

Using SQL to Streamline Monthly Accrual Reporting

I. Nzuki, N. Karanja-Meek, D. Keusch, E. Eells, M. Willer

The University of Kansas Cancer Center

1. Background

The Research Systems team at University of Kansas Cancer Center (KUCC) distributes monthly accrual reports to leadership, showing trial accruals across various data categories such as enrollment sites and disease working groups. Initially, these reports were created in Excel by copying and pasting source data tables into tabs each month, then manually updating formula references. This process was tedious, error-prone, and often caused Excel to crash due to large data volumes and complex formulas. This project aimed to address these issues.

2. Goals

The goal of this project was to improve the efficiency, security, and reliability of the monthly accrual creation process through automation and the use of a capable data management tool (SQL).

3. Solutions and Methods

Amendment processing timelines from Cancer Trials Support Unit (CTSU) posting to local activation improved from an average of 25.5 days to 11.9 days after implementation of the report. The team saw a high of 17 audit findings for delayed activation in 2017 to no regulatory audit findings in 2023.

Next, we created SQL views for each visualization, which aggregated the data as needed and contained only the necessary columns. These views dynamically retrieved data through queries from the source tables, replacing Excel formulas. We saved the queries as labeled files or views as it is easier to maintain and update than complex Excel formulas.

We then connected these views to Excel, allowing direct mapping of tables and charts to the SQL views. This eliminated the need for formulas and manual updates, reducing errors and improving report stability.

4. Outcomes

The new method has reduced the total report creation time by an estimated 70 percent and reduced error rates by 85 percent. The live connection between Excel and SQL ensures charts and tables automatically update with SQL table changes, eliminating manual updates and reducing errors.

Additionally, troubleshooting queries is easier than editing Excel formulas, leading to faster resolution of data issues. Additionally, only authorized users can access the SQL server, securing the underlying data.

This method also enables new data analysis capabilities. Previously, we couldn't compare disparate datasets from different systems using Excel. With SQL, we can join rows from multiple tables/systems to create reports. Additionally, SQL's ability to format columns as different data types allows seamless integration into relevant charts which has enhanced data visualization and reporting capabilities.

5. Lessons Learned and Future Directions

We learned that SQL can quickly answer ad hoc questions and be applied to other processes like audits or data requests requiring complex analysis. We also faced challenges replicating Excel formatting in Power BI due to different formatting options.

Future directions include:

1. Making reporting more efficient and consistent using stored procedures.
2. Expanding this method to other projects to enable leadership to draw further insights.
3. Making monthly accrual reports interactive using dashboard technologies like Power BI.
4. Adding and storing large volumes of past data to analyze trends over time.

Figure

