From Data Prep to Finance Reporting:

3 Examples to Speed Up Analysis

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Introduction

As companies move systems and data to the cloud, finance departments often quickly feel the effects of this digital transformation because of their close partnership with IT to build out infrastructure required for financial data sources. According to IDG's 2018 State of Digital Business Transformation, "more than a third of organizations (37%) have already started integrating and executing a digital-first approach." As more and more companies pursue digital business initiatives, new systems, processes, and data sources are introduced, resulting in a significant risk for finance departments: it creates an additional workstream for finance teams to juggle. Besides helping IT transition legacy financial systems to cloud-based ones, finance departments must continue to serve the business with their day-to-day functions of finance reporting, forecasting, planning, cash flow management, auditing, and more. Having concurrent workstreams can tax even the most efficient of teams, so how do finance organizations support both their KPIs and the digital evolution of the business—all while maintaining trust and credibility with stakeholders? By focusing on financial data preparation and validation as a part of your analytics model. Regardless of where you are in your analytics maturity, there are flows and self-service dashboards you can implement to speed up analysis and scale impact throughout the organization, inspiring confidence in your data and trust in your financial strategy.

While your company begins the shift to cloud-based technology, we share three examples that will hopefully spark ideas for methods to speed up financial analysis based on your data. Read on to learn about our finance analytics team's journey to migrate from an on-premises SQL Server deployment to Snowflake, a cloud-based database. Using Tableau Prep Builder, the team developed automated flows to validate records between SQL and Snowflake, scheduling validation flows with Tableau Prep Conductor. This migration resulted in massive time savings and improved accuracy of data in the new database. The second example shows you how we automate the preparation of payroll journal entries before they're uploaded to the general ledger, saving our accounting team's effort and time. The third example works with expense management data, validating that expense entries are appropriately processed.

Characteristics of an agile finance analytics strategy

As an internal "agency," finance departments affect every business unit and cost center in a company. People, whether they're a marketing manager or sales executive, rely on the detailed and complex work done by finance professionals to make business decisions, so it is critical to have an agile finance analytics strategy that incorporates data validation and preparation to build credible, secure data sources. These stakeholders are both clients and collaborators; finance departments and other business units are interdependent on one another's functions for success, equally contributing to the overall success of the business.

At Tableau, we have a centralized analytics function within the finance organization. Some of the teams that we support include accounting, procurement, financial planning and analysis (FP&A), and treasury among others. As the finance analytics team, we've established several core tenets to help manage daily demands, while also serving as a strategic partner to other business units and senior leadership. One is to drive operational efficiencies using technology to encourage self-service analytics and data exploration with our internal stakeholders. Another is to collect, store, validate, secure, and publish the data used by the overall finance department to understand the high-level business goals to support timely decision-making.

To balance the parallel workstreams that keep Tableau running and help it prepare for future growth, we discovered that adding more analysts didn't necessarily make this juggling act easier—or scalable. What we found is that preventing errors and saving time with data preparation and validation steps was one of the most effective ways to use of our skills and resources. By validating, preparing and cleaning data, the team was able to catch errors before stakeholders did, or quickly find and correct any errors brought to our attention. This effective use of analyst resources also contributed to strong partnerships with the accounting and audit teams, helping them avoid making decisions off of bad data.

Maintaining collaboration with internal stakeholders helps finance teams better understand the higher-level perspective of business goals to support these goals from a tactical perspective.

Our partnership with FP&A

Based on company-wide KPIs, our finance analytics team partnered with FP&A to create a single Tableau workbook pulling from over 20 data sources. This workbook we call, "DATA State of the Union," provides an executive summary while still allowing for drilling down into lower granular details, such as business segments. Since most of the 20 data sources are regularly validated and refreshed, the FP&A team has been able to focus on tracking down the variances between quarters, instead of having to rebuild this from scratch each quarter. This central source of truth is prepared and distributed shortly after quarter-end, providing actionable insights for all consumers of the content and reducing the need for ad hoc reports.
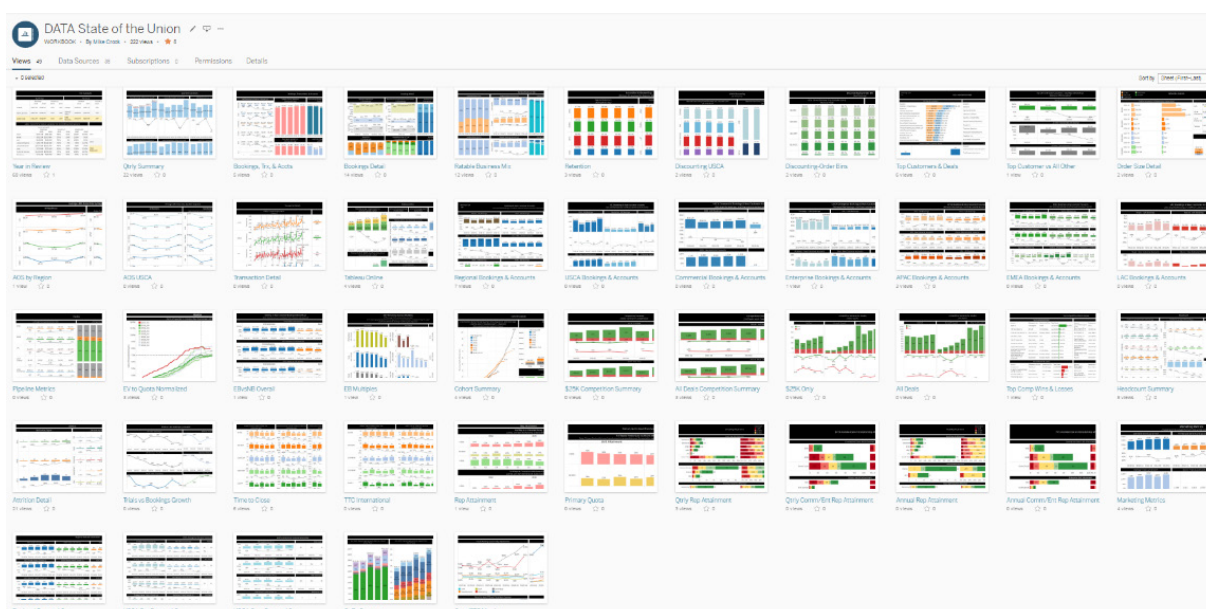
A view of the Tableau finance analytics team's workbook reporting on company-wide KPIs.

When validation and preparation of financial data is done throughout every step of the analytics process, it allows finance to support the enterprise as a strategic partner effectively.

Messy financial data and challenges to extraction

Finance data is often highly segmented, stuck in source systems, which makes it extremely difficult to bring together, join, blend and analyze. There are even instances where connecting to data in a source system is a problem. While there are challenges to every step of the extract, transform, and load process, extraction is the first step to making your data usable.

Source systems like NetSuite, Salesforce, Coupa, and Concur have unique demands and structure. Your finance team is probably doing manual extracts and experiencing long extraction times when dealing with thousands of rows of data. Once your data is extracted, you may be spending up to half your time, or more, cleaning up the data. Financial data can be especially messy with numerous empty fields and entries that vary slightly depending on manual inputs. Everyone thinks that finance data is all numbers, but in reality, only a few key data points are, such as amounts, dates, and account codes. The rest of the data is text which is often manually entered, such as vendor names, account descriptions, and transaction memos—some of which is messy and nuanced.

The limitations of spreadsheets

If you've been able to extract your data, your go-to tool for preparing and analyzing your data is likely Excel. While Excel is used by almost all finance professionals, regardless of their function, this tool has significant limitations to creating a sustainable, self-service analytics model. Let's review the challenges of using Excel for your financial analysis.

One limitation is that data extracted from source systems stops being current as soon as it's exported. Without a platform that connects to a live data source, your team will always be working with stale data. Another limitation is that preparing source data in spreadsheets can take hours of precious time that could be devoted to discovering outliers in audit reports or collaborating with stakeholders regarding strategy.

A time-consuming issue we encounter is duplicated or incorrect data. For example, we have a process for Concur Expense data which pinpoints the exact problem when one appears; the flow and validation outputs show exactly what is wrong with no guessing, searching, or trial-and-error checking. Without these automated validations, we risk making incorrect decisions off of duplicated data we may not be aware is duplicated. Or if a business partner brings our attention to inaccurate data, we must reprocess everything to confirm the data is correct and trustworthy.

Each source system has unique challenges, requiring additional time to validate fields and clean data to a point where it can be joined with other sets for analysis. Due to the highly manual nature of this exercise, any errors missed or created in these spreadsheets, even if it's a null value, will likely spread; spreadsheets are created, then shared with peers, who subsequently make their changes, potentially creating new errors. Incorrect or unknown duplicated data can erode your trust in the data—which means your stakeholders may lose confidence in your reporting.

Even if you began working with extracted data from a secure, certified data source, once you've put it into a spreadsheet, disconnected from a live data source, it's lost some degree of credibility and accuracy. A single Excel sheet is limited to 1,048,576 rows of data and as your company grows, storing and analyzing data in spreadsheets won't be able to support digital transformation. For business partners to make crucial decisions based off of potentially error-riddled spreadsheets is irresponsible. Having a robust platform, like Tableau, connected to a live data source can help you create a single source of truth that stakeholders can be confident is accurate.

At Tableau, we use NetSuite as our general ledger system. Extracting data from NetSuite, or any source system brings with it a particular set of obstacles. Your team may be using database connectivity (ODBC/JDBC) drivers or an application programming interface (API) to communicate with NetSuite or perhaps you're just exporting reports into a spreadsheet. As data volumes grow, you may grapple with potentially slow extract times, based on the number of rows, table sizes, etc. If you are a smaller company with less data, this may be enough in the short term, but to prepare for growth and to develop an agile analytics model, you'll need a platform that can manage large amounts of data quickly.

The value of a master financial records database

If your finance team has grown in analytics maturity, moving beyond a spreadsheet-centric analytics model, you may be housing financial data in an on-premises database.

When Tableau created an on-premises master financial database in 2012, we started to discover efficiencies in the process of turning our data into valuable insight. First, the data preparation was more carefully controlled by our central analytics team, reducing the amount of work analysts had to do on their own. This also offered more real-time analytics by providing access to dozens of tables refreshed as often as every two hours. Second, working from the same data sources created confidence in our data. Our finance teams were able to move away from exporting NetSuite data to Excel for ad hoc analysis in Tableau Desktop to a single source of truth database. Third, when business logic changes, resulting in necessary change to metadata and calculations, we weren't repeating this work in multiple places. Instead, end users would automatically inherit any changes to the live data sources, or Tableau Server published data sources which increases adoption and reduces duplicated effort.

Why we moved our financial database to the cloud

While an on-premises infrastructure can support you during part of your company's growth, the server set-ups have their limitations and can be costly investments.

The Tableau finance analytics team found that after more than six years, our on-premises SQL Server deployment was no longer able to effectively support our financial data storage needs. This architecture eventually affected our ability to deliver the level of service our stakeholders have come to expect without significant investments in hardware and resources. In partnership with IT, we began the process of vetting cloud-based databases that could support an agile and sustainable analytics model.

After testing several different cloud-based database solutions, we decided to partner with Snowflake as we continue our data journey. Snowflake has helped us better manage hardware in a high growth environment, focusing our resources and time on higher value-add projects. This database also made it easy for us to dynamically scale hardware resources, with the option to ramp up during month-end close and scale back when there is less demand, paying only for what we use.

Three examples of how we use Tableau to validate and prepare data

Along this journey in the evolution of our financial reporting architecture, we've used multiple data preparation technologies and strategies to help us make sure we are providing the most accurate data to our business. Tableau Desktop, and now Tableau Prep Builder, have both proved themselves to be invaluable assets to our finance analytics team. Below are three examples of how our platform has enabled the team:

Example 1: Validate our data in the transition to the cloud

We use Tableau Prep Builder to do parallel testing between two data sources to ensure data completeness.

Beyond migrating to a new database platform, we also changed the method of extracting, transforming, and loading (ETL) data and shifted to an ELT paradigm, where the loading occurred before any transformations. We had initially used SQL Server Integration Services for the ETL, and with Snowflake, we elected to use a combination of Talend and a homegrown platform we call, "Meta4."

With all of these infrastructure changes, it was critical to find the best way to validate our over 16 years of financial data.

We quickly decided that it was not practical to validate the values in every column of every table. We also needed to determine when we could compare Snowflake to SQL and when we needed to validate Snowflake back to the source system (NetSuite). To make the validation process feasible and repeatable, we focused on record counts for all tables, primary keys compared for critical tables and being able to tie out the income statement and balance sheet. Another decision made several years prior, that ended up saving time in this transition, was the widespread use of published data sources we engineered for Tableau Server. By having published data sources, we could publish two versions: one with SQL and one with Snowflake to make parallel testing easier, or even accommodate by directly replacing the original data sources—with the end user never knowing the difference.

To complete all of these validations, we picked the appropriate tool for the job. We used a combination of Tableau Desktop, Tableau Server, Tableau Prep Builder, Tableau Prep Conductor, Alteryx Designer, Alteryx Server, and some Excel. With this combination of platforms and processes, we were able to sign off on the accuracy of the data in Snowflake, determining it reliable and credible. In the end, we successfully migrated all Tableau published data sources and workbooks to use data from Snowflake.

Here is one of the many workflows we built in Tableau Prep that you can mirror at your own company when your team needs to do a similar migration.
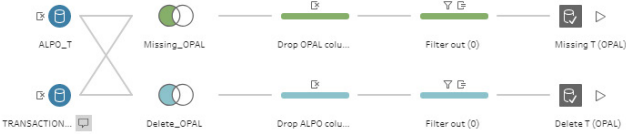
SQL to Snowflake Prep flow

In comparing Snowflake to SQL data, we created a Tableau Prep flow to find any missing records or missing deletes (e.g., NetSuite transactions). Since we had already established confidence in the NetSuite data stored in SQL, we were able to use this validated data to compare against extracted NetSuite data in Snowflake, saving a lot of time and effort as opposed to interfacing to NetSuite directly for the comparisons.

Our team also has dashboards built off of the flow outputs that show missing records or missing deletes in Snowflake so we can act on any inconsistencies found during the data migration process. These dashboards make finding discrepancies easier and faster, making the resolution of them more straightforward. With this, we can stay up-to-date on the validity of the data in Snowflake and have automated processes for identifying discrepancies.

Missing (Soft Deletes or Records) | *Note: Missing records are normally related to refresh timing between ALPO and OPAL (especially if the IDs are larger than 814*)

TPrep_Delete_ALPO_vs_OPAL_T as of None

*TPrep_Missing_ALPO_vs_OPAL_T as of None

TPrep_Delete_ALPO_vs_OPAL_TBM as of None

*TPrep_Missing_ALPO_vs_OPAL_TBM as of None

THIS IS NOT AN ISSUE. WE HAVE CONFIRMED OPAL matches NETSUITE. SQL is missing this 1 record.
TPrep_Delete_ALPO_vs_OPAL_TL as of 1/31/2019 8:10:36 AM

TRANSACTI..	TRANSACTI..	SUBSIDIAR..	DATE_LAST_MODIFIED_G..	
Grand Total				•1
64507606	0	36	7/5/2018 3:15:13 PM	•1
			7/5/2018 3:15:13 PM	

*TPrep_Missing_ALPO_vs_OPAL_TL as of None

THIS IS NOT AN ISSUE. WE HAVE CONFIRMED OPAL matches NETSUITE. SQL is missing these 14 records.
TPrep_Delete_ALPO_vs_OPAL_TLBM as of 1/31/2019 8:06:26 AM

TRANSACTI..	TRANSACTI..	ACCOUNTI..	DATE_CREATED	
Grand Total				•14
64507606	0	1	7/5/2018 3:15:13 PM	•1
		2	7/5/2018 3:15:13 PM	•1
			3:16 PM 3:18 PM 3:20 PM	

*TPrep_Missing_ALPO_vs_OPAL_TLBM as of 1/31/2019 4:55:01 PM

TRANSACTI..	TRANSACTI..	ACCOUNTI..	
Grand Total			2,588
55790794	21	1	1
		2	1
57469723	48	1	1
		2	1
	49	1	1
		2	1

Example 2: Speed up payroll data processing

We use Tableau Prep Builder to create repeatable flows for everyday data prep processes.

Regarding payroll, we have two separate source systems for this data. For a majority of the company, we use Workday for our payroll and use ADP for select international operations. In order to validate payroll data, there are some steps we need to take to prepare this data.

ADP payroll files require a particular format before being uploaded to NetSuite as payroll journal entries. We pivot the data in the Tableau Prep flow to get the files into the right structure, incorporate department data to enrich the payroll file, and perform other data prep steps like computing complex payroll calculations and adding filters. This preparation automates and scales an otherwise manual process performed by accounting in Excel, cutting processing time in half as they upload data to NetSuite across periods and subsidiaries. The process is also less prone to manual mistakes as we can allocate more of our time to validating the files rather than generating them.


Example 3: Automated expense payments

We use Tableau dashboards to validate data and monitor ongoing automated data processes.

For the Tableau finance analytics team, we have a Concur Expense dashboard that serves to check on whether expense reports have been paid multiple times by counting the number of times extracted for payment.

After we perform weekly Concur data processing in Alteryx to load the data for our business partners into Snowflake, we apply business logic in Tableau to validate that all expense entries are paid out of Concur, that no expense reports have been extracted multiple times—paid out twice—and that no expense reports appear in both "In Process" and "Completed" streams, among other things. This is an example of when no data on a dashboard is a good thing. This automated process informs the finance analytics team that the data is loaded properly, also providing additional context as to whether the data is clean with visual triggers. By being able to see outliers or issues easily, an analyst on our team can hone in on problems that affect our business in an actionable way.

Our hope is that once this validation process is complete, we didn't find anything, but when we do, we work with the appropriate teams to update the source system.
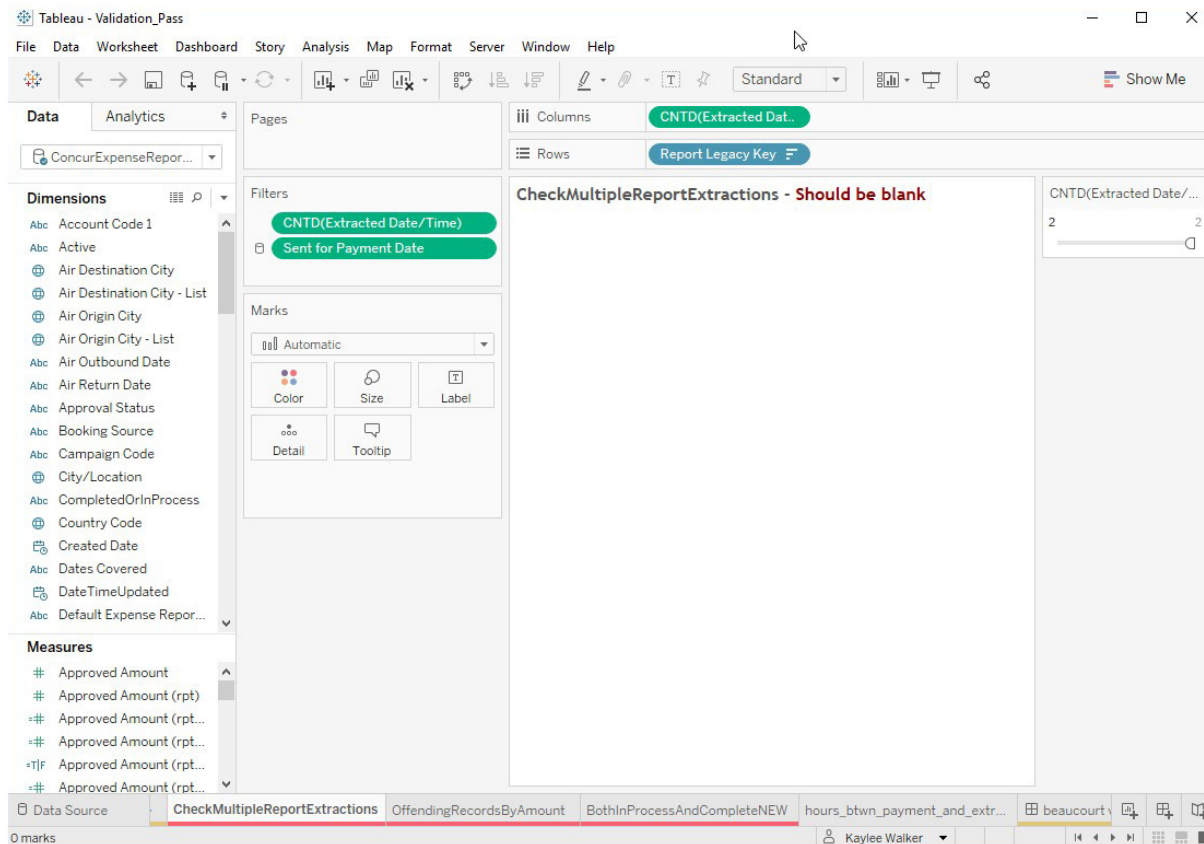
Regardless of the maturity of your analytics model or whether a digital transformation is six months or six years away, there are Tableau Prep flows and self-service dashboards you can deploy to speed up data preparation, validation, and analysis. You have the opportunity to provide additional impact by reducing the frequency in which stakeholders work with bad data, making good, credible data more widely available and accessible across the organization. With faster, more accurate preparation and validation processes, your stakeholders can trust the data and reporting given to them, looking to you as a valued, strategic business partner.

About Tableau

Tableau helps extract meaning from information. It's an analytics platform that supports the cycle of analytics, offers visual feedback, and helps you answer questions, regardless of their evolving complexity. If you want to innovate with data, you want an application that encourages you to keep exploring—to ask new questions and change your perspective. If you're ready to make your data make an impact, download a free trial of Tableau Desktop today.

Here are additional resources to grow your finance team's analytics maturity, supporting both day-to-day functions and digital transformation.

Additional resources

Tableau Finance Analytics solutions page

Fast, flexible webinar analytics series

Fundamental finance analytics webinar series

Dirty data is costing you: How to solve common data preparation issues whitepaper

Sample dashboards on Tableau Public

Download a free trial of Tableau Desktop

Download a free trial of Tableau Prep