

**HUMAN ERROR IS PART OF EVERYDAY LIFE IN THE BUSINESS WORLD.** But when errors occur in complex financial models, the consequences can be disastrous. A spreadsheet mistake in October 2003 required Fannie Mae to restate its unrealized gains by an amazing \$1.2 billion—shortly after it had announced third-quarter earnings. In another case, a simple spreadsheet error caused a company's stock price to tumble so dramatically that trading was halted.

The ugly reality: Similar errors exist in a high percentage of business-critical financial spreadsheets. And these spreadsheets are what organizations rely on to track and calculate their business performance and report it to both management and stockholders. Making matters worse, human errors in Excel-type spreadsheets—resulting from things like incorrectly built formulas or mistakes in cutting and pasting—are often proliferated and exacerbated when users attempt to link or consolidate workbooks.

# Taking **HUMAN ERROR** Out of Financial Spreadsheets

BY JASON ROSE

The challenge is to balance Excel's extensive free-form modeling and formatting capabilities—and the potential for human error—with an application environment that leverages the ubiquitous Excel skill set while providing more control and accuracy in financial planning and reporting.

## COMMON SPREADSHEET, COMMON ERRORS

The spreadsheet's ease of use, low cost, and simple user interface has made it the de facto application for budgeting, reporting, and financial analysis in organizations across the world. But despite their widespread use, complex financial spreadsheets are just as hard to write and maintain as any other kind of software. Yet the overwhelming majority of spreadsheet users aren't professional programmers, and very few have received formal training on how to write and protect spreadsheets. Over the years, many companies have even used spreadsheets as company databases—housing critical information on everything from historical pay increases to product or customer profitability analysis—functions that spreadsheets were never intended to support.

This article covers typical spreadsheet errors and the pragmatic steps that organizations can take to better protect themselves from the unintended impact of human errors, including:

- ◆ Using industry-standard databases to manage and consolidate large volumes of data;
- ◆ Centralizing process control, workflow management, and user security;
- ◆ Standardizing business rules in a methodology library.

### Broken link syndrome, referencing errors, and inconsistently applied standardized assumptions

Most spreadsheets can't easily manage or consolidate large volumes of data, and, in many organizations, consolidation requires managing tens, hundreds, or even thousands of files containing terabytes of data. Using Excel or a similar program to accomplish this is immensely cumbersome since every spreadsheet needs to be identical or share the same structure and geometry to consolidate accurately. Because a spreadsheet is a formula-driven application, it becomes very rigid during any form of consolidation. This means that fixed formats quickly become broken, a result often referred to as broken link syndrome.

Broken link syndrome occurs when a group of files are referenced together through links referring to each indi-

vidual file. When a change is made to one of the underlying files—such as inserting a cell, row, or column or changing the name of the file—this change can cause the link to become broken. In some cases this results in errors that can be exceptionally difficult to audit and correct. Even worse, there may be no error at all. This creates a reference to incorrect data that can cascade through the system without warning, corrupting key numbers, with no audit for those managing the system. The decentralized nature of spreadsheets means a variety of actions performed on a single file can compromise the entire system.

Another common spreadsheet error is a referencing error—accidentally referencing the wrong cell when building spreadsheets or formulas. These errors can take many forms, such as pointing to the wrong cell, thereby using an incorrect factor, or changing a customer account number in one department but not updating it for the entire organization. Both errors can cascade as additional formulas reference the incorrect result.

Standardized assumptions ensure that an organization's planning methodology is consistent throughout the enterprise. In a spreadsheet environment, it's possible to inconsistently apply a standardized assumption, such as a new cost of living increase of 5%. The result is that some but not all of the applicable cells are updated. When this happens, an entire planning cycle can be compromised because salary packages were calculated incorrectly based on an outdated cost of living increase.

### Use industry-standard databases to manage and consolidate data

These three types of errors—broken link syndrome, referencing errors, and errors in standardized assumptions—are virtually eliminated with the use of a centralized database. With a centralized database for the entire corporation, when any change is made to the master data store, all reports will be automatically updated and linked—an easy way to ensure, for example, that a new account number is applied consistently across the entire organization. A centralized look-up table can eliminate erroneous references by using tables that match results to names, account numbers, dates, or balances. And the same centralized database can be used to manage standardized assumptions so that when something like a cost of living increase is determined for the year, this assumption can be universally applied throughout all planning

spreadsheets by making just one change to the master data store. (And, yes, all that information must have been entered correctly the first time.)

### Formula errors, copying errors, and input errors

One of the basic types of human errors in spreadsheets is a mistake in creating a formula. Since spreadsheet formulas contain little or no redundancy, any fault in a formula is likely to cause erroneous output—and users often copy or reproduce certain formulas or sets of formulas from one report to another, mistakes included. Copy errors can exacerbate formula errors or even create entirely new errors, such as when a user picks up only 11 months of a 12-month string of cells to calculate an annual result.

Simple data entry errors are also common and often more difficult to detect than formula or copy errors. Data entry errors include both correctly inputting the *wrong* information (for example, information intended for a different department or time period) and *incorrectly* keying in the right information.

### Standardize business rules in a reusable, dynamic methodology library

Using a methodology library—a centralized repository for frequently used planning formulas and business rules—can eliminate many formula and copying errors. Once a standard planning or forecasting formula is input into a methodology library, users no longer need to recreate the formula from scratch, which effectively eliminates many formula errors. A methodology library that's independent from the spreadsheet and that's reusable and dynamic can also prevent copying errors because programmers can reference the standardized formula and know that they are using or retrieving a complete, accurate formula. Once variances are established, well-defined alerting mechanisms can be used to highlight results outside acceptable ranges—where data entry errors may have occurred.

### Completeness errors, inefficient workflow, and security breaches

Many organizations rely on e-mailed attachments to consolidate planning data. The attached spreadsheets may be returned, forwarded, approved, deleted, or just plain forgotten—leaving planning managers with limited ability to measure or control the planning cycle. The inability to keep track of who has responded and which files are updated, approved, and correct can create errors in the

planning process. Without easily being able to see that only 24 of the 25 reviewers have responded, a planning manager can consolidate data without knowing that critical updates are lacking.

Because spreadsheets like Excel don't natively support centrally managed data access, user roles, and authorizations, organizations using spreadsheets as their primary planning software often build solutions that compromise access to and the security of sensitive financial data. Embarrassing and potentially disastrous leaks of sensitive salary information or personnel data can result.

### Centralize process control, workflow management, and user security

Making the planning process more efficient and accurate, centralized process control and workflow management can automatically check the status of who has submitted information on time and which files are still outstanding and can notify all parties when a complete data set is achieved. Robust data and user security locks sensitive information and makes it accessible to authorized personnel only—ensuring secure data throughout the planning process.

## PROTECTING YOUR INFORMATION

Spreadsheets alone can't protect a company from unintentional human errors. Although they're a marvelous tool, they weren't designed to fulfill the wide range of interconnected functions many organizations use them for. But combining spreadsheets and industry-standard databases—and augmenting the result with workflow, consolidation, and reporting capabilities—can drastically reduce and prevent many common forms of spreadsheet-related human errors.

For example, companies can significantly reduce these errors by utilizing a centralized database that populates Excel spreadsheets automatically with up-to-date data based on an intelligent query of the integrated database. This helps ensure that information is relevant, eliminates referencing errors, and applies standardized assumptions across the organization. In addition, the use of a dynamic methodology library to create and store enterprise-wide planning methodologies—without requiring users to learn calculation scripts—will help promote standardization and use. ■

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