Introduction
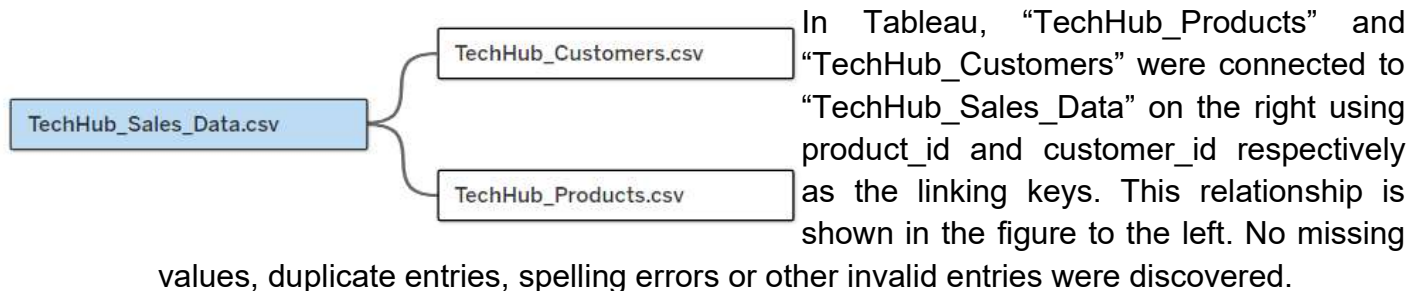
This is a report from the Business Intelligence Team at TechHub Retail, a rapidly growing UK-based online electronics retailer. The purpose of the analysis is to inform strategic planning decisions for 2025 by identifying growth opportunities, analysing performance trends, and presenting actionable reccomendations. The aim of this report is to present the analysis, as well as the accompanying executive-level dashboard. The dashboard serves as a way to present our insights visually, in an interactive manner.

Multi-Dataset Integration Summary

The data consists of 3 datasets. "TechHub_Products" consists of product and supplier information, "TechHub_Customers" consists of customer information, and "TechHub_Sales_Data" consists of transaction information from Jan 2023–Jun 2024.

In Tableau, "TechHub_Products" and "TechHub_Customers" were connected to "TechHub_Sales_Data" on the right using product_id and customer_id respectively as the linking keys. This relationship is shown in the figure to the left. No missing values, duplicate entries, spelling errors or other invalid entries were discovered.
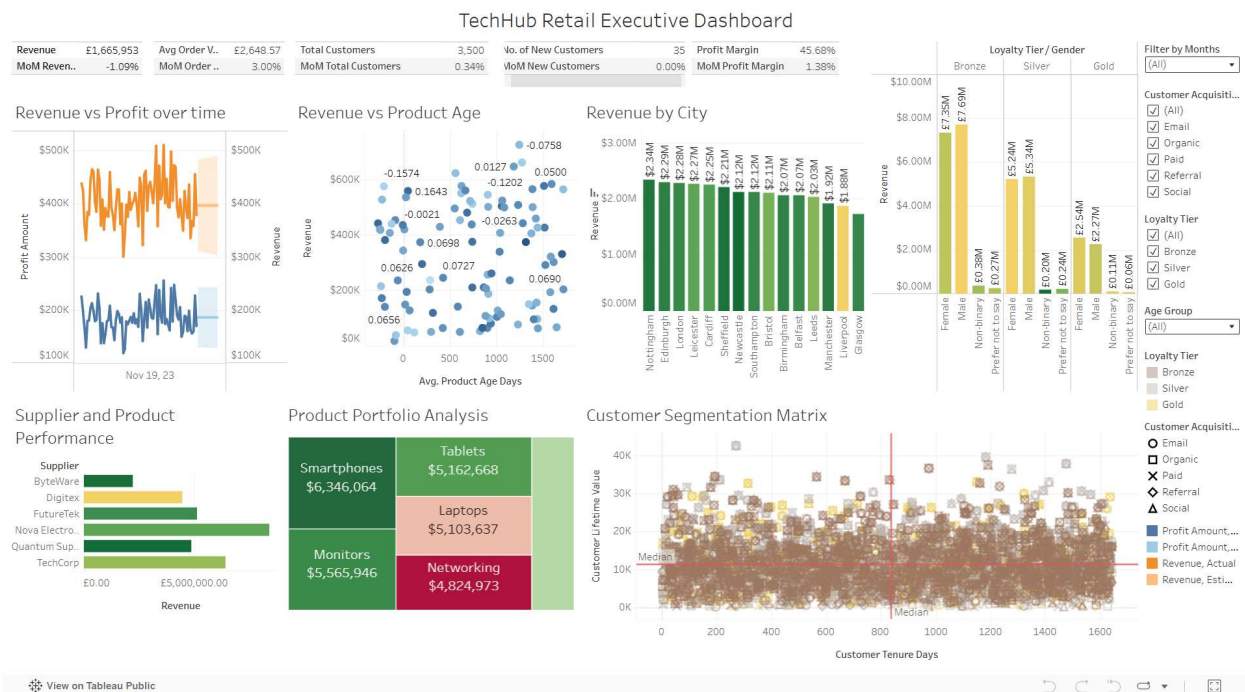
To enable the analysis, several calculated fields were created in Tableau. The following are of note:

1. Profit_Amount: [Revenue]-([Quantity]*[Cost_Price])
2. Profit_Margin: SUM([Profit_Amount])/SUM([Revenue])
3. Customer_Lifetime_Value: {FIXED [Customer_Id] : SUM([Revenue])}
4. Customer_Tenure_Days: DATEDIFF('day',[Signup_Date], DATE('1 July 2024'))

1 and 2 are revenue metrics which help us decide how well a particular region/product is doing. 3 and 4 are customer metrics which help guide retention strategies.

Dashboard Design Summary

The top of the dashboard shows 5 monthly KPIs and their month-on-month change: revenue, average order value, total number of customers, number of new customers, and overall profit margin. These KPIs are static to the latest month in the dataset.

Below that are 3 revenue-related plots, showing, from left to right, a line plot of revenue and profit amount over time with a forecast for the following year, a scatter plot of revenue against product age for each sold product with labelled correlation coefficient, and a bar plot of revenue by customer city, coloured according to profit margin.
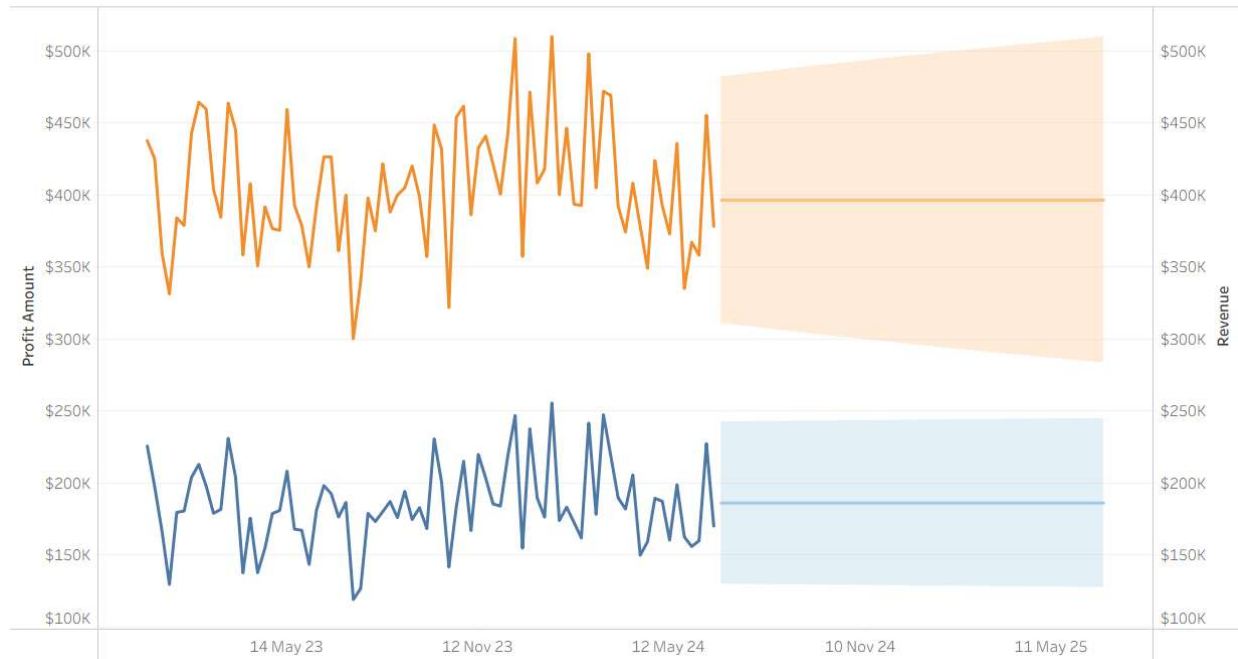
To the right of the dashboard, are 2 customer-related plots. The upper plot shows revenue by loyalty tier and gender, coloured by profit margin, and the lower plot shows a customer segmentation matrix, obtained by plotting "customer_lifetime_value" against "customer_tenure_days". The 2 red median lines divide the plot into 4 quadrants, denoting 4 customer segments to focus on.

The 2 plots in the bottom-left corner of the dashboard concern products. The left bar plot shows overall revenue by supplier, coloured by profit margin, with additional information in the tooltips including the total number of products they carry and how many of those products they actually sold. The right tree map visually shows how each product category is performing, with each block's size proportional to revenue, and colour representing profit margin.

The top filter on the right allows the user to view the dashboard using only data from certain months, allowing for specific analysis of certain timeframes. The next filter relates to the revenue vs profit line graph, allowing the user to see the trends for individual product categories. The remaining 3 filters relate to the customer segmentation matrix, enabling more granular segmentation by age and/or loyalty tier.

Key Insights and Findings

Revenue vs Profit over time

From the figure above, we see that the forecast lines are horizontal. This indicates that there are no seasonal trends, nor are there any overall increasing or decreasing trends in overall revenue or profit. This means that **although TechHub Retail performs equally well throughout the year, its revenue and profits are not growing**. This should be concerning, because once inflation is taken into consideration, TechHub Retail is losing money over time.

A key finding not directly shown in a chart is that we offer 320 different products, but only sold 100 different products. This means that **68.75% of our offering is not attracting sales at all**. We should reconsider how we market these products, and whether to continue offering them at all. A breakdown of this by supplier is available in the tooltips for the bottom-left chart in the dashboard.

Business Question Answers

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

We wish to understand which products and suppliers offer the best profit margins so that we can more efficiently allocate financial resources to well-performing product categories and suppliers.

From the Product Portfolio Analysis on the right, we can see that **the Smartphone product category offers the highest profit margin (60.43%) and revenue**. The Networking category has the lowest profit margin at 19.7% and the 2nd lowest revenue.

From the Supplier and Product Performance chart on the left, we can see that **ByteWare and Quantum Supplies both have the best profit margins (57.01% and 57.51% respectively)**. Interestingly, we offer 50 products from ByteWare, but only 8 of those products were sold during the data timeframe. We offer 54 from Quantum Supplies, but only 15 of those were sold. These are potential opportunities for profit if we can market these unsold products.

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

By undertstanding how demographics impact purchasing behaviour, we can focus our marketing efforts on revenue-generating or underserved demographics.

These 3 plot show the revenue breakdown by age group (top-left), gender and loyalty tier (top-right), and location (left), coloured by profit margin (smallest value gold, largest value dark green).

From the age chart, we see that 26-35s generate the most revenue, but 65+ year-olds have the largest profit margin (48.86%) despite having the lowest revenue. 18-25s have the smallest profit margin (44.72%).

From the gender and loyalty tier chart, we see that Bronze tier customers make up the largest proportion of revenue, with male users generating slightly more revenue than female users. This group however had the lowest profit margin (44.29%).

From the location chart, we see that users from Nottingham, Edinburgh and London generated the most revenue. Sheffield, Newcastle and Nottingham had the highest profit margins (>46%), while Liverpool had the lowest (42.27%).
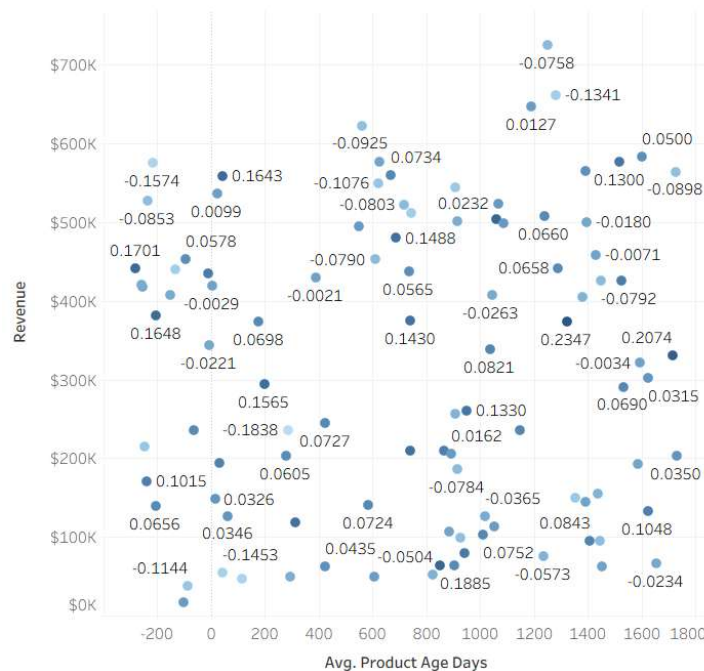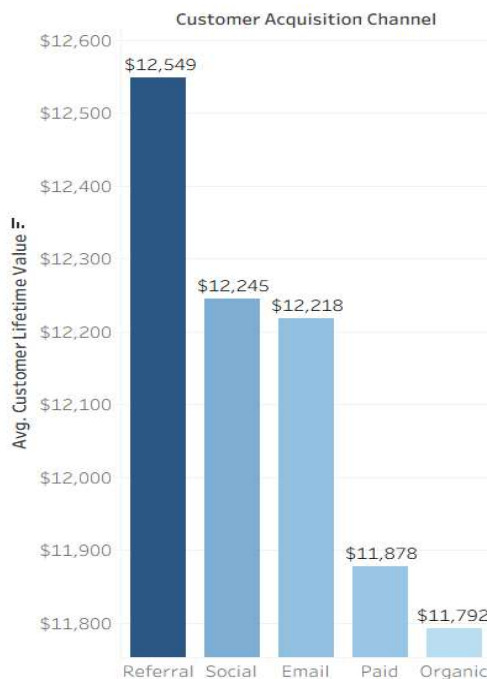
Overall, we expect male 26-35 year-olds at Bronze loyalty tier living in Nottingham to generate the most revenue.

3.What seasonal patterns exist across different product categories and regions?
The existence of seasonal patterns means marketing can be focused during peak sales periods, and more relaxed during off-peak periods. By changing the filter on the revenue vs profit line chart, we can see that for each product category, the forecast line remains straight. This indicates that **no seasonal patterns exist for product categories**. A similar analysis on order regions (not shown on dashboard) revealed that **there are no seasonal patterns across the regions either**.

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

Knowing this will help us focus our marketing channels. The plot on the left below shows that **Referrals deliver the highest average lifetime value customers**.

5. How does product age (time since launch) correlate with sales performance?
From the plot on the right above, we see that the average product age has no clear relationship with revenue. The highest absolute correlation value is 0.2347, which is still quite small. We conclude that **there is no correlation between product age and revenue**. This means that old products sell as well as new products.

Strategic Recommendations
Here we present 3 recommendations for TechHub Retail's 2025 strategy.

1. Product offerings analysis
As discussed earlier, 68.75% of our product offerings are not being sold. An analysis on why customers are not buying these products should be conducted to understand whether our marketing needs improvement, or the product is simply unappealing and we should drop it from our offering. This could be done via feedback channels or surveys. This will allow us to focus our marketing on products that actually drive revenue and profits.

2. Referral Scheme
We identified that referrals resulted the highest average customer lifetime value. We should implement a referral scheme, such as points, discounts or free items for each person referred. This will drive referrals and should result in higher customer values over time.

3. Update this analysis in the future
The dataset provided 18 months of sales data, which is not enough to identify month seasonal trends accurately. A close look at the revenue vs profit line chart suggests that revenue increases slightly around Nov-Jan, but there is not enough data to confirm if this will occur every year. Though consumer spending generally increases during that period, this analysis should be updated with figures from Jul-Dec 2024 to check if the seasonal trend affects us as well. Ideally, we would need a couple years of data to identify monthly seasonality.

Critical Reflection
The dashboard is generally useful for executive decision making. The customer segmentation matrix is quite noisy due to many customers having different acquisition channels for the same customer ID, causing a lot of overlap in the plot. The other plots are helpful in identifying revenue/profit drivers and areas of improvement.
An area of improvement is that the KPIs should update with the latest selected month on the date filter, rather than being static to the latest month in the dataset.

Data Issues/Risks
No issues or risks were identified.