# **SQRCT System Architecture (Updated Apr 20, 2025)**

**1. Introduction**

This document describes the architecture of the SQRCT (Strategic Quote Recovery & Conversion Tracker) system in its current Excel-based implementation. It details the major components, data flow, data models, error handling, and security considerations based on the Power Query M code and VBA modules developed for the User/Master workbooks and the separate SyncTool workbook.

The primary purpose of this system is to track sales quotes, automate follow-up stage calculation, allow user input for engagement tracking via a standardized interface, provide distinct filtered views for Active and Archived quotes, and synchronize user edits into a master dataset, all within the Microsoft Excel environment.

**2. High-Level Overview**

The SQRCT system operates across multiple interconnected Excel workbooks: individual user workbooks (e.g., for Ryan "RZ", Ally "AF") and a central "Automated Master" workbook. A separate "SyncTool" workbook orchestrates the merging of user edit data between these files.

**Core Components:**

* **Data Sources:** Network folders (daily CSV quote exports), local Excel tables (historical data).
* **Power Query Engine (within User/Master Workbooks):** Ingests (CSVQuotes, ExistingQuotes), merges (MasterQuotes\_Raw), transforms, calculates status (AutoStage, AutoNote), and prepares the final quote dataset (MasterQuotes\_Final).
* **Excel Data Target (within User/Master Workbooks):** The output of the MasterQuotes\_Final query, loaded into the workbook for VBA access.
* **VBA Core Logic (Module\_Dashboard):** Orchestrates the main dashboard refresh (RefreshDashboard), builds the core data array (BuildDashboardDataArray), merges Power Query data with user edits, handles initial sheet setup (SetupDashboard), UserEdits backup/restore, and contains various helper functions (e.g., CleanDocumentNumber, ModernButton).
* **VBA View Generation (modArchival):** Creates and manages the "SQRCT Active" and "SQRCT Archive" sheets (RefreshActiveView/RefreshArchiveView), including filtering data (CopyFilteredRows using IsPhaseArchived), applying consistent formatting (ApplyViewFormatting), creating UI elements (AddNavigationButtons), and managing view-specific record counts via Properties (ActiveRecords, ArchiveRecords). Includes a helper (FormatControlRow) for standard Row 2 styling.
* **VBA Utilities (modUtilities):** Contains shared helper functions like Engagement Phase prefix lookup (GetPhaseFromPrefix), applying Data Validation (ApplyPhaseValidationToListColumn), and displaying/styling dynamic counts (UpdateAllViewCounts).
* **VBA User Edit Capture (Worksheet\_Change on Dashboard Sheet):** Automatically captures changes made by users in specific columns **(L-N: Phase, Last Contact, Comments)** and writes them to the hidden "UserEdits" sheet within the same workbook, tagging the edit with user identity and timestamp.
* **VBA Phase Validation (Workbook\_SheetChange in ThisWorkbook):** Intercepts changes in Phase columns (L on Dashboard, B on UserEdits), uses GetPhaseFromPrefix for auto-complete/validation against PHASE\_LIST, and triggers prompts for "Other" phases.
* **Hidden "UserEdits" Sheet (within User/Master Workbooks):** Persistent log of user modifications (Columns A-F: DocNum, Phase, LastContact, Comments, ChangeSource, Timestamp).
* **SyncTool Workbook (VBA Application):** Separate Excel file containing VBA modules for manually synchronizing "UserEdits" data between User/Master workbooks. Reads all sources, resolves conflicts (timestamp priority), writes merged data back *only* to the Master "UserEdits" sheet, and logs its actions.
* **UI Elements:** Standardized Row 2 controls including refresh buttons, view navigation buttons, dynamic count display (J2:L2), and timestamp (N2).

**Diagram (Conceptual Flow):**

Code snippet

flowchart TD

subgraph UserMasterWb [User/Master Workbook (RZ/AF/Master)]

direction LR

subgraph PQ\_Engine [Power Query Engine]

direction TB

CSVSource[("CSV Files")] --> CSVQuotes

ExcelSource[("ExistingQuotes Table")] --> ExistingQuotes

CSVQuotes --> MasterQuotes\_Raw

ExistingQuotes --> MasterQuotes\_Raw

MasterQuotes\_Raw --> MasterQuotes\_Final[MasterQuotes\_Final (Calculates AutoStage/Note)]

end

subgraph VBA\_Engine [VBA Engine]

direction TB

MasterQuotes\_Final -- Reads Data --> ModDash(Module\_Dashboard)

UserEditsSheet[(UserEdits Sheet)] -- Reads/Writes --> ModDash

ModDash -- Builds Array --> RefreshDash[RefreshDashboard]

RefreshDash -- Calls --> ModArch(modArchival)

RefreshDash -- Calls --> ModUtil(modUtilities)

RefreshDash -- Writes Data & Formats --> DashboardSheet{SQRCT Dashboard}

ModArch -- Creates/Updates --> ActiveSheet{SQRCT Active}

ModArch -- Creates/Updates --> ArchiveSheet{SQRCT Archive}

ModArch -- Reads Data --> DashboardSheet

ModArch -- Calls --> ModUtil

DashboardSheet -- User Edit L-N --> WsCode{Worksheet\_Change}

WsCode -- Writes --> UserEditsSheet

ThisWb{ThisWorkbook} -- SheetChange --> ModUtil

ModUtil -- Phase Lookup --> ListsSheet[(Lists Sheet / PHASE\_LIST)]

end

PQ\_Engine --> VBA\_Engine

end

subgraph SyncToolWb [SyncTool Workbook (Manual)]

direction TB

SyncUI{SyncTool UI} --> SyncCode[Sync VBA Logic]

SyncCode -- Reads --> RZ\_UserEdits[(RZ UserEdits)]

SyncCode -- Reads --> AF\_UserEdits[(AF UserEdits)]

SyncCode -- Reads --> Master\_UserEdits[(Master UserEdits)]

SyncCode -- Merges/Resolves --> MergedData

MergedData -- Writes --> Master\_UserEdits

SyncCode -- Triggers Refresh --> MasterWorkbookRef[Master Workbook Refresh]

end

UserMasterWb -- Contains --> RZ\_UserEdits

UserMasterWb -- Contains --> AF\_UserEdits

UserMasterWb -- Is Target For --> MergedData

style UserEditsSheet fill:#f9f,stroke:#333,stroke-width:2px

style RZ\_UserEdits fill:#f9f,stroke:#333,stroke-width:2px

style AF\_UserEdits fill:#f9f,stroke:#333,stroke-width:2px

style Master\_UserEdits fill:#f9f,stroke:#333,stroke-width:2px

**3. Component Breakdown**

* **Power Query Queries:** (Descriptions remain largely the same as your previous version, assuming CLIENT QUOTES is still separate/adjunct)
  + CLIENT QUOTES: Identifies quote document files/metadata. Potentially for ad-hoc use.
  + CSVQuotes: Ingests daily CSVs.
  + ExistingQuotes: Loads historical data from local table.
  + MasterQuotes\_Raw: Combines CSV and Existing data.
  + MasterQuotes\_Final: Core processing - filters, calculates age/status (AutoStage, AutoNote), deduplicates. Loads output to Excel for VBA.
* **VBA Modules (User/Master Workbooks):**
  + Module\_Dashboard: Orchestrates RefreshDashboard. Calls BuildDashboardDataArray. Manages UserEdits backup/restore (CreateUserEditsBackup, RestoreUserEditsFromBackup). Contains initial setup (SetupDashboard), button helper (ModernButton), data processing helpers (CleanDocumentNumber, ResolvePhase, etc.), sheet protection (ProtectUserColumns), and CF application helpers (ApplyColorFormatting, etc.). Interacts heavily with other modules.
  + modArchival: Handles generation of SQRCT Active / SQRCT Archive sheets (RefreshActiveView, RefreshArchiveView). Contains filtering logic (CopyFilteredRows, IsPhaseArchived). Manages view formatting (ApplyViewFormatting) and consistent Row 2 UI (AddNavigationButtons, FormatControlRow). Stores/provides view counts (ActiveRecords, ArchiveRecords Properties).
  + modUtilities: Contains shared helper functions: GetPhaseFromPrefix (for auto-complete), ApplyPhaseValidationToListColumn (for dropdown setup), UpdateAllViewCounts (for displaying counts in J2:L2).
  + Module\_Identity: Defines workbook owner ("RZ", "AF", "MASTER").
  + ThisWorkbook Code: Contains Workbook\_SheetChange event handler to manage Engagement Phase input validation, auto-complete, and "Other" phase prompting by calling modUtilities.GetPhaseFromPrefix.
  + Worksheet Code (SQRCT Dashboard Sheet): Contains Worksheet\_Change event handler to capture user edits in columns L, M, N and save them to the hidden UserEdits sheet.
* **VBA Modules (SyncTool Workbook):** (Based on previous README - verify if accurate)
  + Module\_SyncTool\_Manager: Orchestrates synchronization workflow.
  + Module\_File\_Processor: Handles reading/writing external User/Master workbooks' UserEdits sheets.
  + Module\_Conflict\_Handler: Implements conflict resolution logic (timestamps, comments).
  + Supporting Modules: For Logging, UI, Constants, Utilities within the SyncTool.

**4. Data Model**

* **MasterQuotes\_Final (Power Query Output / Excel Table):**
  + *Structure:* Processed quote data (Doc Num, Dates, Customer Info, Salesperson, AutoStage, AutoNote, DataSource, etc. - Columns A:K approx).
  + *Storage:* Loaded into Excel Table/Connection. Read by VBA.
* **UserEdits (Hidden Sheet in RZ/AF/Master):**
  + *Structure:* User overrides. Columns: A: DocNumber (Key), B: Engagement Phase, C: Last Contact Date, D: User Comments, E: ChangeSource ("RZ", "AF", "MASTER"), F: Timestamp.
  + *Storage:* Hidden Excel sheet. Acts as local change log. Master sheet is target for SyncTool.
* **SyncTool Log Sheets:** SyncLog, ErrorLog, DocChangeHistory within SyncTool workbook.

**5. Data Flow**

1. **Data Ingestion (Power Query):** CSVs + Local Table -> MasterQuotes\_Raw -> MasterQuotes\_Final -> Loaded to Excel.
2. **Dashboard Refresh (Module\_Dashboard.RefreshDashboard):**
   * (If SaveAndRestore Mode): Read L-N from Dashboard -> Update UserEdits sheet (SaveUserEditsFromDashboard).
   * Build data array (BuildDashboardDataArray) by merging MasterQuotes\_Final output with current UserEdits data (using ResolvePhase logic).
   * Write merged array A:N to Dashboard sheet.
   * Sort Dashboard.
   * Apply column widths, number formats, data validation (ApplyPhaseValidationToListColumn).
   * Apply Conditional Formatting (ApplyColorFormatting, etc.).
   * Protect Dashboard, unlocking L:N (ProtectUserColumns); Apply Freeze Panes (FreezeDashboard).
   * Call modArchival.RefreshAllViews to regenerate Active/Archive sheets.
   * Call modArchival.FormatControlRow(ws) to set base grey A2:N2 format on Dashboard.
   * Apply A2 blue override styling to Dashboard A2.
   * Call modArchival.AddNavigationButtons(ws) to add buttons and timestamp to Dashboard N2.
   * Call modUtilities.UpdateAllViewCounts(ws) (using unprotect/reprotect wrapper) to display counts in Dashboard J2:L2.
   * Create/Update Text-Only Sheet.
   * Display completion message.
3. **User Editing (Worksheet\_Change on Dashboard):**
   * User changes cell in L, M, or N.
   * Event triggers -> Get DocNum (A) -> Find/Create row in hidden UserEdits -> Write L, M, N values to UserEdits B, C, D -> Write User ID (E) & Timestamp (F).
4. **Phase Input (Workbook\_SheetChange in ThisWorkbook):**
   * User changes cell in L (Dashboard) or B (UserEdits).
   * Event triggers -> Call modUtilities.GetPhaseFromPrefix.
   * If unique match -> Auto-complete/correct case.
   * If "Other..." match -> Show prompt, select Comments column.
   * If no/ambiguous match -> Show error, undo change.
5. **Synchronization (SyncTool - Manual):**
   * User selects RZ, AF, Master file paths in SyncTool UI -> Clicks "Sync".
   * SyncTool VBA reads UserEdits from all 3 files.
   * Resolves conflicts (timestamp priority, comment merge).
   * Writes resolved data *only* to UserEdits sheet in Master workbook.
   * Triggers refresh of Master workbook.
   * Logs actions in SyncTool log sheets.

**6. Error Handling Strategy**

* **Power Query:** Relies mainly on default behavior; some try...otherwise. Limited logging.
* **VBA (User/Master):** Uses On Error GoTo [Label] in main routines (RefreshDashboard, ApplyViewFormatting, etc.) for controlled cleanup. Uses On Error Resume Next more sparingly in specific formatting/object access blocks where failure is non-critical or handled immediately. Errors logged via DebugLog to Immediate Window and potentially UserEditsLog sheet.
* **VBA (SyncTool):** Structured error handling with centralized logging to dedicated sheets within the SyncTool.

**7. Security Considerations**

* **Password:** Sheet/Workbook protection uses a **blank password** defined in Module\_Dashboard.PW\_WORKBOOK constant.
* **Network Path Access:** Power Query and SyncTool require user/tool access to specified file paths. Parameterization or configuration sheets recommended over hardcoding.
* **SyncTool File Access:** Requires Read/Write access to User/Master workbooks.
* **Macro Security:** Relies on users enabling macros. Standard Trust Center settings apply.
* **Data Exposure:** Access control relies on filesystem/SharePoint permissions.

**8. Deployment & Execution**

* **System Operation:** Runs entirely within Microsoft Excel (.xlsm files).
* **User Interaction:** Users work within their individual .xlsm files, interacting with the "SQRCT Dashboard".
* **Data Refresh:** Power Query refreshes likely triggered manually or via VBA refresh buttons. VBA refreshes triggered by buttons.
* **Synchronization:** Manual process using the separate SyncTool workbook. Requires user intervention to select files and initiate.
* **Code Updates:** Require manual export/import between the Git repository and the operational Excel files' VBA Editors.