

# Project Report

## Project Overview

**Client:** Steven, Sales Manager

**Request Date:** [Insert Date]

**Project Title:** Enhancing Internet Sales Reporting with Visual Dashboards

## **Business Request**

*Email from Steven – Sales Manager:*

*Hi Nasrul!*

*I hope you are doing well. We need to improve our internet sales reports and want to move from static reports to visual dashboards. Essentially, we want to focus on how much we have sold of which products, to which clients, and how sales have trended over time. Since each salesperson works with different products and customers, it would be beneficial to have filtering options. We measure our numbers against the budget, so I have included the budget for 2021 in a spreadsheet for comparison. We typically analyze sales data from the past two years.*

*Let me know if you need anything else!*

*// Steven*

## Business Demand Overview

**Reporter:** Steven – Sales Manager

**Value of Change:** Transition to visual dashboards and enhanced sales reporting

**Necessary Systems:** Power BI, CRM System

**Other Relevant Info:** Budget provided in Excel for 2021

## User Stories

No	Role	Request / Demand	User Value	Acceptance Criteria
1	Sales Manager	To get a dashboard overview of internet sales	Can better follow which customers and products sell the best	A Power BI dashboard that updates data once a day
2	Sales Representative	A detailed overview of Internet Sales per Customer	Can follow up with my customers who buy the most and identify opportunities to sell more	A Power BI dashboard that allows filtering data by each customer
3	Sales Representative	A detailed overview of internet Sales per Product	Can follow up on which products sell the most	A Power BI dashboard that allows filtering data by each product
4	Sales Manager	A dashboard overview of internet sales	Can follow sales performance over time against the budget	A Power BI dashboard with graphs and KPIs comparing sales against the budget

# User Stories and Project Expectations

The table above outlines the key user stories for this project, which are essential in guiding the development of the Power BI dashboards. Each user story focuses on the needs of specific roles within the sales team and describes the desired outcome and the value it will bring to the users.

## **1. Sales Manager - Dashboard Overview of Internet Sales**

- **Objective:** The Sales Manager needs a high-level overview of internet sales, with the ability to track which customers and products are performing the best.
- **Expected Outcome:** The Power BI dashboard should provide a clear and concise view of overall sales performance, including top-performing products and customers. This will enable the Sales Manager to make informed strategic decisions and identify potential growth opportunities.
- **Insight:** Identification of top-selling products and key customers, allowing for targeted marketing and sales strategies.

## **2. Sales Representative - Detailed Overview per Customer**

- **Objective:** Sales Representatives need detailed insights into the sales performance of individual customers, allowing them to track buying patterns and identify opportunities to increase sales.
- **Expected Outcome:** The Power BI dashboard should enable Sales Representatives to filter and analyze sales data by customer. This level of detail will help them tailor their sales approaches to meet the specific needs of each customer.
- **Insight:** Understanding customer purchasing behavior, leading to more personalized sales tactics and potentially increased customer loyalty and sales.

## **3. Sales Representative - Detailed Overview per Product**

- **Objective:** Sales Representatives need detailed insights into product sales, helping them understand which products are performing well and which may require additional attention.
- **Expected Outcome:** The Power BI dashboard should allow for filtering by product, showing sales trends and performance metrics. This will help Sales Representatives focus on promoting the right products to the right customers.
- **Insight:** Recognition of product trends, enabling more effective product promotions and inventory management.

#### 4. Sales Manager - Sales Performance vs. Budget

- **Objective:** The Sales Manager needs to track sales performance against the budget to assess how well the sales team is meeting its financial goals.
- **Expected Outcome:** The Power BI dashboard should include graphs and KPIs that compare actual sales figures against the budgeted targets. This comparison will be crucial for understanding whether the team is on track to meet its financial goals.
- **Insight:** Real-time tracking of sales performance against budget, enabling proactive adjustments to sales strategies as needed.

#### Project Goals:

- Improve the accuracy and accessibility of sales data.
- Enable dynamic filtering by salesperson, product, and customer.
- Provide real-time updates to ensure data is current.
- Compare actual sales against budgeted targets to identify performance gaps.

#### Key Performance Indicators (KPIs):

- Total sales per product
- Total sales per customer
- Sales performance against budget
- Sales trends over time

#### Project Timeline:

- **Phase 1:** Requirements gathering and initial design (2 weeks)
- **Phase 2:** Development of Power BI dashboards (4 weeks)
- **Phase 3:** Testing and feedback (2 weeks)
- **Phase 4:** Final adjustments and deployment (1 week)

#### Stakeholders:

- Sales Team
- IT Department
- Finance Department

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### **Sales Representative - Detailed Overview per Product:**

- **Objective:** Sales Representatives need detailed insights into product sales, helping them to understand which products are performing well and which may require additional attention.
- **Expected Outcome:** The Power BI dashboard should allow for filtering by product, showing sales trends, and performance metrics. This will help Sales Representatives focus on promoting the right products to the right customers.
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### **Sales Manager - Sales Performance vs. Budget:**

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- **Insight:** Real-time tracking of sales performance against budget, enabling proactive adjustments to sales strategies as needed.

## **Project Expectations:**

The primary goal of this project is to transition from static reports to interactive visual dashboards that provide actionable insights into internet sales. The Power BI dashboards will serve as a powerful tool for both Sales Managers and Sales Representatives, offering the following benefits:

- **Improved Decision-Making:** By providing a visual representation of sales data, the dashboards will enable the sales team to make more informed decisions quickly.
- **Enhanced Sales Performance Monitoring:** The ability to filter data by customer, product, and time will allow the team to monitor performance in real-time and respond promptly to trends.
- **Budget Tracking:** The integration of budget data into the dashboards will help the Sales Manager ensure that the team is meeting its financial goals.
- **Increased Efficiency:** Automating the update process (e.g., daily updates) will reduce the time spent on manual reporting and allow the team to focus on driving sales.

## Key Insights to be Driven:

- **Top-Performing Products and Customers:** Identifying the products and customers that contribute the most to sales will allow the sales team to focus efforts on high-value areas.
- **Sales Trends Over Time:** Understanding how sales performance changes over time will help in forecasting and planning future sales strategies.
- **Customer and Product Segmentation:** The ability to filter data by specific customers or products will enable targeted approaches, potentially leading to increased sales.
- **Budget vs. Actual Performance:** Comparing sales performance against the budget will highlight areas where the team is excelling or falling short, guiding necessary adjustments.

## Query Syntax for Data Gathering

*This query is designed to cleanse and refine the DIM\_Date table, ensuring it is optimized for reporting purposes. Below is an explanation of the query's functionality and the rationale behind its structure:*

```
-- Cleansing DIM_Date Table

SELECT
    [DateKey],
    [FullDateAlternateKey] AS Date,
    [EnglishDayNameOfWeek] AS Day,
    -- [DayNumberOfWeek]
    -- [SpanishDayNameOfWeek]
    -- [FrenchDayNameOfWeek]
    -- [DayNumberOfMonth]
    -- [DayNumberOfYear]
    [WeekNumberOfYear] AS WeekNr,
    [EnglishMonthName] AS Month,
    Left([EnglishMonthName], 3) AS MonthShort, -- Extracting the first three
letters for better visualization
    -- [SpanishMonthName]
    -- [FrenchMonthName]
    [MonthNumberOfYear] AS MonthNo,
    [CalendarQuarter] AS Quarter,
    [CalendarYear] AS Year
    -- [CalendarSemester]
    -- [FiscalQuarter]
    -- [FiscalYear]
    -- [FiscalSemester]
FROM
    dbo.DimDate
WHERE
    CalendarYear >= 2019;
```

### Insights Driven:

- *This cleansed and prepared DIM\_Date table will be a crucial part of your Power BI model, providing a reliable timeline for the analysis of sales trends, seasonal patterns, and performance against the budget.*
- *The data will support the creation of accurate and timely visualizations that reflect the sales team's performance, helping stakeholders make informed decisions based on the most up-to-date information.*



*This query focuses on cleansing and refining the DIM\_Customer table to prepare customer-related data for use in reporting. Here's an explanation of the query and its purpose:*

```
-- Cleansing DIM_Customer Table

SELECT
    c.customerkey AS CustomerKey,
    -- [GeographyKey]
    -- [CustomerAlternateKey]
    -- [Title]
    c.firstname AS First_Name,
    -- [MiddleName]
    c.lastname AS Last_Name,
    c.firstname + ' ' + c.lastname AS Full_Name,
    -- [NameStyle]
    -- [BirthDate]
    -- [MaritalStatus]
    -- [Suffix]
    CASE c.gender
        WHEN 'M' THEN 'Male'
        WHEN 'F' THEN 'Female'
    END AS [Gender],
    -- [EmailAddress]
    -- [YearlyIncome]
    -- [TotalChildren]
    -- [NumberChildrenAtHome]
    -- [EnglishEducation]
    -- [SpanishEducation]
    -- [FrenchEducation]
    -- [EnglishOccupation]
    -- [SpanishOccupation]
    -- [FrenchOccupation]
    -- [HouseOwnerFlag]
    -- [NumberCarsOwned]
    -- [AddressLine1]
    -- [AddressLine2]
    -- [Phone]
    c.datefirstpurchase AS DateFirstPurchase,
    -- [CommuteDistance]
    g.city AS Customer_City
FROM
    dbo.DimCustomer AS c
LEFT JOIN
    dbo.DimGeography AS g ON g.geographykey = c.geographykey
ORDER BY
    CustomerKey ASC;
```

### *Insights Driven:*

- *Customer Demographics: The cleansed data will provide a clear understanding of customer demographics, including names, gender distribution, and purchase history.*
- *Geographic Sales Distribution: By linking customer data with geographic information, the sales team can analyze trends and performance across different regions.*
- *Purchase Behavior Analysis: With the DateFirstPurchase column, the analysis can focus on customer acquisition trends and how they correlate with sales performance over time.*

*This query focuses on cleansing and refining the DIM\_Product table, preparing product-related data for use in reporting. Below is an explanation of the query and its purpose:*

```
-- Cleansed DIM_Product table

SELECT
    p.[ProductKey],
    p.[ProductAlternateKey] AS ProductItemCode,
    -- [ProductSubcategoryKey]
    -- [WeightUnitMeasureCode]
    -- [SizeUnitMeasureCode]
    p.[EnglishProductName] AS product_name,
    ps.[EnglishProductSubcategoryName] AS sub_category,
    pc.[EnglishProductCategoryName] AS product_category,
    -- [SpanishProductName]
    -- [FrenchProductName]
    -- [StandardCost]
    -- [FinishedGoodsFlag]
    p.[Color] AS product_color,
    -- [SafetyStockLevel]
    -- [ReorderPoint]
    -- [ListPrice]
    p.[Size] AS product_size,
    -- [SizeRange]
    -- [Weight]
    -- [DaysToManufacture]
    p.[ProductLine] AS product_line,
    -- [DealerPrice]
    -- [Class]
    -- [Style]
    p.[ModelName] AS product_model_name,
    -- [LargePhoto]
    p.[EnglishDescription] AS product_description,
    -- [FrenchDescription]
    -- [ChineseDescription]
    -- [ArabicDescription]
    -- [HebrewDescription]
    -- [ThaiDescription]
    -- [GermanDescription]
    -- [JapaneseDescription]
    -- [TurkishDescription]
    -- [StartDate]
    -- [EndDate]
    p.[Status] AS Example,
    ISNULL(p.[Status], 'Outdated') AS product_status
FROM
    dbo.DimProduct AS p
LEFT JOIN
    dbo.DimProductSubcategory AS ps ON ps.ProductSubCategoryKey =
p.ProductSubCategoryKey
LEFT JOIN
    dbo.DimProductCategory AS pc ON ps.ProductCategoryKey = pc.ProductCategoryKey
ORDER BY
    p.ProductKey ASC;
```

### *Insights Driven:*

- *Product Performance: This cleansed product data will be instrumental in analyzing which products are performing well and which are underperforming. The product\_category and sub\_category columns will enable categorization and comparison across different product lines.*
- *Inventory Management: The product\_status column, which defaults to 'Outdated' when NULL, can provide insights into inventory management, particularly in identifying products that may need attention or are no longer active.*
- *Sales Trends: The clean and structured product data will support trend analysis, helping the sales team and management understand product sales over time and across different segments.*

This query focuses on extracting and cleansing data from the FactInternetSales table, specifically targeting sales data from the past two years. Here are some insights that can be derived from this query:

```
-- Cleansed FACT_InternetSale Table

SELECT
    [ProductKey],
    [OrderDateKey],
    [DueDateKey],
    [ShipDateKey],
    [CustomerKey],
    -- [PromotionKey]
    -- [CurrencyKey]
    -- [SalesTerritoryKey]
    [SalesOrderNumber],
    -- [SalesOrderLineNumber]
    -- [RevisionNumber]
    -- [OrderQuantity]
    -- [UnitPrice]
    -- [ExtendedAmount]
    -- [UnitPriceDiscountPct]
    -- [DiscountAmount]
    -- [ProductStandardCost]
    -- [TotalProductCost]
    [SalesAmount]
    -- [TaxAmt]
    -- [Freight]
    -- [CarrierTrackingNumber]
    -- [CustomerPONumber]
    -- [OrderDate]
    -- [DueDate]
    -- [ShipDate]
FROM
    dbo.FactInternetSales
WHERE
    LEFT(OrderDateKey, 4) >= YEAR(GETDATE()) - 2 -- Ensure we only bring two years
of data from extraction (e.g., OrderDateKey starting with 2021 and onwards)
ORDER BY
    OrderDateKey ASC;
```

- **Recent Sales Trends:** By filtering the data to include only the past two years, you can analyze recent sales trends. This helps in understanding how sales have been performing in the most recent periods, which is crucial for making timely business decisions.
- **Product Performance:** The inclusion of the ProductKey allows for the analysis of sales performance by product. You can identify which products are selling well and which are not, enabling better inventory and marketing strategies.

# Data Modeling

## Data Model Structure

The data model consists of several key tables and their relationships, which are crucial for creating comprehensive and insightful reports in Power BI. Below are the main components of the data model:

### *Products Table (d\_products):*

- **Fields:** *product\_id, product\_category, product\_description, product\_name, product\_price*
- **Purpose:** *Contains detailed information about each product, including its category, description, name, and price.*

### *Calendar Table (cl\_calendar):*

- **Fields:** *DateKey, Day, MonthName, QuarterNumber, etc.*
- **Purpose:** *Provides a comprehensive timeline for analyzing sales trends, seasonal patterns, and performance over different periods.*

### *Customer Table (el\_customer):*

- **Fields:** *CustomerKey, DateFirstPurchase, FullName, Customer\_City, Gender*
- **Purpose:** *Contains customer-related data, including demographics and purchase history, which is essential for customer behavior analysis.*

### *Sales Table (cl\_internetsale):*

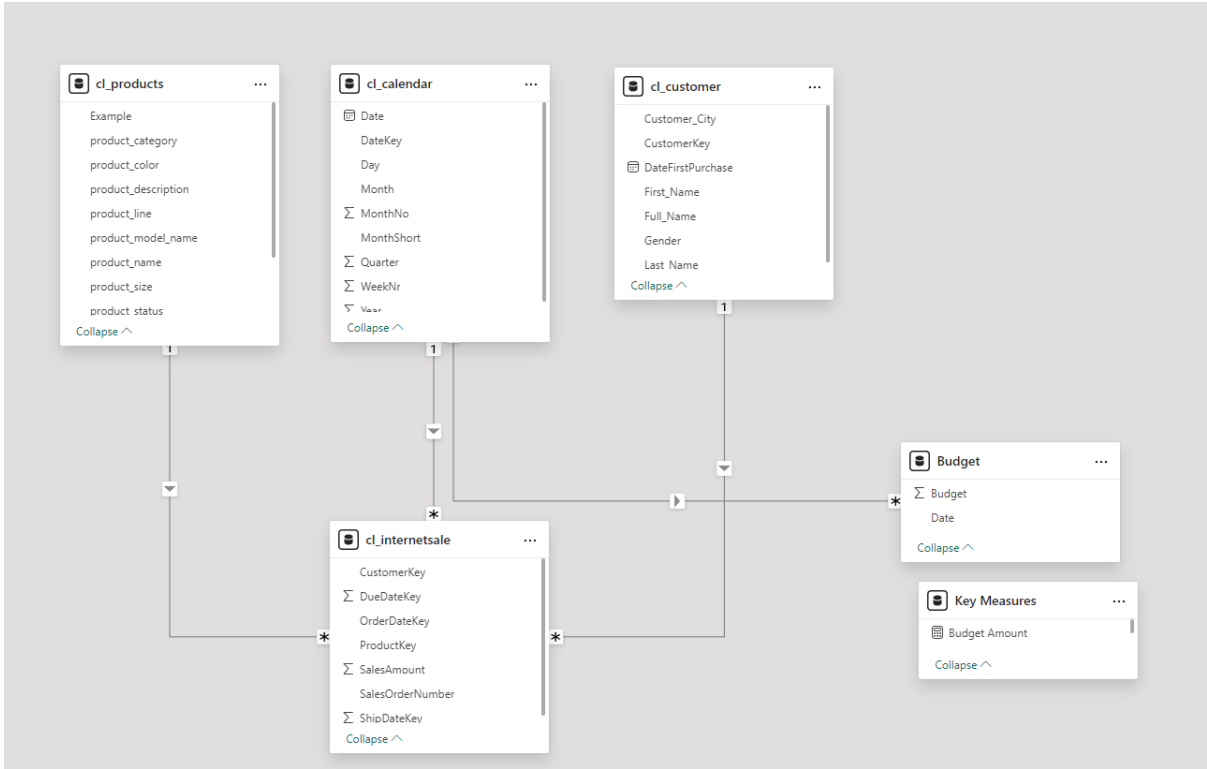
- **Fields:** *ProductKey, OrderDateKey, DueDateKey, ShipDateKey, CustomerKey, SalesOrderNumber, SalesAmount*
- **Purpose:** *Records sales transactions, linking products, customers, and dates to provide a complete view of sales activities.*

### *Key Measures (Budget):*

- **Fields:** *Budget Amount*
- **Purpose:** *Contains budget data, which is used to compare actual sales performance against budgeted targets.*

## *Relationships*

- **Products to Sales:** *One-to-Many relationship based on ProductKey*
- **Calendar to Sales:** *One-to-Many relationship based on DateKey*
- **Customer to Sales:** *One-to-Many relationship based on CustomerKey*
- **Budget to Sales:** *Used for calculating performance metrics against budget*



# Dashboard

## Overview

*The dashboard provides a comprehensive view of key performance indicators (KPIs), sales by category, product, and city, as well as budget amounts. It aggregates complex data into visual representations like graphs, charts, and maps, making it easier for stakeholders to analyze and make informed decisions.*

## Key Components

### KPIs Section:

**Metrics:** *Displays key figures such as total sales for the years 2021 and 2022, along with a percentage change indicator.*

**Purpose:** *Provides a quick snapshot of overall sales performance and growth over time.*

### Sales by Category:

**Visualization:** *Pie chart representing sales distribution across different product categories.*

**Purpose:** *Helps in understanding which product categories contribute the most to overall sales.*

### Sales by Product:

**Visualization:** *Bar graph ranking products based on sales volume.*

**Purpose:** *Identifies top-performing products and those that may need additional attention.*

### Sales vs Budget Amount:

**Visualization:** *Line graph showing sales trends over several months compared to budget amounts.*

**Purpose:** *Tracks performance against financial targets, highlighting any variances.*

### Sales by City:

**Visualization:** *List ranking sales by city, accompanied by a world map highlighting sales locations.*

**Purpose:** *Provides geographic insights into sales performance, identifying high-performing regions.*



## Insights Driven

### Sales Performance:

- **Analysis:** The KPIs section allows for a quick assessment of overall sales performance and growth trends.
- **Insights:** Stakeholders can quickly gauge whether sales targets are being met and identify periods of significant growth or decline.

### Product Category Contribution:

- **Analysis:** The sales by category pie chart helps in understanding the contribution of each product category to total sales.
- **Insights:** Enables strategic decisions on product focus, marketing efforts, and inventory management based on category performance.

### Top Products:

- **Analysis:** The sales by product bar graph ranks products by sales volume.
- **Insights:** Identifies top-selling products, allowing the sales team to focus on promoting these products and managing inventory effectively.

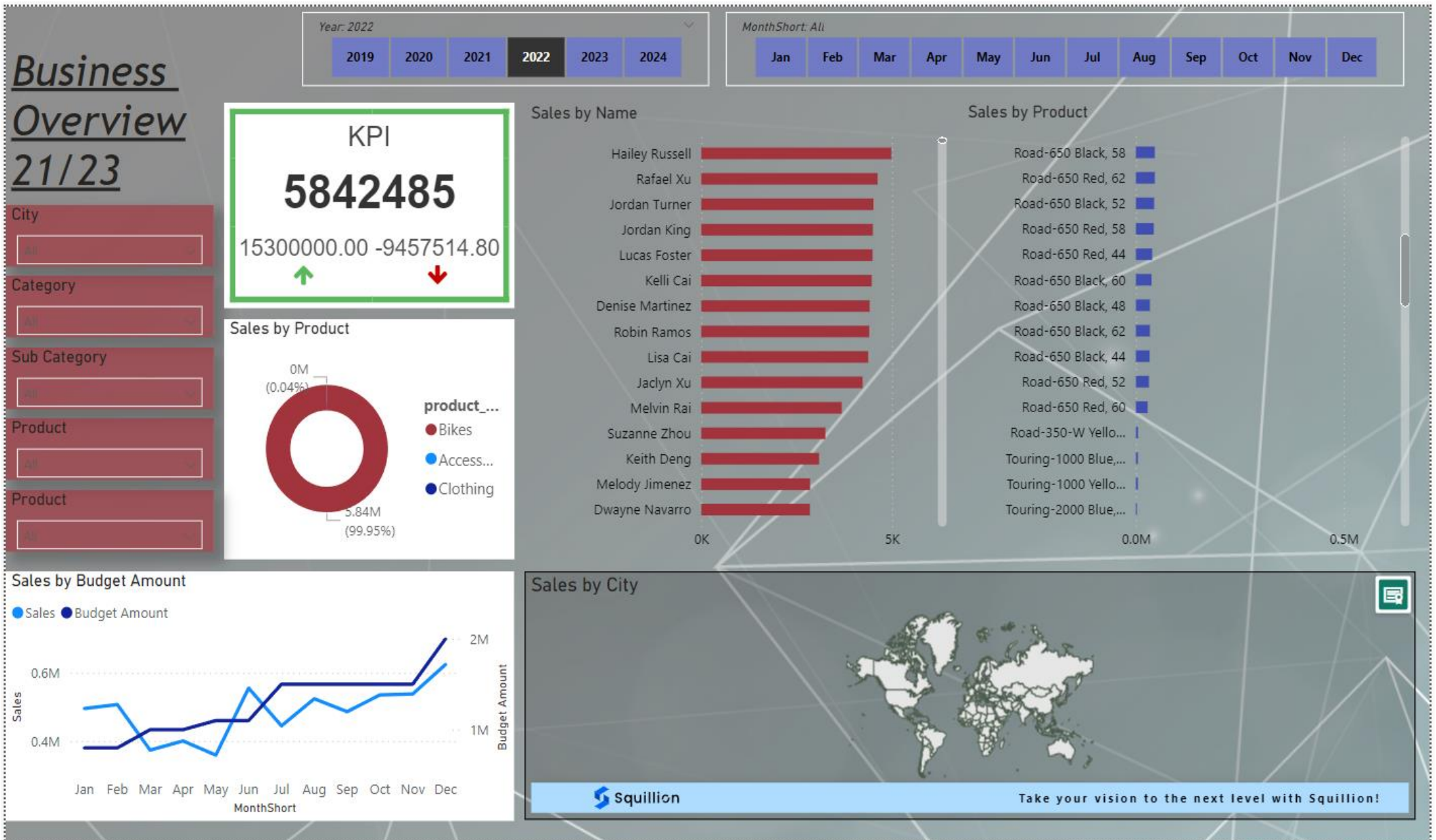
### Budget Variance:

- **Analysis:** The sales vs budget amount line graph compares actual sales with budgeted targets.
- **Insights:** Highlights variances between actual performance and financial goals, enabling proactive adjustments to sales strategies.

### Geographic Sales Insights:

- **Analysis:** The sales by city section, along with the world map, provides insights into regional sales performance.
- **Insights:** Identifies high-performing regions, helping in resource allocation and regional marketing strategies.

## Power BI Dashboard:



# Customer Details 21/23

Year: All

2019

2020

2021

2022

2023

2024

MonthShort: All

Jan

Feb

Mar

Apr

May

Jun

Jul

Aug

Sep

Oct

Nov

Dec

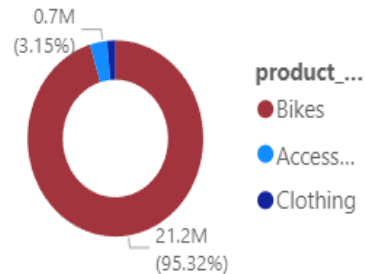
KPI

22239730

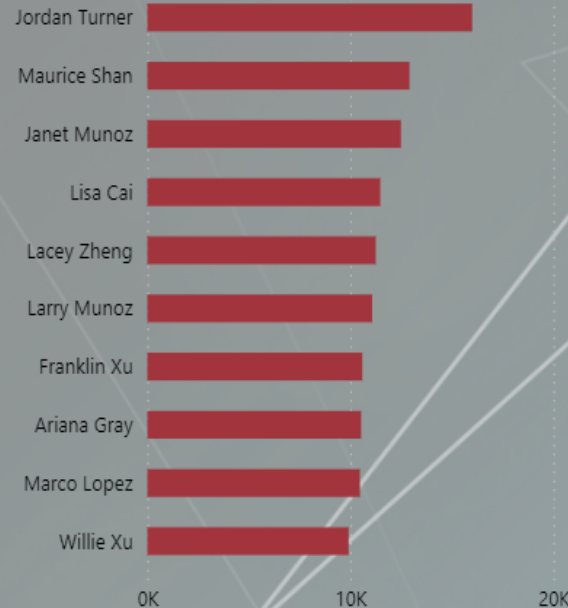
21100000.00 1139730.26



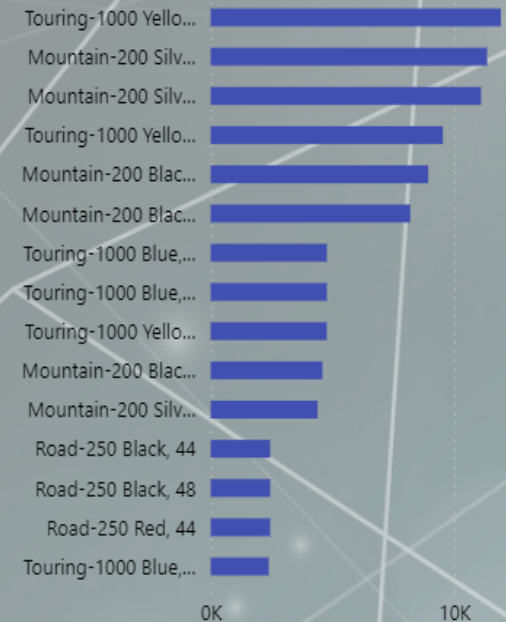
Sales by Product



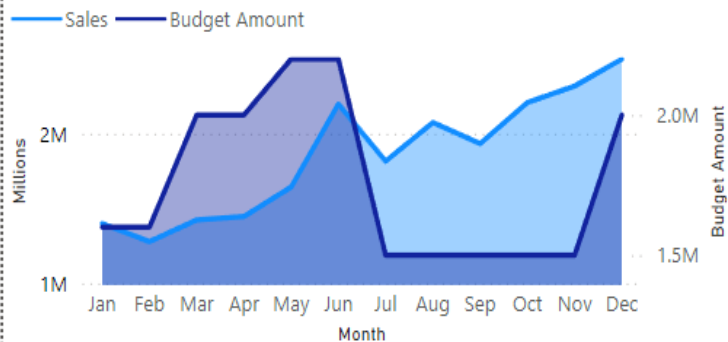
Sales by Name



Sales by Product



Sales by Budget Amount



Full_Name	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Aaron Adams				117.96									117.96
Aaron Alexander											69.99		69.99
Aaron Baker									1,750.98				1,750.98
Aaron Bryant				58.98			74.98						133.96
Aaron Butler											14.98		14.98
Aaron Campbell									1,155.4				1,155.48