

## Project Coversheet

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### 1. Introduction:

- **Project Overview**

The Business Intelligence Team at **TechHub Retail**, a rapidly expanding UK-based online electronics retailer, is undertaking the development of comprehensive analytics to support strategic decisions for 2025. With 18 months of expansion, the company lacks comprehensive analytics to guide strategic decisions for 2025 planning.

To address this, the Chief Executive has commissioned the creation of an executive dashboard and the delivery of data-driven insights to inform strategic planning.

The objectives of the project are to:

- **Identify growth opportunities** across products, regions, and customer segments
- **Analyse performance trends** and seasonal patterns
- **Build predictive insights** for 2025 planning
- **Provide actionable recommendations** for executive decision-making

The project will include the development of an interactive dashboard using **Tableau Public** and the preparation of an executive-level business presentation.

- **Datasets:**

1. Dataset TechHub\_Sales\_Data.csv - 18 months of sales transactions (Jan 2023 - June 2024):

Column Name	Description
order_date	Date of Transaction
customer_id	Unique Customer Identifier
product_id	Product Identifier
product_category	Electronic Category (6 Categories)
revenue	Salary Revenue (£)
quantity	Items Purchased
region	UK Region
customer_aquisition_channel	Marketing Channel

Dataset Size: 12,000+ transactions

2. TechHub\_Customers.csv - Customer demographic and profile information:

Column Name	Description
customer_id	Unique Customer Identifier
signup_date	Customer Registration date
age_group	Age Demographic (18-25, 26-35 etc)
gender	Customer Gender
city	Customer City
customer_type	New or Returning Customer
loyalty_tier	Bronze,Silver,Gold

Dataset Size: 3,500+

3. unique customers Supporting Dataset: TechHub\_Products.csv - Product catalog with cost and margin information:

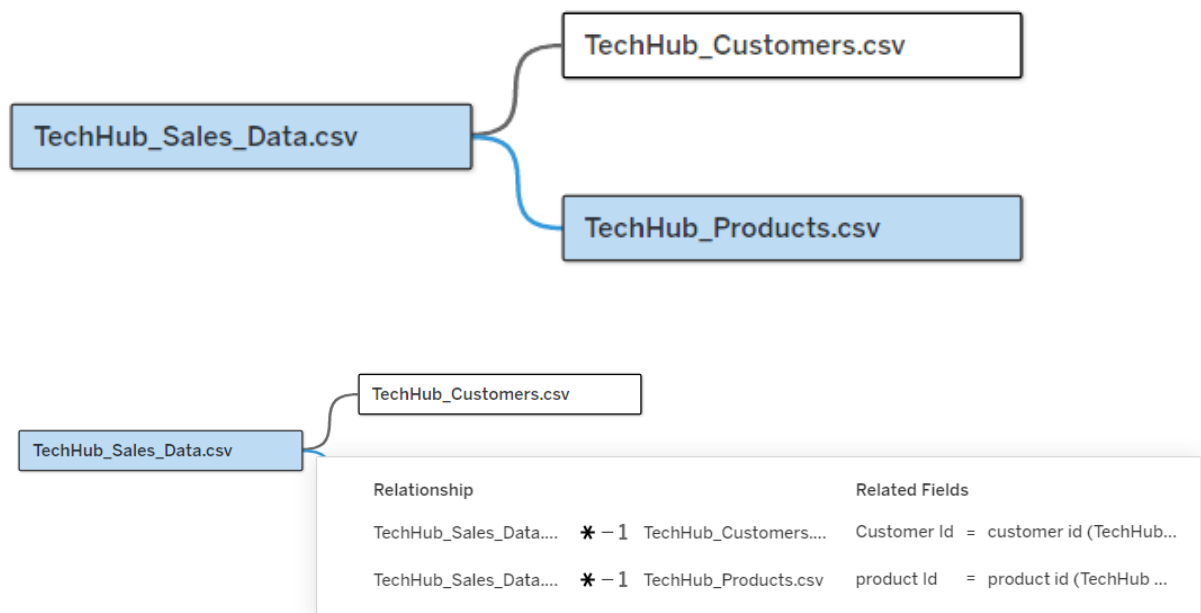
Column Name	Description
product_id	Product Identifier
product_name	Product Name
product_category	Category Classification
cost_price	Product Cost (£)
list_price	Retail Price (£)
supplier	Product Supplier
launch_date	Product Launch Date

Dataset Size: 300+ products

## 2. Multi-Dataset Integration Summary

- Load & Transform Multiple Datasets:

Connected all the 3 datasets to Tableau and created proper data relationships between the datasets at the logical layer using customer\_id and product\_id as linking keys



- Data preparation tasks:

- Converted all the date fields to proper date format, to make use of date hierarchy on the visual.
- No missing value found.
- We have all the 1200 rows of data from Sales coming in the merged output, which means all the product Ids and Customer Ids are valid.

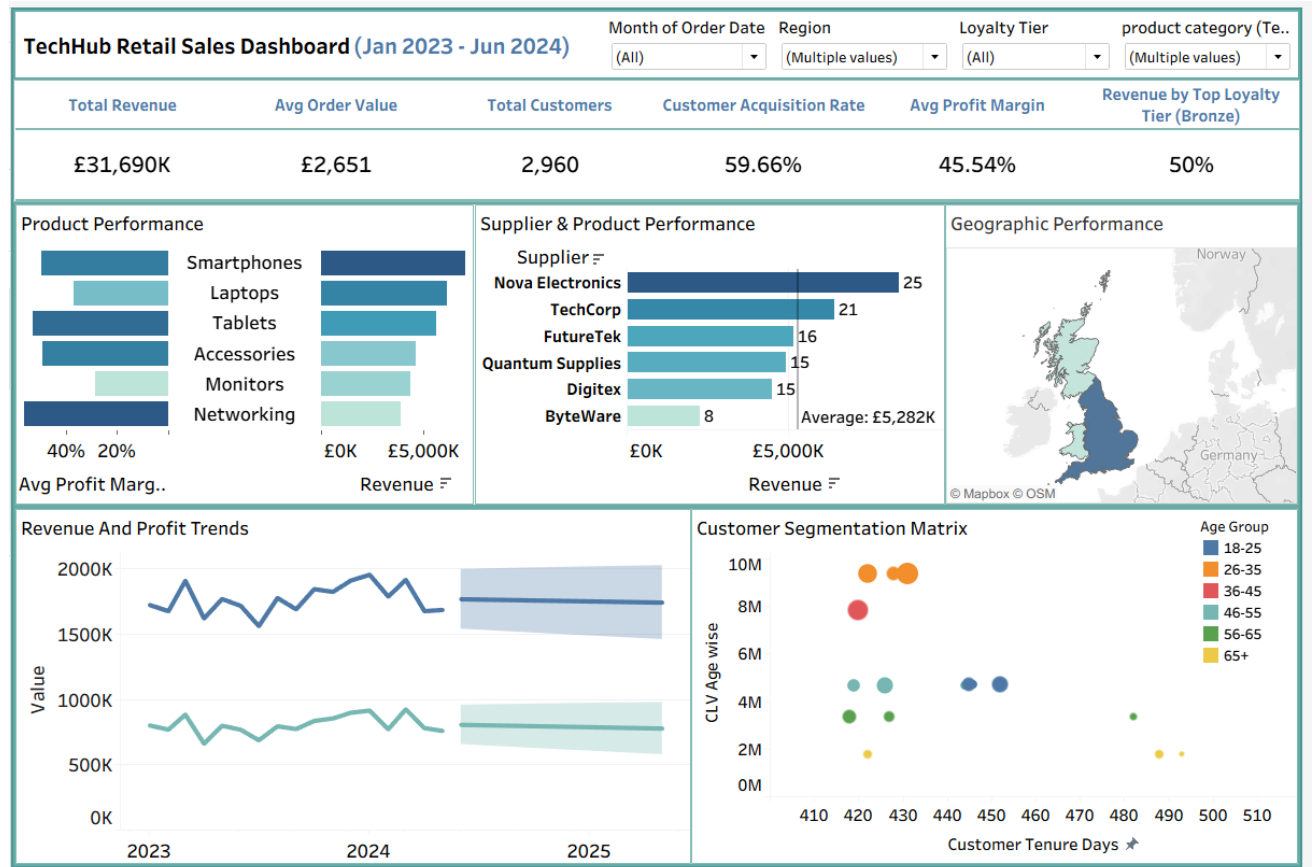
- Created calculated fields:

- Profit Amount = [Revenue] - ([Cost Price] × [Quantity])
- Overall Profit Margin % = (Sum([Profit Amount]) / Sum([Revenue])) × 100
- Customer Tenure Days = DATEDIFF('day', [Signup Date], TODAY())
- Customer Lifetime Value = SUM([Revenue]) per customer
- Product Age Days = DATEDIFF('day', [Launch Date], [Order Date])

- Data relationship challenges

- **Geographic Mapping:** Some UK regions/cities (e.g., Newcastle, North East) were not recognized in Tableau, causing missing map values. Resolved by **manual mapping, standardizing hierarchies, and geo-coding** all locations.

### 3. Dashboard Design Summary



## Executive KPI Dashboard Design

### 1. Key Performance Indicators (KPIs)

- Total Revenue
- Average Order Value (AOV)
- Total Customers
- Customer Acquisition Rate
- Average Profit Margin
- Revenue by top Loyalty Tier (Bronze)

### 2. Sales & Profitability Trends

- **Dual-axis line chart** displaying *Revenue* vs. *Profit* over time.
- Includes **forecasting** to project future trends.

### 3. Customer Segmentation Matrix

- **Scatter plot** of *Customer Lifetime Value (CLV)* vs. *Tenure*.
- Segmented by **Loyalty Tier** and **Age Group** to analyze demographic impact.

### 4. Product Portfolio Analysis

- **Butterfly chart** of Total Revenue and Average Profit Margin across all product categories
- Helps identify high-value and low-margin product lines.

### 5. Supplier & Product Performance

- **Horizontal bar chart** ranking suppliers by *Total Revenue*.
- Annotated with **Product Count** to compare breadth vs. profitability.

### 6. Geographic Performance

- **Filled map of UK regions** showing *Revenue per Customer*. All the Regions of England (North East, North West etc) are grouped under the country, to enable the filled map.

### 7. Interactive Elements (applied across the dashboard)

- **Date Filters** (affects all views).
- **Product Category Multi-Select Filter**.
- **Customer Loyalty Tier Selector**.
- **Region** filters for geographic insights.

## 4. Key Insights & Findings

- **Product Performance:** *Smartphones, Monitors, and Tablets* are the top profit drivers, while *Accessories* show low margins and limited revenue impact.
- **Supplier Strength:** *Quantum Supplies, ByteWare, and FutureTek* contribute the highest revenue and profitability, making them critical partners.
- **Customer Demographics:** The **26–35 age group** is the strongest segment, followed by **36–45**, highlighting the purchasing power of younger to mid-career customers.
- **Regional Trends:** Revenue distribution is balanced across the UK, with the **South West leading** and **Scotland lagging**.
- **Seasonality:** Peaks in **Q4 (holiday season)** and smaller surges in **Q1** drive the strongest demand; mid-year shows volatility, especially in weaker categories.

- **Acquisition Channels: Organic and Paid channels** deliver the highest Customer Lifetime Value (CLV), indicating sustainable long-term profitability.

5. Business Questions Answered

1. Which product categories and suppliers offer the best profit margins for 2025 focus?

Key Insights

- **Product Categories (Fig. 1): Smartphones, Monitors, and Tablets** emerge as the **top-performing categories**, generating the highest contribution to overall profit.
- **Suppliers (Fig. 2): Quantum Supplies, ByteWare, and FutureTek** are identified as the **top three suppliers**, driving significant revenue and profitability.

**Implication:** These findings highlight where the business is currently strongest. A strategic focus on strengthening supplier relationships with these key partners, while doubling down on high-profit categories, can maximize growth potential in 2025.

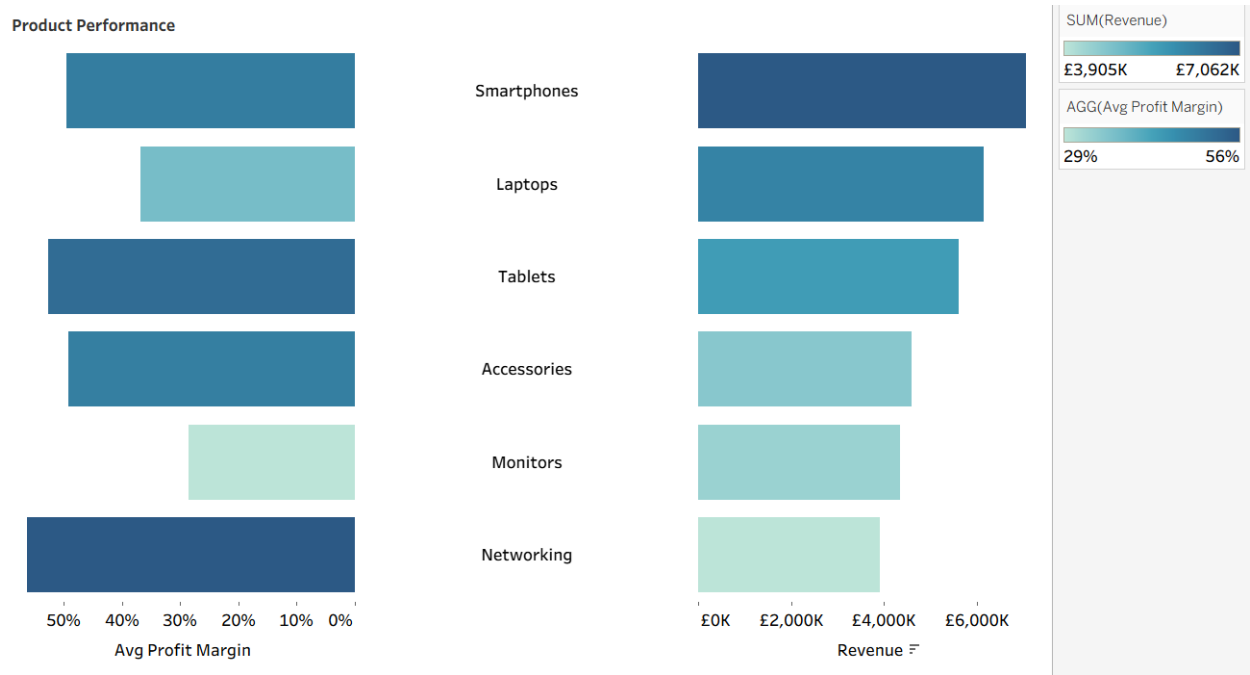


Fig1. Product Categories

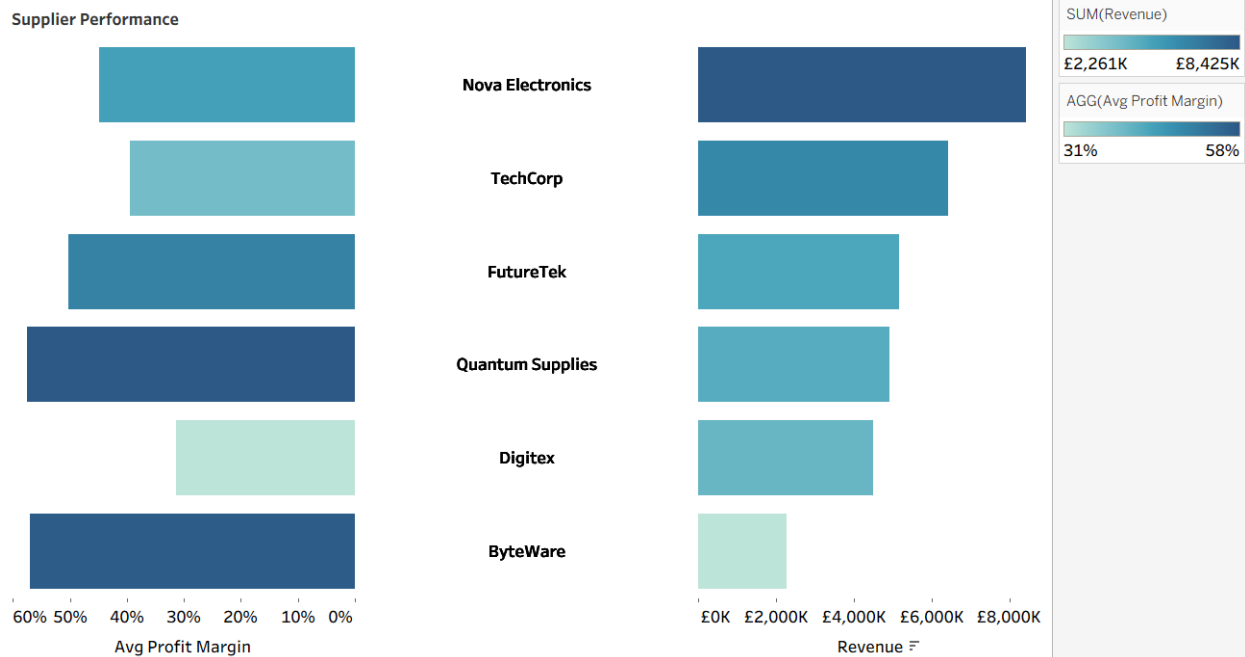


Fig2. Suppliers

2. How do customer demographics (age, location, loyalty tier) impact purchasing behavior?

### Customer Demographics (Fig. 3):

Across all loyalty tiers, the **26–35 age group** emerges as the **most valuable segment**, generating the highest revenue contribution. This is followed by the **36–45 age group**, highlighting the strong purchasing power of younger to mid-career customers.

### Regional Performance (Fig. 4):

Revenue distribution across UK regions remains relatively balanced, ranging from just under **3.9M** to above **4.1M**. The **South West** leads as the top-performing region, while **Scotland** records the lowest revenue contribution.

BQ2 Demographics vs Total Revenue

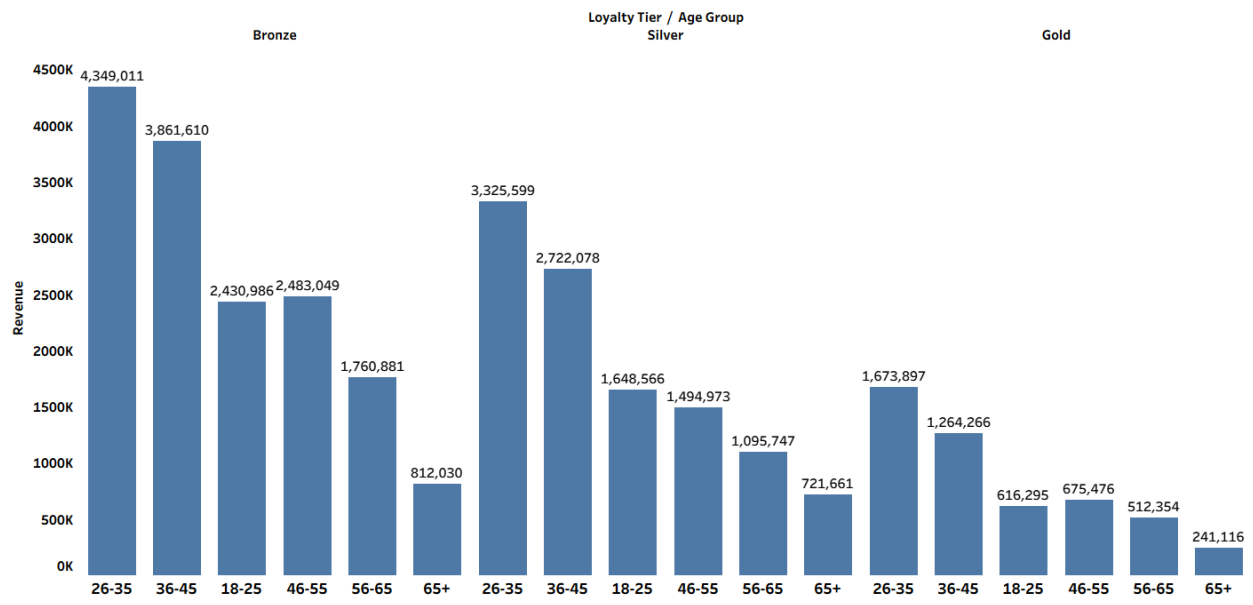


Fig3. Customer Demographics

BQ2 Region vs Total Revenue

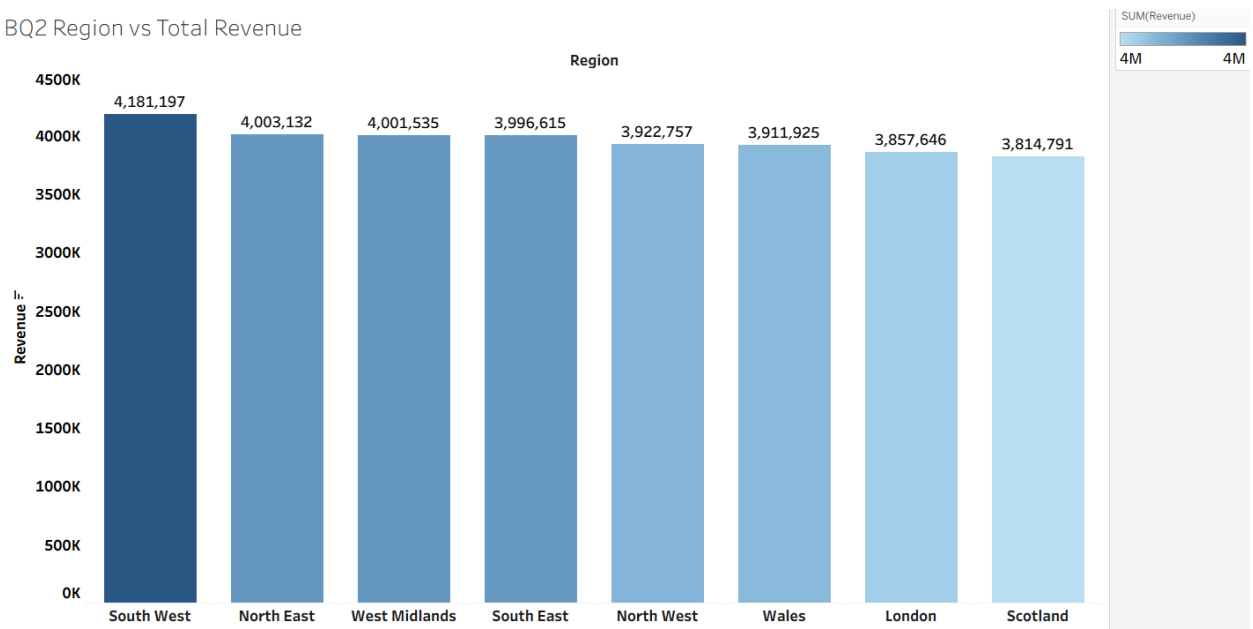


Fig4. Region Vs Total Revenue

- What seasonal patterns exist across different product categories and regions?



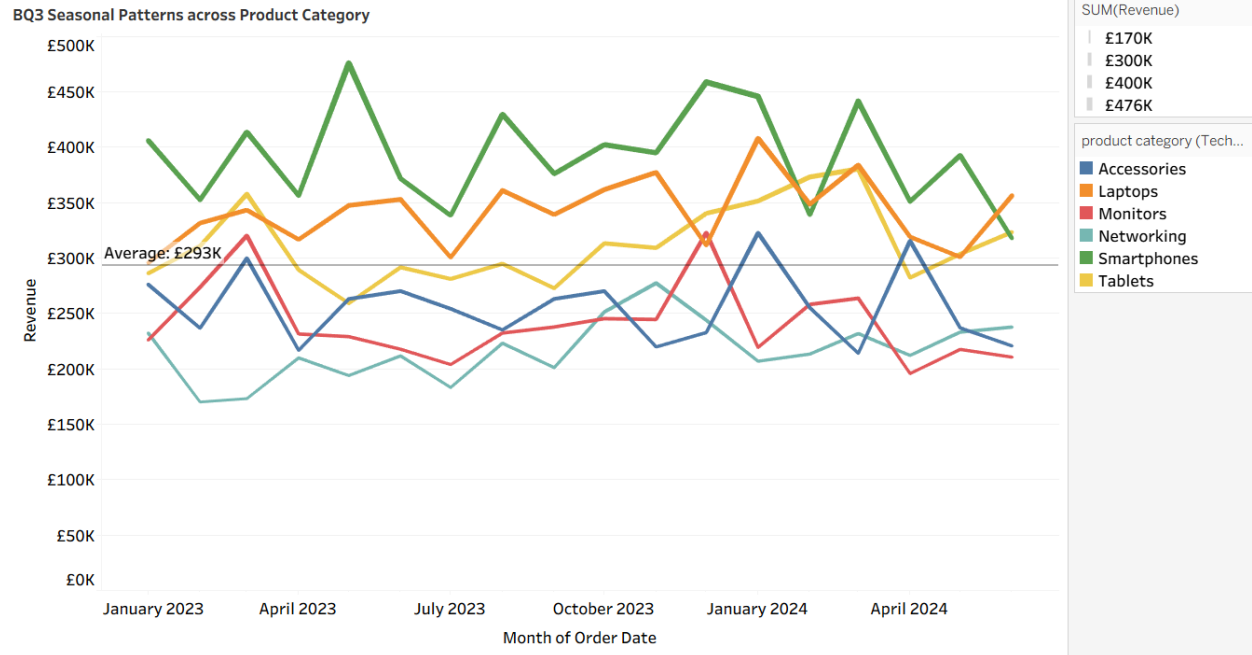


Fig5. Seasonal Patterns across Product Category

The analysis highlights clear seasonality in revenue performance. Peaks are observed in Q4 (holiday season) and smaller surges in Q1, reflecting strong year-end and early-year demand. Among categories, **Smartphones and Monitors consistently outperform, remaining above the overall average revenue**, while weaker categories exhibit greater volatility during mid-year.

**Strategic Insight:** Inventory planning and promotional efforts should be concentrated in **Q4 and early Q1** to capture demand surges, while targeted initiatives are required to **stabilize weaker product categories during off-peak periods**.

BQ3 Seasonal Patterns across regions

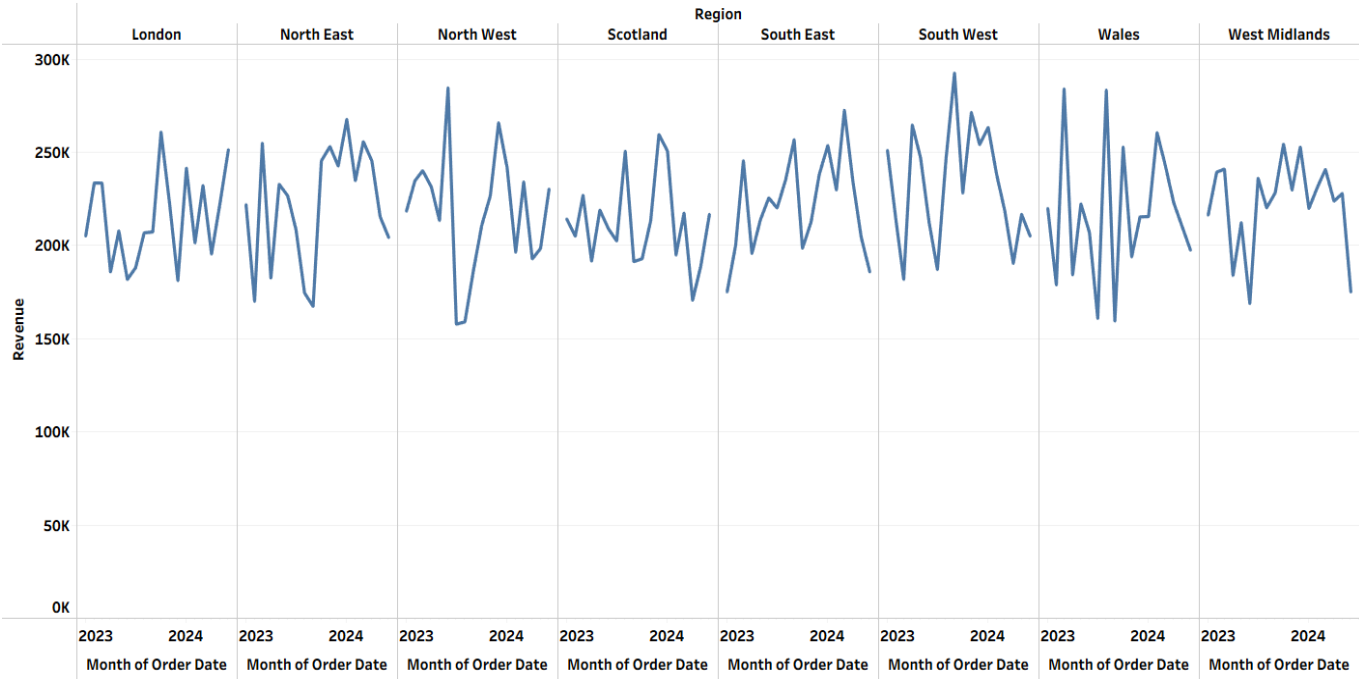


Fig6. Seasonal Patterns across UK Regions

Sales between Jan 2023 and Jun 2024 follow a clear seasonal cycle, with peaks in **March, June, and November–December** and weaker volumes in **July–August** (notably in the North East and Wales). Quarter-wise, **Q1 shows strong momentum** from new year campaigns, **Q2 delivers moderate growth** with June spikes in regions like London and the South East, **Q3 experiences a slowdown**, and **Q4 records the highest volumes**, driven by holiday demand in major regions.

4. Which customer acquisition channels deliver the highest lifetime value customers?

BQ4

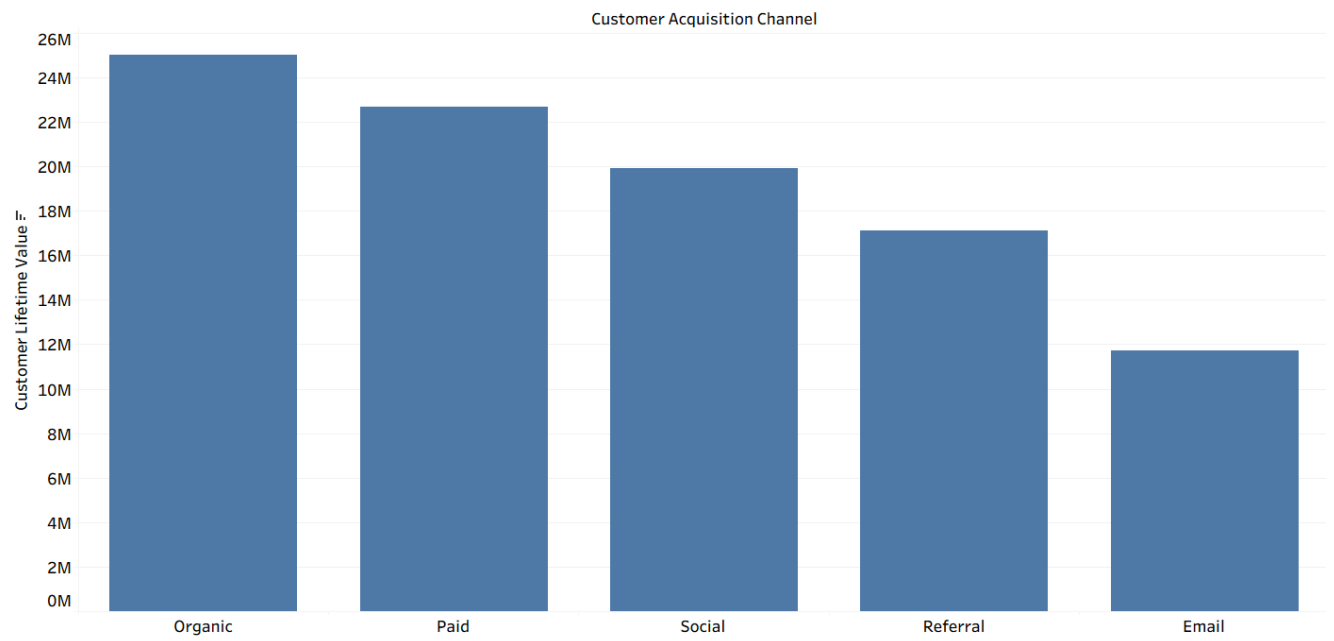


fig7. Customer Acquisition Channels vs CLV

### Fig 7. Customer Acquisition Channels vs. CLV

The analysis reveals that **Organic and Paid acquisition channels deliver the highest Customer Lifetime Value (CLV)**, indicating stronger long-term profitability compared to other channels. This suggests that investments in **organic growth strategies and targeted paid campaigns** may yield the most valuable customers over time.

5. How does product age (time since launch) correlate with sales performance?

BQ5 Correlation of Sales with Product Age

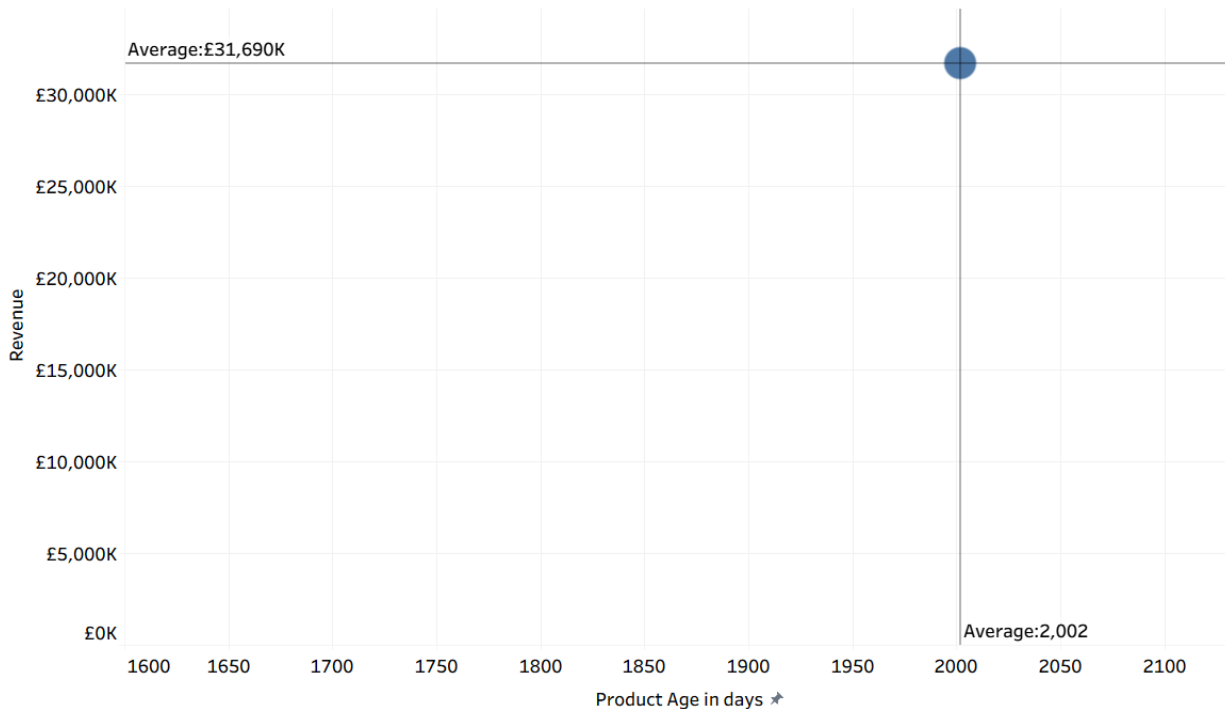


Fig8. Correlation of Sales with Product Age

### Product Age and Sales Performance:

Older products, with an average Age of around 2,000 days continue to deliver the highest revenues (over **£31.6M**) showing that **mature products sustain strong performance over time**. No significant contribution is visible from newer products, suggesting that sales remain concentrated in established offerings.

**Implication:** The business should **continue to rely on proven older products for stability**, but also **develop and promote newer products** to reduce over-dependence and secure long-term growth.

## 6.Strategic Recommendations

- **Focus on High-Profit Engines**
  - Prioritize **Smartphones, Monitors, Tablets** and strengthen ties with **Quantum Supplies, ByteWare, FutureTek**.
  - Action: Launch **bundles & co-branded campaigns** with these suppliers.
- **Target Core Customer Segments Seasonally**
  - Concentrate on **26–45 age group** and **South West region**.

- Action: Use **Q4 & Q1 loyalty offers** to capture peak demand.
- **Invest in High-CLV Acquisition Channels**
  - Scale **Organic & Paid campaigns** (highest CLV).
  - Action: Reallocate spend from weaker channels into **content + precision ads**.

## 7. Critical Reflection

- The dashboard effectively captures **seasonality, category profitability, supplier strength, and customer behavior**, making it useful for high-level executive decisions.
- However, it could be improved by adding **predictive analytics (e.g., demand forecasts)**, more **interactive drill-downs**

## 8. Data Issues or Risks

- **Imbalance:** Smaller categories and low-volume regions may skew insights.
- **Overstated correlations:** Some relationships (e.g., product age vs. revenue) need validation.
- **Coverage:** Dataset ends in Jun 2024, missing recent trends.
- **Quality:** Supplier reporting inconsistencies may affect accuracy.