**High Impact Skills Development Program**

**in Artificial Intelligence, Data Science, and Blockchain**

**Module 3: Data Visualization**

Lab 4: Creating Interactive Dashboards with Tableau

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# Objective:

In this lab, you will learn to create interactive Tableau dashboards using parameters, filters, and calculated fields. You will also explore advanced techniques to enhance user experience and dashboard functionality.

# Materials Needed:

* Tableau Online

# Dataset:

* Superstore Dataset

# Lab Work:

## 1. Task 1: Loading and Connecting Data

* Open Tableau and Upload the Superstore Dataset
  + Connect to the Superstore dataset by selecting "Connect to Data" and choosing the Superstore-Dataset.xls file.
  + Ensure that all sheets (e.g., Orders, Returns) are loaded correctly into Tableau.
  + Review the imported data to verify its accuracy.
* Connect to the Orders Sheet
  + Select the "Orders" sheet for this exercise.
  + Review the available fields, such as Order ID, Product Name, Sales, and Profit, to familiarize yourself with the data structure.
  + This sheet will be the primary data source for creating visualizations.

## 2. Task 2: Creating Initial Visualizations

* Create a Scatter Plot for Sales vs. Profit
  + Build a scatter plot to analyze the relationship between Sales and Profit.
  + Add "Customer Segment" to the Detail shelf to differentiate data points by segment.
* Use Category for Color Encoding and Sub-Category for Labels
  + Enhance the scatter plot by adding color encoding and labels for the "Category" field and the "Sub-Category" field respectively.
* Create a Line Chart for Sales Over Time
  + Create a line chart to visualize sales trends over time.
  + Customize the chart by adjusting the granularity of the date (e.g., by year or quarter) and adding labels to significant data points.

## 3. Task 3: Creating and Applying Parameters

* Create a Parameter Named "Discount Percentage"
  + Introduce interactivity by creating a parameter for "Discount Percentage."
  + Go to the Data pane, right-click, and select "Create Parameter."
  + Name the parameter "Discount Percentage" and set the data type to "Float" with a range of 0% to 100%. This parameter will allow users to adjust the discount percentage dynamically.
* Create a Calculated Field Named "Discounted Sales"
  + Create a calculated field that applies the discount parameter to sales.
  + Right-click in the Data pane and select "Create Calculated Field."
  + Name the field "Discounted Sales" and use the formula ***[Sales] \* (1 - [Discount Percentage]/100)***. This calculated field will display sales values after applying the user-defined discount.
* Apply the Parameter to the Visualizations
  + Integrate the "Discount Percentage" parameter into your visualizations.
  + Replace the "Sales" field in a bar chart with the newly created "Discounted Sales" field. This will dynamically update the chart based on the discount percentage selected by the user.
  + Add a parameter control to the dashboard so users can easily adjust the discount value.

## 4. Task 4: Building and Customizing Dashboards

* Create a New Dashboard
  + Create a new dashboard to bring together your visualizations.
  + Click on the "New Dashboard" icon in the Tableau interface.
  + Name the dashboard and set the size to fit the target display (e.g., desktop or tablet). This will serve as the canvas where you will combine your scatter plot, line chart, and other visualizations.
* Add Scatter Plot and Line Chart to the Dashboard
  + Drag the scatter plot and line chart you created earlier onto the dashboard.
  + Arrange them side by side or stack them vertically, depending on the desired layout.
  + Ensure that both visualizations are clearly visible and well-positioned for easy interpretation.
* Add Titles and Arrange Visualizations
  + Add descriptive titles to each visualization to provide context for the viewers.
  + Double-click on the title area of each chart to edit the text.
  + Consider adding text boxes or images for additional context or branding.

## 5. Task 5: Adding Interactivity and Sharing Dashboards

* Create Filter Actions for the Dashboard
  + Enhance the dashboard’s interactivity by adding filter actions.
  + Set the scatter plot to filter the line chart based on the selected data point.
  + To do this, right-click on the scatter plot, select "Use as Filter," and configure the filter action to affect the line chart. This will allow users to explore data more dynamically by interacting with the visualizations.
* Test and Ensure Interactivity
  + Thoroughly test the dashboard to ensure that all interactive elements work as intended.
  + Click on different data points in the scatter plot to see if they correctly filter the line chart.
  + Adjust the discount parameter and observe how it affects the "Discounted Sales" values.
  + Make any necessary adjustments to improve the dashboard’s responsiveness.
* Save and Publish the Dashboard
  + Save your completed dashboard with appropriate names and publish it to Tableau Public for online access.

# Additional Resources for Self-Learning:

* [Make Your Dashboard Interactive - Create Dashboards with Tableau](https://openclassrooms.com/en/courses/5873606-create-dashboards-with-tableau/6702916-make-your-dashboard-interactive)
* [Interacting with Views - Tableau](https://help.tableau.com/current/reader/desktop/en-us/interact.htm)
* [Filter Data from Your Views - Tableau](https://help.tableau.com/current/pro/desktop/en-us/filtering.htm)
* [Sort Data in a Visualization - Tableau](https://help.tableau.com/current/pro/desktop/en-us/sortgroup_sorting_computed_howto.htm)
* [Actions - Tableau](https://help.tableau.com/current/pro/desktop/en-us/actions.htm)
* [Build Interactive Dashboard using Tableau (YouTube)](https://www.youtube.com/watch?v=J-KgHlcYv8M)