



UNIVERSIDADE  
CATÓLICA  
PORTUGUESA

BRAGA

# Behavior Analysis Technologies

Session 24

## Power BI and Sentiment Analysis

Applied Data Science

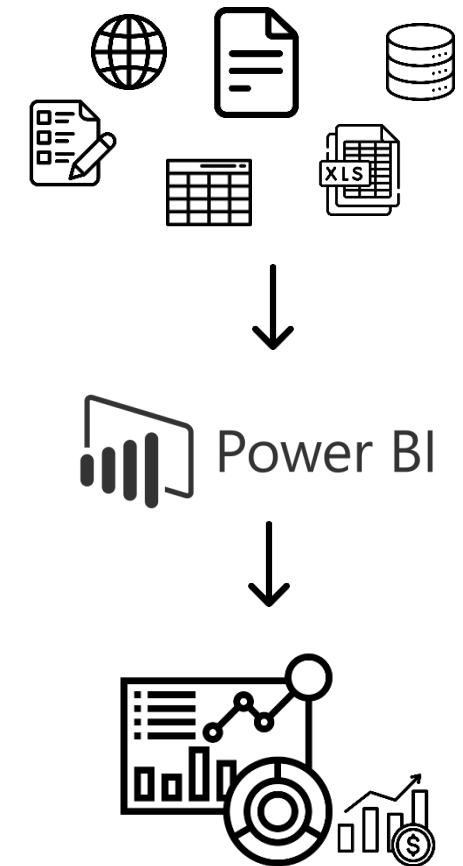
2024/2025



- A **business intelligence (BI)** tool by Microsoft.
- A **suite of software services, apps, and connectors** that transform unrelated data sources into coherent, visually immersive, and interactive **insights**.
- Enables data-driven decision-making through powerful **visualizations**.

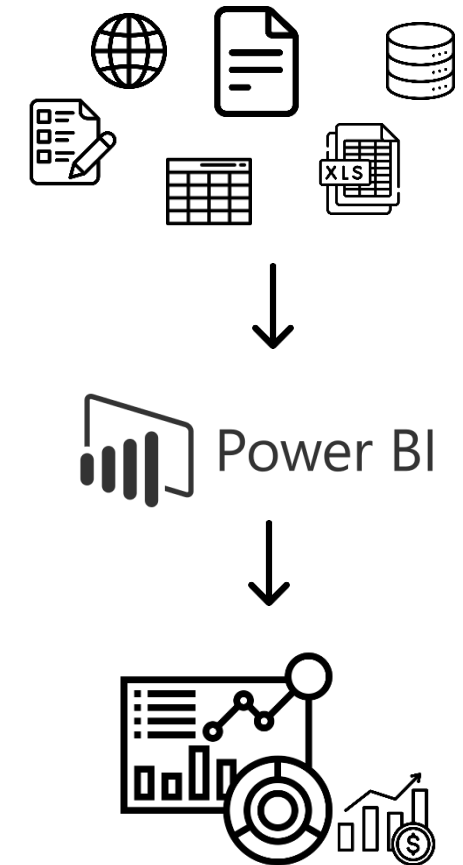
# Why Use Power BI?

- **Usability:** User-friendly interface; no coding required.
- **Affordability:** Free desktop version.
- **Visualizations:** Create visually engaging, interactive insights.
- **Customization:** Tailor dashboards and reports for specific needs.
- **Collaboration:** Share and track changes; access via mobile apps.

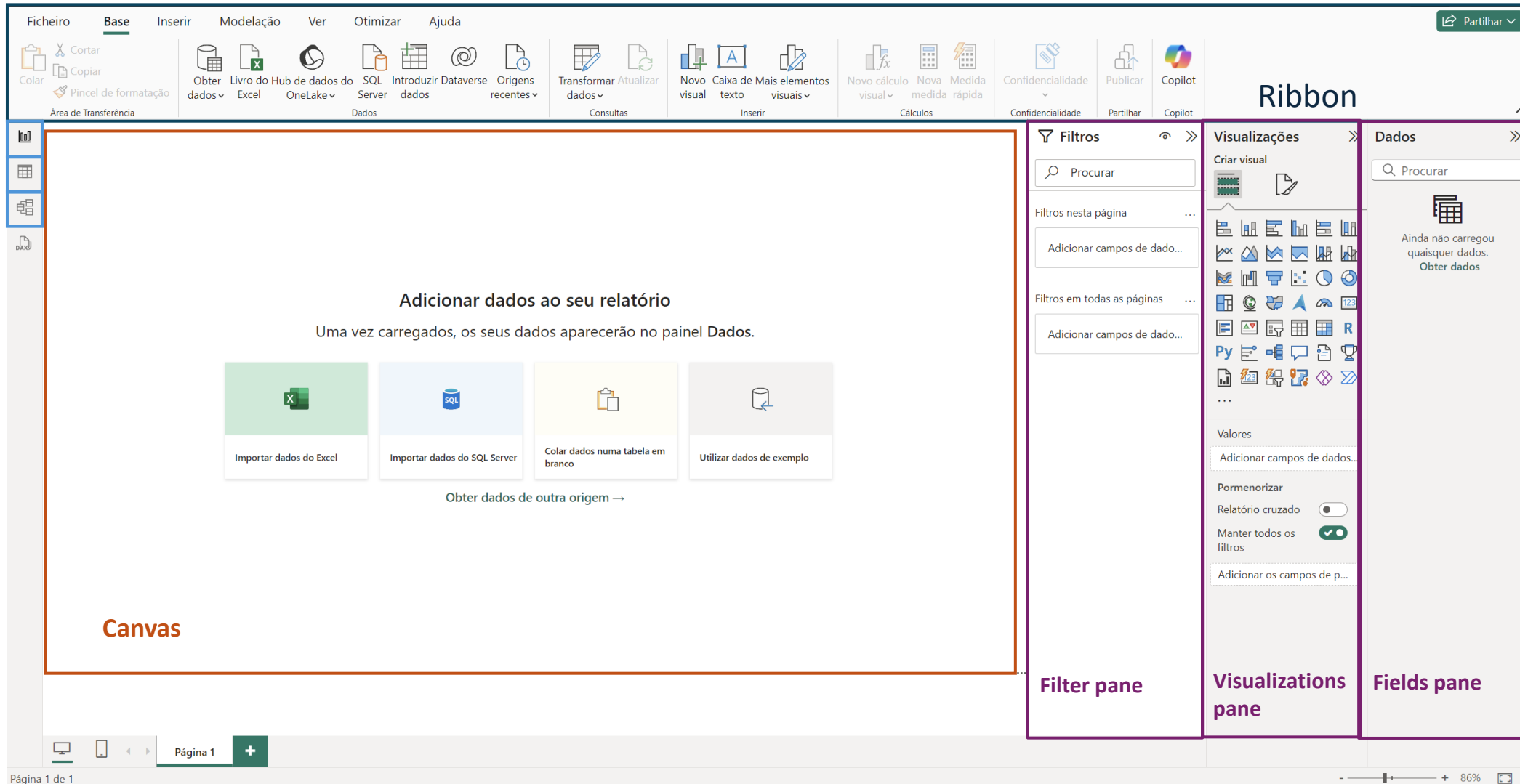


# Why Use Power BI?

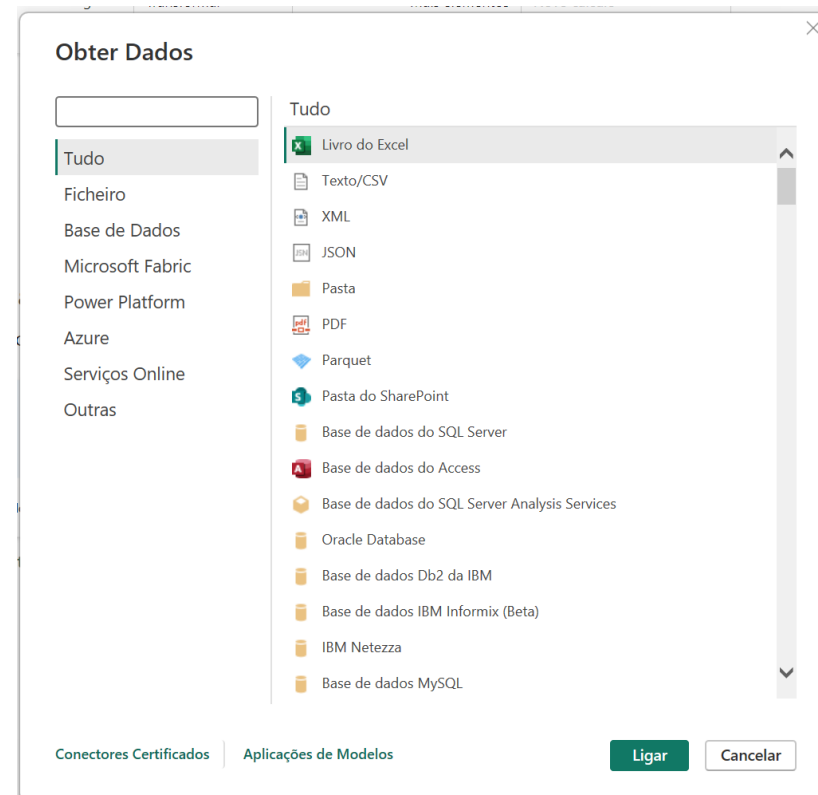
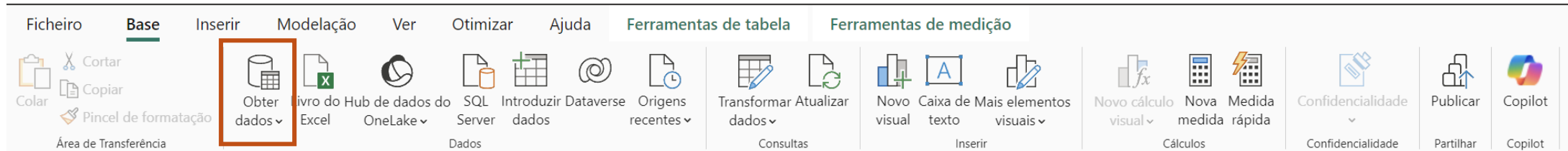
- **Connectivity:** Supports diverse sources: Excel, SQL, Google Analytics.
- **Cloud-Based:** No installation; automatic updates for all users.
- **Real-Time Updates:** Auto-refresh ensures data is always current.
- **Security:** SaaS ensures safe data sharing and compliance.



# Recap: Power BI Concepts



# Recap: Power BI Concepts



# Recap: Power BI Concepts

**Navegador**

Opções de Apresentação ▾

▲ Sentiment\_Analysis\_Dataset\_with\_Region.xlsx [1]

✓ Sheet1

Sheet1

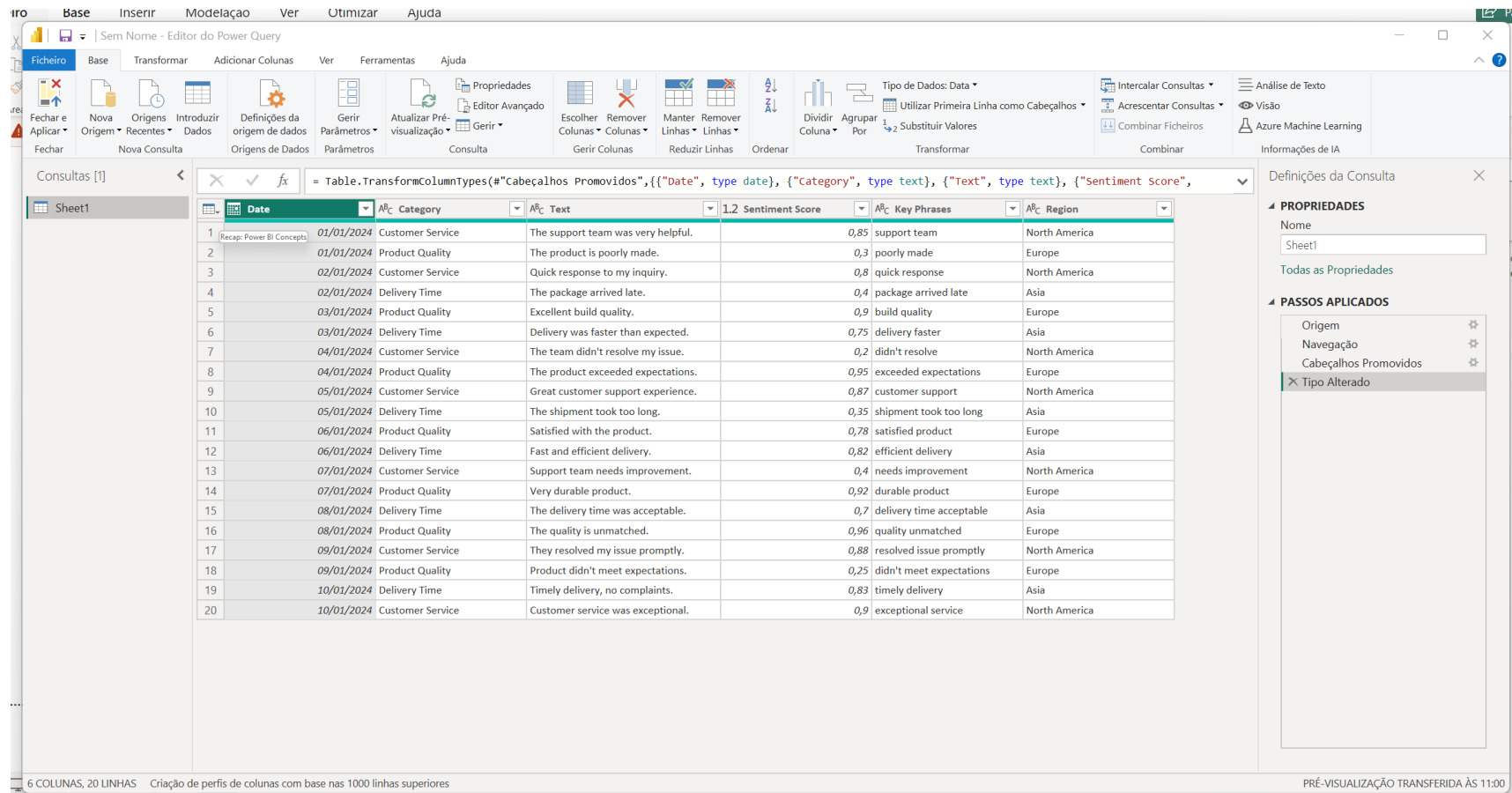
Date	Category	Text	Sentiment Score
01/01/2024	Customer Service	The support team was very helpful.	
01/01/2024	Product Quality	The product is poorly made.	
02/01/2024	Customer Service	Quick response to my inquiry.	
02/01/2024	Delivery Time	The package arrived late.	
03/01/2024	Product Quality	Excellent build quality.	
03/01/2024	Delivery Time	Delivery was faster than expected.	
04/01/2024	Customer Service	The team didn't resolve my issue.	
04/01/2024	Product Quality	The product exceeded expectations.	
05/01/2024	Customer Service	Great customer support experience.	
05/01/2024	Delivery Time	The shipment took too long.	
06/01/2024	Product Quality	Satisfied with the product.	
06/01/2024	Delivery Time	Fast and efficient delivery.	
07/01/2024	Customer Service	Support team needs improvement.	
07/01/2024	Product Quality	Very durable product.	
08/01/2024	Delivery Time	The delivery time was acceptable.	
08/01/2024	Product Quality	The quality is unmatched.	
09/01/2024	Customer Service	They resolved my issue promptly.	
09/01/2024	Product Quality	Product didn't meet expectations.	
10/01/2024	Delivery Time	Timely delivery, no complaints.	
10/01/2024	Customer Service	Customer service was exceptional.	

Carregar Transformar Dados Cancelar

# Recap: Power BI Concepts

## Power Query

Data transformation and preparation tool that allows users to **connect, clean, and shape data** from various sources to create a reliable foundation for **analysis and visualization**.



The screenshot displays the Power Query Editor window. The ribbon at the top includes tabs for Base, Inserir, Modelação, Ver, Otimizar, and Ajuda. The Base tab is active, showing options like Nova Origem, Recentes, Introduzir Dados, and Definições da origem de dados. The main area shows a data table with the following columns: Date, Category, Text, Sentiment Score, Key Phrases, and Region. The data is organized into rows, with the first row being a header row. The right-hand pane shows the 'Definições da Consulta' (Query Settings) for 'Sheet1', including 'Propriedades' (Properties) and 'Passos Aplicados' (Applied Steps).

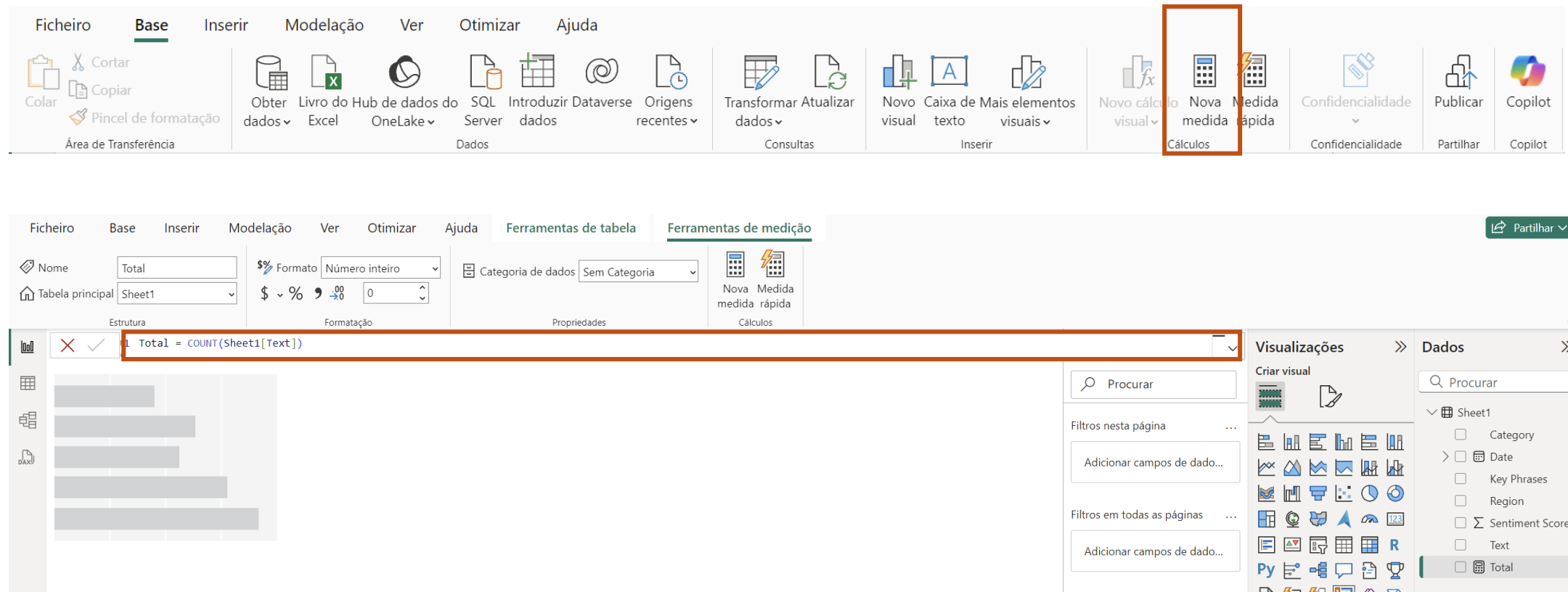
	Date	Category	Text	Sentiment Score	Key Phrases	Region
1	01/01/2024	Customer Service	The support team was very helpful.	0,85	support team	North America
2	01/01/2024	Product Quality	The product is poorly made.	0,3	poorly made	Europe
3	02/01/2024	Customer Service	Quick response to my inquiry.	0,8	quick response	North America
4	02/01/2024	Delivery Time	The package arrived late.	0,4	package arrived late	Asia
5	03/01/2024	Product Quality	Excellent build quality.	0,9	build quality	Europe
6	03/01/2024	Delivery Time	Delivery was faster than expected.	0,75	delivery faster	Asia
7	04/01/2024	Customer Service	The team didn't resolve my issue.	0,2	didn't resolve	North America
8	04/01/2024	Product Quality	The product exceeded expectations.	0,95	exceeded expectations	Europe
9	05/01/2024	Customer Service	Great customer support experience.	0,87	customer support	North America
10	05/01/2024	Delivery Time	The shipment took too long.	0,35	shipment took too long	Asia
11	06/01/2024	Product Quality	Satisfied with the product.	0,78	satisfied product	Europe
12	06/01/2024	Delivery Time	Fast and efficient delivery.	0,82	efficient delivery	Asia
13	07/01/2024	Customer Service	Support team needs improvement.	0,4	needs improvement	North America
14	07/01/2024	Product Quality	Very durable product.	0,92	durable product	Europe
15	08/01/2024	Delivery Time	The delivery time was acceptable.	0,7	delivery time acceptable	Asia
16	08/01/2024	Product Quality	The quality is unmatched.	0,96	quality unmatched	Europe
17	09/01/2024	Customer Service	They resolved my issue promptly.	0,88	resolved issue promptly	North America
18	09/01/2024	Product Quality	Product didn't meet expectations.	0,25	didn't meet expectations	Europe
19	10/01/2024	Delivery Time	Timely delivery, no complaints.	0,83	timely delivery	Asia
20	10/01/2024	Customer Service	Customer service was exceptional.	0,9	exceptional service	North America



# Recap: Power BI Concepts

## Measures

**Dynamic calculations** created using **DAX** (Data Analysis Expressions) to perform advanced data analysis, track KPIs and generate insights within reports and dashboards.



The image shows the Power BI interface with the 'Cálculos' (Calculations) tab highlighted in the ribbon. The main interface shows the 'Ferramentas de medição' (Measures tools) tab selected. The formula bar displays the DAX measure: `Total = COUNT(Sheet1[Text])`. The 'Visualizações' (Visualizations) pane on the right shows the 'Total' measure added to the data model.

**Ribbon:**

- Ficheiro
- Base**
- Inserir
- Modelação
- Ver
- Otimizar
- Ajuda

**Measures tools (Ferramentas de medição) ribbon:**

- Nome: Total
- Formato: Número inteiro
- Categoria de dados: Sem Categoria
- Tabela principal: Sheet1
- Formato: \$ % ' 0
- Novo cálculo visual
- Nova medida rápida

**Formula bar:**

```
Total = COUNT(Sheet1[Text])
```

**Visualizações pane:**

- Procurar
- Filtros nesta página
- Adicionar campos de dado...
- Filtros em todas as páginas
- Adicionar campos de dado...

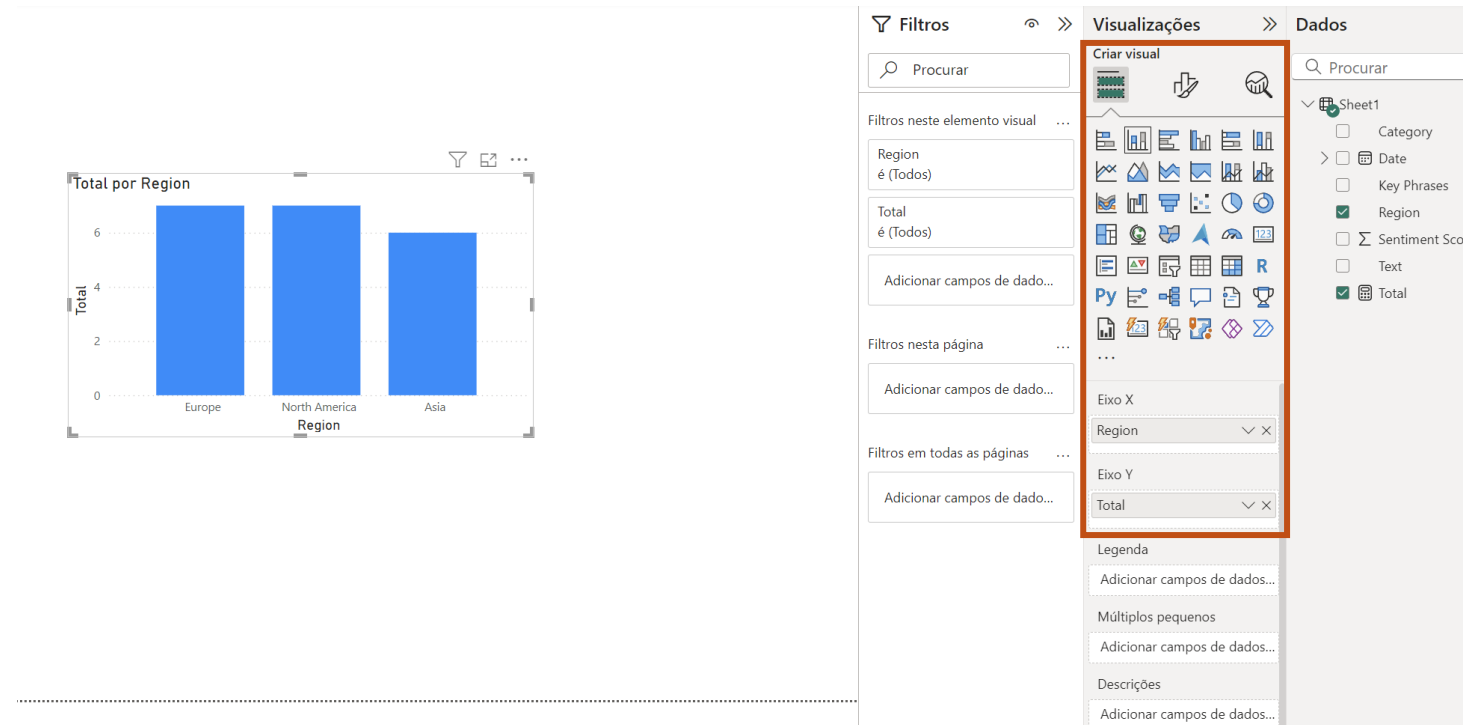
**Dados pane:**

- Procurar
- Sheet1
- Category
- Date
- Key Phrases
- Region
- Sentiment Score
- Text
- Total

# Recap: Power BI Concepts

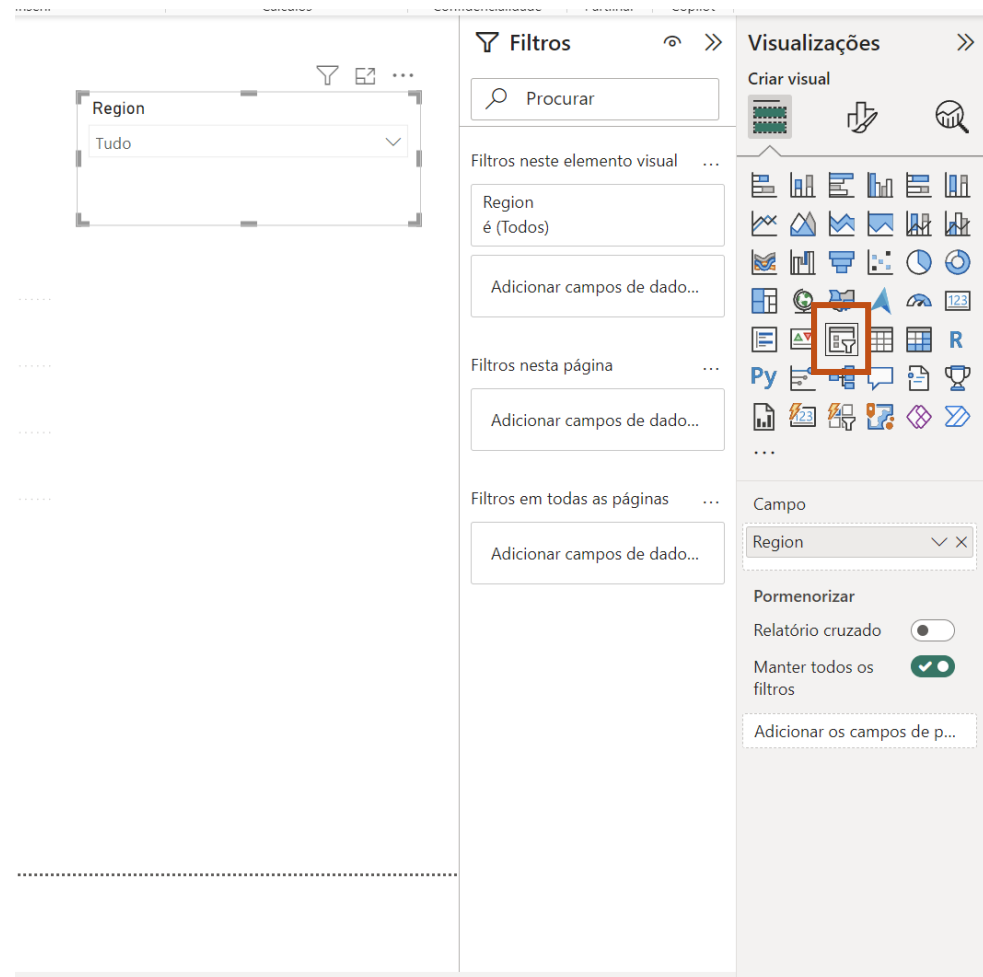
## Visuals

Interactive **charts, graphs, and representations** that transform data into meaningful insights, enabling users to analyze trends and make informed decisions effectively.



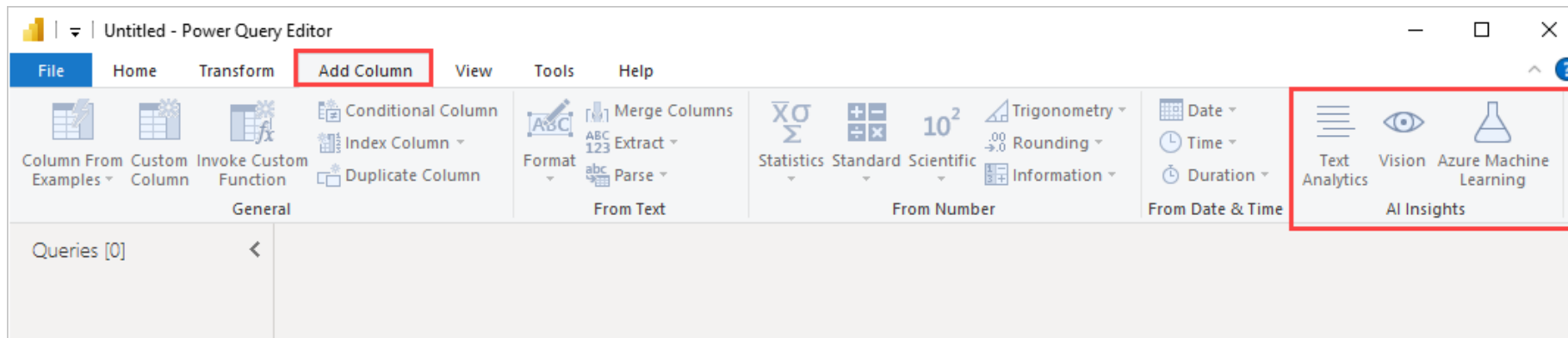
# Recap: Power BI Concepts

## Filters



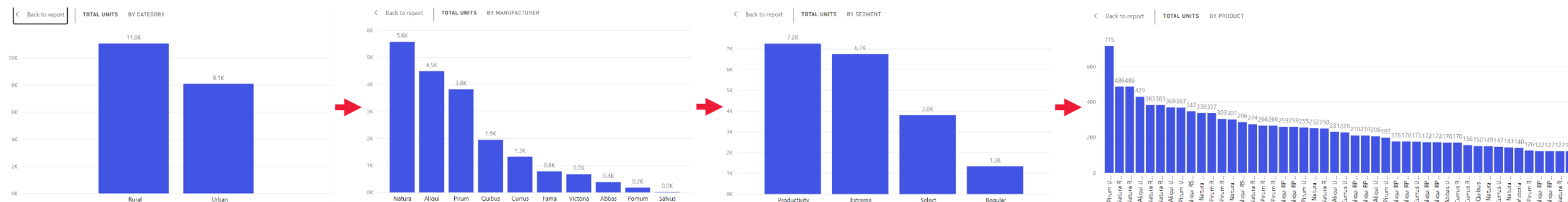
# Key Features For Sentiment Analysis

- **Integration with Azure Cognitive Services:**
  - **Sentiment Scoring:** Power BI connects seamlessly with Azure Cognitive Services to analyze text and assign a sentiment score.
  - **Key Phrase Extraction:** Extracts significant phrases from text for insights into trends and topics.



# Key Features For Sentiment Analysis

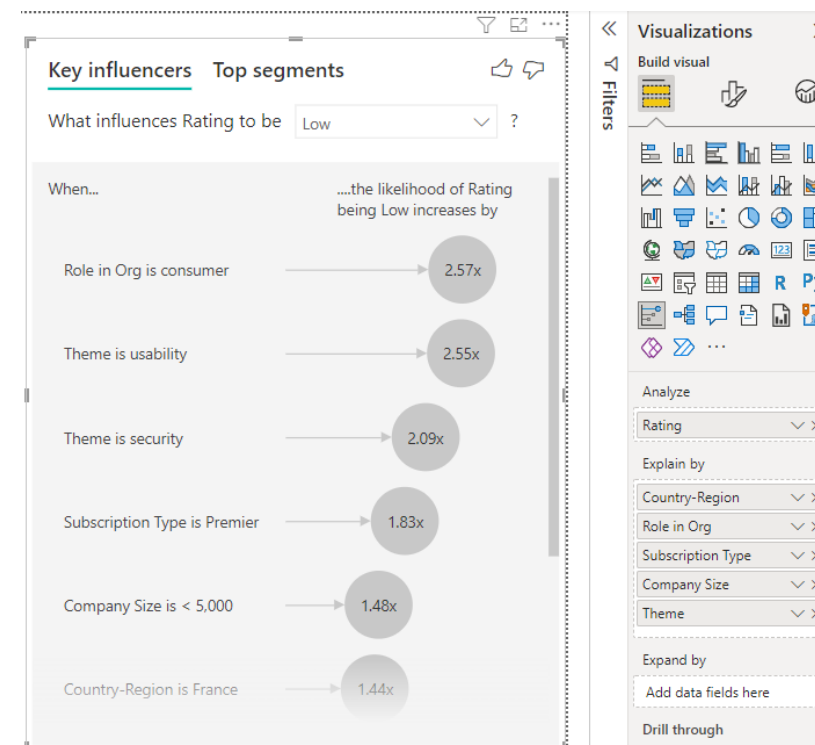
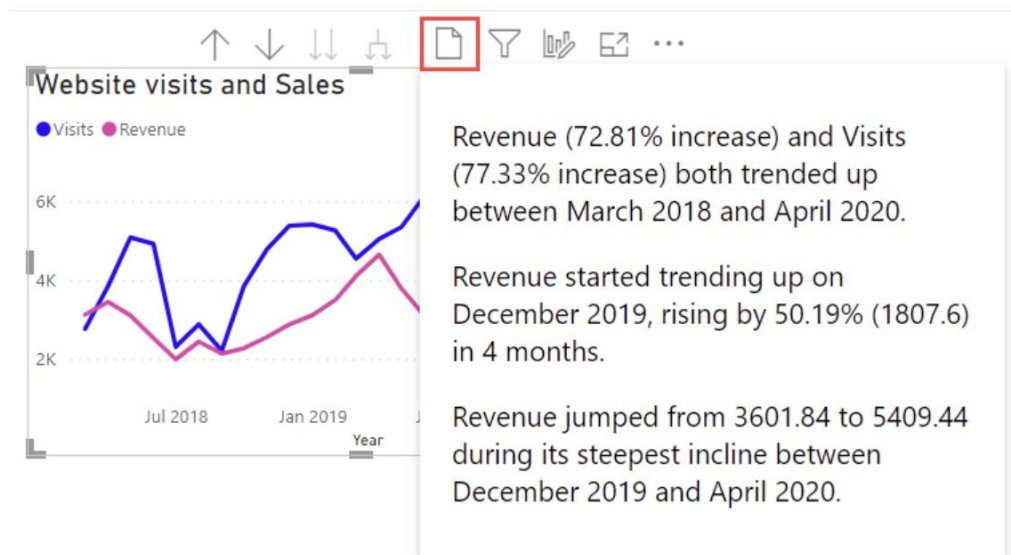
- **Data Connectivity**
  - Multiple data sources and real-time data refresh
- **Advanced Visualization**
  - **Customizable Dashboards:** Build tailored, interactive visuals to represent sentiment data.
  - **Data Drill-Down:** Explore specific data points for granular sentiment insights.



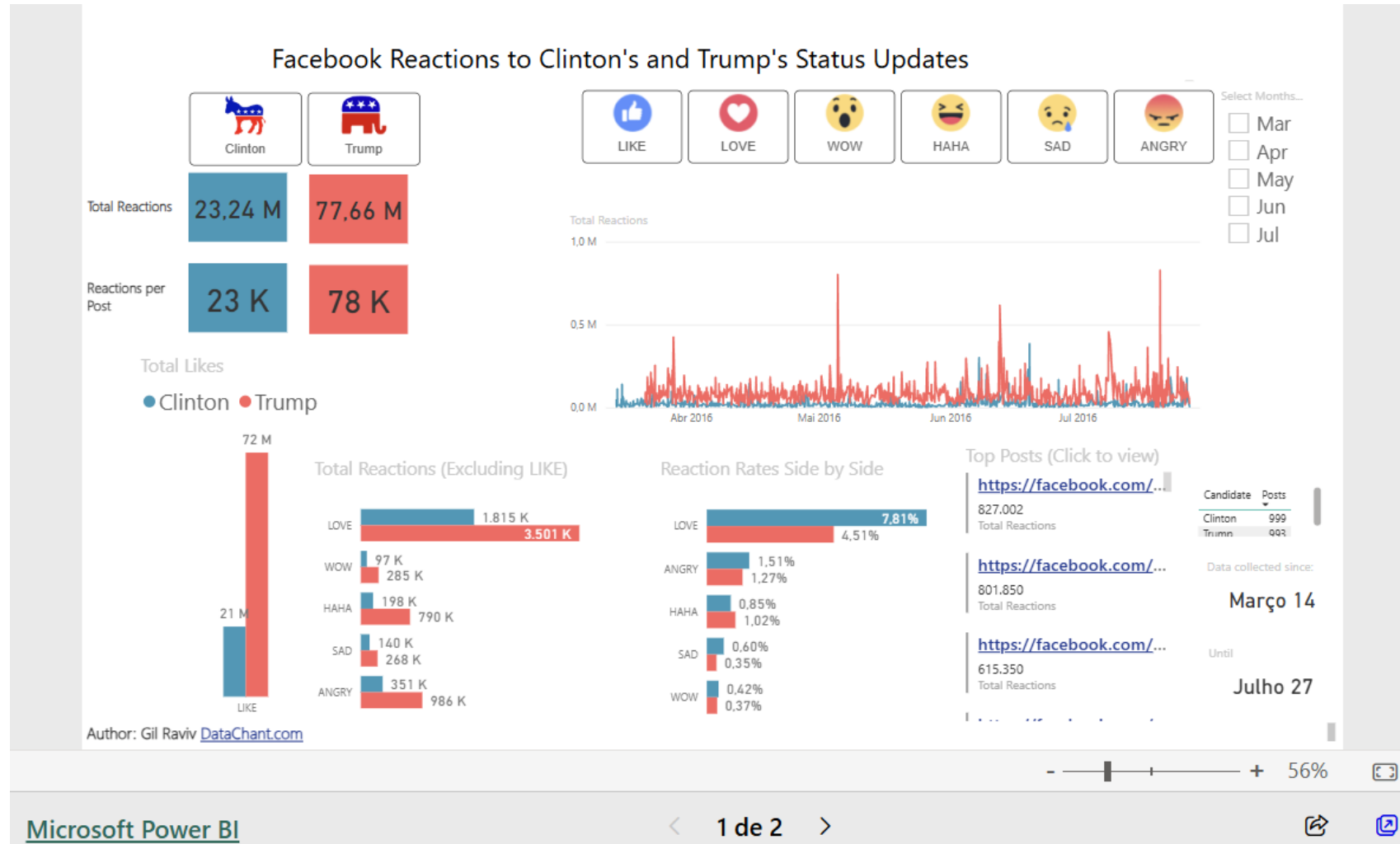
# Key Features For Sentiment Analysis

- **AI-Driven Insights**

- **Smart Visualizations:** Features like Smart Narrative and AI visuals highlight trends and anomalies in sentiment data.
- **Natural Language Querying:** Use Q&A features to get instant visualizations by typing queries like "Show sentiment trends over time."

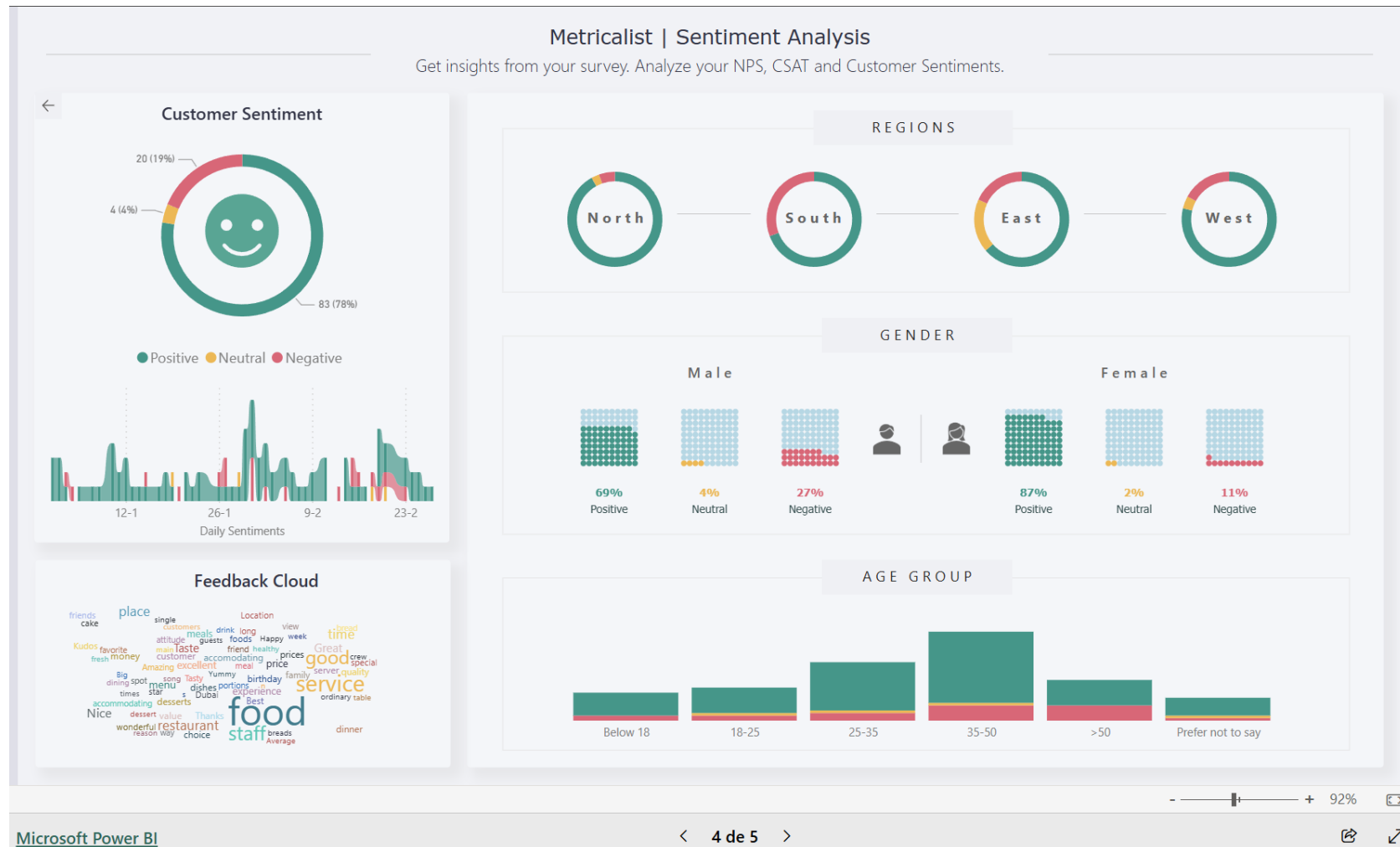


# Sentiment Analysis Dashboard Example



<https://app.powerbi.com/view?r=eyJrIjojMTZmYjQ3MGYtYWM1MS00NzExLWFINTU0NTkyNjNmM2Y3NDIhIiwidCI6IjlyNzNjNDFlLWI4ZDAtdmVhZi1iZWU2LWUwODQ5NmFINjcxOCIsImMiOiJN9>

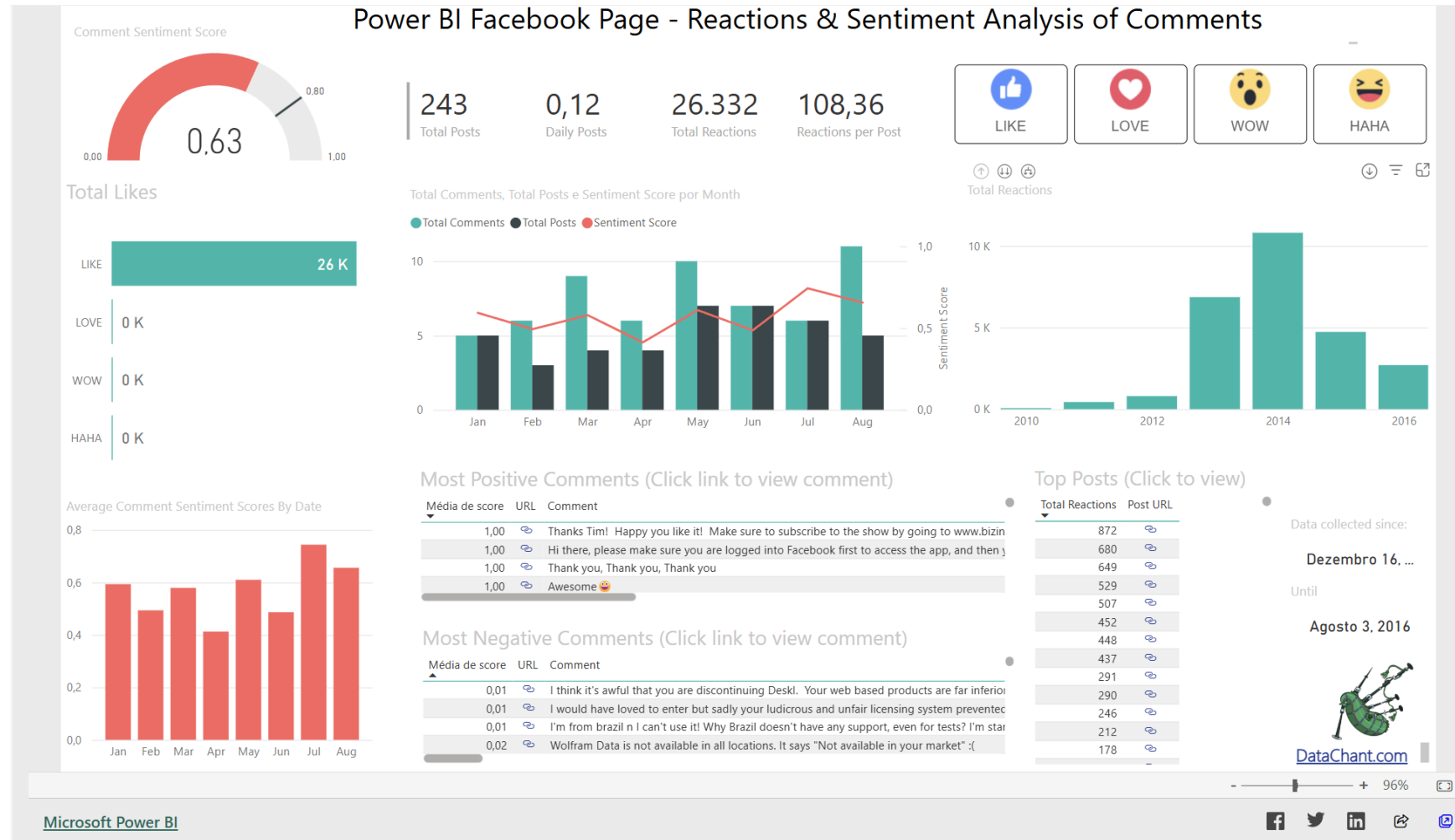
# Sentiment Analysis Dashboard Example



<https://community.fabric.microsoft.com/t5/Data-Stories-Gallery/Customer-Satisfaction-Report-by-Metricalist/m-p/3724415>



# Sentiment Analysis Dashboard Example



<https://community.fabric.microsoft.com/t5/Data-Stories-Gallery/Sentiment-Analysis-of-Comments-amp-Reactions-to-Power-BI/m-p/56351>

# Exercise

- Using the results from the previous exercise in Power Automate, create an interactive and visual sentiment analysis dashboard in Power BI. The dashboard should allow users to explore and analyze the sentiment data in an intuitive way.
- Suggested Visuals:
  - Sentiment Score Distribution (Bar or Column Chart):** Display the distribution of sentiment scores (positive, neutral, negative) across the dataset.
  - Sentiment Trend (Line Chart):** Show how sentiment changes over time (e.g., by month or week).
  - Key Phrases Analysis (Word Cloud or Bar Chart):** Display the most frequent key phrases extracted from the data, highlighting the most discussed topics.
  - Sentiment by Region (Map or Bar Chart):** Visualize sentiment scores by geographic region, if applicable.
  - Sentiment Breakdown (Donut or Pie Chart):** Show the percentage of positive, neutral, and negative sentiment in the dataset.