboard should provide a snapshot of the percentage change for stocks and market indices, allowing users to assess the overall market performance immediately.
6. Facilitate Informed Decision Making: By automating the report generation process and presenting market insights in a clear and interactive manner, the project should enable users to make timely and informed decisions based on the provided data.

### Documenting the requirements

Based on the requirements gathered from the client, the following additional features and customizations are identified for the Power BI dashboard:

1. Additional Features:

* Include Weekly Percentage Change: In addition to the daily percentage change, the dashboard should display the weekly percentage change for the selected stocks. This will provide a broader perspective on the stock's performance over a week.
* Include Monthly Percentage Change: Like the weekly percentage change, the dashboard should also show the monthly percentage change. This allows for a longer-term analysis of the stock's performance.

1. Customizations:

* Data Source: Retrieve data from the NSE website as the primary data source for the equities.
* Data Format: Process the data in CSV format obtained from the NSE website.
* Data Cleaning and Transformation Steps:
  + Filter for EQ series: Keep only the equities (stocks) in the data and discard other series.
  + Select Stocks from Specific Indices: Include only the stocks that are part of the NIFTY 50, NEXT 50, and MIDCAP 50 indices. This helps narrow down the analysis to specific sets of stocks.
  + Remove Open, High, Low, and Close Prices: Exclude these columns from the dataset since the client is interested in analyzing the percentage change based on the last price of the stock.

1. Visualization and Metrics:

* Tabular Format: The report should be presented in a tabular format, displaying the names of the selected stocks and their respective percentage changes.
* No Visual Charts: Instead of visual charts, the dashboard should focus on presenting the data in a clear and concise tabular format.

By incorporating these additional features and customizations, the Power BI dashboard will provide the desired functionalities and meet the client's requirements. It will allow for analyzing the percentage change of the selected stocks on a daily, weekly, and monthly basis, enhancing the insights and decision-making capabilities.

## Development steps

Based on the gathered requirements, the development steps for the Power BI dashboard to automate market insights generation can be outlined as follows:

1. Data Extraction and Integration:
   1. Develop a data extraction process to fetch the required CSV files from the NSE website.
   2. Create a data integration pipeline to combine the CSV files into a unified dataset.
   3. Apply the data cleaning and transformation steps identified during the requirement gathering phase:
      1. Filter for EQ series to keep only the equities.
      2. Select stocks from specific indices (NIFTY 50, NEXT 50, MIDCAP 50) and exclude others.
      3. Remove open, high, low, and close prices, retaining only the last price for percentage change calculations.
      4. Validate and test the data extraction, integration, and transformation processes to ensure data accuracy.
2. Data Modeling and Calculation:
   1. Design the data model in Power BI, defining relationships and hierarchies based on the integrated dataset.
   2. Create measures and calculated columns to calculate the daily, weekly, and monthly percentage changes for each selected stock.
   3. Validate the data model and calculations to ensure accuracy and consistency.
3. Tabular Report Design:
   1. Develop the tabular report layout in Power BI, incorporating the desired metrics and visualizations:
   2. Display the names of the selected stocks.
   3. Include columns for the daily, weekly, and monthly percentage changes.
   4. Customize the formatting and styling of the report to enhance readability.
4. Additional Features:
   1. Implement the functionality to calculate and display the weekly and monthly percentage changes for the selected stocks.
   2. Ensure the appropriate filtering options are available to allow users to switch between daily, weekly, and monthly views.
5. Testing and Validation:
   1. Conduct thorough testing of the Power BI dashboard to ensure data accuracy, functionality, and responsiveness.
   2. Validate the calculations for daily, weekly, and monthly percentage changes, comparing them against manual calculations to ensure accuracy.
   3. Test the filtering options and verify that the report displays the desired insights based on the selected time.
6. Deployment and Automation:
   1. Deploy the Power BI dashboard to the desired hosting environment or platform.
   2. Set up scheduled refresh to automate the data extraction and update the dashboard with the latest data on a daily basis.
   3. Configure any necessary security measures and access controls to protect the data and ensure appropriate user access.
7. User Training and Documentation:
   1. Provide user training on how to navigate and interact with the Power BI dashboard.
   2. Create user documentation or guides that outline the steps to access and utilize the dashboard's features effectively.
   3. Address any questions or concerns from users regarding the dashboard's functionality or usage.
8. Client Review and Iteration:
   1. Conduct a review session with the client to gather feedback on the developed Power BI dashboard.
   2. Incorporate the client's feedback and make necessary iterations and refinements to enhance the dashboard's functionality and user experience.

Throughout the development process, it's important to follow best practices, such as version control, code documentation, and collaborative communication with the client. Regular communication, feedback, and iterative development will help ensure the successful implementation of the Power BI dashboard for automated market insights generation

## Scheduling Power BI refresh

1. Install Gateway on Local Machine or On-premises system
   1. Installed Personal mode gateway on the local machine
2. Schedule refresh in Power BI service at every 8 PM

Scheduled to run python scripts on windows using Windows Task

Testing is done by manually making the excel report and cross checking with the power bi report.