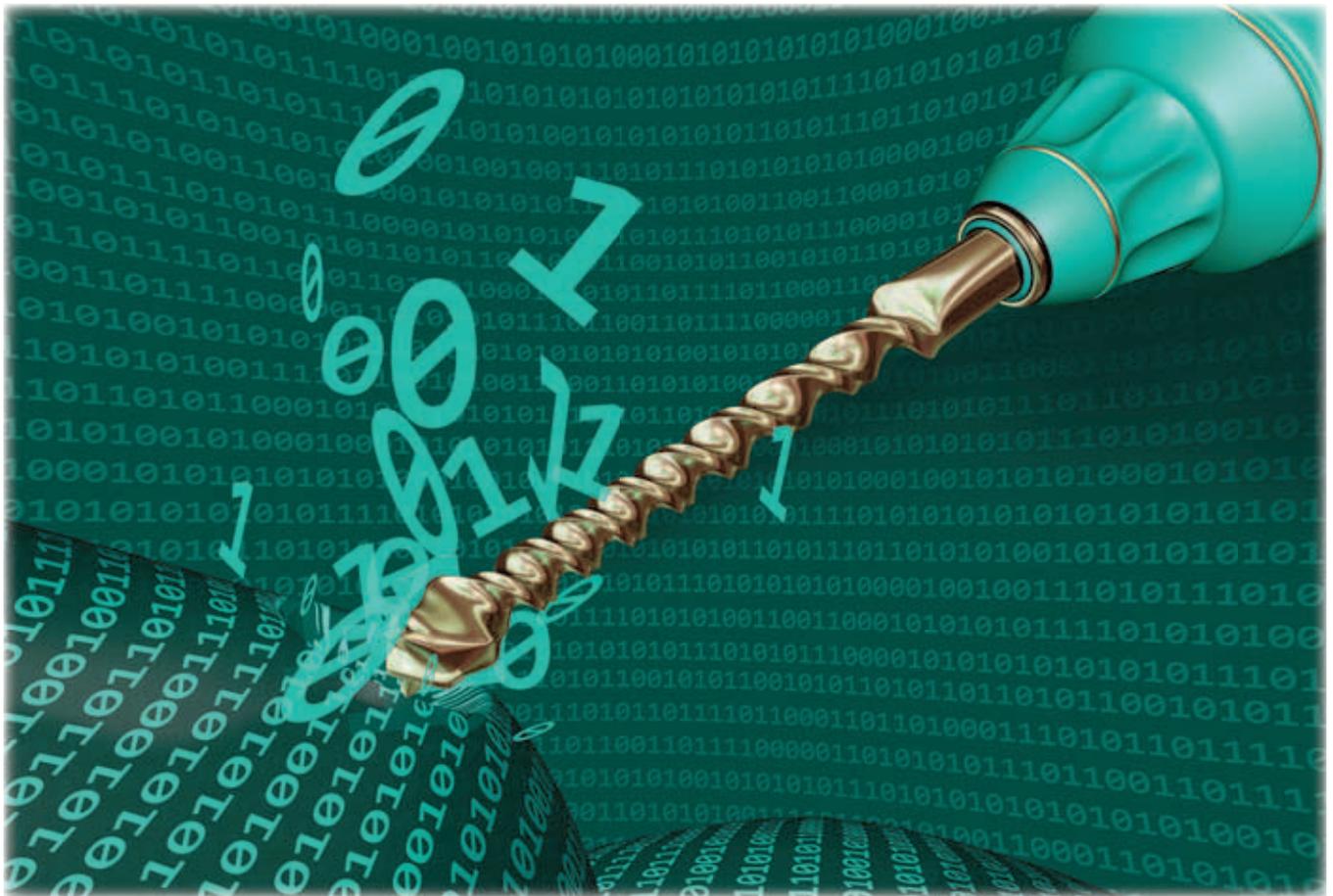# Adding Data Mining and Analytics to Your Tool Box

Like an auto mechanic, an SBO should use diagnostics to ensure a smooth-running district.

By Karin M. Smith, MBA, CFE, SFO

If I were a gambler, I would wager that you conduct somewhat regular maintenance on your vehicle. After all, you invest a significant amount of money in your car and want to ensure it gets you to your next destination.

Similarly, we rely on our financial data to ensure we have the necessary resources to meet our educational objectives. But how often do we conduct maintenance reviews of those data? Do we rely on the canned reports to tell us if there are problems?

Examining school district financial data for potential fraud, misuse, or honest mistakes can be a daunting task. Thousands of transactions make up a school district's expenditures. Although school business officials often delay examining financial data to address more immediate needs, data checks should be a priority. According to the Association of Certified Fraud Examiners, almost 40% of instances of fraud are detected by management review, internal audit functions, and internal controls.

Data mining and analytics allow us to sort through data sets and raw data to identify anomalies and undiscovered patterns as we look for hidden relationships within our data. Data mining and analytics take the school business official beyond the traditional view of data analysis—beyond a typical review of revenue against expenses and beyond examining ratio of expenses from period to period.

A mechanic uses diagnostics as a tool for working on vehicles, so should school business officials apply key diagnostics to financial data to seek out fraud, misuse, or simple mistakes in posting of transactions. Particular focus should be on payroll, purchasing and payables, general ledger, and user security.

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Payroll

Payroll and related expenditures account for over 75% of school district expenditures. Ensuring we aren't overpaying, paying ghost employees, or paying unearned wages are important data analytics when reviewing payroll transactions. The following are some simple tests SBOs can complete during their diagnostics.

Does gross pay equal net pay? Each of us learned quickly with our first paying job that the amount our employer told us he would pay us per hour is far from the amount we take home in our paycheck. Exporting the pay journal to Excel and comparing the gross pay to the net pay amount will help identify an employee who is missing key mandatory deductions.

Are certain employees regularly being paid on off-cycle payments? Most school districts run a standard 26 payrolls throughout the year. Occasionally, there is an off-cycle payroll because an employee neglected to submit a time card and needs the earned wages to survive until the next regularly scheduled payroll. If, however that same employee is being paid on an off-cycle frequently, it may signal possible time card manipulation or identify an employee who must be reminded of district policies on timeliness of time card submission.

Exporting all payroll records into Excel and running a few quick sorts on the count of employee identification numbers paid on-off cycle payrolls will help detect this issue.

Does your district experience a high volume of overtime? Digging into your data to find employees who are reporting high amounts of overtime can help identify a few areas of concern:
- Is the employee really working the overtime?
- Does the employee have poor time-management skills?
- Does the employee have too much responsibility assigned to him or her? Maybe a task analysis is necessary.

Exporting your payroll records each quarter can help identify the outliers when it comes to overtime compensation.

Are past employees still being paid? Occasionally there is a need to process pay to a termed employee, usually due to a payout of accumulated leave balances or performance pay after the close of the fiscal year. Comparing the employees' term date and last paid date will help identify past employees who are still receiving paychecks because the termination process was not completed in the financial system.

Do you have ghost employees in your payroll records? Ghost employees are fake employees set up in payroll records as a means to steal school district monies. In the past, the district business office could catch this when reviewing printed paychecks, noting that a check was being processed for a name that didn't match employee records. With direct deposit, it's harder to pick up on these fake names.

A comparison of direct deposit account numbers shows when two payroll amounts are being sent to the same bank account. Of course, this doesn't always signal fraud—it could be because a husband and wife work for the district and share a bank account.

Purchasing and Payables

Vendor invoices come in all forms and formats. While strong internal controls monitor the invoice approval process, ensuring against anomalies in the amounts paid is critical to protecting the district from possible fraud or payment processing errors. The following are some simple diagnostics.

Was an invoice processed twice? It is not uncommon for an invoice to be misfiled and accidentally paid twice. However, it is critical to identify this duplicate payment and ensure you receive a credit/refund from the vendor. By exporting your invoice data from your financial software and sorting it by vendor and amount, you can do a basic Excel formula to identify duplicate payments.

Are an abnormal number of payments being made to a particular vendor? Consider your vendors and the frequency of payments to them. For

example, the district will likely make 12 monthly payments each year to a utility company. If financial data show 14 payments were made, determine whether the two additional payments were appropriate. Using a simple Excel formula, examine the same set of data from the example above and look for abnormal volume of payments to a particular vendor.

Are employees set up as vendors? Traditionally, employees should not also be vendors to the district except, for instance, when reimbursing an employee for non-taxable benefits. Examining vendor data to ensure an employee's name, variation of a name, or address are not used will help identify that employee as a vendor.

General Ledger

Identifying what anomalies to look for within the general ledger can be a daunting task. The general ledger is the storybook of the district finances and reading this story carefully can help identify errors in journal postings, duplication of entries, or out of the ordinary trends. The following are some simple tests school business officials can complete.

Are there duplicate journal entries? It is not uncommon for one person to enter a journal entry and another person re-enter it, not realize the entry had already been made. Examining for duplicate journal entry totals will help identify any errors.

Are employees posting journals that fall outside of their duties? Extracting all adjusting journal entries by user name and creating a pivot table of total count by employee and sum total of all adjusting journal entries can help identify if any employees are posting journal entries to an area outside their job duties or if they have a small number of journal entries resulting in a high dollar amount of adjustments.

One of the greatest benefits of looking at this set of anomalies is the ability to identify user names who are no longer employed but still having transactions posted against their name.

Do you have an abnormally high number of transaction journal entries posted that don't follow your trends? School business officials are familiar with the trends associated with when revenues are received, year-end payroll journals, and of course many year-end clean up journal entries. Examining the stratification of journals by month can help the SBO identify any unusual trends. This type of analysis over multiple years can help with management decision making.

User Security Roles

Review of user access is critical and should be considered on a regular basis. Staff typically have a clear job description to identify their duties and responsibilities; however, the employees' user role in the financial software program doesn't always match their job description.

Does an employee have too much access? Consider your employee job descriptions and ensure their user role does not provide them more access than necessary to complete their tasks. Does your payroll clerk have the ability to add an employee? Does your accounts payable clerk have the ability to add a vendor?

While these tasks may not be part of their job duties, if their user role provides them with this access, the district has a gap in controls and can be exposing the district to the risk of fraud.

A Smooth-Running Machine

School business officials are responsible for designing and implementing effective internal controls to detect and prevent fraud. The review of financial data often will reveal anomalies in the district's financial data. They are simply a means to determine whether these anomalies can be justified and to provide the school business official with a starting point for examining financial data further. It is important to understand that anomalies do not always equal fraud or misuse of public dollars. The above strategies will help SBOs analyze those areas to keep the district running smoothly and efficiently.

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