**Analysis**

**Data Description**

The data was derived from Kaggle <https://www.kaggle.com/datasets/ronnykym/online-store-sales-data>. It contains sales data of a UK-based retail company from 2nd Jan 2019 to 30th Dec 2020. The store is online based with no physical store and serves clients in several countries through an e-commerce site where clients make orders. The data consists of order date, order value, cost, item category, customer name, country, device type, order id, sales manager, and sales representative. The order value and cost columns are in EUR currency.

**Problem Statement**

The company would like to identify the channel (PC, mobile, tablet) that contributes the highest sale and profit, what category contributes the largest proportion of sales, and understand sales and profits by country. The insights could help the company craft a marketing campaign based on sales per country and improve their site versions based on sales generated by each channel and what category of goods to stock more. Time series analysis of sales and profit informed the month with the lowest and highest sales and profits. Besides, the stakeholder would like to understand the important KPI for specific sales managers and select the best-performing manager. With these insights, the company can identify the low season and develop vigorous marketing campaigns to increase sales during those months.

## **Visualization Justification**

A combined line and bar chart was the most appropriate to visualize sales and gross sales margin. The sales variable is on the left axis, while the gross sales margin is on the right axis. This makes it easy for stakeholders to view sales and sales margin from one graph and understand the gap between sales and sales margin over time (months).  A vertical bar chart was the appropriate visual to summarize sales and profit for item categories and countries. The management can easily view actual figures by hovering the mouse over the bars. Also, the bars are arranged in descending order, thus making it easy for the reader to identify the entity with the highest and lowest sales or profit.

The line chart was the right visual to present profit accrued over the month since it is a time series data. The line graph clearly shows the pattern in profits over the months. With this graph, the management can quickly identify trends, seasonality, and horizontal and vertical profit patterns. The scorecards are crucial in business intelligence analysis as they show summaries of key performance metrics that measure the health of a business. In this analysis, we included four scorecards at the top to give the reader a quick summary of key performance indicators. The donut and pie charts were useful in visualizing the proportion of profit and sales by device type since there are only 3 categories in the device type column. This makes the slices clear and not too crowded to disrupt the reader.

Additionally, we included a date slicer on the top right corner of the dashboard to allow the stakeholders to slice data for a specific period of interest. By default, the slider includes data for all dates. We added three filters that allow the user to filter data by categories, countries, and sales manager.

## **Derived Metrics**

1. Gross sales margin

Gross sales margin was used to represent the percentage of revenue that exceeds the cost of sales. The metric shows how efficiently the company sources and sells its products. A higher gross sales margin is preferred since it implies that the company is generating sufficient income to take care of its production and still has money left to cover other operational expenses and generate profit.

Gross sales margin = (Sales – Cost of sales / Sales) \* 100

1. Profit

Gross profit was computed by deducting the cost of sales from total sales revenue. Profit is the company's ultimate measure as it indicates the extent to which it can sustain its operations, reward stakeholders and invest in growth.

Gross profit = Sales – Cost of sales

## **Existing Metrics**

1. Gross Sales Revenue

Total sales represent the total revenue realized from the sale of goods. Sales are a business's most crucial income stream as they directly impact its growth. In this analysis, we tracked monthly sales to measure the company's market demand.

1. Cost of Sales

Cost of sales incorporated direct costs incurred in purchasing and providing the goods. Tracking the cost of sales is crucial as it directly affects the company's gross profit margin and overall profitability.

## **Analysis Results Summary**

1. Sales and Sales Margin

This visualization combines a line chart and bars to show gross sales margin over the total sales per month.   
﻿At 14,850,372.76, June had the highest Sales and was 205.88% higher than February, which had the lowest Sales at 4,854,976.90.﻿﻿ ﻿﻿ ﻿﻿﻿﻿June accounted for 13.10% of Sales.﻿﻿ ﻿﻿ ﻿﻿Sales and Sales Margin diverged the most in June, when Sales were 14,850,372.59 higher than Sales Margin.﻿﻿ ﻿﻿ ﻿

1. Sales by country

At 27,796,361.83, Portugal had the highest Sales and Austria, which had the lowest Sales at 190,166.35.﻿﻿ ﻿﻿ ﻿﻿Portugal accounted for 24.52% of Sales.﻿﻿ ﻿﻿ ﻿﻿Across all 15 country, Sales ranged from 190,166.35 to 27,796,361.83.﻿﻿ ﻿﻿ ﻿

1. Sales by Device Type

﻿PC had the highest Sales at 89,647,283.79, followed by Mobile at 15,447,394.39 and Tablet at 8,267,060.53.﻿﻿ ﻿﻿ ﻿﻿PC accounted for 79.08% of Sales.﻿﻿ ﻿﻿ ﻿

We can confirm most of the clients make purchases from their PC, therefore the company should consider even revamping the PC web version of their online store to attract more customers and retain the existing ones.

1. Sales by Category

At 17,661,682.13, Clothing had the highest Sales and was 441.27% higher than Other, which had the lowest Sales at 3,262,983.20.﻿﻿ ﻿﻿ ﻿﻿Clothing accounted for 15.58% of Sales.﻿﻿ ﻿﻿ ﻿﻿Across all 10 categories, Sales ranged from 3,262,983.20 to 17,661,682.13.﻿﻿ ﻿﻿ ﻿

1. Profit Summary

At 2,492,322.84, June had the highest profit and was 208.09% higher than February, which had the least profit at 808,955.41.﻿﻿ June accounted for 13.12% of total profit.﻿﻿ ﻿﻿ ﻿﻿Across all 12 Month, profit ranged from 808,955.41 to 2,492,322.84.﻿﻿ ﻿﻿ ﻿

1. Profit by Country  
   ﻿At 4,670,107.56, Portugal had the highest profit while Austria had the lowest profit at 35,718.38.﻿﻿ ﻿﻿ ﻿﻿﻿﻿Portugal accounted for 24.59% of total profit.﻿﻿ ﻿﻿ ﻿﻿Across all 15 country, profit ranged from 35,718.38 to 4,670,107.56.﻿﻿ ﻿﻿ ﻿
2. Profit by Device Type  
   ﻿PC users generated the highest Profit at 15,088,298.24, followed by Mobile at 2,552,714.33 and Tablet users at 1,351,415.15.﻿﻿ ﻿﻿ ﻿﻿PC users accounted for 79.44% of the total profit.﻿﻿ ﻿﻿ ﻿