**Data Analysis Report: Three-Year (2016-2018) Sales/Revenue Report of Wheels-N-More Bicycle Company**

**1. Introduction**

**1.1 Project Overview**

This report provides a comprehensive analysis of the sales data over the past three years for Wheels-N-More, a bicycle-selling company. The objective is to identify key trends, performance metrics, and actionable insights to inform business strategies.

**1.2 Purpose of the Report**

The primary goals of this analysis are to:

* Understand sales performance over the three years.
* Identify top-performing products, categories, and brands.
* Analyze customer demographics and purchasing behavior.
* Evaluate store and staff performance.
* Provide recommendations based on the findings.

**2. Data Model Description**

**2.1 Entities and Relationships**

* **Categories**: category\_id, category\_name
* **Stores**: store\_id, store\_name, phone, email, street, city, state, zip\_code
* **Staffs**: staff\_id, first\_name, last\_name, email, phone, active, store\_id, manager\_id
* **Orders**: order\_id, customer\_id, order\_status, order\_date, required\_date, shipped\_date, store\_id, staff\_id
* **Order Items**: order\_id, item\_id, product\_id, quantity, list\_price, discount
* **Products**: product\_id, product\_name, brand\_id, category\_id, model\_year, list\_price
* **Customers**: customer\_id, first\_name, last\_name, phone, email, street, city, state, zip\_code
* **Brands**: brand\_id, brand\_name
* **Stocks**: store\_id, product\_id, quantity

**2.2 Relationships Between Entities**

* **One-to-Many Relationships**:
  + Each category can have multiple products.
  + Each store can have multiple staffs.
  + Each customer can have multiple orders.
  + Each order can have multiple order items.
  + Each product can be in multiple order items.
  + Each store can stock multiple products.
* **Many-to-One Relationships**:
  + Each product belongs to one category.
  + Each product is associated with one brand.
  + Each order is associated with one store and one staff member.

**3. Data Analysis Methodology**

**3.1 Data Collection**

The data was collected from the sales database, which records details of sales transactions, customer information, product inventory, and staff activities over the past three years.

Data retrieval query:

SELECT

ord.order\_id,

CONCAT(cus.first\_name, ' ', cus.last\_name) AS customer\_name,

cus.city,

cus.state,

ord.order\_date,

SUM(ordit.quantity) AS total\_units,

SUM(ordit.quantity \* ordit.list\_price) AS total\_revenue,

prod.product\_name,

cat.category\_name,

sto.store\_name,

CONCAT(sta.first\_name, ' ', sta.last\_name) AS staff\_name,

brd.brand\_name

FROM

sales.orders ord

INNER JOIN

sales.customers cus ON ord.customer\_id = cus.customer\_id

INNER JOIN

sales.order\_items ordit ON ord.order\_id = ordit.order\_id

INNER JOIN

production.products prod ON ordit.product\_id = prod.product\_id

INNER JOIN

production.categories cat ON prod.category\_id = cat.category\_id

INNER JOIN

sales.stores sto ON ord.store\_id = sto.store\_id

INNER JOIN

sales.staffs sta ON ord.staff\_id = sta.staff\_id

INNER JOIN

production.brands brd ON prod.brand\_id = brd.brand\_id

GROUP BY ord.order\_id , customer\_name , cus.city , cus.state , ord.order\_date , prod.product\_name , cat.category\_name , sto.store\_name , staff\_name , brd.brand\_name;

**3.2 Data Cleaning**

Data cleaning is a critical step in ensuring the accuracy and reliability of the analysis. For this project, the data cleaning was performed using Microsoft Excel. The specific steps taken to clean the data include:

* Handling missing values in customer information and order details.
* Normalizing data formats (e.g., dates, text fields).
* Removing duplicate records.

**4. Business Questions and Analysis**

**4.1 Sales Performance Over Three Years**

**Question**: What are the total sales and growth trends over the past three years?

* The company experienced a significant revenue growth of 41.93% from 2016 to 2017.
* However, there was a substantial decline in revenue by 47.37% from 2017 to 2018.

**4.2 Product Performance Analysis**

**Question**: Which products have the highest sales volume over the three years?

* The "Electra Townie Original 21D - 2016" was the best-selling product.

**Question**: What is the total revenue generated by each product?

* Detailed revenue figures for each product were analyzed.

**4.3 Customer Analysis**

**Question**: What are the top cities or states where most customers are located?

* New York holds the largest customer base, accounting for more than 67% of the total customers.

**Question**: What is the average purchase amount per customer?

* The average purchase is around ₹1816.81.
* Breakdown by state:
  + CA: ₹1779.47
  + NY: ₹1823.55
  + TX: ₹1847.60

**4.4 Monthly Analysis**

**Question**: What are the revenue trends by month or quarter?

* Monthly and quarterly revenue trends were analyzed to identify peak sales periods.

**4.5 Store and Staff Analysis**

**Question**: Which stores have the highest sales over the three years?

* Store performance was evaluated based on total sales and growth rates.

**Question**: Which staff members have processed the highest number of orders?

* Staff performance was assessed based on the number of orders processed and sales generated.

**4.6 Brand Analysis**

**Question**: Which brands are the top sellers?

* Analysis of brand performance highlighted the top-selling brands.

**5. Visualizations**

An interactive dashboard has been created: [Tableau Dashboard](https://public.tableau.com/app/profile/abhinandan.naskar/viz/bike_sales_executive_dashboard/Dashboard1?publish=yes)

* **Yearly Revenue**: Column graph showing total revenue per year.
* **Monthly Revenue**: Line chart displaying monthly revenue per year.
* **State-wise Revenue**: Heatmap showing total revenue in all states.
* **Top 10 Customers**: Bar chart showing top 10 revenue-generating customers.
* **Store-wise Revenue**: Pie chart displaying revenue generated by each store.
* **Staff Performance**: Bar chart showing the number of orders processed by each staff member.
* **Top-Selling Brands**: Bar chart displaying sales by brand.
* **Category-wise Revenue**: Pie chart displaying revenue generated by each category.

**Key Insights**

1. **Overall Revenue Trends**:
   * Significant growth in revenue by 41.93% from 2016 to 2017.
   * Decline in revenue by 47.37% from 2017 to 2018.
2. **Top-Selling Products**:
   * "Electra Townie Original 21D - 2016" was the best-selling product.
   * Other top-selling products included "Electra Townie Original 7D EQ - 2016" and "Electra Cruiser 1 (24-Inch) - 2016".
3. **Customer Base Distribution**:
   * New York holds the largest customer base, accounting for over 67% of total customers.
   * Other significant customer locations included regions with 21.30% and 11.03% of the customer base.
4. **Store and Staff Performance**:
   * Detailed analysis of store performance includes metrics such as total sales per store and growth rates.
   * Staff performance metrics include the number of orders processed and sales generated by each staff member.

**Recommendations**

1. **Inventory Management**:
   * Increase stock levels for top-selling products like "Electra Townie Original 21D - 2016" to meet high demand.
2. **Marketing Strategy**:
   * Focus marketing efforts on New York, given it has the largest customer base.
   * Explore strategies to expand the customer base in other potential growth regions.
3. **Product Development**:
   * Consider expanding product lines for popular categories and models to leverage their popularity.
4. **Addressing Revenue Decline**:
   * Investigate the reasons for the revenue decline from 2017 to 2018 and develop strategies to mitigate this trend.
5. **Store and Staff Optimization**:
   * Provide additional training and support to underperforming stores and staff to improve overall performance.
   * Recognize and reward top-performing stores and staff members to maintain high morale and motivation.

**Conclusion**

The analysis reveals critical insights into sales performance, customer demographics, and product popularity over the past three years. By addressing the identified issues and leveraging the strengths, the company can develop effective strategies to enhance its sales and overall business performance.