Healthcare Datasets Project Report

Project Overview

The Healthcare Datasets Project aims to analyze healthcare data to gain insights into various aspects such as billing amounts, medication and treatment costs, insurance coverage, and patient satisfaction. Using Power BI, this project utilizes data modeling, visualization, and calculation measures to provide actionable insights.

Objectives

- To analyze total billing amounts by different attributes such as state, city, diagnosis, procedure, and department.
- To calculate and visualize key metrics like total medication cost, treatment cost, insurance coverage, room charges, and out-of-pocket expenses.
- To derive insights from patient data, including length of stay and patient satisfaction scores.
- To create a dynamic and interactive dashboard that allows stakeholders to explore data through various slicers and filters.

Data Description

The project uses various healthcare-related datasets, which include the following key variables:

- Patient Information: Patient ID, admission date, discharge date, satisfaction score.
- Cost Information: Medication cost, treatment cost, daily room charges, insurance coverage.
- Procedure and Diagnosis Information: Service type, diagnosis, department.

Data Preparation and Cleaning

- Creating Dimension Tables: Dimension tables were created in Excel for cleaner data management and imported into Power BI.
- Data Import: The datasets were imported into Power BI, where the datatypes for each column were checked and validated.
- Data Modeling: A star schema was implemented to create relationships between the fact and dimension tables, optimizing the data model for analysis.

New Columns and Measures

Calculated Columns

Year: Extracted from admission dates.
Month Name: Extracted from admission dates.
Quarter: Extracted from admission dates.
Length of Stay: Calculated using the DATEDIFF function between the admission and discharge dates.

Quick Measures

Total Medication Cost: SUM(Medication Cost)
Total Treatment Cost: SUM(Treatment Cost)
Total Insurance Coverage: SUM(Insurance Coverage)
Total Room Charges: SUMX(Visits, [Length of Stay] * [Daily Room Charges])
Total Billing Amount: Total Medication Cost + Total Room Charges + Total Treatment Cost
Out of Pocket: Total Billing Amount - Total Insurance Coverage
Total Patients: DISTINCTCOUNT(Patient ID)
Average Medication Cost: AVERAGE(Medication Cost)
Average Treatment Cost: AVERAGE(Treatment Cost)
Average Insurance Coverage: AVERAGE(Insurance Coverage)
Average Length of Stay: AVERAGE(Length of Stay)
Average Billing Amount: DIVIDE(Total Billing Amount, Total Patients)
Average Out-Of-Pocket: DIVIDE(Out of Pocket, Total Patients)
Average Patient Satisfaction Score: AVERAGE(Patient Satisfaction Score)
Average Room Charges: DIVIDE(Total Room Charges, Total Patients)

Analysis Performed

Billing Analysis:
- Total Billing Amount by State and City: A column chart was used to visualize billing amounts due to a limited number of unique cities.
- Total Billing Amount by Procedure: Displayed using a donut chart to show the amount and percentage of the grand total.
- Total Billing Amount by Diagnosis and Service Type: Visualized using a 100% stacked bar chart.
- Total Billing Amount by Department: Displayed with percentage contribution to the grand total.

Performance Over Time:
- Billing Performance by Year and Quarter: Implemented using slicers in tile style, allowing users to filter and view data dynamically by year and quarter.

Similar Analysis for Other Metrics:
- Medication Cost, Treatment Cost, Insurance Coverage, Out-Of-Pocket Cost, and Room Charges: The same analysis techniques were applied to these metrics, providing comprehensive insights into each area.

Visualizations

The project includes various visualizations to communicate findings effectively:

- Column Charts: For state and city-level billing amounts.
- Donut Charts: For procedure-based billing amounts.
- Stacked Bar Charts: For analyzing diagnosis and service types.
- Slicers: For filtering data by year and quarter dynamically.

Conclusion

The Healthcare Datasets Project successfully leveraged Power BI to turn raw healthcare data into meaningful insights. The analysis revealed key cost drivers, patient behavior, and satisfaction trends. These insights can assist healthcare administrators and policymakers in making informed decisions to optimize operational efficiency and improve patient care.