



Sales Performance Analysis

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Introduction

Business Problem:

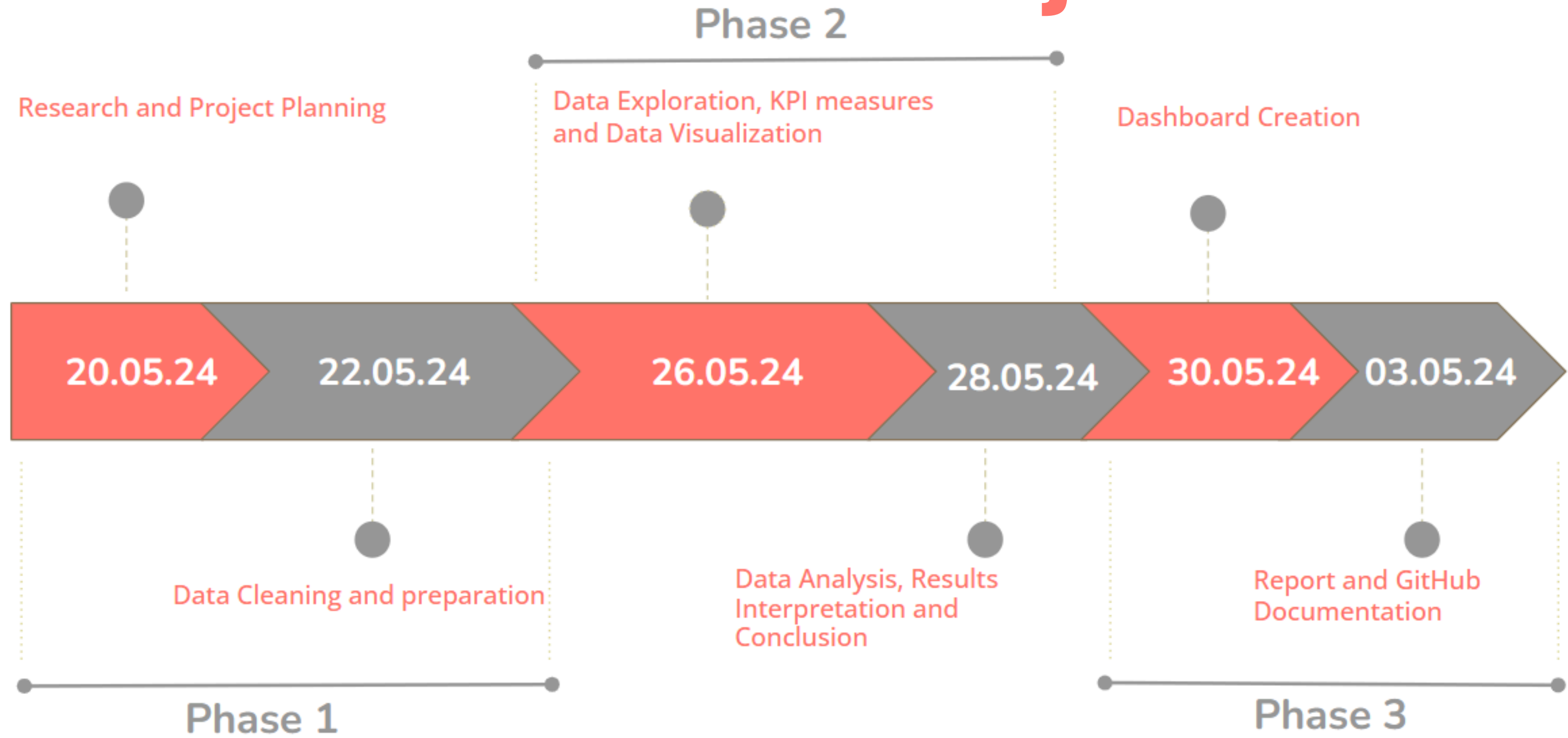
Extract various information such as Sales, Budget, and Variance. You can even compare sales and budgets with various attributes. Extract necessary information about Products and Customers. Make the necessary dashboard with the best you can extract from the data. Use various visualization and features and make the best dashboard. Find key metrics and factors and show the meaningful relationships between attributes. Do your own research and come up with your findings.

The AdventureWorks is a multinational manufacturing company. In this project I've explored and analyzed sales data of its products from 2014 to 2016 to gain insights into the company's revenue trends, product performance and customer preferences.

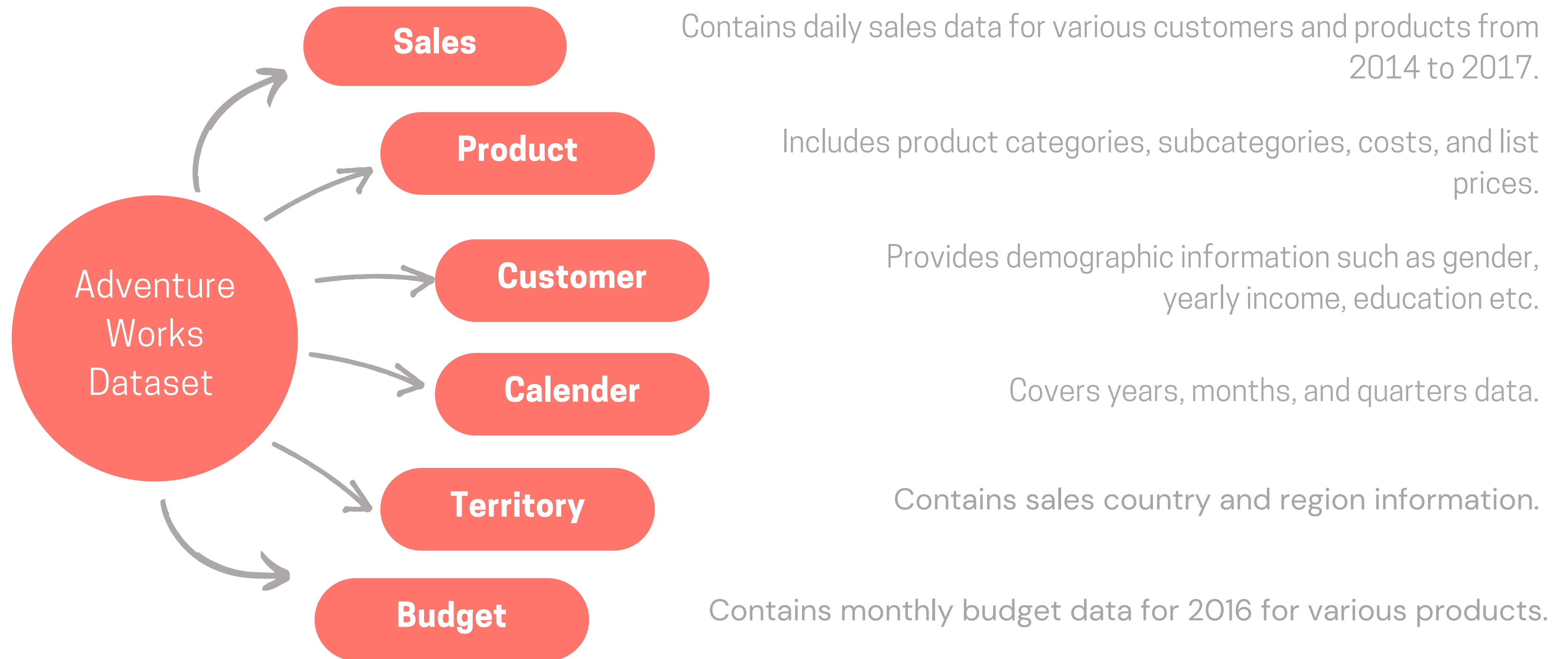
Using Excel, Alteryx and Power BI, I compared the Sales Budget with the Actual Sales data for 2016. Additionally, I categorized the customers based on their buying habit.

Finally, I've discussed the project's limitations and proposed some future directions in the end.

Project Timeline



Data Sources



Tools

01. Excel

02. Alteryx

03. Power BI

04. Google Slides

05. Canva

06. GitHub

Methodologies

01. Data Cleaning

03. Exploratory Data Analysis

05. RFM Analysis

07. Reporting

02. Data Wrangling

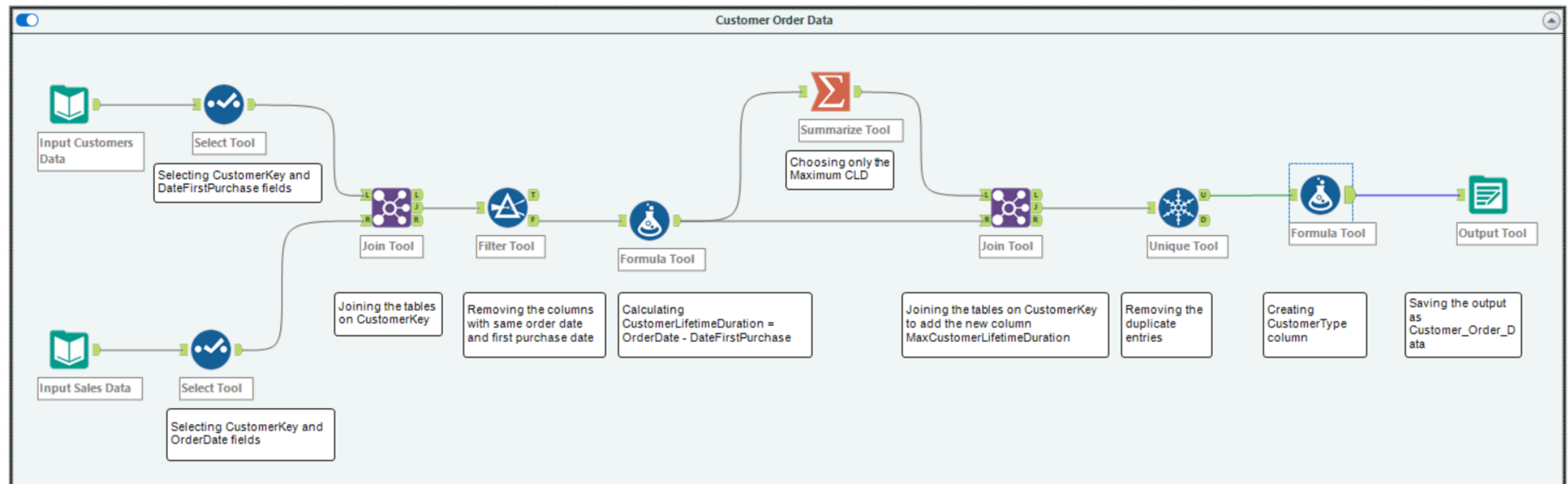
04. Customer Segmentation

06. Data Visualization

I leveraged Alteryx's Data Blending tools to create insightful new variables from existing data columns.

Procedure

3. Creating a new table Customer_Order_details with Customer Lifetime Duration column and CustomerType by categorizing them into 3 distinct groups - High, Medium and Low Value customers.



A snippet of the Data Transformation Workflow in Alteryx.

I have used these metrics to measure the sales performance using various numerical fields.

Metrics

Sales Revenue

Total revenue generated from sales over a specific period.

Sales Growth Rate

Percentage increase or decrease in sales over a defined period.

Sales by Time Period

Revenue of sales analyzed over different time periods (monthly, quarterly, annually).

Sales Quantity

Total number of units or products sold.

Sales by Product Category

Revenue of sales for each product category.

Product Performance

Analysis of how well each product is selling (e.g., top-selling products, slow-moving products).

Average Order Value (AOV)

Average revenue earned per order.

Sales by Customer Segment

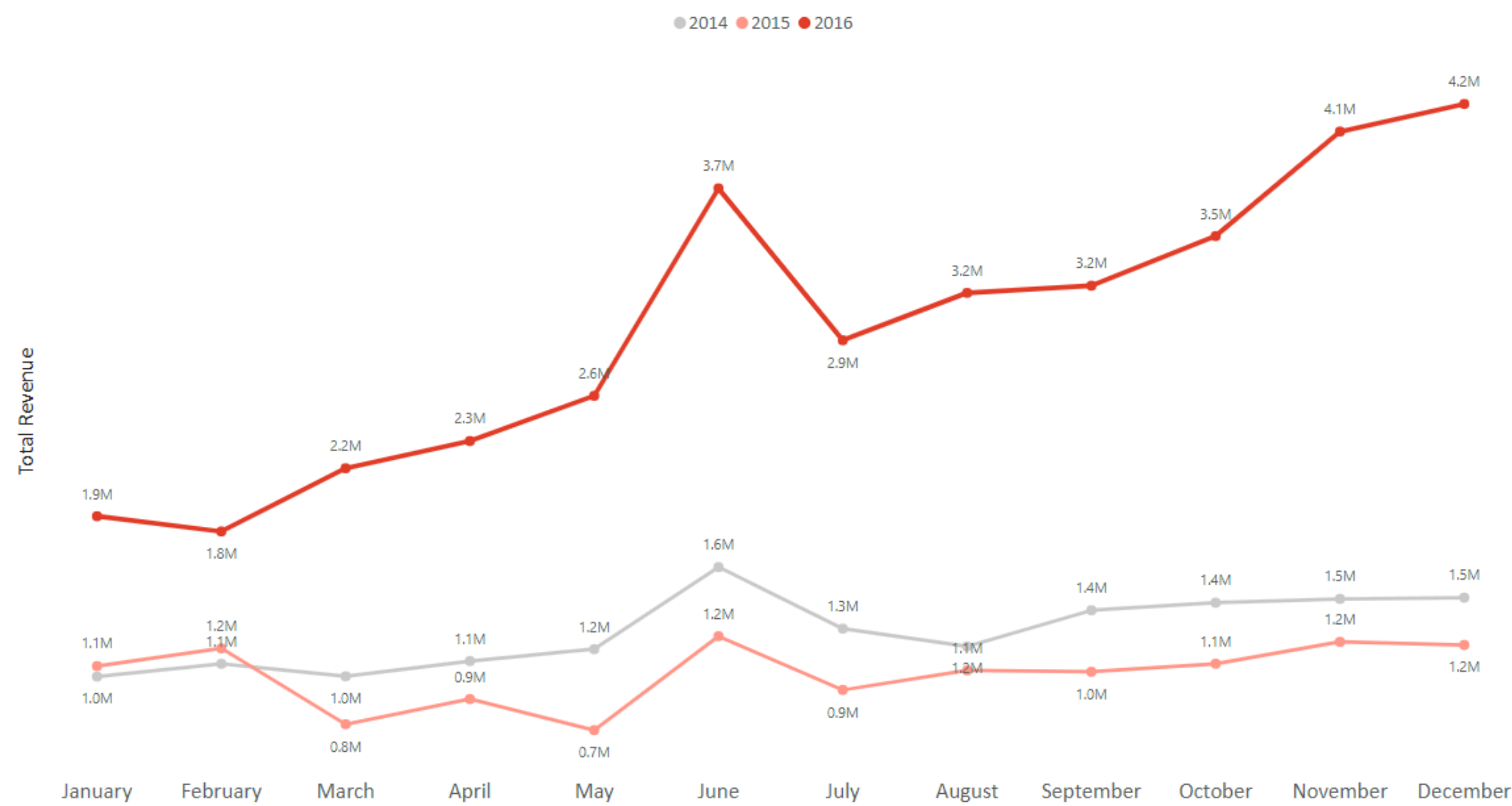
Revenue of sales by different customer segments

Sales by Territory

Revenue of sales by geographical territory.

Sales Revenue Trends from 2014 to 2016

Monthly Sales Revenue in Dollars



Sales Overview

2016 has a much higher sales revenue compared to 2014 and 2015. There's a gradual growth apparent for 2016.

Revenue dropped **23%** from 2014 to 2015 but it grew **63%** from 2015 to 2016.

There is a significant spike in **June** for each year. **November** and **December** see an increase in revenue, likely due to holiday shopping and year-end sales events.

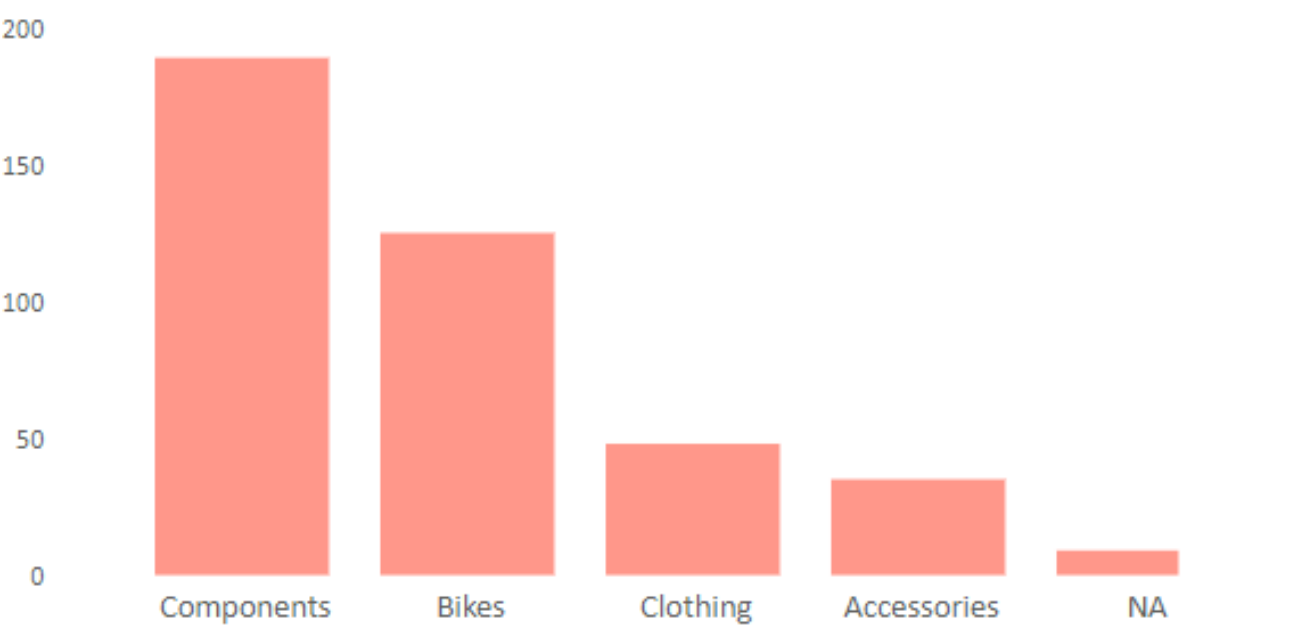
Sales Variance Table (\$)

Variance is the difference between actual and budget sales. The red rows showing negative variance, meaning the **actual sales was lower than the budget**, signifying potential low performing products.

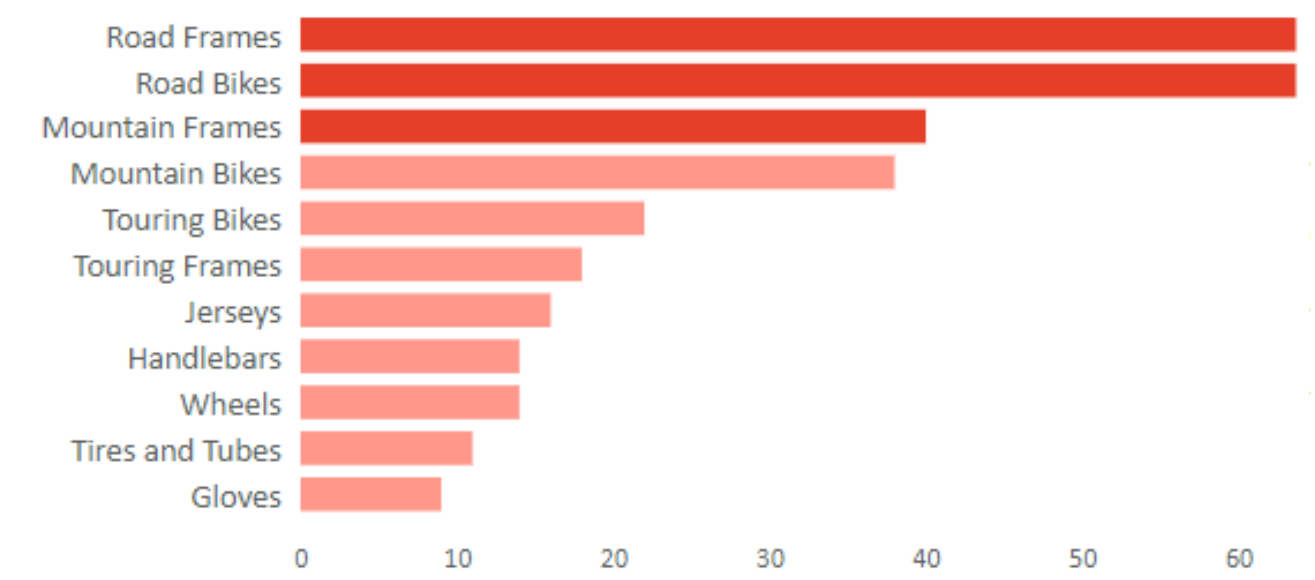
Budget Analysis

ProductName	Jan_Variance	Feb_Variance	Mar_Variance	Apr_Variance	May_Variance	Jun_Variance	Jul_Variance	Aug_Variance	Sep_Variance	Oct_Variance	Nov_Variance	Dec_Variance
All-Purpose Bike Stand	708	3,517	3,657	4,411	4,117	4,317	2,721	3,522	3,437	5,547	4,705	2,322
Classic Vest, S	-157	-774	-60	-940	-706	-945	-1,459	-2,071	-1,954	-1,916	-119	-1,793
Bike Wash - Dissolver	183	438	630	598	782	912	768	562	723	689	894	1,194
Half-Finger Gloves, S	-16	-675	-1,158	-272	-650	-374	-700	-1,254	-943	-959	-1,243	-1,227
Patch Kit/8 Patches	-3,312	-17,477	-19,767	-16,725	-20,399	-21,012	-22,684	-21,586	-19,718	-20,401	-22,555	-22,251
Touring-2000 Blue, 60	-115,262	-158,069	-157,294	-258,029	-268,261	-429,526	-283,362	-386,076	-373,211	-457,699	-485,418	-471,206
Sport-100 Helmet, Red	-1,765	-4,128	-5,264	-5,669	-4,960	-7,744	-2,619	-7,032	-2,623	-5,149	-6,676	-5,781
Fender Set - Mountain	1,404	4,250	4,075	3,907	4,006	5,869	5,210	3,598	4,428	4,464	5,895	4,841
Hydration Pack - 70 oz.	1,448	3,374	4,091	3,939	3,460	4,104	3,235	4,316	4,419	2,472	4,517	4,679
Hitch Rack - 4-Bike	1,202	3,845	4,420	3,005	3,584	3,460	2,448	2,934	4,409	2,959	6,223	4,484
Long-Sleeve Logo Jersey, S	-3,655	-8,161	-10,388	-9,110	-9,766	-14,050	-12,851	-8,854	-11,237	-12,033	-12,351	-15,184
AWC Logo Cap	531	1,509	1,451	1,950	1,184	1,937	1,868	1,916	1,851	1,551	2,093	2,470
Water Bottle - 30 oz.	-696	-1,440	-412	-1,000	-850	-1,859	-1,045	-1,178	-1,257	-1,250	-866	-1,584

Number of Products per Category



Number of Products per Subcategory

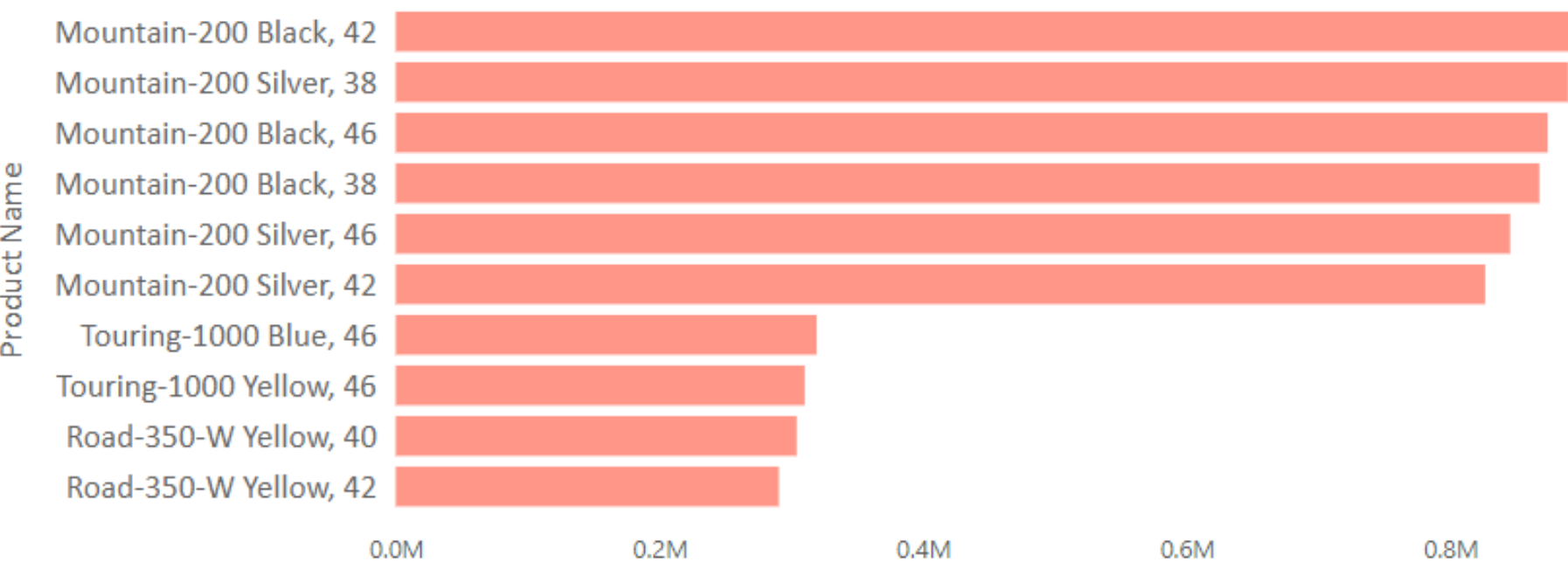


Product Performance

I analyzed the revenue generated by **Product Category**, **Subcategory**, **Product line** and **Color** of **406** products. Here I’m presenting only a few interesting results.

Top 10 Most Profitable Products in 2016

Based on Total Profit generated in Dollars.

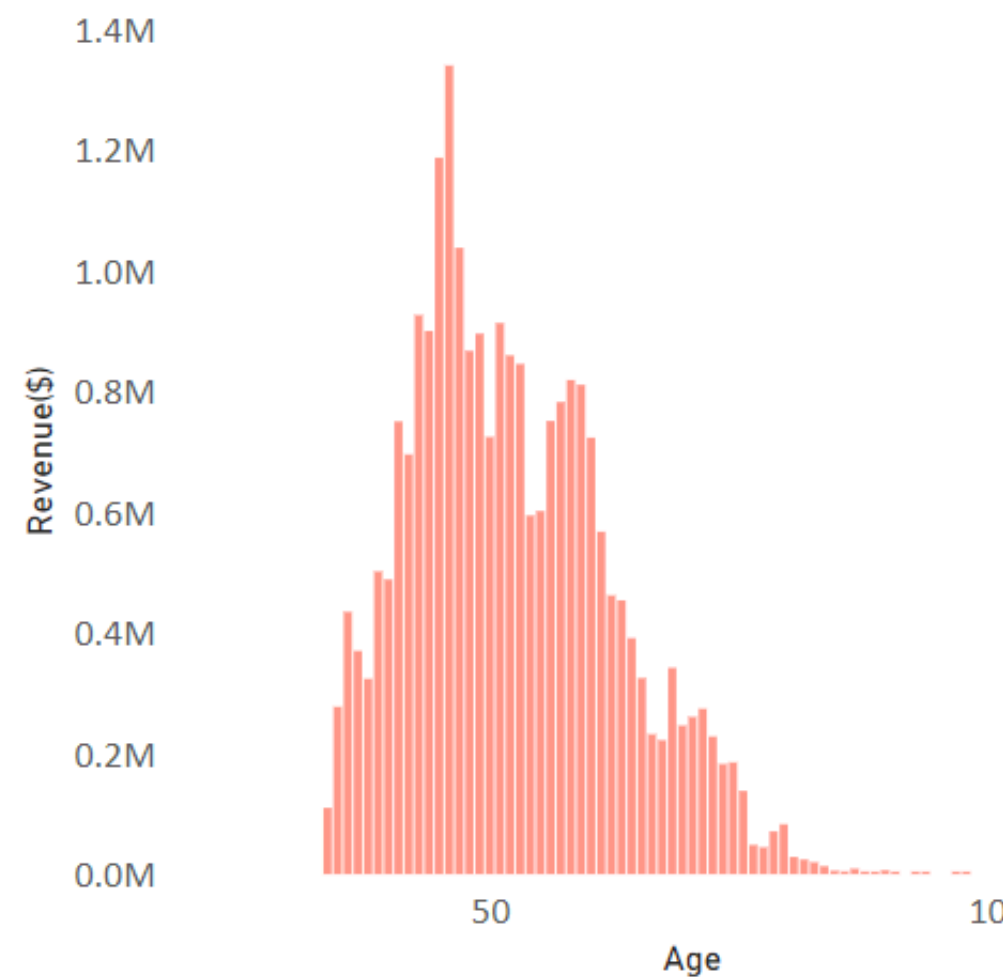


Customer Segmentation

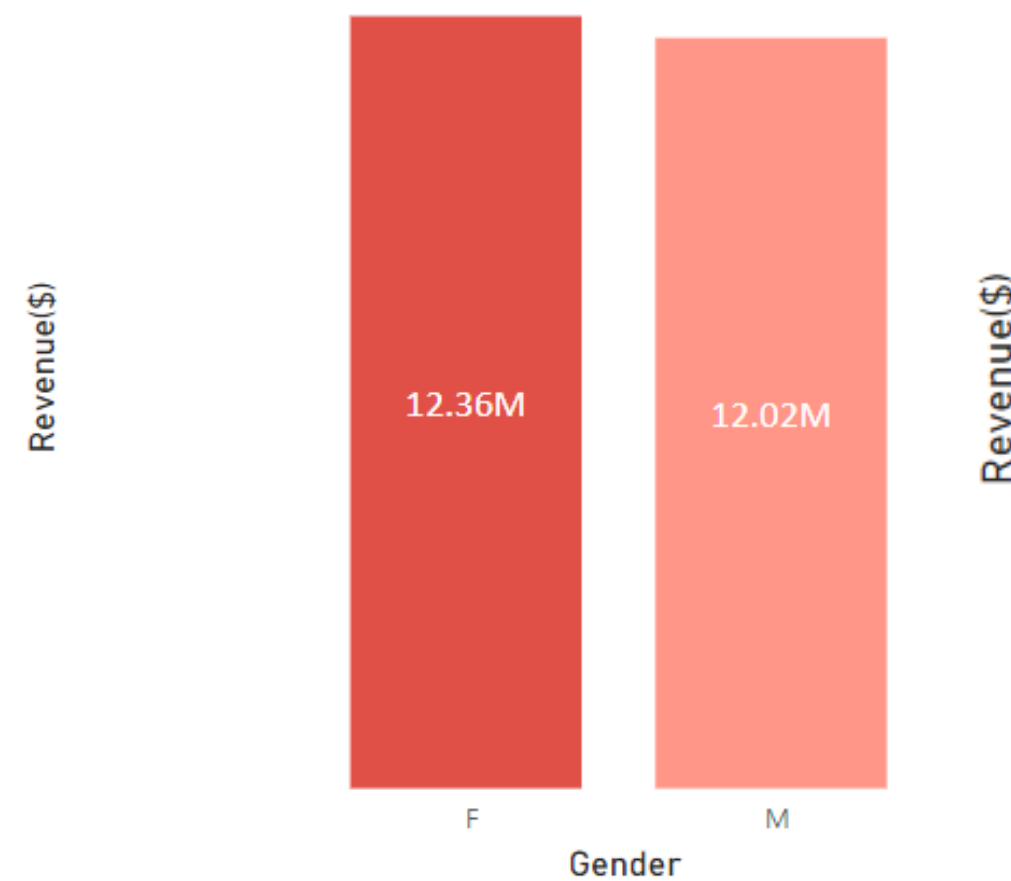
I used these demographics to segment customers: **Gender, Age, Income Category, Marital Status, Total Children, Number of Children at Home, Education, Occupation, House Ownership, Number of Cars Owned, Country, Commute Distance** and **Customer Lifetime Duration (days)**.

Here I present only a few interesting results.

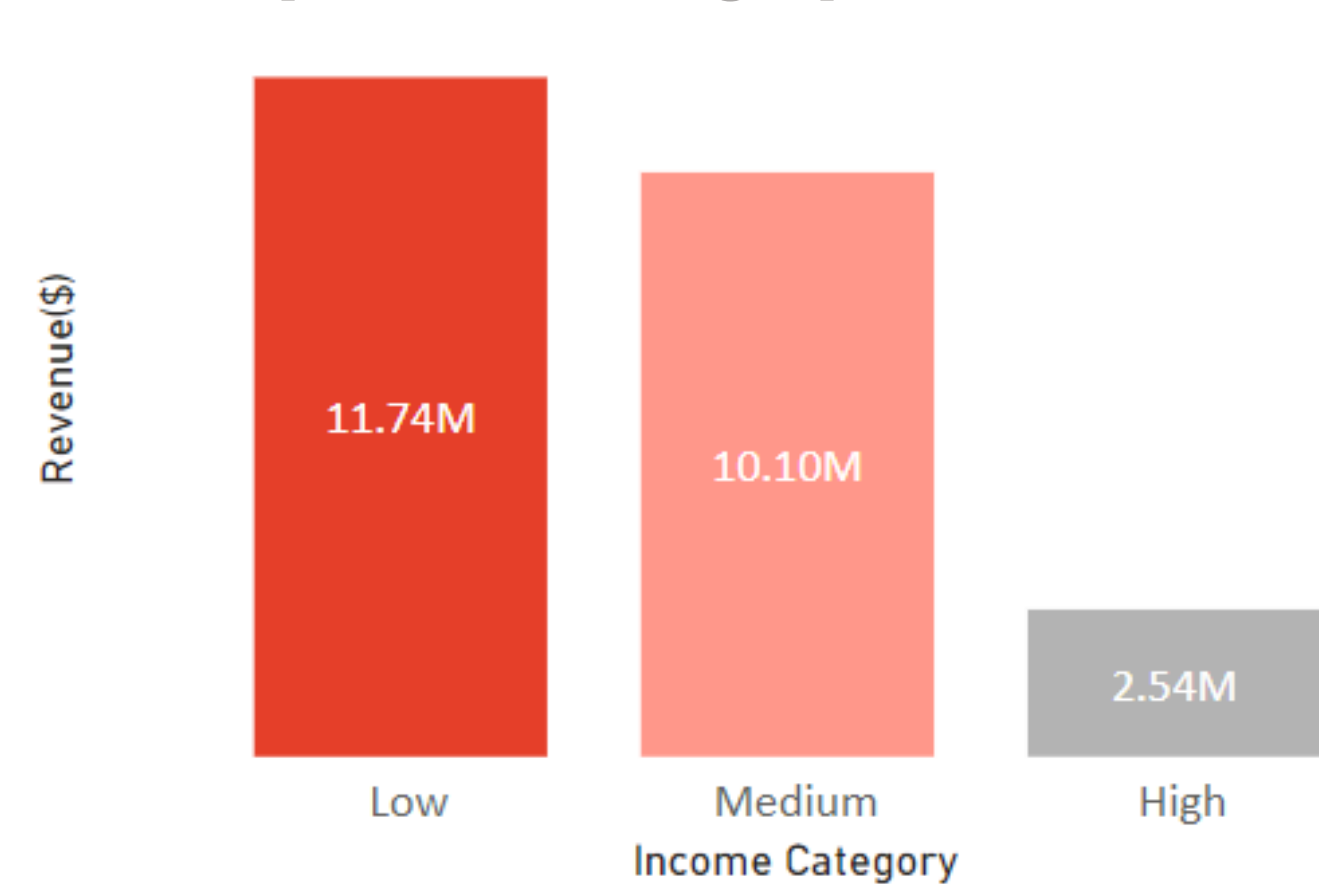
By Age



By Gender



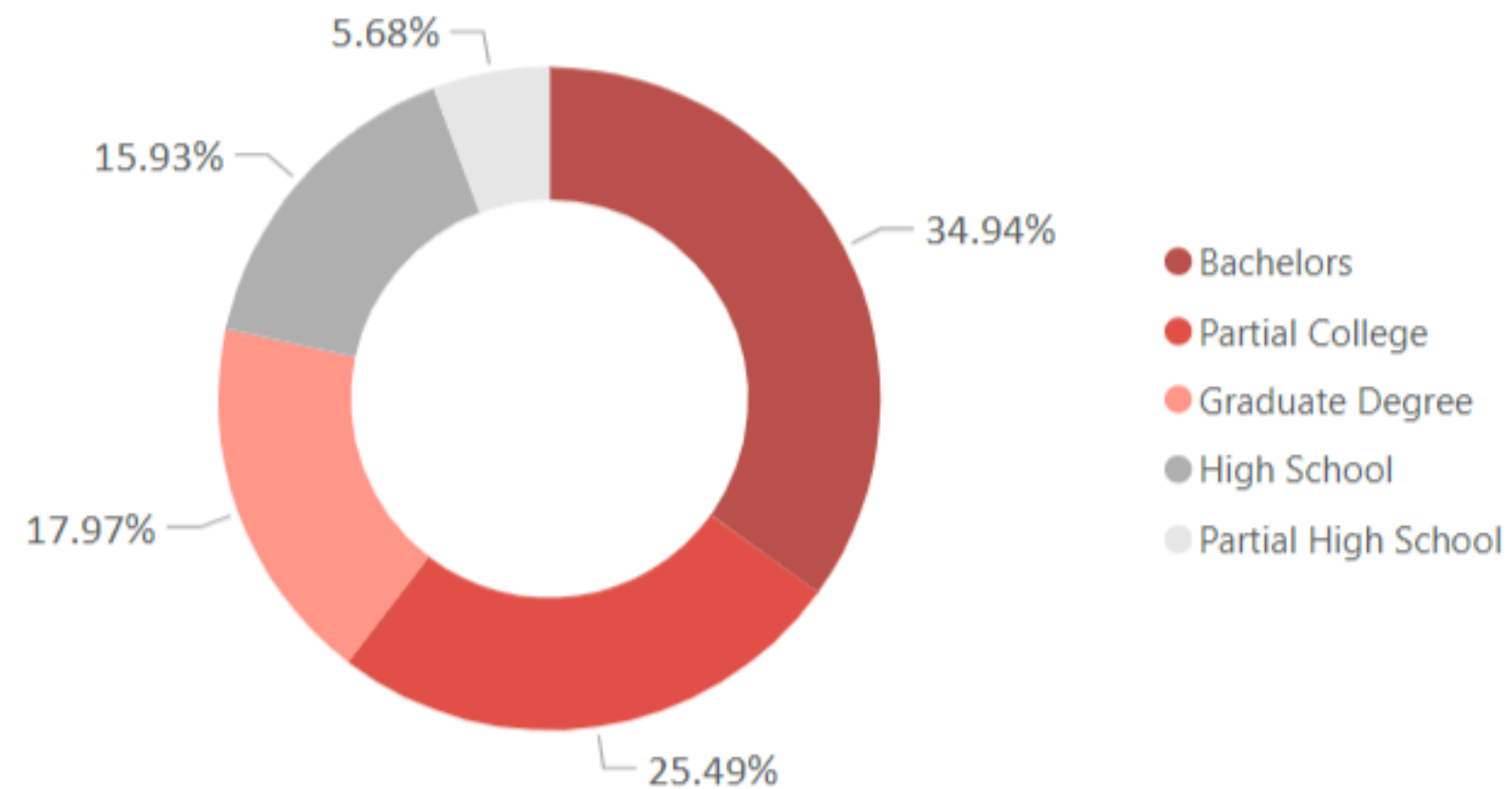
By Income Category



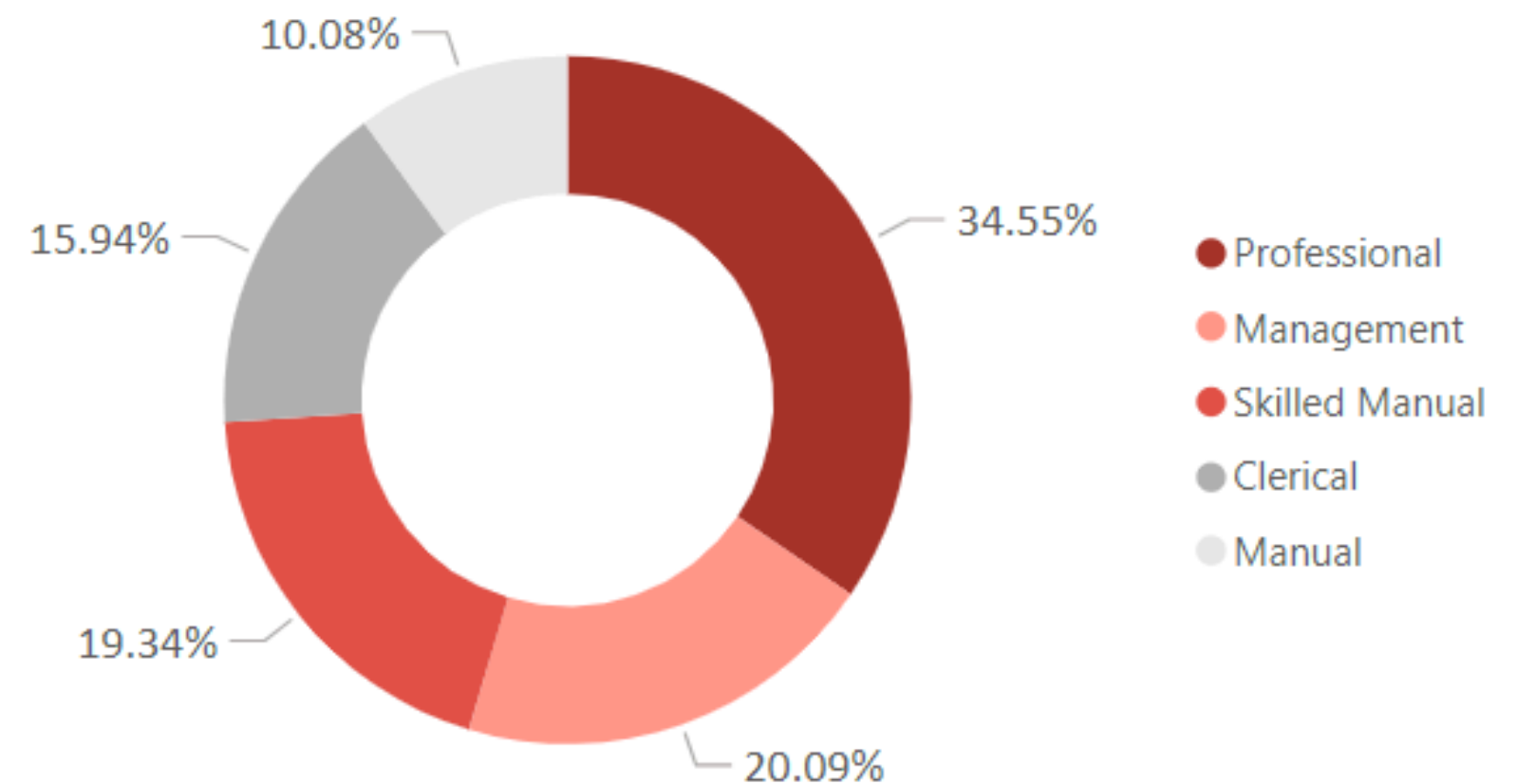
Customer Segmentation

The largest segment in terms of Education is customers with **Bachelors' degree**, generating approximately **35%** of the total revenue. Customers with a **Professional** background also generating about **35%** of the overall revenue.

By Education Level



By Occupation



RFM Analysis

RFM stands to Recency, Frequency, Monetary value of a customer. RFM Score ranges from 3 - 15.

Recent Customers (3.1%)

- **RFM Score:** 9 - 12
- **Characteristics:** High Recency, Low to Moderate Frequency, Moderate Monetary Value
- **Behavior:** Recent buyers who may need encouragement to increase frequency.

Needs Attention (26.3%)

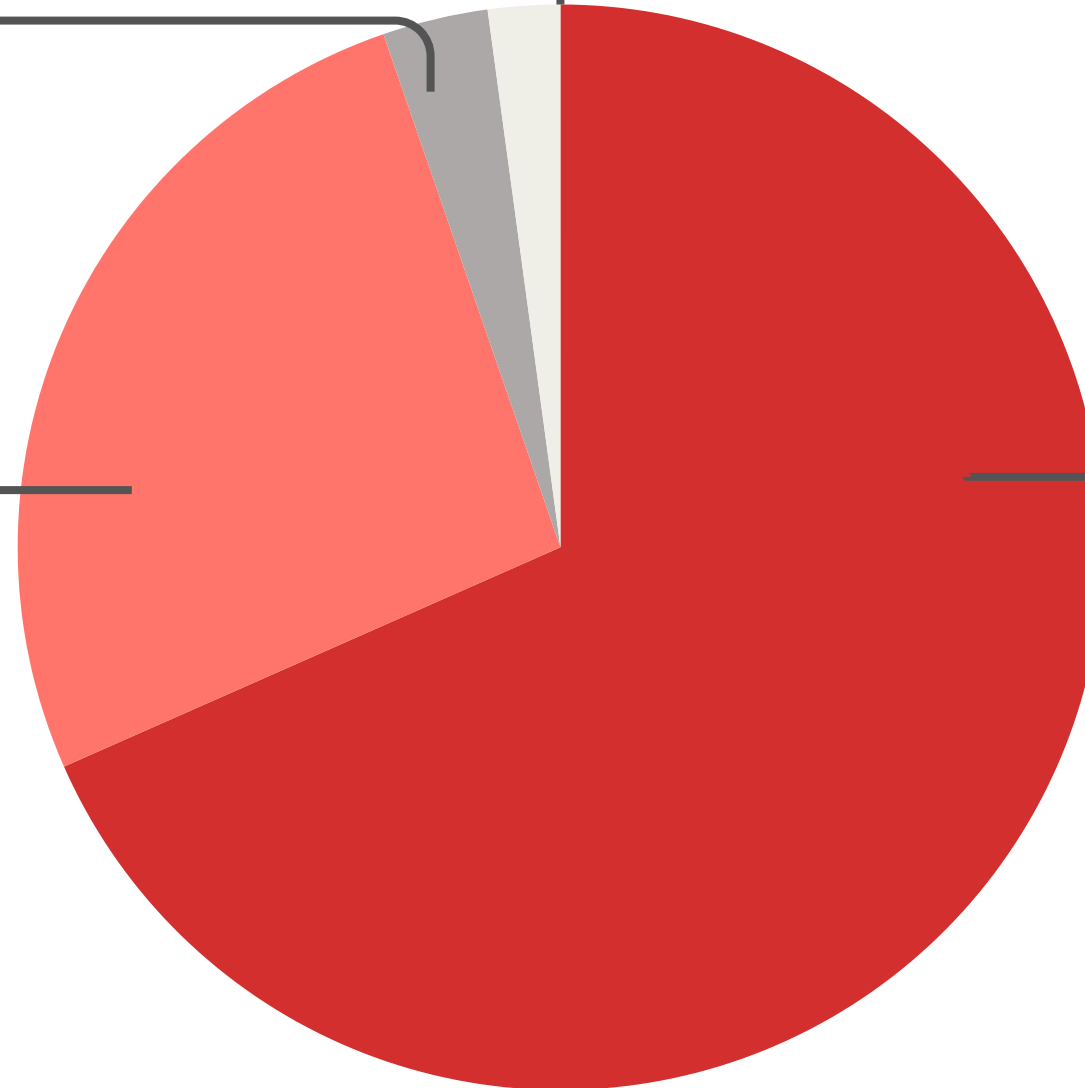
- **RFM Score:** 4 - 6
- **Characteristics:** Low Recency, Low Frequency, Low Monetary Value
- **Behavior:** At risk of churn.


At Risk Customers (2.1%)

- **RFM Score:** 3 - 4
- **Characteristics:** Very Low Recency, Very Low Frequency, Very Low Monetary Value
- **Behavior:** High risk of churn or already churned.

Promising New Customers (68.4%)

- **RFM Score:** 6 - 9
- **Characteristics:** Moderate Recency, Low Frequency, Low Monetary Value
- **Behavior:** New customers who need nurturing to increase engagement and loyalty.





AdventureWorks Sales Data Analysis (2014-2016) Dashboard

Dashboard Design by Arpita Deb - June 2024

Page 1

About the dashboard:

This dashboard gives an overview of the Sales Data of AdventureWorks Bike Manufacturer from 2014 to 2016.

Year Filter

Select...

2014

2015

2016

Month Filter

January

February

March

April

May

June

July

August

September

October

November

December

63.30M

Sales Revenue

183K

Order Quantity

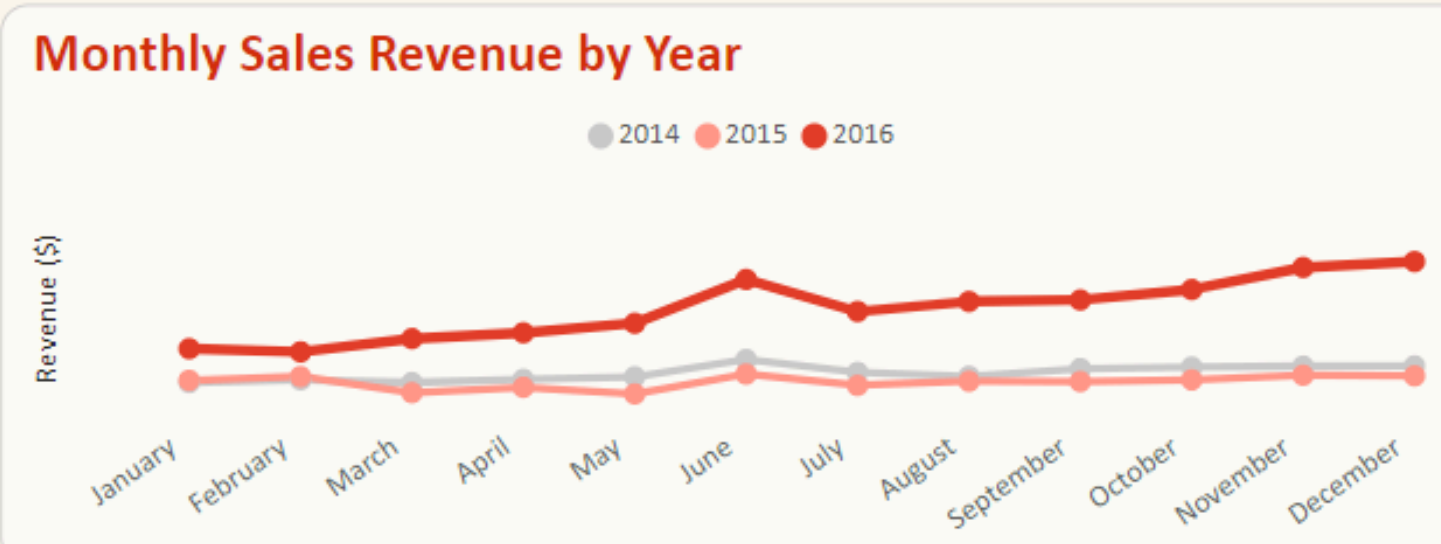
24.11M

Total Profit

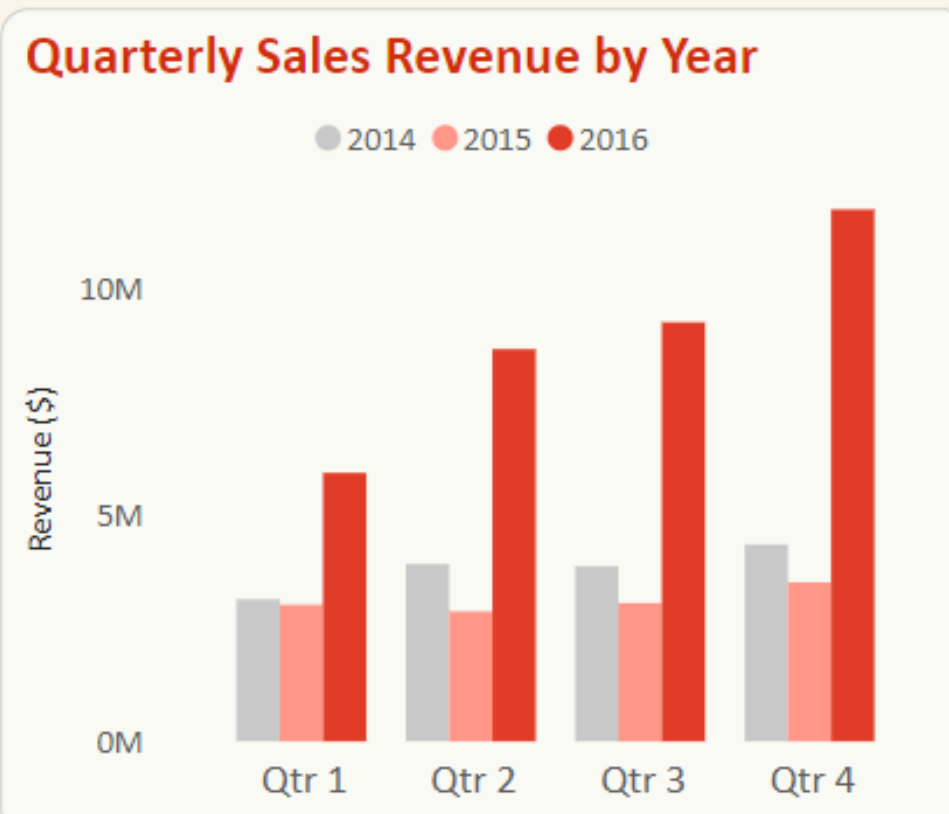
543.96

Average Order Value

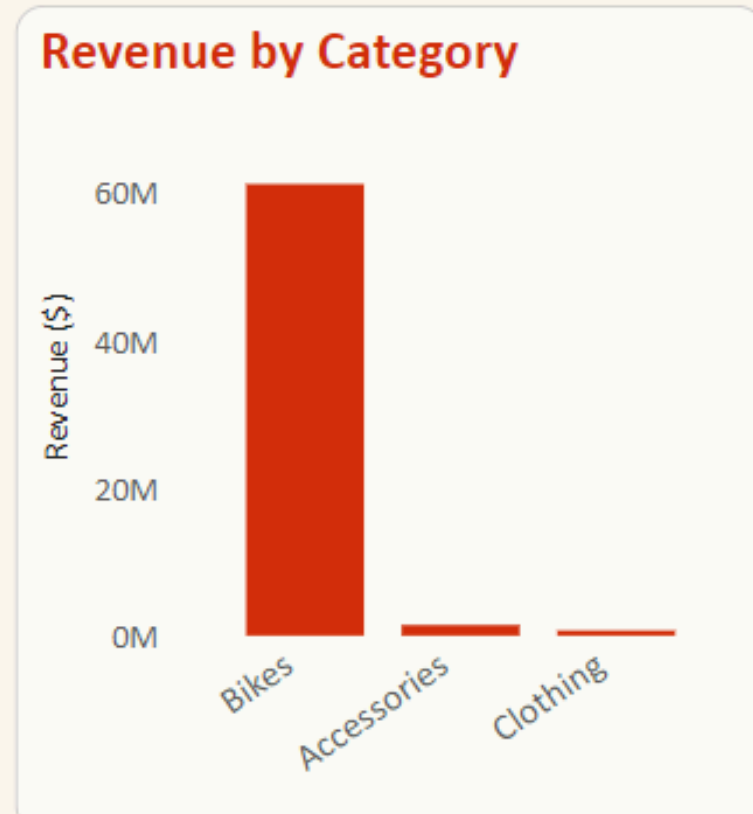
Monthly Sales Revenue by Year



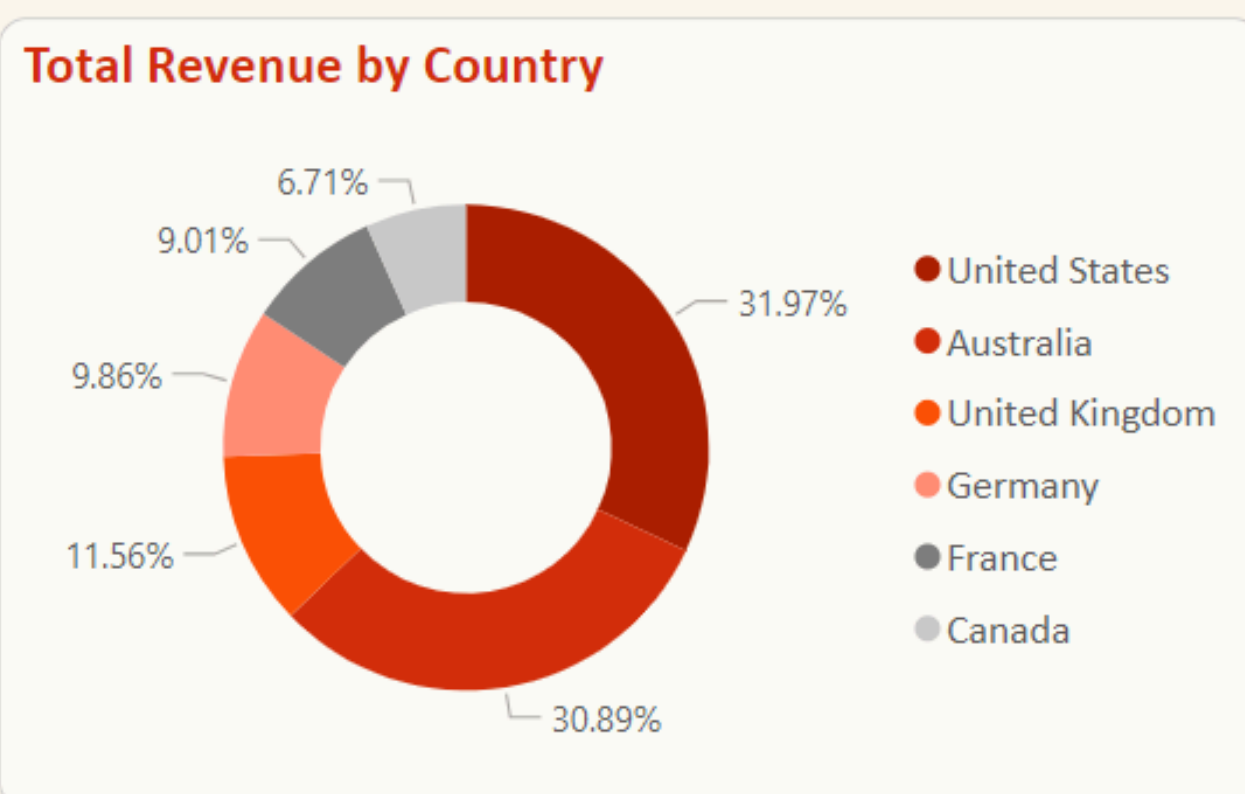
Quarterly Sales Revenue by Year



Revenue by Category



Total Revenue by Country



Country	Percentage
United States	31.97%
Australia	30.89%
United Kingdom	11.56%
Germany	9.86%
France	9.01%
Canada	6.71%

Top 10 Profitable Products

Product Name	Total Profit (\$)
Mountain-200 Black, 38	11,80,954.92
Mountain-200 Black, 42	12,43,519.22
Mountain-200 Black, 46	12,53,243.15
Mountain-200 Silver, 38	12,21,728.87
Mountain-200 Silver, 42	11,47,023.88
Mountain-200 Silver, 46	11,86,980.95
Road-150 Red, 48	9,48,301.69
Road-150 Red, 52	8,49,813.38
Road-150 Red, 56	8,30,115.72

AdventureWorks

AdventureWorks Monthly Sales Budget Analysis Dashboard

Dashboard Design by Arpita Deb - June 2024Page 2

About the dashboard:

This dashboard shows the comparison between the Actual Sales amount and Budget for 13 products in 2016. It also shows the variance amount and percentage which is the difference between Actual Sales and Budgeted Sales. A positive variance indicates that the sales revenue exceeds the sales budget, signifying profitability.

Select a Product

All-Purpose Bike...AWC Logo CapBike Wash - ...Classic Vest, SFender Set - ...Half-Finger Glove...Hitch Rack - 4-BikeHydration Pack - 7...Long-Sleeve Logo...Patch Kit/8 PatchesSport-100 Helmet,...Touring-2000 Blue...

Select a Month

AprAugDecFebJanJulJunMarMayNovOctSep

Product Name

Water Bottle - 30 oz.

Sales Revenue (\$)

43.93K

Sales Budget(\$)

57K

Actual Monthly Revenue Vs Monthly Sales Budget

Sum of Revenue (\$)Sum of Budget(\$)

Month	Revenue (\$)	Budget (\$)
Dec	~4.5K	~5.2K
Jun	~4.5K	~5.5K
Nov	~4.5K	~5.0K
Oct	~4.5K	~5.2K
Sep	~4.5K	~5.1K
Aug	~4.5K	~5.0K
Jul	~4.5K	~4.8K
Apr	~4.5K	~4.5K
Feb	~4.5K	~4.8K
Mar	~4.5K	~4.5K
May	~4.5K	~4.8K
Jan	~4.5K	~4.5K

Revenue, Budget and Variance breakdown

Revenue (\$)Budget (\$)Variance (\$)

-13,436.24Total Variance (\$)-36.77% Variance

Category	Value
Revenue (\$)	44K
Budget (\$)	57K
Variance (\$)	-13K

15

Conclusion

01. The total sales dropped **23%** from 2014 to 2015 but grew **63%** from 2015 to 2016. **June** consistently experienced a sales spike.
02. **7** out of **13** products had **lower actual sales revenue** in 2016 than projected. Possible reasons include sales gaps in specific months and pricing differences across countries.
03. Majority of customers fell within the **40 to 60 years** age range. **Gender** had minimal impact on revenue. **Low-income customers** (annual income < \$63,328) are the largest segment in terms of revenue generated.
04. Most customers were **Promising New Buyers** with low frequency and spending. Other segments being recent customers, at-risk churn, and attention-needed.
05. **Components** category had the highest product count compared to bikes, accessories, and clothing.

Recommendations

01. Focus marketing efforts on the 40-60 age group. Target High-Potential Segments such as customers with bachelor's degrees or higher education, or professional and management roles.
02. Implement retention strategies for skilled manual workers and clerical roles. These segments contribute less to revenue and may be at risk of churning.
03. Concentrate efforts in countries with the highest customer concentration (Australia, the United States, Canada, and the UK). Investigate reasons behind lower revenue in Germany and France.
04. Adjust pricing strategies based on income levels. Offer budget-friendly options for low-income customers and premium products for high-income customers.
05. Since 30% of customers have no children and 60% of customers have no children at home, consider offering family-friendly products.

Limitations

01. Since the Budget data only contains monthly sales budget for a few products, a detailed Budget Analysis was not possible.
02. Due to joining of multiple datasets, I lost some amount of data points, which could have enriched the analysis.
03. A detailed Customer Segmentation has not been performed using Cluster Analysis or other Machine Learning Techniques due to time constraint
04. The data is outdated.

Next Steps

01

Advanced Customer Segmentation

Perform cluster analysis using machine learning techniques (e.g., k-means, hierarchical clustering) to create more refined customer segments.

02

Time-Series Forecasting

Predict future sales trends using historical data. Identify potential growth areas or challenges.

03

Customer Lifetime Value (CLV) Modeling

Estimate CLV for different customer segments. Understand which segments contribute most to long-term revenue.

References

- AdventureWorks sample databases
- How to Download and Install AdventureWorks Database in SQL?
- What Is Average Order Value (AOV)? Definition and How to Calculate
- What Is Recency, Frequency, Monetary Value (RFM) in Marketing?
- RFM analysis for Customer Segmentation

Appendices

- Problem Statement Document
- GitHub Project Documentation
- Data sets used
- Data Cleaning and Transformation Changelog
- Sales Budget Analysis Workflow 1 Data Transforming
- Sales Budget Analysis Workflow 2 Data Analyzing
- Power BI Dashboards



Thank You

FOR YOUR ATTENTION



Presented by
Arpita Deb

Dated
June, 2024

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GitHub
<https://github.com/Arpita-deb/Arpita-deb>