EXPLORING CUSTOMER SATISFACTION AND PREFERENCES USING POWER BI

1. Introduction

In today's digital world, understanding what customers like and how satisfied they are is very important for any business. With so much data being collected every day, companies need tools that help turn that data into useful insights. That's where Power BI comes in.

This project was done to explore customer data using Power BI. The main goal was to find out which product categories perform best, how customers feel about their purchases (positive or negative), and how different age groups interact with products. Using charts and visuals, we made it easier to understand these trends clearly and quickly.

2. Problem Statement

Many businesses collect large amounts of customer data, but they face a few common problems:

- They don't know which products bring in the most money.

- They want to know if customers are happy or not.

- They find it hard to compare preferences among different age groups.

- They need a better way to analyse how often people buy things and how much they spend.

- Identifying which categories contribute most to revenue.

- Understanding customer sentiment and ratings.

- Comparing demographic patterns (like age) with product categories.

- Analyzing monthly purchase behavior and total order value.

This project tries to solve those problems using Power BI by creating visuals that show patterns and trends clearly.

3. Dataset – Customer Preferences Dataset

| Customer Name	Email	Gender	Age	Location	Category	Purchases Per Month	Order Value ($)	Sentiment	Rating
David Austin	cynthia65@example.com	Female	36	Port Williamton	Sports	1	177.38	Positive	1
Kevin Byrd	michaelmorgan@example.net	Female	21	Nicoleshire	Sports	6	915.24	Positive	1
Jennifer Martin	jonathanbaker@example.net	Female	24	Sloanberg	Sports	6	853.14	Positive	2
Jonathan Carlson	geraldcampbell@example.com	Male	22	Karlaton	Sports	9	244.73	Positive	5
Bryan English	hensleypaige@example.net	Female	56	Danielleview	Sports	2	429.88	Positive	1
Rebecca Allen	fordjoshua@example.org	Female	31	Port Alexanderbury	Sports	2	982.99	Positive	4
Lisa Jones	soliver@example.org	Male	60	Petersontown	Sports	5	393.52	Positive	3
Keith Simpson	bfrench@example.net	Female	50	South Joel	Sports	5	106.22	Positive	1
Jeremy Aguilar DVM	christian03@example.org	Male	57	Justinport	Sports	6	322.04	Positive	2
Martha Ramirez	randykent@example.com	Male	52	Thomastown	Sports	5	222.62	Positive	1
Bradley Conway	nwhitaker@example.com	Female	60	North Chelseaside	Sports	5	812.92	Positive	3
Evelyn Thomas	saraduarte@example.net	Male	18	Brianborough	Sports	6	310.35	Positive	3
Michael Livingston	bakerjeffery@example.org	Male	25	Craneberg	Sports	4	188.12	Positive	5
Greg Peters	tanyakelley@example.com	Female	39	Patriciaport	Sports	4	282.95	Positive	1
Craig Short	jjohnson@example.org	Female	27	East Ryanland	Sports	2	921.92	Positive	3
Joseph Phillips	rachel80@example.net	Female	42	West Shannonton	Sports	9	714.76	Positive	4
Sandra Pearson	kellylittle@example.com	Male	33	Brennanshire	Sports	1	736.95	Positive	5
Paul Gay	nmartin@example.net	Male	40	Andrewbury	Sports	8	364.21	Positive	4
Kaitlin Wilson	james45@example.org	Male	51	Michaelshire	Sports	10	572.03	Positive	4
Brett Howard	garciaaaron@example.net	Male	33	South Michelle	Sports	8	561.92	Positive	1
Dana Webb MD	christinejohnson@example.org	Male	20	East Richardland	Sports	5	684.03	Positive	1
Michelle Rubio	scott19@example.com	Male	45	Port Lauren	Sports	9	162.87	Positive	3
Lorraine Gibson	linda43@example.org	Female	21	Mendozaview	Sports	2	183.36	Positive	2
Brendan Dunn	wrighttaylor@example.org	Male	45	Simmonstown	Sports	2	112.75	Positive	2
Gregory Barnes	dherman@example.org	Female	53	Thomastown	Sports	10	986.22	Positive	5
Marcus Fisher	stephanieklein@example.com	Male	36	Amyland	Sports	5	749.99	Positive	5
Michael Fisher	jonathan18@example.com	Male	32	West Olivia	Sports	4	320.01	Positive	3
Kerry Howard	nancybrown@example.net	Female	42	South Ericatown	Sports	6	617.94	Positive	3
Juan Fleming	canthony@example.com	Male	37	East Hannahton	Sports	3	505.92	Positive	3
Lisa Collins	sanchezedward@example.com	Female	35	North Dianeton	Sports	4	250.86	Positive	5
Brittany Brooks	scott15@example.net	Male	57	Port Matthew	Sports	7	232.1	Positive	1
Matthew Hall	danielwheeler@example.com	Male	27	Port Richardstad	Sports	1	551.98	Positive	4
Tina Bowman	robin26@example.org	Female	57	South David	Sports	4	252.96	Positive	2
Janet Alexander	kristen74@example.net	Female	37	Port Morgan	Sports	2	746.36	Positive	2
Ronnie Frazier	timothy23@example.org	Female	24	Hoovershire	Sports	9	388.32	Positive	1
Lori Gill	courtneylopez@example.net	Male	39	Stanleyshire	Sports	9	620.24	Positive	5
Katherine Watkins	theresaherrera@example.com	Female	46	West Ericburgh	Sports	7	352.97	Positive	4
Tracey Gray	joshuajones@example.com	Female	24	South Melissa	Sports	6	762.45	Positive	2
Jose Mathis	jjimenez@example.net	Male	50	Portertown	Sports	7	826.44	Positive	4
Edwin Holland MD	miguel62@example.org	Male	58	Rogerstown	Sports	6	289.83	Positive	5
Elizabeth Douglas	hesscrystal@example.com	Female	25	Perezfort	Sports	8	394.45	Positive	4
Brian Sullivan	piercephilip@example.org	Female	51	Nguyenburgh	Sports	9	962.57	Positive	5
Michael Wallace	shawnriley@example.com	Female	53	West Scott	Sports	4	625.36	Positive	1
Beth Campos	kathybryant@example.com	Male	37	Jacobville	Sports	5	231.24	Positive	5
Katrina Sparks	david82@example.org	Female	58	Port Matthewfort	Sports	7	359.46	Positive	5
Tina White	annettestewart@example.net	Female	23	South Robertside	Sports	2	491.56	Positive	2
Larry Chen	emmanewman@example.net	Female	54	Quinnberg	Sports	9	454.12	Positive	3
Michael Hernandez	katherine40@example.com	Female	42	Terrystad	Sports	5	621.1	Positive	5
Daniel Peterson	creeves@example.org	Female	22	East James	Sports	5	988.23	Positive	4
Michelle Tyler	hgreer@example.org	Male	20	Port Michael	Sports	1	537.57	Positive	3
Benjamin Nichols	cherylgarcia@example.net	Male	47	Lake Raymondborough	Sports	10	978.21	Positive	2
Julia Gray	crystal05@example.com	Female	19	Rosestad	Sports	8	259.9	Positive	5
David Valentine	catherine82@example.org	Male	46	Sandovalview	Sports	9	429.05	Positive	4
Michael Edwards	bsummers@example.com	Female	22	Caseyberg	Sports	9	812.68	Positive	1
Lori Banks	erika77@example.net	Male	36	Rosefort	Sports	5	195.25	Positive	5

4. Visualizations and Key Insights

1) Clustered Column chart – Sum of Rating by Category and Sentiment

This chart shows the total sum of customer ratings for each product category, separated by sentiment — whether the customer's feedback was Positive, Neutral, or Negative.

- **X-Axis:** Product Categories (like **Sports, Electronics, Books**, etc.)

- **Y-Axis:** Sum of Rating (how much customers rated each category)

- **Legend:** Colors represent Sentiments (**Positive, Neutral, Negative**)

Insight:

- Categories like Clothing and Books received **high ratings with mostly positive sentiment**.

- Some categories like Electronics have a noticeable share of **neutral or negative ratings, suggesting mixed feedback**.

- **Home & Kitchen and Sports also show moderate ratings**, leaning more towards the neutral side.
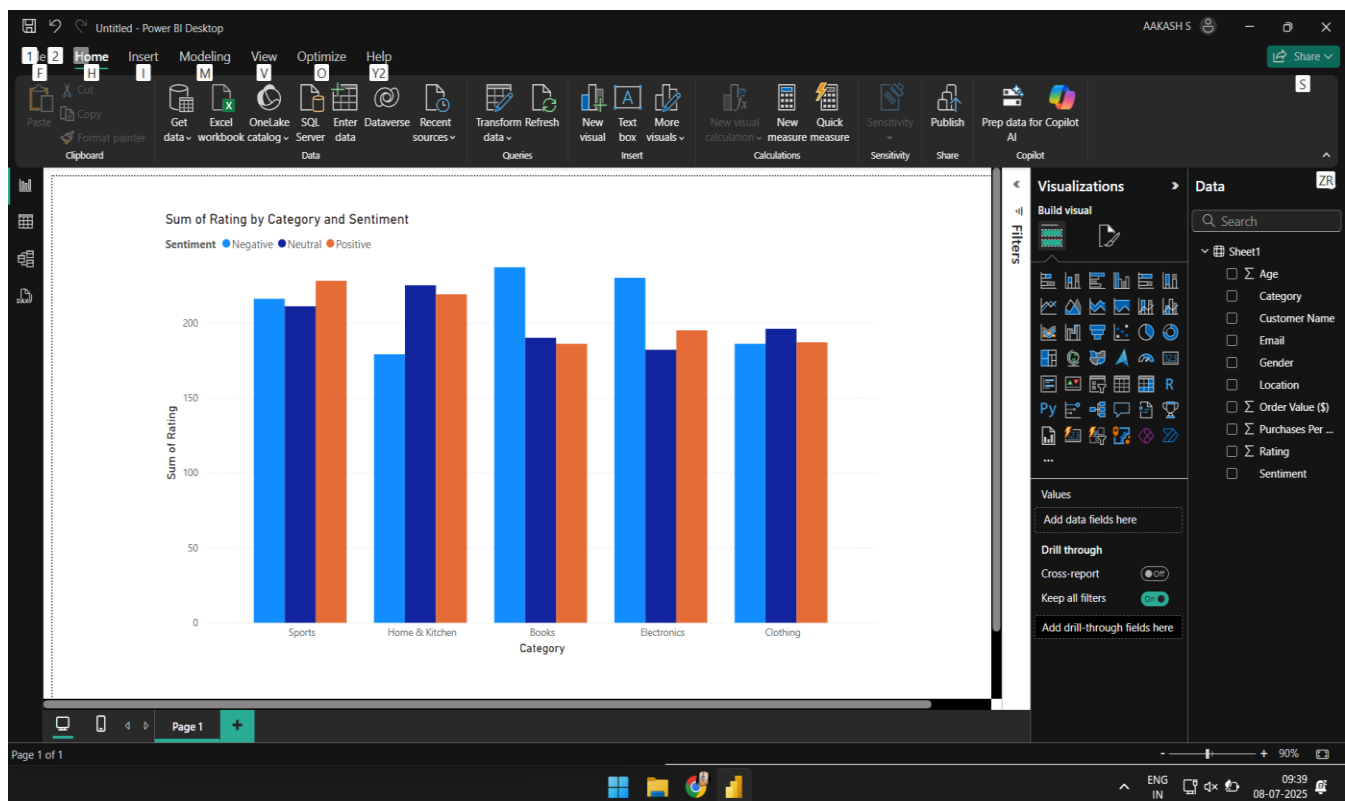
2) Clustered Bar chart – Sum of Purchases per month and Order value

This clustered column chart displays a side-by-side comparison between two key metrics:

- **Number of Purchases per Month**

- **Total Order Value**

It shows how often customers are buying and how much they're spending overall.

- **X-Axis:** Metrics – Purchases Per Month and Order Value

- **Y-Axis:** Total Values (count for purchases, sum for order value)

Insight:

- Although the number of purchases is not very high, the total order value is significantly higher.

- This suggests that **customers buy less frequently**, but when they do, **they tend to spend more per purchase**.
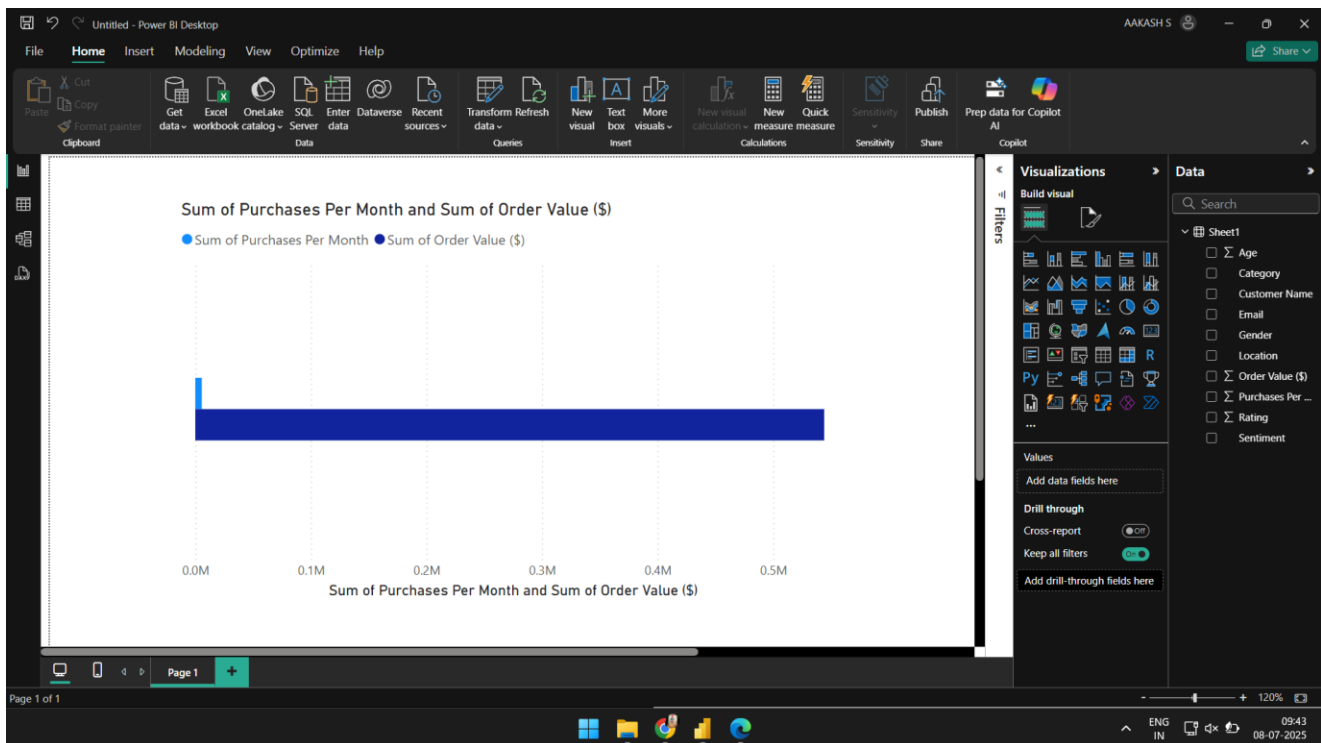
3) Treemap – Sum of Age by Category

This treemap shows the total sum of customer ages grouped by different product categories. The size of each block represents how much a category contributes to the total age value, indicating how engaged different age groups are with each category.

- **Box Size:** Proportional to the sum of customer ages per category

- **Coloring:** Differentiates each product category

Insight:

- **Sports and Home & Kitchen categories** show the largest blocks, meaning they attract older or a higher number of customers.

- Books and Clothing have relatively smaller blocks, suggesting they are more popular among **younger audiences or fewer** older individuals.
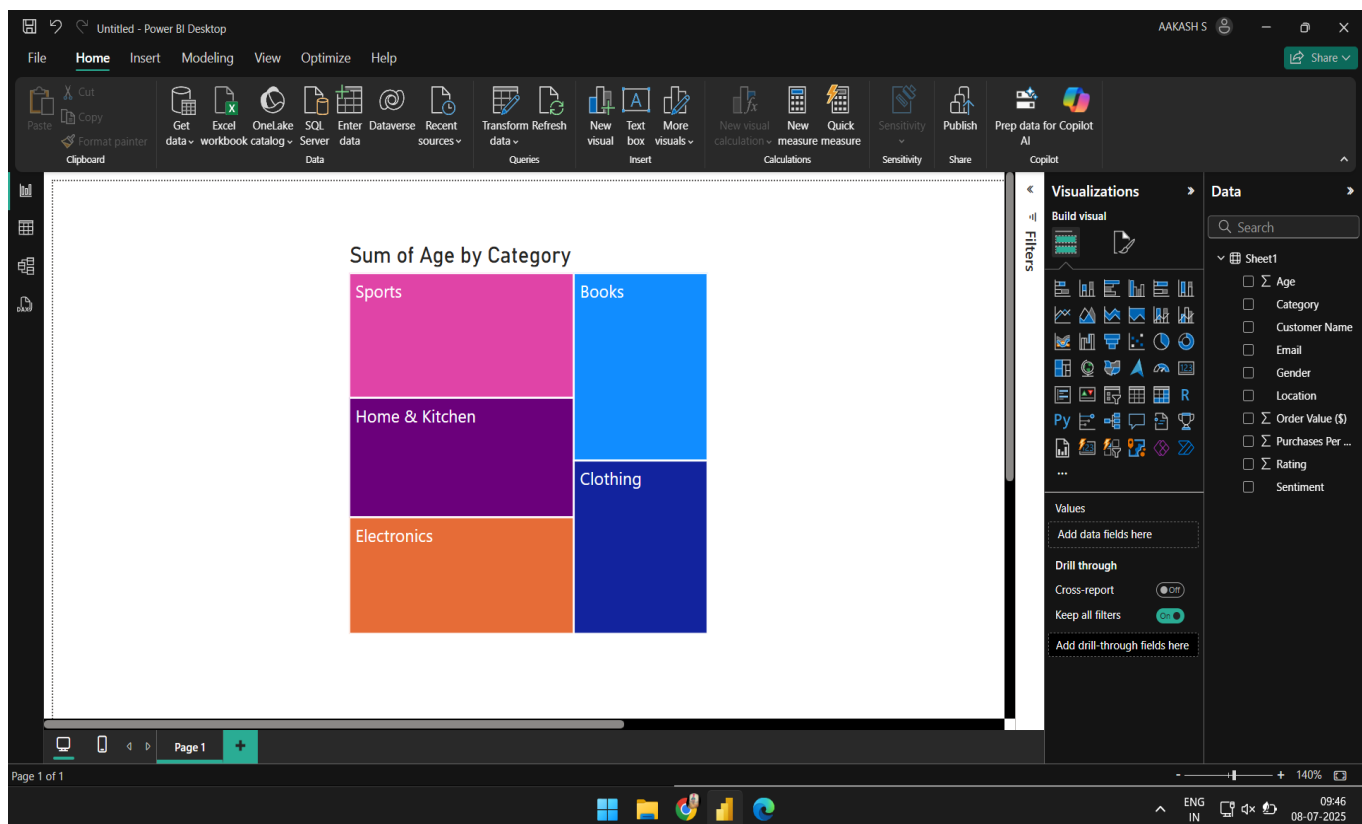
4) Donut Chart – Sentiment Analysis

This donut chart visualizes how customers feel about their purchases by categorizing their feedback as **Positive**, **Neutral**, or **Negative** sentiment.

- **Segments:** Represent each sentiment category

- **Size:** Based on the number of records/feedback entries per sentiment

- **Colors:** Usually distinguish Positive, Neutral, and Negative clearly

Insight:

- The majority of customer sentiment is **positive**, followed by **neutral**.

- A very small portion reflects **negative** sentiment, indicating that **most customers are satisfied** with their experience.
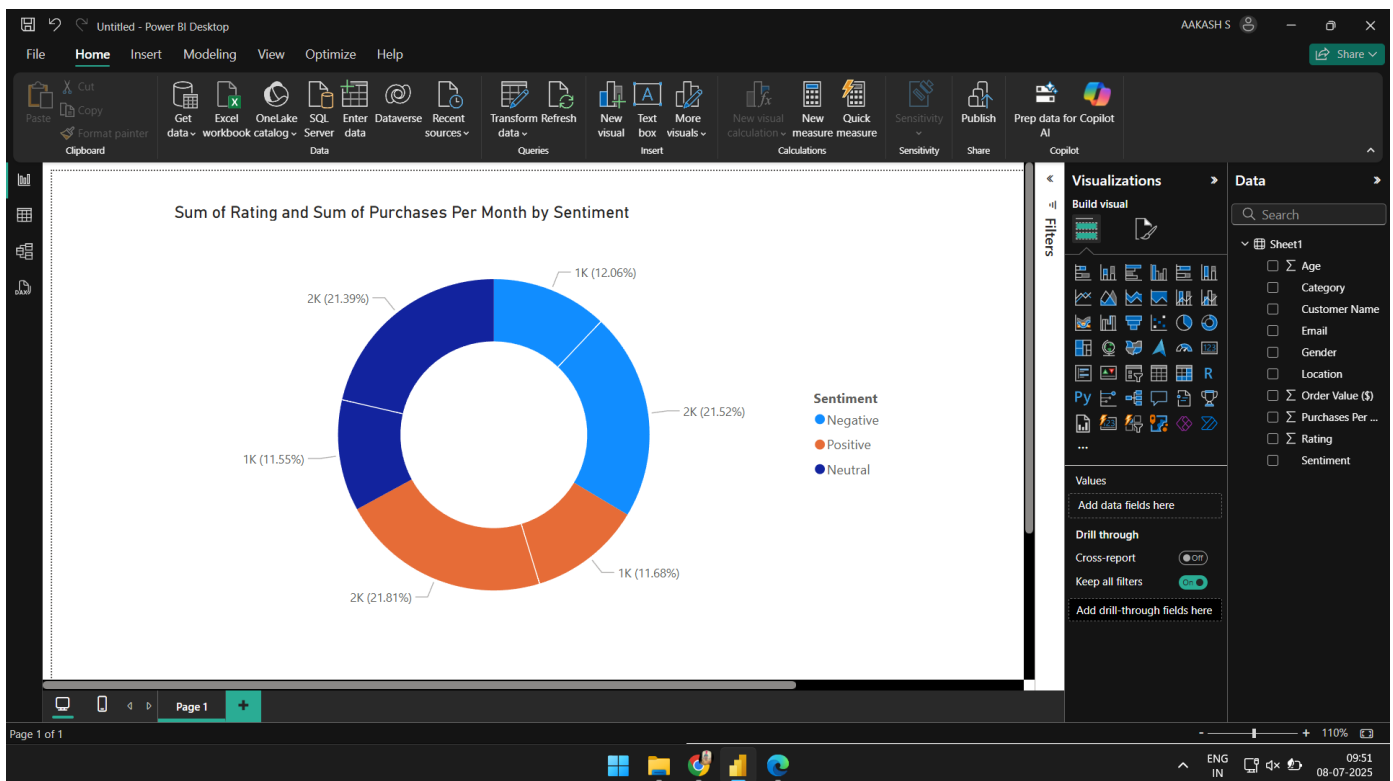
4) Waterfall Chart: Category-wise Contribution to Revenue

This waterfall chart breaks down how each product category contributes to the **total order value**. It shows the **incremental increase** from each category and ends with the overall total.

- **X-Axis:** Product Categories

- **Y-Axis:** Order Value ($)

- **Color Indicators:**

    o **Green:** Increase

    o **Red (if present):** Decrease

    o **Blue:** Final total

Insight:

- **Clothing** and **Books** contribute the highest amounts to overall revenue.

- **Sports** shows the least contribution.

- The blue bar at the end confirms the **total combined revenue** from all categories.
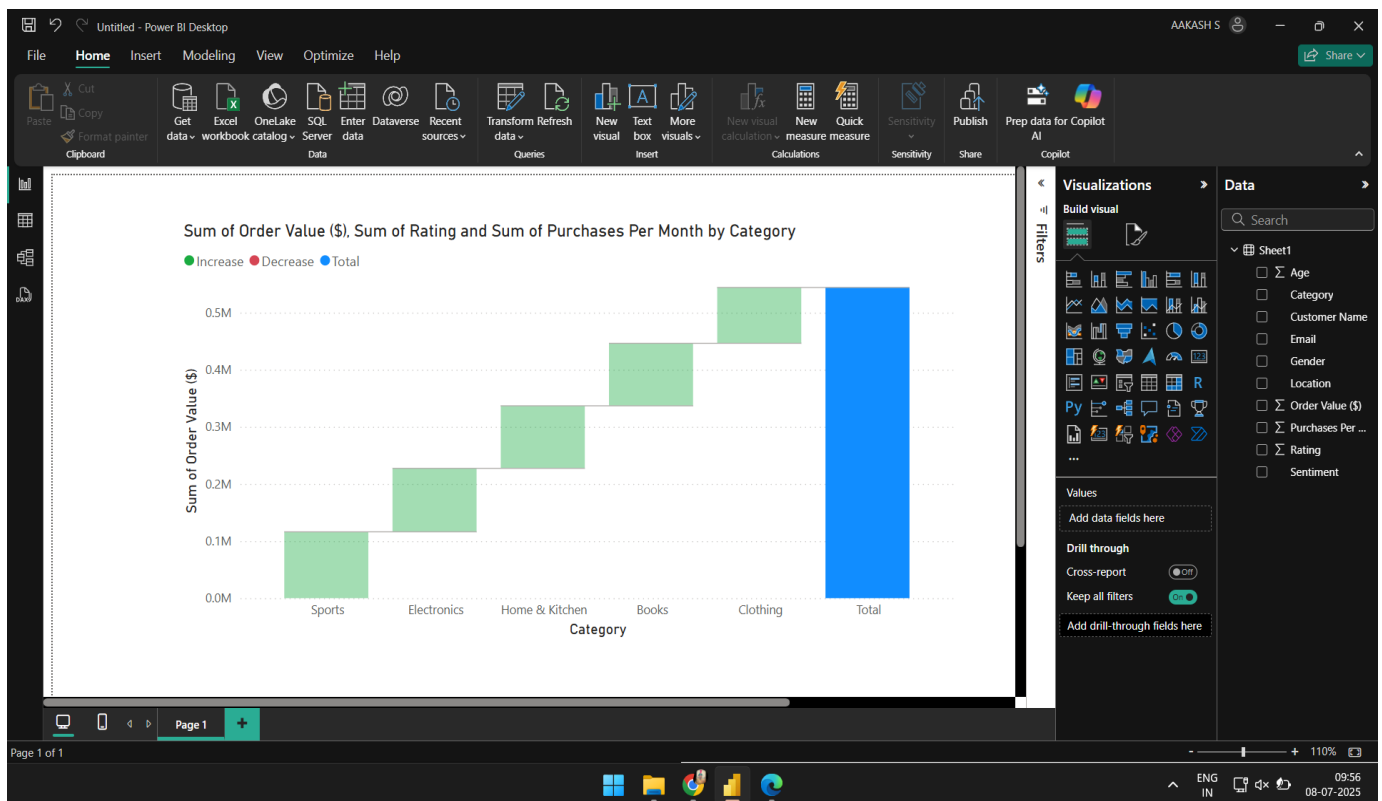
5.Conclusion

This project explored how customer satisfaction and preferences can be better understood using Power BI. We analysed a dataset containing details like product categories, customer ratings, order values, purchase frequency, sentiments, and age. With the help of Power BI visuals, we turned raw data into clear and meaningful insights. The **waterfall chart** helped us see which categories contributed the most to total revenue. The **clustered column chart** showed how customers may not purchase often but tend to spend more when they do. The **treemap** gave us an idea of how different age groups engage with different product types, while the **donut chart** showed that most customer feedback was either positive or neutral, with very little negativity.

These visuals helped us quickly spot trends, such as which categories are popular, where improvement is needed, and how customer sentiment aligns with sales performance. The insights gained can help businesses improve their marketing strategies, product focus, and customer service. Overall, this project shows how powerful and simple tools like Power BI can make data analysis easy and effective. It allows businesses to make smarter decisions by understanding their customers better, based on facts and clear visuals rather than assumptions.

Project Link : [Exploring Customer Satisfaction and Preferences](#)