MASTER OF BUSINESS ADMINSTARTION (MBA) SEMESTER-IV
BUSINESS INTELLIGENCE PRACTICAL LAB QUESTION BANK

SET 1

1. What is ETL process in Power BI? Explain with example?
2. What is Data visualization and explain various tools for visualization of Data?
3. Create a Histogram for the given sales force data
4. Create a data model in Power BI with an example of 10 years sales and profit information of XYZ company.
5. What is Dashboard? Create a dash board using Excel data?
6. Explain the concept of creating a new column in Power BI desktop with example?
7. How to create a Pivot table in Power BI?
8. Create a simple table in Power BI desktop and visualize the data with the help of Pie chart?
9. Explain the steps to Create a Business report using Power BI with Example
10. What is Power Query and how it is useful for analyzing the data in Power BI?
11. Explain the steps involved in connecting and preparing data for visualization in Tableau?
12. Briefly explain various data aggregation and statistical functions used in Tableau?
13. What are the different visualization operations performed on data in Tableau.
14. What is meant by KPI? How the stakeholders of a company need KPI's to understand the business at glance? (Example)
15. Create a visually appealing and informative report that summarizes key findings from your data analysis. Include relevant charts, tables, and titles using Tableau.
16. Create a bar chart to visualize total sales by product category. Explore sorting options to highlight top-selling categories using Tableau.
17. Explain how you would tailor your dashboard for different audiences (e.g., management vs. sales team) to emphasize relevant insights for each group using Tableau.
18. Create a scatter plot to analyze the relationship between sales amount and product price. Consider adding a trend line to identify any correlations.

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19. Get a data set containing supply chain data, including inventory levels, lead times, and supplier performance metrics from web source and design visualizations to identify bottlenecks, optimize inventory management, and improve supply chain efficiency. Use tools like heat maps.

20. Analyze healthcare data, such as patient demographics, medical diagnoses, and treatment outcomes, to identify patterns and insights that can improve patient care and operational efficiency. Create visualizations to track patient wait times, appointment scheduling, and resource utilization in healthcare facilities.

SET 2

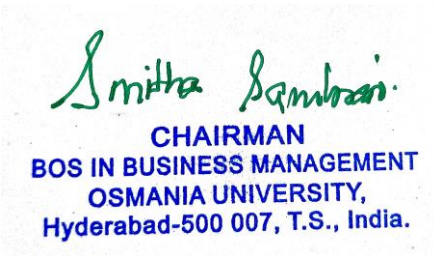
1) Explain and show the various filers available in Power BI
2) How do you get data in Power BI?
3) What are the various connectivity modes available in Power BI
4) Show the refresh option and various types of refresh options provided in Power BI
5) dataset containing sales data for a retail store, create a report with the following elements:
    - A template showing total sales revenue.
    - A bar chart showing total sales by product category.
    - A line chart displaying total sales trend over time.

6) Name three types of visualizations available in Power BI and explain when each is appropriate
7) create a date in calendar table in Power BI
8) Explain the different connectivity modes available in Power BI
9) Explain the various sources Power BI can connect to
10) Explain different views available in Power BI Desktop
11) How do you use building blocks of Microsoft Power BI.
12) Explain critical components of the Power BI toolkit and spot the same in query
13) Name some commonly used tasks in the Query Editor.
14) Explain the Schedule Refresh feature designed to work
15) How do you depict a story in Power BI

SET 3

1. What is Power BI?

Power BI is a collection of Business Intelligence tools, techniques, and processes that are used to extract valuable information from the raw business data by connecting, transforming, and visualizing raw data sets from multiple sources.



It provides the right tools to create interactive dashboards and live reports that can be shared and published on various platforms to help business users and stakeholders make better decisions. With the competitive and highly categorized information, planners and decision-makers can track their performance in the market.

2. How do you import data into Power BI?

Data can be imported into Power BI from various sources such as Excel files, databases, online services like Salesforce, and more. You can import data using the "Get Data" option in the Home tab.

3. How does Power BI differ from Excel?

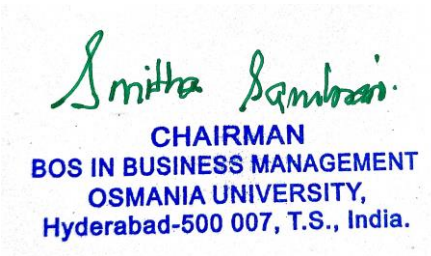
Power BI is a business analytics tool by Microsoft, whereas Excel is a spreadsheet program. Power BI is more focused on data visualization and analysis, with capabilities for creating interactive reports and dashboards, whereas Excel is a general-purpose spreadsheet tool.

4. Why should we use Power BI?

Power BI provides an easy way for anyone, including non-technical people, to connect, change, and visualize their raw business data from many different sources and turn it into valuable data that makes it easy to make smart business decisions.

5. Difference between Power BI and Tableau

Power BI	Tableau
Power BI can handle a limited volume of datasets.	Can handle huge datasets without affecting the performance of the system.
Can be used by both naive and experienced users.	Used by experienced professionals for data analytics purposes.
Power BI has an easy-to-learn interface that helps the user to visualize the data and create reports.	The interface is difficult to understand by a non-technical user.
Provides an easy way for embedding the reports.	It’s a real-time challenge for embedding reports in Tableau.
Power BI uses Data Analysis Expression(DAX) to build formulas and expressions for measuring the columns.	Tableau uses Multidimensional Expressions(MDX) to create complex calculations and measure columns and dimensions.



6. What is business intelligence and why is it important?

Business intelligence (BI) refers to the use of technology, applications, and practices for the collection, integration, analysis, and presentation of business information. It helps organizations make data-driven decisions, identify trends, optimize processes, and gain a competitive edge in the market. BI is important because it enables businesses to turn raw data into actionable insights, leading to better strategic planning and improved performance.

7. What is data visualization and why is it important in BI?

Data visualization is the graphical representation of data and information. It's important in BI because it allows users to easily interpret and understand complex datasets, trends, and patterns. By presenting data visually through charts, graphs, and dashboards, BI systems enable stakeholders to make informed decisions quickly and effectively. Data visualization enhances communication, facilitates analysis, and improves decision-making across all levels of an organization.

8. What are the different types of visualizations available in Power BI?

Power BI offers various types of visualizations including bar charts, line charts, pie charts, maps, tables, matrices, and more. These visualizations help users represent data in a meaningful way.

9. What are the major components of Power BI?

There are five different components of Power BI.

Power Pivot: Fetches and cleans data and loads on to Power Query

Power Query: Operates on the loaded data

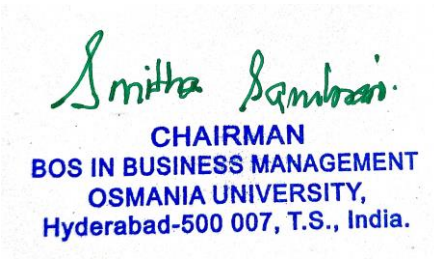
Power Q&A: Makes it possible for users to interact with reports using simple English language

Power View: Lets users create interactive charts, graphs, maps, and other visuals

Power Map: Enables the processing of accurate geographic locations in datasets

10. What is Power BI Q&A?

Ans: Power BI Q&A is a natural language tool that helps in querying your data and getting the results you need from it. You do this by typing into a dialog box on your Dashboard, which the engine instantaneously generates an answer similar to Power View. Q&A interprets your questions and shows you a restated query of what it is looking from your data. Q&A was developed by Server and Tools, Microsoft Research, and the Bing teams to give you a complete feeling of truly exploring your data.



11. What is Power Pivot?

Power Pivot is an add-on provided by Microsoft for Excel since 2010. Power Pivot was designed to extend the analytical capabilities and services of Microsoft Excel.

12. What is Power Query in Power BI?

Power Query is a data transformation tool integrated into Power BI Desktop. It allows users to connect to various data sources, transform and clean the data, and then load it into the Power BI data model.

13. What is DAX?

DAX stands for Data Analysis Expressions. It's a collection of functions, operators, and constants used in formulas to calculate and return values. In other words, it helps you create new info from data you already have.

14. What is Power View?

Ans: Power View is a data visualization technology that lets you create interactive charts, graphs, maps, and other visuals which bring your data to life. Power View is available in Excel, SharePoint, SQL Server, and Power BI.

15. What is Power Map?

Ans: Power Map is an Excel add-in that provides you with a powerful set of tools to help you visualize and gain insight into large sets of data that have a geo-coded component. It can help you produce 3D visualizations by plotting upto a million data points in the form of column, heat, and bubble maps on top of a Bing map. If the data is time stamped, it can also produce interactive views that display, how the data changes over space and time.

16. What is a dashboard in Power BI?

A dashboard is a single-layer presentation sheet of multiple visualizations reports. The main features of the Power BI dashboard are: It allows you to drill through the page, bookmarks, and selection pane and also lets you create various tiles and integrate URLs. A dashboard can also help you set report layout to mobile view.

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17. How can you create calculated columns in Power BI?

Calculated columns can be created in Power BI using the "New Column" option in the modeling tab. You can write DAX (Data Analysis Expressions) formulas to define calculated columns based on existing data.

18. Explain how relationships are defined in Power BI Desktop.

Relationships between tables are defined in two ways:

Manually - Relationships between tables are manually defined using primary and foreign keys.

Automatic - When enabled, this automated feature of Power BI detects relationships between tables and creates them automatically.

19. How can we filter data in Power BI?

Data can be filtered using various filters that are available in Power BI, implicitly. There are basically three types of filters, namely, Page-level filters, Drillthrough filters, and Report-level filters.

Drillthrough filters: With Drillthrough filters in Power BI Desktop, users can create a page in their reports that focuses on specific entities such as suppliers, customers, or manufacturers.

Page-level filters: These are used to filter charts that are present on individual pages.

Report-level filters: They are used to simultaneously filter charts that are present on all pages of a report.

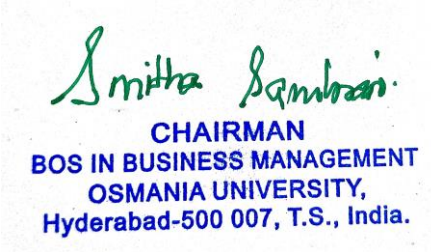
20. What is a slicer in Power BI?

Answer: A slicer is a visual filter in Power BI that allows users to interactively filter data within a report or dashboard. It provides a user-friendly way to filter data by selecting specific values or ranges from a list.

SET 4

What is Tableau?

Tableau is a fast growing and powerful data visualization tool. Tableau is a business intelligence tool which helps us to analyze the raw data in the form of the visual manner; it may be a graph, report, etc.



Example: - If you have any data like **Big Data, Hadoop, SQL,** or any cloud data and if you want to analyze that given data in the form of pictorial representation of data, you can use Tableau.

Data analysis is very fast with Tableau, and the visualizations created are in the form of worksheets and dashboards. Any professional can understand the data created using Tableau.

Tableau software doesn't require any technical or any programming skills to operate. Tableau is easy and fast for creating visual dashboards.

Tools of Tableau

A list of Tableau tools:

- Tableau Desktop
- Tableau Public
- Tableau Online
- Tableau Server
- Tableau Reader

Download and Installation of Tableau

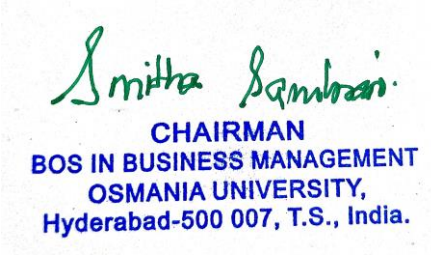
Tableau is available in two ways:-

- Tableau Public (Free)
- Tableau Desktop (Commercial)

Here is a comparison between the Tableau Public and Tableau Desktop

Tableau Public

- Tableau Public is a free and open-source.
- Tableau public data source can connect to Excel and Text files.
- Tableau public can be installed on Window and Mac operating system.
- Data and Visualizations are not secured in the Tableau public because it is available in public.



- In Tableau public, data cannot be obtained from different data sources as it is limited to connect only Excel and Text files.
- Tableau public uses the details at Personal level.

Tableau Desktop

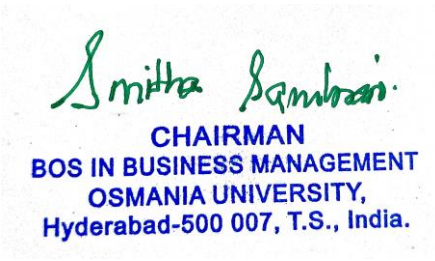
- Tableau Desktop is a paid source, personal edition- $35 per month and professional edition- $70 per month.
- Tableau desktop data source can connect to any data source file, including databases, web applications, and more.
- Tableau desktop can also install on Window and Mac operating system.
- Data and Visualization are secured in Tableau desktop.
- In Tableau desktop, data can extract from various data sources and stored as Tableau extract file.
- Tableau desktop uses the details at Professional and Enterprise level.

Lets install the Tableau Desktop on Window machine and go through step by step:-

Go to https://www.tableau.com/products/desktop on your Web browser

Parameters	**Tableau**	**Power BI**
Meaning	Tableau is the data analytics and business intelligence tool for generating reports and data visualization tool with high flexibility.	Power BI is the business analytics tool to analyze the business and derive insight from it.
Year	Tableau was established in 2003.	Power BI was established in 2013.
Cost	Tableau is more expensive when it comes to large enterprise, and it paid more when connected to third party application.	Power BI is less expensive when compared to the Tableau.
Data visualization	Tableau is a more preferred tool when it comes to data visualization.	Power BI focused on predictive modeling and reporting.
Data source	Tableau has access to many database sources and servers. **Ex:** Text file, Excel, JSON file, Access, PDF file, Statistical file, Spatial file, etc.	Power BI has limited access to other database and servers. **Ex:** Access database, SQL server database, SQL server analysis services database, IBM DB2 database, Oracle

		database, etc.
Deployment	Tableau have more flexible deployment. It available on-premises and cloud both model options.	Power BI is available as SaaS model options only.
User interface	Tableau has a slick user interface that enables the user to create a customized dashboard.	Power BI has a more understandable interface and much simpler to learn. Due to its simplicity and easy to use, that's why business users prefer power BI.
Data capacity	Tableau works on the columnar based structure that stores unique values for each column, making it possible to fetch millions of rows.	Power BI can Handel up to 10 GB of data. For more than 10 GB, data should be in the cloud (Azure). If it is in the local database, then Power BI selects the data from the database but does not import.
Machine learning	Python machine learning capacities is in build with a Tableau that makes it efficient for performing machine learning operation over the datasets.	Power BI is integrated with Microsoft Azure that helps in analyzing the data and understanding the pattern of the business.
Performance	Tableau can handle huge data with better performance.	Power BI can handle limited data only.
Users	Tableau required analysts users for their analytics purpose.	Power BI required both technical and non-technical users.
Infrastructure	Tableau provides flexible infrastructure.	Power BI provides software as a service infrastructure.
Overall functionality	Tableau has excellent functionality.	Power BI has good functionality.
Support level	Tableau has a high support level in comparison to power BI.	Power BI has a low support level.
Programming tools support	Tableau integrates much better with R language as compared to power BI.	Power BI is also connected to the R language using Microsoft revaluation analytics. But it is only available for enterprises level users.



Lab Experiment:01

Introduction to Business Intelligence Tools - Tableau and Power BI

Objective:

To familiarize with and compare the functionalities of Tableau and Power BI for data visualization and analysis.

Requirements:

- Computers with Tableau and Power BI installed.
- Sample datasets for testing.
- Access to online resources for assistance.

Experiment Steps:

1. **Data Import:**
   - Import the provided dataset into both Tableau and Power BI.
   - Ensure the data is imported correctly and preview the dataset.
2. **Data Exploration:**
   - Explore the dataset in both Tableau and Power BI.
   - Identify key attributes and understand the data structure.
   - Utilize filtering, sorting, and grouping functions to gain insights.
3. **Visualization Creation:**
   - Create basic visualizations (bar chart, line graph, pie chart, etc.) in Tableau using the dataset.
   - Repeat the same process in Power BI.
   - Compare the ease of creating and customizing visualizations in both tools.
4. **Interactive Dashboards:**
   - Build an interactive dashboard in Tableau with the visualizations created.
   - Repeat the process in Power BI.
   - Evaluate the interactivity and user experience of the dashboards in both tools.
5. **Advanced Analysis:**
   - Perform advanced analysis tasks such as forecasting or trend analysis in Tableau.
   - Repeat the same tasks in Power BI.
   - Compare the capabilities and performance of each tool for advanced analysis.
6. **Sharing and Collaboration:**
   - Explore the sharing and collaboration features of Tableau and Power BI.
   - Share the created dashboards with peers or colleagues.
   - Gather feedback on usability and accessibility from others.
7. **Documentation and Analysis:**
   - Document your findings, including observations, comparisons, strengths, and weaknesses of both Tableau and Power BI.

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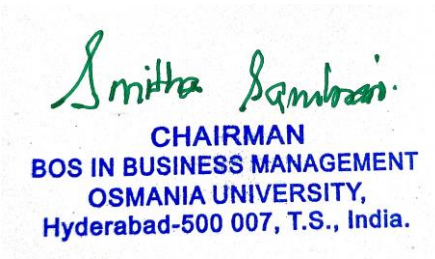
- Analyze which tool better meets your requirements based on the experiment outcomes.

Solution:

1. **Data Import:**
   - Use the import data feature in Tableau and Power BI to load the dataset.
   - Ensure the dataset is properly imported, and preview the data to confirm accuracy.
2. **Data Exploration:**
   - Explore the dataset using Tableau's data pane and Power BI's data view.
   - Identify key attributes, such as numerical and categorical variables.
   - Utilize filtering and sorting options to analyze data subsets.
3. **Visualization Creation:**
   - Create a bar chart depicting sales performance in Tableau by dragging the "Sales" measure to the Columns shelf and "Product Category" dimension to the Rows shelf.
   - Repeat the same process in Power BI by selecting the "Sales" measure and "Product Category" dimension for visualization.
4. **Interactive Dashboards:**
   - Build an interactive dashboard in Tableau by combining the created bar chart with a line graph showing sales trends over time.
   - Repeat the process in Power BI by adding the bar chart and line graph to a single dashboard.
5. **Advanced Analysis:**
   - Perform forecasting in Tableau by applying the built-in forecasting feature to the sales trend line graph.
   - Repeat the forecasting task in Power BI using its forecasting capabilities.
6. **Sharing and Collaboration:**
   - Share the Tableau dashboard with colleagues by publishing it to Tableau Server or Tableau Online.
   - Share the Power BI dashboard by publishing it to Power BI Service and granting access to collaborators.
7. **Documentation and Analysis:**
   - Document observations regarding the ease of use, feature availability, performance, and collaboration capabilities of both Tableau and Power BI.
   - Analyze which tool better meets the requirements based on the experiment outcomes and provide recommendations.

OUTCOME:

This experiment should provide a comprehensive introduction to Tableau and Power BI, enabling participants to understand their functionalities and make informed decisions regarding their suitability for business intelligence purposes.



What is the Purpose of a Dashboard?

A car dashboard provides real-time information about a car's speed, fuel volume, RPM, and other engine-related indicators. Similarly, a data dashboard provides information about company historical sales, key performance indicators (KPIs), sales growth, operational indicators, and customer feedback. This information is presented in a precise manner so that managers or executives can understand the situation and make appropriate decisions.

There are hundreds of moving parts in your business and a dashboard summarizes these events into an easy-to-understand, real-time data visualization. These visualizations and charts can be used to make fast and effective decisions.

There are several benefits of dashboard reporting:

- Usability: a typical company generates gigabytes of raw data daily. Understanding the data can help companies create value from it and make better decisions. Dashboards provide access to all key metrics on a single screen, turning raw data into valuable insights.
- Access to data: a single dashboard has access to multiple data sources to provide detailed reports of the inner workings of a company.
- Decision making: managers or executives can view anomalies, forecast sales, and review historical data to come up with business strategies. The information is available in an interactive visual form, where we can dive deep into historical data or filter out critical parameters.
- Accountability: it provides an unbiased picture of how well your company is performing. The dashboard can show you the difference in growth percentage and how you may have failed at a certain marketing campaign. Accountability is necessary to keep companies away from bankruptcy.
- Interactivity: the gamified and dynamic experience of the dashboard makes it easy to use and understand various factors of organizations. You can filter, isolate a single metric, zoom into a map or time series line plot, search for terms or even use third-party tools to generate anomaly alarms.

- Analysis: you can use these dashboards to come up with detailed analytical reports. The dashboard simplifies data analysis tasks as you are monitoring key permanence metrics and making sense of past events.

What are the Types of Dashboards?

There are several ways to customize the dashboard, and they all fall into one of three categories - **iDashboards**:

1. Operational Dashboards: these dashboards show the real-time performance of day-to-day business operations. They are connected to multiple data sources and contain hundreds of metrics, indicating various functionalities of the business.
2. Analytical Dashboards: these dashboards use historical data to identify trends. They are mainly used by data analysts to write detailed reports about a company's past performance and what steps they can use to improve current systems.
3. Strategic Dashboards: these dashboards are mainly used to track current performance compared to key performance indicators and align actions with strategy.

Lab Experiment:02

Creating Interactive Dashboards and Reports

Objective:

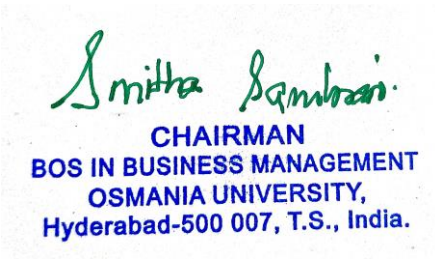
To learn and practice creating interactive dashboards and reports using Tableau.

Requirements:

- Computer with Tableau Desktop installed.
- Sample dataset for experimentation.
- Access to online resources for assistance.

Experiment Steps:

1. **Data Import:**



- Import the provided dataset into Tableau.
- Ensure the data is properly structured and loaded into Tableau.

2. **Data Exploration:**
   - Explore the dataset using Tableau's data pane and preview functionality.
   - Identify key attributes and understand the data's structure and distribution.
3. **Visualization Creation:**
   - Create individual visualizations (e.g., bar charts, line graphs, pie charts) to represent different aspects of the dataset.
   - Customize each visualization by adjusting colors, labels, and other formatting options.
4. **Dashboard Creation:**
   - Combine multiple visualizations into a dashboard layout.
   - Arrange the visualizations to create a logical flow of information.
   - Add dashboard objects such as text boxes, images, or web objects to enhance the dashboard's presentation.
5. **Interactivity:**
   - Implement interactivity features such as filters, parameters, and actions to make the dashboard interactive.
   - Test the interactivity by interacting with the dashboard elements and observing the changes in the visualizations.
6. **Formatting and Styling:**
   - Apply formatting and styling options to the dashboard to improve its visual appeal and readability.
   - Use themes, backgrounds, and borders to enhance the overall design.
7. **Testing and Validation:**
   - Test the dashboard's functionality across different devices and screen sizes to ensure responsiveness.
   - Validate the accuracy of the data and the effectiveness of the visualizations in conveying insights.
8. **Documentation and Analysis:**
   - Document the steps taken to create the interactive dashboard.
   - Analyze the effectiveness of the dashboard in conveying insights and facilitating data-driven decision-making.
   - Reflect on the challenges encountered and lessons learned during the dashboard creation process.

Solution:

1. **Data Import:**
   - Open Tableau Desktop and connect to the provided dataset (e.g., CSV file, Excel spreadsheet).
   - Navigate to the "Data Source" tab and confirm that the dataset fields are correctly identified.
2. **Data Exploration:**
   - Review the dataset by examining the fields and data types in the Data Source tab.

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- Drag individual fields onto the canvas to create initial visualizations and understand the data's distribution.

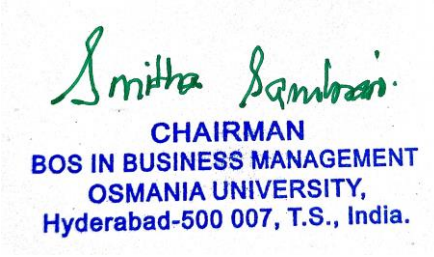
3. **Visualization Creation:**
   - Create various visualizations such as bar charts, line graphs, and scatter plots by dragging fields onto the Rows and Columns shelves.
   - Customize each visualization by adjusting colors, labels, and other formatting options in the "Marks" card.
4. **Dashboard Creation:**
   - Click on the "New Dashboard" button to create a blank dashboard.
   - Drag the desired visualizations onto the dashboard canvas and arrange them to create a cohesive layout.
5. **Interactivity:**
   - Add interactivity to the dashboard by creating filters, parameters, and actions.
   - For example, create a filter to allow users to select specific time periods or regions to dynamically update the visualizations.
6. **Formatting and Styling:**
   - Apply formatting options such as font styles, background colors, and borders to enhance the dashboard's appearance.
   - Use Tableau's built-in themes or create custom styles to maintain consistency across the dashboard.
7. **Testing and Validation:**
   - Test the dashboard's responsiveness by resizing the Tableau window or viewing it on different devices.
   - Verify the accuracy of the data by cross-referencing the visualizations with the original dataset.
8. **Documentation and Analysis:**
   - Document the steps followed to create the interactive dashboard, including any challenges encountered and solutions implemented.
   - Analyze the effectiveness of the dashboard in conveying insights and facilitating data-driven decision-making.
   - Reflect on the lessons learned and identify areas for improvement in future dashboard projects.

Lab Experiment: 03

Data Storytelling and Communicating Insights Effectively

Objective:

To learn and practice the art of data storytelling and effectively communicating insights using data visualization.



Requirements:

- Computer with data visualization software (e.g., Tableau, Power BI, Python libraries) installed.
- Sample dataset for experimentation.
- Access to online resources for assistance.

Experiment Steps:

1. **Data Exploration:**
   - Begin by exploring the dataset to understand its structure, variables, and relationships.
   - Identify key insights or trends that can be potentially interesting for storytelling.
2. **Identify the Story:**
   - Determine the overarching narrative or story you want to convey with the data.
   - Consider the target audience and what insights would be most relevant and impactful for them.
3. **Visualize the Data:**
   - Create visualizations that support the narrative and key insights identified.
   - Use appropriate chart types, colors, and annotations to enhance clarity and understanding.
4. **Craft the Story:**
   - Structure the narrative around the key insights, using visualizations to support each point.
   - Incorporate context, background information, and real-world examples to make the story relatable and engaging.
5. **Design the Presentation:**
   - Design a presentation or report format to communicate the data story effectively.
   - Consider the layout, flow, and visual design elements to ensure clarity and coherence.
6. **Practice Delivery:**
   - Practice presenting the data story, focusing on clear communication and engaging delivery.
   - Use storytelling techniques such as pacing, suspense, and emotion to captivate the audience.
7. **Solicit Feedback:**
   - Present the data story to peers or colleagues and solicit feedback on clarity, engagement, and effectiveness.
   - Use feedback to refine and improve the storytelling approach.
8. **Reflect and Iterate:**
   - Reflect on the feedback received and the overall effectiveness of the data storytelling.
   - Identify areas for improvement and iterate on the storytelling approach for future presentations.

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Solution:

1. **Data Exploration:**
   - Explore the provided dataset, which includes sales data for a retail company, including product categories, sales amounts, and customer demographics.
2. **Identify the Story:**
   - Determine that the story will focus on analyzing sales performance by product category and identifying key factors driving sales.
3. **Visualize the Data:**
   - Create visualizations such as bar charts and line graphs to represent sales performance by product category over time.
   - Use additional visualizations such as pie charts and scatter plots to analyze relationships between sales and other variables such as customer demographics.
4. **Craft the Story:**
   - Structure the narrative around the key findings, highlighting trends, patterns, and outliers in the data.
   - Incorporate insights into factors influencing sales, such as marketing campaigns, seasonality, and customer preferences.
5. **Design the Presentation:**
   - Design a slide deck presentation with a clear agenda, introduction, main body, and conclusion.
   - Use visual design elements such as color, typography, and imagery to enhance the presentation's visual appeal.
6. **Practice Delivery:**
   - Practice delivering the presentation, focusing on clear articulation, pacing, and engagement.
   - Use storytelling techniques such as anecdotes, examples, and visual cues to enhance audience engagement.
7. **Solicit Feedback:**
   - Present the data story to a small group of colleagues and solicit feedback on clarity, engagement, and effectiveness.
   - Receive feedback on the clarity of the narrative, the relevance of the insights, and the effectiveness of the visualizations.
8. **Reflect and Iterate:**
   - Reflect on the feedback received and make adjustments to the storytelling approach, visualizations, or presentation format as needed.
   - Iterate on the presentation to improve clarity, engagement, and overall effectiveness for future presentations.

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Lab Experiment: 04

Developing a Comprehensive Business Analysis Solution

Objective:

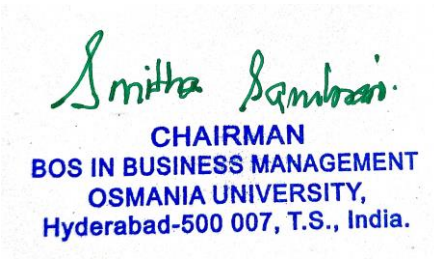
To apply business analysis techniques to address a real-world business problem and develop a comprehensive solution.

Requirements:

- Computer with tools for data analysis, modeling, and documentation (e.g., Excel, business process modeling software).
- Access to the business problem statement and relevant data sources.
- Access to stakeholders or subject matter experts for consultation.

Experiment Steps:

1. **Problem Identification:**
   - Review the provided business problem statement and clarify any ambiguities with stakeholders or subject matter experts.
   - Clearly define the problem scope, objectives, and constraints.
2. **Stakeholder Analysis:**
   - Identify and analyze stakeholders involved in or affected by the problem.
   - Determine their needs, expectations, and influence on the project.
3. **Business Process Analysis:**
   - Map out the current business processes related to the problem using process modeling techniques (e.g., BPMN).
   - Identify inefficiencies, bottlenecks, and areas for improvement in the existing processes.
4. **Requirements Gathering:**
   - Conduct interviews, surveys, or workshops with stakeholders to gather requirements for the solution.
   - Document functional and non-functional requirements, prioritizing them based on importance and feasibility.
5. **Data Analysis:**
   - Analyze relevant data sources to gain insights into the problem and potential solutions.
   - Use data visualization and statistical analysis techniques to identify trends, correlations, and patterns.
6. **Solution Design:**
   - Develop a solution design that addresses the identified requirements and aligns with the business goals.
   - Consider alternative solutions and evaluate their feasibility, risks, and benefits.



7. **Prototyping and Validation:**
   - Create prototypes or mockups of the proposed solution to validate its functionality and usability.
   - Gather feedback from stakeholders and iterate on the design based on their input.
8. **Documentation:**
   - Document the entire BA process, including problem analysis, stakeholder analysis, requirements, solution design, and validation results.
   - Ensure that the documentation is clear, concise, and organized for easy reference.

Solution:

1. **Problem Identification:**
   - Review the problem statement provided by the client, which involves optimizing the inventory management process for a retail business to reduce costs and improve efficiency.
2. **Stakeholder Analysis:**
   - Identify stakeholders including retail managers, warehouse staff, procurement team, and IT department.
   - Analyze their needs, with retail managers prioritizing inventory accuracy, warehouse staff focusing on operational efficiency, and procurement team emphasizing cost reduction.
3. **Business Process Analysis:**
   - Map out the current inventory management process, from procurement to sales, using BPMN diagrams.
   - Identify bottlenecks such as manual data entry, lack of real-time visibility, and overstocking.
4. **Requirements Gathering:**
   - Conduct interviews with stakeholders to gather requirements, including the need for real-time inventory tracking, automated reorder alerts, and integration with POS systems.
   - Prioritize requirements based on stakeholder feedback and business impact.
5. **Data Analysis:**
   - Analyze historical sales data and inventory records to identify trends, seasonality, and stock turnover rates.
   - Use data visualization tools to create charts and graphs illustrating inventory levels, sales trends, and stockouts.
6. **Solution Design:**
   - Develop a solution that includes implementing an Inventory Management System (IMS) with real-time tracking, barcode scanning, and automated reorder functionality.
   - Integrate the IMS with existing ERP and POS systems for seamless data exchange.
   - Design user-friendly interfaces for retail managers and warehouse staff to access inventory information and generate reports.
7. **Prototyping and Validation:**
   - Create prototypes of the IMS interfaces and workflow diagrams to validate the solution with stakeholders.
   - Conduct usability testing sessions to gather feedback on the prototypes and iterate on the design based on user input.

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8. **Documentation:**

- Document the entire BA process, including problem analysis, stakeholder analysis, requirements documentation, solution design, and validation results.
- Provide detailed specifications and user manuals for the IMS implementation team.
- Maintain clear communication channels with stakeholders throughout the project lifecycle.

Example: Optimizing Inventory Management for a Retail Business

Problem Statement:

ABC Retail is experiencing challenges with inventory management, leading to stockouts, overstocking, and increased costs. The current manual inventory tracking system is inefficient and prone to errors. The retail managers lack real-time visibility into inventory levels and struggle to make data-driven decisions. The objective is to implement a solution that improves inventory accuracy, reduces costs, and enhances operational efficiency.

Outcome:

By implementing the proposed solution, ABC Retail successfully optimizes its inventory management processes. Retail managers gain real-time visibility into inventory levels, enabling them to make data-driven decisions and prevent stockouts. Automated reorder functionality reduces excess inventory and associated costs. The integration with existing systems streamlines operations and enhances overall efficiency, leading to improved customer satisfaction and profitability for ABC Retail

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