

SmartCloud, Inc. Tax Intelligence Trial Application

Welcome to the SmartCloud, Inc. Tax Intelligence System, or TIS, trial application on Microsoft AppSource.

The 5 steps below walk you through the trial application highlighting key features. This trial application is designed for you to see firsthand the many ways [SmartCloud situational decision support](#) improves tax law compliance through monitoring of transactions, detection of non-compliance, and learning of new non-compliance patterns. You can also watch the [TIS video](#) to get a quick overview of the same features.

The TIS Trial application is a menu-driven web application embedding Microsoft Power BI to display insights and dashboards of summary data, as well as real-time tax monitoring data. The business intelligence features of Power BI are the best way to help you understand what the TIS application can do for your organization.

Step 1 – Logging into the Trail TIS

Log-in is simple. Just open a browser and navigate to the URL by clicking on the application link on the AppSource page. In the upper-righthand corner (see Figure 1) click ‘Log in’, and follow the instructions. You will need a Microsoft email address to complete the login.

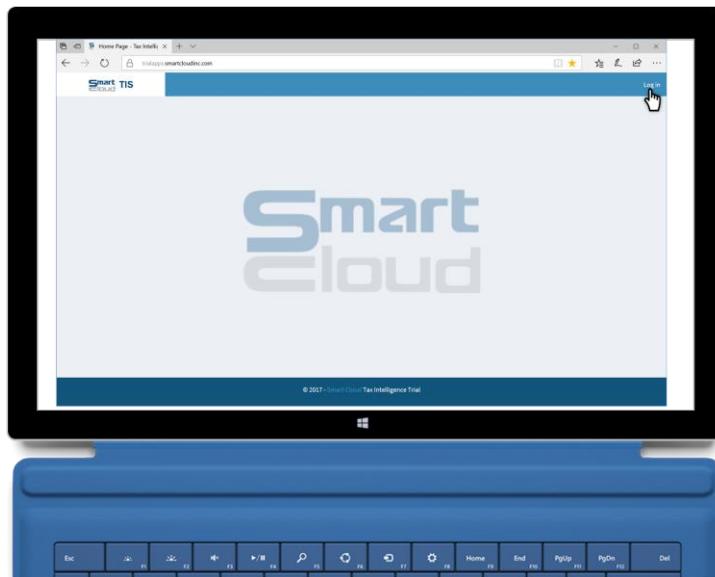


Figure 1. Logging into the Tax Intelligence System for the first time.

Once you are logged in, the TIS landing page will display as shown in Figure 2.

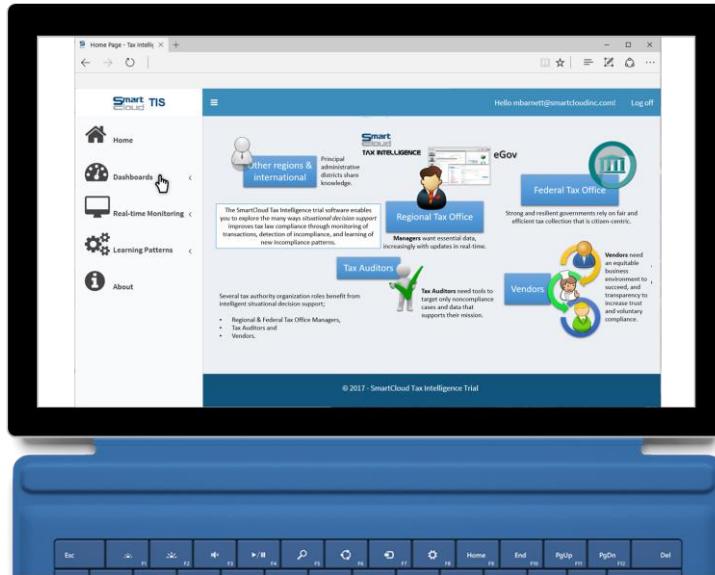


Figure 2. The Tax Intelligence System landing page.

The landing page depicts various roles involved in maintaining effective tax compliance in modern eGov systems. The roles include citizen-centric Federal Tax Offices that ensure fair and efficient tax collections, Regional Tax Offices that collect tax and need access to tax data, Tax Auditors responsible to maintaining compliance, and Vendors or tax-paying community that desire a fair business environment and transparency into tax data. Other Regional government agencies want to share knowledge within and across administrative districts.

Step 2 – Tax Dashboards

Click on the Dashboards item at left to view a drop-down list of the Tax and Fraud dashboards. The small menu icon (☰) at top left will expand/collapse the menu bar on the left side. Click on the Tax Dashboard as shown in Figure 3.

The Tax Dashboard provides Tax Officials with a high-level view of activities, audit personnel, and tax revenue data related to compliance. These data include real-time data if they are available. SmartCloud Tax Intelligence System provides flexibility features that tailor displays to your organization's needs. Some examples are provided in the AppSource trial, including lists of Tax Auditors, case management information, tax submission rates by quarter and tax region, and numbers of critical issues currently outstanding.

The Revenue and Projection chart at top center enables you to compare quarterly data, both past and projected. SmartCloud Tax Intelligence includes underlying tax models that enable these projections.

The buttons just below the Revenue and Projection chart represent degrees of compliance management effectiveness. A value of '0' means no or limited compliance management is practiced, and '0.3' represents an organization that applies thorough, best practices. To compare levels of compliance

management, leave the ‘Current’ and ‘Historical’ buttons as is, press and hold the ‘Ctrl’ key, and click numbers such that only one number is selected (shown highlighted in blue). In this way, you can compare current and projected revenue for different degrees of compliance management.

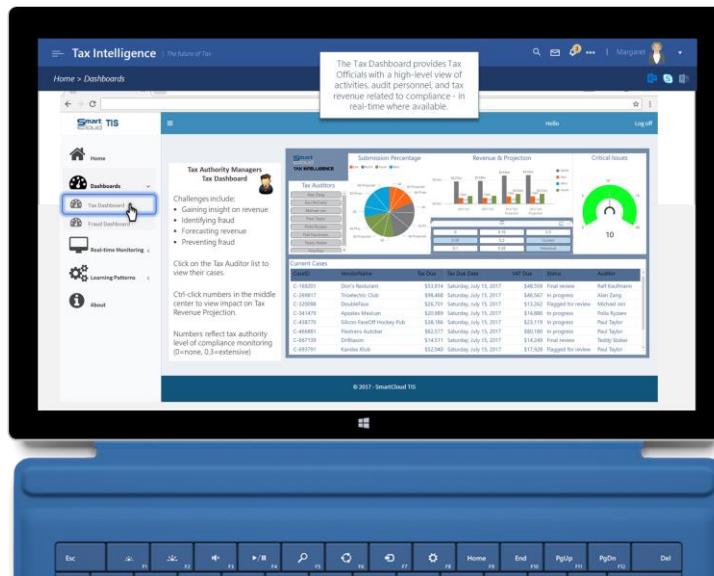


Figure 3. The Tax Dashboard.

Now click the Fraud Dashboard item in the menu bar at left to display this dashboard as shown in Figure 4.

The Fraud Dashboard displays data important to Tax Auditors, organized based on Goals most important to auditors, and the Situations they evaluate when working to achieve, or ‘satisfy’, these Goals. For example, a key goal in promoting a fair business environment is to discourage sales suppression by vendors. This is achieved by putting in place more effective real-time monitoring systems that include rules-based detection of sales suppression available in SmartCloud Tax Intelligence System.

Click on “Monitor sales suppression” in the Goal list, then click on “a). Monitor sales suppression” to display Projected Revenue Capture for this specific Goal and Situation.

An important parameter in automated detection of sales suppression within the Tax Intelligence System is cash-to-credit card ratio, which can be evaluated by-vendor. Vendors showing a consistent pattern of cash-to-credit ratio *below* a specified parameter value or limit can be flagged for review. If the limit is set very low (0.05), then only cases of egregious non-compliance will be detected. Setting the limit to a high value (0.3) will cause many vendors to be flagged for review. The value a tax authority chooses will determine how much additional revenue is captured, but too high a value may inconvenience some taxpayers. SmartCloud Tax Intelligence System includes the models needed to assess this balance using ‘Sensitivity’ and ‘Selectivity’ measures, as well as models to predict the impact of automated detection on Revenue Capture.

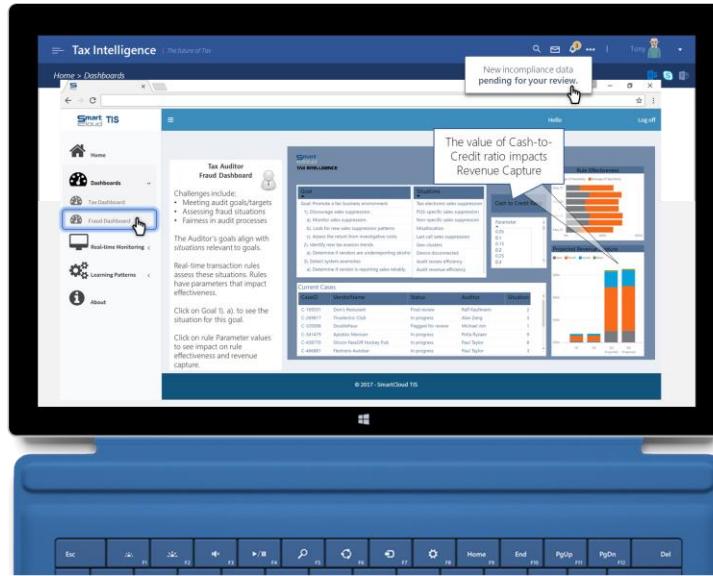


Figure 4. The Fraud Dashboard.

In the Cash to Credit Ratio list, click on different values from 0.05 to 0.3 to see changes in Sensitivity, Selectivity and Projected Revenue Capture.

Step 3 – Real-time Monitoring of Sales Suppression

Tax Auditors depend on actionable data that supports their mission. In the age of Big Data it's important not to burden auditors with irrelevant data. Focusing on relevant data means displaying only situation-specific information. SmartCloud Tax Intelligence visuals hide unnecessary details and highlight the most important aggregations of data needed for effective compliance management.

Click on 'Real Time Monitoring' in the menu at left to show the drop-down list of monitoring displays, then click on the 'Real Time Monitoring' item as shown in Figure 5.

Real-time displays provide, goal-relevant, situationally-focused, and actionable data. The displays are active, changing as new data arrive with lists of vendors, selection buttons for data drill-downs, and mapping visuals.

At the top of the display is a playback feature that enables you to view a non-compliance situation as it evolves over time. Click on the yellow play button (⌚) to start the playback.

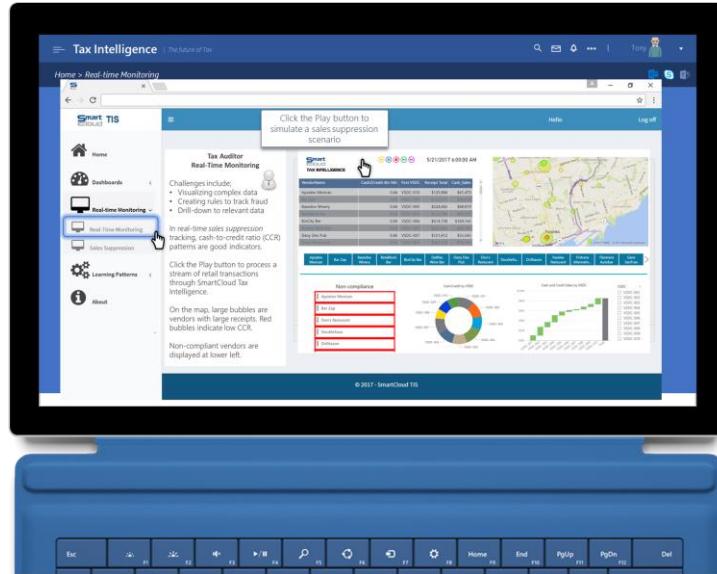


Figure 5. Real time monitoring display.

The playback shows changes in cash-to-credit card ratio over a one week period. During this period, a few vendors exhibit a pattern of very low cash-to-credit card ratio for 4 hours, suggesting that these vendors were suppressing cash sales. When the Tax Intelligence System detects this pattern, the vendor is displayed in the ‘Non-compliance’ list at lower-left. Data for the listed non-compliant vendors can be displayed by clicking on the vendor’s name in the center button-bar. Vendors are shown as circles on the map at top right and are colored from green to red depending on the current cash-to-credit ratio (red means a low value, green means a normal value). The size of the circles on the map indicate the cumulative hourly sales volume.

In the scenario playback, you can clearly see sales suppression by some Vendors, represented by red circles on the map visual, and by inspecting evaluated cash-to-credit ratios in the list at top left. Using Power BI’s interactive drill-down features you can isolate specific Vendors and geographical regions serviced by Virtual Sales Data Collectors or VSDCs.

Click on the ‘Sales Suppression’ item under Real-time Monitoring at left to display additional details on vendors and data related to sales suppression. Use Power BI’s interactive capabilities to focus on the vendors that you saw displayed in the Non-compliance list described previously (see Figure 5).

In the Sales Suppression display, select the first two days (May 21 & May 22) using the date selector at right, then find and click on one of the non-compliant vendors (Kandax Klub) in the center button-bar. You may need to scroll to the right to find Kandax Klub. The time series chart at lower left shows the cash-to-credit value for this vendor for the selected two days, and you can see that the value dips late in the day on May 21. The bar chart at lower right clearly shows the extended period of low cash-to-credit ratio late on May 21 and early May 22.

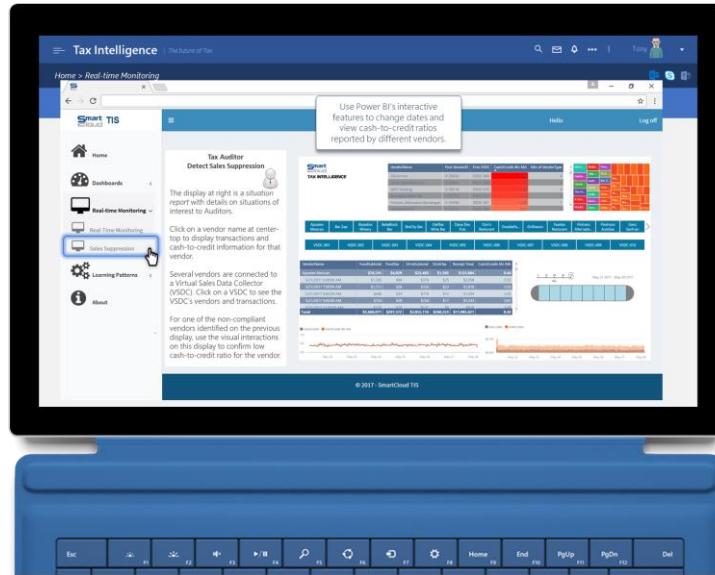


Figure 6. Sales suppression detail display.

Step 4 – Machine Learning Improves Tax Analytics

New patterns of vendor behavior occur with changing business models and economic conditions. Incompliant vendors continually find new ways to avoid detection and Big Data amplifies the problem of recognizing new forms of incompliance.

Machine learning enhances tax analytics by regularly checking data to determine if new patterns emerge. Clustering and deep learning networks provide information Tax Analysts need to see these patterns even when human experts can't. Over time and with additional data machine learning models improve gradually and are effective tools that augment the work of Tax Analysts.

The SmartCloud Tax Intelligence System knowledge base includes several rules, tailored by tax experts, that identify when a newly-detected pattern of data is worthy of investigation. These rules highlight correlations that suggest possible incompliance. The Learning displays in the TIS trial application (Figure 7) depict one scenario that shows how these rules can be applied to assist a Tax Analyst. In this scenario, machine learning is applied each hour to look for clusters that suggest possible incompliance.

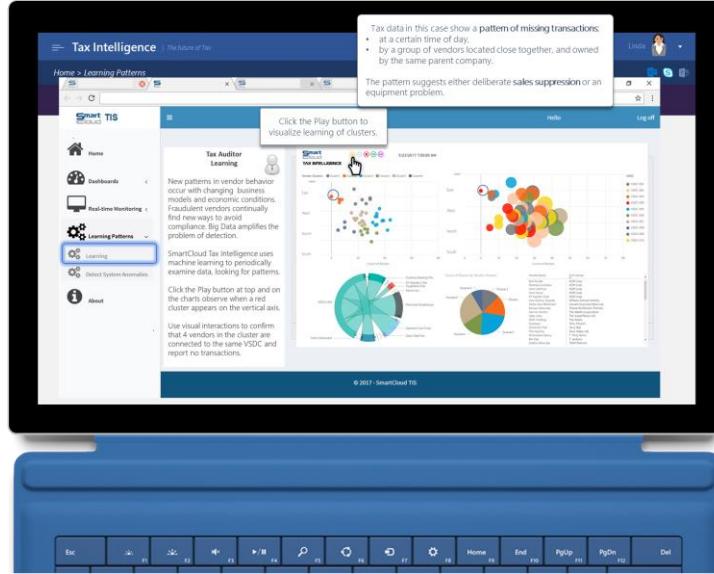


Figure 7. Learning new patterns from tax data.

The Learning display shows clusters of vendors represented graphically by geographical location or VSDC (top right), a virtual sales data collector deployed in a specific geographical location. Clusters are shown by count of reported receipts (top left) and by owner (bottom right).

Click the yellow play button (⌚) to start a playback of this scenario and notice in the top two visualizations that for several hours a cluster of vendors, indicated with a red circle, report no receipts (transactions). Mouse over the red circles to confirm that the vendors reporting no receipts are also in the same VSDC. Use Power BI's interactive features to sort the owner list at lower right by 'First Owner' and confirm that the vendors reporting no transactions have the same owner. This pattern suggests either deliberate sales suppression or an equipment problem.

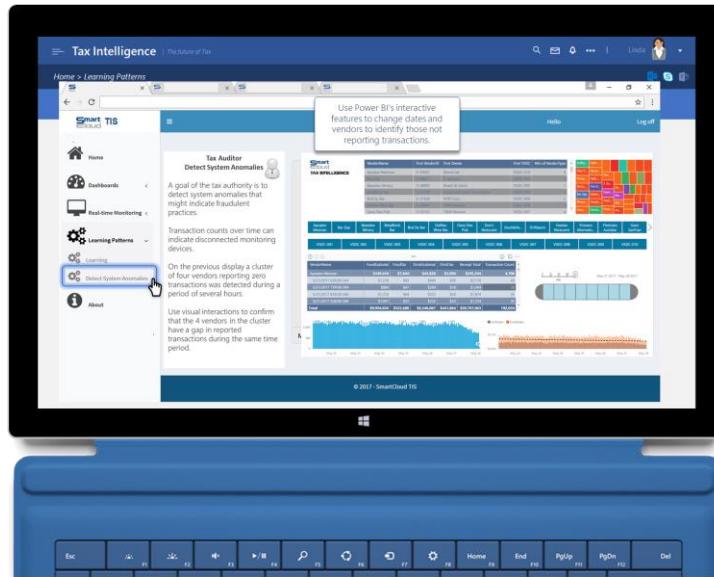


Figure 8. Detailed sales suppression data visualization.

Click on ‘Detect System Anomalies’ in the Learning Patterns drop-down list at left (see Figure 8) to display detailed sales suppression data visualizations. The data drill-down visuals include lists of vendor information (top, middle-left), a tree map of vendor transaction counts (top right), and bar charts of transaction counts (bottom left) and cash or credit card sales (right).

Earlier in this step a cluster was detected in which four vendors reported zero transactions over a period of several hours. The scenario playback indicated that the period started on May 23rd at around 7:00am and continued until around 12:00pm. In the Detect System Anomalies display, choose May 23rd from the timeline visual at middle right, and select BioCity Bar in the zero-transactions cluster. In the bar charts note the missing transactions the morning of May 23rd.

Step 5 – More Information on SmartCloud Tax Intelligence

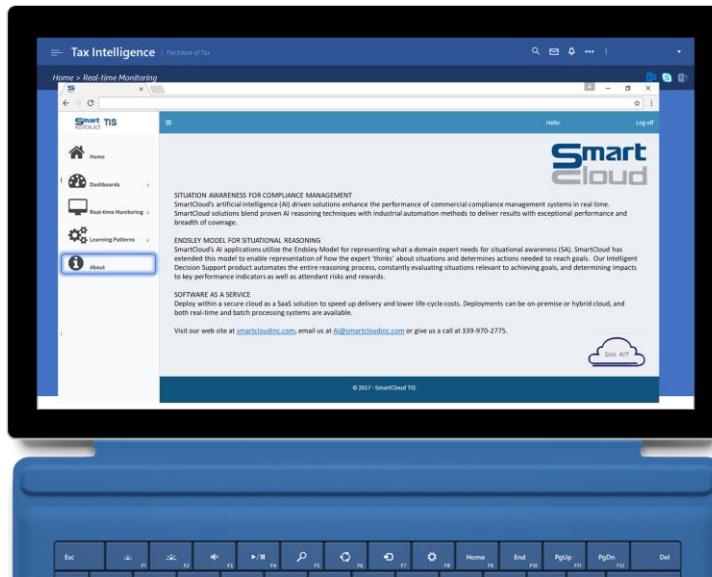


Figure 9. Get more information on SmartCloud Tax Intelligence.

Get more information on the Tax Intelligence System and how SmartCloud applies Goal-Directed Task Analysis to focus AI capabilities on supporting your Tax Authority's mission. Visit www.smartcloudinc.com or email us ai@smartcloudinc.com.