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Walmart Business Performance Dashboard: A Data-Driven Approach to Retail Analytics

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ABSTRACT

In the retail market, data-driven decision-making is key to maintaining profitability and growth. This project involve creating a Walmart Business Performance Dashboard to offer detailed insights into business technic like sales performance, revenue trends, customer behaviour, inventory management, and regional profitability. Employing data visualization software such as Power BI, Tableau, or Python libraries (Matplotlib, Seaborn) the dashboard reports interactive real-time analytics that assist stakeholders in making educated decision. The dashboard assists in recognizing sales trends, streamlining inventory levels, and predicting demand patterns. Moreover, predictive analytics enable processes by applying techniques foe strategic planning improvement and overall business performance enhancement. Through the use of data analytics and visualization, can mechanized processes, enhance customer satisfaction, and create long-term profitability.

KEYWORDS: *Retail Analytics, Sales Performance, Inventory Management, Customer Insights, Revenue Forecasting, Stock Turnover Ratio.*

I. INTRODUCTION

Walmart is the global wholesale corporate, maintain in a very dynamic and competitive industry. In order to continue holding the leadership edge, Walmart banks on data-driven decision-making in optimizing sales, inventory, and overall business performance. A Business Performance Dashboard acts as a unified platform that charts critical metrics so that Walmart's management can keep tabs on trends, spot opportunities, and address challenges in real time.

Walmart Business Performance Dashboard offers a live photos of critical business KPIs like revenue from sales, profit margins, inventory turnover, customer demand, and regional distribution of sales. It merges information from different sources like point-of-sale, supply chain networks, and customer analytics, and presents a rich and interactive picture of business performance. Using data visualization tools such as Power BI, Tableau, or Python-based dashboards, Walmart is able to obtain actionable insights on: Sales Trends & Forecasting, Inventory Management, Customer Insights, Operational Efficiency. The main objective of this study is to predict weekly sales for Walmart stores and create a Power BI dashboard that tracks the final predicted sales until 2024 through interactive and immersive visualizations. The conclusion section highlights the findings from the data analysis as well as from the models implemented as part of this study. The dashboard created compares the findings from the Data Analysis with the findings from the dashboard.

II. WORK RELATED

A number of research and projects have investigated the application of business intelligence (BI) dashboards for improving Walmart's performance analysis. The focus areas are mostly on sales trends, inventory control, customer trends. The dashboard will monitor and graph the below metrics:

Sales Performance: Overall revenue, sales growth rate, top-selling products, and product category-wise sales.

Inventory Management: Stock levels, inventory turnover, frequency to restock, and availability of products.

Profitability Analysis: Gross margin, net profit, and profitability by stores.

Power BI and Tableau-Based Dashboards for Retail Analysis:

Analysts have created interactive dashboards in Power BI and Tableau to track sales performance, customer profiles, and revenue distribution across various Walmart store locations.

These dashboards generally consist of KPIs such as sales per store, profit margins, customer segmentation, and seasonal demand fluctuations. Tools & Technologies:

Data Processing & Storage: Microsoft Excel, SQL, Pandas (Python)

Data Visualization: Power BI, Tableau, Python (Matplotlib, Seaborn)

III. DATA AND SOURCES OF DATA

To create a Walmart business performance dashboard, use the following data sources:

Sales Data: Point-of-sale systems, e-commerce platforms, and sales reports.

Inventory Data: Inventory management systems, warehouse management systems, and supply chain data.

Supply Chain Data: Supply chain management systems, logistics providers, and transportation management systems.

Customer Feedback: Customer surveys, social media, and customer review platforms.

Walmart's Annual Reports: These documents include detailed financial information, including revenue, net sales, and inventory levels.

Kaggle Datasets: Kaggle provides datasets directly related with Walmart's sales and stock. These datasets can be extremely beneficial for examining sales patterns and predicting demand.

IV. RESEARCH METHODOLOGY

This research uses a descriptive and analytical design, utilizing secondary data sources to analyse Walmart's business performance. The objective of this research is to analyse Walmart's business performance using key performance indicators (KPIs) such as revenue, profit, and inventory.

Figure I:-

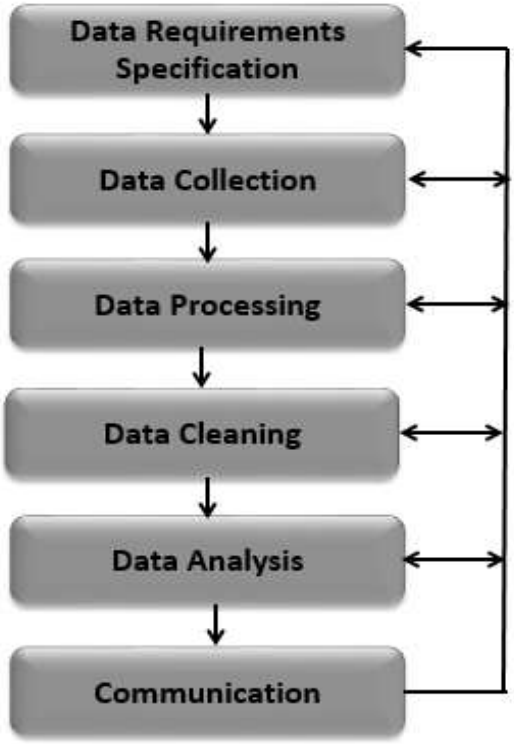


Fig1: steps to analyse the dataphases required for data analysis and to create insightful dashboard

Phase 1: Data Requirements specification:

Financial Data

- Revenue: Monthly/Quarterly/Yearly revenue data for the past 3-4 years.
- Profit: Monthly/Quarterly/Yearly profit data for the past 3-4 years.
- Cost of product: Monthly/Quarterly/Yearly data for the past 3-4 years

Sales Data

- Sales by Region: Monthly/Quarterly/Yearly sales data by region for the past 3-4 years.
- Sales by Product Category: Monthly/Quarterly/Yearly sales data by product category for the past 3-4 years.

Data Format

- CSV: Comma-separated values format.
- Excel: Microsoft Excel format.

Phase 2: Data Collection:

Secondary Data Collection: Collecting existing data from internal and external sources, such as:

- Walmart's annual reports
- Industry reports
- Market research reports
- Government databases

Primary Data Collection: Collecting original data through:

- Surveys: Online or offline surveys of Walmart customers, employees, or suppliers
- Interviews: In-depth interviews with Walmart director, managers, or employees
- Observations: Observing Walmart's operations, customer behavior, or employee interactions.

Phase 3: Data Cleaning:

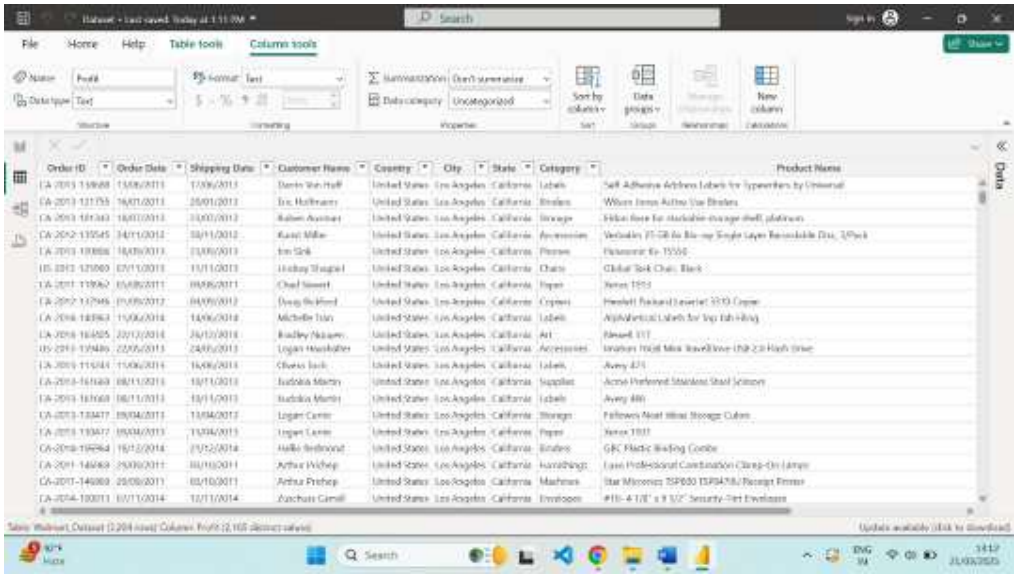
Ensure Data Accuracy: Verify data accuracy and completeness.

- Remove Errors and Mistakes: Identify and correct errors, difference and missing values.
- Transform Data: Convert data into a suitable format for analysis.
- Data Profiling: Analyse data distribution, frequency, and patterns to identify potential issues.
- Data Validation: Check data against predefined rules, such as data types, formats, and ranges.
- Data Cleansing: Correct or remove errors, inconstant, and missing values.
- Data Transformation: Convert data into a suitable format for analysis, such as collecting data or creating new variables.
- Data Normalization: Normalize data to ensure to be same.

Phase 4: Data Analysis:

- Identify Trends and Patterns: Analyse data to identify trends and patterns in Walmart's business performance.
- Check Performance Metrics: Check out Walmart's performance example, such as revenue growth, profit margin, and inventory turnover.
- Identify Areas for Improvement: Identify areas for improvement in Walmart's operations and supply chain management.
- Data Preparation: Prepare data for analysis by cleaning, transforming, and formatting data.
- Data Analysis: Perform data analysis to identify trends, patterns, and relationships in data.
- Insight Generation: Create insights and advice from data analysis results.

V. RESULTS AND DISCUSSION



- This is the image of sorted data in Power Bi. By using the sorted clean data we have to use it for creating dashboard. The sorted data in Power BI provides a structured and organized view, allowing for more effective data analysis and decision-making. By sorting the data based on specific points such as date, customer name, location, or product category, users can easily identify trends, patterns, and variation within the dataset. This enhances the accuracy of insights derived from the data, making it easier to generate meaningful visualizations and reports. Moreover, sorting helps in improving the efficiency of querying and filtering, reducing the time required to find relevant information. In business intelligence, clean and sorted data ensures better forecasting, performance evaluation, and strategic planning, ultimately leading to more informed business decisions.

VI. CONCUSION

The research methodology for Walmart Business Performance Dashboard aimed to provide a comprehensive framework for developing a data-driven dashboard to monitor and analyse Walmart's business performance. The methodology employed a mixed-methods approach, combining both qualitative and quantitative methods to gather and analyse data.

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