

Strategic product placement analysis: unveiling sales impact with tableau visualization

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TEAM GROUP



Strategic Product Placement Analysis: Unveiling Sales Impact with Tableau Visualization

This project aims to investigate the relationship between product positioning, sales performance, and consumer behavior. Using Tableau, we will analyze data to uncover insights into how different positioning strategies impact sales and consumer preferences. By visualizing the data, we aim to provide actionable recommendations to optimize product positioning strategies and drive revenue growth.

A retail company wants to understand the impact of product positioning on its sales and consumer behavior. They have collected data on sales figures, product placement, and consumer demographics. They seek insights into which product positioning strategies are most effective in driving sales and how they can tailor their marketing efforts accordingly. Through data visualization with Tableau, the company hopes to gain actionable insights to improve its product positioning strategies and increase revenue.

Scenario 1. Film and Television Production Companies:
Production companies can utilize strategic product placement analysis to optimize revenue generation through partnerships with brands. By employing Tableau visualization, they can analyze the effectiveness of product placements in different scenes or episodes. This analysis can help them negotiate better deals with brands, understand audience engagement with specific products, and make data-driven decisions on future placement opportunities.

Scenario 2. Retail and Consumer Goods Companies: Retailers and consumer goods companies can leverage strategic product placement analysis to enhance their marketing strategies and boost sales. By using Tableau visualization, they can track the performance of products placed in various locations within their stores or on their websites. They can identify high-traffic areas, understand customer preferences, and optimize product placement to increase visibility and drive conversions.

Scenario 3. Advertising Agencies: Advertising agencies can benefit from strategic product placement analysis to provide valuable insights to their clients and optimize advertising campaigns. By utilizing Tableau visualization, they can analyze the impact of product placements in different media channels such as movies, TV shows, or online videos. This analysis can help them demonstrate the ROI of product placement initiatives, refine targeting strategies, and improve campaign effectiveness for their clients.

Technical Architecture

Technical Architecture:



Project Flow

To accomplish this, we have to complete all the activities listed below,

- ? Data Collection & Extraction from Database
 - o Collect the dataset
 - o Connect data with Tableau
- ? Data Preparation
 - o Prepare the Data for Visualization
- ? Data Visualizations
 - o No of Unique Visualizations
- ? Dashboard
 - o Responsive and Design of Dashboard
- ? Story
 - o No of Scenes of Story
- ? Performance Testing
 - o Utilization of Data Filters
 - o No of Calculation Fields
 - o No of Visualizations/ Graphs
- ? Web Integration
 - o Dashboard and Story embed with UI With Flask
- ? Project Demonstration & Documentation
 - o Record explanation Video for project end-to-end solution
 - o Project Documentation-Step step-by-step project development procedure

Data Collection and Extraction of Data

Data collection is the process of gathering and measuring information on variables of interest, in an established systematic fashion that enables one to answer stated research questions, test hypotheses, and evaluate outcomes, and generate insights from the data.

Collect the dataset

Please use the link to download the dataset:

<https://www.kaggle.com/datasets/amitvkulkarni/impact-of-product-positioning-on-sales>

Understanding the Data

The dataset includes information on sales data, product positioning, and consumer behavior metrics. It contains variables such as product placement (endcap, aisle, shelf), sales revenue, customer demographics, product attributes, and promotional activities. The dataset covers a range of products and periods, allowing for a comprehensive analysis of the impact of product positioning on sales and consumer behavior.

1. Product ID: A unique identifier assigned to each product in the dataset.
2. Product Position: The relative placement or ranking of the product within its category(endcap, aisle, shelf)of the market.
3. Price: The selling price of the product.
4. Competitor's Price: The price at which competitors are selling a similar product.
5. Promotion: Any special offers, discounts, or promotions associated with the product.
6. Foot Traffic: The volume of people passing by or visiting the location where the product is sold.
7. Consumer Demographics: Characteristics and traits of the target audience (Families, Seniors, Young adults,

- and College students) or consumers purchasing the product.
8. Product Category: The broad category or type of product to which it belongs.
 9. Seasonal: Indicates whether the product is seasonal or not seasonal.
 10. Sales Volume: The quantity of units sold for the product over a specific period.

Connecting the dataset with Tableau

To visualize the dataset in Tableau, import the dataset file into Tableau Desktop. Then, link the relevant columns to Tableau's data fields to create visualizations and analyze the data effectively.

Reference Video:

https://drive.google.com/file/d/1cS7Ork8XG7c_RjdmMW_EwZqQj6cwgn9x/view?usp=sharing

Data Preparation

Preparing data for visualization is a crucial step in the data analysis pipeline, involving various tasks to ensure the quality and usability of the dataset. Initially, cleaning the data is essential, which entails identifying and removing irrelevant or missing data points that could skew the analysis.

Transforming the data into a format conducive to visualization involves organizing it in a structured manner, standardizing units of measurement, and converting categorical variables into numerical ones where necessary.

Prepare the Data for Visualization

Exploring the data is another vital aspect of preparation, where analysts delve into the dataset to uncover underlying patterns, trends, and relationships among variables. This exploration aids in determining which aspects of the data are most relevant for visualization and analysis. Filtering the data allows analysts to focus on specific subsets or segments of the dataset, refining the scope of analysis and visualization to address particular questions or objectives.

Once the data is cleaned, transformed, explored, and filtered, it is prepared for integration into visualization software such as Tableau. This involves formatting the data according to the requirements of the software and ensuring compatibility with the chosen visualization techniques. Additionally, ensuring the accuracy and completeness of the data is paramount throughout the preparation process, as any inaccuracies or omissions could lead to erroneous conclusions during analysis.

Data Visualization

- Data visualization is the process of creating graphical representations of data in order to help people understand and explore the information. The goal of data visualization is to make complex data sets more accessible, intuitive, and easier to interpret. By using visual elements such as charts, graphs, and maps, data visualizations can help people quickly identify patterns, trends, and outliers in the data.

No of Unique Visualizations

The number of unique visualizations that can be created with a given dataset. Some common types of visualizations that can be used to analyze the performance and efficiency of Product Placement include bar charts, Stacked Bar charts, heat maps, Donut charts, Bubble charts, pie charts, etc. These visualizations can be used to compare performance, track changes over time, and show distribution, and

relationships between variables, such as revenue and customer demographics, Competitors' price, Product Category, Product Position, Season, and Promotion.

Activity 1.1: Avg Sales Volume vs Product Category

Explanation Video Link:

https://drive.google.com/file/d/1U7VKPbMDP1aTYd1KLdk284DZGPgJXkQF/view?usp=drive_link

Activity 1.2: Competitor Price Vs Price

Explanation Video Link:

https://drive.google.com/file/d/1mzcXYd1Sv3WXWnt8fzqkpC5c9M3MPM/view?usp=drive_link

Activity 1.3: Avg Sales Volume by Product Category by Product Position

Explanation Video Link:

https://drive.google.com/file/d/1HBeHTh_XHriqfFR7dsJTP-iTPuEyS9fV/view?usp=drive_link

Activity 1.4: Consumer Demographics vs Sales Volume

Explanation Video Link:

https://drive.google.com/file/d/1laY_qirn7JN1kTGs3bVKEpl1085pYHmr/view?usp=drive_link

Activity 1.5: Product Category vs Price

Explanation Video Link:

https://drive.google.com/file/d/1-BUwN1kuJguZ6eQV6vvT6g9ysZxYx4cY/view?usp=drive_link

Activity 1.6: Avg Sales Volume by Product Category by Season

Explanation Video Link:

https://drive.google.com/file/d/12E_h12OOvQuHBoknh19e8MIBvLKs8ySq/view?usp=drive_link

Activity 1.7: Foot Traffic by Avg Sales Volume

Explanation Video Link:

https://drive.google.com/file/d/17PbnYEKHEfuzOFBLhp9pTz9UkhYoZd1S/view?usp=drive_link

Activity 1.8: Promotion of Product Category on Price and Sales Volume

Explanation Video Link:

https://drive.google.com/file/d/1N-BwMnpXj87BrH86GpBwn5W_z8MxWEaV/view?usp=drive_link

Dashboard

A dashboard is a graphical user interface (GUI) that displays information and data in an organized, easy-to-read format. Dashboards are often used to provide real-time monitoring and analysis of data and are typically designed for a specific purpose or use case. Dashboards can be used in a variety of settings, such as business, finance, manufacturing, healthcare, and many other industries. They can be used to track key performance indicators (KPIs), monitor performance metrics, and display data in charts, graphs, and tables.

Responsive and Design of Dashboard

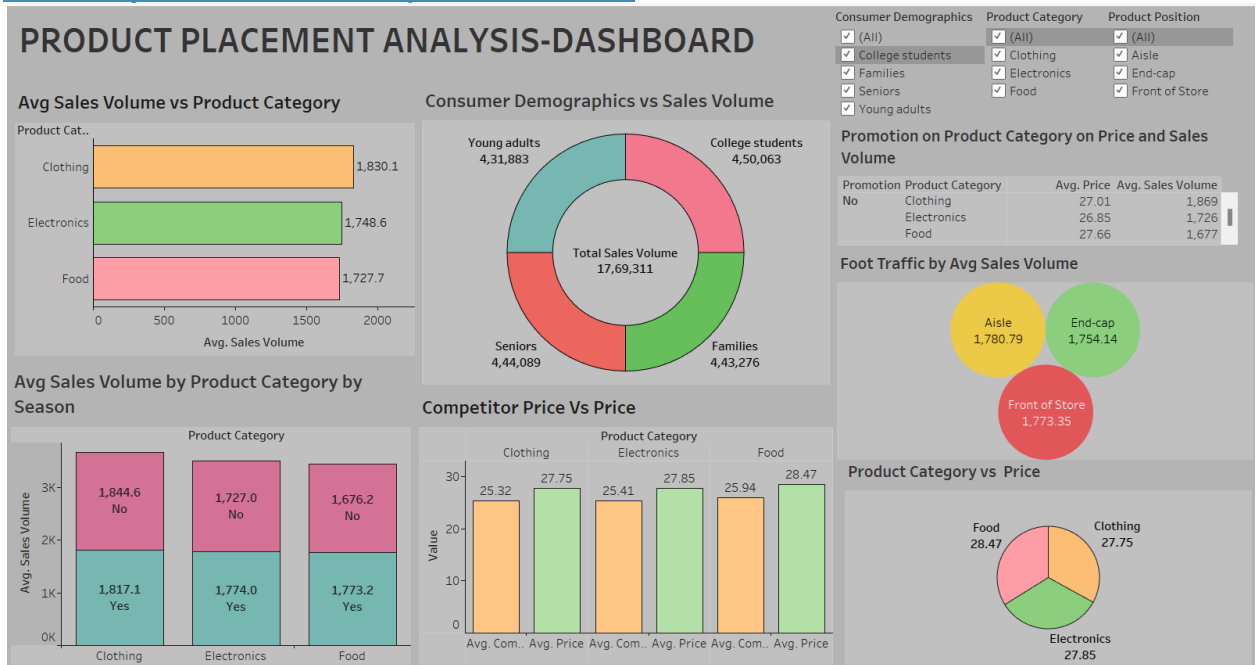
The responsiveness and design of a dashboard for analyzing the performance and efficiency of Product Placement is crucial to ensure that the information is easily understandable and actionable. Key considerations for designing a responsive and effective dashboard include user-centered design, clear and concise information, interactivity, data-driven approach, accessibility, customization, and security. The goal is to create a dashboard that is user-friendly, interactive, and data-driven,

providing actionable insights to improve the performance and efficiency of Product Placement Analysis.

Once you have created views on different sheets in Tableau, you can pull them into a dashboard.

Explanation Video Link:

https://drive.google.com/file/d/1u67ecEyQz7XswgekZnpdHA_E5sEhy79rS/view?usp=drive_link



Responsive and Design of Dashboard

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https://drive.google.com/file/d/1u67ecEyQz7XswgekZnpdHA_E5sEhy79rS/view?usp=drive_link

Story

A data story is a way of presenting data and analysis in a narrative format, intending to make the information more engaging and easier to understand. A data story typically includes a clear introduction that sets the stage and explains the context for the data, a body that presents the data and analysis logically and systematically, and a conclusion that summarizes the key findings and highlights their implications. Data stories can be told using a variety of mediums, such as reports, presentations, interactive visualizations, and videos.

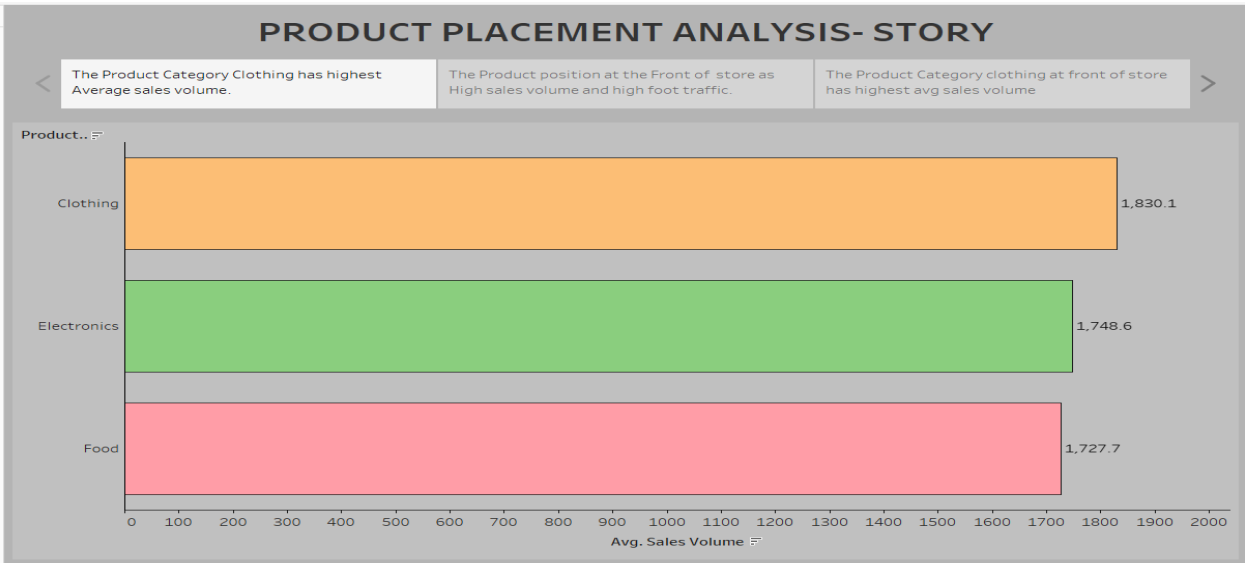
No of Scenes of Story

The number of scenes in a storyboard for a data visualization analysis of the performance and efficiency of Product Placement will depend on the complexity of the analysis and the specific insights that are trying to be conveyed. A storyboard is a visual representation of the data analysis process and it breaks down the analysis into a series of steps or scenes.

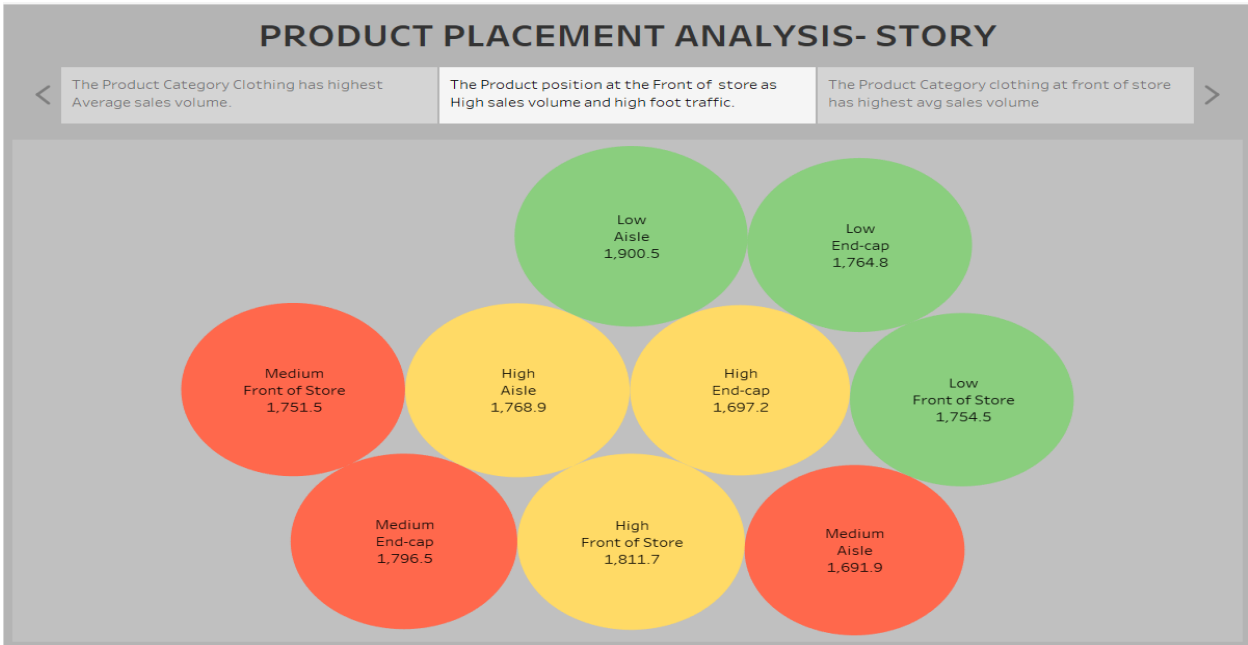
Explanation Video Link:

https://drive.google.com/file/d/15Q105EwhPRdJiEuYl6q9l7lxqZk8HYWo/view?usp=drive_link

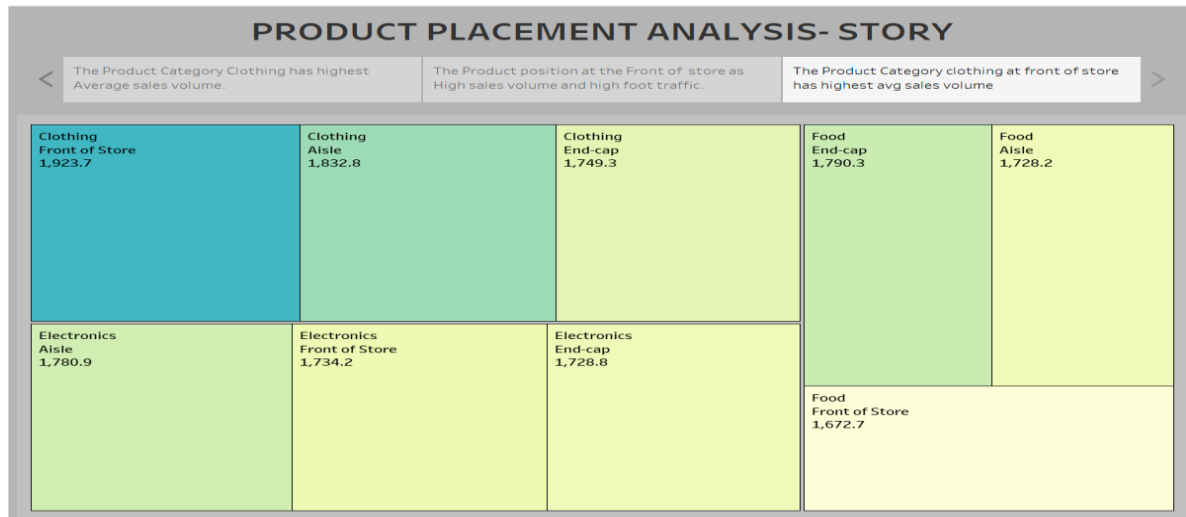
STORY SCENE-1



STORY SCENE-2



STORY SCENE-3



Performance Testing

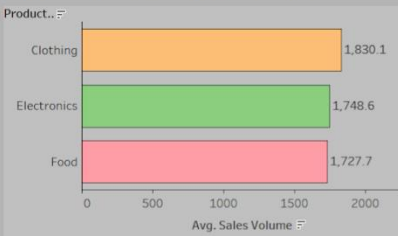
Performance testing is a crucial aspect of software development aimed at evaluating the speed, responsiveness, stability, and scalability of an application under various workload conditions. It involves simulating real-world usage scenarios to assess how the system behaves and performs under stress, peak loads, or normal conditions.

Utilization of Filters

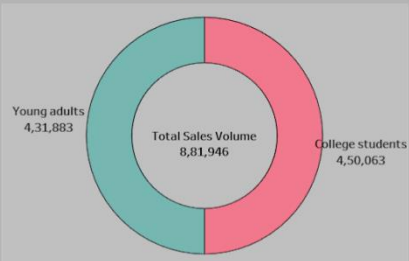
1. Filters are an indispensable tool in data analysis and visualization, allowing users to refine and focus on specific subsets of data that are relevant to their analysis objectives.

PRODUCT PLACEMENT ANALYSIS-DASHBOARD

Avg Sales Volume vs Product Category



Consumer Demographics vs Sales Volume



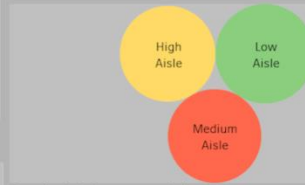
Product Category: ☐ (All) ☒ Clothing ☐ Electronics ☐ Food

Product Position: ☐ (All) ☒ Aisle ☐ End-cap ☐ Front of Store

Consumer Demograp..: ☐ (All) ☒ College students ☐ Families ☐ Seniors ☒ Young adults

Promotion	Product Category	Avg. Price	Avg. Sales Volume
No	Clothing	27.01	1,869
No	Electronics	26.85	1,726
No	Food	27.66	1,677
Yes	Clothing	28.68	1,781
Yes	Electronics	28.90	1,773
Yes	Food	29.34	1,782

Foot Traffic vs Product Position by Avg Sales Volume



Avg Sales Volume by Product Category by Season



Competitor Price Vs Price



Product Category vs Price

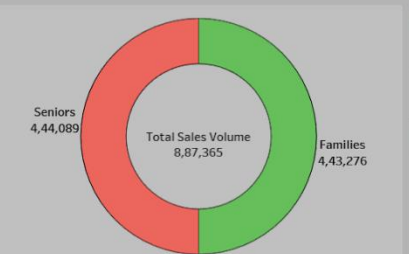


PRODUCT PLACEMENT ANALYSIS-DASHBOARD

Avg Sales Volume vs Product Category



Consumer Demographics vs Sales Volume



Product Category: ☐ (All) ☒ Clothing ☐ Electronics ☒ Food

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Foot Traffic vs Product Position by Avg Sales Volume



Avg Sales Volume by Product Category by Season



Competitor Price Vs Price



Product Category vs Price



No of Calculation Fields

- Price

- Competitors Price
- Sales Volume

No of Visualizations/ Graphs

Avg Sales Volume by Product Category

? Avg Sales Volume by Product Category on Sales

? Consumer Demographics vs Product Category

? Foot traffic vs Sales Volume

? Competitors Price vs Price.

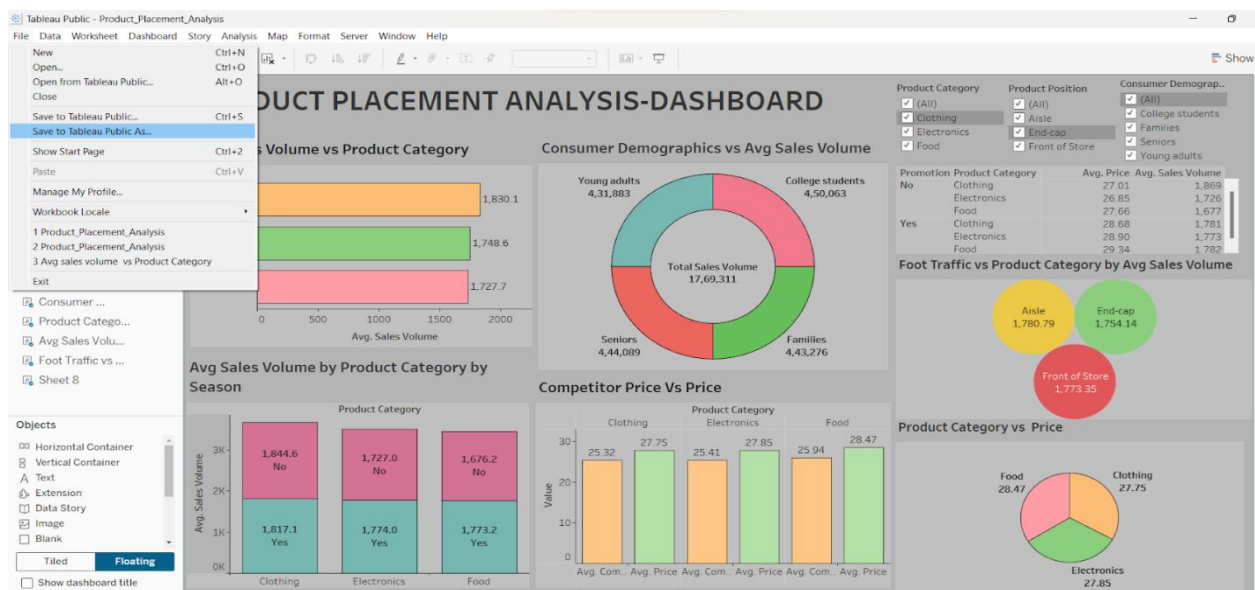
? Promotion of Product Category on Price and Sales Volume.

? Product Category vs Price

? Avg Sales Volume by Product Category by Product Position.

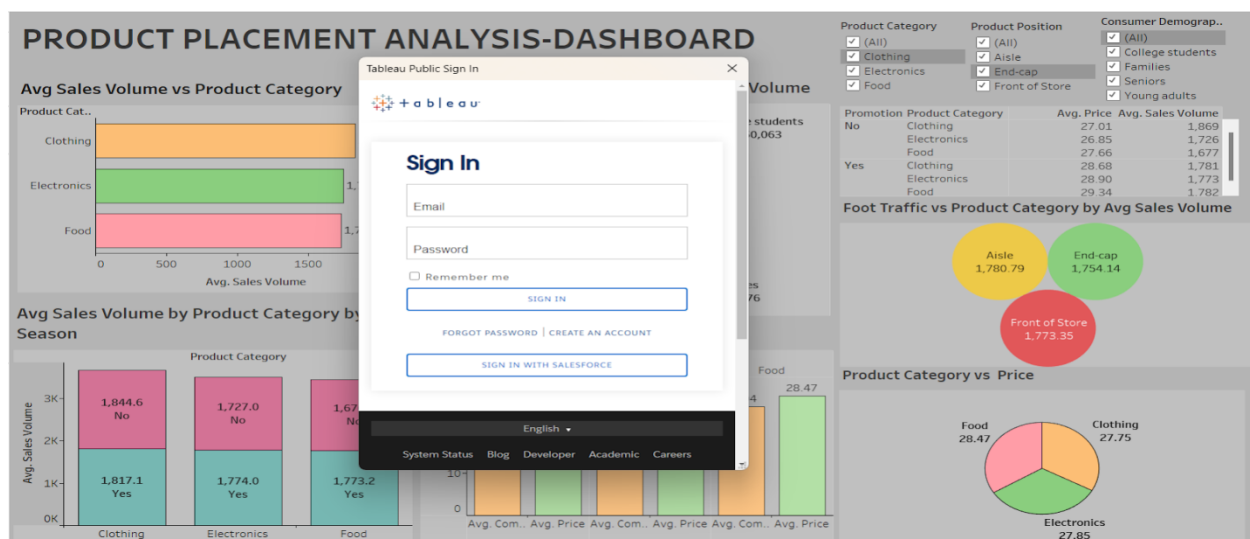
Web integration

Publishing helps us to track and monitor key performance metrics, to communicate results and progress. help a publisher stay informed, make better decisions, and communicate their performance to others.

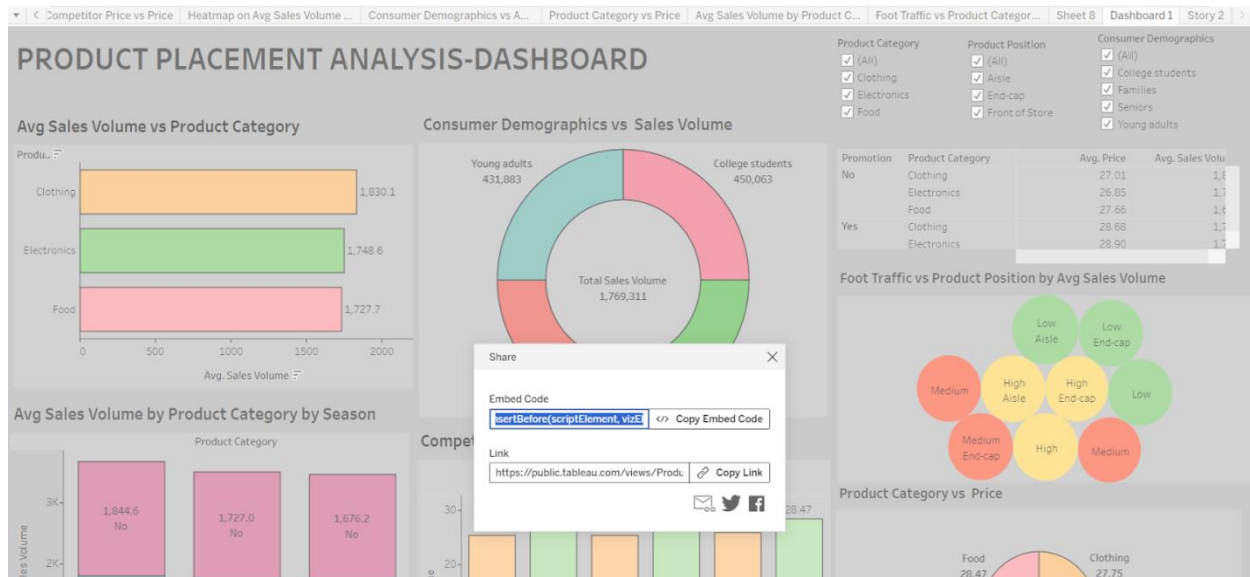


The above gives information on how to save and publish the dashboard to the tableau public.

- Click on “File” which is displayed on the left top corner of the dashboard sheet.
- Now click on the Save as Tableau Public As option and that will redirect to your sign-in account as shown below.

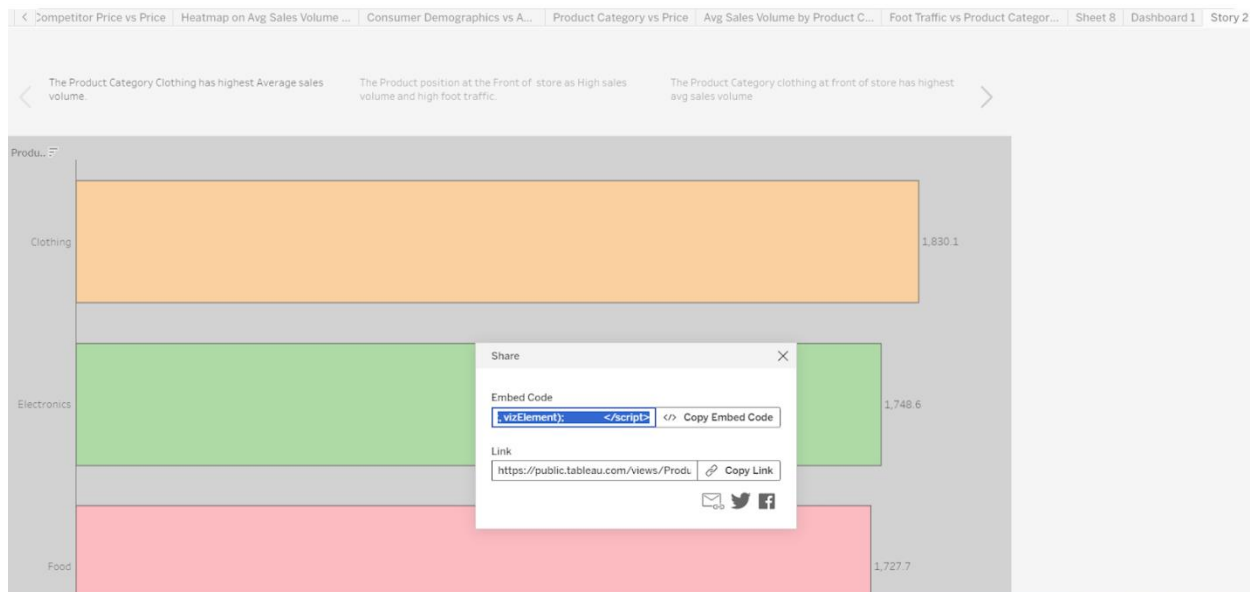


Now sign in to your Tableau public account and there your visualization, dashboard, and story are published. In this way, we can publish your dashboard and story into your tableau public.



After signing into your public account the workbook is displayed. Now click on “settings” and then it will display to show sheets are disabled so enable it so, that all your sheets are visible.

Now click on the dashboard sheet in the top right corner we have an option called share click on it then it will show like the above screenshot. Then, copy the embedded code and place the copied embedded code into your bootstrap template as shown in the reference video below.



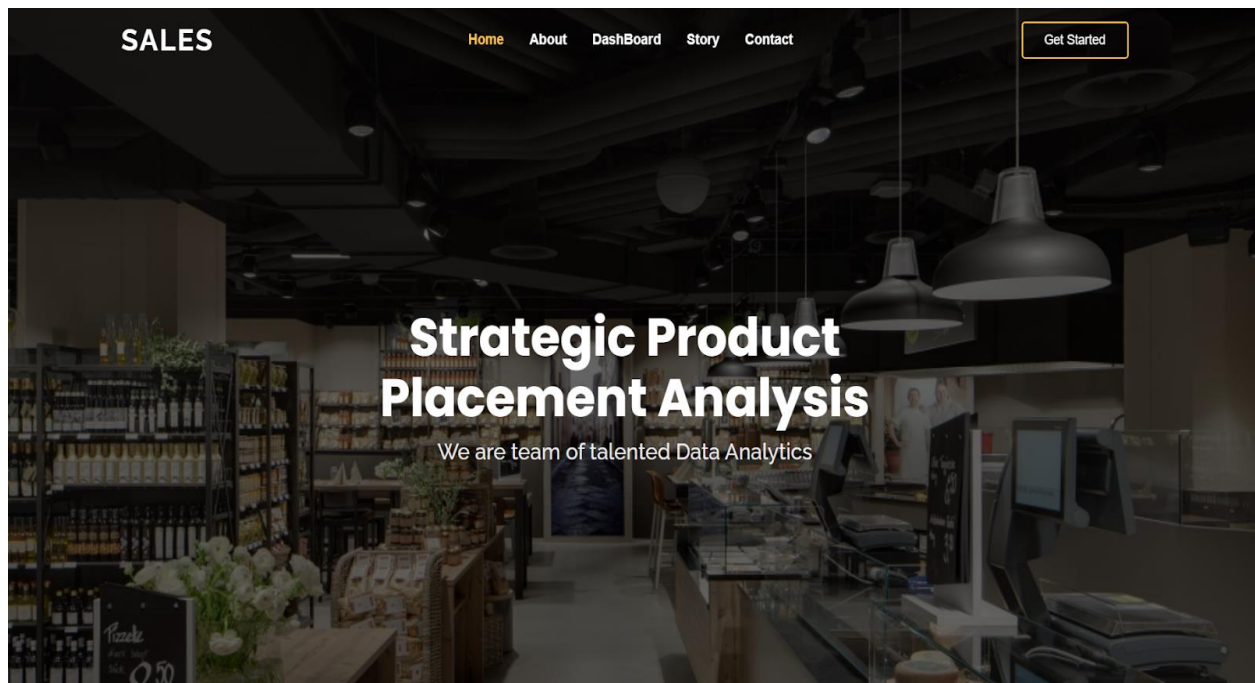
After copying the embedded code of the dashboard from Tableau Public and pasting it in the Bootstrap template then use the same procedure for the story also to copy the embedded code from the Tableau Public and paste it into the Bootstrap template.

Dashboard and Story embed with UI With Flask

Explanation Video Link:

[https://drive.google.com/file/d/1-](https://drive.google.com/file/d/1-ImErECS0qUz3dOHx901QKa5HXGTGkdl/view?usp=drive_link)

[ImErECS0qUz3dOHx901QKa5HXGTGkdl/view?usp=drive_link](https://drive.google.com/file/d/1-ImErECS0qUz3dOHx901QKa5HXGTGkdl/view?usp=drive_link)



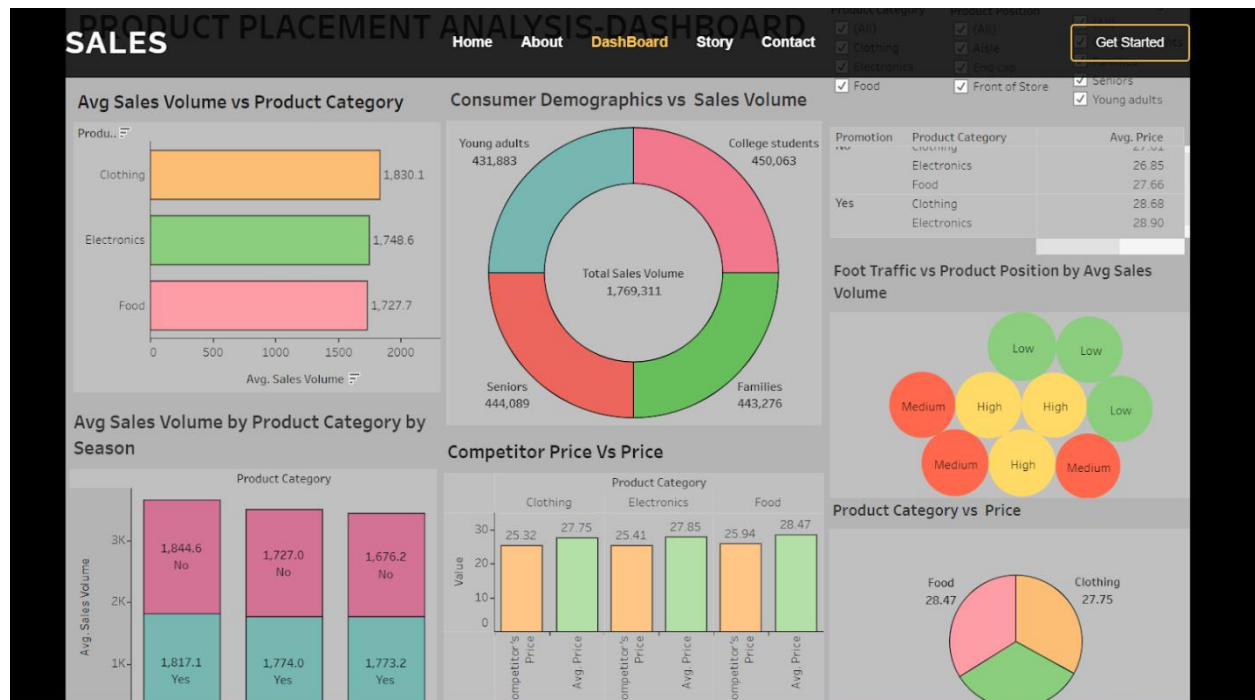
ABOUT

The Project Involves

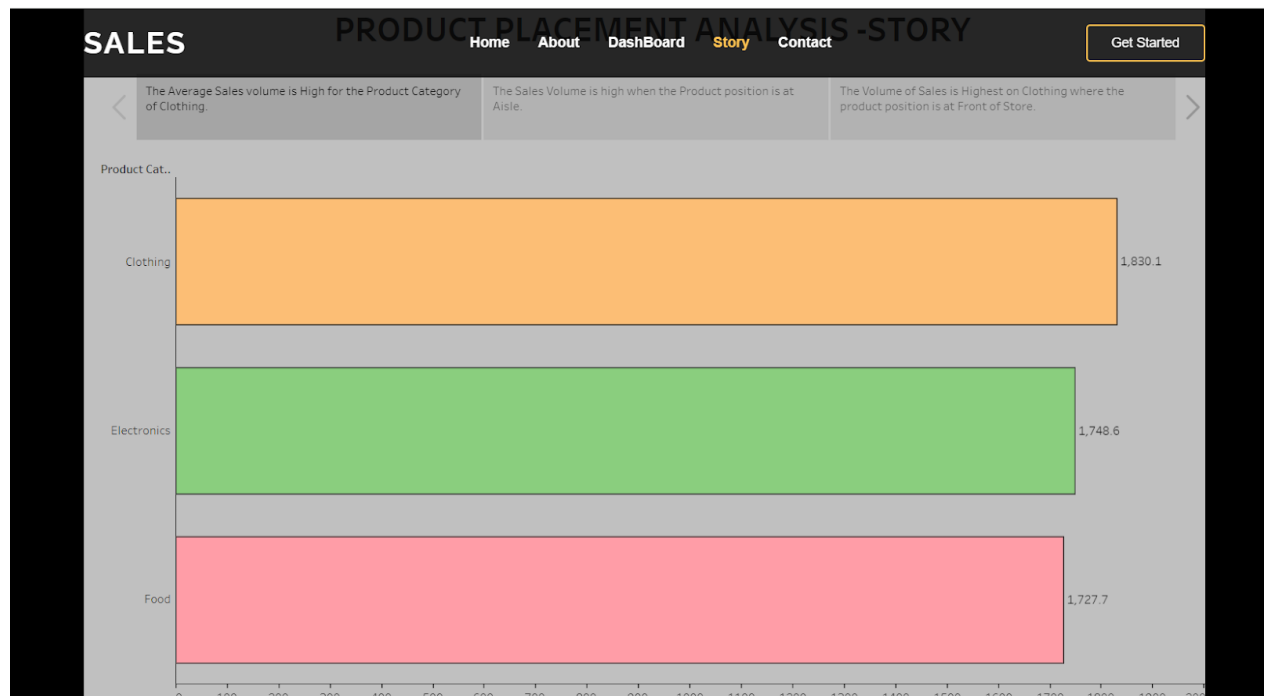
- ✔ Data collection is the process of gathering and measuring information on variables of interest, in an established systematic fashion that enables one to answer stated research questions, test hypothesis, and evaluate outcomes and generate insights from the data.
- ✔ Data preparation is the process of cleaning, transforming, and organizing data in order to make it suitable for analysis. It is an important step in the data analysis process, as the quality of the data used can have a significant impact on the accuracy and reliability of the results.
- ✔ Data visualization is the process of creating graphical representations of data in order to help people understand and explore the information. The goal of data visualization is to make complex data sets more accessible, intuitive, and easier to interpret. By using visual elements such as charts, graphs, and maps, data visualizations can help people quickly identify patterns, trends, and outliers in the data.



DASHBOARD



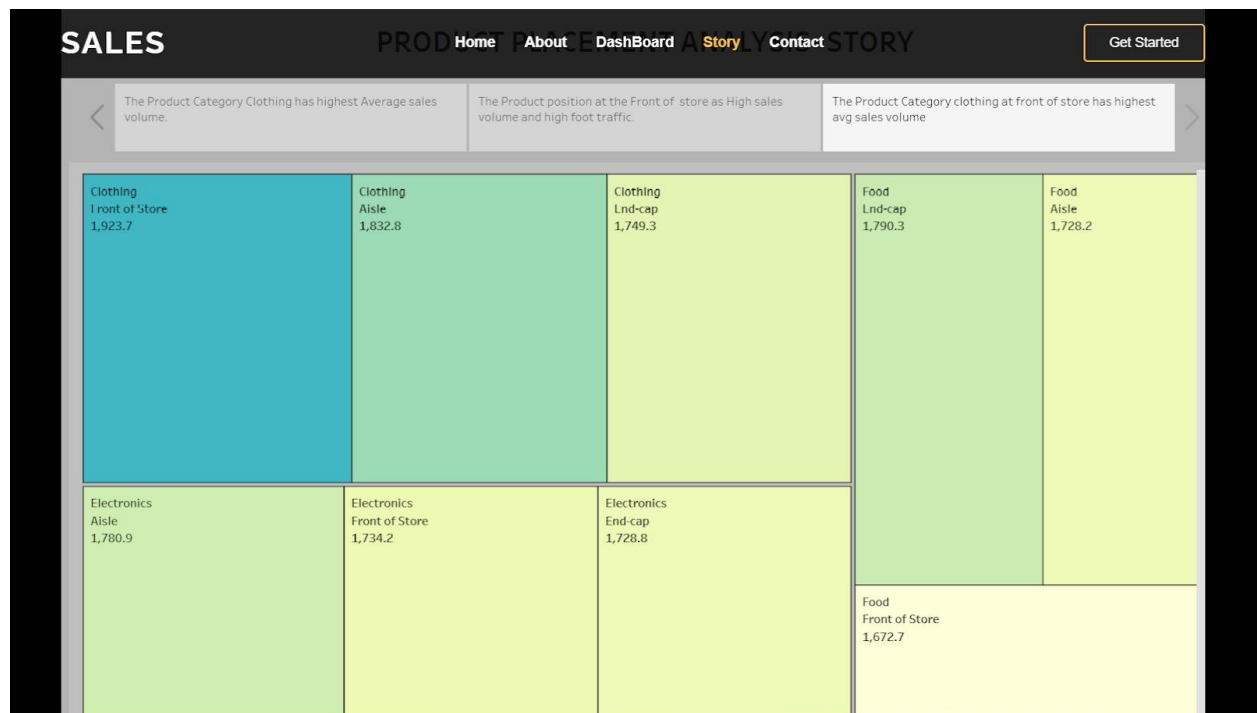
STORY SCENE-1



STORY SCENE-2



STORY SCENE-3



SALES Home About DashBoard Story **Contact** [Get Started](#)

CONTACT

CONTACT US

Location:
Gachibowli Circle, Gachibowli, Hyderabad, INDIA

Email:
businessstore@example.com

Call:
89554 48855

Your Name

Your Email

Subject

Message

[Send Message](#)

Project Demonstration & Documentation

The mentioned deliverables are to be submitted along with other deliverables

Record an explanation Video for the project end to end solution

Creating a record explanation video for a project's end-to-end solution is crucial for ensuring clarity and transparency in its implementation.

Project Documentation-Step by step project development procedure

Create a document as per the template provided

Clean Data from Excel, CSV, PDF, and Google Sheets with Data Interpreter

Applies to: Tableau Cloud, Tableau Desktop, Tableau Server

When you track data in Excel spreadsheets, you create them with the human interface in mind. To make your spreadsheets easy to read, you might include things like titles, stacked headers, notes, maybe empty rows and columns to add white space, and you probably have multiple tabs of data too.

When you want to analyze this data in Tableau, these aesthetically pleasing attributes make it very difficult for Tableau to interpret your data. That's where Data Interpreter can help.

Tip: Though Tableau's Excel add-in is no longer supported, Data Interpreter can help you reshape your data for analysis in Tableau.

What does Data Interpreter do?

Data Interpreter can give you a head start when cleaning your data. It can detect things like titles, notes, footers, empty cells, and so on and bypass them to identify the actual fields and values in your data set.

It can even detect additional tables and sub-tables so that you can work with a subset of your data independently of the other data.

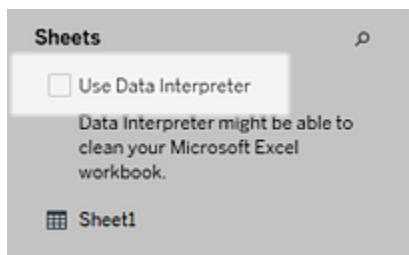
After Data Interpreter has done its magic, you can check its work to make sure it captured the data that you wanted and identified it correctly. Then, you can make any necessary adjustments.

After you select the data that you want to work with, you might also need to do some additional cleaning steps like pivoting your data, splitting fields, or adding filters to get the data in the shape you want before starting your analysis.

Note: If your data needs more cleaning than what Data Interpreter can help you with, try [Tableau Prep](#)([Link opens in a new window](#)).

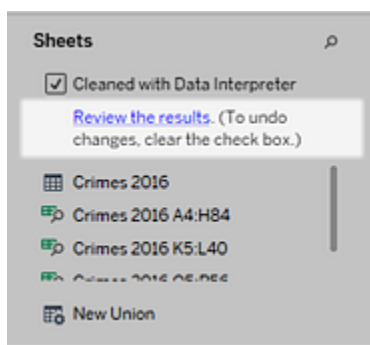
Turn on Data Interpreter and review results

1. From the **Connect** pane, connect to an Excel spreadsheet or other connector that supports Data Interpreter such as Text (.csv) files, PDF files or Google sheets.
2. Drag a table to the canvas (if needed), then on the **Data Source** page, in the left pane, select the **Use Data Interpreter** check box to see if Data Interpreter can help clean up your data.



Note: When you clean your data with Data Interpreter, Data Interpreter cleans all the data associated with a connection in the data source. Data Interpreter does not change the underlying data.

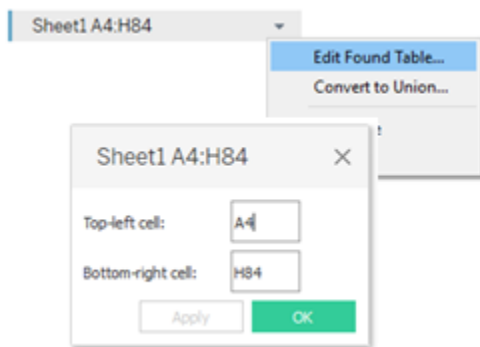
3. In the Data pane, click the **Review the results** link to review the results of the Data Interpreter.



A copy of your data source opens in Excel on the **Key for the Data Interpreter** tab. Review the key to find out how to read the results.

5. To replace the current table with any of the found tables, drag the current table off the canvas and then drag the found table that you want to use to the canvas.

If Data interpreter has misidentified the range of the found table, after you drag the found table to the canvas, click the drop-down arrow on that table, and then select **Edit Found Table** to adjust the corners of the found table (the top-left cell and bottom-right cell of the table).



6. After you have the data that you want to work with, you can apply any additional cleaning operations to your data so that you can analyze it.

Data Interpreter Example

In this example we are connecting to an Excel spreadsheet with violent crime data by city and state for the year 2016. This spreadsheet includes multiple tables on one sheet and some extra formatting.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q						
1	Violent Crimes in 2016 in the United States by City and State																						
2																							
3																							
4	Location		Months																				
5	city	state	Apr	Jun	Jul	Aug	Sep	Oct										state	Total Crimes 2016	State	Population 2016		
6	Albuquerque	New Mexico						46										Alabama	12	Alabama	4860545		
7	Anaheim	California			4													Alaska	26	Alaska	741522		
8	Anchorage	Alaska		1				26										Arizona	132	Arizona	6908642		
9	Arlington	Texas					17											California	515	Arkansas	2988231		
10	Atlanta	Georgia						85										Colorado	64	California	39296476		
11	Aurora	Colorado						16										D.C.	105	Colorado	5530105		
12	Austin	Texas					28											Florida	210	Connecticut	3587685		
13	Bakersfield	California			22													Georgia	85	Delaware	952698		
14	Baltimore	Maryland							230										Hawaii	9	District of Co	684336	
15	Boston	Massachusetts						28										Illinois	536	Florida	2065689		
16	Buffalo	New York						38										Indiana	151	Georgia	10313620		
17	Chandler	Arizona						3										Kansas	10	Hawaii	1428683		
18	Charlotte-M	North Carolina			25													Kentucky	95	Idaho	1680026		
19	Chicago	Illinois							536										Louisiana	127	Illinois	12835726	
20	Chula Vista	California		2				1										Maryland	230	Indiana	6634007		
21	Cincinnati	Ohio						50										Massachuset	28	Iowa	3130869		
22	Cleveland	Ohio						89										Michigan	221	Kansas	2907731		
23	Colorado Sp	Colorado					15											Minnesota	26	Kentucky	4436113		
24	Columbus	Ohio						70										Missouri	223	Louisiana	4686157		
25	Corpus Chris	Texas			9													Nebraska	25	Maine	1330232		
26	Dallas	Texas						118										Nevada	128	Maryland	6024752		
27	Denver	Colorado					33											New Jersey	86	Massachuset	6823721		
28	Detroit	Michigan							221										New Mexico	46	Michigan	9933445	
29	Durham	North Carolina		5						30										New York	290	Minnesota	5525050
30	El Paso	Texas						14										North Carolin	82	Mississippi	2985415		
31	Fort Wayne	Indiana						34										Ohio	217	Missouri	6091176		
32	Fort Worth	Texas		7				49										Oklahoma	82	Montana	1038656		
33	Fresno	California				19												Oregon	14	Nebraska	1907603		
34	Greensboro	North Carolina							20										Pennsylvania	259	Nevada	2939254	

A. Title

B. Merged header cells

C. Extra white space

D. Sub-tables

The extra formatting in this spreadsheet makes it difficult for Tableau to determine what the field headers and values are.

Instead, it reads the data vertically and assigns each column the default value F1, F2, F3 (Field 1, Field 2, Field 3) and so on. Blank cells are read as null values.

Crimes 2016 (crimes_2016)												
Connection: Live Extract												
Crimes 2016												
Sort fields: Data source order Show aliases Show hidden fields												
Abc Crimes 2016 F1	Abc Crimes 2016 F2	Abc Crimes 2016 F3	Abc Crimes 2016 F4	Abc Crimes 2016 F5	Abc Crimes 2016 F6	Abc Crimes 2016 F7	Abc Crimes 2016 F8	Abc Crimes 2016 F11	Abc Crimes 2016 F12	Abc Crimes 2016 F15	Abc Crimes 2016 F16	
Violent Crimes in 201...	null	null	null	null	null	null	null	null	null	null	null	
Location	null	Months	null	null	null	null	null	null	null	null	null	
city	state	Apr	Jun	Jul	Aug	Sep	Oct	state	Total Crimes 2016	State	Population 2016	
Albuquerque	New Mexico	null	null	null	null	46	null	Alabama	12	Alabama	4860645	
Anaheim	California	null	4	null	null	null	null	Alaska	26	Alaska	741522	
Anchorage	Alaska	1	null	null	null	26	null	Arizona	132	Arizona	6908642	
Arlington	Texas	null	null	null	17	null	null	California	515	Arkansas	2988231	
Atlanta	Georgia	null	null	null	null	85	null	Colorado	64	California	39296476	

To see if Data Interpreter can help clean this data set, we select **Use Data Interpreter**.

Data Interpreter detected the proper headings for the fields, removed the extra formatting and found several sub-tables. The sub-tables are listed in the **Sheets** section in the Data pane and are named using the original sheet name and the cell ranges for each sub-table.

In this example there are three sub-tables: **Crimes 2016 A4:H84**, **Crimes 2016 K5:L40**, and **Crimes 2016 O5:P56**.

Crimes 2016 (crimes_2016) (2)												
Connection: Live Extract												
Crimes 2016												
Sort fields: Data source order Show aliases Show hidden fields												
Crimes 2016 Location city	Crimes 2016 Location state	Crimes 2016 Months Apr	Crimes 2016 Months Jun	Crimes 2016 Months Jul	Crimes 2016 Months Aug	Crimes 2016 Months Sep	Crimes 2016 Months Oct	Crimes 2016 state	Crimes 2016 Total Crimes 2016	Crimes 2016 State	Crimes 2016 Population 2016	
Albuquerque	New Mexico	null	null	null	null	46	null	Alabama	12	Alabama	4,860,545	
Anaheim	California	null	4	null	null	null	null	Alaska	26	Alaska	741,522	
Anchorage	Alaska	1	null	null	null	26	null	Arizona	132	Arizona	6,908,642	
Arlington	Texas	null	17	null	null	null	null	California	515	Arkansas	2,988,231	
Atlanta	Georgia	null	null	null	null	85	null	Colorado	64	California	39,296,476	
Aurora	Colorado	null	null	null	null	16	null	D.C.	106	Colorado	5,530,105	
Austin	Texas	null	null	null	28	null	null	Florida	210	Connecticut	3,587,685	
Bakersfield	California	null	22	null	null	null	null	Georgia	85	Delaware	952,630	
Baltimore	Maryland	null	null	null	null	230	Mass	9	District of Columbia	684,336		

To examine the results of the Data Interpreter more closely, we click the **Review the results** link in the Data pane to view an annotated copy of the spreadsheet.

Here we see a copy of the original data, color coded to identify which data was identified as header data and which data was identified as field values.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	Violent Crimes in 2016 In the United States by City and State																
2																	
3																	
4	Location	Location	Months	Months	Months	Months	Months	Months									Header
5	city	state	Apr	Jun	Jul	Aug	Sep	Oct			state	Total Crimes 2016			State	Populatio	Header
6	Albuquerque	New Mexico						46			Alabama	12			Alabama	4860545	Data
7	Anaheim	California			4						Alaska	26			Alaska	741522	Data
8	Anchorage	Alaska	1					26			Arizona	132			Arizona	6908642	Data
9	Arlington	Texas					17				California	515			Arkansas	2988231	Data
10	Atlanta	Georgia						85			Colorado	64			California	39296476	Data
11	Aurora	Colorado						16			D.C.	105			Colorado	5530105	Data
12	Austin	Texas					28				Florida	210			Connectic	3587685	Data
13	Bakersfiel	California			22						Georgia	85			Delaware	952698	Data
14	Baltimore	Maryland							230		Hawaii	9			District of	684336	Data
15	Boston	Massachusetts						28			Illinois	536			Florida	20656589	Data
16	Buffalo	New York						38			Indiana	151			Georgia	10313620	Data
17	Chandler	Arizona						3			Kansas	10			Hawaii	1428683	Data

The next tab shows us the sub-tables that Data Interpreter found, outlined by the cell ranges.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	Violent Crimes in 2016 In the United States by City and State																
2																	
3																	
4	Location	Location	Months	Months	Months	Months	Months	Months									
5	city	state	Apr	Jun	Jul	Aug	Sep	Oct			state	Total Crimes 2016			State	Population 2016	
6	Albuquerque	New Mexico						46			Alabama	12			Alabama	4860545	
7	Anaheim	California			4						Alaska	26			Alaska	741522	
8	Anchorage	Alaska	1					26			Arizona	132			Arizona	6908642	
9	Arlington	Texas					17				California	515			Arkansas	2988231	
10	Atlanta	Georgia						85			Colorado	64			California	39296476	
11	Aurora	Colorado						16			D.C.	105			Colorado	5530105	
12	Austin	Texas					28				Florida	210			Connectic	3587685	
13	Bakersfiel	California		22							Georgia	85			Delaware	952698	
14	Baltimore	Maryland							230		Hawaii	9			District of	684336	
15	Boston	Massachusetts						28			Illinois	536			Florida	20656589	
16	Buffalo	New York						38			Indiana	151			Georgia	10313620	
17	Chandler	Arizona						3			Kansas	10			Hawaii	1428683	
18	Charlotte	North Carolina		25							Kentucky	95			Idaho	1680026	
19	Chicago	Illinois							536		Louisiana	127			Illinois	12835726	
20	Chula Vist	California	2				1				Maryland	230			Indiana	6634007	
21	Cincinnati	Ohio						50			Massachu	28			Iowa	3130869	
22	Cleveland	Ohio						89			Michigan	221			Kansas	2907731	
23	Colorado :	Colorado					15				Minnesot	26			Kentucky	4436113	
24	Columbus	Ohio						70			Missouri	223			Louisiana	4686157	
25	Corpus Ch	Texas		9							Nebraska	29			Maine	1330232	
26	Dallas	Texas					118				Nevada	128			Maryland	6024752	
27	Denver	Colorado					33				New Jerse	86			Massachu	6823721	
28	Detroit	Michigan	5					221			New Mexi	46			Michigan	9933445	
29	Durham	North Carolina							30		New York	290			Minnesot	5525050	
30	El Paso	Texas						14			North Car	82			Mississipp	2985415	
31	Fort Wayn	Indiana						34			Ohio	217			Missouri	6091176	
32																	

In this example the first sub-table, **Crimes 2016 A4:H84**, has the main data that we want to work with. To use this table as our data table, we can simply drag the original table off the canvas and then drag the new table to the canvas.

The screenshot shows a data tool interface with a sidebar on the left containing 'Connections' and 'Sheets' sections. The main area displays a table titled 'Crimes 2016 A4:H84 (crimes_2016)'. The table has columns for 'Location city', 'Location state', and months from April to October. The data is as follows:

Crimes 2016 A4:H84 Location city	Crimes 2016 A4:H84 Location state	Crimes 2016 A4:H84 Months Apr	Crimes 2016 A4:H84 Months Jun	Crimes 2016 A4:H84 Months Jul	Crimes 2016 A4:H84 Months Aug	Crimes 2016 A4:H84 Months Sep	Crimes 2016 A4:H84 Months Oct
Albuquerque	New Mexico	null	null	null	null	46	null
Anaheim	California	null	4	null	null	null	null
Anchorage	Alaska	1	null	null	null	26	null
Arlington	Texas	null	null	null	17	null	null
Atlanta	Georgia	null	null	null	null	85	null
Aurora	Colorado	null	null	null	null	16	null
Austin	Texas	null	null	null	28	null	null
Bakersfield	California	null	22	null	null	null	null
Baltimore	Maryland	null	null	null	null	null	230
Boston	Massachusetts	null	null	null	null	28	null
Buffalo	New York	null	null	null	null	38	null
Chandler	Arizona	null	null	null	null	3	null

Once we have the data that we want to work with in the canvas, we can do some additional clean up on the data. For example we can:

- Change the field names so that they represent city, state, and month names.
- Pivot the months fields.
- Drag in the third sub-table **Crimes 2016 05:P56** and join it to our first sub-table on the **State** field to include state populations for our analysis.
- Hide any duplicate fields that were added as a result of the join.

The results might look something like this:

Sort fields Data source order				
Crimes 2016 A4:H84 City	Crimes 2016 A4:H84 State	Crimes 2016 O5:P56 Population 2016	Abe Pivot Months	# Pivot Crimes
Phoenix	Arizona	6,908,642	August	111
Pittsburgh	Pennsylvania	12,787,085	August	null
Plano	Texas	27,904,862	August	5
Portland	Oregon	4,085,989	August	null
Raleigh	North Carolina	10,156,689	August	null
Riverside	California	39,296,476	August	7
Sacramento	California	39,296,476	August	null
San Antonio	Texas	27,904,862	August	null
San Diego	California	39,296,476	August	30
San Francisco	California	39,296,476	August	null
San Jose	California	39,296,476	August	35
Santa Ana	California	39,296,476	August	null
Seattle	Washington	7,280,934	August	14
St. Louis	Missouri	6,091,176	August	133
St. Petersburg	Florida	20,656,589	August	14

Now we are ready to start analyzing our data in Tableau.

When Data Interpreter is not available

The Data Interpreter option might not be available for the following reasons:

- **The data source is already in a format that Tableau can interpret:** If Tableau Desktop doesn't need extra help from Data Interpreter to handle unique formatting or extraneous information, the Data Interpreter option is not available.
- **Many rows or many columns:** The Data Interpreter option is not be available when your data has the following attributes:
 - Data contains more than 2000 columns.
 - Data contains more than 3000 rows and more than 150 columns.
- **The data source is not supported:** Data Interpreter is only available for Microsoft Excel, Text (.csv) files, PDF files and Google Sheets. For Excel, your data must be in the .xls or .xlsx format.

