



FTA Awards Nomination/Entry Form

Person who led this effort or project

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About your program, idea, or project

Name your program, idea, or project: Wisconsin Department of Revenue Processing and Analytics Dashboard

What is the problem that you wanted to solve?

Wisconsin Department of Revenue's Tax Operations Bureau sets business rules on tax returns to ensure taxpayers follow form instructions and claim credits correctly. These rules suspend returns and create work items for agents to review and determine if adjustments are needed. However, we faced three problems:

1. No visibility into rule effectiveness

There was minimal visibility into whether our suspension rules were working as intended and we had difficulty answering questions like:

- How many suspensions result in adjustments to the return?
- Which rules are generating unnecessary work?
- What is the financial impact on the adjustments our agents make?

For example, a rule might suspend 5,000 returns over the course of a filing season. But we have no way to know if those 5,000 work items resulted in 4,000 adjustments or 4.

2. Reactive problem detection

Identifying issues relied primarily on anecdotes from agents and the backlog in our work queues. This lag in identifying issues can result in thousands of returns unnecessarily suspending.

When an agent notices a rule seems to be suspending more often than it should, they will reach out to their supervisor, who reaches out to their business analyst, who then researches the issue and potentially logs a ticket for the technical team to fix. This workflow is initiated by a hunch, not by data.

3. Inefficient Reporting and analysis

Throughout the filing season, we frequently receive requests for statistics about credits and processing performance. These requests often required ad hoc reports to be created by business analysts. Some data is not available on standard tables requiring even more time-consuming methods to pull the requested information. Many of these requests would require assistance from technical staff, which could add weeks to the turnaround time.

In summary, we didn't have an easy way to proactively manage our business rules, couldn't quickly identify issues during the processing season, and reporting was time consuming.

Who was involved in addressing the problem?

Tax Operations bureau business analyst, bureau managers, and some technical expertise from our Division of Technology Services.

How did they go about finding a solution?

We combined four equally important criteria to find a solution to our problem:

1. Comprehensive Data Extraction

We utilized our integrated tax system's functionality to extract granular data that wasn't available through standard search tools. Specifically, we captured:

- Original values: What taxpayers claimed on each line when the return was filed.
- Final values: What was ultimately posted to the account for each line on the return.
- Suspension data: What business rules suspended the return or whether the return processed without any intervention.
- Header information (excluding PII): Filing method, processing dates and a unique identifier linking back to the return.

Capturing the original and final version of the return allowed us to calculate exactly what changed on the return during processing and whether those changes align with the reason the return was suspended.

2. Suspension Rule Documentation

Over the past several years, we have created and maintained reference tables that translate return suspension rules into plain language explanations of their functionality. These tables transform raw suspension codes (meaningless to end users) into actionable business context. So, users can immediately understand what the rule checks, which form line it affects, and what area owns the work item.

3. (Semi) Automated Analytics Pipeline

We built a series of SQL views to process the data into actionable metrics for each rule on the return:

- True positive: Returns that suspended and resulted in agent adjustments.
- False positive: Returns that were suspended but required no adjustments by the agent.
- Adjustment Magnitude: dollar impact of changes made to the given field or refund.
- Total claimed: Aggregate count and total amount claimed on each line across all posted returns.

4. Documentation

We recognized early that this solution's long-term value depends on sustainability and reproducibility. During this project, we created a comprehensive document listing the business requirements, the problem the requirement addresses, and how each aspect of the requirement was implemented along with weekly and yearly maintenance steps.

This solution was designed around two key limitations:

1. Only the most recent suspense reasons are captured within the data

For example, if Agent A resolves line 1 issues and saves the return in error when Agent B later resolves the issue on line 3, our data only shows Line 3 suspension information. This can result in underreporting on the count of suspensions for a specific rule. However, this workflow is discouraged, and the majority will resolve all errors present on a return at the same time. Since we're evaluating rule performance at scale for optimization decisions, this small percentage doesn't materially affect the analysis.

2. Magnitude of refund change cannot be distributed against multiple suspension reasons

For example, a return could suspend for an error on line 1 (minor adjustment) and line 3 (major adjustment impacting refund). When both adjustments are made the total refund change is attributed to both rules. This can skew the results of attributing refund changes to an individual rule. So, we evaluate rule performance based on the changes to the line associated with the rule in conjunction with the total refund change.

Describe the outcome. What is the new idea, approach, program, or activity?

We transformed how our agency monitors tax return processing by creating an intelligent analytics platform that converts data from millions of returns into actionable insights. By using the data extraction methodology, business rule documentation framework and automated analytics pipeline described above, we built an interactive processing dashboard that empowers leaders with enhanced visibility into processing effectiveness.

Suspension Analytics: For each business rule and return field, users can instantly see current suspension

counts and how many of those suspensions resulted in a correction or were a false positive.

Suspension Impact: When suspended returns result in an adjustment, users can assess the overall impact by reviewing the sum of adjustments made and the impact on tax obligations. This analysis is available at both the individual field and rule level.

Intelligent Rule Documentation: When users select any field or rule, the dashboard displays a plain language explanation of how the rule functions, eliminating the need to reference separate technical documentation.

Comprehensive Coverage: The dashboard tracks all types of suspension, including those that do not cleanly associate to specific fields on the return.

High-Definition Error Detection: By capturing additional data points as returns move through the processing lifecycle, we can more precisely assess business impact as problems arise. This enables faster, more targeted responses and reduces the risk of overreacting or misjudging the scope of a problem.

What has changed since this was implemented? How have your operations improved? Include any data, analytics or metrics that would show the value of your program. Don't forget management advantages such as improved morale.

1. Reactive to Proactive
We have shifted from reactive volume-based monitoring to proactive optimization based on rule effectiveness. Instead of asking how many returns were suspended for a specific rule we now know how many suspended AND how many suspensions were justified. For each rule, we can easily see the true/false positive rates of suspensions, the magnitude (in terms of dollars) of adjustments made, and the inventory of work items created by each rule. This enables supervisors to identify problematic rules during the filing season, assess their impact and initiate corrective action immediately. This process previously took weeks and was primarily done at the end of the income tax processing season. This evaluation can now happen weekly and takes only a couple hours.

2. Data-Driven Rule Optimization
Prior to implementing suspension rule adjustments, we now optimize rule criteria and simulate impact to reduce unnecessary work generated under any new rule criteria. We now have the means to test-drive and optimize rule changes utilizing our data set rather than a series of adjustments to live production rules during the processing season.

3. Better impact and root cause analysis
By storing return data in a database with more comprehensive return data that can easily be queried, we've created a rapid investigation and impact assessment tool that transforms how we respond to processing issues. Before logging tickets with our technical team, we can quickly answer critical questions like: How many returns are affected? Who submitted the returns? What's the financial impact? When did the problem start? What is the list of affected taxpayers. Previously, we would often need assistance from our technical teams to assess impact, thus diverting resources away other known problems.

4. Improvements to reporting
Weekly dashboard updates take less than 10 minutes compared to hours for our other reporting processes. Now, we are reporting on metrics we could not have efficiently produced prior. This tool has given leadership better operational insight and data visibility while reducing the overall reporting burden.

Is there any component of your program that makes it workable only in your state or city?

Everybody ought to be doing this.

Is this an in-house project, or did you partner with an outside vendor or service-provider?

100% in-house

Additional information or comments about your usage of outside vendors or service providers.

The methodology used here is universal where we extract original state, final state, compare the difference, classify outcomes and then present the data in a user-friendly way. The framework is scalable due to rule definitions being housed in a reference table that can be easily edited. Overall, the steps taken are platform agnostic and can be created using any database management system and visualization tool. This is primarily an in-house project led by management and business analysts in Tax Operations, with AWS partnership for cloud infrastructure and the agency's Division of Technology Services support for data extraction. Any cloud infrastructure and AI tool with sufficient protection could be used.

What comes next – will you be adding to your program, rolling it out more widely, trying additional approaches?

This dashboard represents a fundamental shift in how Wisconsin DOR thinks about business rule management. We have moved from a periodic rule review to continuous optimization. This started as a project, and we are working to transform it into a program for analytical enhancement and operational refinement. Our roadmap includes both immediate enhancements and long-term expansion into other tax types and processing areas.

Ongoing: Continue maintaining documentation for long-term success and information sharing.

Q3 2026: Incorporating fraud actions to determine if changes were made by either a business rule or the result of a fraud denial.

Q4 2026: Attribute changes to specific areas. Currently adjustments are aggregated across Tax Operations, Audit and automated batch processing. Submit a formal project proposal to integrate this dashboard with our integrated tax system and further include our technical resources in this development.

Q1 2027: Incorporation of other non-PII account attributes to use as a metric for better refining existing rules.

Q2 2027: Expand to other form types Tax Operations supports.

Additional Optional Materials

Documentation Upload

 WI Tax Operations Rule Analysis Dash... .pdf