Detroit Chapter of the IIA in Partnership with Experis Finance Presents

Key Aspects of Spreadsheet Controls

April 25, 2012
Key Aspects of Spreadsheet Controls

Christopher Mishler
Spreadsheets

• Also known as an
  • End User Computing (EUC) tool
  • User Developed Application (UDA)
• MS Excel most widely used
• One of the most brilliant software tools
• Flexible and convenient for large masses of users
• Do not follow a standard software development lifecycle
• Outside the general controls of the IT function
Who is Responsible to Manage Spreadsheets

- Overriding challenge – which department should be responsible for spreadsheet risk
- Three quarters (74%) of those surveyed said no department or function was tasked with addressing spreadsheet risk
- 10% believed it was the finance department’s responsibility
- Others thought to be responsible
  - Risk management – 8%
  - IT – 5%
  - Internal audit – 3%

^1 FSN, February 6, 2012 report on a Protiviti poll of 100 ICAEW Chartered Accountants in December 2011.
Key Aspects of Spreadsheet Controls

Who is Responsible to Manage Data?

Your financial analysis is only as good as the data upon which it is based

- Scenario analysis
- Transparent audit trail
- Threshold tests
- Validation errors
- Assess data quality
- Source missing data
- Reasonableness
- Reconciliation
- Check totals
- Import details
Risks and Challenges Associated with Critical Spreadsheets
Corporate Spreadsheet Challenges

1. Risks of erroneous data from uncontrolled spreadsheets

2. Limitations for sustainable controls
   a. Lack of traceability
   b. Lack of change controls
   c. Loss of security and integrity
   d. Inconsistent retention of files

3. Poor productivity and inconsistent development, documentation, review & approval of spreadsheets

4. Risks of lost knowledge with employee turnover and inadequate documentation, retention and control of spreadsheets

5. Limited options for users to justify replacing a spreadsheet with IT applications
Corporate Spreadsheet Challenges

Key Aspects of Spreadsheet Controls

ERP
OLAP
OLAP
Reports, Models, Dashboards (all spreadsheets)
Shared Drives
Financial Spreadsheets
Management Reporting
Lack of Change Controls
Misuse of Spreadsheets

Day 0
General Ledger
Lack of Confidence & Trust

Day 14
CEO, CFO Signoffs
Collaboration & Review

Annual, Quarterly Reports

Loss of Security, Integrity
Lack of Traceability
Poor Productivity
Email

Experis Finance
32% of Corporate Data is in Uncontrolled EUCs

EUCs/UDAs: Spreadsheets, PC databases, BI reports

IT Controlled Applications (Non-PC Data)

Control Type
- **Internal controls**
  - Access, Change, Version, Input/Output, Developmental...

IT Applications
- Enterprise level

Potentially high-risk
- Data security/Integrity
- Confidence/Trust

Low risk
High

Source: Baseline Consulting Annual CIO Survey
The Ubiquitous Spreadsheet...

The number of public companies using spreadsheets for revenue recognition...

92%

92% of Public Companies’ Revenue Processes at Risk for Compliance Failures and Restatements

New study by RevenueRecognition.com and IDC reveals widespread reliance on spreadsheets, which greatly increases the likelihood of control weakness and accounting errors.

Download the full report now.

www.RevenueRecognition.com and IDC, RevenueRecognition.com

A recent survey of 685 senior financial executives from a broad range of companies, revealed that revenue recognition and reporting activities are not automated within Financial/ERP systems. As a result, 92% of public companies are forced to rely on spreadsheets to fill vital gaps in their revenue reporting processes—despite the fact that spreadsheets are prone to errors, lack audit capabilities, and resist internal controls. This, and other findings, is from a new report by www.RevenueRecognition.com and IDC, “Enterprise Systems and Revenue Recognition: The Missing Link”.

Revenue Spreadsheets: The Compliance Killers

Source: IDC, 2006
Spreadsheet Errors

“Audits of real-world spreadsheets found that…”

- 94% of audited spreadsheets contained errors
- 91% of audited spreadsheets contained at least a 5% error in a bottom-line value

Research on Spreadsheet Errors

What are the reasons for these error rates?

• Humans have an “error floor”
  – Cognitive multi-tasking capabilities
  – Results in a 5.4 percent average error rate

• Spreadsheets are not tested prior to deployment
  – Consequently, errors exist in spreadsheets used for:
    • Financial reporting
    • Analytical review
    • Operational management
    • Regulatory compliance

Source: *Sarbanes-Oxley: What About All The Spreadsheets?*, Raymond R. Panko and Nicholas Ordway, University of Hawaii
Scope of Risks for CAEs, CROs, and CFOs to Consider

- State & Federal Tax Compliance
- Parent Company Requirements
- Lender Requirements
- Regulatory Reporting
- Fraud
- Footnote Support
Scope of Risks for CAEs, CROs, and CFOs to Consider (cont.)

- Regulatory compliance
- Regulatory reporting
- Financial reporting and analysis
  - Accuracy of account balances used in financial reporting
  - Operational analysis, metrics and management reporting
- Reliability of subsidiary system controls
- Undetected Fraud
- Lost earnings
- Company image and reputation
Risks with Consequences

- **Errors**: A power company took a **$24 million** charge to earnings in 2003 after a bidding mistake landed it more U.S. power transmission hedging contracts than it bargained for due to a cut-and-paste error in an Excel spreadsheet.

- **More Errors**: During a buyout of bank assets, one firm overlooked **179 contracts** that were mistakenly included in the asset purchase agreement by a junior associate when reformatting an Excel spreadsheet.

- **Cooking the Books**: CFO from a software company falsified earnings and expenses in close-the-books spreadsheets for 6 years by hiding data in invisible cells, costing **$437 Million** in market and drop in stock price from $29.41 to $12.31.

- **Fraud**: A rogue trader at a French investment bank was able to falsely build up positions that eventually resulted in a **7 billion euro** loss for the bank. He had advanced skills with VB that allowed him to embed usernames and passwords into spreadsheets queries granting unlimited access through powerful administrator or developer accounts.
Spreadsheet Fraud – Causes and Detection
Spreadsheet Fraud Linked to Madoff Case

“Madoff or DiPascali would enter trades that never happened, with real prices, into an old IBM AS/400 computer he used for his advisory business and – voilà! – he had a track record. Then, using a simple spreadsheet such as Excel, more than 2,300 client accounts were updated automatically – dividing among all the accounts the gains from the “trades” that amounted to “profits” of 1 per cent.”

Source: http://www.ft.com/cms/s/2/89542248-9821-11de-8d3d-00144feabdc0.html

How Bernard Madoff escaped detection
September 4, 2009
The Financial Times
Common Fraud Indicators

Errors and Risks “Hit List” for Critical Spreadsheets

- Invisible cells (e.g., white on white)
- Hidden rows / Columns hidden / Very hidden worksheets (accessible through VBA)
- Broken or incorrect links and data connections
- Out-of-synch and/or erroneous data (source spreadsheet altered after target spreadsheet)
- Plugged formulas and formulas referencing blank cells outside of normal input range
- Formula errors – improper use of functions
- Replacing formulas with constants (“plugged” cells)
- Cells with numeric values stored as text (e.g. “L23” vs. “123”)
- Unlocked formula cells when relying on Excel worksheet protection
- Duplicate named items or named items with range reference errors
- Retaining redundant or historic data
- Using blank row/columns for formatting purposes
Key Aspects of Spreadsheet Controls

Causes and Indicators of Risks for Fraud

Why are spreadsheets susceptible to fraud?

Non-automated control environment
User-defined governance
Sub-optimal development

Lack of adequate controls
Lack of data security
Autonomy of users to make unmonitored changes

Errors and Risks “Hit List” for Critical Spreadsheets

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How to Protect Against Spreadsheet Fraud

- Identify the most likely candidates for fraud
  - Consider external factors (e.g., personal motivation, outside pressures)
  - Can be financial, analytical, or operational spreadsheets
  - Consider use, existing controls, ease of manipulation

- Perform an audit on identified spreadsheets
  - Automated diagnostics, manual testing
  - Investigate any and all Red Flags
  - Remediate any deficiencies

- Establish a Spreadsheet and EUC or UDA Control Policy
  - Promote it as your organization’s leaders (“Tone at the top”)

- Implement an automated control environment
  - Continuous monitoring, audit trails, real-time reporting
  - Tied to the UDA Control Policy
Risks and Controls for Critical Spreadsheets
Critical Spreadsheets: Financial, Analytical, Operational, Regulatory

- **Financial** – Support key controls in the financial reporting process
  - Source of journal entry input
  - Source of disclosure in 10Q - 10K SEC filing and/or regulatory reports

- **Analytical** – Relied upon for critical business decisions
  - Forecasting
  - Capital expenditure analysis
  - Project economics

- **Operational** – Monitor subsidiary systems activity and related controls
  - A/P, A/R, F/A, Inventory, and production

- **Regulatory** – Ensure compliance and reflect related liabilities or revenue
  - Financial institutions, Insurance, Utilities

- **Critical spreadsheets also include:**
  - Spreadsheets that are linked to critical spreadsheets and supply input data
  - Spreadsheets that are the source of manual input data into critical spreadsheets
Risk Assessment Challenges

• Limited or no knowledge of spreadsheet content & complexity

• No insight on spreadsheet operations

• No quantifiable methodology to assess risk / impact to business

• Must rely primarily upon subjective criteria

• Thousands of cells to check
Risk Assessment Methodology

Perform a spreadsheet risk assessment

• Typical risk factors used for the assessment are:
  • Spreadsheet complexity
  • Spreadsheet materiality
  • Spreadsheet application
Risk Assessment Methodology – Risk Factors

Spreadsheet Complexity

- Number of formulas
- Complexity of formulas (nested ifs, arrays, lookups)
- Complexity of spreadsheet operations (use of macros, pivot tables)
- Number of worksheets
- Number of external workbooks or data sources providing data to the critical spreadsheet
Risk Assessment Methodology – Risk Factors

Spreadsheet Materiality

- Highest output value over the past 12 months
- Contains Social Security numbers
- Contains credit card information
- Contains other key words “billion”, “net income”
Risk Assessment Methodology – Risk Factors

Spreadsheet Application

• Creates a journal entry
• Uploads information into ERP or legacy systems
• Data source to other critical spreadsheets
• Documentation support for 10Q/10K disclosures
Risk Rank Your Critical Spreadsheets

Define Your Financial Spreadsheet Risk Criteria – for example:

**High Risk**
- The spreadsheet produces an amount \( \geq \$25 \text{ million} \) on an annual basis
- The spreadsheet produces an amount \( \geq \$10 \text{ million} \) on an annual basis and the complexity of the spreadsheet is considered high

**Medium Risk**
- The spreadsheet produces an amount that is between \$25 \text{ million} and \$10 \text{ million} annually

**Low Risk**
- The spreadsheet produces an amount that is between \$5 \text{ million} and \$10 \text{ million} annually
Risk Assessment Framework - Automated

Materiality factors

Complexity factors

Assignment of risk
Ensure Adequate Controls on Your Critical Spreadsheets

Two categories of critical spreadsheet controls

Preventive or Detective
- Deter or prevent undesirable events; proactive to prevent a loss → Preventive
- Detect undesirable acts; provide evidence of a loss → Detective

External and Internal
- Controls around the spreadsheets → External
- Controls within the spreadsheets → Internal
# Automated Control Environment – Detective vs. Preventive Controls

<table>
<thead>
<tr>
<th>Control Mode</th>
<th>Pervasive Monitoring (Detective)</th>
<th>Exception-Based Reporting (Detective)</th>
<th>Lock Down (Preventive)</th>
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</thead>
<tbody>
<tr>
<td>Description</td>
<td>Continuous monitoring of any and all changes</td>
<td>Continuous monitoring of any and all changes + Flags, exceptions and policy violations</td>
<td>Restricts access to authorized users only</td>
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<tr>
<td>Workflow</td>
<td>Non-invasive</td>
<td>Exception handling</td>
<td>Controls user input</td>
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<td>Audit Efficiency</td>
<td>Retrospective</td>
<td>Real time</td>
<td>Real time</td>
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<td>Security Options</td>
<td>• Active directory • SharePoint • Rights management</td>
<td>• Active directory • SharePoint • Rights management</td>
<td>• Document and cell level • Active directory • SharePoint • Rights management</td>
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</tbody>
</table>
External Spreadsheet Controls

- **Development controls** – require that spreadsheets are developed using best practices and are tested and approved prior to deployment into production.
- **Access controls** – restrict who has access to critical spreadsheets. They also define and control user privileges.
- **Change controls** – define the process to be followed anytime formula changes or structural changes are made to a critical spreadsheet. They also define the testing and approval process required prior to deploying the modified critical spreadsheet back into the production environment.
- **Segregation of duties** – requires that duties, roles and responsibilities are defined for development, usage, changes, testing and approving of spreadsheets.
- **Backup and archival** – requires that spreadsheets be maintained on a secured server that is backed-up on a regular basis, with prior versions of critical spreadsheets moved to a secure archive folder to ensure they are not accessed and used in error.
Key Aspects of Spreadsheet Controls

Internal Spreadsheet Controls

- **Documentation controls** – require that critical spreadsheets include a documentation worksheet tab.
- **Data security and integrity** – requires that critical input cells that do not change on a periodic basis are locked to prevent unintentional changes to the data. Also, data validation to control or restrict input into critical cells should be used.
- **Input/output controls** – require the use of cross checks and balancing to ensure all input data has been accounted for and reflected in the outputs, along with data validation to prevent or highlight potential output errors.
- **Version Controls** – require standard naming conventions incorporating intelligence with regard to the application, time period and current version of the spreadsheet.
Spreadsheet Management Tools
Diagnostic Software for Excel

• Cimcon – XLAudit

• Incisive – Xcellerator

• ClusterSeven’s SaaS ESM

• Finsbury Solutions - EXChecker
Diagnostic and Control Tools

Start with colors as an aid to understanding

- Common features of the tools:
  - Differential coloring of data types
  - Formula maps by color or other highlighting

Look at the cell contents in specific lists

- Workbook Analysis and related templates
Key Aspects of Spreadsheet Controls

Spreadsheet Remediation
Automated Approach

- Automated formula and cell diagnostics
- Formula error checking
- Quickly identify structural issues
  - very hidden worksheets
  - inconsistent formulae
  - missing input data
- Color coding
- Dependency diagrams to verify links, inputs
- Spreadsheet documentation
Key Aspects of Spreadsheet Controls

Formula Analysis - XLAudit

[Image of a spreadsheet showing formulas and comments]
### Key Aspects of Spreadsheet Controls

#### Formula Map

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<th></th>
<th>B</th>
<th>C</th>
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<th>E</th>
<th>F</th>
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<th>H</th>
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</tbody>
</table>

*Note: The table above represents a partial subset of the spreadsheet controls, focusing on key aspects and formulas used in financial analysis.*
Risk lists work too

<table>
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<tr>
<th>Description</th>
<th>Count</th>
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<tbody>
<tr>
<td>Formula Cells</td>
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<tr>
<td>Hidden Columns</td>
<td>49</td>
</tr>
<tr>
<td>Comments</td>
<td>37</td>
</tr>
<tr>
<td>Hidden Rows</td>
<td>18</td>
</tr>
<tr>
<td>Formula Cells Formatted as Text</td>
<td>0</td>
</tr>
<tr>
<td>Array Formulas</td>
<td>0</td>
</tr>
<tr>
<td>Query Cells</td>
<td>0</td>
</tr>
</tbody>
</table>
The Eventual Maturity

Many benefits to proactive UDA risk management

- Business intelligence transformation
- Business analysis
Non-automated tools
Experis Excel Design Best Practices

Key Aspects of Spreadsheet Controls
## Best Practice Policy Checklist

### User Defined Application (UDA) 'High Risk' Spreadsheets

<table>
<thead>
<tr>
<th>Control Objective</th>
<th>Prescribed Requirements</th>
<th>Control Activities Assessment</th>
<th>Compliance Assessment Against Control Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process</td>
<td>Control Activity</td>
<td>Actual Control Activity</td>
<td></td>
</tr>
<tr>
<td>1. Establish Control Environment for Spreadsheet Development</td>
<td>1.11 Set up UDA Oversight Committee</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.2 Ensure intended UDA spreadsheet does not already exist elsewhere in organization</td>
<td>1.2.1 Review details of existing UDA spreadsheets for functionality/output matches on the UDA Application Index &amp; review data input/output (consider merging)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.3 Purpose of UDA spreadsheet is validated by UDA Oversight Committee</td>
<td>1.3.1 Before any new high risk spreadsheet is built, an UDA Request Form is submitted to the UDA Oversight Committee - detailing: - Spreadsheet purpose - Data inputs/output/throughput - Department/application owner details</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.3.2 The UDA Oversight Committee confirms that build can proceed</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Rationale**: The UDA Oversight Committee ensures that all high-risk spreadsheets are properly reviewed and validated before implementation. This helps in identifying potential risks and ensuring compliance with best practices. The UDA Oversight Committee also reviews the data inputs/output/throughput, ensuring that there is no redundancy or unnecessary effort in the spreadsheets.

- **Control Activities Assessment**: Includes review and approval of request and approval of feasibility, status of request, and notification of spreadsheet developer for status of testing.

- **Compliance Assessment Against Control Objective**: The assessment is categorized as Non-Compliant, Marginal Compliance, and Compliant based on the requirements met and the activities performed.
## Policy Checklist - Sample

<table>
<thead>
<tr>
<th>CA #</th>
<th>Control Activity</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.2.5</td>
<td>Adjustment columns/rows are included in data input sections where dependent formulae may require occasional adjustments</td>
<td>Current period adjustments are clearly identified to ensure proper treatment in subsequent periods. The need to add multiple data input values together in formulae is removed. A clear audit trail is provided.</td>
</tr>
<tr>
<td>2.2.6</td>
<td>Where data inputs are subject to frequent changes requiring row insertions, data inputs with differing structures are organized from top to bottom, and data inputs with identical structures from left to right.</td>
<td>Disruptions to adjacent data inputs resulting from row insertions are avoided.</td>
</tr>
<tr>
<td>2.2.7</td>
<td>Similar or identical data inputs are organized together.</td>
<td>File mechanics, documentation, monthly processes and formulae are simplified.</td>
</tr>
</tbody>
</table>
# Key Aspects of Spreadsheet Controls

## Documentation Template

<table>
<thead>
<tr>
<th>Spreadsheet Documentation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Filename and Path</strong> - Enter <code>=CELL(&quot;filename&quot;)</code></td>
</tr>
<tr>
<td><strong>Development Date</strong></td>
</tr>
<tr>
<td><strong>SOX Process #</strong></td>
</tr>
<tr>
<td><strong>Type</strong> - Analytical / Financial / Operational</td>
</tr>
<tr>
<td><strong>Spreadsheet Developer</strong></td>
</tr>
<tr>
<td><strong>Spreadsheet Owner / Department</strong></td>
</tr>
<tr>
<td><strong>Other Spreadsheet Users / Departments</strong></td>
</tr>
<tr>
<td><strong>Spreadsheet Criticality</strong> - High / Medium / Low</td>
</tr>
<tr>
<td><strong>Highest $Value Output During Preceding 12 Mos.</strong></td>
</tr>
<tr>
<td><strong>Spreadsheet Purpose / Frequency of Use</strong></td>
</tr>
</tbody>
</table>

### Data Input Sources

<table>
<thead>
<tr>
<th>Source #1</th>
<th>Source #2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Report Name / Number / Title</td>
<td></td>
</tr>
<tr>
<td>Received From (Source)</td>
<td></td>
</tr>
<tr>
<td>Manual Input or Automated Input from System / Download</td>
<td></td>
</tr>
<tr>
<td>Identify Input Data to Specific Rows / Columns on Worksheets Impacted</td>
<td></td>
</tr>
</tbody>
</table>

### Spreadsheet Logic/Operations / Calculations

<table>
<thead>
<tr>
<th>Source #1</th>
<th>Source #2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Describe Spreadsheet Logic / Operations (How the spreadsheet functions from the point of data input through output generation)</td>
<td></td>
</tr>
<tr>
<td>Describe Unique Calculations Performed on the Data (Complex formulas such as IF’s, Nested IF’s, Arrays, Pivot Tables, Lookup Tables, Use of Named Ranges, Formula Operators, Macros)</td>
<td></td>
</tr>
</tbody>
</table>

### Spreadsheet Outputs from Data Input Sources

<table>
<thead>
<tr>
<th>Source #1</th>
<th>Source #2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Report Name / Number / Title, JE Number, Other Uses</td>
<td></td>
</tr>
<tr>
<td>Sent To (Recipient)</td>
<td></td>
</tr>
<tr>
<td>Manual Report, Manual or Automated JE, Linkage to other Spreadsheets</td>
<td></td>
</tr>
</tbody>
</table>
Next Steps
Embedding spreadsheet controls into everyday business operations mitigates risk, improves compliance, and drives process efficiency.
Where to Go From Here

• Step 1  – Review existing controls and policies surrounding spreadsheets
• Step 2  – Compile an inventory of financial files and assign risk level to the files
• Step 3  – Review the highest risk files with Diagnostics Software
• Step 4  – Remediate spreadsheets, as necessary
• Step 5 – Oversee establishment of sustainable maintenance and ongoing controls
  • Enterprise spreadsheet management
  • Proactive spreadsheet analyses
Determine the Future Control Environment – Who are the Key Stakeholders?

Key stakeholders must have active involvement in improving spreadsheet controls environment

- **Application Owner**
  Issue: Efficiency of use – Rework based on data accuracy and spreadsheet mechanics

- **Chief Financial Executive**
  Issue: Data integrity – Accuracy of financial statement inputs and results

- **Chief Audit Executive**
  Issue: Adequacy and effectiveness of controls over processes, especially financial statement processes

- **SOX Director**
  Issue: Spreadsheet effect on key controls and testing of spreadsheets

- **Chief Compliance Officer**
  Issues: Reporting and tracking of critical regulatory information through spreadsheets, privacy laws compliance

- **Chief Information Officer**
  Issues: Data processing – Potential to automate critical spreadsheets into the ERP production environment, supporting security
Monitor Compliance

At a Minimum Ensure

- Have and adhere to spreadsheet control policy
- Control over the process: a champion (again!)
- IT supervision of access to controlled network folders
- Conduct SOX quarterly questionnaire, with specific spreadsheet control questions
- Periodic inventory
- Ongoing high-risk spreadsheet audits
- Checklist for evaluating high-risk file status
Key Takeaways

• Uncontrolled (critical) spreadsheets expose organizations to unacceptable business risks
  – Errors
  – Non-compliance
  – Fraud

• An effective Spreadsheet Risk Mitigation program requires a combination of best practices, domain expertise, and proven technology for automation and sustainability

• The ROI includes effective risk mitigation, productivity enhancements, and improved compliance
Questions?

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Cell: 734-395-8324