Power BI for Financial Performance Analysis and Visualization

Project Description

This project will equip finance and accounting students with hands-on experience in financial data analysis, visualization, and reporting using Power BI. The primary purpose is to analyze the financial performance and ownership structures of companies listed in NSE100 and NSE500, enabling students to develop insights into corporate financial health, industry trends, and investment decisions. The project covers key aspects of the data analytics lifecycle, including data collection, preparation, transformation, modeling, and visualization.

Students will work with real-world financial datasets, learning how to clean and structure data, compute financial metrics such as EBITDA, total assets, equity, debt, and net profit, and derive financial ratios like Net Profit Margin, Return on Assets (ROA), Debt-Equity Ratio, and Current Ratio. They will gain expertise in data modeling, establishing relationships between multiple datasets, and applying interactive Power BI tools such as slicers, filters, drill-throughs, and bookmarks to enhance data-driven decision-making.

The key use cases include trend analysis of financial performance over time, industry comparisons using financial ratios, and ownership structure evaluations (promoters, institutional investors, and pledged shares). This project is particularly beneficial for students aspiring to careers in financial analysis, investment banking, auditing, and corporate finance, as it develops practical skills in data visualization, dashboard creation, and financial reporting. By the end of the project, students will be proficient in Power BI's advanced analytics functions, enabling them to interpret complex financial data, build dynamic dashboards, and make informed business decisions. This hands-on experience will give them a competitive edge in today's data-driven finance and accounting landscape.

Data Files Details

Here's a summary and explanation of each file and their structures:

1. NSE100 Companies (NSE100_companies.xlsx):

This dataset contains detailed financial and ownership information about companies listed in NSE100. Important variables include:

- **Company Name and Year**: Identifies company data across multiple years.
- **Financial Metrics**: Such as PBDITA, total assets, current assets, net property, short-term inventories, intangible assets, total equity, and long-term financial investments.
- **Ownership and Shareholding**: Promoters' stake and pledged shares.
- **Market Classification**: Includes indices like NIFTY50, NIFTY100, and SENSEX.
- **Company Information**: Entity type, year of incorporation, industry group, ownership group, company age group, and size decile.

2. NSE500 Advanced Profile (NSE500_Advanced_Profile.xlsx):

This dataset includes market and classification details for NSE500 companies. Important variables include:

- **Company Name and Industry Classifications**: TRBCIndustry, GICSIndustry, TRBCEconomicSector, and TRBCBusinessSector.
- **Market Indices Classification**: Inclusion in indices like NSE200, NIFTY50, NIFTY100, and SENSEX.
- **Stock Liquidity and Diversification**: Indicators for liquidity and diversification status.
- **Ownership and Shareholding Details**: Promoter stakes and percentage of shares pledged.

3. NSE500 Basic Profile (NSE500_Basic_Profile.xlsx):

This dataset provides foundational data about NSE500 companies. Variables include:

- **Company Name and Identification Code**: Unique identification (Prowess company code).
- **Entity and Incorporation Information**: Entity type and incorporation year.
- **Industry and Ownership Details**: Industry group, ownership group, and categorization of age and size decile.

Project Plan for Power BI Implementation

Data Preparation and Data Transformation stages

This project belongs to the **Data Preparation and Data Transformation stages** of the data visualization lifecycle. Specifically, it covers:

- **Data Collection & Integration**:
  Collecting and uploading datasets (Step 1).
- **Data Preparation**:
  Renaming variables, handling missing values, and correcting data types (Steps 2, 3, and 4).
- **Data Transformation & Calculations**:
  Computing derived variables and ratios (Steps 5 and 6).
- **Data Modeling & Relationship Establishment**:
  Creating relationships between datasets (Step 7).

Once these steps are completed, your project will be ready to move to the next stage, **Visualization Development**, which involves creating visualizations, dashboards, and analytical reports

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Step 1: Uploading Data to Power BI

- Open Power BI Desktop.
- Select **"Get Data" → "Excel Workbook"**.
- Upload each of the following files separately:
  1. **NSE100_companies.xlsx**
  2. **NSE500_Basic_Profile.xlsx**
  3. **NSE500_Advanced_Profile.xlsx**

Step 2: Renaming Variables

In Power Query Editor, rename columns exactly as provided in the mapping below:

File 1: Data File (NSE100_companies.xlsx):

Original Variable Name	New Variable Name
company_name	company_name
year	year
PBDITA	EBDITA
Total assets	assets
Net property, plant and equipment (Ind AS)	PPE
Current assets (incl. short term investments, loans & advances)	current_assets
Short term inventories	inventory
Net intangible assets	intangibles
Long term financial investments	investments
Total equity	equity
Long term borrowings excl equity component of compound fin instruments	debt
Sales	sales
Profit / (loss) after tax for the year	net_profit
No. of employees	emploees

File 2: Basic Profile (NSE500_Basic_Profile.xlsx):

Original Variable Name	New Variable Name
company_name	company_name
Prowess company code	code
Entity type	entity
Incorporation year	incorp_year
Industry group	industry
Ownership group	ownership

Original Variable Name	New Variable Name
Age group	age
Size decile	size

File 3: Advanced Profile (NSE500_Advanced_Profile.xlsx):

Original Variable Name	New Variable Name
company_name	company_name
TRBCIndustry	TRBCIndustry
GICSIndustry	GICSIndustry
TRBCEconomicSector	EconomicSector
TRBCBusinessSector	BusinessSector
nse200_index	nse200
diversified	diversified
large_liquid_stocks	liquid
nifty50	nifty50
nifty100	nifty100
sensex	sensex
promoters	promoters_holdings
pledged_shares	pledged_shares_percent
institutional_investors	institutional_investors

Step 3: Handling Missing Values

Within Power Query Editor:

Column	Action
inventory	Replace missing values with 0
intangibles	Replace missing values with 0

Column	Action
investments	Replace missing values with 0
debt	Replace missing values with 0
employees	**No action** (leave blanks)

Procedure:

- Right-click column → **Replace Values** → Replace nulls with 0.

Step 4: Verify and Correct Data Types

Verify and adjust the data types to ensure accuracy for each variable in Power Query:

- **Text**:
  - company_name, entity, industry, ownership, EconomicSector, BusinessSector, etc.
- **Whole Number**:
  - year, incorp_year, code, employees
- **Decimal Number** (All financial variables):
  - assets, EBDITA, PPE, current_assets, inventory, intangibles, investments, equity, debt, sales, net_profit, promoters_holdings, pledged_shares_percent

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Step 5: Computation of New Financial Variables (Columns)

Create calculated columns within Power BI:

Variable (long name)	Short Name	Formula
Long Term Assets	LTA	PPE + intangibles
Total Assets	Assets	LTA + current_assets + investments
Quick Assets	QA	current_assets - inventory
Gross Profit	GP	sales * 0.25
Cost of Goods Sold	COGS	sales - GP

Step 6: Calculation of Financial Ratios (Measures/Columns)

Create these ratios within Power BI:

Ratio (long name)	Short Name	Formula
Net Profit Margin	NPM	net_profit / sales
Return on Assets	ROA	net_profit / Assets
Current Ratio	CR	current_assets / Current_Liabilities
Debt-Equity Ratio	DE_ratio	debt / equity
Interest Coverage Ratio	ICR	EBDITA / Interest_expenses *(assumed available)*
Asset Turnover Ratio	ATR	sales / Assets
Inventory Turnover Ratio	ITR	COGS / inventory

(Note: Ensure Current_Liabilities and Interest_expenses columns are available or sourced externally.)

Step 7: Establishing Relationships (Data Model)

Create relationships among datasets:

- **Primary Key**:
  - company_name, code
- **Suggested relationships:**
  - NSE100_companies ↔ NSE500_Basic_Profile (via company_name, code)
  - NSE100_companies ↔ NSE500_Advanced_Profile (via company_name)

Step 8: Visualization Development

Suggested Visualizations:

- **Financial Ratio Trends** *(line chart, by year)*
- **Industry and Sector Analysis** *(bar charts and matrix visuals)*
- **Ownership Analysis** *(pie charts, donut charts)*
- **Company Rankings** *(tables sorted by financial ratios)*
- **Filters and Slicers**:
  - Year, Industry, Economic Sector, Size, Indices (Nifty50/100/Sensex)

Step 9: Documentation and Labeling

- Clearly label all measures and calculated columns with both short and long names.
- Create tooltips that briefly explain each calculation.

Example Tooltip:

- **ROA**: "Return on Assets, calculated as Net Profit divided by Total Assets, indicating asset efficiency."

Step 10: Final Checks and Validation

- Cross-verify a few computed ratios manually for accuracy.
- Ensure data interactions and visuals are responsive.

Outline: Visualization Development Stage (Power BI)

Step 1: Defining the Purpose and Audience

- Identify target audience (e.g., financial analysts, academic researchers, corporate management).
- Define clear objectives (financial analysis, industry comparison, company benchmarking, etc.).

Step 2: Selecting Suitable Visualizations

- Determine the types of visuals suitable for each analysis:
  - Line Charts (Trend analysis over multiple years).
  - Bar/Column Charts (Comparative analysis across industries/companies).
  - Pie/Donut Charts (Ownership and holding structures).
  - Scatter plots (Ratio relationships and correlation analysis).
  - Tables and Matrix visuals (Detailed financial metrics and rankings).
  - Cards/KPIs (Key metrics highlights).

Step 3: Dashboard Layout Design

- Sketch and plan the dashboard layout:
  - Decide the number of pages (Overview, Financial Ratios, Industry Insights, Ownership Patterns).
  - Organize visuals logically, based on data-driven storytelling.

Step 4: Implementing Interactive Features

- Plan for interactivity through:
  - Slicers (Year, Industry, Sector, Size, Nifty50/Nifty100/Sensex).
  - Drill-through and drill-down features for deeper insights.
  - Bookmarks and buttons for guided navigation.

Step 5: Developing Visualizations

- Financial Ratios and Metrics:
  - Implement visuals for each calculated ratio.
- Industry and Sector Analysis:
  - Develop visuals that allow comparison of companies within specific industries and sectors.
- Ownership and Shareholding Analysis:

    - Visualize ownership structures clearly.
- Company Performance Rankings:
    - Table visualizations sorted by key financial metrics.

Step 6: Enhancing Visual Appeal

- Format and style:
    - Select a professional color scheme.
    - Ensure visual consistency (fonts, colors, alignment, spacing).
    - Implement clear, concise titles and labels.

Step 7: Creating Tooltips & Documentation

- Define informative tooltips for each visualization.
- Provide explanations of metrics and ratios within Power BI for user-friendliness.

Step 8: Testing and Validation

- Validate visual accuracy by cross-checking visuals with original data.
- Test dashboard responsiveness and interactivity.

Step 9: Final Adjustments and Optimizations

- Optimize dashboard performance.
- Ensure clarity and readability.

Step 10: Final Deployment and Sharing

- Plan distribution method (Power BI service, embedded reports, exports, etc.).
- Provide clear instructions for users on accessing and navigating reports.

Detailed Visualization Development Plan in Power BI

Step 1: Defining the Purpose and Audience

1. Identify Target Audience

- **Audience Categories**:
    - **Financial Analysts** (interested in detailed financial metrics, trend analysis, and ratios).
    - **Academic Researchers** (interested in in-depth data exploration, hypothesis testing, comparative analysis).
    - **Corporate Management** (interested in summarized financial KPIs, industry comparisons, ownership insights).

2. Define Clear Objectives

- **Financial Performance Analysis**
    - Evaluate profitability, liquidity, leverage, and operational efficiency.
- **Industry Comparison**
    - Benchmark companies against their industry and sector peers.
- **Company Benchmarking**
    - Identify high and low-performing companies across selected metrics.
- **Ownership Structure Analysis**
    - Analyze promoters' holdings, institutional ownership, and pledged shares.

Step 2: Selecting Suitable Visualizations

Select visualization types based on objectives identified above:

1. Trend Analysis Over Time (Line Charts)

- **Use Case**: Show trends in financial metrics over multiple years.
- **Metrics Examples**:
    - Net Profit Margin (NPM)
    - Return on Assets (ROA)
    - Debt-Equity Ratio (DE_ratio)

Power BI Implementation:

- Select **Line Chart** from visualizations pane.

- Drag year onto the X-axis.
- Drag financial ratios (e.g., NPM, ROA) onto Y-axis.
- Add slicers (filters) for company_name, industry, or sector.

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2. Comparative Analysis Across Industries/Companies (Bar/Column Charts)

- **Use Case**: Compare financial ratios between companies or industries.
- **Metrics Examples**:
    - Current Ratio (CR)
    - Asset Turnover Ratio (ATR)
    - Inventory Turnover Ratio (ITR)

Power BI Implementation:

- Select **Clustered Bar/Column Chart**.
- Drag industry or company_name onto Axis.
- Drag ratios onto Values (e.g., CR, ATR).
- Use sorting options to identify top performers.

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3. Ownership and Holding Structures (Pie/Donut Charts)

- **Use Case**: Visualize proportionate shareholding by promoters, institutions, and pledged shares.
- **Metrics Examples**:
    - promoters_holdings
    - institutional_investors
    - pledged_shares_percent

Power BI Implementation:

- Select **Pie/Donut Chart**.
- Drag shareholding percentages onto Values.
- Clearly label and format for readability.
- Add slicer for company selection.

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4. Ratio Relationships and Correlation Analysis (Scatter Plots)

- **Use Case**: Visualize relationships between two financial metrics (ratios).

- **Metrics Examples**:
    - ROA vs. DE_ratio
    - ATR vs. NPM

Power BI Implementation:

- Select **Scatter Plot** from visualizations pane.
- Drag one ratio onto the X-axis, another onto the Y-axis.
- Drag company_name or industry into Legend for visual clarity.
- Use Analytics Pane to add trend lines for correlation analysis.

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5. Detailed Financial Metrics and Rankings (Tables & Matrix Visuals)

- **Use Case**: Display precise numerical data and allow detailed exploration.
- **Metrics Examples**:
    - Net Profit, Sales, Assets, Debt, Equity
    - All calculated financial ratios (NPM, ROA, CR, DE_ratio, etc.)

Power BI Implementation:

- Select **Table** or **Matrix** visual.
- Drag relevant financial measures and ratios onto the Values area.
- Enable sorting and conditional formatting for highlighting key insights.

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6. Key Metric Highlights (Cards/KPIs)

- **Use Case**: Provide summarized key metrics at a glance.
- **Metrics Examples**:
    - Overall average NPM, ROA, Current Ratio, Debt-Equity Ratio.

Power BI Implementation:

- Select **Card** visual.
- Drag key metrics onto visual.
- Apply conditional formatting to highlight performance thresholds (color coding: red for low, green for high).

Step 3: Dashboard Layout Design

Clearly define dashboard structure with a data-driven storytelling approach:

Dashboard Pages:

1. Overview Page

- **Purpose**: Summarize overall key financial metrics and visual highlights.
- **Suggested visuals**:
  - Cards (NPM, ROA, CR, DE_ratio)
  - Top-performing companies (Bar chart)
  - Line chart summarizing key financial ratios over time.
- **Interactive Elements**:
  - Slicers: year, industry, company_name

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2. Financial Ratios Page

- **Purpose**: Deep dive into financial health through ratios.
- **Suggested visuals**:
  - Line charts (NPM, ROA trends)
  - Bar charts (Comparative analysis of CR, DE_ratio)
  - Scatter plots (Correlation analysis, e.g., ROA vs. DE_ratio)
- **Interactive Elements**:
  - Slicers: year, company_name, industry, size

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3. Industry Insights Page

- **Purpose**: Compare companies within industries and sectors.
- **Suggested visuals**:
  - Clustered column charts for industry-specific financial ratios.
  - Matrix visual (Company ranking within industry based on key ratios).
- **Interactive Elements**:
  - Slicers: industry, EconomicSector, BusinessSector, year

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4. Ownership Patterns Page

- **Purpose**: Analyze detailed ownership and holding structures.
- **Suggested visuals**:

- Pie/donut charts (Ownership structure breakdown)
- Tables/matrix for detailed holding information
- Bar charts (Top companies with highest pledged shares)

- **Interactive Elements**:
  - Slicers: company_name, ownership, promoters_holdings

Additional Recommended Power BI Features for Enhanced Interaction

- **Bookmarks and Buttons**:
  - Add bookmarks to save specific dashboard views.
  - Insert buttons for navigation across pages (Overview → Financial Ratios → Industry Insights → Ownership Patterns).
- **Drill-Through**:
  - Enable drill-through from high-level visuals (e.g., from Overview page visuals) to detailed analysis on Financial Ratios or Ownership Patterns page.
- **Tooltips**:
  - Create custom tooltips to provide additional insights on hover.

Detailed Implementation Plan (Power BI): Steps 4, 5, and 6

Step 4: Implementing Interactive Features

1. Using Slicers for Enhanced Interaction

- **Purpose**: Allow users to filter visuals based on specific criteria dynamically.

Implement the following slicers:

- **Year**: Enable trend and yearly comparisons.
- **Industry/Sector**: For analyzing data within industry/sector groups.
- **Size (Size Decile)**: Enable filtering by company size category.
- **Indices**: Nifty50, Nifty100, Sensex to filter based on market indices.

How to Implement in Power BI:

- Select the **Slicer** visual from the visualizations pane.
- Drag relevant fields (year, industry, EconomicSector, size, nifty50, nifty100, sensex) onto slicer fields.
- Configure slicer format options (single-select/multi-select, dropdown/list style).

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2. Drill-through and Drill-down Features

- **Purpose**: Enable deeper exploration from high-level summaries to detailed analyses.

Drill-through (to detailed pages):

- From summary visualizations (e.g., Overview page), right-click to explore detailed financial ratios on the **Financial Ratios** page.
- Drill-through from Industry insights visuals to company-level details.

How to Implement Drill-through in Power BI:

- On target page, drag field (e.g., company_name, industry) into **Drill-through fields** area.
- From other pages, users right-click visuals → **Drill-through** → choose target page.

Drill-down (Hierarchical exploration):

- Example hierarchy: EconomicSector → Industry → company_name
- Users click "Expand" or "Drill-down" buttons on visuals (like column/bar charts) to explore deeper levels.

Implementation:

- Drag hierarchical fields onto Axis or Legend.

- Activate drill-down options (arrows at visual top corners).

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3. Bookmarks and Buttons for Guided Navigation

- **Purpose**: Guide users through specific analytical journeys and enable quick navigation across pages.

Suggested Bookmarks:

- Create bookmarks for default views like "Overview", "Financial Ratios", "Industry Insights", "Ownership Analysis".

Implementation Steps:

- Set the visual/page state.
- Open **Bookmarks Pane** (View → Bookmarks).
- Click **"Add"** to save current view as a bookmark (rename clearly).

Navigation Buttons:

- Insert buttons linking pages or bookmarks for smooth navigation.

Implementation Steps:

- Insert a **Button** (Insert → Buttons → Blank button).
- In Format Pane → Action → Select type "Bookmark/Page Navigation".
- Link button to desired bookmark/page.

Step 5: Developing Visualizations

1. Financial Ratios and Metrics

Implement visuals clearly displaying each ratio:

- **Line charts** for trends (NPM, ROA, ATR over years).
- **Bar charts** for comparative visuals (DE_ratio, CR, ITR).

Steps:

- Drag calculated ratio measures to appropriate visuals.
- Use slicers for interactive filtering.

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2. Industry and Sector Analysis

Visualizations for company comparisons within industries/sectors:

- **Clustered Bar/Column charts** comparing industries based on key ratios.

- **Matrix visuals** ranking companies within sectors based on financial metrics (NPM, ROA, CR, DE_ratio).

Implementation:

- Select matrix visualization.
- Drag industry, company_name into rows; metrics (e.g., ROA) into values.
- Enable sorting to rank companies clearly.

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3. Ownership and Shareholding Analysis

Clear visualization of ownership structure:

- **Pie/Donut charts** to illustrate proportion of:
    - promoters_holdings
    - institutional_investors
    - pledged_shares_percent

Implementation:

- Drag ownership metrics into Pie/Donut visuals.
- Enable tooltips for detailed insights on hover.

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4. Company Performance Rankings

Tables sorted by key financial metrics to highlight top/bottom performers:

- Create tables for:
    - Highest Net Profit Margin
    - Highest ROA
    - Best Debt-Equity Ratio

Implementation:

- Select Table visual.
- Drag company identifier (company_name) and financial ratios to visual.
- Click on column headers for sorting ascending/descending.

Step 6: Enhancing Visual Appeal

1. Selecting a Professional Color Scheme

- Choose subtle, professional colors (e.g., shades of blue, grey, green).

- Maintain consistent coloring across visuals:
    - Positive/high metrics: green or blue shades.
    - Negative/low metrics: red or orange shades.

How to implement in Power BI:

- Customize visual colors via **Format Pane** under Visuals → Colors.
- Use "Themes" for cohesive appearance:
  View → Themes → Customize Theme

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2. Ensure Visual Consistency

- Maintain uniform formatting:
    - Consistent fonts (e.g., Segoe UI, Arial), font size (10-12 for text, 14-16 for headings).
    - Proper alignment and spacing between visuals.
    - Uniform padding and margins.

How to implement:

- Select visuals and adjust via **Format Pane**.
- Use Power BI gridlines (View → Gridlines) for accurate alignment.
- Utilize Format Painter (Home tab) to replicate formatting.

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3. Clear, Concise Titles and Labels

- Use straightforward and descriptive titles (e.g., "Return on Assets (ROA) Trends", "Debt-to-Equity Ratio Comparison by Industry").
- Clearly label axes, legends, and slicers.

Implementation:

- Click visual → Format pane → General → Title → Enter meaningful text.
- Ensure axes and legend labels are concise yet descriptive (adjust in Format pane).

Example Final Dashboard Layout (Brief):

- **Overview** (Page 1):
    - KPIs (NPM, ROA, CR, DE_ratio)
    - Bar chart (top companies by ROA)

    - Line chart (financial ratios trends)
- **Financial Ratios** (Page 2):
    - Detailed trend line charts (multiple ratios)
    - Scatter plot (ROA vs. DE_ratio correlations)
- **Industry Insights** (Page 3):
    - Clustered bar charts (industry comparisons)
    - Matrix visual (company rankings)
- **Ownership Patterns** (Page 4):
    - Pie/donut charts (shareholding proportions)
    - Tables of companies sorted by highest pledged shares

Next Steps for You:

- Review and validate the detailed steps above.
- Implement each step methodically within Power BI.
- Reach out with specific queries or for additional guidance.

Detailed Implementation Plan: Steps 7 to 10

Step 7: Creating Tooltips & Documentation

1. Defining Informative Tooltips

Tooltips enhance user understanding by providing quick context or explanations when hovering over visuals.

Implementation:

- **Default Tooltips:**
  - Automatically generated by Power BI.
  - Confirm correct data points (measures/fields) are included.
- **Customized Tooltips:**
  - Create separate tooltip pages to offer richer information.
  - **How to Implement:**
    1. Create new page, enable **"Tooltip"** in Format pane.
    2. Select page size: **"Tooltip"**.
    3. Add relevant visuals (e.g., small charts or tables).
    4. Go to the main visual → Format pane → enable **Tooltip → Type: Report page** → Select created tooltip page.

Suggested Custom Tooltips:

- Explanation of financial ratios (e.g., NPM, ROA, DE_ratio).
- Definitions of industry classifications and terms.

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2. Providing Explanations within Power BI

Include documentation directly within reports for clarity:

- **Text Boxes and Cards:**
  - Use text visuals to clearly define ratios:
    - Example:

"**ROA (Return on Assets)** = Net Profit ÷ Total Assets; indicates company's asset efficiency."

- **Information Buttons (Q&A visuals):**
  - Insert buttons/icons linked to explanatory text/tooltips.

Implementation:

- Insert **Button → Information icon**.
- Set action to display explanatory bookmark or tooltip when clicked.

Step 8: Testing and Validation

1. Validate Visual Accuracy

Ensure visuals accurately represent underlying data:

- **Cross-Checking Data:**
  - Select random visuals and manually verify data points against original Excel files.
  - Check calculated ratios against manually computed samples.

2. Testing Dashboard Responsiveness and Interactivity

Ensure all interactions function smoothly:

- **Check Interactivity:**
  - Test slicers by selecting different filters.
  - Validate Drill-down and Drill-through functionality:
    - Right-click visuals → Drill-through to check the detail views.
    - Use hierarchical drill-down/up arrows on visual headers.
- **Responsiveness Testing:**
  - Resize visuals and confirm readability.
  - Switch between Desktop and Mobile view (View → Mobile Layout) for layout optimization.

Step 9: Final Adjustments and Optimizations

1. Dashboard Performance Optimization

- **Data Compression and Model Optimization:**
  - Use Power Query to remove unnecessary columns/rows.
  - Disable auto date/time where unnecessary (Options → Data Load → Time intelligence).
- **Performance Analyzer:**
  - Open **View → Performance Analyzer**.
  - Record actions to identify slow visuals.

- Optimize or simplify visuals identified as slow-loading.

2. Ensure Clarity and Readability

- **Visual clarity**:
  - Titles are clear and meaningful.
  - Labels on charts, axes, and legends are concise.
  - Data points readable at a glance (adjust font size, color contrast).
- **Consistent Formatting:**
  - Ensure uniform style across pages (font, color, alignment).
- **Accessibility:**
  - Confirm colors are friendly for colorblind users.
  - Enable alt-text descriptions for visuals (Format pane → General → Accessibility).

Step 10: Final Deployment and Sharing

1. Plan Distribution Method

Choose appropriate deployment method(s):

- **Power BI Service (Online Cloud):**
  - Recommended for easy, secure sharing, and regular updates.
  - Implementation Steps:
    - Publish report from Power BI Desktop (File → Publish).
    - Select workspace on Power BI Service.
    - Manage permissions and access controls via Power BI Service.
- **Embedded Reports:**
  - Embed reports on websites, intranet portals, or SharePoint:
    - Publish report to Power BI Service.
    - Use embed links provided by Power BI Service (File → Embed report → Website/Portal).
- **Exports (PDF/PowerPoint):**
  - Static sharing for presentations/reports:
    - File → Export → Export to PDF or PowerPoint.

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2. Provide Clear Instructions for Users

Clearly document access and navigation:

- **User Guide Page in Dashboard**:
    - Create a “Help” page in Power BI with step-by-step guidance:
        - Navigation instructions (use of buttons/bookmarks).
        - Explanation of slicers, drill-through, and drill-down interactions.
        - Contact details for technical support/questions.
- **Documentation (PDF or Word)**:
    - Prepare a brief, external document highlighting:
        - Dashboard structure and navigation.
        - Description and definitions of financial ratios and terms.
        - Instructions for accessing the dashboard via Power BI Service.
        - Frequently Asked Questions (FAQs).

Annexure

Financial Calculations and Ratios in Power BI

[DAX]

Before You Start:

- Open **Power BI Desktop**.
- Load and clean datasets as described previously.
- Navigate to the **Data View** to create calculated columns and measures.

Step-by-Step Implementation

✅ **Step A: Create Calculated Columns**

Calculated columns are new columns computed from existing data, stored physically in your dataset.

How to Create Calculated Columns:

- **In Data View**, select the relevant table.
- Click **New Column** in the toolbar at the top.

📌 **Create the following columns exactly as shown:**

1. Long Term Assets (LTA)

```
LTA = [PPE] + [intangibles]
```

Explanation: Combines net Property, Plant & Equipment with intangible assets.

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2. Total Assets (Assets)

```
Assets = [LTA] + [current_assets] + [investments]
```

Explanation: Summarizes the overall assets of the firm.

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3. Quick Assets (QA)

```
DAX

QA = [current_assets] - [inventory]
```

Explanation: Represents current assets minus inventory, indicating liquid assets available quickly.

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3. Gross Profit (GP)

```
DAX

GP = [sales] * 0.25
```

Explanation: Assumes a standard gross profit margin of 25%.

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4. Cost of Goods Sold (COGS)

```
DAX

COGS = [sales] - [GP]
```

Explanation: Represents the direct costs of producing goods sold.

✅ **Step-by-Step Creation of Financial Ratios**

Create **Calculated Measures** (preferred) for flexibility in analysis:

(Note: Measures in Power BI are created using the "New Measure" option in the Modeling tab.)

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1. Net Profit Margin (NPM)

```
DAX

NPM = DIVIDE(SUM([net_profit]), SUM([sales]), 0)
```

Explanation: Profit generated per unit of sales.

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2. Return on Assets (ROA)

```
DAX

ROA = DIVIDE(SUM([net_profit]), SUM([Assets]), 0)
```

Explanation: Efficiency measure of profits generated relative to total assets.

---

3. Current Ratio (CR)

Ensure you have a column [Current_Liabilities] in your dataset.

```
DAX
```

```
CR = DIVIDE(SUM([current_assets]), SUM([Current_Liabilities]), 0)
```

Explanation: Measures liquidity (short-term solvency).

---

4. Debt-Equity Ratio (DE_ratio)

```
DAX

DE_ratio = DIVIDE(SUM([debt]), SUM([equity]), 0)
```

Explanation: Indicates financial leverage level.

---

5. Interest Coverage Ratio (ICR)

Ensure you have [Interest_expenses] in your dataset.

```
DAX

ICR = DIVIDE(SUM([EBDITA]), SUM([Interest_expenses]), 0)
```

Explanation: Ability to meet interest obligations.

---

5. Asset Turnover Ratio (ATR)

```
DAX

ATR = DIVIDE(SUM([sales]), SUM([Assets]), 0)
```

Explanation: Efficiency of assets in generating sales.

---

6. Inventory Turnover Ratio (ITR)

```
DAX

ITR = DIVIDE(SUM([COGS]), SUM([inventory]), 0)
```

Explanation: Efficiency in inventory management.

Important Considerations in DAX Calculations:

- Use DIVIDE function to handle division by zero errors.
- Use SUM aggregation to calculate measures accurately in visual contexts.

Step 7 (Earlier requested): Creating Tooltips & Documentation

✅ **Creating Informative Tooltips:**

- **Custom Tooltip Implementation**:
    - Create separate report pages specifically formatted as tooltips.

Example of Custom Tooltip for ROA:

- Create new page named "ROA Tooltip".
- Size page appropriately (**Format → Page size → Tooltip**).
- Add Card or Text box with explanation:
    - *"Return on Assets (ROA): Measures company's profitability relative to its total assets. Calculated as Net Profit divided by Total Assets."*
- On visualization page, select visual → Format → General → Tooltip → Type: Report Page → Select your created tooltip page.

Step 8 (Earlier requested): Testing and Validation (Reminder)

- Cross-check computed ratios manually (sample 3-4 companies).
- Confirm values match manually computed results.
- Ensure interactivity works correctly (e.g., Drill-through, Drill-down).

Step 9 (Earlier requested): Enhancing Visual Appeal

- Use a professional theme consistently (View → Themes → Customize theme).
- Set uniform font size, style, color scheme.
- Clearly label all visualizations and fields with concise titles.

Step 10: Final Deployment & Sharing

- **Publish to Power BI Service**:
    - In Power BI Desktop → Click **Publish** (Home tab).
    - Select workspace to upload.
- **Share and Manage Access**:
    - In Power BI Service, create app workspace for dashboard/report.
    - Manage sharing settings securely via permissions.
- **Embedded Reports**:
    - Embed reports in websites or intranet portals:
        - After publishing, use **File → Embed Report → Website or portal**.

- **Exports**:
    - Export as PDF or PowerPoint: **File → Export → PDF/PowerPoint** for offline presentations.

Documentation (User Guide) Suggestions:

Provide end-users with a simple user manual including:

- Dashboard structure overview.
- Definitions for each metric and ratio.
- Instructions for navigation (using slicers, drill-through, tooltips, bookmarks).

Final Checks (Before Sharing):

- Cross-check calculations.
- Test interactivity features thoroughly.
- Ensure visual responsiveness across different devices (desktop/mobile layout).