

PART I

A. Evaluate this report in detail following the Visual Analytics methodology for the report phase.

The SAS Visual Analytics report does a pretty good job of following the core ideas behind effective dashboard design. Each page focuses on one specific area, which keeps things clean and easy to follow. For example,

The Customer Analysis page focuses on customer behaviour and profit trends.

The Retail Analysis page highlights store performance and product categories.

The Customer Details section is smartly implemented as a pop-up to avoid clutter and maintain a clean layout. This avoids overcrowding the main dashboard and keeps the layout tidy.

The button bar is another useful feature, letting users quickly filter data based on the order channel, which makes the report more interactive and personalized.

There's also a drill-down feature that lets you go from yearly data to quarters or even months, which adds more depth to the analysis.(Figure 1)

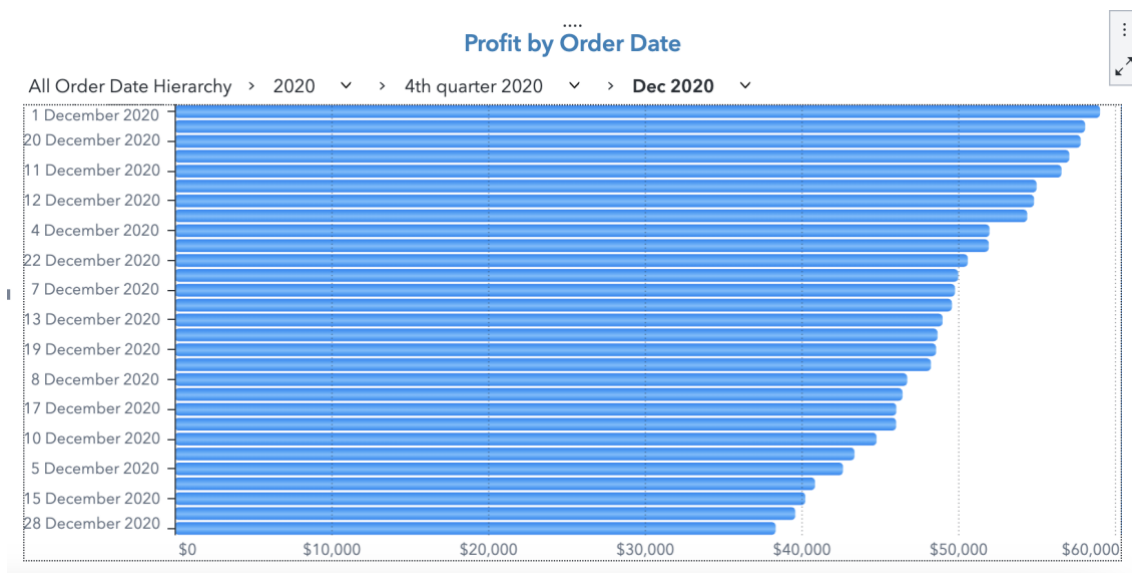
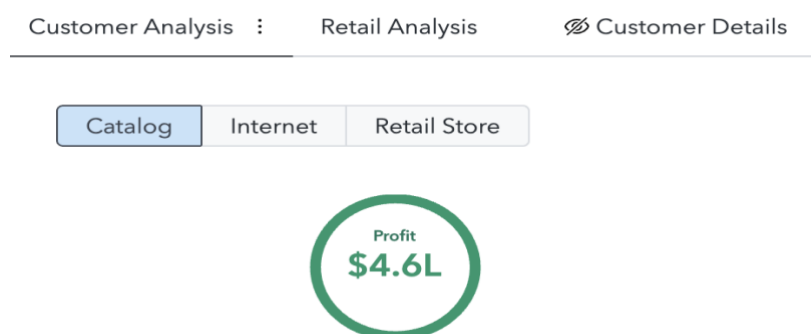


Figure 1

That said, there are definitely a few areas that could be improved.



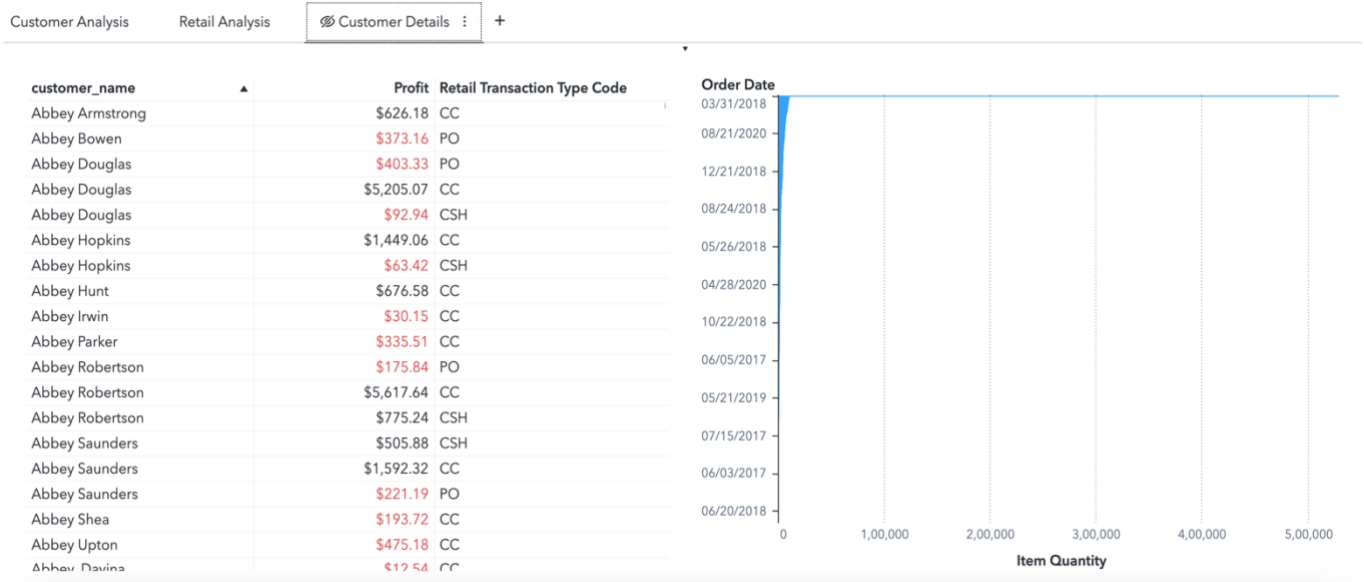


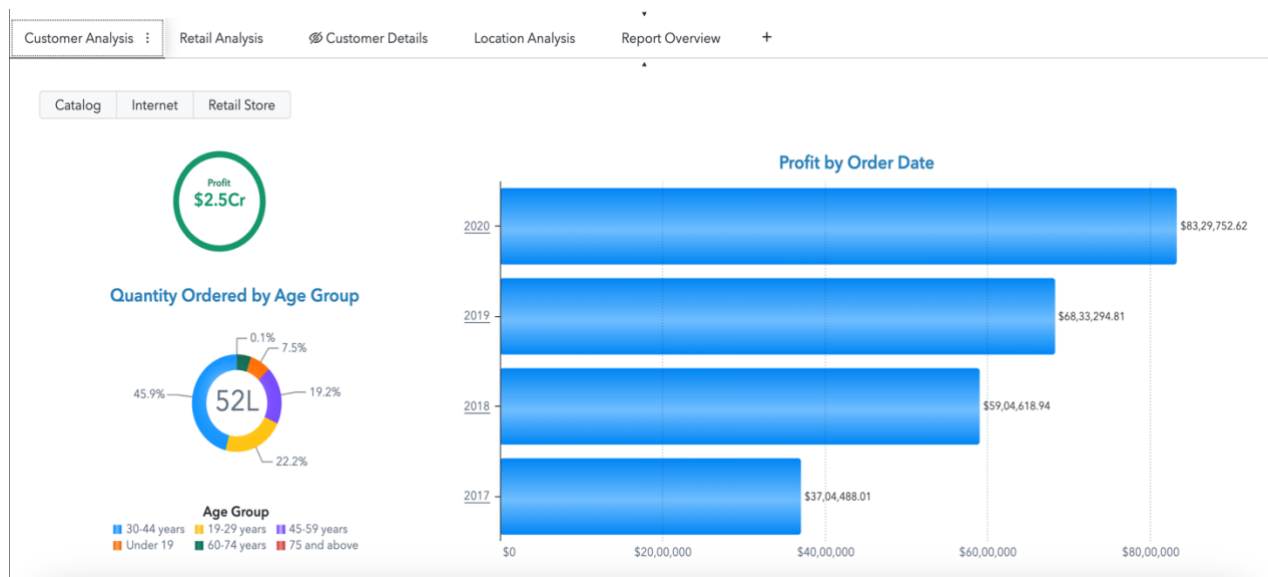
Figure 2

Some charts and tables (like the ones shown in Figure 2) don't have titles, which can make it hard for users to immediately understand what they're looking at.

The bar charts and their headers use the same colour, which reduces visibility. Adding better contrast and slightly larger fonts would really help, especially for people with vision difficulties. Overall, the report follows the right ideas it's interactive, focused, and informative but a few small changes in design and clarity would make it even stronger.

- B. On the Customer Analysis page, identify and describe any actions, prompts, and links used on it, and provide step-by-step instructions on how to create them in SAS Viya

The purpose of the report is to examine the purchasing habits and behaviour of customers. It includes important analytics like Sales Channel Filters, Quantity Ordered by Age Group, and Profit by Order Date. The report makes use of links, actions, and prompts to enhance user involvement by enabling users to dynamically examine the data.



Actions allow users to interact with visuals by filtering, highlighting, or drilling down into data.

- Age Group Selection in Donut Chart: Clicking on an age group in the Quantity Ordered by Age Group donut chart filters other charts to show only data for that group.
- Key Value Object: Displays total Profit
- Profit by Order Date: Clicking on a specific year in the Profit by Order Date bar chart opens a detailed breakdown of customer orders for that year.

Prompts act as interactive filters that let users control how data is displayed.

- Sales Channel Selection: A drop-down allows users to switch between Catalog, Internet, and Retail Store sales data.

Links provide navigation to other reports, pages, or external resources.

Add a Button Bar Prompt

- Go to the Objects pane on the left side of the screen.
- Under the Controls section, drag and drop the Button Bar onto the canvas.
- Double-click the button bar to open its configuration.
- In the Roles pane, assign the Order Channel field to the Category role.

Add Object Links for Interaction

- Click on the Button Bar, then go to the Actions tab (right pane).
- Under Object Links, select each visual object (e.g., pie chart, bar chart, key figure) to link with the Button Bar.
- This ensures that selecting a sales channel will filter all linked visuals accordingly.

Create a Date Hierarchy

- Right-click the Order Date field in the Data pane.
- Select New Date Hierarchy.
- Include levels such as Year, Quarter, and Month.
- Use this hierarchy in a bar chart to enable drill-down analysis from Year → Month → Day.

When a user selects a value (e.g., “Retail Store”) in the Button Bar:

- The Pie Chart updates to show item quantity by age group for that channel.
- The Bar Chart reflects profits by order year, filtered by that channel.
- The Key Figure dynamically updates to display profit for the selected channel.

This structure provides a dynamic, responsive dashboard experience without needing page reloads or manual filtering.

- C. Examine the rest of the Customer Analysis page. Identify all the objects presented on this page, except from the prompts or actions identified in I.(b). Describe how they are created and explain why they are included, which requires you to describe SAS report methodology (8 guidelines)

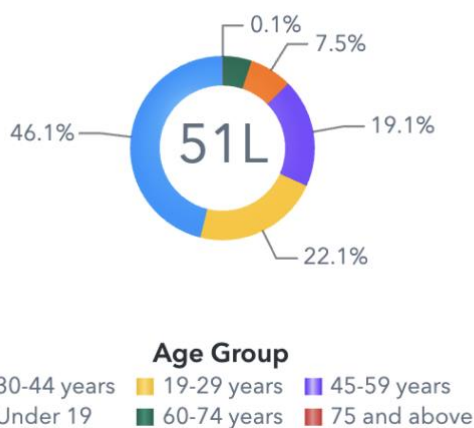
Key Value Object – Total Profit



- What it shows:
A single numeric value representing the total profit for the selected order channel.
- How it's created:
 - Drag the Key Value object from the Objects pane.
 - Assign the Profit measure in the Roles tab.
 - Filtered dynamically via Object Links from the Button Bar.
- Why it's included:
To provide an instant summary of overall profitability.
- Related SAS Guideline:
 - Guideline 2: Highlight key findings
 - Guideline 5: Use layout to tell a story

Donut Chart : Quantity Ordered by Age Group

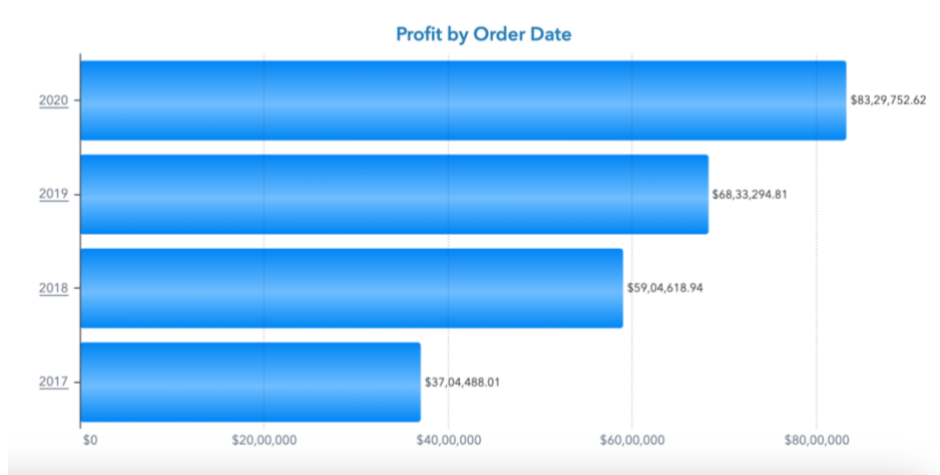
Quantity Ordered by Age Group



- What it shows:
Proportional breakdown of total orders by customer age group.
- How it's created:
 - Drag the Donut Chart object onto the canvas.
 - Assign:
 - Category: Age Group
 - Measure: Item Quantity
 - Use Page Links to apply interactivity with the Customer Detail page
- Why it's included:
Visualizes customer demographics contributing to order volume.
- Related SAS Guideline:

- Guideline 1: Know your audience
- Guideline 6: Use visuals to support insight

Bar Chart – Profit by Order Date (with Hierarchy)



- What it shows:
Displays Profit over time, starting from Year, with drill-down to Quarter, Month, and Day.
- How it's created:
 - Right-click Order Date → Create Date Hierarchy.
 - Drag a Bar Chart onto the canvas.
 - Assign:
 - Category: Order Date Hierarchy
 - Measure: Profit
 - Enable hierarchical drill-down in the chart.
 - Linked to Button Bar using Object Links.
- Why it's included:
Enables time-based trend analysis and seasonal pattern detection.
- Related SAS Guideline:
 - Guideline 3: Use appropriate detail
 - Guideline 4: Allow interactivity (drill-downs)

SAS Visual Analytics Guideline	How It's Applied in the Report
1. Know your audience	Focuses on sales and customer behavior — key for marketing and management decision-makers.
2. Highlight key findings	Key Value object (Profit) surfaces core performance instantly.
3. Use appropriate detail	Date Hierarchy allows users to explore profit trends from Year to Day.
4. Enable interactivity	Object Links and drill-downs make the dashboard dynamic and user-driven.
5. Support storytelling layout	Top-to-bottom layout: from summary (profit) to segmentation (age group) to trends (time).
6. Use effective visuals	Donut chart for category comparison; bar chart for time trends.
7. Filter for relevance	All visuals filtered by the Order Channel using object-level interactions.
8. Keep the report clean	Minimal clutter, focused visuals, limited color use, and organized structure across one page.

PART II

- D. Prepare to further analyse the data set. Before starting your analysis for the tasks below, you should access and investigate the data set, including understanding its structure, data types, variables, dimensions, and possible data issues. Provide clear instructions on how you access and explore the data set, and write a detailed description of the data set.

Before beginning any data analysis, it is essential to first explore and understand the dataset. This process involves identifying the structure, data types, key variables, dimensions, and any potential data quality issues. Below are the step-by-step instructions to access and explore the dataset using SAS Visual Analytics, followed by a description of the dataset.

Here are the steps

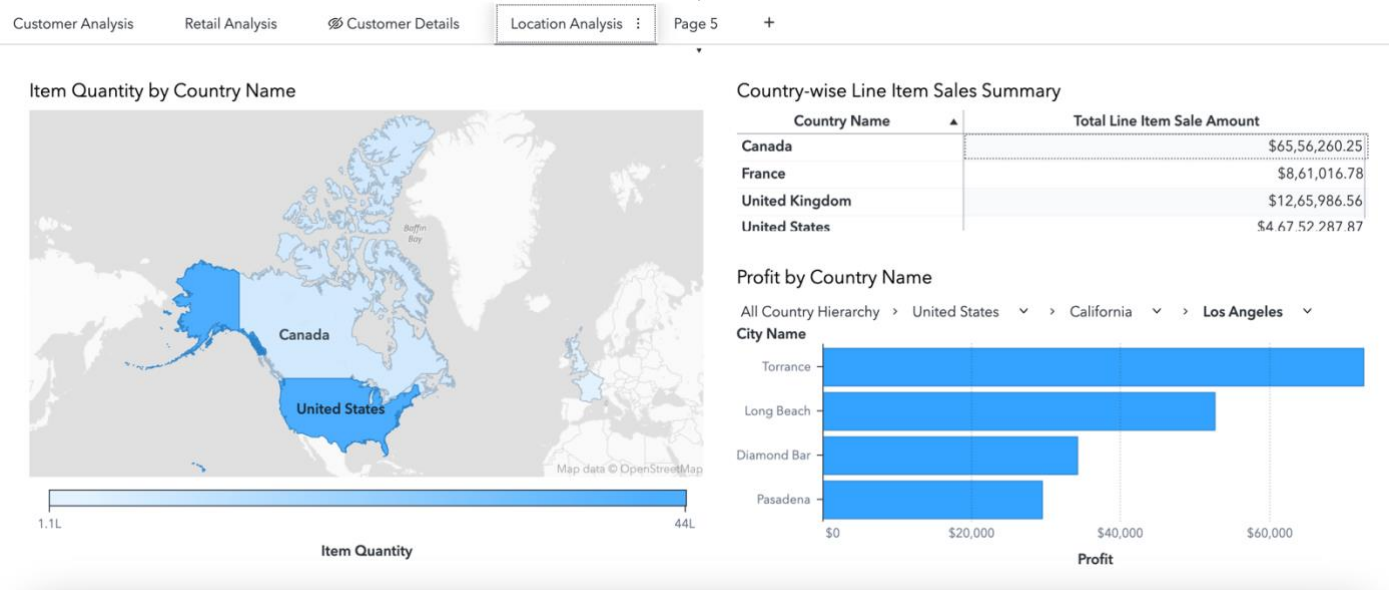
1. Step 1: Click on the data pane on the top left of the page.
2. Step 2: In the data pane, click on the data source menu.
3. Step 3: Under that menu, click on 'View Dataset_name as source table'.
4. Step 4: The table that pops up displays the dataset being used.
5. Step 5: Hover over the column names to view the three dots menu, and click on them.
6. Step 6: With the menu open, click on 'View Properties' to see specific data type details.
7. Step 7: To identify missing values, filter the dataset for blank cells.

The dataset contains 38 columns with various data types and a total of 491,826 rows. Each variable plays a specific role in the analysis, and a snapshot of key variables is shown below:

Variable Name	Type	Missing Values	Format
Transaction Id	CHAR (length 32)	0	
Transaction Line Item No	DOUBLE	0	
Retail Transaction Type Code	CHAR (length 3)	0	
order type	CHAR (length 8)	0	
Total Line Item Sale Amount	DOUBLE	0	DOLLAR12.2
Item Quantity	DOUBLE	0	
List Price Amount	DOUBLE	0	DOLLAR 12.4
Item Price Amount	DOUBLE	0	DOLLAR12.4
Item Key	DOUBLE	0	F12.
store id	DOUBLE		
Customer Key	DOUBLE	0	E12
continent	CHAR (length 40)	0	
Country Code	CHAR (length 3)	0	
Country Name	CHAR (length 50)	0	
State Region Code	CHAR (length 3)	31580	
state region nm	CHAR (length 50)	31580	
County Name	CHAR (length 100)	0	
City Name	CHAR (length 100)	0	
Postal Code	CHAR (length 30)	0	
Retail Outlet Name	CHAR (length 40)	0	
Total Size	DOUBLE	16768	
Address Line 1 Text	CHAR(length 100)	0	
total line item cost	Double	0	
Order Channel	CHAR (length 32)	0	
Retail Outlet Format Code	CHAR (length 32)	0	

Retail Outlet Type Code	CHAR (length 32)	0	
date	DOUBLE	0	MMDDYY10.
purchaseDt	DOUBLE	0	
customer name	CHAR (length 26)	0	\$CHAR26.
Email	CHAR (length 41)	51,064	\$CHAR41.
Customer Self Description	CHAR (length 32)	0	
card program membership	CHAR (length 100)	0	
bday month	DOUBLE	0	
age	DOUBLE	0	
Item Product Line	CHAR (length 100)	0	
Item Category	CHAR (length 100)	0	
Item Package Type	CHAR (length 32)	0	
Item Description	CHAR (length 100)	0	

- E. Produce a Location Analysis report page in SAS Viya to provide a summary of the global and regional profits for Chocolate Enterprise company's senior management. These facts should include financial, marketing-related data, and/or efficient use of resources. Capture a screenshot of this page after you have created it, and include it in the coursework report. Describe how you have chosen the appropriate visualization tools. How did you choose the objects in your report (charts, tables, etc.)? What questions would they ask and what answers could they derive based on your report?



1. Geo Map: "Item Quantity by Country Name"

The geo map offers an intuitive way to visualize item sales across global regions. It immediately highlights which countries have the highest sales volumes based on Item Quantity. Senior leaders can identify countries where the product performs well and where performance is weak helping plan market-specific strategies.

2. Crosstab Table: "Country-wise Line-Item Sales Summary"

Tables are perfect for precise comparisons. This cross-tabulation shows the Total Line Item Sale Amount per country in a clear, numerical format.

This view helps in financial decision-making, budget allocation, and assessing market performance by country.

3. Bar Chart: “Profit by Country Name” with Drill-Down

A bar chart with a geographic hierarchy (Country > State > County > City) enables drill-down analysis, revealing regional and sub-regional performance.

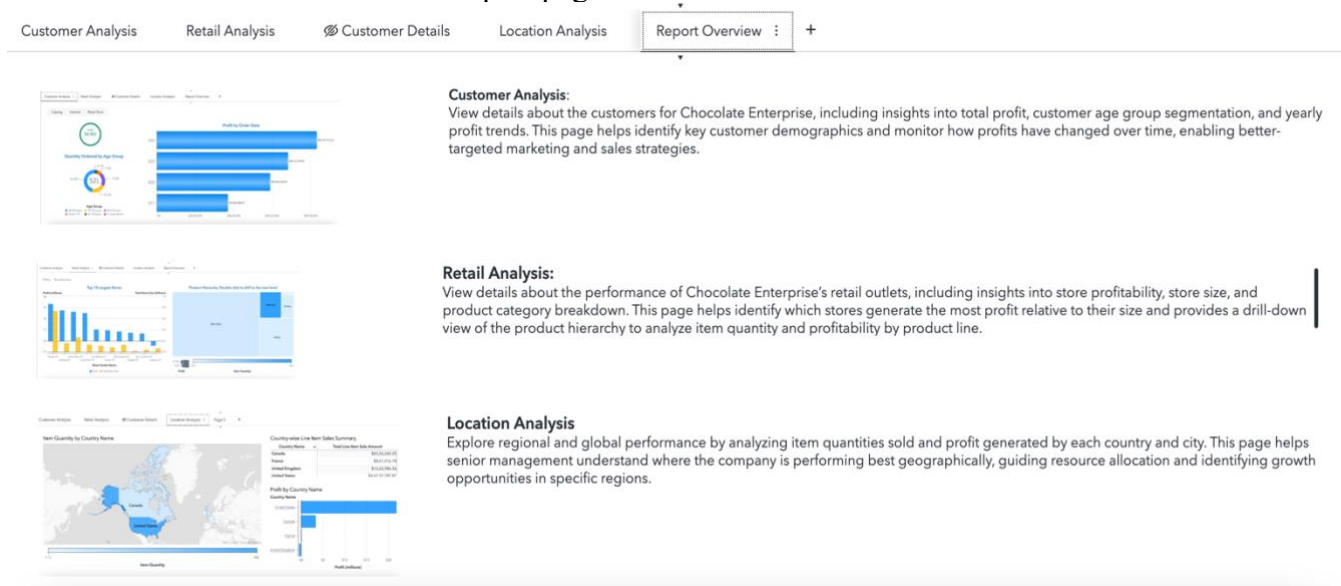
Managers can analyze which cities or regions within a country contribute most to profit. For example, in the United States, Los Angeles > Torrance shows the highest local profit. This also aids in resource optimisation, distribution strategies, and localized marketing decisions

Key Questions this report can answer:

1. Where are we making the most profit globally?
- Answered using the Geo Map and Profit Bar Chart.
2. Which country or city should we target for marketing investments?
- Insights from the City-level drill-down.
3. Are we utilizing our retail outlets efficiently across regions?
- Derived from the combination of quantity and profit distribution.
4. Which regions are underperforming?
- Can be easily spotted from the geo heatmap and sales summary table.

Bonus task:

Produce an Overview page as the first page that summarizes all three pages, using a variety of interactions such as links to connect with other report pages.



Here are the steps

- Step 1: Click on the data pane on the top left of the page.
- Step 2: In the Objects pane, click on the Image and Text
- Step 3: Upload the Image and insert the text
- Step 4: Click on the Actions pane on the top right of the page.
- Step 5: Click on Page Links and select the page