**Dynamic VBA Solution for Annual Sales, Delivery, and Payment Analysis**

Document Title: User Guide for VBA Macro Automation

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**1. Introduction**

* **Purpose:**  
  This guide provides step-by-step instructions for using and interpreting the VBA macros developed for the company’s annual reporting.
* **Audience:**  
  This document is intended for employees and analysts who will run, review, or modify the macros to generate the annual report.

**2. Overview of the VBA Automation**

The VBA macros automate data consolidation, feature engineering, and analysis, producing key metrics and insights for stakeholders. The automated steps include:

* **Data Consolidation:** Importing and merging raw data from various sources (customers.csv, orders.csv, etc.) into a single workbook.
* **Feature Engineering:** Adding calculated columns such as timeFrameForDeliveries, Revenue, ProfitPercentage, and others to enrich the dataset.
* **SLA Compliance Analysis:** Assesses adherence to delivery timeframes (within 6 days ) by location.
* **Comparative Revenue Trends:** Summarizing monthly sales, payments, and probabilities (based on a relative frequency approach).
* **Dashboard Creation:** A summary tab for high-level insights.

**3. Accessing the Macros**

* **Location:**  
  The Excel workbook containing the macros is saved at [annual\_internal\_report.xlsm](https://tusmm-my.sharepoint.com/:x:/r/personal/k00278245_student_tus_ie/Documents/Group4/working%20files_Macros/VBA%20Macros/annual_internal_report.xlsm?d=w287ee417438e49b88a09560f97c58eb1&csf=1&web=1&e=rclIWF)
* **Files Required:**  
  Ensure all raw data files (customers.csv, orders.csv, etc.) are in the specified folder before running the macros.

**3. Accessing the Report**

* **Location:** [annual\_internal\_report.xlsm](https://tusmm-my.sharepoint.com/:x:/r/personal/k00278245_student_tus_ie/Documents/Group4/working%20files_Macros/VBA%20Macros/annual_internal_report.xlsm?d=w287ee417438e49b88a09560f97c58eb1&csf=1&web=1&e=rclIWF)

**Workbook and Worksheet Setup Requirements**

**Why This Matters:**  
The macros rely on specific sheet names and structure to run properly. If anything is off—like a tab being named wrong or missing—it could break the automation.

**Naming the Workbook**  
Make sure the workbook is named **annual\_internal\_report** and saved as a macro-enabled workbook.

**Tab Requirements**  
Here’s the list of tabs you’ll need. These names are case-sensitive, so double-check for typos or extra spaces.

1. **Refresh Report**
2. **Summary Dashboard**
3. **SLA\_Compliance**
4. **SLA\_Compliance\_Analysis**
5. **Sales Analysis**
6. **Payments Analysis**
7. **Master Sheet**
8. **Payments Master Sheet**
9. **Products & Profit Master Sheet**
10. **Orders**
11. **Customers**
12. **Employees**
13. **Offices**
14. **OrderDetails**
15. **Payments**
16. **ProductsLine**
17. **Products**

If the tabs aren’t set up exactly as listed, the macros won’t work properly.

**Conditional Formatting Rules**

In the **SLA Compliance Analysis**, **Sales Analysis**, and **Payments Analysis** tabs, conditional formatting is used to make key trends stand out. Here's how it works:

1. **Top 2 Values in Each Column**
   * Highlighted in green to show the best-performing offices or months. This helps you quickly spot what's working well and where strategies are succeeding.
2. **0% or Lowest Values**
   * Highlighted in red to flag problem areas. For example, if SLA compliance is 0% in a month, it’s a sign of a potential cashflow issue. Low values in Absolute Percentage Deviation are formatted as red, and this indicate a small difference between historical and most recent data, suggesting that comparisons between locations are similar over time, so this is a positive.

**Purpose and Use**  
The goal is to make the data easier to interpret at a glance. The green highlights show benchmarks or success stories you can learn from, while the red highlights pinpoint areas that need attention.

**Troubleshooting Common Issues**

If you’re having trouble running the macros or interpreting the results, here are a few tips:

1. **Macros Not Running**:
   * Double-check that all tab names match the required list.
   * Make sure the workbook is saved as .xlsm and macros are enabled.
2. **Data Not Loading**:
   * Check that your raw data files are saved in the correct folder. Look for typos in file names like customers.csv or orders.csv.
3. **Incorrect Year Assignment**:
   * If the macro isn’t assigning historical years correctly, look at cells A1:E2 in the Master Sheet tab. You might need to manually edit the years or rerun the year assignment macro (Macro\_06).

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* + Editing the years is a completely acceptable approach. Just remember to proceed from macro 7 if entering the years manually. Historical years are defined as a year where we have a full 12 months of data. Current year is defined as where we have less then 12 months of data.

1. **Formatting Looks Off**:
   * If charts or tables don’t look right, try rerunning the relevant macro. For example, if the SLA visuals aren’t working, rerun Macro\_10. However, macro if macro 10 is the macro causing issues, feel free to skip it as what it creates is not essential to the report overall.
2. **Unexpected Errors**:
   * Go to the Developer tab and step through the macro to see where it’s breaking. Most issues will be related to missing data or incorrectly named tabs.

**Step-by-Step Guide to Running the Report**

Once everything is set up (correct tabs, workbook name, and raw data files), go to the tab titled *Refresh Report*: and click on each step sequentially.

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* (**Note:** Button titled Step 3C: SLA Visuals can be finnicky. If it is not working for you, feel free to skip it as what it creates is not essential to the report overall.)
* **Note**: You will get a confirmation message after running each of the macros to let you know that each has been ran successfully.

**Explainer of what’s behind each button:**

1. **Step 1: Load Data**
   * This step runs **Macro\_01\_LoadData**. It pulls raw data from external CSV files (“orders.csv”, “customers.csv”, “offices.csv”, “orderdetails.csv”, “payments.csv”, “productlines.csv”, and “products.csv.”) into an “annual\_internal\_report.xlsm”.
   * What it does:
     + The code is automated to detect the folder path where the files are located. You must ensure that the CSV files are in the same folder as the workbook “annual\_internal\_report.xlsm” and the file names match with those specified in the macro. If CSV files are not in same folder it will pop up a error.
     + Clears any old data from the relevant tabs to avoid duplication.
     + Loads fresh data from the source files.
     + Confirms when the process is complete so you can move to the next step.
2. **Step 2: Data Preparation**
   * This step runs **Macro\_99\_DataPreparation**, which includes several sub-macros:
     + **Macro\_02\_Populate\_Master\_Data\_tab**: Structures the raw data in the Master Sheet.
     + **Macro\_03\_PopulatePaymentsMaster**: Prepares payment data for analysis.
     + **Macro\_04\_PopulateProductsAndProfitMaster**: Organises product and profit data.
     + **Macro\_04A\_FilterStatuses**: Cleans up any invalid or unnecessary data entries.
   * Why it matters: This step ensures all data is cleaned and ready for deeper analysis.
3. **Step 3A: SLA Compliance Data Preparation**
   * Runs **Macro\_99A\_SLAComplianceDataPreparation**, which:
     + Populates the SLA Compliance tab with raw data.
     + Assigns year labels based on the month of the order.
     + Adds formulas for SLA compliance percentages and other calculations.
4. **Step 3B: SLA Compliance Analysis**
   * Runs **Macro\_08\_SLAComplianceAnalysisStructure** and **Macro\_09\_SLAComplianceAnalysis** to:
     + Build and populate the SLA Compliance Analysis tab.
     + Calculate SLA compliance percentages for each office.
     + Highlight deviations and trends for quick insights.
5. **Step 3C: SLA Visuals**
   * Runs **Macro\_10\_SLAComplianceVisuals**, which:
     + Creates dynamic charts showing historical and recent SLA compliance trends.
     + Automatically adjusts chart layouts for clarity.
6. **Step 4: Payments Analysis**
   * Runs **Macro\_99\_PaymentsAnalysis**, including:
     + **Macro\_11\_CreatePaymentsAnalysisStructure**: Sets up the Payments Analysis tab.
     + **Macro\_12\_Populate\_Payments\_Analysis**: Fills in the tab with detailed payment data and trends.
7. **Step 5: Sales Analysis**
   * Runs:
     + Structures the Sales Analysis tab.
     + Populates it with metrics like sales volume, revenue, and profitability.
8. **Step 6: Summary Dashboard**
   * Runs:
     + **Macro\_15\_Create\_Summary\_Dashboard\_Structure**: Lays out the dashboard framework.
     + **Macro\_16\_Populate\_All\_Charts\_In\_Summary\_Dashboard**: Fills the dashboard with visuals and summaries.
     + **Macro\_17\_Apply\_All\_Conditional\_Formatting**: Highlights key metrics for easy interpretation.

If you have issues with any of the above, go to the developer tab as follows and click on each macro (1-17 ) individually:

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**Important Notes:**

**Do not run macros with "99" in their names individually.** These macros are specifically linked to the buttons on the *Refresh Report* page and are designed to run from there only. Running them independently may cause errors or incomplete execution.

**No need to worry about pre-existing formulas or formatting.** Each macro is designed to fully recreate the relevant tabs, including all formulas, formatting, and charts where applicable. Everything required is embedded directly in the code, ensuring a clean and consistent output every time the macros are run.

**End of Main Instructions.**

1. **Additional Resources**

**Explainer for SLA Compliance Analysis Tab**

The **SLA Compliance Analysis Tab** is designed to evaluate how well each office meets Service Level Agreements (SLAs), focusing on on-time deliveries and their contribution to the overall operational performance. Here’s what each section means:

**Sections and Metrics:**

1. **Overall Historical SLA Compliance by Office:**
   * **Total Deliveries:** The number of total deliveries made by each office historically.
   * **On-time Deliveries:** The number of deliveries made within the SLA timeframe (6 days).
   * **SLA Compliance (%):** The percentage of deliveries made on time relative to total deliveries.
   * **Contribution to Total On-Time Deliveries (%):** Each office’s share of the total on-time deliveries across all offices historically.
2. **Recent SLA Compliance by Office:**
   * Similar to the historical section but focuses on the most recent year’s data, offering insights into current performance trends.
3. **SLA Compliance Comparison - Summary:**
   * This section compares historical and recent SLA compliance metrics and highlights **absolute percentage deviations** to show performance improvements or declines.
   * Contribution deviations show shifts in the role each office plays in on-time deliveries over time.
4. **Monthly SLA Performance Matrix:**
   * Displays historical SLA compliance data for each office by month to identify seasonal trends or challenges.
5. **Recent SLA Compliance Matrix:**
   * Recent performance trends for each office by month, useful for pinpointing areas needing immediate attention.
6. **Monthly Error Analysis:**
   * Highlights the months and offices with significant deviations from expected SLA performance, helping identify specific problem areas.

**Rules and Interpretation:**

* **Compliance Threshold:** Deliveries made within 6 days are considered "on-time."
* **High SLA Compliance:** Offices with consistently high percentages (e.g., Boston) indicate effective processes and resource management.
* **Low SLA Compliance:** Offices with low percentages (e.g., Tokyo or Sydney) need further investigation into operational challenges.
* **Monthly Trends:** Patterns of poor performance in certain months (e.g., July or August) suggest seasonal issues that need preemptive solutions.

**Explainer for Sales Analysis Tab**

The **Sales Analysis Tab** tracks office-wise and month-wise sales activities, revenue, and profitability. This data helps assess market performance and identify key areas for growth.

**Sections and Metrics:**

1. **Sales Activity:**
   * Represents the total number of sales transactions completed by each office during a given month.
   * This measures the operational efficiency and customer engagement of each location.
2. **Total Revenue:**
   * Calculated as the total monetary value of items sold (price × quantity).
   * Indicates how much revenue each office generates and helps highlight top-performing offices.
3. **Profitability:**
   * Derived as profit per item multiplied by the total items sold.
   * Provides insights into the efficiency of each office in generating profit.

**Rules and Interpretation:**

* **High Sales Volume with Low Profitability:** Indicates potential issues with pricing strategies or operational inefficiencies.
* **Low Sales Volume with High Profitability:** Suggests premium product sales or cost-effective processes.
* **Seasonal Trends:** Monitor patterns like increased sales in December for London, indicating opportunities for future planning.

**Explainer for Payments Analysis Tab**

The **Payments Analysis Tab** focuses on payment activities, emphasising the operational efficiency of collecting payments and their monetary value.

**Sections and Metrics:**

1. **Payment Activity:**
   * Tracks the total number of payments received by each office during a given month.
   * Indicates how active each office is in collecting payments and managing customer relationships.
2. **Payment Value:**
   * Represents the monetary value of the payments received.
   * Highlights the financial contribution of each office and helps assess the quality of the payments.

**Rules and Interpretation:**

* **High Payment Activity with Low Value:** Indicates smaller transactions or outstanding large payments.
* **Low Payment Activity with High Value:** Suggests fewer but larger payments, which might carry a higher risk of delayed payments.
* **Seasonal Trends:** Months like November and December often see spikes in payment activity, especially in high-performing offices like London and Boston.

Each tab serves as a crucial component of the annual report, providing insights into performance, trends, and areas needing attention, all tied to the company’s operational goals.

**Conditional Formatting Rules for SLA Compliance, Sales, and Payments Tabs**

In the **SLA Compliance Analysis**, **Sales Analysis**, and **Payments Analysis** tabs, conditional formatting has been applied to highlight key insights for easy interpretation. Here's an explanation of how the rules work and what they mean:

**Conditional Formatting Rules:**

1. **Top 2 Values in Each Column (Green):**
   * The top 2 performing values in each column are highlighted in **green**.
   * This is used to quickly identify the offices or months with the best results, whether it’s high SLA compliance, sales, revenue, profitability, or payment performance.
   * For example, in the SLA Compliance tab, Boston and London often appear in green due to their consistently strong SLA compliance rates.
2. **0% or Lowest Values (Red):**
   * Values of **0%** or the lowest performers in the column are highlighted in **red**.
   * This rule is designed to immediately flag underperforming months or offices that require attention.
   * For instance, in the Payments Analysis tab, any office with 0% payment activity is shown in red, indicating no payments received for that period.

**Purpose and Interpretation:**

* **Green Highlights:** These are the benchmarks and reflect the best-performing offices or months. They’re useful for identifying strategies or practices that are working well and can potentially be replicated across other locations.
* **Red Highlights:** These act as warning signals, showing areas that need urgent intervention. For example, an office with a red value in SLA compliance might indicate inefficiencies in their delivery processes or customer service.
* **Comparisons:** These conditional formats make it easy to compare performances across offices or months at a glance, helping management focus on strengths and weaknesses without manually reviewing every number.

The use of green and red formatting makes the data visually intuitive, helping stakeholders immediately understand what’s working and where improvements are needed. These formatting rules are consistent across all tabs to ensure a uniform approach to analysis.

**Explainer of individual macros:**

**1. Macro\_01\_LoadData**

This macro is the foundation of the automation process. It imports data from external CSV files into the workbook. Each dataset is assigned to its corresponding worksheet (e.g., Orders, Customers, Payments). It clears any existing data on these sheets and reloads fresh data, ensuring you're always working with the most up-to-date information.

**2. Macro\_02\_Populate\_Master\_Data\_tab**

This macro consolidates and structures data in the **Master Data** tab. It creates a unified dataset from multiple sources, which is critical for downstream analysis. Think of it as laying the groundwork for all the analyses to follow.

**3. Macro\_03\_PopulatePaymentsMaster**

This macro focuses specifically on preparing the **Payments Master** sheet. It aggregates payment-related data, ensuring the necessary calculations and summaries are ready for further processing.

**4. Macro\_04\_PopulateProductsAndProfitMaster**

Here, data related to products and profit is compiled and calculated. This macro pulls together details such as product categories, sales, and profits into a well-structured format for easy analysis.

**5. Macro\_04A\_FilterStatuses**

This macro cleans and filters statuses in your datasets. It standardizes values and removes any unnecessary or invalid entries, ensuring data accuracy and consistency.

**6. Macro\_05\_SLAMacro1\_PopulateSLACompliance**

This macro is the first step in the SLA Compliance Analysis. It populates the **SLA Compliance Summary** tab with raw data, setting the stage for more advanced analyses.

**7. Macro\_06\_SLAMacro2\_IdentifyYearsBasedOnMonths**

This macro helps categorize data into yearly buckets based on month information. It ensures that SLA compliance data is correctly grouped and organized by year.

**8. Macro\_07\_SLAMacro3\_PopulateFormulasinSLACompliance**

This macro fills in the formulas for SLA compliance metrics. It automates calculations for compliance percentages, deviations, and other critical indicators.

**9. Macro\_08\_SLAMacro4\_SetComplianceAnalysisStructure**

This macro creates the structure for the **SLA Compliance Analysis** tab. It sets up the necessary columns, headings, and formats to prepare for deeper analysis.

**10. Macro\_09\_SLAMacro5\_PopulateSLAComplianceAnalysis**

This macro populates the compliance analysis with data and formulas. It ensures that all metrics are calculated and displayed accurately in the **SLA Compliance Analysis** tab.

**11. Macro\_10\_SLAMacro6\_CreateSLAVisuals**

This macro is dedicated to creating visualizations for SLA Compliance. It generates two dynamic charts:

1. Historical On-Time Delivery Rates by Office
2. Historical vs. Recent SLA Compliance.

These charts are added to the **SLA Compliance Analysis** sheet for clear, actionable insights.

**12. Macro\_11\_PaymentsAnalysisMacro1\_CreatePaymentsAnalysisStructure**

This macro sets up the **Payments Analysis** tab, creating headers and a structure for monthly payment data. It prepares the space for subsequent population of data.

**13. Macro\_12\_Populate\_Payments\_Analysis**

This macro fills in the **Payments Analysis** tab with calculated payment metrics, including totals and trends over time.

**14. Macro\_13\_Macro\_SalesAnalysis\_CreateStructure**

This macro structures the **Sales Analysis** tab. It creates headers and organizes the layout to display revenue, profit, and sales trends.

**15. Macro\_14\_Populate\_Sales\_Analysis**

This macro populates the **Sales Analysis** tab with sales data and formulas. It automates calculations such as monthly revenue, product sales, and profit percentages.

**16. Macro\_15\_Create\_Summary\_Dashboard\_With\_Chart\_Structures**

This macro designs the **Summary Dashboard**, setting up the structure, headers, and placeholders for all key charts and summaries.

**17. Macro\_16\_Populate\_All\_Charts\_In\_Summary\_Dashboard**

This macro fills the Summary Dashboard with data-driven charts. It ensures all summaries, trends, and KPIs are visualized effectively.

**18. Macro\_17\_Apply\_All\_Conditional\_Formatting**

This macro applies conditional formatting across the workbook. It highlights important values, such as SLA compliance deviations and top performers, using color-coded rules to improve readability.