BTEC
Alliance with FPT Education

BUSINESS PROCESS SUPPORT

ASSIGNMENT 1

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- Discussion on how data and information support business processes, including the value they have for organisations
- Discussion of how data is generated and used by organisations to support business processes and the tools for manipulation to form meaningful data.
- Assess the value of data and information to individuals and organisations in relation to real-world business processes.

THE ROLE OF DATA AND INFORMATION IN BUSINESS PROCESSES

1.DEFINITION OF DATA AND INFORMATION.

a. Data:

- Definition: Data refers to raw, unprocessed facts and figures collected from various sources. These can be numbers, text, images, or any other forms of basic units of information
- Example: In the context of ABC Manufacturing, data can include:
  - Sales numbers
  - Customer feedback
  - Sensor readings from production equipment
  - Inventory levels

THE ROLE OF DATA AND INFORMATION IN BUSINESS PROCESSES

1. DEFINITION OF DATA AND INFORMATION.

b. Information

- Definition: Information is data that has been processed, organized, or structured in a way that adds meaning and context, making it useful for decision-making.

- Example:

  - When ABC Manufacturing analyzes sales data to identify trends and patterns, the processed results provide valuable information that can guide business strategies.
  - Summarized production data showing efficiency metrics and performance indicators.

THE ROLE OF DATA AND INFORMATION IN BUSINESS PROCESSES

2. THE VALUE OF DATA AND INFORMATION FOR ORGANIZATIONS

- Decision-Making: Data and information provide the foundation for making informed business decisions. Accurate data helps managers choose the best course of action.
- Operational Efficiency: Data-driven insights can streamline operations, reduce waste, and improve overall efficiency.
- Strategic Planning: Long-term strategies are formulated based on comprehensive data analysis, enabling businesses to anticipate market changes and stay competitive.
- Risk Management: By analyzing data, businesses can identify potential risks and implement measures to mitigate them.
- Performance Measurement: Data helps in tracking performance metrics, assessing progress, and identifying areas for improvement.

THE ROLE OF DATA AND INFORMATION IN BUSINESS PROCESSES

3. EXAMPLES OF DATA AND INFORMATION IN BUSINESS:

- Sales Data: Detailed records of products sold, including quantities, prices, and customer details.
- Market Trends: Information on market conditions, competitor activities, and industry developments.
- Customer Feedback: Insights gathered from customer reviews, surveys, and support interactions.
- Production Metrics: Data on manufacturing output, efficiency, and resource utilization.

THE ROLE OF DATA AND INFORMATION IN BUSINESS PROCESSES

4. HOW THEY SUPPORT BUSINESS PROCESSES:

- Use historical data and market trends to predict future sales and demand.
- Inventory Management: Optimize inventory levels based on demand forecasts to reduce carrying costs and avoid stockouts.
- Resource Allocation: Allocate resources effectively by understanding usage patterns and production needs.
- Customer Relationship Management: Use customer data to personalize marketing efforts and improve customer service.
- Performance Optimization: Analyze operational data to identify bottlenecks and areas for process improvement.

DATA GENERATION AND TOOLS FOR MANIPULATING DATA TO SUPPORT BUSINESS OPERATIONS

1.DATA GENERATION IN ORGANIZATIONS

Sources of Data Generation:

- Generated from daily business transactions, such as sales, purchases, and financial transactions.
- Produced from routine operations including manufacturing, logistics, and inventory management. Example: Manufacturing Execution Systems collect data on production line activities.
- Collected from customer interactions and feedback through various channels like Customer Relationship Management systems, social media, and surveys.
- Acquired from external sources such as market research reports, competitor analysis, and industry trends.

DATA GENERATION AND TOOLS FOR MANIPULATING DATA TO SUPPORT BUSINESS OPERATIONS

2.DATA COLLECTION TOOLS

Data Analytics Software:

- Tableau: For visualizing and analyzing data through interactive dashboards and reports. Example: Creating visual dashboards to monitor sales trends and inventory levels at ABC Manufacturing.
- Power BI: Microsoft's analytics service for business intelligence, providing insights through data visualization. Example: Generating interactive reports on production efficiency and customer feedback.

DATA GENERATION AND TOOLS FOR MANIPULATING DATA TO SUPPORT BUSINESS OPERATIONS

2. DATA COLLECTION TOOLS

Data Processing and Transformation Tools

- ETL (Extract, Transform, Load) Tools: Extract data from various sources, transform it into a suitable format, and load it into databases or warehouses. Example: Talend and Apache NiFi for data integration and transformation tasks.
- Data Integration Platforms: Combine data from different sources into a unified view. Example: Informatica and MuleSoft integrate data from disparate systems for comprehensive analysis.

Data Storage Solutions

- Usage: Structured storage solutions for transactional and operational data.
- SQL databases like MySQL and PostgreSQL store detailed sales and inventory data.Example: Storing and retrieving sales transactions, production data, and inventory levels.

2.DATA COLLECTION TOOLS

Machine Learning and AI Tools

- Scikit-Learn: A Python library for machine learning, offering tools for predictive analytics and data mining. Example: Predicting future sales based on historical data and market trends.
- TensorFlow: An open-source platform for machine learning, used for training models to recognize patterns and make predictions. Example: Developing models to forecast demand and optimize inventory.

DATA GENERATION AND TOOLS FOR MANIPULATING DATA TO SUPPORT BUSINESS OPERATIONS

3.UTILIZING DATA TO SUPPORT BUSINESS PROCESSES

- Decision-Making: Data aids in recognizing market trends, customer preferences, and demand patterns, optimizing pricing, developing new products, and allocating resources efficiently. Example: Sales data analysis helps businesses predict product demand, allowing for better production planning and inventory management.
- Performance Monitoring: KPI Tracking: Data is used to monitor and evaluate Key Performance Indicators (KPIs) across various business functions, tracking progress, identifying improvement areas, and measuring strategy effectiveness. Example: Monitoring sales performance data helps identify top-performing products and sales regions, as well as areas needing improvement.

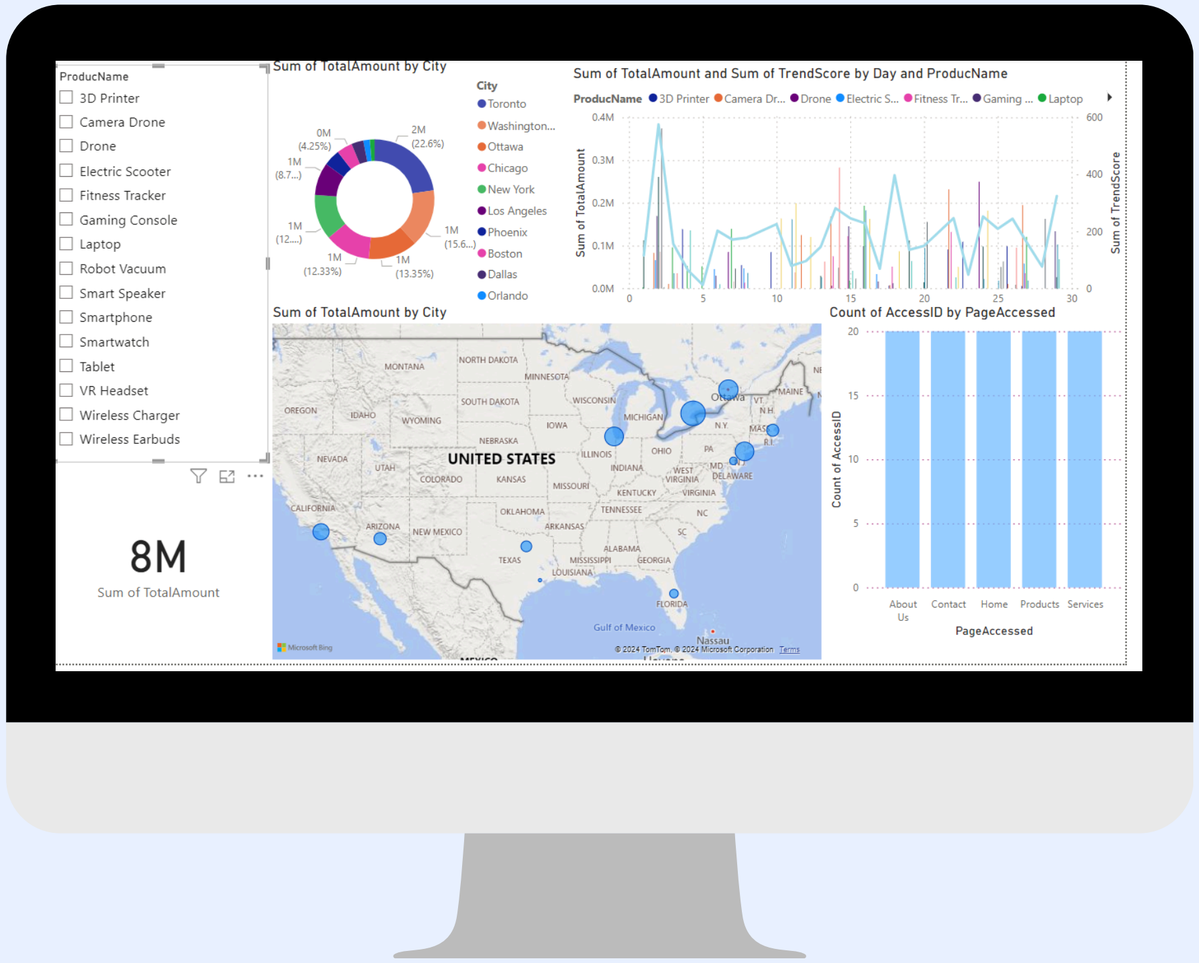
3.UTILIZING DATA TO SUPPORT BUSINESS PROCESSES

- Forecasting and Optimization: Historical data and advanced predictive analytics techniques enable organizations to build models for forecasting future trends, predicting demand, and optimizing inventory levels. Example: Predictive models using sales history and market trends forecast future demand, ensuring appropriate inventory levels are maintained.
- Data-driven insights enable organizations to personalize applications, tailor marketing campaigns, and deliver customized customer experiences.Example: By analyzing customer data, businesses can segment customers and provide targeted recommendations or promotions, enhancing customer satisfaction and loyalty.

EVALUATING THE IMPACT OF DATA AND INFORMATION ON BUSINESS PROCESSES

SCENARIO

ABC Manufacturing, a multinational consumer electronics company, faces significant supply chain management challenges. Leveraging data and information, the company has achieved substantial operational improvements. Power BI, a powerful data analysis tool, creates insightful dashboards showcasing key performance metrics like total sales by category, revenue trends, product sales proportions, product trend scores, and customer access frequency. These visualizations support informed decision-making, optimize supply chain management, and enhance customer satisfaction.



EVALUATING THE IMPACT OF DATA AND INFORMATION ON BUSINESS PROCESSES

APPLICATION OF POWER BI FOR STRATEGIC DECISION-MAKING AT ABC MANUFACTURING

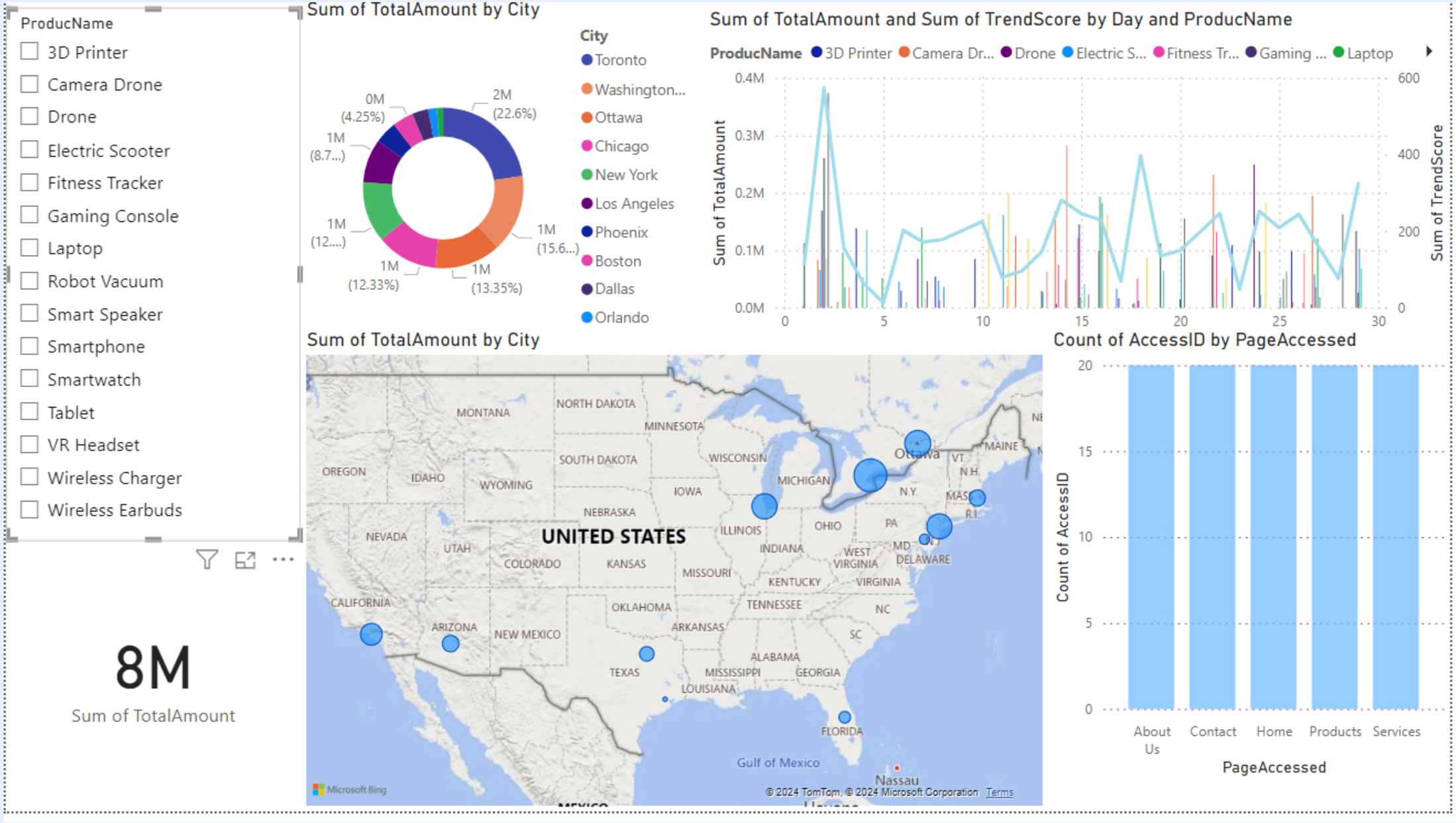
The project focused on integrating multiple data sources:

- Customer Table: Stores customer information.
- Product Table: Contains product details.
- Access Table: Records customer access to different pages.
- Sale Table: Captures sales transactions.
- Trending Table: Evaluates product trends over time.

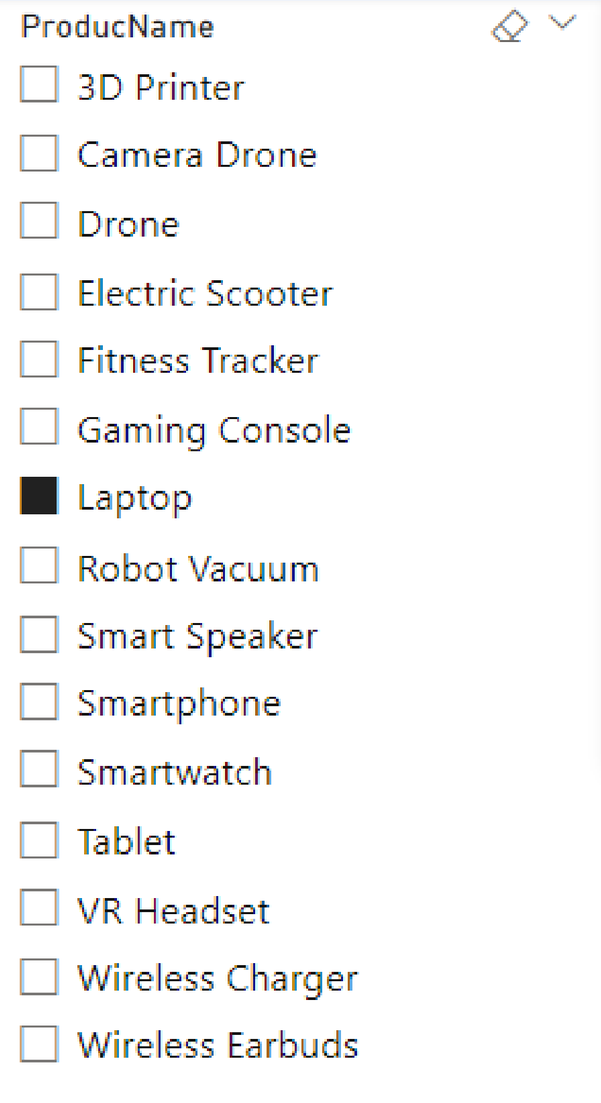
Objectives:

- Integrate Data Sources: Consolidate data from various sources into a unified Power BI dashboard.
- Analyze and Visualize Data: Create visual representations to easily interpret complex data sets.
- Support Decision-Making: Provide business leaders with clear, actionable insights to improve operational efficiency and strategic planning.

POWER BI VISUALIZATIONS:

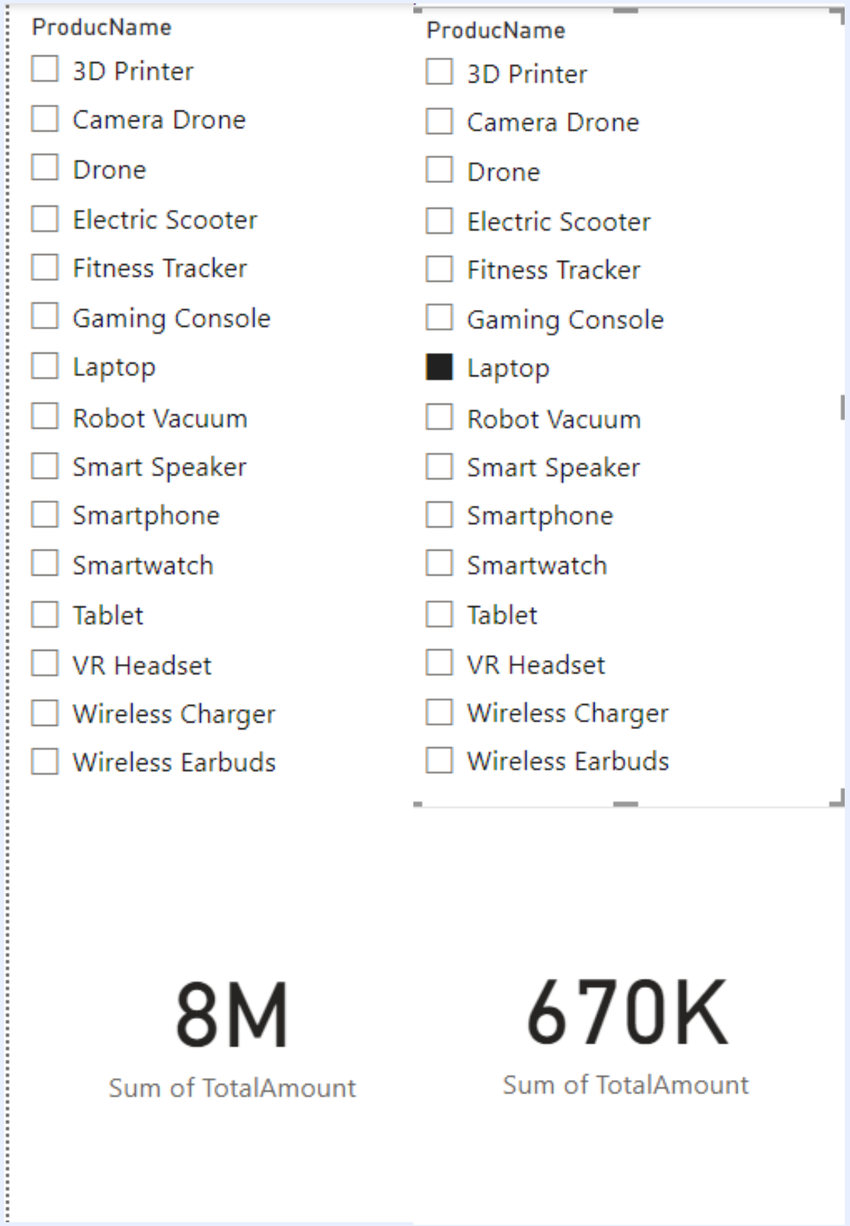


SLICER FOR PRODUCT NAME



- A slicer for product names allows users to filter and analyze data for specific products. When a product is selected from the slicer, the charts will update to display data related to that product, providing users with a clear and detailed view of the performance and trends of each product
- Using a slicer for product names in Power BI helps ABC Manufacturing conduct detailed and easier analysis, improving supply chain management and product development. The slicer provides strong interactivity, enabling managers to make strategic decisions based on specific data, enhancing operational efficiency and customer satisfaction.

CARD COMBINED WITH SLICER

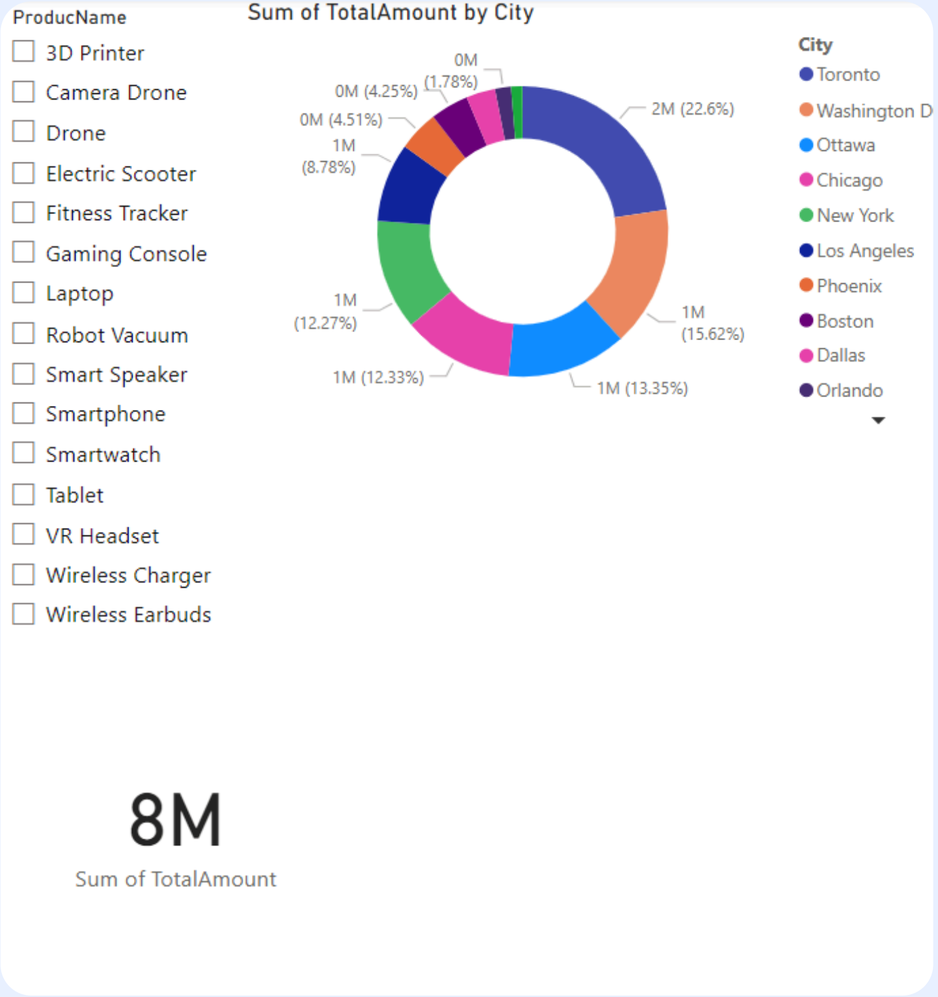


- Card displaying total revenue (TotalAmount) help company track business performance easily and quickly.
- When combined with a slicer, the card will display the totalAmount of a specific product when the user selects that product from the slicer.
- Example:

  + Before selecting products from the cutter: The card shows the total amount for all products, for example: 8M (8 million).

  + After combining select Products from slicer: When a user selects the product “Laptop” from the slicer, the card will update to only show totalAmount for the product “Laptop”(670K). The value displayed will change based on data filtered from the Sales table related to Product [Product Name].

DONUT CHART: SUM OF TOTALAMOUNT BY CITY

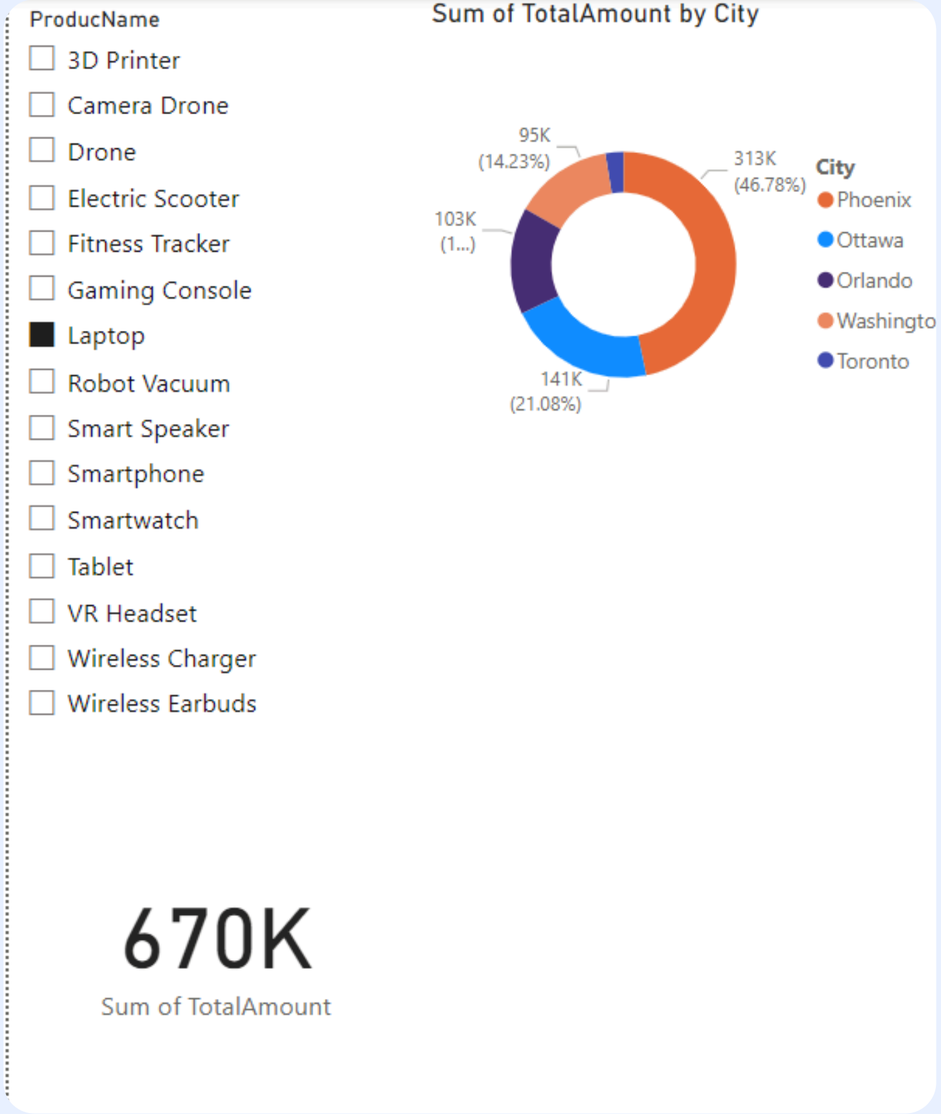


This chart shows total amount by city. For example:

- Toronto: 2 million (22.6%)
- Washington: 1 million (13.35%)
- Ottawa: 1 million (12.33%)
- Chicago: 1 million (15.6%)
- New York: 1 million (12.33%)
- Los Angeles, Phoenix, Boston, Dallas, Orlando: These cities have smaller totalAmount (4.25%-8.7%)

=> Conclusion: Toronto is the city with the highest revenue, accounting for 22.6% of total revenue, followed by Chicago, Washington and Ottawa.

DONUT CHART: SUM OF TOTALAMOUNT BY CITY

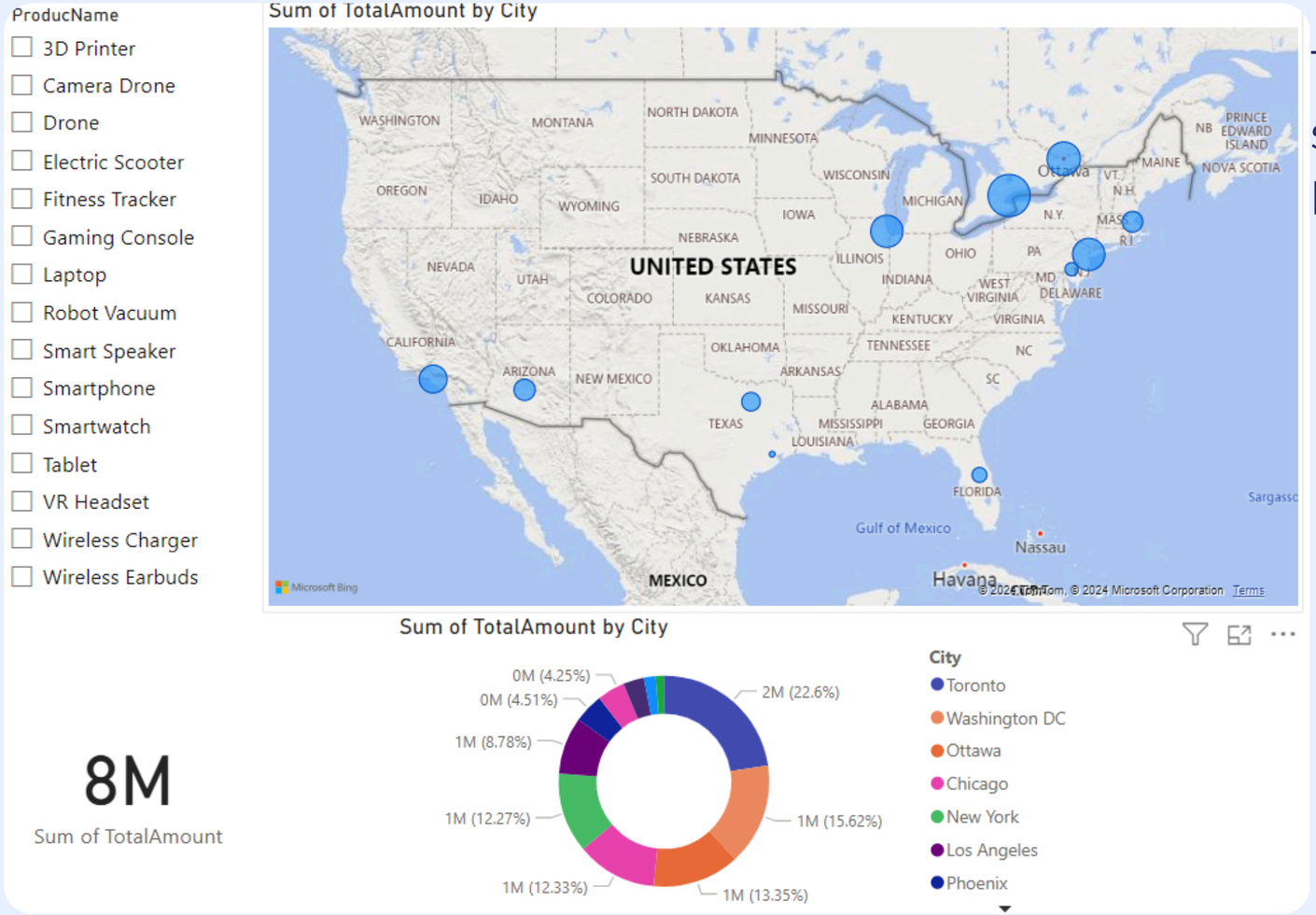


- When considering all products, Toronto leads in sales.
- However, when considering only Laptops, Ottawa leads with sales accounting for nearly half of totalAmount for Laptop (46.78%), while Toronto has no Laptop sales.
- Cities like Washington, Phoenix, and Orlando still show significant laptop sales, though not as high as their total sales for all products.

=> Toronto, despite being the leader in total product sales, shows no revenue for laptops, indicating a need for specific strategies to improve laptop sales in this city.

Ottawa, while not leading in total product sales, has the highest laptop sales, indicating a particular focus or interest in this product in the city.

MAP

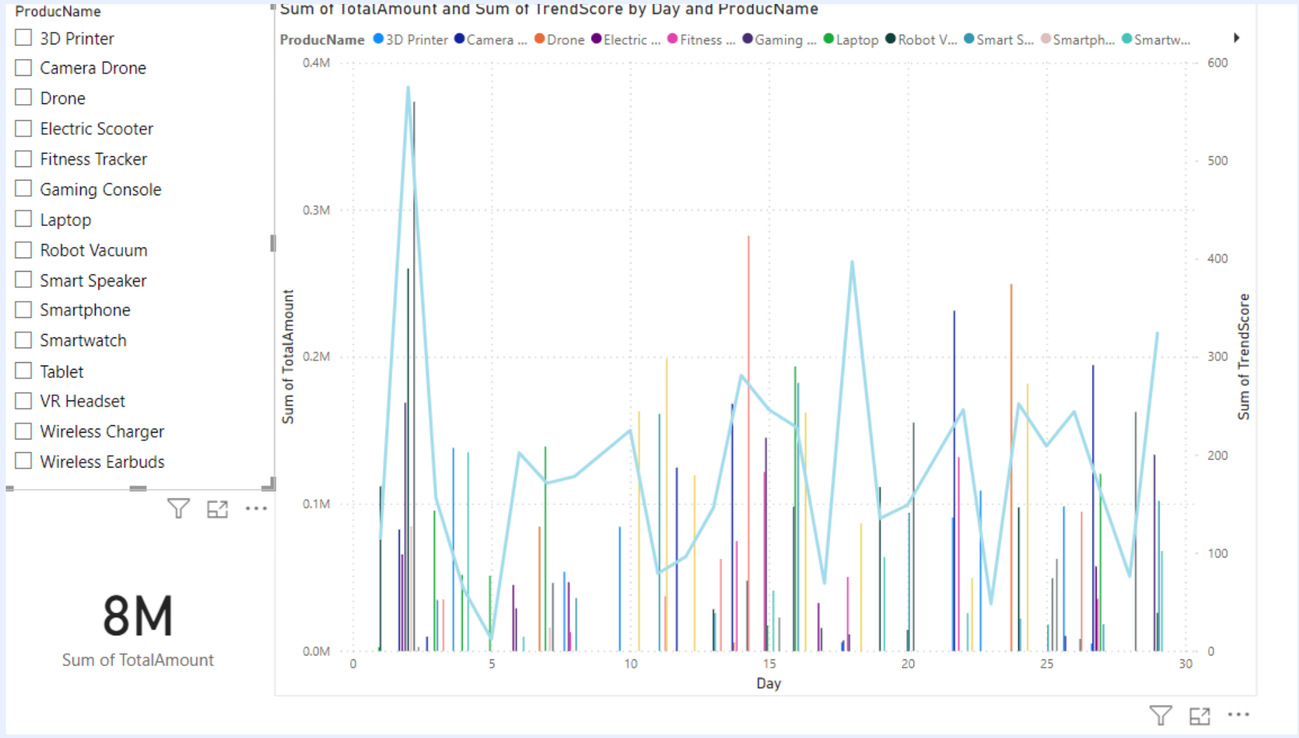


The map chart shows total sales by city with the size of the bubble representing total revenue.

Example:

- Cities with highest revenue: New York, Chicago, and Toronto are the cities with the largest bubbles, showing the highest revenue.
- Cities with average revenue: Philadelphia, Boston, and Dallas have moderate bubbles, indicating average revenue.
- Cities with lower revenue: Orlando, Los Angeles, and Phoenix have smaller bubbles, indicating lower revenue.

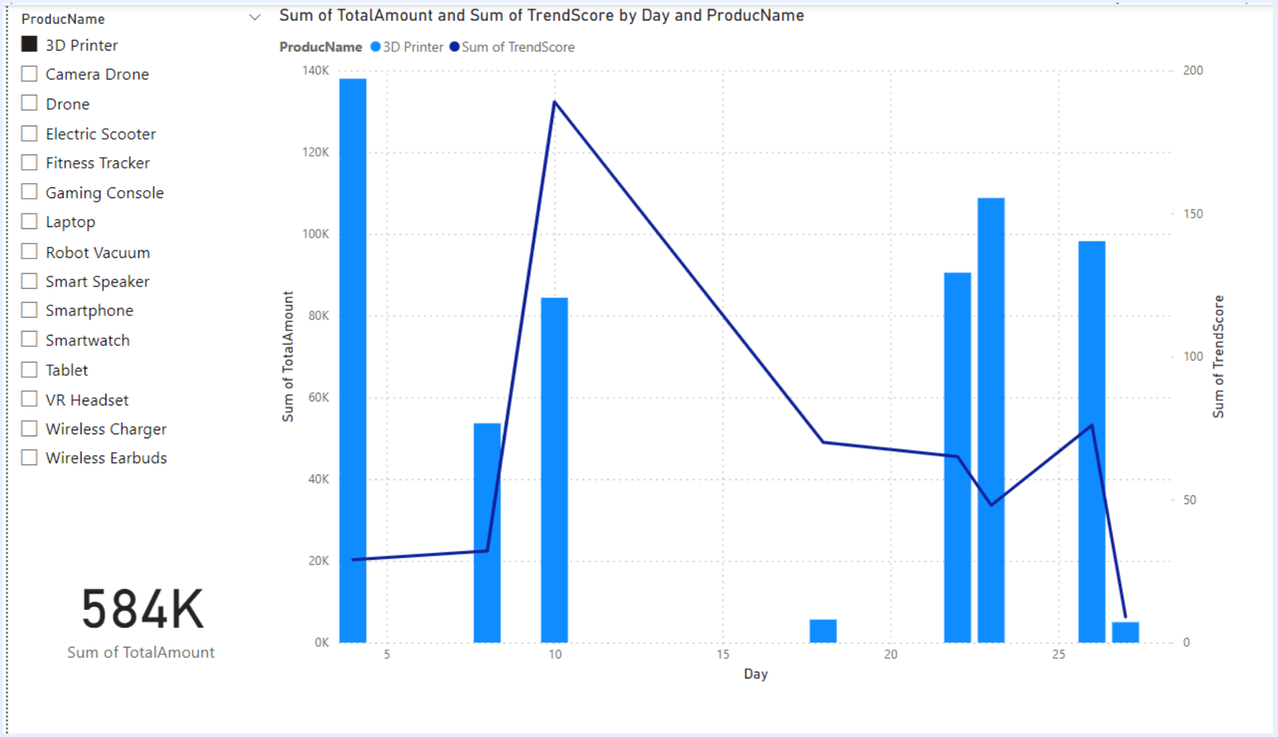
LINE AND CLUSTERED COLUMN CHART



This chart presents the daily total amount and trend score for various product names over a month. It provides insights into the performance of different products and their trends over time.

- Line: Represents the "Sum of TrendScore" - the trend score of all products over time.
- Column Represents "Sum of TotalAmount" - total amount sold of all products over time
- X axis (Horizontal Axis): Represents TrendDate
- Left Vertical Axis: Represents the total amount sold (Sum of TotalAmount)
- Right Vertical Axis: Represents the trend score (Sum of TrendScore)

LINE AND CLUSTERED COLUMN CHART

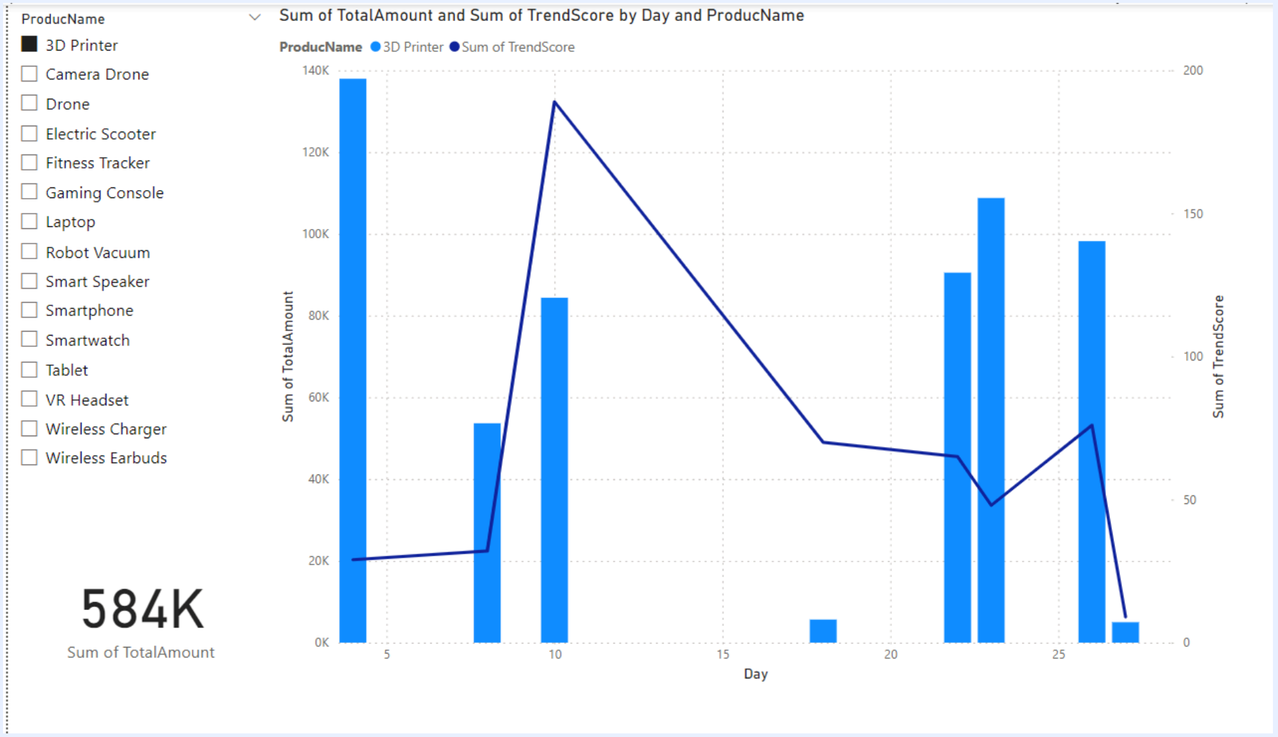


This is a Power BI chart showing the total amount and trend score of the product "3D Printer" according to TrendDate:

TotalAmount:

- Beginning of the month (Day 1-5): Total amount increased sharply, peaking at about 140K on Day 4.
- From Day 6-10: Total amount reached about 84K on day 10, then decreased significantly.
- Mid-month (Day 11-21): Total amount drops sharply and there is almost no revenue.
- End of month (Day 22-30): The total amount increases again, reaching about 100K on the 23th and 26th, then drops sharply on the 30th.

LINE AND CLUSTERED COLUMN CHART



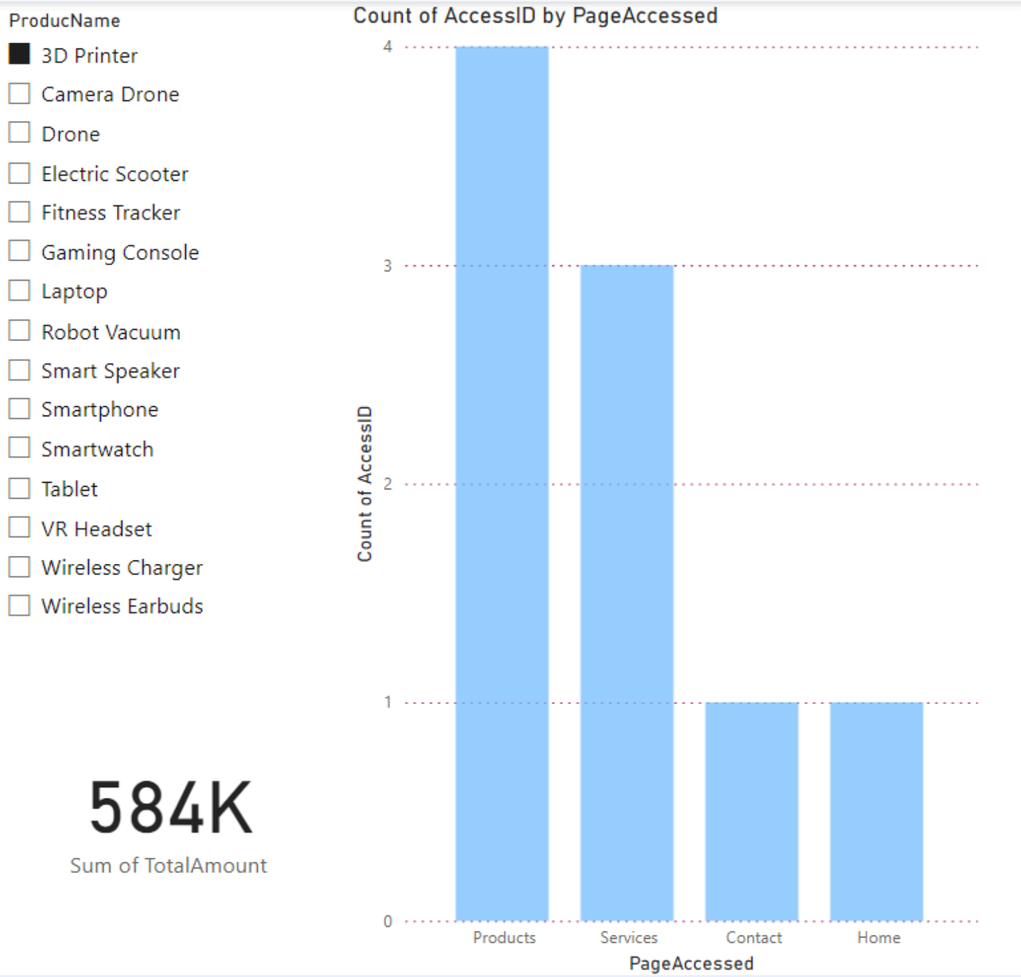
This is a Power BI chart showing the total amount and trend score of the product "3D Printer" according to TrendDate:

TrendScore

- Beginning of the month (Day 1-10): Trend point increases slowly and peaks on day 10 (trend score about 189)
- Days 11-17: Trend point drops sharply after day 10.
- Day 18-26: Trend point starts to increase again.
- End of month (Day 27-30): Trend points decrease sharply at the end of the month.

=> By analyzing this chart, ABC Manufacturing can identify key sales and engagement trends, allowing them to make data-driven decisions for marketing, promotions and inventory management .

STACKED COLUMN CHART



- This chart helps in understanding user behavior when visiting the website and is filtered by product name using a slicer. From this, we can develop strategies to improve user experience and increase interaction with relevant pages. Optimizing high-traffic pages and improving lesser-accessed pages will enhance overall user satisfaction and drive sales.

Example: Website Page Access Data with ProductName is "3D Printer":

- Products: 4 AccessIDs
- Services: 3 AccessIDs
- Contact: 1 AccessID
- Home: 1 AccessID

=> By focusing on user needs and desires, we can create a more user-friendly, effective website that attracts more visits, thereby increasing revenue and ensuring sustainable growth.

EVALUATING THE IMPACT OF DATA AND INFORMATION ON BUSINESS PROCESSES

THE IMPORTANCE OF DATA AND INFORMATION

Data and information from data sheets helped ABC Manufacturing:

- Forecasting product trends: Based on data from the Trending and Sales tables, the company can forecast the consumption trends of products over time.
- Inventory management: Use sales data and product information to optimize the inventory management process, minimizing shortages or excess goods.
- Enhance customer satisfaction: Analyze customer visit data and shopping behavior to personalize marketing strategies and improve customer experience.

=> **PowerBI has had a profound impact on ABC Manufacturing's business. By effectively using data and information, the company has achieved many important achievements such as revenue growth, process optimization and improved customer satisfaction. Applying lessons from this project will be the foundation for sustainable development and continuous improvement in the future.**

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THANK YOU