

Data Preparation & Visualization-Tableau – Basics

23MCT305 - Data Analytics in Automation System



What is Tableau?

Powerful data visualization and business intelligence tool

Purpose in Data Analytics

- Transform raw data into actionable insights
- Create interactive dashboards
- Enable data-driven decisions

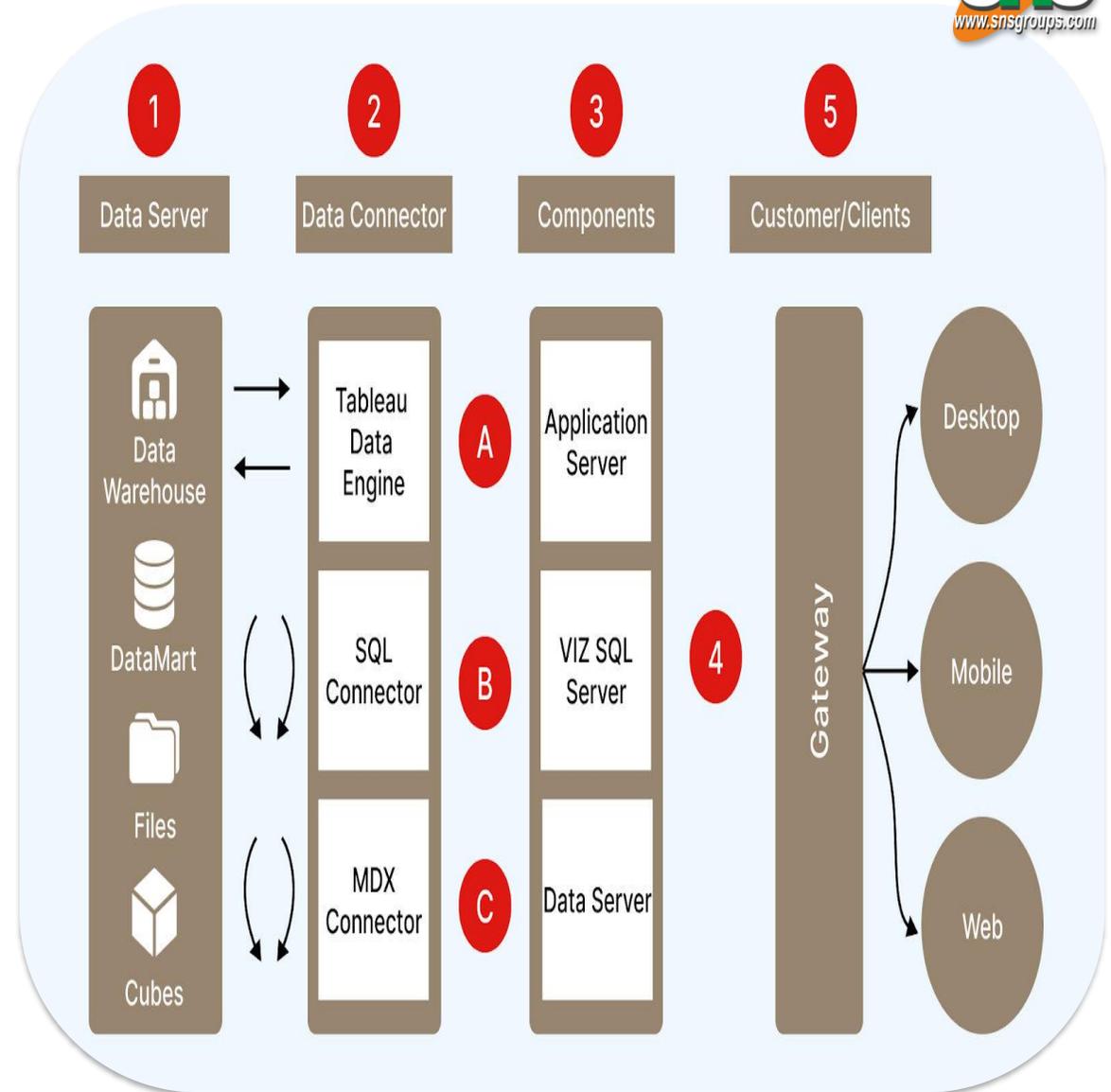
Key Features

- Interactive visualizations
- Drag-and-drop interface
- Real-time data analysis
- Connect to multiple data sources



Data Preparation Workflow

- 1 Connect to Data Sources
- 2 Import and Review Data
- 3 Clean and Transform Data
- 4 Create Data Models
- 5 Prepare for Visualization

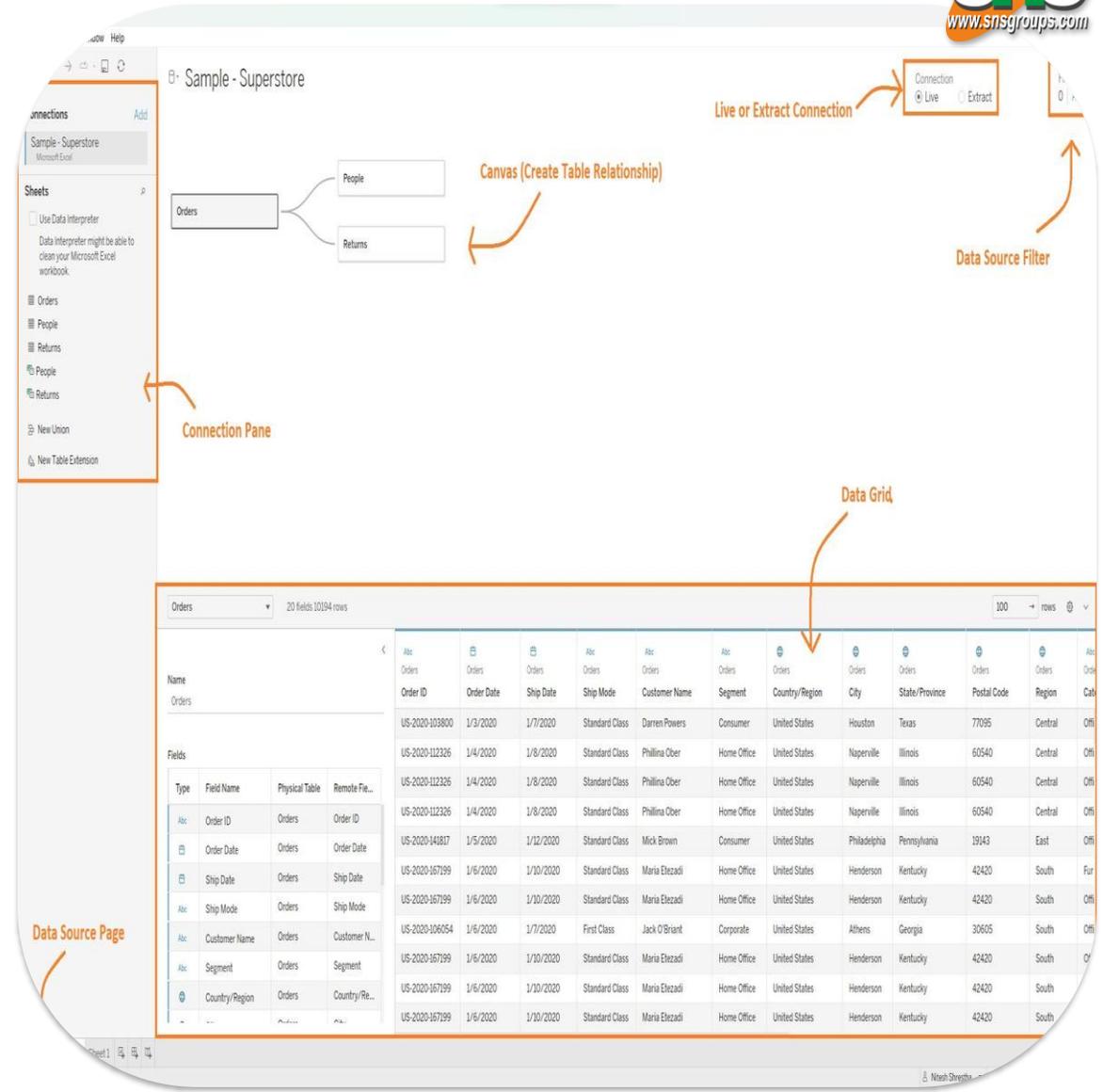


Supported Data Sources

- Excel Files (.xlsx, .xls)
- SQL Databases (MySQL, PostgreSQL)
- Cloud Data Sources (Google Sheets, AWS, Azure)
- CSV and Text Files

Connection Types

- Live Connection - Direct data access
- Extract Connection - Data snapshot



The screenshot shows the Tableau interface for a 'Sample - Superstore' connection. On the left, the 'Connections' pane shows 'Sample - Superstore' selected. Below it, the 'Sheets' pane lists 'Orders', 'People', 'Returns', 'New Union', and 'New Table Extension'. The main canvas displays a relationship diagram with 'Orders' connected to 'People' and 'Returns'. A 'Live or Extract Connection' dialog is open, showing 'Live' selected. A 'Data Source Filter' is also visible. The 'Data Grid' shows a table of data for the 'Orders' table, with columns for Order ID, Order Date, Ship Date, Ship Mode, Customer Name, Segment, Country/Region, City, State/Province, Postal Code, Region, and Category. The 'Data Source Page' is also visible at the bottom.

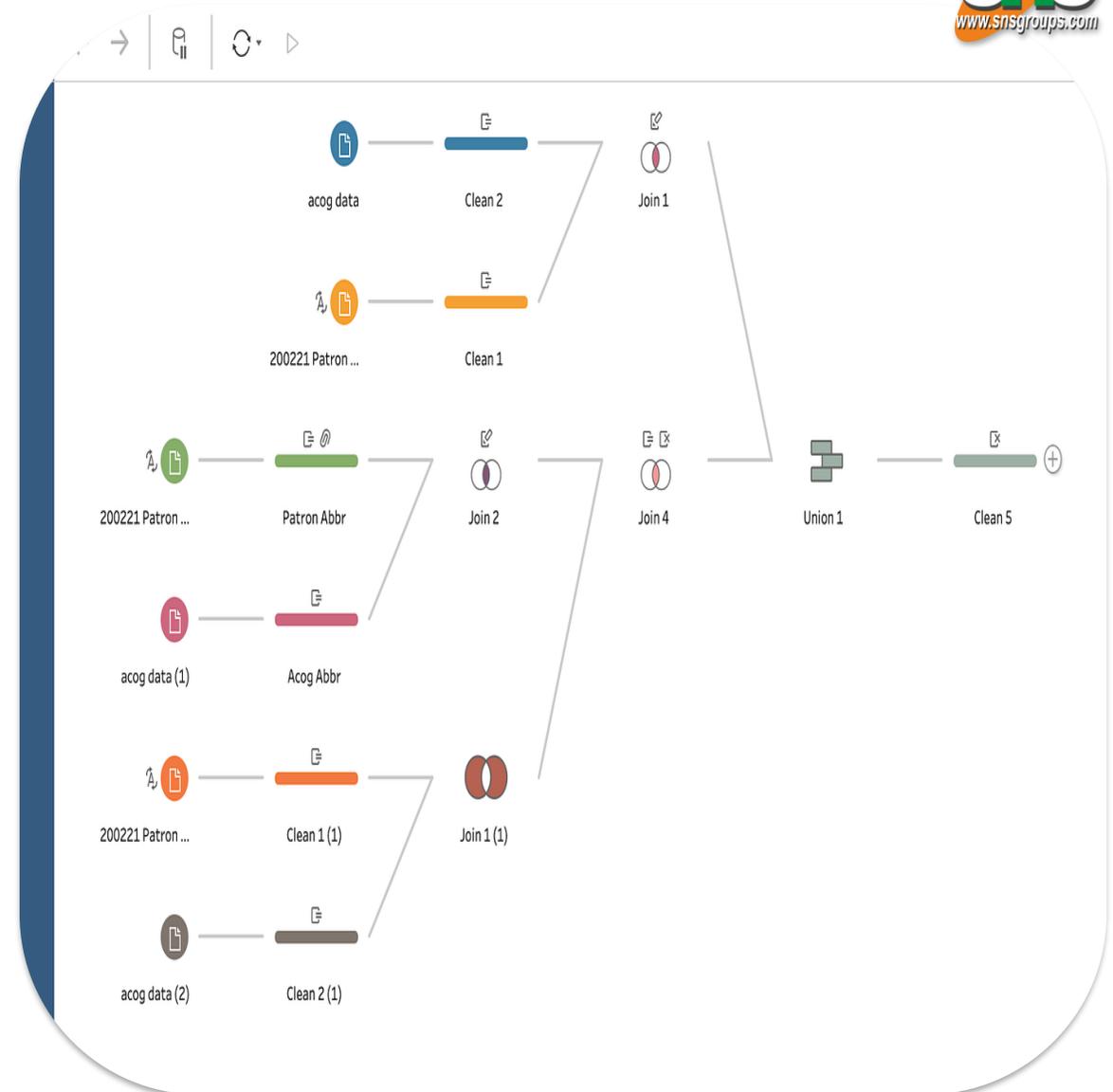
Order ID	Order Date	Ship Date	Ship Mode	Customer Name	Segment	Country/Region	City	State/Province	Postal Code	Region	Category
US-2020-103800	1/3/2020	1/7/2020	Standard Class	Darren Powers	Consumer	United States	Houston	Texas	77095	Central	Office
US-2020-112326	1/4/2020	1/8/2020	Standard Class	Phillina Ober	Home Office	United States	Naperville	Illinois	60540	Central	Office
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US-2020-148817	1/5/2020	1/12/2020	Standard Class	Mick Brown	Consumer	United States	Philadelphia	Pennsylvania	19143	East	Office
US-2020-167199	1/6/2020	1/10/2020	Standard Class	Maria Elezadi	Home Office	United States	Henderson	Kentucky	42420	South	Furniture
US-2020-167199	1/6/2020	1/10/2020	Standard Class	Maria Elezadi	Home Office	United States	Henderson	Kentucky	42420	South	Office
US-2020-106054	1/6/2020	1/7/2020	First Class	Jack O'Brian	Corporate	United States	Athens	Georgia	30605	South	Office
US-2020-167199	1/6/2020	1/10/2020	Standard Class	Maria Elezadi	Home Office	United States	Henderson	Kentucky	42420	South	Office
US-2020-167199	1/6/2020	1/10/2020	Standard Class	Maria Elezadi	Home Office	United States	Henderson	Kentucky	42420	South	Office
US-2020-167199	1/6/2020	1/10/2020	Standard Class	Maria Elezadi	Home Office	United States	Henderson	Kentucky	42420	South	Office

Common Issues & Solutions

- Handle Missing Values
- Remove Duplicates
- Standardize Data Formats
- Filter Outliers
- Data Type Corrections

Best Practices

- Validate data quality
- Document changes
- Test transformations



Key Principles

 Choose Appropriate Chart Type

 Keep It Simple and Clear

 Use Colors Effectively

 Add Labels and Legends

 Tell a Story with Data

 Make It Interactive

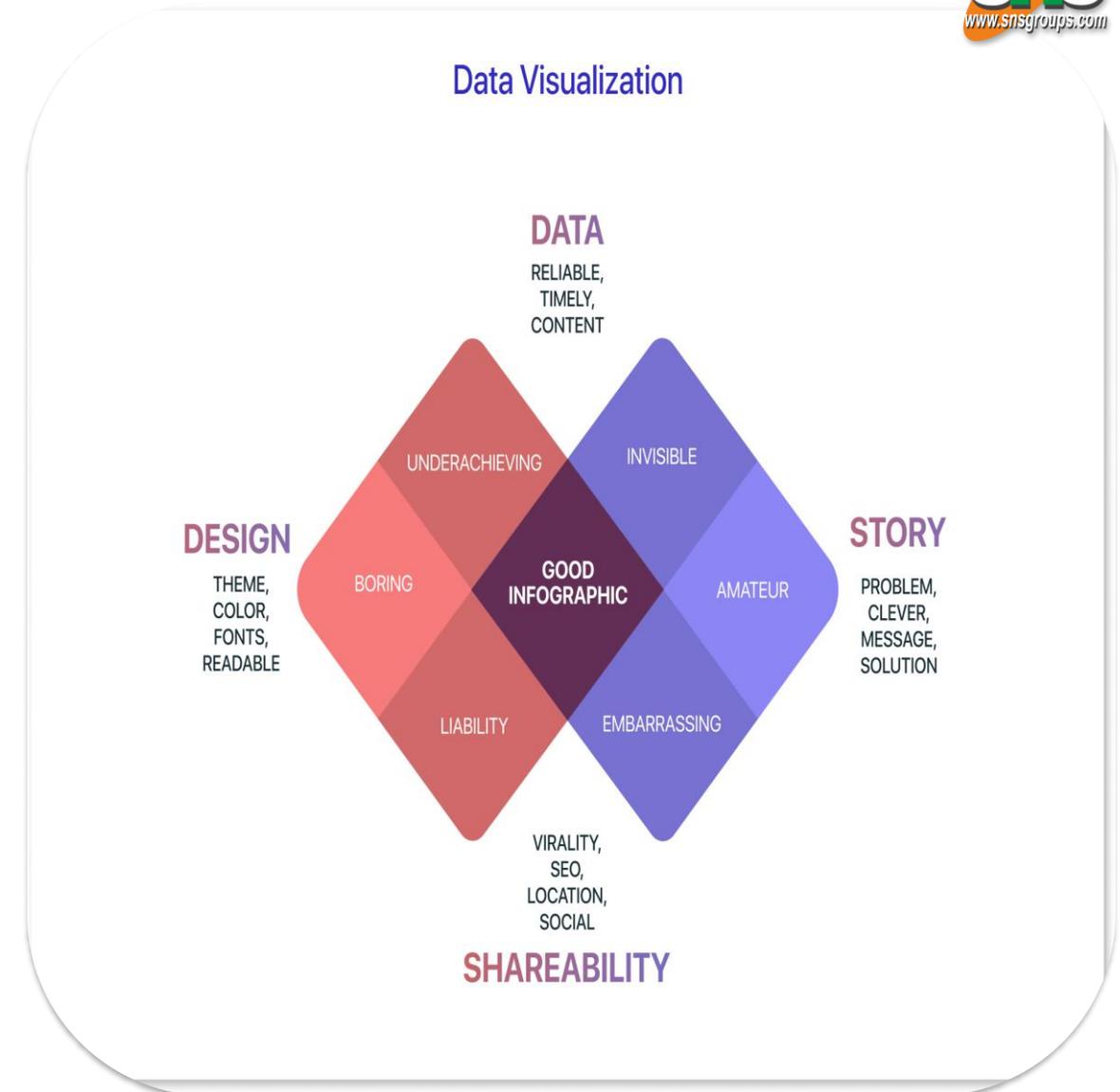


Chart Types & Use Cases

-  Bar Charts - Comparing categories
-  Line Charts - Trends over time
-  Pie Charts - Proportions and percentages
-  Scatter Plots - Relationships between variables
-  Maps - Geographical data
-  Heat Maps - Density and patterns



Dashboard Best Practices

-  Combine Multiple Visualizations
-  Use Filters and Parameters
-  Add Interactivity
-  Maintain Consistent Design
-  Highlight Key Insights
-  Optimize for Audience



Tableau Concepts Mind Map (GenAI-generated)

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Data Preparation

- Connect to data sources
- Clean and transform data
- Ensure data quality

Data Visualization

- Choose appropriate charts
- Apply design principles
- Create compelling stories

Tableau Features

- Interactive dashboards
- Real-time data analysis
- Multiple data source connections

Key Takeaways

- Data connection fundamentals
- Effective cleaning techniques
- Visualization best practices
- Dashboard creation skills