Comprehensive Data Analysis and Adidas Report

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1. Objective

To empower Adidas' strategic decisions by leveraging data analytics and implementing time series forecasting to provide actionable sales insights, interactive dashboards, and accurate predictions for operational efficiency.

Key Deliverables:

1. Interactive dashboards for stakeholders to explore data dynamically.
2. Visualizations to understand sales performance, regional trends, and product preferences.
3. A 15-day time series-based sales forecast to optimize inventory and logistics.
4. Actionable recommendations to improve sales strategies and operational efficiency.
5. Comprehensive analysis of retailer performance and product category trends

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2. Problem Statement

Despite its strong brand presence, Adidas faces challenges in effectively utilizing sales data for forecasting, trend analysis, and decision-making.

Challenges:

1. Fluctuating sales trends across regions and retailers.
2. Inefficient inventory management due to inaccurate forecasts.
3. Limited insights into customer preferences and product performance.
4. High operational costs from suboptimal resource allocation.
5. Lack of a unified platform for stakeholders to visualize and analyze data.

Goals:

1. Develop a robust forecasting model for sales predictions.
2. Create intuitive dashboards for data-driven decision-making.
3. Identify KPIs and provide insights to optimize performance.
4. Enable actionable reporting to align sales and operational strategies.

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3. Data Requirement

To perform the analysis, the following columns are required:

Field Name	Description
Retailer	**Name of the retailer (e.g., Foot Locker).**
Retailer ID	**Unique identifier for each retailer.**
Invoice Date	**Date of the transaction.**
Region	**Geographical region of the sale.**
State/City	**State and city of the sale.**
Product	**Product category (e.g., Men's Footwear).**
Price per Unit	**Selling price per unit.**
Units Sold	**Quantity of units sold.**
Total Sales	**Total revenue generated.**
Operating Profit	**Profit from the sale.**
Operating Margin	**Profit margin as a percentage of sales.**
Sales Method	**Sales channel (e.g., In-store or Online).**
Field Name	**Description**

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4. Data Collection

The dataset was sourced from Adidas US sales records and contains information on:

- Retailer details and transaction metadata.
- Product-level sales, profits, and margins.
- Sales methods (In-store and Online).

Sources:

- Adidas internal sales database.
- Publicly available e-commerce datasets.
- Logistic performance and customer feedback records.

Invoice Date	Retailer	Region	Product	Units Sold	Total Sales	Operating Profit
2020-01-01	Foot Locker	Northeast	Men's Footwear	1200	$600,000	$300,000
2020-01-02	Foot Locker	Northeast	Women's Footwear	850	$382,500	$133,875

Sample Data:

5. Data Validation

Objective: Ensure data accuracy and readiness for analysis.

1. **Completeness Check:**

   Validate all key fields (e.g., Invoice Date, Units Sold, Total Sales).

2. **Consistency Check:**

   Standardize date formats and ensure uniform state/city names.

3. **Duplicate Records:**

   Identify and remove duplicates.

4. **Range Validation:**

   Ensure no negative sales or invalid product categories.

5. **Missing Data Handling:**

   Apply appropriate imputation techniques or drop irrelevant records.

6. **Outlier Analysis:**

   Detect anomalies using statistical methods and domain expertise.

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6. Data Cleaning

Steps:

1. Replace missing values in non-critical fields using mean/mode imputation.
2. Standardize text and date formats for consistency.
3. Address outliers in sales, profits, and units sold using interquartile ranges.
4. Consolidate related product categories for simplified reporting.
5. Merge duplicate records and remove unnecessary columns.

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7. Tools and Methodology

Tools Used:

1. **Microsoft Power BI**: Interactive dashboards and visualizations.
2. **Microsoft Excel:** Data preprocessing and validation.

Methodology:

1. **Exploratory Data Analysis (EDA):**
    - Understand sales patterns, identify anomalies, and calculate KPIs.
2. **Statistical Analysis:**
    - Perform trend analysis and correlation studies.
3. **Dashboard Creation:**
    - Design interactive visualizations for trends, forecasts, and insights.
4. **Forecasting Models:**
    - Develop and validate time series models using ARIMA and exponential smoothing.

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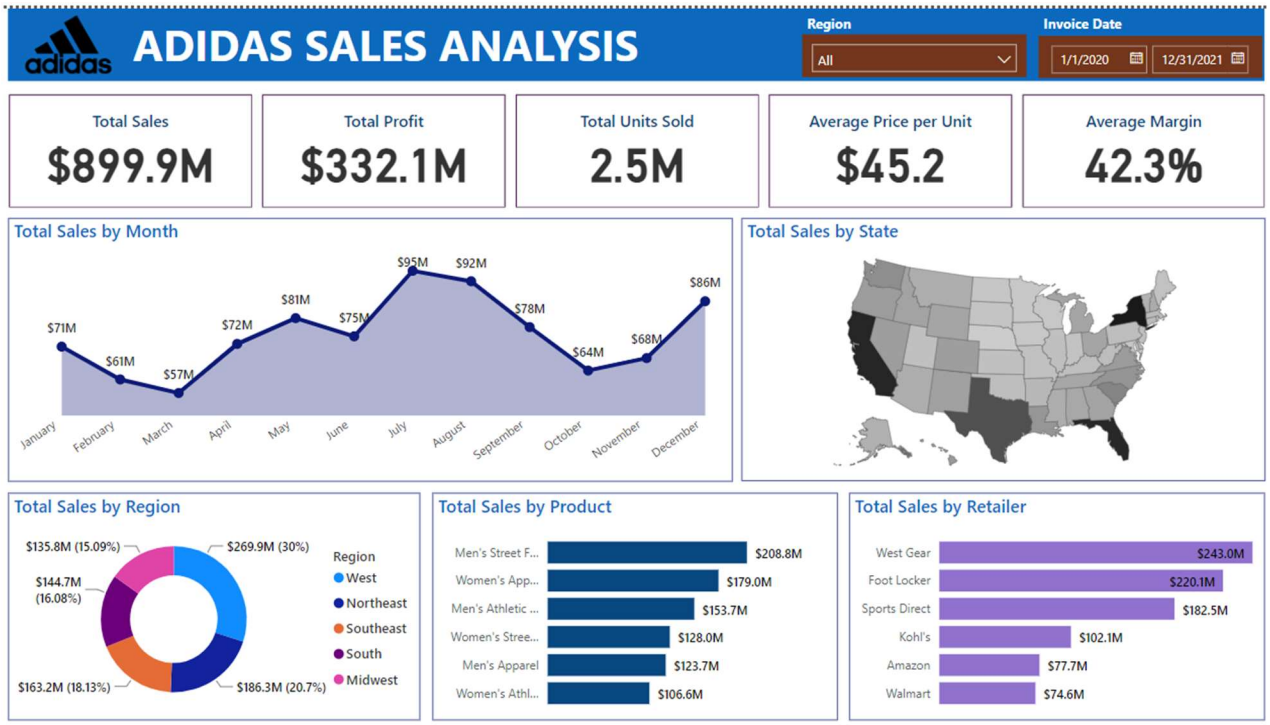
8. Dashboard Design

Key Dashboard Elements:

1. **Sales Overview:**
    a. Total sales by region, state, and product category.
    b. Monthly and quarterly performance trends.
2. **Product Insights:**
    a. Top-performing categories and units sold.
    b. Revenue contribution by product type.
3. **Customer Insights:**
    a. Segmentation by region, sales channel, and demographic trends.
4. **Forecasting:**
    a. Sales predictions with confidence intervals.
5. **Logistics Performance:**
    a. Delivery timelines, return rates, and stock-outs.

Dashboard


ADIDAS SALES ANALYSIS
Region
All
Invoice Date
1/1/2020
12/31/2021
Total Sales
$899.9M
Total Profit
$332.1M
Total Units Sold
2.5M
Average Price per Unit
$45.2
Average Margin
42.3%
Total Sales by Month
$71M
$61M
$57M
$72M
$81M
$75M
$95M
$92M
$78M
$64M
$68M
$86M
January
February
March
April
May
June
July
August
September
October
November
December
Total Sales by State
Total Sales by Region
$135.8M (15.09%)
$269.9M (30%)
$144.7M (16.08%)
$163.2M (18.13%)
$186.3M (20.7%)
Region
West
Northeast
Southeast
South
Midwest
Total Sales by Product
Men's Street F...
$208.8M
Women's App...
$179.0M
Men's Athletic ...
$153.7M
Women's Stree...
$128.0M
Men's Apparel
$123.7M
Women's Athl...
$106.6M
Total Sales by Retailer
West Gear
$243.0M
Foot Locker
$220.1M
Sports Direct
$182.5M
Kohl's
$102.1M
Amazon
$77.7M
Walmart
$74.6M

9. Insights and Recommendations

Key Insights:

1. The Northeast region drives the highest revenue but faces delivery delays.
2. Men's and Women's Footwear categories dominate sales.
3. Online sales are growing rapidly, indicating a shift in customer behavior.

Recommendations:

1. Focus inventory and promotional efforts on top-performing regions and products.
2. Improve logistics in underperforming areas through strategic partnerships.
3. Enhance online store experience to capture the growing digital audience.
4. Optimize pricing strategies to improve margins in competitive categories.
5. Implement targeted campaigns for underperforming regions and products.

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10. Storytelling

Narrative Flow:

1. **Introduction:** Highlight objectives and challenges.
2. **Analysis:** Present trends, forecasts, and KPIs with visual evidence.
3. **Recommendations:** Explain how insights can drive growth and efficiency.
4. **Conclusion:** Summarize the impact of implementing recommendations.

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11. Learning and Conclusion

Key Learnings:

- Enhanced understanding of time series forecasting and its business applications.
- Gained expertise in designing dashboards for effective communication.
- Developed actionable insights to address real-world business problems.
- Learned the importance of cross-functional collaboration in data projects.

Outcome: This project highlights opportunities for Adidas to optimize operations, enhance profitability, and strengthen its market position. The integration of analytics into decision-making processes will ensure sustained growth.