Project Coversheet

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Project Title (Example – Week1, Week2, Week3, Week 4)	Week 4 – Business Intelligence Techhub Retail Dashboard

Instructions:

Students must download this cover sheet, use it as the first page of their project, and then save the entire document as a PDF before submission.

Project Guidelines and Rules

1. Formatting and Submission

- Format: Use a readable font (e.g., Arial/Times New Roman), size 12, 1.5 line spacing.
- Title: Include Week and Title (Example - Week 1: Travel Ease Case Study.)
- File Format: Submit as PDF or Word file
- Page Limit: 4–5 pages, including the title and references.

2. Answer Requirements

- Word Count: Each answer should be within 100–150 words; Maximum 800–1,200 words.
- Clarity: Write concise, structured answers with key points.
- Tone: Use formal, professional language.

3. Content Rules

- Answer all questions thoroughly, referencing case study concepts.
- Use examples where possible (e.g., risk assessment techniques).

- Break complex answers into bullet points or lists.

4. Plagiarism Policy

- Submit original work; no copy-pasting.
- Cite external material in a consistent format (e.g., APA, MLA).

5. Evaluation Criteria

- Understanding: Clear grasp of business analysis principles.
- Application: Effective use of concepts like cost-benefit analysis and Agile/Waterfall.
- Clarity: Logical, well-structured responses.
- Creativity: Innovative problem-solving and examples.
- Completeness: Answer all questions within the word limit.

6. Deadlines and Late Submissions

- Deadline: Submit on time; trainees who fail to submit the project will miss the "Certificate of Excellence"

7. Additional Resources

- Refer to lecture notes and recommended readings.
- Contact the instructor or peers for clarifications before the deadline.

1. **Introduction:**

TechHub Retail is a rapidly growing UK-based online electronics retailer that has experienced significant expansion over the past 18 months. With increasing product variety, customer segments, and regional reach, senior management requires a centralized analytics solution to support strategic planning for 2025.

The objective of this project is to design an executive-level business intelligence dashboard in Tableau Public and deliver data-driven insights to inform decision-making. The scope of the analysis includes sales performance, profitability, customer behavior, geographic trends, and forward-looking indicators derived from historical data. The dashboard is intended to help executives identify growth opportunities, understand performance trends, and shape data-backed strategies for future growth.

2. **Multi-dataset Integration Summary:**

Three datasets were integrated within Tableau Public to support a holistic analysis:

TechHub_Sales_Data.csv – *transactional sales data (Jan 2023 – June 2024)*

TechHub_Customers.csv – *customer demographic and profile information*

TechHub_Products.csv – *product, cost, margin, and supplier information*

The datasets were connected using Tableau relationships. The customer_id field was used to link sales transactions with customer demographics, while the product_id field linked sales data with product and supplier details. All date fields were converted to proper date formats, and date hierarchies (Year → Quarter → Month) were created to enable time-based analysis. Data validation checks were conducted to ensure key consistency across datasets. Missing values were reviewed and handled appropriately to prevent distortion in KPIs and visualizations. Minor data mismatches were filtered where necessary to maintain analytical accuracy. Several calculated fields were created to enhance business insight:

These calculations enabled deeper analysis of profitability, customer value, and product lifecycle performance.

- **Profit Amount**: Revenue – (Cost Price * Quantity)

- **Profit Margin %** : IF SUM([Revenue]) = 0 THEN 0 ELSE
  SUM([Profit Amount]) / SUM([Revenue]) END

- **Customer Tenure Days**: Days since customer signup
  DATEDIFF('day', [Signup Date], TODAY())

- **Customer Lifetime Value (CLV):** Total revenue generated per customer
  {FIXED [Customer Id]: SUM([Revenue])}

- **Product Age Days**: Days between product launch and order date
  DATEDIFF('day', [Launch Date], [Order Date])

Figure 1: Data Source Screenshot

3. Dashboard design Summary:

The dashboard was designed as a single executive view combining high-level KPIs with detailed analytical visualizations. The top section presents key performance indicators, including Total Revenue, Average Order Value, Total Customers, Customer Acquisition Rate, Average Profit Margin, and Top Customer Segment, each supported by month-over-month indicators. The dashboard includes the following visual components:

- Revenue and profit trend analysis over time
- Geographic performance visualization by region and city
- Product portfolio analysis by category and margin
- Customer segmentation based on lifetime value and tenure
- Supplier performance comparison by revenue contribution

Geographic performance was visualized on a city-level map using generated latitude and longitude coordinates. One unmapped city record was excluded to ensure accurate geographic representation. Interactive elements were incorporated to enhance usability, including a global date range filter, product category multi-select filter, customer loyalty tier selector, and region-to-city drill-down functionality. These features allow executives to explore insights dynamically and focus on specific strategic questions.
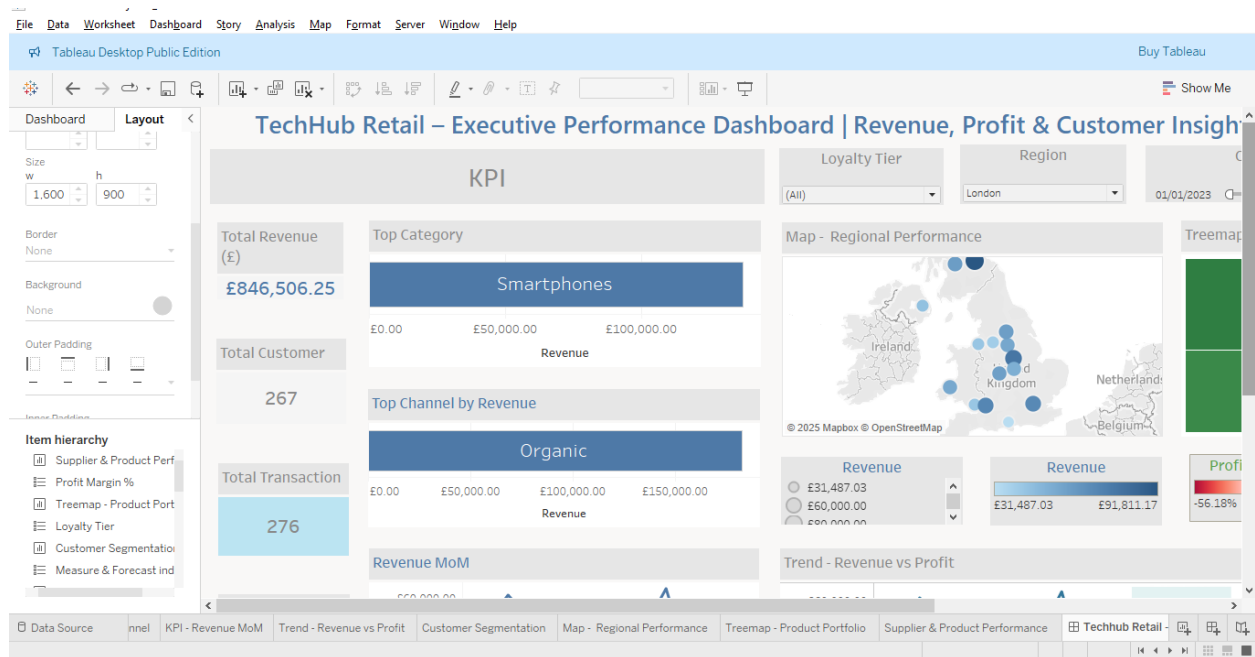
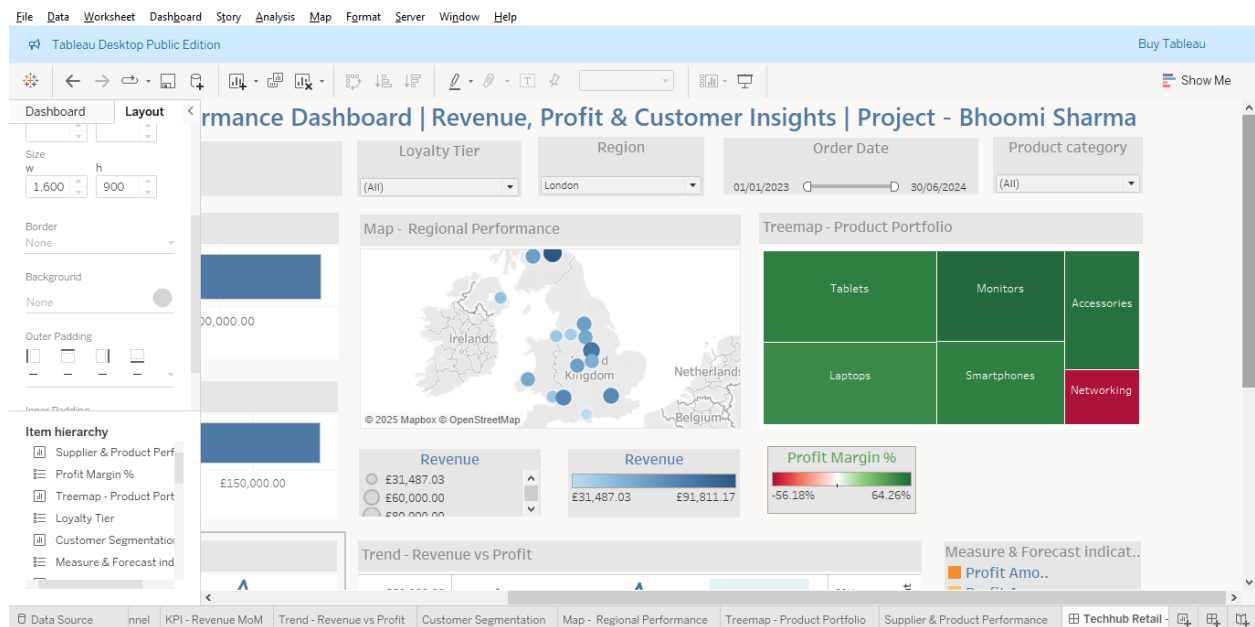**Figure 2: Executive Dashboard Overview (from Left Top)**

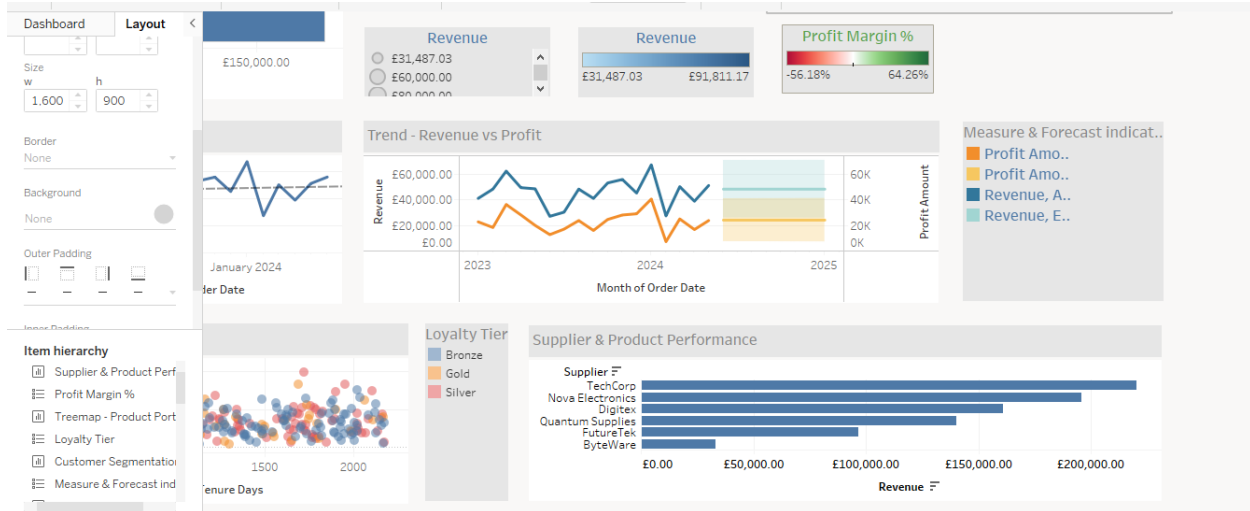**Figure 3: Executive Dashboard screenshot (from Right Top)**

Figure 4: Executive Dashboard Screenshot (Right Bottom)
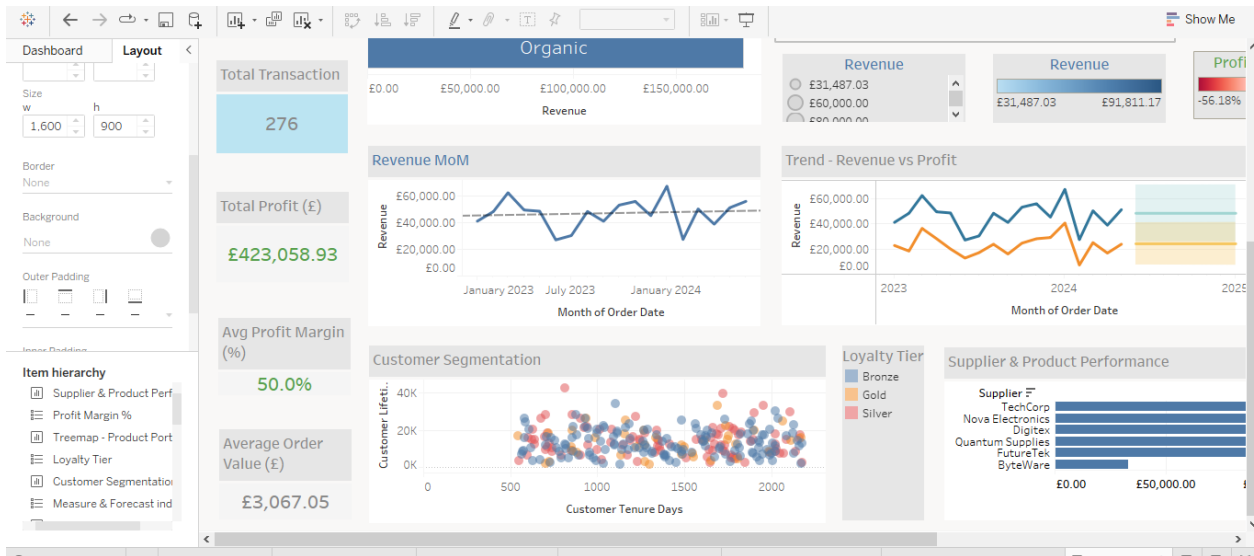

Figure 5: Executive Dashboard Screenshot (slide Left bottom)

4. **Key Insights & Findings:**

The analysis reveals that revenue growth has remained relatively stable over the observed period, with noticeable seasonal peaks corresponding to promotional and high-demand periods. Profitability varies significantly across product categories, underscoring the importance of margin-focused decision-making rather than relying on revenue alone. Geographic analysis shows that major urban areas contribute disproportionately to total revenue, indicating opportunities for region-specific marketing and inventory strategies. Customer segmentation shows that Gold-tier customers generate substantially higher lifetime value than Bronze- and Silver-tier customers, reinforcing the importance of customer retention initiatives. Supplier performance analysis indicates that a limited number of suppliers account for a significant share of total revenue, suggesting opportunities for strategic supplier partnerships and negotiation.

5. **Business Question Answered:**

   1) **Which Product Categories and suppliers offer the best profit margins for the 2025 focus?**

      High-margin product categories such as **Tablets and Monitors** consistently outperform others in profitability, as shown in the product portfolio treemap. Certain suppliers also generate substantial revenue with better margin efficiency, making them suitable for strategic focus in 2025. Low-margin categories like **Networking** should be reviewed for pricing or cost optimization.

   2) **How do customer demographics impact purchasing behaviour?**

      Customer demographics significantly influence purchasing patterns. Customers with longer tenure and higher loyalty tiers **(Gold and Silver)** demonstrate higher lifetime value, while specific age groups show stronger spending behavior. This highlights the importance of retention-driven and demographic-targeted strategies.

   3) **What seasonal patterns exist across products and regions?**

      Sales show clear **seasonal peaks during promotional and year-end periods,** particularly in high-demand regions. Revenue and profit trends move consistently together, indicating stable margins during peak seasons. These patterns support proactive inventory and marketing planning.

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

Organic and repeat-engagement channels contribute the most revenue and the highest customer lifetime value. Customers acquired through these channels show higher retention and repeat purchases than those from short-term promotional channels.

5) **How does product age correlate with sales performance?**

Newer products experience **strong initial adoption**, while mature products deliver **stable and consistent revenue** over time. Maintaining a balanced portfolio of new and established products ensures both growth and revenue stability.

6) **What are the top strategic actions supported by the data?**

The analysis supports prioritizing **high-margin products, high-value customers, and strong acquisition channels**, as well as region-specific growth strategies. Seasonal trends and forecasts further guide effective planning for 2025.

6. Predictive Insights and Trend Analysis:

Due to Tableau Public's forecasting limitations, predictive insights were derived using trendline analysis and month-over-month growth patterns. The revenue trend line indicates a generally stable growth trajectory with moderate seasonal fluctuations, providing forward-looking guidance for 2025 planning. The coefficients suggest that, while the trend is positive, growth is moderate and driven by seasonal variation rather than by aggressive upward acceleration. This reinforces the need for targeted strategic initiatives rather than reliance on organic growth alone.

7. Strategic Recommendation:

Prioritize High-Margin Products and Suppliers

Focus inventory investment and supplier partnerships on categories and vendors with consistently strong profit margins. Optimize Marketing Toward High-Value Customers

Redirect acquisition and retention efforts toward channels that convert customers into higher loyalty tiers with greater lifetime value. Leverage Regional Insights for Localized Strategy.

Implement region-specific promotions and inventory planning based on urban demand

concentration. These initiatives should be rolled out over a 6–12 month period, with performance monitored through KPI trends and customer lifetime value metrics.

8. **Critical Reflection:**

The dashboard effectively consolidates complex, multi-source data into a clear and executive-friendly decision support tool. Interactive filters and drill-downs enhance exploratory analysis while maintaining clarity at the executive level. Future improvements could include advanced statistical forecasting, integration of external economic or demographic data, and enhanced mobile optimization to strengthen executive usability further.

9. **Data Issues and Risks:**

Potential risks include data imbalance across regions and product categories, as well as limited historical depth for long-term forecasting. Additionally, customer lifetime value calculations may evolve as customer behavior changes over time. These limitations should be considered when applying insights to long-term strategic planning.