Project Documentation

Proactive Risk Intelligence Dashboard for Legal Tech Operations

Using Excel, SQL, and Power BI

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Executive Summary

The *Proactive Risk Intelligence Dashboard* is a full-cycle Business Intelligence solution designed to detect and mitigate financial and operational risks in legal-tech firms.

The project, which was developed from the ground up using artificial but realistic legal data, necessitated the cleaning and organization of Excel datasets, their modelling in MySQL, and the visualization of the results using Power BI.

This project was developed with the perspective of a business analyst to address the following issues: matter-level cost tracking, billing inefficiencies, and a lack of consistent insight across high-risk clients. The system enables organizations to precisely monitor recovery gaps, optimize attorney resource allocation, and proactively identify at-risk revenue by querying and analysing data and converting the results into meaningful dashboards.

Finally, it provides more intelligent, proactive risk management by giving transparent, data-driven insights on client risk distribution, unpaid dues, matter profitability, attorney workloads, and other factors.

Project Objectives

- Risk Stratification: Analyse patterns in billing, payment behaviour, and overdue amounts to identify high, medium, and low-risk customers.

- Operational Visibility: Facilitate the process of making informed decisions by legal firms by visualizing financial and procedural red flags through intuitive interfaces.

- Proactive Risk Management: Provide legal consultants and operations managers with data-driven, preventive insights, thereby transitioning the focus from reactive problem-solving to anticipatory action.

Tools & Technologies

Tool	Purpose
Microsoft Excel	Data cleaning, preparation, and generation of synthetic legal datasets
MySQL (Workbench)	SQL-based querying, joins, aggregations, and transformation based on client risk, billing behaviour, and legal operations
Power BI	Designing interactive dashboards, data modelling, and executive-level visual storytelling
MS Word	Report creation, project documentation, and stakeholder-ready presentation material.

Data Sources

Source	Description
Cleaned Client Billing Data	6–8 Excel-cleaned CSV files including clients, matters, invoices, attorneys, time entries, expenses, logs, and users.
SQL Query Results	8 major SQL query outputs exported as individual CSV files for Power BI import.
PBIX File	Final Power BI dashboard containing interactive visuals across 7+ report pages.
Screenshots	Captured evidence of SQL script executions and Power BI visual pages for documentation and validation.

Methodology: Step-by-Step Workflow

1. Data Collection & Cleaning

- Imported raw client billing and operational datasets (CSV format) into **Microsoft Excel**.
- Performed data cleaning by removing null values, fixing duplicate records, and standardizing formats (dates in MM/DD/YYYY, numeric consistency in amount_billed, rate, hours_worked, etc.).
- Ensured uniformity in key IDs like client_id, matter_id, and attorney_id for relational modelling.

2. Data Modelling in SQL (MySQL Workbench)

- Imported cleaned Excel CSVs into MySQL using structured schema design.
- Built relational connections between tables such as invoice, client, matter, time_entries, expense, and attorney.
- Wrote optimized **SQL JOINs** to bring together billing, client, and attorney data.
- Used **CASE statements** and logical conditions to categorize clients into:
    - **High Risk**: Long overdue invoices with high outstanding amounts.
    - **Medium Risk**: Delays or underpayment with moderate outstanding.
    - **Low Risk**: Consistent, timely payers.

3. Risk Flag Generation

- Embedded risk-flag logic into queries and exported risk-categorized client data as CSVs.

- Maintained separate SQL scripts for each query, supporting modular review and reuse.
- Created derived columns (e.g., total due, total billed, total paid) for analytical modelling.

4. Data Visualization in Power BI

- Imported query outputs and raw tables into Power BI Desktop.
- Created interactive visuals including:
    - **Clustered and Stacked Column Charts** (Attorney Workload, Expenses)
    - **Donut Chart** (Client Risk Distribution)
    - **Tables** (Invoice Gaps, Risk Revenue, Audit Logs)
- Integrated **slicers** and **filters** for client name, risk category, and date range.
- Used **summary cards** for:
    - Total Outstanding
    - Average Delay
    - Number of High-Risk Clients

5. Insights & Actionable

- Dashboard reveals key insights:
    - High-risk clients contributing disproportionately to revenue leakage.
    - Matters with poor profitability despite high attorney involvement.
    - Attorneys logging large hours but lower billed realization.
- Recommended **data-driven interventions**, such as:
    - Prioritizing collections from flagged clients.
    - Assigning paralegals or second-line review on high-risk matters.
    - Scheduling periodic internal audits based on dashboard indicators.

Challenges & Solutions

Challenge	Solution Implemented
Overlapping or duplicate data entries	Used **Excel's Remove Duplicates** and manual cross-verification during data cleaning.
Inconsistent client names across tables	Applied **VLOOKUP** and **relational joins in SQL** to standardize and align references.

Challenge	Solution Implemented
CSV files not importing correctly in SQL	Ensured correct **column order**, removed empty headers, and fixed **date format (MDY)** before import.
Foreign key dependencies during import	Resolved by importing tables in **relational order**: client → matter → invoice, etc.
SQL query syntax issues	Debugged with **step-by-step execution**, saved queries in .sql script for reusability.

Business Value

- Empowers **Legal Operations Teams** to act *proactively* by identifying and addressing client and financial risks early.
- **Reduces manual effort** spent in chasing payment discrepancies, client risk profiling, and matter audit preparation.
- Drives **data-backed decisions** for client prioritization, attorney workload management, and profitability tracking.
- Builds a **culture of accountability** by visualizing performance metrics and operational inefficiencies.

Future Scope

- **Automate the SQL pipeline** using scheduled scripts or ETL tools for regular data refresh without manual imports.
- Integrate **Power Automate** or equivalent tools to trigger **real-time alerts** for high-risk clients or overdue payments.
- Enable **cloud-based dashboard access** (e.g., Power BI Service) with **role-based permissions** for attorneys, admins, and financial teams.
- Incorporate **predictive modelling** to flag risk clients before due date breaches occur using machine learning in future iterations.

Project Resources & Deliverables

Below are the complete resources and assets associated with the **Proactive Risk Intelligence Dashboard for Legal Tech Operations (Google Drive):**

https://drive.google.com/drive/folders/1asOldVDKulrYXZw_pjopyLMHhi8G39SD?usp=drive_link
Includes cleaned Excel datasets, SQL scripts, screenshots, and the Power BI .pbix file (downloadable).