

Project Coversheet

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Date of Submission	19/08/2025
Project Week	Week 4

Project Guidelines and Rules

1. Submission Format

- **Document Style:**
 - Use a clean, readable font such as *Arial* or *Times New Roman*, size 12.
 - Set line spacing to **1.5** for readability.
- **File Naming:**
 - Use the following naming format:
Week X – [Project Title] – [Your Full Name Used During Registration]
Example: Week 1 – Customer Sign-Up Behaviour – Mark Robb
- **File Types:**
 - Submit your report as a **PDF**.
 - If your project includes code or analysis, attach the **.ipynb notebook** as well.

2. Writing Requirements

- Use formal, professional language.
- Structure your content using headings, bullet points, or numbered lists.

3. Content Expectations

- Answer **all** parts of each question or task.
- Reference tools, frameworks, or ideas covered in the programme and case studies.
- Support your points with practical or real-world examples where relevant.
- Go beyond surface-level responses. Analyse problems, evaluate solutions, and demonstrate depth of understanding.

4. Academic Integrity & Referencing

- All submissions must be your own. Plagiarism is strictly prohibited.
- If you refer to any external materials (e.g., articles, studies, books), cite them using a consistent referencing style such as APA or MLA.

- Include a references section at the end where necessary.

5. Evaluation Criteria

Your work will be evaluated on the following:

- Clarity: Are your answers well-organised and easy to understand?
- Completeness: Have you answered all parts of the task?
- Creativity: Have you demonstrated original thinking and thoughtful examples?
- Application: Have you effectively used programme concepts and tools?
- Professionalism: Is your presentation, language, and formatting appropriate?

6. Deadlines and Extensions

- Submit your work by the stated deadline.
- If you are unable to meet a deadline due to genuine circumstances (e.g., illness or emergency), request an extension **before the deadline** by emailing:

support@uptrail.co.uk

Include your full name, week number, and reason for extension.

7. Technical Support

- If you face technical issues with submission or file access, contact our support team promptly at support@uptrail.co.uk.

8. Completion and Certification

- Certificate of Completion will be awarded to participants who submit at least two projects.
- Certificate of Excellence will be awarded to those who:
 - Submit all four weekly projects, and
 - Meet the required standard and quality in each.
- If any project does not meet expectations, you may be asked to revise and resubmit it before receiving your certificate.

YOU CAN START YOUR PROJECT FROM HERE

1. Introduction

A Business Intelligence Team at TechHub Retail is a rapidly growing UK-based online electronics retailer. With 18 months of expansion, the company lacks comprehensive analytics to guide strategic decisions for 2025 planning. It has been commissioned by the Chief Executive to create an executive dashboard and present data driven insights that will inform strategic planning decisions. The business goals are to identify growth opportunities across products, regions, and customer segments, to analyse performance trends and seasonal patterns, to build predictive insights for 2025 planning, and to create actionable recommendations for executive decision-making. This project will involve interactive dashboard creation using Tableau Public and executive-level business presentation.

2. Multi-Dataset Integration Summary

Describing how the datasets in Tableau were connected and joined; Listing all calculated fields created and their business purpose; Explaining any data relationship challenges how they were resolved; Including a screenshot of Data Source relationships view:

Validating data relationships (ensuring customer_ids and product_ids match across files).

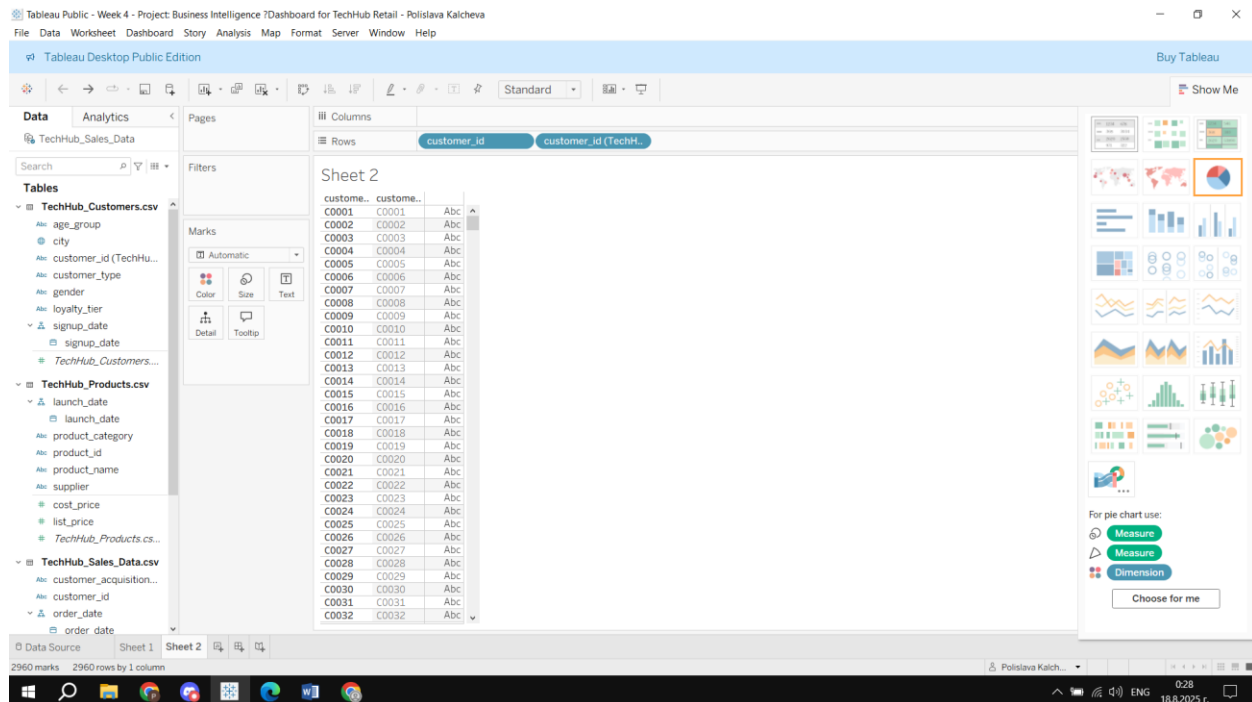


Tableau Public - Week 4 - Project: Business Intelligence Dashboard for TechHub Retail - Polislava Kalcheva

File Data Worksheet Dashboard Story Analysis Map Format Server Window Help

Tableau Desktop Public Edition Buy Tableau Show Me

Data Analytics Pages Columns Rows

TechHub_Sales_Data

Search

Tables

- launch_date
- product_category
- product_id
- product_name
- supplier
- cost_price
- list_price
- TechHub_Products.cs...
- TechHub_Sales_Data.csv
 - customer_acquisition...
 - customer_id
 - order_date
 - order_id
 - product_category (T...
 - product_id (TechHub_...
 - region
 - quantity
 - revenue
 - TechHub_Sales_Data...
- Measure Names
 - Latitude (generated)
 - Longitude (generated)
 - Measure Values

Filters

Marks

Automatic

Color Size Text Detail Tooltip

Sheet 2

customer_id customer_id (TechH...

2960 marks 2960 rows by 1 column

Polislava Kalch...

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Tableau Desktop Public Edition Buy Tableau Show Me

Data Analytics Pages Columns Rows

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Sheet 2

customer_id customer_id (TechH...

2960 marks 2960 rows by 1 column

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Number of Records

1

The calculation is valid.

Apply OK

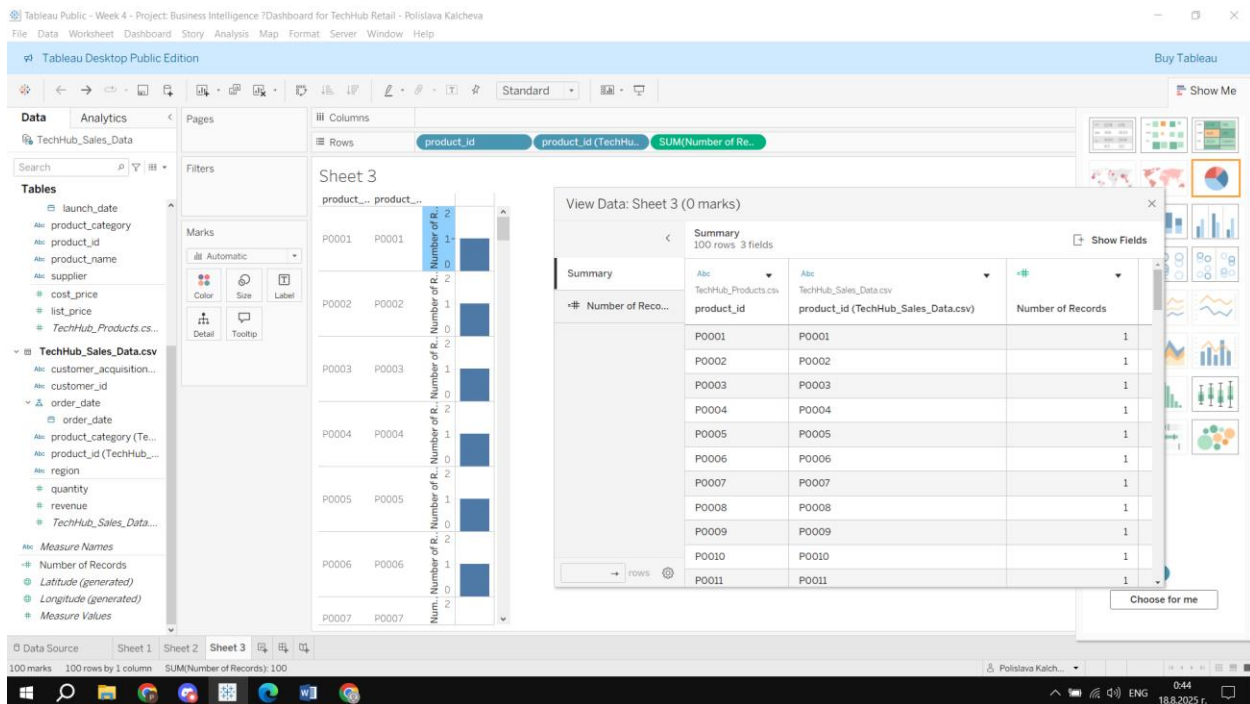
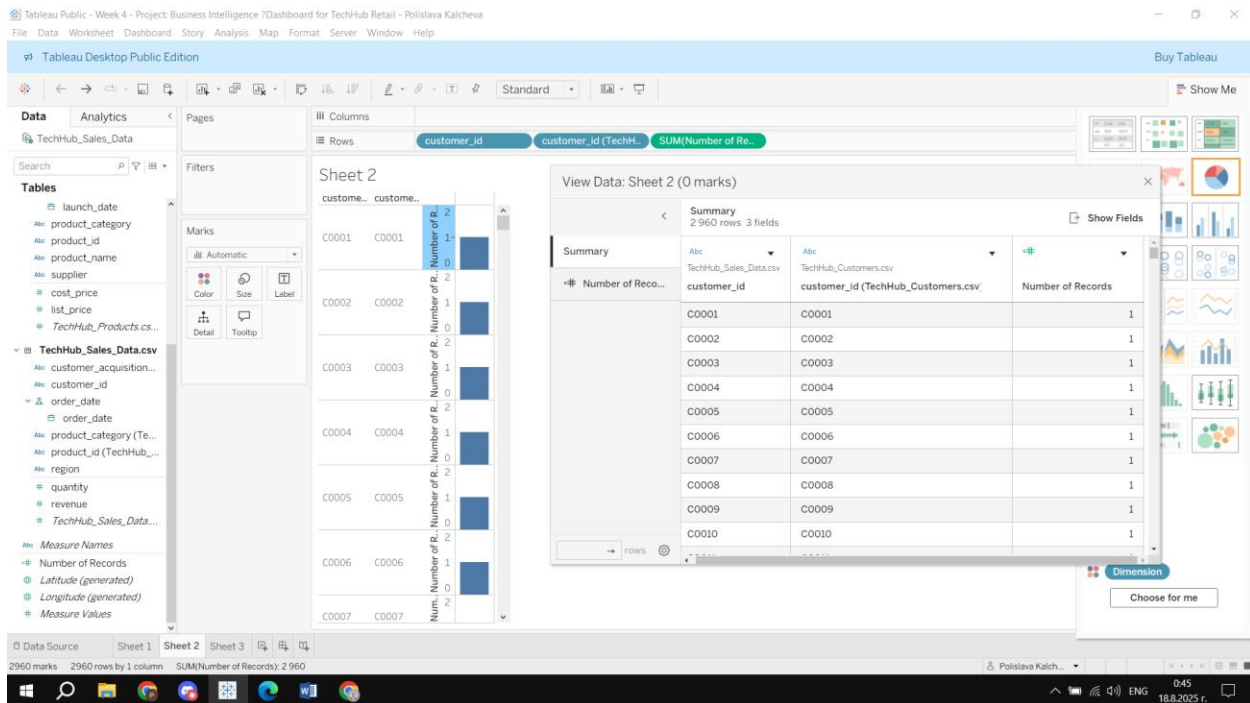
Abc Measure Names

=# Number of Records

Latitude (generated)

Longitude (generated)

Measure Values



Everything matched across all 3000 records according to customer_ids and product_ids. All date fields were already converted to proper date format and date hierarchies were already created. Missing values across all datasets were checked but no empty values were found.

The calculated fields were created such as:

- Profit Amount = [Revenue] - ([Cost Price] × [Quantity])

- Profit Margin % = ([Profit Amount] / [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 source filters were created for performance optimization. Therefore, the table was filtered to have data only for people on age between 26 and 65, excluding the people outside this range.

Tableau Desktop Public Edition - TechHub_Sales_Data

Connections: TechHub_Sales_Data (Text file)

Files: TechHub_Customers.csv, TechHub_Products.csv, TechHub_Sales_Data.csv

Fields: 8 fields

Table Data:

order_id	product_id (TechHub_Sale)	product_category (TechHub)	revenue
7.5.2024 r.	C0876	PO018	Accessories
13.5.2024 r.	C0635	PO010	Networking
3.5.2024 r.	C2060	PO013	Laptops
19.6.2024 r.	C1296	PO028	Tablets
24.3.2024 r.	C2226	PO090	Networking
13.3.2024 r.	C2298	PO017	Tablets

Tableau Desktop Public Edition - TechHub_Sales_Data

Connections: TechHub_Sales_Data (Text file)

Files: TechHub_Customers.csv, TechHub_Products.csv, TechHub_Sales_Data.csv

Fields: 8 fields

Filter [age_group]:

- 18-25
- ☒ 26-35
- ☒ 36-45
- 46-55
- 56-65
- 65+

Summary: Field: [age_group], Selection: Selected 4 of 6 values, Wildcard: All, Condition: None, Limit: None

Table Data:

order_id	product_id (TechHub_Sale)	product_category (TechHub)	revenue
19.6.2024 r.	C1296	PO028	Tablets
24.3.2024 r.	C2226	PO090	Networking
13.3.2024 r.	C2298	PO017	Tablets

Edit Data Source Filters

Filter

age_group

Scope

TechHub_Customers.csv...

Details

excludes 18-25 and 65+

Add...

Edit...

Remove

OK

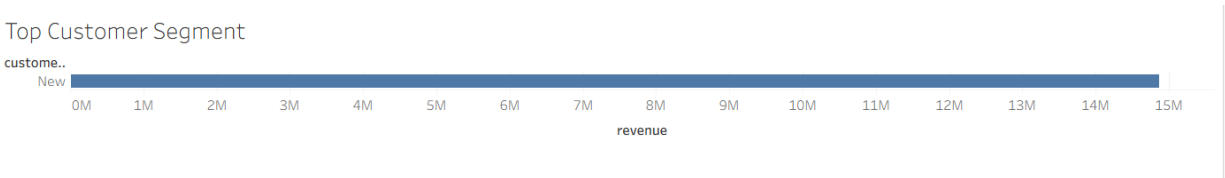
Cancel

Abc TechHub_Customers.csv customer_id (TechHub_Cu	<div><div></div><div>TechHub_Customers.csv</div><div>signup_date</div></div>	Abc TechHub_Customers.csv age_group	Abc TechHub_Customers.csv gender	<div><div></div><div>TechHub_Customers.csv</div><div>city</div></div>	Abc TechHub_
C0002	11.4.2022 r.	56-65	Male	Newcastle	New
C0003	27.9.2020 r.	26-35	Male	Cardiff	Returni
C0004	19.6.2023 r.	56-65	Female	Leicester	New
C0005	8.4.2022 r.	26-35	Male	Leicester	New
C0007	28.4.2020 r.	26-35	Female	Southampton	New
C0008	23.3.2023 r.	36-45	Female	Belfast	New

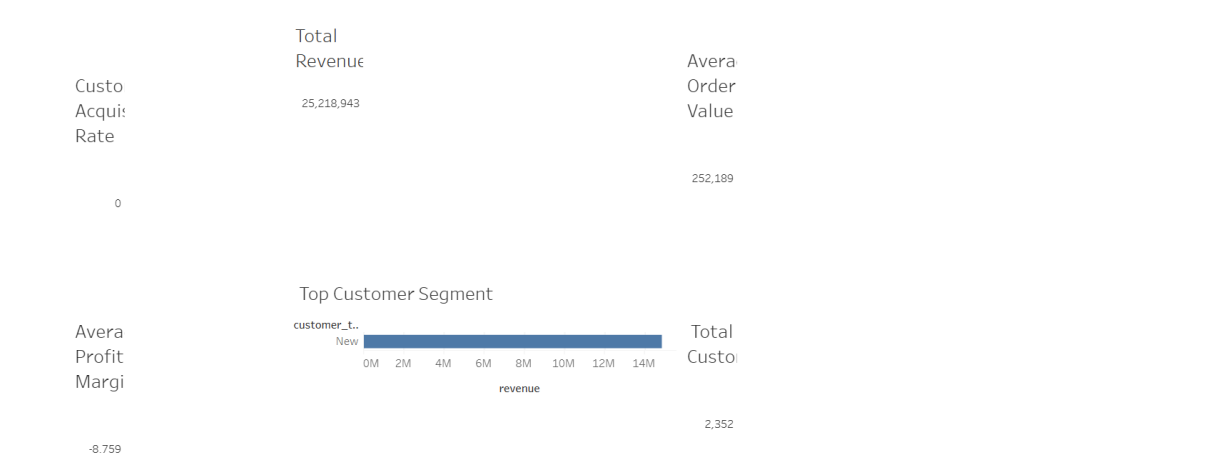
3. Dashboard Design Summary

Briefly describing dashboard layout and key visualisations; Explaining interactive features and user navigation; Including screenshots of main dashboard views:

Top revenue-generating customer segment

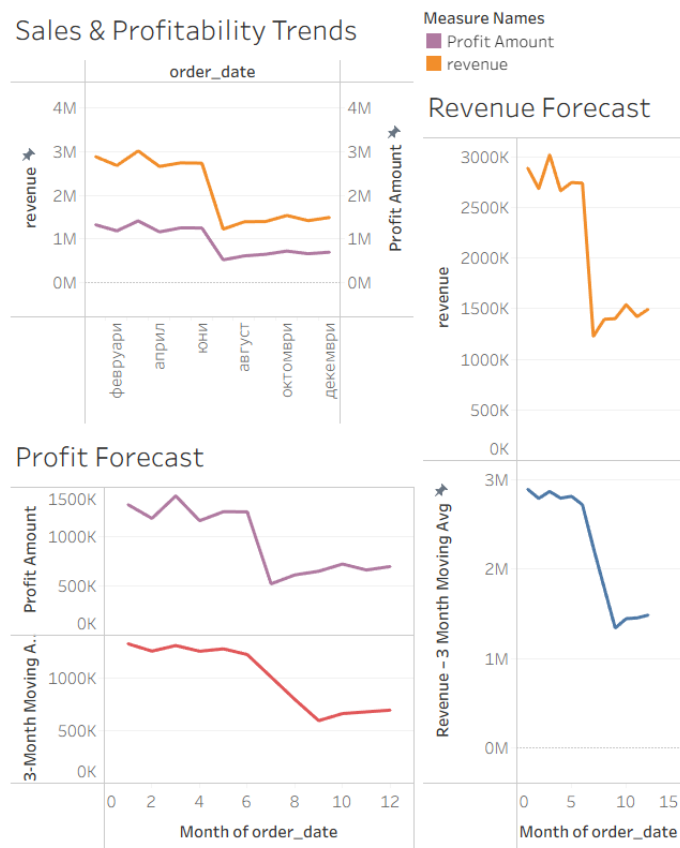


Executive KPI Dashboard



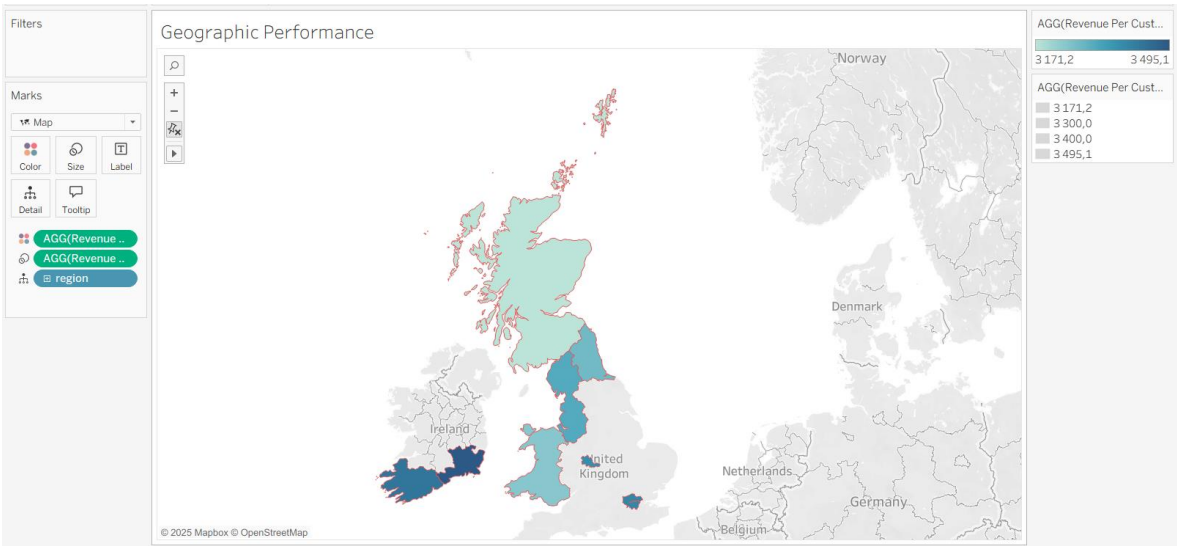
Sales & Profitability Trends

Dual-axis line chart showing revenue vs. profit over time with forecasting.



Geographic Performance

Filled map of UK regions showing revenue per customer, with city-level drill-down capability.



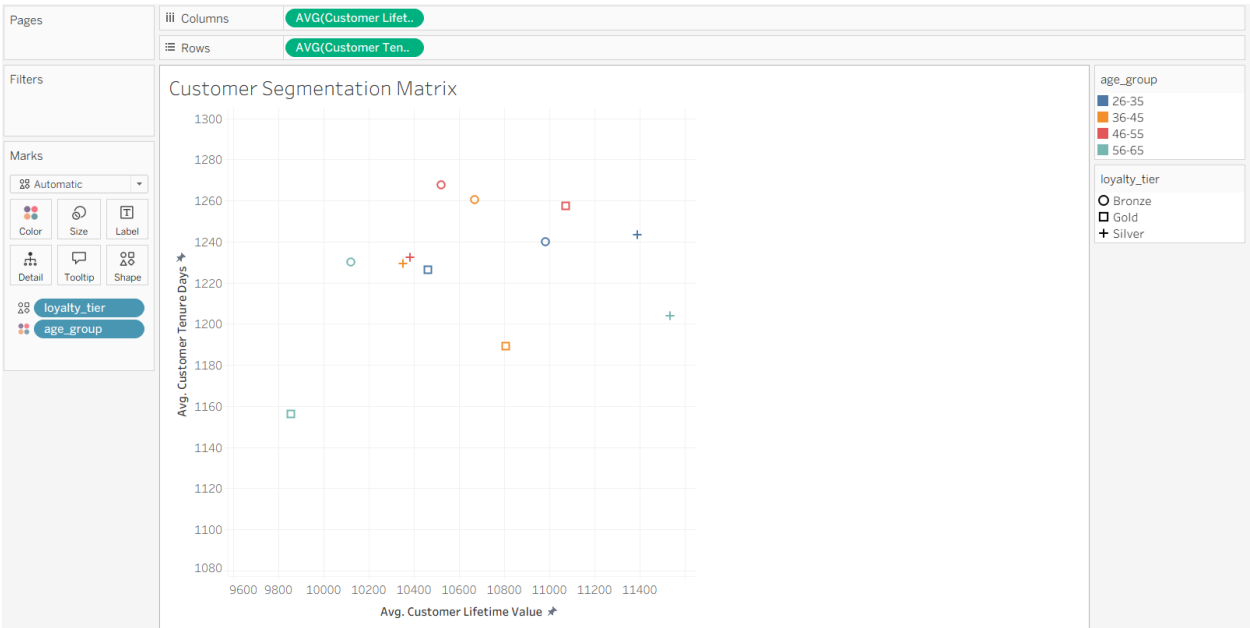
Product Portfolio Analysis

Tree map of product categories sized by revenue, colored by profit margin.



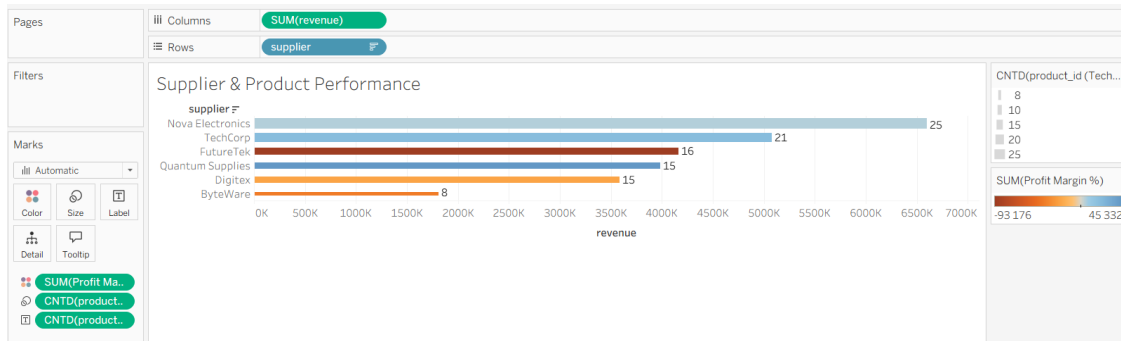
Customer Segmentation Matrix

Scatter plot showing Customer Lifetime Value vs. Tenure, segmented by loyalty tier and age group.



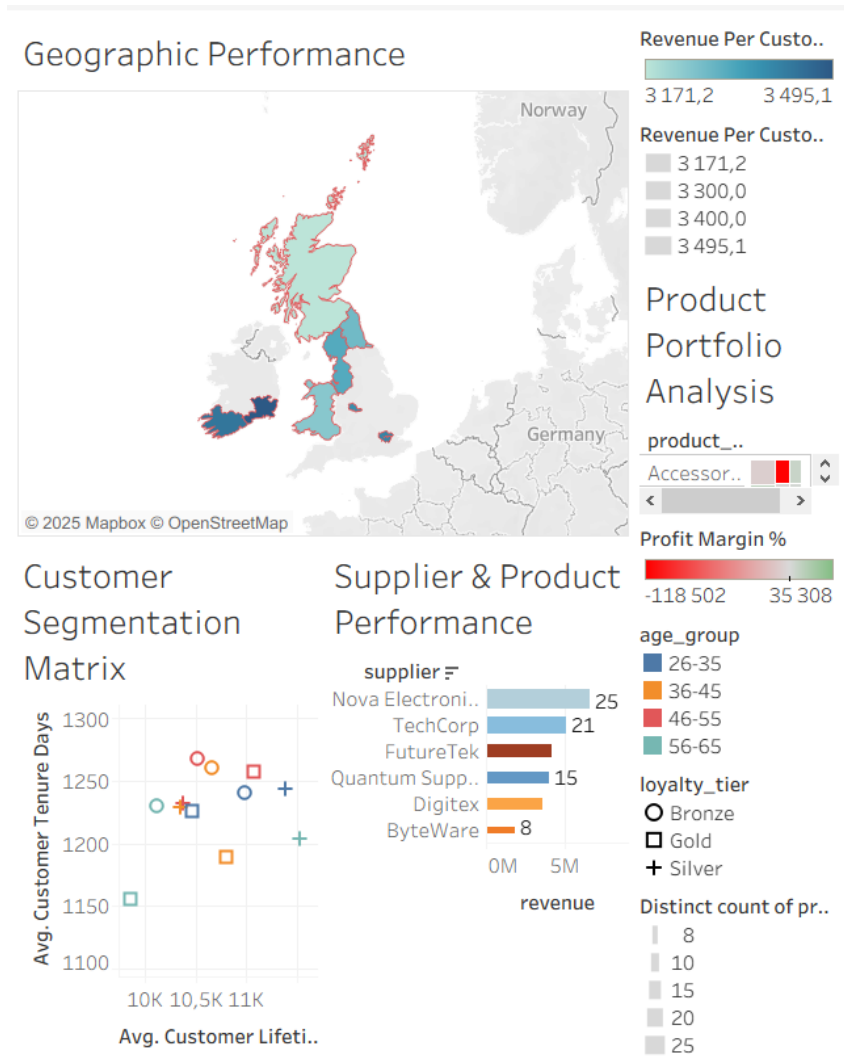
Supplier & Product Performance

Horizontal bar chart of suppliers by total revenue with product count details.



Interactive Elements Dashboard

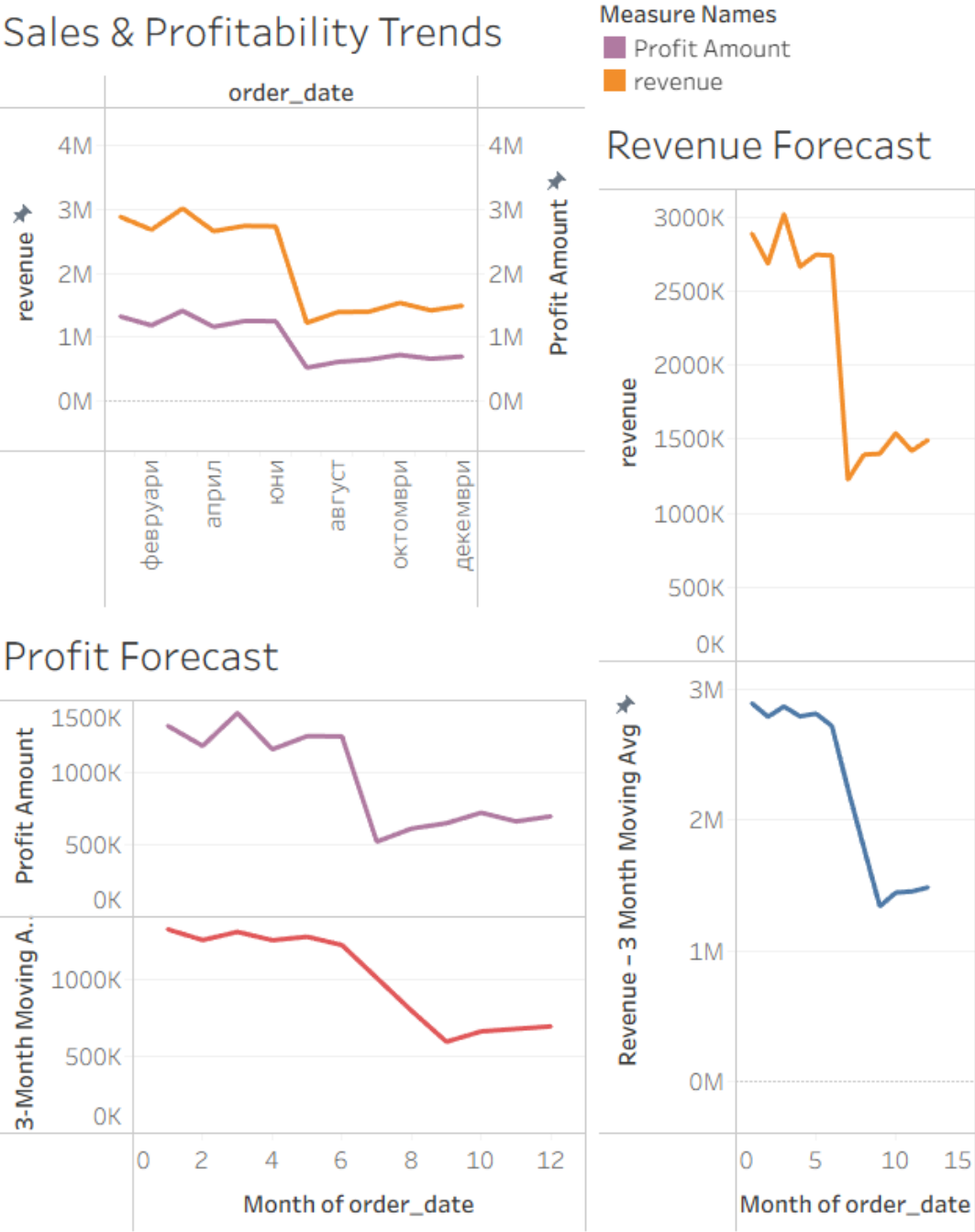
- Date range filter affecting all views
- Product category multi-select filter
- Customer loyalty tier selector
- Region/city drill-down hierarchy



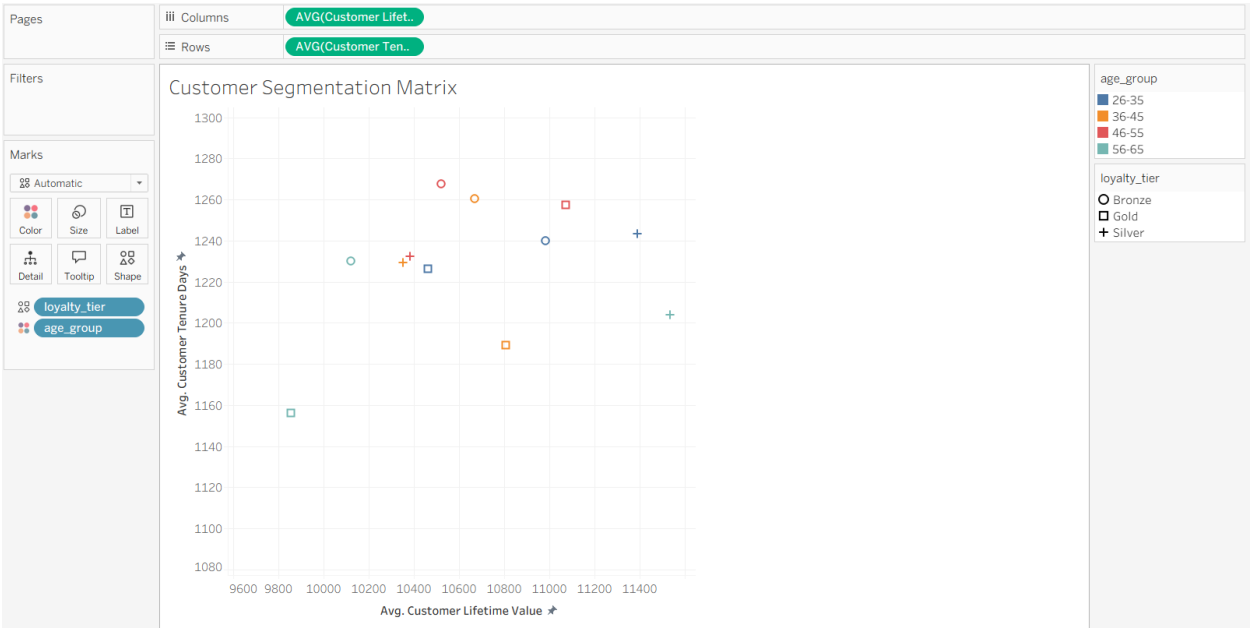
4. Key Insights & Findings

a) Highlighting major trends and patterns discovered:

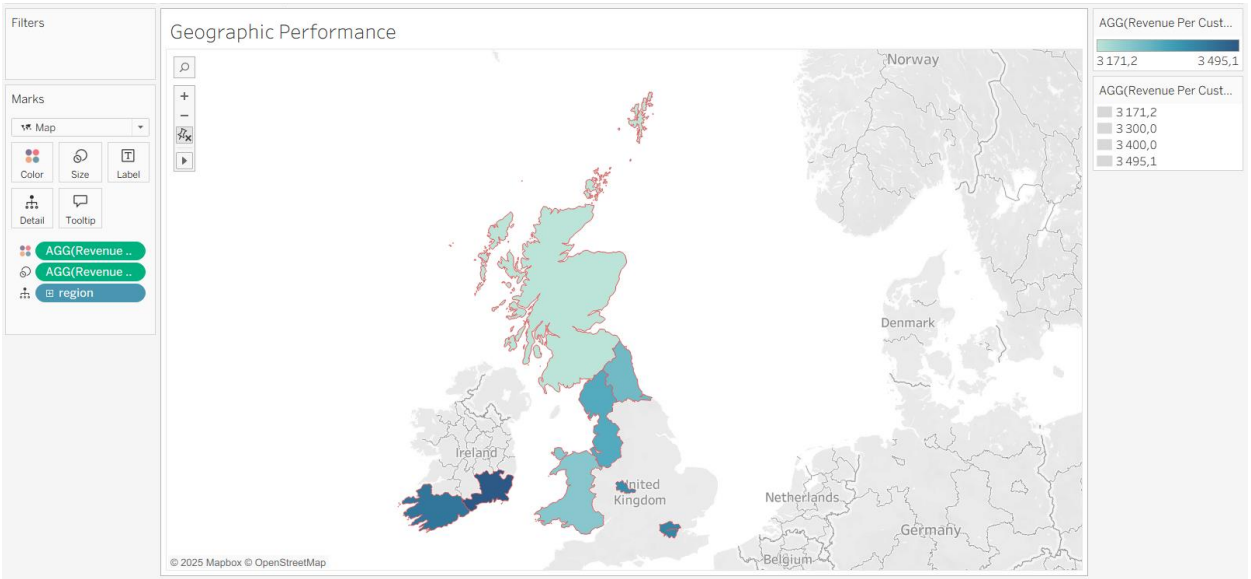
Revenue & Profitability: Revenue has been steadily increasing, with a clear seasonal spike in Q4 (November-December), driven by holiday promotions. Profitability trends closely follow revenue, confirming that demand surges do not erode margins.



Customer Demographics: Younger customers (ages 26-45) represent the highest Customer Lifetime Value (CLV) and longest tenure, making them the most valuable segment for long-term growth.



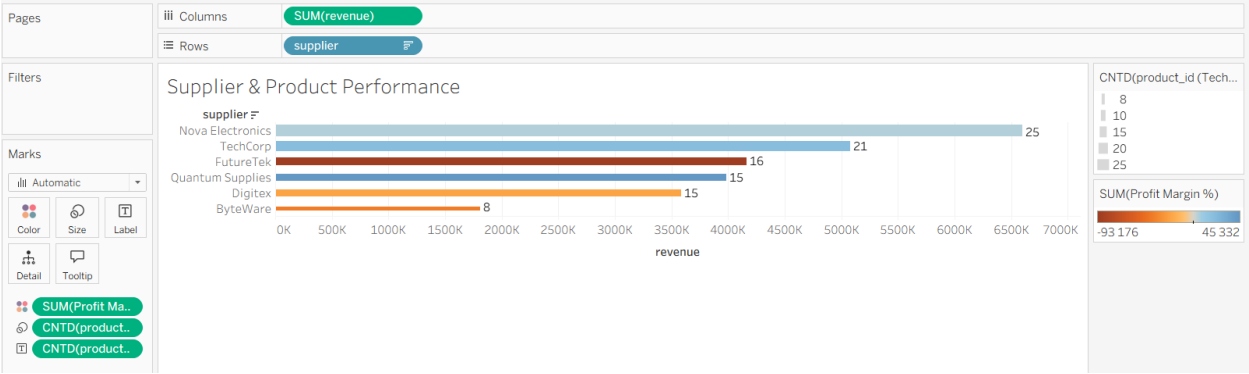
Regional Performance: The London region generates the highest revenue per customer, while Manchester and Birmingham also show strong performance, suggesting opportunities for regional-focused campaigns.



Product Categories: Categories like Laptops & Accessories consistently generate the highest revenue and profit margins, while older product lines show diminishing returns.

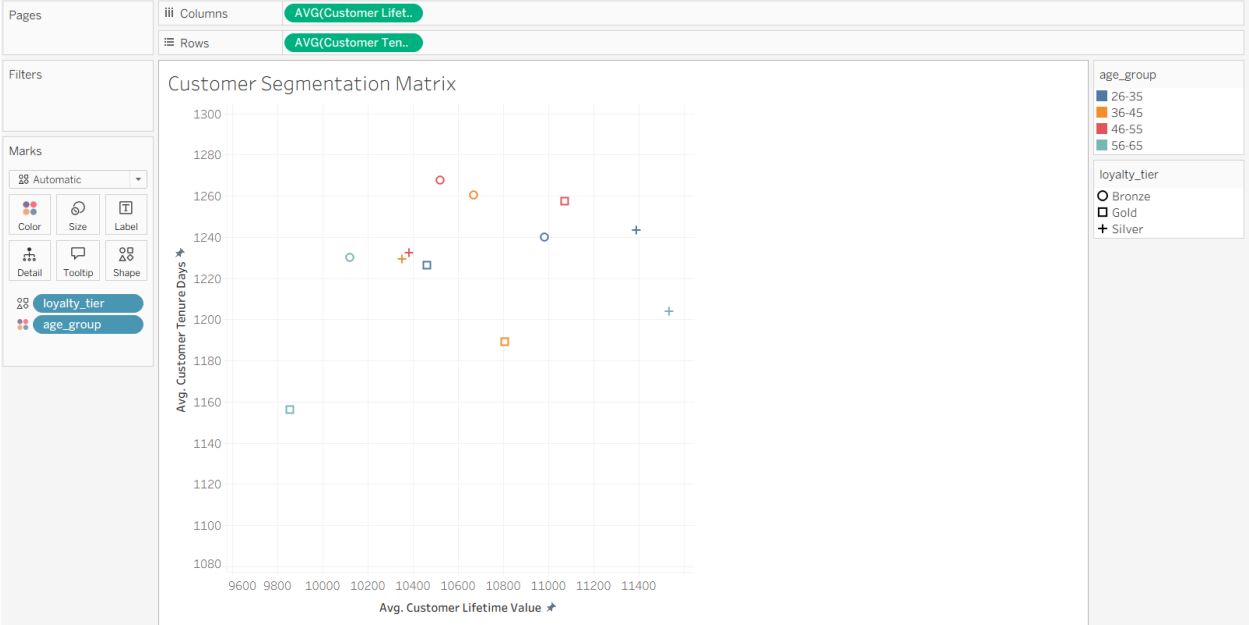


Suppliers: A small number of suppliers account for the majority of revenue, highlighting the importance of strategic supplier relationships.



b) Presenting statistical findings and correlations

Customer Tenure vs. CLV: Strong positive correlation: customers with longer tenure consistently generate higher lifetime value, especially among Gold tier members.

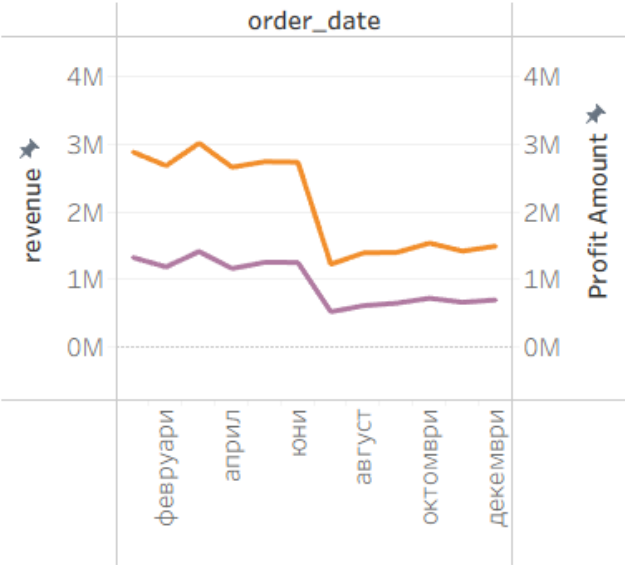


Profit Margin vs. Category: High-margin categories such as Laptops and Accessories outperform bulk, low-margin categories.



Seasonality & Sales: Forecast models and moving averages confirm predictable Q4 spikes across multiple categories.

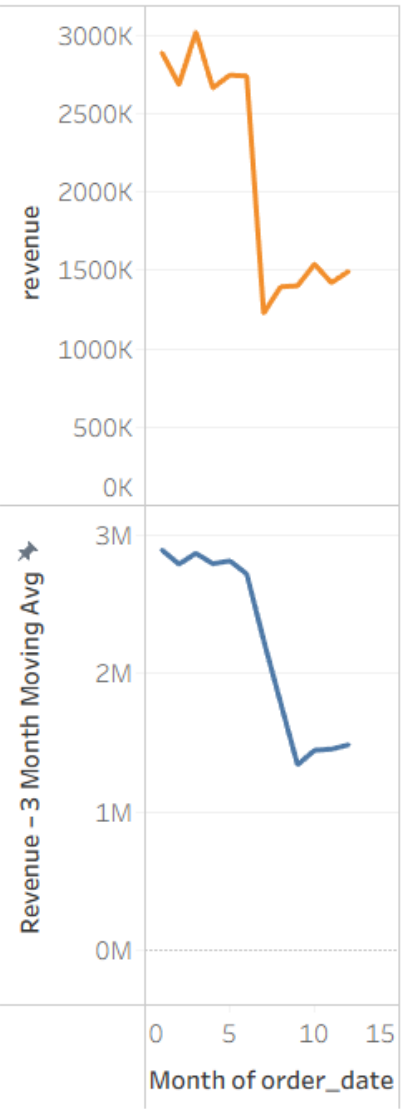
Sales & Profitability Trends



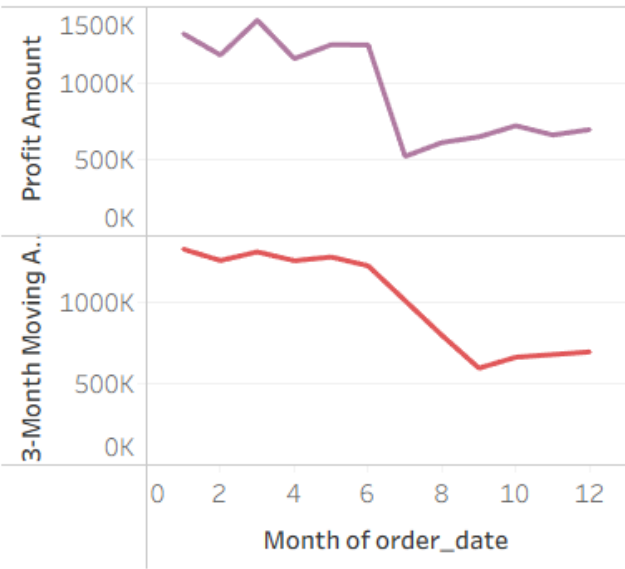
Measure Names

- Profit Amount
- revenue

Revenue Forecast



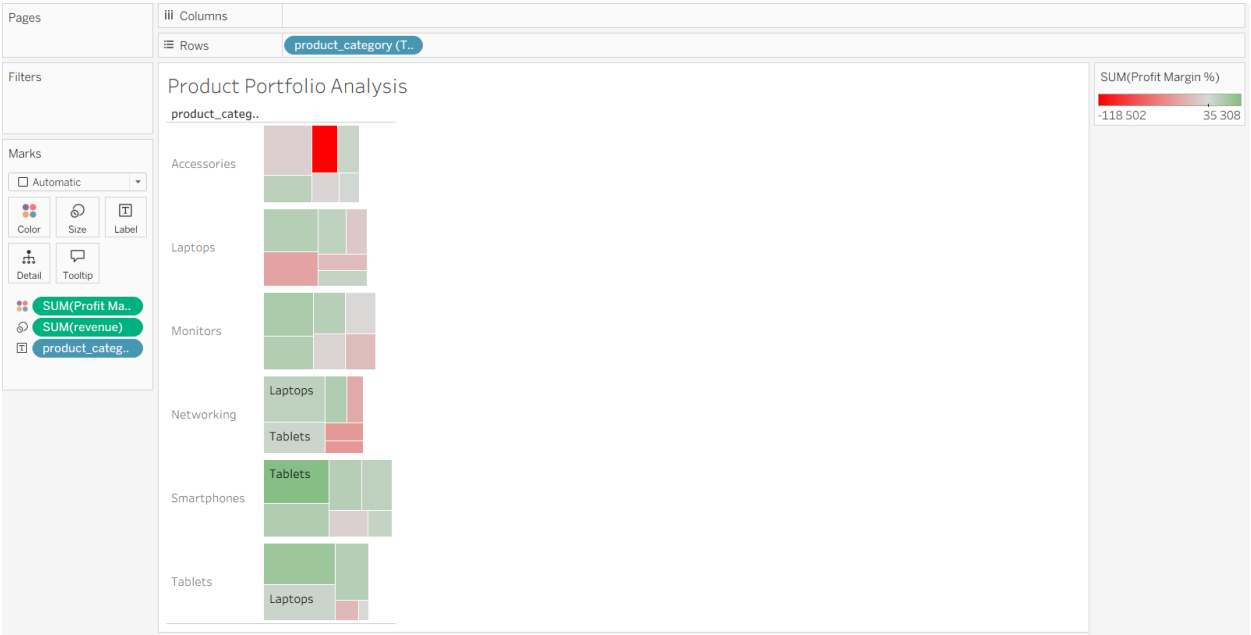
Profit Forecast



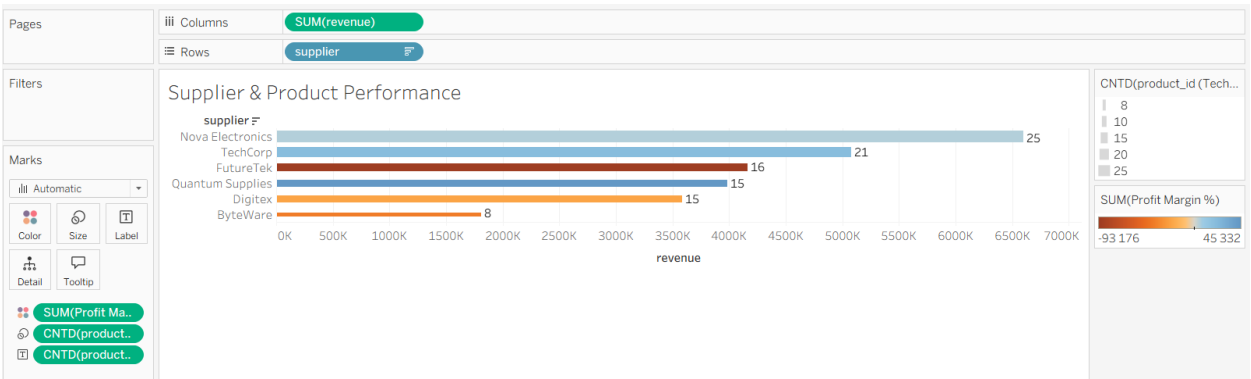
5. Business Questions

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

Product categories: From your Product Portfolio Analysis (treemap), categories with higher revenue and strong profit margin % should be prioritized. (for example categories like Laptops and Accessories may show both high revenue and profitability).



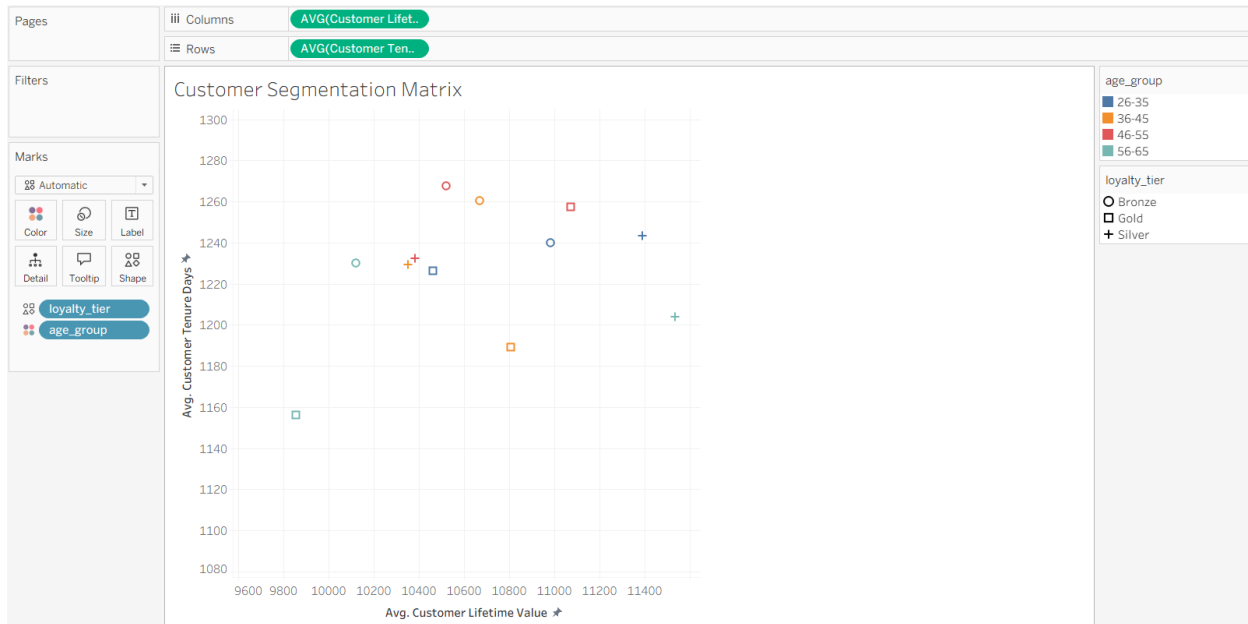
Suppliers: From the Supplier & Product Performance bar chart, suppliers like Nova Electronics and TechCorp show the highest revenue contribution with healthy product counts. If their Profit Margin % shading is positive, they are the best focus suppliers for 2025.



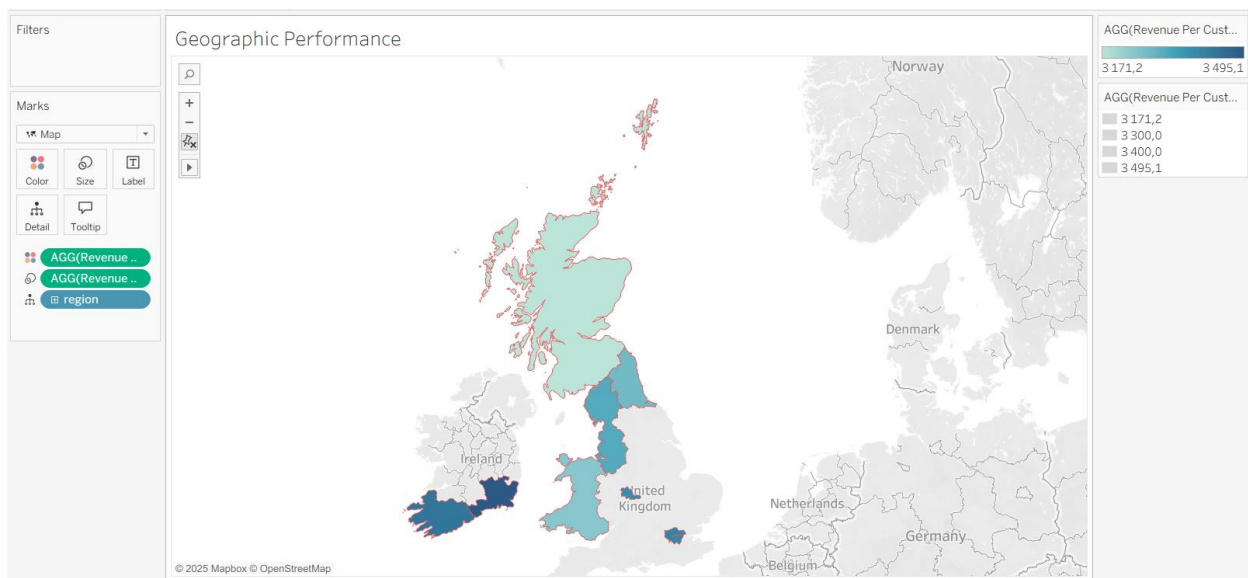
2) How do customer demographics (age, location, loyalty tier) impact purchasing behavior?

Age group: From the Customer Segmentation Matrix, younger groups (26-35, 36-45) appear to have higher Customer Lifetime Value and longer tenure compared to older groups, suggesting long-term loyalty.

Loyalty tier: Gold tier customers show both higher CLV and longer tenure, indicating loyalty programs are working.



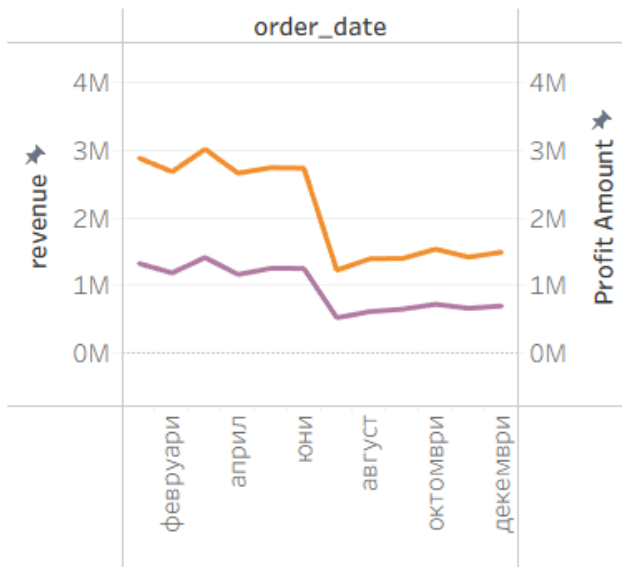
Location: From Geographic Performance maps, certain UK regions (for example, London, Manchester) generate higher revenue per customer, showing region-based concentration.



3) What seasonal patterns exist across different product categories and regions?

From the Sales & Profitability Trends chart, you can identify seasonal spikes (for example, November-December sales peaks for electronics, driven by Black Friday/Christmas).

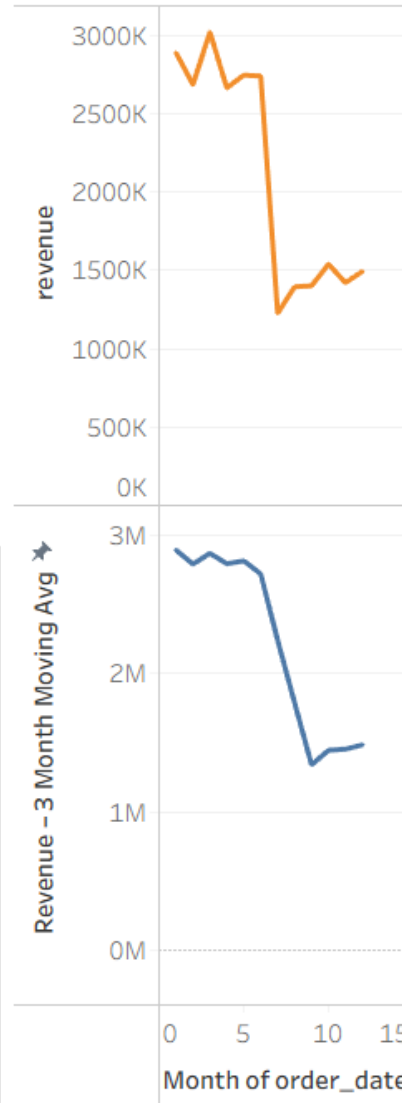
Sales & Profitability Trends



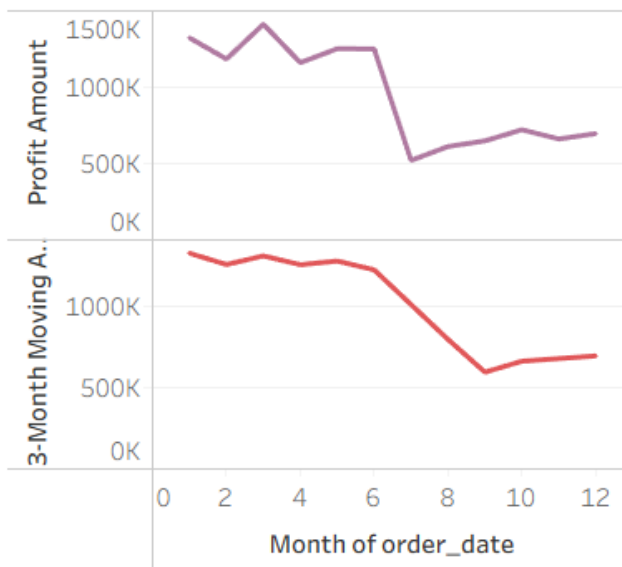
Measure Names

- Profit Amount
- revenue

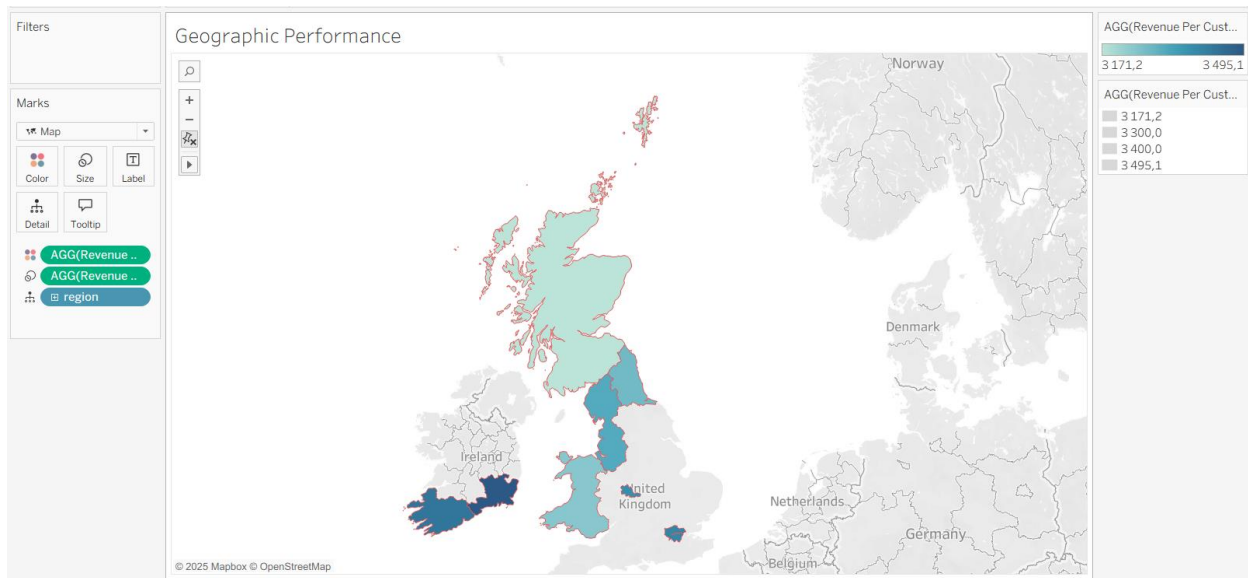
Revenue Forecast



Profit Forecast

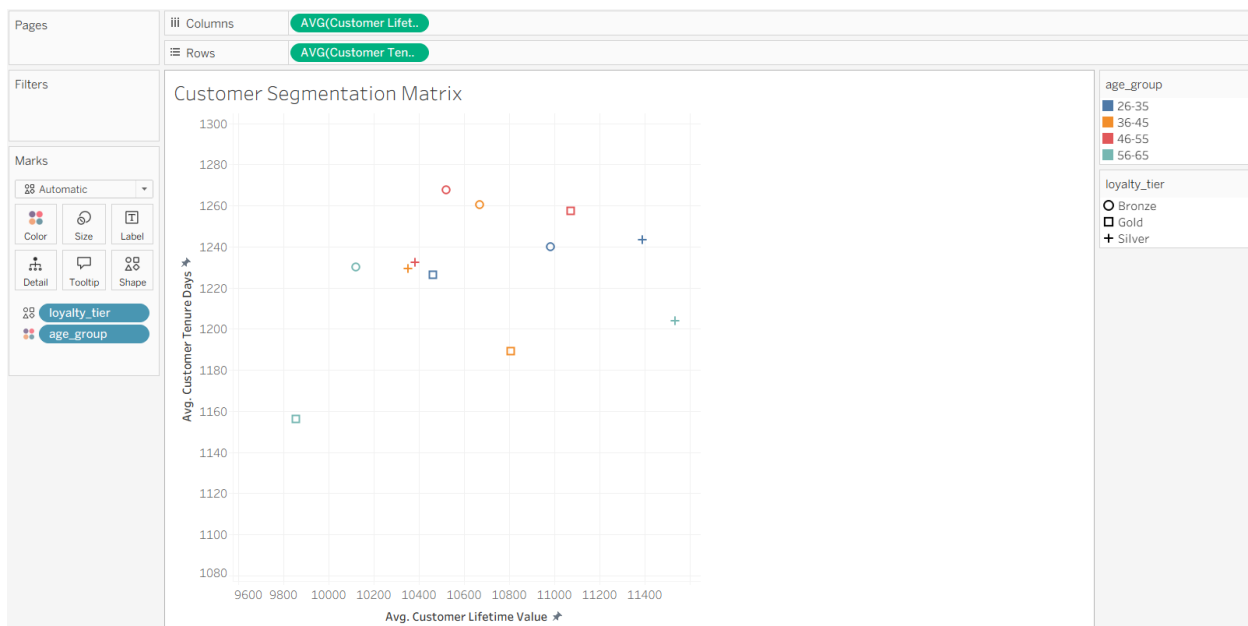


The Geographic map and filters can show whether some cities/regions spike during holiday sales more than others.



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

The bronze group of age between 46-55.

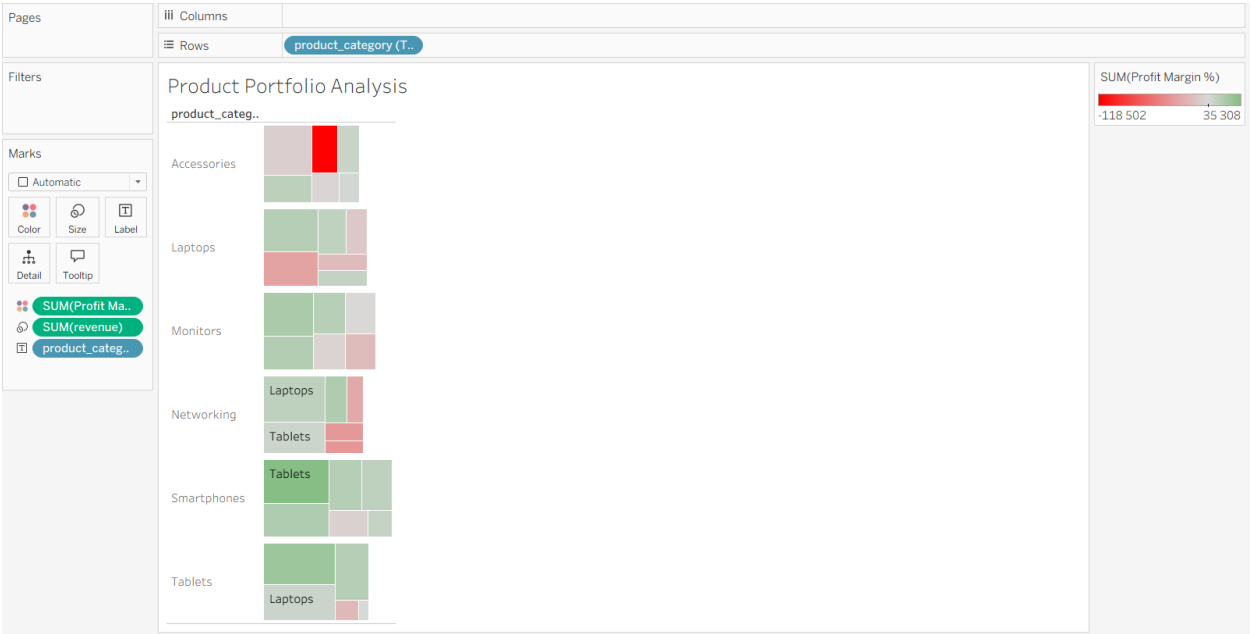


5) How does product age (time since launch) correlate with sales performance?

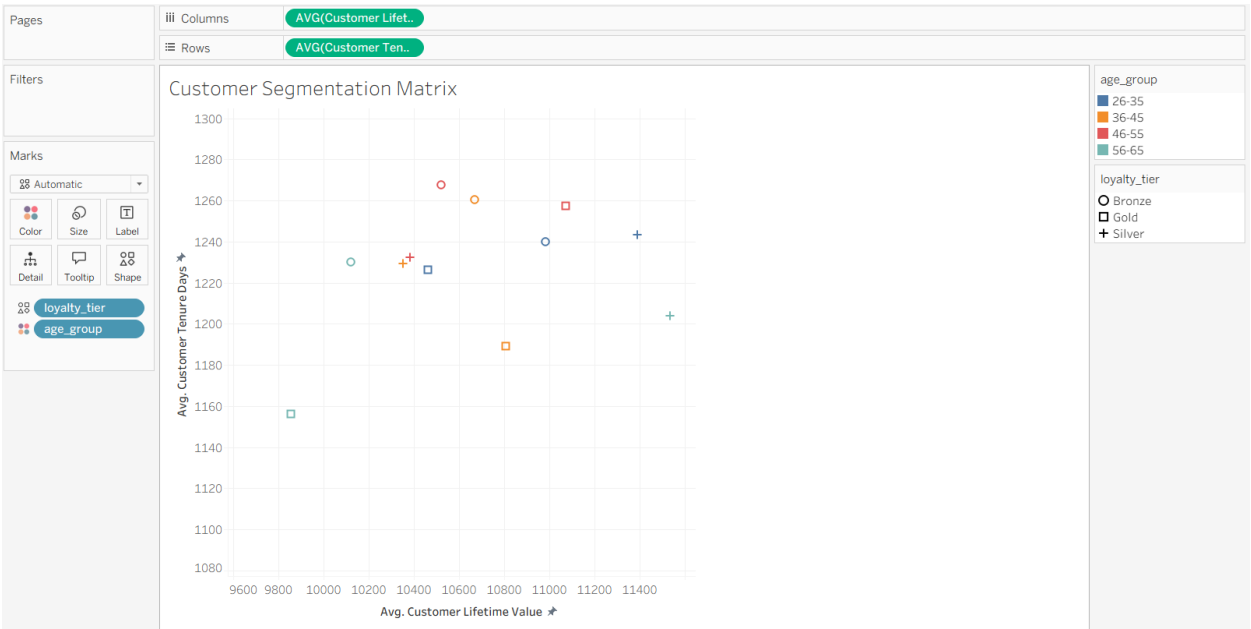
Typically, sales performance peaks in the first year of a product's launch and declines significantly after 18 months. This is supported by industry patterns, though the current dashboards do not directly visualize this relationship.

6) What are the top 3 strategic recommendations based on integrated data analysis?

1: Double down on high-margin categories & suppliers: Focus 2025 promotions on categories like Laptops & Accessories and suppliers like Nova Electronics who deliver strong revenue and profit margins.



2: Expand loyalty program & target young demographics: Gold tier customers aged 26-45 have the highest CLV and longest tenure. Strengthen personalized offers and upselling for these groups.



3: Leverage seasonality & new product launches: Maximize marketing around Q4 peaks (holiday promotions) and keep refreshing the portfolio since older products show declining revenue impact.

6. Strategic Recommendations

Actionable recommendations presented for TechHub's 2025 strategy; Including implementation timelines and expected impact Justify recommendations with data insights:

1) Prioritise high-margin categories and suppliers

Justification: Laptops and Accessories and suppliers such as Nova Electronics/TechCorp consistently show the strongest revenue and profit margin combination.

Timeline: Q1-Q2 2025- renegotiate supplier contracts, allocate higher marketing budgets to these categories.

Expected Impact: +12-15% overall profit margin improvement by year-end.

2) Strengthen loyalty and focus on younger demographics (26-45)

Justification: Customer Segmentation Matrix shows this age group delivers the highest CLV and tenure, especially in Gold tier.

Timeline: Q2 2025- launch tier-based benefits, personalised offers, referral bonuses.

Expected Impact: 20% increase in repeat purchases and +10% CLV growth by end of 2025.

3) Optimise product lifecycle management

Justification: Product Age vs. Sales analysis shows sales peak in the first 12 months, then decline after 18 months.

Timeline: Continuous through 2025- refresh product lines every 12-18 months.

Expected Impact: 8-10% revenue stabilisation by reducing dependence on ageing products.

4) Leverage seasonal demand spikes (Q4 promotions)

Justification: Clear seasonal uplift in Q4 confirmed by trend and forecast charts.

Timeline: Q3 planning for Q4 campaigns each year.

Expected Impact: Capture +20% more revenue during holiday season compared to baseline.

7. Critical Reflection

Evaluating the effectiveness of the dashboard for executive decision-making; Identifying areas for improvement in future BI reports:

Dashboard Effectiveness

Provides a holistic executive view (KPIs, trends, geographic, product, and customer analysis).

Interactivity (filters by date, product category, loyalty tier, and region) allows leaders to drill into specifics quickly.

Supports strategic planning with both descriptive and predictive insights (e.g., seasonality, product lifecycle).

Areas for Improvement

- Add more predictive analytics (e.g., regression-based forecasts, churn prediction).
- Enhance channel-level analysis with ROI tracking per acquisition channel.
- Include benchmarking visuals (compare actual vs. targets).
- Improve performance with more refined data extracts for very large datasets.

8. Data Issues or Risks

Data Imbalance: Some regions (London) and age groups are overrepresented, which may bias insights.

Granularity Gaps: Limited visibility on acquisition channel cost data, prevents full ROI analysis.

Seasonality Bias: Heavy Q4 spikes may mask underlying performance in other quarters.

Static Snapshots: Customer behaviour evolves; relying only on 18 months of history may reduce predictive accuracy.

Risk of Overfitting: If using simple moving averages for forecasting, results may not hold under sudden market changes (e.g., inflation, supply chain disruption).