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A Real Time Dashboard for Asset Monitoring in Power BI: An Overview

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Abstract- This paper explores the development and analysis of two methodologically aligned dashboards: the HR Analytics Dashboard and the Coffee Sales Dashboard. Both dashboards were developed to demonstrate the transformative power of data analytics. This improvs decision-making across diverse domains. The HR Analytics Dashboard focuses on workforce metrics for example attrition rates, recruitment efficiency, and employee performance etc. The Coffee Sales Dashboard focuses on sales performance, customer trends, and inventory management. This paper includes data collection methods, preprocessing techniques, analytical models, visualization strategies, insights derived, and the potential for cross-domain applications. This integrated approach highlights the versatility of data analytics tools, particularly Power BI, in managing and interpreting complex datasets.

Keywords: HR Analytics, Coffee Sales Dashboard, Data Visualization, Power BI, Business Insights, Data Analytics

I. Introduction

The dashboard used for displaying the different types of visual data at one place. These are useful for monitoring, measuring, and analyzing relevant data in various areas such as human resource data, web analytics, marketing performances, sales information, logistic information etc. They provide a platform to us and make better, more informed, data-driven decisions because they are dynamic, interactive, and show near real-time data. A dashboard meets most of the user's informational needs. In today's scenario organizations, industries, companies rely on data-driven strategies to optimize performance, enhance efficiency, and future growth. The ability to harness data from different domains and transform it into actionable insights is critical for informed decision-making.

There are various tools which are used to visualize and analyze within dashboard such as Google Analytics, Looker, Sisense, Domo, Infogram, Qlik, Tableau, Spotfire, ThoughtSpot, and Microsoft Power BI etc. This paper is focus on Microsoft Power BI. It is a smart business intelligence tool which convert simple data into refined representations. It is a user-friendly interface, integrating data from various sources, vast range of interactive visualizations and has ability to connect to diverse data sources. It also provides an easy to use drag and drop functionality.

Our studies and findings are based upon trends in employee attrition based on demographic factors, impact of training programs on key performance improvement, recruitment efficiency, time-to-hire metrics, best-selling products and seasonal sales trends, regional performance variations and customer preferences and inventory turnover rates and stock optimization insights. In this digital era Power BI recognize as a vital tool for improving operational efficiency, finding market trends, and running startups or business growth. This research work focuses on two independent dashboards that is HR analytics the coffee sales analytics. Although these dashboards serve different purposes, the underlying analytical principles, methodologies but the visualization techniques are comparable. In this paper we are discussing the process of creating, managing, and analyzing data demonstrate the broader applications of analytics and developing an interactive Analytics & Insight Dashboard that empowers users to explore key metrics in Human Resources (HR) and Sales domains. With the help of AI-driven predictions, automation, and real-time analytics there is transformation in business, future academic or professional work.

II. Literature Review

This literature review explores the existing literature on real time dashboards and empirical studies to understand the current research in this field.

D. Dowding et.al. were introduced a dashboard for easy work in business sector and clinical dashboard which is beneficial in the medical field. P. Singh and their coworkers investigated the dashboard for identification of challenges faced by education providers. R. Matheus et. al. designed a dashboard for smart cities development. Based on a cross-sectional survey, Reinking et al. proposed a theoretical model of dashboards to improve the individual and organizational performance gains. M. Raje et.al.,

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used Power Bi for data analysis. They studied Power Bi desktop has the feature to use various sources of data and create reports for business intelligence by using source data. T. Susnjak et.al. and Psarommatis F. and their team also worked in the same field. M. D. Jadhav et. al. created a sales dashboard by using power BI for displays monthly sales performance. C. T. Goncalves and coworkers studied the impact of business intelligence tools in sales marketing. Many other research papers were based investigation of Power BI Marketing Dashboard with advertising data and predicted the expected sales through investment inputs of different marketing channels using multiple linear regression in Python and visualized that in the Power BI Interactive Dashboard.

III. Methodology

The data are collected from relevant resources which are related to their sales and KPIs. The next step to understand that the available data are accurate and reliable and could be transformed into valuable information. Thus, data cleaning is essential. This procedure is crucial. During this process duplicate or unnecessary data are eliminated. The Power Query Editor which is a data transformation and cleaning tool within Power BI is used for this. After the data cleaning procedure these data are used for Power BI analysis. If any incomplete or missing data is found in the second phase few statistical techniques such as mean imputation or regression imputation are used. If there are many missing data then they are omitted and the conflicting data are sent in to third stage. The irregularities are spotted by comparing data from various sources or by analyzing data from a single source. The standardization, categorization, and normalization are used to handle data inconsistencies. At the last stage verification of data integrity and accuracy is carried out. In case of any inaccuracies the anticipated range validation techniques including cross-validation and outlier detection are used to resolve it. Hence the process of data analysis is start with data cleaning from which we get accurate and consistence obtained data are used for analysis. After that we transformed the cleaned data for analysis using Power BI's.

IV. Studies and Findings

Our studies and findings are based upon trends in employee attrition based on demographic factors, impact of training programs on key performance improvement, recruitment efficiency, time-to-hire metrics, best-selling products and seasonal sales trends, regional performance variations and customer preferences and inventory turnover rates and stock optimization insights. The foundation of this paper is built upon previously gathered data, methodologies, and analytical techniques from distinct domains, treating each completed segment as a building block. This approach has been used to consolidate insights from both the HR Analytics Dashboard and the Coffee Sales Dashboard.

HR Analytics Dashboard developments include

A. Data Collection: For the Data is collected from various online websites & YT sources. The data covers /include these domains-

Human Resources Information System (HRIS): For employee demographics (age, gender, education, department, job role), tenure, salary, performance ratings, training records, etc.

Applicant Tracking System (ATS): For recruitment data like applications, hires, time-to-hire, recruitment sources.

Learning Management System (LMS): For training completion data.

Exit Interview Data: For insights into reasons for employee attrition.

Employee Engagement Surveys: For satisfaction scores. After data collection, data is stored in Excel.

B. Data Collection and preprocessing:

Handling Missing Values:

Removing Duplicates

Data Type Conversion

Outlier Handling in Excel & Power BI

New column Creation using formulas in Power BI

C. Data Modeling (in Power BI):

Connecting to Data Sources: Establishing connections between Power BI and the various HR data sources.

C**reating Relationships:** Defining relationships between different tables based on common fields (e.g., linking an "Employee" table to a "Department" table using a "Department ID"). This allows for data from different sources to be combined and analyzed together.

D. Dashboard Design and Visualization:

Selecting Appropriate Visuals: Choosing charts and graphs that effectively communicate the insights for each KPI and

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dimension. Examples from your HR dashboard:

KPI Cards: For displaying key metrics like "Overall Employees," "Attrition," "Attrition Rate," "Active Employees," and "Average Age."

Pie Chart: For showing the proportion of attrition by department.

Bar Chart: For comparing the number of employees by age group and attrition by education field.

Table: For detailed job satisfaction ratings.

Donut Charts: For visualizing attrition rate by gender across different age groups.

E. Layout and Navigation: Arranging the visuals in a logical flow, often starting with high-level summaries and allowing for drill-down into more detail. Filters (like the "Month" filter in the Sales dashboard) and slicers (not explicitly visible in your HR dashboard image but common) enable interactive exploration.

F. Insights Generation and Analysis:

Identifying Trends and Patterns: Analyzing the visualized data to identify key trends (e.g., increasing attrition in a specific department, lower job satisfaction in certain roles).

Comparing Data Points: Examining relationships between different variables (e.g., attrition rates across different age groups and genders, the impact of education level on attrition).

G. Deployment and Sharing (via Power BI Service):

Publishing the generated by Power BI.

The methodology for the Coffee Shop Sales Dashboard follows a similar structure, but with different data sources and KPIs:

Data Collection:

Data is collected from online websites.

The data contains information about -Data on stock levels, inventory turnover, and potential stockouts. Information on campaigns, promotions, and their impact on sales. Data on customer behavior and preferences of loyalty members.

B. Data Cleaning and Preprocessing:

The steps followed are similar to HR dashboard process.

Data Modelling (in Power BI):

Creating relationships between tables (e.g., linking "Transactions" to "Products," "Locations," and potentially "Customers").

Creating calculated columns (e.g., calculating "Total Revenue" per transaction, extracting the day of the week or hour from the timestamp).

Creating measures (using DAX) for key sales metrics visible on the dashboard:

Total Sales: Sum of revenue.

Total Orders: Count of unique transactions.

Total Quantity Sold: Sum of the number of items sold.

Sales Trend over the period: Sales aggregated over time (days, weeks, months).

Sales by Weekday/Weekend: Comparing sales performance on different days of the week.

Sales by Product Category: Analysing sales contribution of different product types.

Sales by Store Location: Comparing performance across different branches.

Sales by Day | Hours: Examining sales patterns throughout the day.

Dashboard Design and Visualization:

KPI Cards: Displaying "Total Sales," "Total Orders," and "Total Quantity Sold" as key performance indicators. The variance indicators (e.g., "-31.8% | +37.0K vs LM") show comparisons to a previous period (likely last month - LM).

Line Chart: Visualizing the "Sales Trend over the period" to show performance over time.

Donut Chart: Showing the breakdown of "Sales by Weekday/Weekend."

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Bar Charts: Comparing "Sales by Product Category" and "Sales by Store Location."

Heatmap/Table: Displaying "Sales by Day | Hours" to identify peak sales times.

Filters: The "FILTER PANEL" with "MONTH" allows users to focus on specific time periods. The calendar visual also acts as a filter.

Insights Generation and Analysis:

Identifying best-selling products and categories.

Understanding sales trends over time and identifying seasonality.

Comparing the performance of different store locations.

Identifying peak sales hours and days.

Analyzing the impact of promotions (if that data is integrated).

Deployment and Sharing (Power BI Desktop):

Similar to the HR dashboard, publishing to Power BI Service

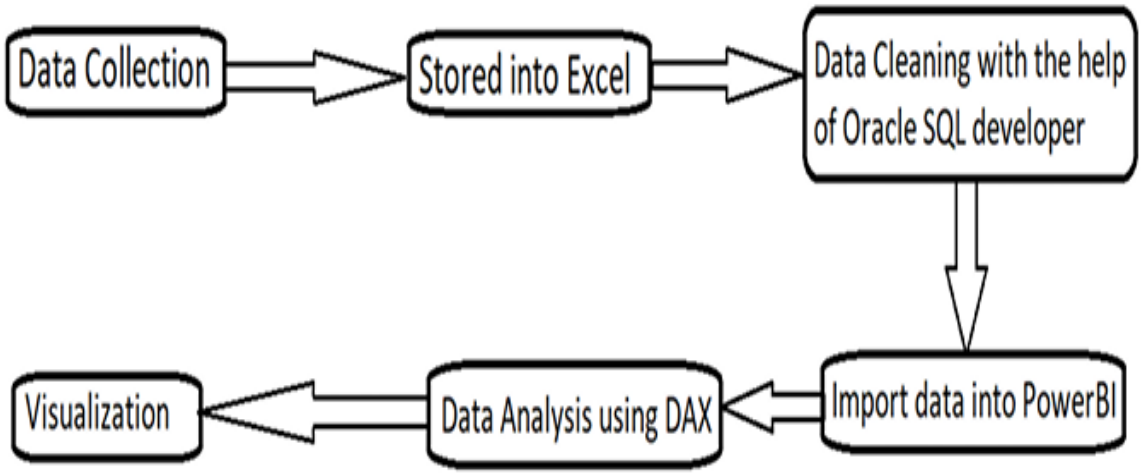

Fig. 1: Steps of Creating Dashboards

V. Result & Discussion

This tool is used to make several dashboards with the help of market survey and various KPIs of organization and business sector. We used Microsoft Power BI to visualize and analyze the data. The process involved to create both dashboard is data collection, cleaning, visualization, and interpretation. Both dashboards demonstrated the ability to identify key trends, forecast future outcomes, and support data-driven decision-making. The flexibility of Power BI in handling different datasets highlight its value as a comprehensive analytics tool.

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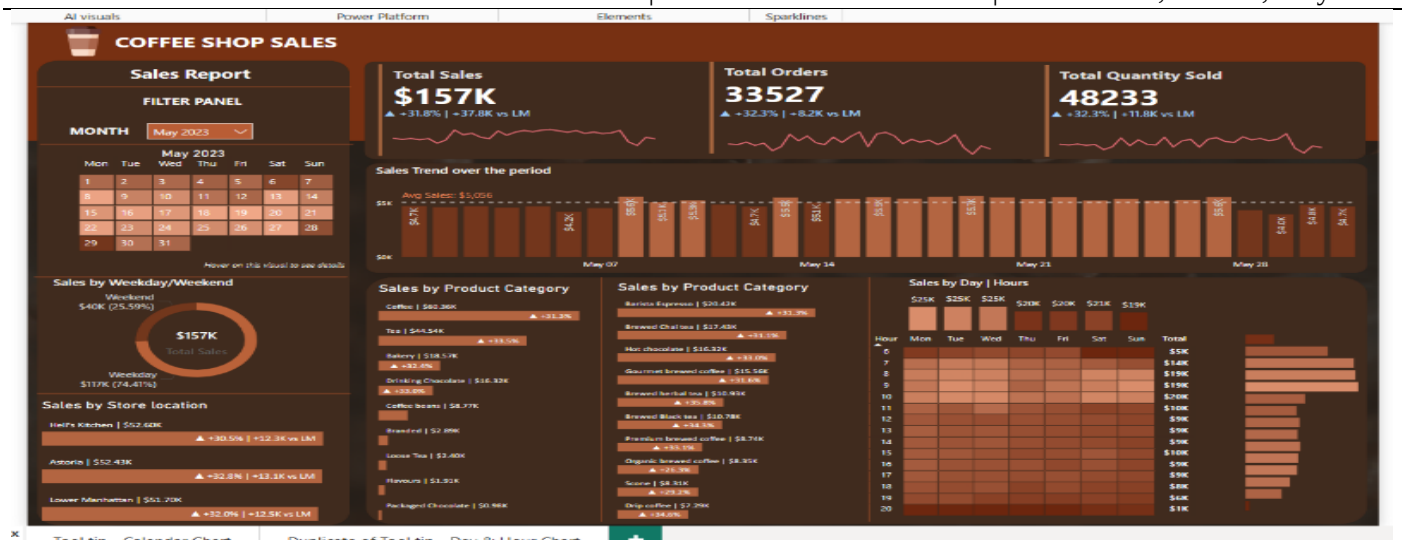

Fig. 2: HR Dashboard and Coffee Dashboard

Future Scope

The scope of this integrated analytics is wide and have significant opportunities for growth and development. In this digital era data-driven decision-making continues to evolving, thus both the HR Analytics and Coffee Sales Dashboards can be enhanced with predictive analytics and machine learning capabilities to forecast trends and automate insights. This field has potential for real-time analytics integration, enabling dynamic updates and immediate decision-making support. The dashboards are also covering other business areas such as finance, marketing, and supply chain management and capable to provide a more comprehensive view of organizational and business performance. Integration of cross-domain data will uncover hidden correlations between HR metrics and sales performance and leading to holistic organizational and business strategies. Cloud-based deployment and accessibility mobile will further increase the dashboards usability. Hence these are the valuable tools for digital India seeking agile and informed decision-making processes.

Furthermore, as outlined in the future scope, the potential for integrating advanced analytics, real-time data, and cross-domain insights promises to further enhance the value of such dashboards, transforming how organizations leverage data to drive strategic initiatives and achieve a competitive advantage in the digital era. The future development of such dashboards, incorporating advanced analytical techniques and addressing the challenges of data integration and governance, holds significant promise for enhancing organizational agility and data-driven culture.

Potential Challenges

In new technology implementation there are some pros and cons. If the goals, KPI's, purpose of organization or business are not clear means objectives are not defined then dashboards do not produce right outputs. The quality of input data is not accurate then misleading results are obtained and it may contain inaccuracies, incomplete information, duplicate errors etc. When data security, system access are not secured this leads to the improper data handling. The poor knowledge of data analyst team is the main barrier to the success of Power BI in long term. The main challenge is choosing right visualization and interactivity between visuals. Performance of this tools is affected by large and complex datasets. However, these challenges are addressed properly organizations, business sectors can leverage the full potential of Power BI dashboards to gain valuable outputs.

IV. Conclusion

This paper explored the development and application of two distinct yet methodologically similar dashboards that is one for HR analytics and the other for coffee sales. The process of data collection, cleaning, modeling, visualization, and analysis, facilitated by the capabilities of Microsoft Power BI, highlights the broad applicability of data analytics principles across diverse business functions. The insights derived from both dashboards underscore the importance of visual communication in making data accessible and understandable for effective decision-making. A dashboard is used for presenting a real-time status of business or organization. This is the best platform for monitoring their performance. An effective dashboard facilitates the decision-making process and delivers the information to end users rapidly. Now days the sales department facing challenges so it requires a visual communication platform. Microsoft power BI is a best tool to visualize and display sales data through dashboard.

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