**TOY SALES ANALYTICS**

**BUSINESS PROBLEM**

Angani company wants to better understand its toy sales performance and gain actionable insights that can help in improving sales. The manager is looking for a data-driven way to make strategic decisions. This project aims to create a dashboard that provides clear and intuitive insights.

Key questions:

1. What are the sales trends over time?
2. Which products perform best and which are underperforming?
3. Who are the most valuable customers?
4. What actionable insights can help the company improve sales?

**Objective**:

Main objective:

* Create a dynamic, intuitive power BI dashboard that consolidates these insights.

This dashboard will help the manager:

* Track overall sales trends over time by region and branch
* Identify top-selling and underperforming products by overall category performance
* Identify high-value performance and geographical sales distribution.
* Use actionable insights to make informed decisions.

**DATA UNDERSTANDING**

This dataset consists of three main components:

1. Main Data - contains individual sales transaction records.
2. Product Master - contains information on the different products available for sale linking to the Main Data via *productCode.*
3. Data Dictionary - provides description for each field across *Main Data* and *Product Master.*

The main data contains columns that provide:

* Order details
* Temporal information
* Product information
* Customer information
* Branch information

The data has 22 columns and 2 columns contain missing values:

* postalCode - contains 76 missing values
* Territory - contains 1074 missing values

**DATA PREPARATION**

1. **Handling missing values in the Territory column**

To address the missing values, we decided to impute them based on the *country* column. For entries where the *country* is USA or Canada and *Territory* is missing, we set *Territory* to NA (North America).

1. **Handling missing values in the postalCode column**

We decided to fill these missing values with 0 as a place holder, representing unknown postal codes.

1. **Combining contact first and last names**

We combined *contactFirstName* and *contactLastName* into a new column *contactName.* After merging, we removed the original *contactFirstName* and *contactLastName* columns to keep the data streamlined.

1. **Creating a Single Date Column**

We combined the *YEAR\_ID*, *MONTH\_ID* and *DAY\_ID* into a new column *Date*. After merging we removed the original columns to reduce redundancy.

1. **Merging datasets**

To enrich the *Main Data* with product-specific details, we performed a merge with the *Product Master* dataset using the *productCode* column as the key.

* Merge Type: we used an inner join to include only records with a matching *productcode* in both datasets.
* The merged dataset now combines the sales transaction data with additional product details. This merged dataset, *Sales*, will be the foundation for further exploration and analysis.
* Also we confirmed on the shape, columns, full information, whole description and the null values of the *sales* data.

**DATA PREPROCESSING**

In this step we decided to add calculated columns for more business insights.

**1. Checking the numeric columns**

First, we began by checking the numeric columns which will help in identifying the fields to use for calculations, visualizations and key performance indicators(KPIs)

**2. Calculating the Total costs**We calculated the *TotalCosts* which is the value of *QuantityOrdered* by the *CostPrice.* This column represents generated revenue from purchasing a specific quantity of a product before you sell it to the customers.

This will be helpful for calculating profitability.

**3. Calculating the Total Sales Amount**

We decided to calculate the *TotalSalesAmount* which is the value of *QuantityOrdered* by the *PriceEach* of each product. This column represent the revenue generated from selling a specific quantity of a product at a given price.

This is essential for understanding overall sales performance and will help in calculation of the profit.

**4. Calculating profit**

To get the *profit* we took the difference between *TotalsalesAmount* and *TotalCosts.* This will be crucial for assessing profitability and performance.

**5. Calculating profit margin**

We changed the profit into percentage through dividing *Profit* by *TotalCost* and then multiplying by 100. This allowed us to assess the profitability of our sales relative to our costs.

**6. Calculating total discounted**

It showed us how much revenue was lost due to discounts. This was calculated by *MSRP* multiply by *QuantityOrdered* minus the *TotalSalesAmount.*

**EXPLORATORY DATA ANALYSIS (EDA)**

The following visual analysis were made to be used to identify patterns and guide decision-making for the dashboard:

**1. Sales by Product Line Analysis**

We created a bar chart which visualize the *total sales* amount by *productline.*

This visualization helped in identifying the top performing product lines. We identified that *classic cars* have the most sales.

**2. Consumption of the products by each country**

We identified the top 5 countries by product line sales. We used a grouped bar plot where by *countries* are on the x-axis and *product lines* on the y-axis being represented by different colors.

This visualization enabled a clear comparison of sales performance for each product line within the top 5 countries, showing the strongest product line in each country.

**3. Product Line Performance Across Territories**

We used a bar plot to visualize sales data, with each *productline* being displayed on the x-axis and the *total sales* on the y-axis. The territory is represented by different colors for allowing the direct comparison of each product line performed in various territories.

**4. Distribution of Sales by Branch**

We used a donut chart to visualize the distribution of sales across branches. The chart displays each branch's proportion as a percentage, with different colors representing different branches. It helped in giving a clear view of the sales contribution of each branch. **Beergenville** branch had the most sales(49.0%),**Geiselweg** had the least sales of(5.6%)

**5. Top 10 Contact Persons with the Most Sales** We created a bar plot to display the *top* *10* *contact* *persons* on the x-axis and their *total* *sales* on the y-axis. This analysis was valuable for identifying high-performing contacts. The contact person with the most sales is **Diego Freyre.**

**6. Top 5 Customers with the Highest Sales**

We created a bar chart to visualize the top 5 customers, with *CustomerName* on the x-axis and *Total* *Sales* on the y-axis. This chart highlighted the top customers based on sales, offered insights into which customers generated the most revenue. The customer with the highest sales is **Euro Shopping Channel**, as indicated by the tallest bar in the chart.

**7. Top 10 Customers with the Most Quantity Ordered**

We plotted a bar chart to visualize the top 5 customers, with *CustomerName* on the x-axis and *Total Quantity Ordered* on the y-axis. This chart highlighted customers who have ordered the most products by quantity, providing insights into high-demand customers. The customer with the most quantity ordered is **Euro Shopping Channel**, as indicated by the tallest bar in the chart.

**8. Distribution of order status**

We used a bar plot to display the *Number of orders* by *each Order status*. This plot enabled the identification of the number of orders in each Order status which shows that **shipped** had the most number of orders.

**9. Total Profit by Branch**

We created a bar plot where x-axis represented the *branch* and y-axis represented the *total profit.* This bar plot gave us a clear comparison of profit in each branch. **Beergenville** has highest profit overall.

**10. Top 5 products by revenue**

We used a bar plot to visualize the top 5 products by revenue. Where we used the x-label as the *product code* and y-label as the *totalsales*. By calculating total sales revenue per product and identifying the top 5 products, this helped us pinpoint which products generated the most revenue.

#### **TOY SALES POWERBI ANALYSIS**

**HOME**

**DASHBOARD OVERVIEW**

The Toy Sales Dashboard provides a comprehensive view of key performance indicators (KPIs) related to toy sales. This dashboard allows users to filter data by **Country** and **Date**, and it includes navigation buttons to access deeper insights on branch, product, customer, and order trends.

#### **Filter Options**

* **Country**: Allows the user to filter data based on specific countries. By default, it shows data for all countries.
* **Date**: Allows filtering based on selected time periods. Default is set to include all dates.

#### **Key KPI Metrics**

1. **Total Sales**: Displays the total sales value. In this instance, it's shown as **$8.3M**.
2. **Gross Profit**: Shows the total gross profit, currently at **$2.9M**.
3. **Total Costs**: Displays the total costs incurred, shown as **$5.4M**.
4. **Total Discounts**: Indicates the total discounts given, amounting to **$1.7M**.
5. **Quantity Ordered**: Reflects the total quantity of products ordered, with a value of **99.07K**.

Each KPI is displayed in a highlighted box for quick visualization of financial performance and quantity metrics.

#### **Page Navigation**

Below the KPI section, a navigation area provides buttons to drill down into specific trend analyses:

* **Branch Trends**: Redirects to a page focused on analyzing sales trends across different branches.
* **Product Trends**: Provides insights into product performance and popularity.
* **Customer Trends**: Focuses on customer-related data, including demographics and purchasing behavior.
* **Order Trends**: Displays trends related to order volume, patterns, and frequency.

A **Next** button is provided on the bottom right for users to proceed to additional pages, enhancing dashboard interactivity.

#### **Instructions for Users**

1. **To Filter Data**: Use the dropdown menus for **Country** and **Date** at the top of the dashboard.
2. **To Navigate Pages**: Click on any of the four trend buttons to access detailed trend analysis, or press the **Next** button to move sequentially to the next page.

#### **Design Notes**

* **Color Scheme**: The dashboard uses a grey background with contrasting pink and black highlights to make key metrics and navigation options visually distinct.
* **Layout**: The dashboard layout is divided into a filtering section, KPI section, and navigation area for a streamlined user experience.

### **BRANCH TRENDS DASHBOARD**

#### **Dashboard Overview**

The Branch Trends Dashboard provides a detailed view of sales performance across different branches. It allows users to filter by **Product Line**, **Date**, and **Branch** to gain insights into branch-specific trends in total sales, quarterly sales distribution, profits, and quantities ordered.

#### **Navigation**

* **Home**: Returns the user to the main dashboard page.
* **Previous**: Takes the user back to the previous page in the dashboard.
* **Next**: Advances the user to the next page in the dashboard.

#### **Filter Options**

* **Product Line**: Allows the user to filter the data by specific product lines.
* **Date**: Provides the option to filter data by specific dates.
* **Branch**: Allows filtering by specific branches to focus on individual branch performance.

#### **Dashboard Components**

1. **Total Sales**
   * This KPI card displays the overall sales value, currently **$8.29M** for all branches combined.
2. **Sales by Branch**
   * A bar chart that breaks down total sales by branch, providing a quick comparison of sales across different locations.
   * Branches include:
     + **Bergenville**: $5.0M
     + **Skates Road**: $2.6M
     + **Geiselweg**: $0.7M
3. **Sales by Quarter, Month, and Branch**
   * A stacked area chart displaying sales trends over the months, segmented by branch and grouped by quarters.
   * This visualization highlights seasonal sales patterns and branch performance over the year, with peaks visible in specific months.
4. **Profits by Branch**
   * A donut chart showing the profit share for each branch.
   * The profit distribution is segmented as follows:
     + **Bergenville**: 59.85% (1.74M)
     + **Skates Road**: 31.24% (0.91M)
     + **Geiselweg**: 8.91% (0.26M)
5. **Quantity Ordered by Branch**
   * Another donut chart that displays the quantity of orders fulfilled by each branch, indicating order volume rather than revenue.
   * Breakdown by branch:
     + **Bergenville**: 53.01% (53K)
     + **Skates Road**: 39.5% (39K)
     + **Geiselweg**: 7.48% (7K)

#### **Instructions for Users**

1. **To Filter Data**: Use the filters at the top (Product Line, Date, Branch) to customize the data displayed on the dashboard.
2. **To Navigate**: Use the **Home**, **Previous**, and **Next** buttons at the top of the dashboard to move between pages.

#### **Design Notes**

* **Color Scheme**: The dashboard uses shades of blue, orange, and gray to differentiate branches and enhance readability.
* **Layout**: The layout groups key metrics at the top, with branch-specific details below, allowing users to quickly scan high-level metrics before diving into detailed branch analysis.

### **PRODUCT TRENDS DASHBOARD**

#### **Dashboard Overview**

The Product Trends Dashboard provides a comprehensive view of product performance across various dimensions, including total sales, quantity ordered, discounts, and product line breakdowns. This dashboard helps users identify trends and analyze sales data by product category and geographic distribution.

#### **Navigation**

* **Next**: Advances the user to the next page in the dashboard.
* **Previous**: Takes the user back to the previous page.
* **Home**: Returns the user to the main dashboard page.

#### **Filter Options**

* **Date**: Allows filtering data by specific dates to observe product trends over time.
* **Status**: Enables filtering based on product status or other criteria.
* **Product Line**: Provides the option to filter data by specific product lines to focus on individual product categories.

#### **Dashboard Components**

1. **Total Sales KPI**
   * A KPI card displaying the total sales, currently at **$8.29M**.
2. **Quantity Ordered KPI**
   * A KPI card showing the total quantity ordered, which is **99K** units.
3. **Total Sales by Product Line**
   * A bar chart breaking down total sales by each product line.
   * The **Classic Cars** category leads in sales, followed by **Vintage Cars** and **Motorcycles**. This visualization helps quickly identify the best-selling product lines.
4. **Total Sales, Quantity Ordered, and Total Discounted by Quarter and Month**
   * A line chart depicting the monthly and quarterly trends for total sales, quantity ordered, and total discounts.
   * Sales tend to peak in **November**, with consistent increases in **Q4**. This chart provides a view of how sales and discounts fluctuate over time.
5. **Total Sales by Territory and Product Line**
   * A stacked bar chart showing sales distribution by territory and product line, including **EMEA**, **NA**, **APAC**, and **Japan**.
   * **NA** and **EMEA** have the highest sales, particularly in the Classic Cars and Vintage Cars categories. This component helps analyze regional preferences in product lines.
6. **Total Sales by Country and Product Line**
   * A bar chart illustrating sales by country and product line.
   * The **USA** has the highest sales, especially in Classic Cars, followed by **Spain** and **France**. This chart helps identify top-performing countries for specific product categories.

#### **Instructions for Users**

1. **To Filter Data**: Use the filters at the top (Date, Status, Product Line) to customize the displayed data for specific product trends.
2. **To Navigate**: Use the **Next**, **Previous**, and **Home** buttons to move between pages in the dashboard.

#### **Design Notes**

* **Color Scheme**: A consistent color scheme differentiates product lines, providing a clear visual cue for each product category.
* **Layout**: Key metrics are highlighted at the top, with detailed breakdowns by product line, territory, and country below, enabling users to quickly transition from overall performance to specific insights.

### **CUSTOMER TRENDS DASHBOARD**

#### **Dashboard Overview**

The Customer Trends Dashboard provides an analysis of customer distribution and trends across various dimensions. It allows users to filter by **Product Line**, **Status**, **Country**, and **Date** to gain insights into customer demographics, sales by customer, and order quantities.

#### **Navigation**

* **Next**: Advances the user to the next page in the dashboard.
* **Previous**: Takes the user back to the previous page.
* **Home**: Returns the user to the main dashboard page.

#### **Filter Options**

* **Product Line**: Allows filtering data by specific product lines.
* **Status**: Enables filtering based on customer status or other predefined statuses.
* **Country**: Provides the option to filter data by specific countries.
* **Date**: Allows date-based filtering to examine customer trends over time.

#### **Dashboard Components**

1. **Customers KPI**
   * A KPI card that displays the total number of unique customers, currently at **92**.
2. **Customers by Month**
   * A line chart showing the number of customers on a monthly basis. This visualization helps track customer growth or fluctuations over time.
   * Notable trends include peaks in April and December, suggesting possible seasonal spikes in customer engagement.
3. **Customers by Country**
   * A bar chart showing the number of customers by country, with the highest representation from the **USA** followed by **France**, **Australia**, and **Spain**.
   * This chart provides a quick geographic breakdown of the customer base.
4. **Customers by Territory**
   * A donut chart that segments customers by territory, which includes **EMEA (47.83%)**, **NA (41.3%)**, **APAC (6.52%)**, and **Japan**.
   * This distribution reveals the regions with the highest customer concentration, with EMEA and NA having the largest shares.
5. **Total Sales by Customer Name**
   * A bar chart displaying total sales attributed to individual customers, with **Euro Shopping Channel** and **Mini Gifts Distributors Ltd.** as the top contributors.
   * This visualization helps identify the most valuable customers by sales volume.
6. **Quantity Ordered by Customer Name**
   * A horizontal bar chart showing the quantity of orders by each customer.
   * **Euro Shopping Channel** leads in order quantity with 9K orders, followed by **Mini Gifts Distributors Ltd.** at 6K.
   * This component aids in understanding order volume across the customer base.

#### **Instructions for Users**

1. **To Filter Data**: Use the filters at the top (Product Line, Status, Country, Date) to customize the data displayed on the dashboard.
2. **To Navigate**: Use the **Next**, **Previous**, and **Home** buttons to move between pages in the dashboard.

#### **Design Notes**

* **Color Scheme**: Consistent colors are used to differentiate regions, countries, and customer data, providing a cohesive visual theme.
* **Layout**: Key metrics and trends are presented at the top, with more detailed insights on territories and individual customer contributions below, enabling a logical flow from broad to detailed insights.

### **ORDER TRENDS DASHBOARD**

**Dashboard Overview**

This Power BI dashboard provides an in-depth view of order quantities, average order value, and average quantity ordered. It is categorized into different sections to highlight insights based on quantity ordered, order value, status, branch, country, and product line.

**Main KPIs**

1. **Quantity Ordered:** Displays the total quantity of items ordered (99K).
2. **Average Order Value:** Shows the average value per order (83.69).
3. **Average Quantity Ordered:** Indicates the average quantity per order (35.09).

#### **Filter Options**

* **Date:** Allows filtering data by specific date ranges.
* **Country:** Allows filtering data based on the country of orders.
* **Product Line:** Enables filtering data by specific product lines.

#### **Dashboard Components**

1. **Top Countries by Quantity Ordered**
   * A bar chart displays the quantity of orders for the top countries, with the USA having the highest order quantity.
2. **Quantity Ordered by Status**
   * A donut chart shows the distribution of order statuses, such as Shipped, Cancelled, On Hold, etc. The majority of orders (92.26%) are shipped.
3. **Quantity Ordered by Branch**
   * + A donut chart breaks down order quantities by branch. The **Bergenville** branch has the largest share, followed by **Geiselweg** and **Skates Road has the least share.**
4. **Average Order Value by Quarter and Month**
   * A line chart displays the trend in average order value across different months and quarters, showing seasonal trends or fluctuations in order value.
5. **Order Number by Product Line**
   * A clustered bar chart represents the number of orders per product line Classic Cars, Motorcycles, Planes, segmented by year, highlighting trends in product demand over time.

**Navigation**

* **Previous:** Allows navigation to the previous page or report in the dashboard.
* **Home:** Returns the user to the main or home page of the dashboard.

#### **Design Notes**

**Layout and Color Scheme**

* The dashboard follows a structured layout that places high-level KPIs at the top for quick insights, followed by detailed visualizations arranged below.
* A consistent color palette is used across charts blue for USA, orange for Australia,to ensure a uniform look and aid in user comprehension.
* Light background and contrasting dark borders help separate each section, creating a clean, organized appearance.