CIMCON Software | Reducing End-User Computing Risk™

TAMING THE SPREADSHEET MENACE

Manage Risks of Spreadsheets and Other End-User Controlled Files

"*Microsoft's Excel Might Be the Most Dangerous Software on the Planet. Yes, more dangerous than rogue code running a nuclear power plant, than the Stuxnet that was deliberately sent off to sabotage Iran's nuclear program, worse, even, than whatever rent in the fabric of space time led to the invention of Lolcats. Really, that serious... it's all become so complex and it's handled in such a slapdash manner that no one is really on top of it anymore… But there's another deeper level of risk here. That very throwing of trillions a day around the markets is dependent upon the existence of Excel itself.*"

—Tim Worstall - Economics Writer / Commentator & Senior Fellow of the Adam Smith Institute

TAMING THE
SPREADSHEET MENACE

Manage Risks of Spreadsheets and Other End-User Controlled Files

Table of Contents

TAMING THE SPREADSHEET MENACE

Manage Risks of Spreadsheets and Other End-User Controlled Files

Executive Summary

Spreadsheets are the foundation for core operational models and tools of most companies' financial and critical business processes. Other end-user computing applications (EUCs) such as Access databases, Python, R, and VBA scripts are also widespread and increasing in sophistication and complexity. If not controlled, these models, tools and spreadsheets pose an unacceptably high level of risk for financial loss, business disruption, fraud, compromise of data security, regulatory fines, and damage to a company's reputation. In fact, based on numerous real life examples, the lack of spreadsheet controls can cost companies millions, tens of millions or even billions.

Given these risks, a spreadsheet error detection, management and control strategy should be a key component of any operational risk strategy. With the support of enabling software, it is possible to automatically find errors in your spreadsheets, identify EUC usage across your organization, assess criticality, and implement self-governing monitoring & controls. Not only will you reduce operational risks, but you will enjoy significant savings through increased productivity.

Objective

The purpose of this white paper is to provide insight into the risk factors that can undermine spreadsheets' effectiveness as a business tool and result in unacceptably high costs or financial losses. Based on an understanding of how potential problems can occur, we will then scope out the processes and technologies that can help you to avoid them.

Spreadsheets: The Good, the Bad – *and Cautionary Tales*

Business Runs on Numbers – Numbers Run on Spreadsheets

You'd be hard-pressed to find any company in the world that does not use Microsoft Excel spreadsheets. With over a billion users worldwide, spreadsheets are the most widely used analysis and reporting tool and play an important role in every company's financial processes. From modeling and forecasting, to reporting and analysis, companies across industries employ spreadsheets to perform mission-critical functions for determining revenue, costs, profitability, valuations, and more.

In many cases they are inextricably embedded in a company's core operations, financial reporting, and used in critical decision making. Even in companies that have adopted more formal, managed enterprise applications, spreadsheets still play a role in accounting, tax, auditing and data transformation for aggregating financial data across disparate systems, geographies and lines of business.

A Spreadsheet's Strengths: Flexibility & Speed

Spreadsheets offer scores of powerful capabilities for sorting, calculating, modeling and charting data. In fact, few master all their available functions. At the same time, spreadsheets are low-cost, quick to implement, and easy enough to use that most people can start working with them even without training. Another key advantage is that unlike centralized IT-controlled systems, spreadsheets can be easily and immediately changed by end users as quickly as business requirements change. Clearly, accessibility and flexibility are key strengths that have led to spreadsheets' pervasive adoption.

Spreadsheets in Business-Critical Functions with No Effective Controls

Spreadsheets empower staff to do the calculations and data manipulation companies need to run their business. However, as many companies have learned the hard way, that power that can lead to fraud and other adverse consequences. Even well-intentioned end users can use an outdated version, improperly edit a calculation, or inadvertently make one of a near infinite number of potential mistakes. Multiply this capacity for error across the number of end users in each department, and the spreadsheet results the company relies on can quickly become unreliable. Despite these facts, many companies leave spreadsheets entirely in end users' hands, with no governance, no standards for error detection or version control, no data security and more.

Cautionary Spreadsheet Tales

There are numerous real-world examples that illustrate the quantifiable operational losses that can arise from the uncontrolled use of spreadsheets and the models and tools built upon them. Here are just a few:

- A junior trader at one of the world's largest banks was able to rack up $7 billion in losses by manipulating the Excel spreadsheet reports used by managers to monitor trades.

- The CEO of a global outsourcing firm resigned when it was discovered that its annual report overstated profit by $4.6M due to a spreadsheet error.

- Due to a spreadsheet re-formatting error, a law firm accidentally added 179 toxic contracts into a major asset purchase agreement.

- Due to a combination of copy-paste mistakes and a faulty equation in an Excel spreadsheet used to model risk, an investment bank underestimated the downside of a portfolio, leading to $6 billion in losses and a possible $600 million in fines.

- A rogue currency trader hid $691 million in bad trades and exaggerated bonuses by over half a million dollars by falsifying cells within his trading spreadsheet.

- One of the world's largest drugmakers saw its shares fall 0.4% after it inadvertently included confidential company information in a spreadsheet sent to analysts.

- Use of the wrong spreadsheet by an employee in Accounting for a Fortune 500 company resulted in a $1.4M overpayment to the CEO and a key investor. It took over 6 months to find and correct the error, and led to the company's auditor resigning and share prices falling 7.1%

- The UK operations of an international bank was hit with a £5.6 million penalty because its trading business was "overly reliant on large spreadsheets with multiple entries."

The Many Faces of Spreadsheet Risk

Risks from spreadsheet, whether as a standalone file, model, or a highly interconnected system, can occur in a myriad of ways:

Errors

Complex spreadsheets often contain errors which, if undetected, can negatively impact bottom line financial results. Studies have shown that 90% of spreadsheets with over 150 rows contain errors. Even very experienced users manually searching for errors can, on average, identify only 54% of such errors.

Errors frequently occur within formulas, spreadsheet logic or links to other spreadsheets/models and external data sources. Here are some examples of common errors that are hard to detect:

- Omission of a newly inserted row or column in a summation formula.
- Using a hard-coded value in a formula for temporary use, but then forgotten.
- A reference to an absolute cell address which is no longer valid.
- Use of invisible cells, rows, columns or sheets, which make the logic of the spreadsheet difficult to follow or understand. Use of complex formulas such as Nested If statements complicate this further.

Lack of Documentation

Due to the manual effort involved, spreadsheet design, inputs, outputs, assumptions and logic are rarely documented. This makes it extremely difficult for anyone other than its creator to understand the logic and purpose of the spreadsheet, significantly compounding its risks.

> *"An error in a spreadsheet-based application can subvert all the controls in all of the systems which feed data into it."*
>
> Raymond R. Panko, Professor of IT Management and Shidler Fellow, University of Hawaii

Increasing Spreadsheet Complexity

The most critical spreadsheets have grown in unprecedented sophistication and complexity. Often they are collections of interlinked systems, spreadsheets and data sources. This complexity, combined with the lack of training, is a contributing factor to spreadsheet errors. As a consequence, business decisions based on inaccurate data or faulty calculations can have serious and far-reaching consequences.
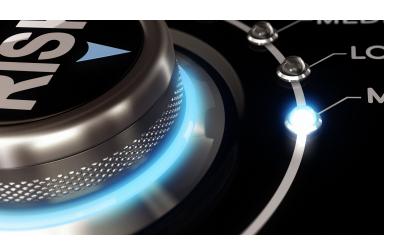
Lack of Access Controls

Typically, spreadsheets have minimal access controls in place. Even in companies where IT implements read/write privileges to folders using file permissions, many users still have write access to spreadsheets. That poses unnecessary risk of introducing inadvertent errors. Changes users make can import wrong data not only into the spreadsheet they are working on, but also cause errors on linked spreadsheets through data dependencies.

CIMCON Software | Reducing End-User Computing Risk™

Broken Links

Spreadsheets are often linked with other spreadsheets, tools, and databases. For example, a spreadsheet that contains interest rates, exchange rates or a current portfolio may feed this data into several other spreadsheets. If this spreadsheet is renamed or moved, it will break the link to all parent spreadsheets, thus invalidating their results. In some cases, the resulting deviation may be significant and any decisions made on the invalid result could cause significant losses to the organization.

No Version Control

In a typical business process, a new version of a spreadsheet is created at the end of every financial period using the 'Save As' function. But if proper file naming conventions are not followed or overlooked, other users can end up updating an older version of the spreadsheet. Sorting through each value and fixing this innocent mistake can cost hours or even days of manual labor during the time of financial close.

Sensitive Information

Spreadsheets can often contain sensitive data, ranging from hard-coded passwords in macros, to credit card numbers, social security numbers, or other sensitive (PII, PHI) information. If this information falls into the wrong hands, it can put customers at financial risk and seriously harm an organization's reputation.

Shared Passwords

Certainly passwords can be used to protect spreadsheets from unauthorized users. But they can also provide a false sense of security. Too often, a single global password is set and shared among colleagues. In this case, there are no safeguards to prevent the password from being shared with unauthorized users, thus compromising security.

Fraud

The power of spreadsheets, put in an end user's hands, can easily be abused. There have been numerous high-profile cases where employees have manipulated spreadsheets to commit fraud. Common tricks include using invisible cells (white text on white cells), hidden rows or columns, adding hard-coded values to formulas… the possibilities are limited only by the imagination and expertise of the bad actor. Such manipulations, however, are difficult to detect when manually diagnosing errors and challenges in spreadsheet.

EUC Risk Management

Every organization is affected to some degree by the problems inherent in spreadsheets and other EUCs. To solve these risks, it's important to address the problem at both ends of the spectrum: **Eliminate errors** on an individual level, helping line of business find & fix all types of errors in the spreadsheets used in critical business processes; and **safeguard EUC integrity** on an enterprise level, empowering organizations to automatically discover, control & report on their highest risk spreadsheets & EUCs. Working towards a solution requires 5 key elements:

Spreadsheet Accuracy	**EUC Inventory**	**Criticality Assessment**	**EUC Controls**	**Audit Trail & Alerts**
Automatically review spreadsheets for errors, , especially files identified as "high risk"	Identify all spreadsheets and EUCs used within critical processes across the organization	Determine risk exposure by performing automated risk assessments of each EUC	Ensure all spreadsheets and high-risk EUCs have automated controls to ensure integrity	Continually monitor edits to highest risk EUCs, including smart alerts on critical changes

1. Spreadsheet Accuracy

Manually checking critical spreadsheets used within your company is *not* a productive use of time. As previously noted, even very experienced users manually searching for errors can, on average, identify only 54% of such errors. Therefore, an automated diagnostic tool is an absolute necessity. When selecting a tool, be sure that it has the capability to automatically find the most common forms of errors, including:

- Formula errors
- Data inconsistencies
- Cells containing external links or broken queries
- Data dependency mapping

2. EUC Inventory

For many companies, the use of spreadsheets is so widespread that it's extremely difficult to assess just how many exist, how many are used in critical business applications, how they are linked together, and where data is fed into or extracted from other IT applications. To properly quantify this risk, it is necessary to carry out an inventory of spreadsheet & EUC usage, along with a detailed risk / criticality assessment of your business-critical EUCs.

This process can entail inventorying all spreadsheets in use and reviewing them for accuracy, as well as documenting whatever processes are in place to assure version control, access control, data accuracy/integrity, data security, etc. There are a number of software tools specifically designed for this purpose.

CIMCON Software | Reducing End-User Computing Risk™

When you are choosing an EUC inventory solution, make sure it delivers the following core functionality:

- Systematically scan network drives and folders (on-premises or cloud) to create a complete spreadsheet/EUC inventory
- Automatically generate a visual map of the entire data lineage/linkage for all your spreadsheets at the enterprise, department, folder and file levels

3. Criticality Assessment

Every company with ineffective spreadsheet controls faces risks, but the nature and potential costs associated with those risks varies by company and industry. For example, financial institutions must comply with a number of regulations governing their processes for managing and reporting data – and failure to achieve compliance can result in multi-million dollar fines. There are also universal risks that can result from trying to run your business on inaccurate data.

Business losses that directly result from spreadsheet issues typically range from millions to tens of millions, and in some cases have led to losses in the billions. Given the state of your company's spreadsheets as determined in the inventory, you must consider the specific risks your company faces and their potential cost. Here are some common negative outcomes you should consider:

- Business disruption
- Data loss/theft and other information security issues
- Negative impact to brand/reputation
- Financial loss, P&L impact
- Lower stock value
- Increased cost of auditing and compliance
- Regulatory fines for non-compliance
- Increased capital adequacy requirements

Risk or criticality assessment entails applying qualitative expert judgment based on knowledge of your own business. But there should also be quantitative assessment. There are software tools available that can help automate the process of scanning all spreadsheets and assigning a preliminary risk factor based on the attributes of each file.

4. EUC Controls

Assuring consistent spreadsheet integrity requires robust control procedures around development and usage. For most organizations, the use of spreadsheets and other critical EUCs is so pervasive that trying to control them manually will likely be too burdensome on line of business and too unwieldy to truly effectively manage risk.

Fortunately, there are software solutions available that can automate the process of applying controls. Some controls don't require any business process change. From a technical perspective, they can be integrated quickly and easily with your existing systems. For a comprehensive and effective solution you should consider the following:

- Workflow automation for review/approvals
- Flexible degrees of controls, configurable to business/user need
- Version control
- Segregation of duties
- Access controls

5. AUDIT TRAIL & ALERTS

Continually monitor and document changes to highest risk EUCs, including smart alerts on critical changes. When choosing a solution, make sure it delivers the following:

- Continuous, automated monitoring of high-risk spreadsheets and EUCs
- Cell-level audit trail traceability
- Automatic alerts for critical changes/exceeding thresholds

The cost of implementing a software solution for managing risk can be viewed as insurance against the material losses that can result from errors.

But beyond decreasing your exposure, putting an automated spreadsheet risk management system in place can also increase productivity. Spreadsheet review, auditing and comparison can all be completed in a much shorter time frames, and automatic alerts and approval processes ensure that managers spend less time reviewing spreadsheets. ROI calculations estimate that automation can save 2 hours per critical spreadsheet per week. Applied to 100 critical spreadsheets at an average cost of $75 per hour, cost savings can exceed $750,000 per year.

Conclusion

Spreadsheets and other end user computing applications have become so essential to business-critical functions, they can no longer be left unmanaged without governance and controls. The high probability for errors and the material harm that can come to your business necessitates a systematic approach to risk management including automated spreadsheet error detection to quickly find the hidden problems in important files, and continuous monitoring and self-governing controls to automatically track significant files changes and control access down to the cell level, while significantly minimizing the burden on end users or changes to existing processes. Not only is it insurance against unexpected and unacceptable business losses, but it can also lead to improved productivity and reduced costs.

For more information about Spreadsheet & EUC Risk Management,
please visit us at cimcon.com.

CIMCON Software, LLC

Headquarters:
Westford, MA

United Kingdom:
London