*You are the Data Analyst for a Chain of Departmental stores. The CEO has asked you to make a weekly sales dashboard/report. There is no data pipeline/warehouse available as such. Weekly data is extracted using a data tool connected to the POS at every store. The senior assistant (Suleman) has extracted a number of files for you to add to your report/dashboard. Every week Suleman will send you this data and you will expected to update this dashboard and then send it to the CEO via a link or otherwise.*

1. *You have been asked to decide the tool to do this task, what are the pros and cons of pbi vs streamlit. What would you recommend to your CEO and why. Understand the scale of the business and the sales before answering this question.*

**Question 1 solution:**

**Power BI:**

*Pros:*

* Scalability: Well-suited for large-scale enterprises, handling extensive datasets.
* Integration: Seamlessly integrates with various data sources for smooth data extraction and analysis.
* Visualization: Offers a wide range of visualization options for clear representation of sales data.
* Scheduled Refresh: Ensures the dashboard always reflects the latest sales figures.
* User-Friendly: Provides an intuitive interface for creating dashboards and reports.

*Cons:*

* Cost: Licensing costs may be a concern, especially for advanced features and large-scale deployments.
* Learning Curve: Users might need time to get acquainted with the tool.

**Streamlit:**

*Pros:*

* Flexibility: Allows for customization and rapid development of interactive web applications using Python.
* Open Source: Cost-effective and allows for community contributions and extensions.
* Python-based: Enables powerful data analysis and visualization leveraging Python's libraries.
* Quick Prototyping: Facilitates quick experimentation with different visualization techniques.
* Easy Deployment: Applications can be easily deployed on various platforms.

*Cons:*

* Limited Native Visualization Options: May require more coding for advanced visualizations compared to dedicated BI tools.
* Scalability Concerns: Might face challenges with large datasets and enterprise-level deployments.
* Data Integration: Setting up data integration might require additional effort compared to tools with built-in connectors.

**Recommendation:**

Considering the scale of the business and the need for a weekly sales dashboard/report, I would recommend Power BI to the CEO. Power BI offers scalability, seamless integration with various data sources, robust visualization capabilities, and scheduled data refresh, making it suitable for managing and analyzing sales data at the enterprise level. While Streamlit provides flexibility and customization, it may not be the most efficient option for handling large datasets and ensuring seamless data integration across multiple sources without a dedicated data pipeline or warehouse. Therefore, Power BI would better serve the needs of the CEO and the organization in this scenario.

1. *The CEO (Sumera) has told you that it is common practice to compare weekly data to the year before. For e.g Sumera wants to see how well Store 3, Dept 1 did in Week 20 this year as compared to Week 20 last year. She also wants to see bigger picture by store and department.*
   1. *Hint: A common way to do such comparison is via Indices, usually calculated as Current Sales/Previous sales \* 100. If index is > 100 it shows growth, maybe the dashboard could show this as green*
   2. *YTD or Year To Date values also provide a good comparison to last year. It is simply the running total of Sales till the current week. It is worthwhile to compare this number by last year and take out an index*

**Question 2 solution:**

All of these calculations and comparisons have been done in the Power BI Dashboard attached.

1. *Folder named All data contains all data till the current week*

**Question 3 solution:**

All the data has been imported in the Power BI file, by connecting to the folder named All data.

1. *Sumera wants to see big picture summary, for eg top 10 stores in the current week, top 10 depts in the current week. Assume our current week is 19th to 25th Oct 2012*
   1. *Try defining what top 10 stores should be based on, also think about the worst performing stores/departments*
   2. *Every week the manager of the 5 best performing stores in terms of Sales gets a commission, the CEO would like to see who these people are. Commission is 0.5% of Sales. The CEO would also like to see Year to Date Values for these commissions for the top 10.*

**Question 4 solution:**

All of the relevant visuals have been added in the dashboard.

1. *The CEO likes simple design and big numbers, layout availability on mobile will impress her. She absolutely dislikes clutter and dark themes*

**Question 5 solution:**

The CEO’s design preferences have been kept in mind while designing the dashboard.

1. *Assume you are now in week of 26th Oct 2012, try refreshing the numbers on the dashboard with this new data and see how long it takes. Think about how long it would take you to refresh and recommend the CEO what to do about the org data. Make a case to convince Sumera about your recommendations. This data is in the folder called New week.*

**Question 6 solution:**

Dear Sumera,

I'm writing to provide an overview and some strategic recommendations following our latest weekly sales dashboard update, which impressively took just 30 seconds. This speed not only highlights our current system's efficiency but also marks a pivotal foundation for our forward-thinking data management strategies, ensuring robustness, scalability, and continued efficiency.

**Power BI: The Optimal Choice**

**User-Friendly:** Power BI stands out for its accessibility, especially beneficial for those without a technical background. Its intuitive design simplifies data visualization and analysis. Does not require any prior knowledge of programming languages.

**Comprehensive Features:** With robust data processing and visualization capabilities, Power BI aligns perfectly with your preference for simplicity and accessibility. It's our best tool for the sales dashboard, facilitating easy insight sharing. It’s a Microsoft product, provides seamless integration with Excel.

**Elevating Our Data Strategy Current Efficiency and Future Growth:** The swift dashboard updates are pivotal for real-time sales performance insights, reflecting our ability to manage current data volumes effectively. Looking ahead, we aim not just to maintain but to elevate this efficiency as we grow.

**Automation and Resource Optimization:** By automating the dashboard refresh process, we aim to optimize resource allocation, freeing up time for strategic analysis and growth exploration. Automation will also reduce the risk of errors, ensuring our decisions are based on reliable data.

**Strategic Scalability:** Proactively monitoring our dashboard's performance will help us identify and address any potential issues early, ensuring our data handling evolves seamlessly with our expanding operations.

**Recommendations**

**Continue with Current Process:** Our existing update mechanism serves us well, striking a balance between efficiency and comprehensiveness.

**Explore Automation:** Implementing automated updates for our dashboard will ensure consistent data accuracy and free up valuable time for strategic endeavors.

**Routine Performance Monitoring:** Establishing a systematic approach to monitor our dashboard’s performance will equip us to anticipate and adapt to future growth challenges without compromising insight quality.

I'm eager to discuss these proposals in more detail. With your support, I'm confident we can further refine our data analytics framework to better align with our ambitious growth strategies and operational needs.

Best regards,

Fatima Rama