Auditing Spreadsheets
Concerns & Comments

Diana H Shutt Consulting, LLC
Agenda

• Introduction
• The Invention of Spreadsheets
• Before Desktop Spreadsheets
• Spreadsheet Use Today
• Spreadsheet Architecture
• Spreadsheet Concerns & Comments
• Can We Properly Audit Spreadsheets?
• Conclusion
Introduction

A little bit about Diana Shutt
The Invention of Spreadsheets

1961 - Professor Richard Mattessich pioneered development of mainframe computerized spreadsheets – MF Corp.

Dan Bricklin – Father of Electronic Spreadsheet & Co-creator of VisiCalc with Bob Franston (improved design & functionality and Daniel Fylstra (marketed)

• Fall 1978 – Prototype Matrix (5 cols & 20 rows) - Bricklin
• 1979 – First Electronic Spreadsheet – continued to be used for personal computing many years

source – http://dssresources.com/history/sshistory.html
The Invention of Spreadsheets

1985 – Lotus 123 (created by Mitch Kapor) eventually replaced VisiCalc

1984 - 85 – Microsoft Excel originally written for 512K Apple Macintosh

1987 – Microsoft launched Windows O/S, Excel was one of the first products released

source – http://dssresources.com/history/sshistory.html
The Invention of Spreadsheets

1990’s – Business used Excel & Lotus

Today – Excel, Lotus, and other open source programs are used

source – http://dssresources.com/history/sshistory.html
Before Desktop Spreadsheets

*Remember when there were ...*

Paper spreadsheets called green ledger pads

To complete my task in the 1970’s, I needed:

- Red Pen / Blue Pen / Green Pen
- Adding Machine
Before Desktop Spreadsheets

In the 1990’s:
- Mainframe (MF) or other platform reports
- Paper (including ledger), pencil & adding machine/calculators
- Business Users ran SAS programs (or another 4GL language) against MF (or other platform) data (The business could run jobs under the IT radar.)
Spreadsheet Use Today

• Analysis of data
• Financial processes
• Operations tasks
• Quick & dirty calculation
• Scratch Pads
• Tool to organize data
• etc.
Spreadsheet Use Today

Analysis of data (usually under IT radar)

• One time activity to analyze data to determine a conclusion (s)
  • Can include a large amount of data
  • Good for “what if” and multiple scenarios analysis (with variables that can be easily changed)
  • Good for a process outside of business system that does not warrant system development

• Regularly scheduled activity not supported by business systems
  • Should system development be considered?
Spreadsheet Use Today

Financial Processes

• Management Reporting
  • Usually occurs on a regular schedule
  • Probably outside of SOX scope
  • Often uses data from repositories

• Financial Reporting
  • May be in scope for SOX (dependent on $$$ & process)
  • Data may be systemically or manually input from systemic or hard-copy sources
  • Processing is not available from IT systems
  • Output can be input to another system (or spreadsheet)

Should system development be considered?
Spreadsheet Use Today

Operational Tasks

• Management Reporting
  • Usually occurs on a regular schedule
  • Probably outside of SOX scope, but can be in Auditing scope
  • Often uses data from repositories

• Operational Reporting
  • Probably outside of SOX scope (dependent on $$$ & process), but may be in Auditing scope
  • Data may be systemically or manually input
  • Processing is not available from IT systems
  • Output can become input to a system (or spreadsheet)

Should system development be considered?
Spreadsheet Use Today

Quick & Dirty Calculation

“I can do it on the back of a napkin”

• May be in SOX scope (dependent on $$$ & process)
• Usually involves a small amount of input
• Data often manually input from systemic or hard-copy sources
• Processing is not available (or easily accessible) from IT systems
• Output can become an input to another system or spreadsheet.

Should system development be considered?
Spreadsheet Use Today

Scratch Pad

• An extension of a calculation in your head

• Could be a data interface feeding data to a system-of-record (The spreadsheet may not be considered important because the data is recorded on the fed system.)

• Could be a one-time activity or used on a regular basis

Should system development be considered?
Spreadsheet Use Today

Tool to Organize Data

• Columns and rows are convenient for organizing data (not necessarily used for calculations)
• Data can be sorted and/or filtered
• Data can be easily searched
• The spreadsheet can be deemed important dependent upon the classification of the data in the spreadsheet.
Spreadsheet Architecture

Spreadsheet Interface Considerations:

• Spreadsheet can be “Stand-Alone” (One worksheet in one spreadsheet)

• Spreadsheet can have multiple worksheets in the same workbook interfacing with each other

• Spreadsheet can interface with multiple spreadsheets in separate workbooks
Spreadsheet Architecture

Worksheet Process Considerations:

• Can be used only as a “Data Interface Tool” (data input only, no processing done) & data output - spreadsheet is then uploaded to another system

• Can be used as a Data In/Process/Data Out Tool
Spreadsheet Architecture

If a spreadsheet is more than a data interface, it can be considered as “All-in-1” tool

<table>
<thead>
<tr>
<th>Data In</th>
<th>Processing</th>
<th>Data Out</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manually or Systemically</td>
<td>(Formulas, manual copy/paste) One result per calculation per cell (Probably not used if spreadsheet is only a data interface)</td>
<td>Data result (final) or Data result is input to another process – check next process</td>
</tr>
</tbody>
</table>
Spreadsheet Architecture

Some Questions to Ask...

• What is the purpose of the spreadsheet?
• Who uses it?
• Is spreadsheet a “Stand-alone” Tool?
• If not “Stand-alone”, how many worksheets or workbooks are used in the Spreadsheet (system)?
• How is data input entered?
• What processing is done?
• How is data output used?

*It is time to do an architecture drawing of how things work (if one is not available).*
Spreadsheet Architecture

Documentation:

• Is documentation available that describes the inputs, outputs and processing in the spreadsheet?
• Can the spreadsheet user explain how to use the spreadsheet?
• Can the spreadsheet designer provide specs for how and why the spreadsheet was designed?
• Is there evidence of approval for the spreadsheet process?

How to proceed will be determined by your audit rules of engagement and/or control test plan.
Spreadsheet Architecture

Design Considerations:

• The best spreadsheets are those that are well thought out (and documented) before spreadsheet creation.
• The design should be based upon business requirement(s).
• (Ideally), the designer should not also be the user.
• Someone other than the designer should review the spreadsheet to ensure that it meets the requirements for its development and produces accurate results.

Often what happens is that a model is in the head of the designer who iteratively designs the spreadsheet until it works the way she wants it to. Excel is a great visual tool!
Spreadsheet Architecture

Design Considerations:

• Because a spreadsheet can be designed iteratively, there is a tendency toward spreadsheet processing sprawl.

• Over time, Spreadsheets can suffer from numerous changes and patches to fix anomalies.

• New patches can break existing processing. The entire spreadsheet should be checked to ensure each processing cell has valid results.
Spreadsheet Architecture

Design Considerations:

• How many users will be using the spreadsheet? If numerous users will be entering data on the spreadsheet, a template or a different type of tool may be more appropriate.

• Spreadsheets are not scalable. As spreadsheets grow in size, their processing can become slower and even freeze during processing.

• Multiple linked spreadsheets can lead to errors if one of the linked spreadsheets is changed.
Spreadsheet Concerns & Comments

Problems can occur in 3 Spreadsheet areas

- Bad Data Input  (Garbage In – Garbage Out)
- Processing Error(s)
  - Can be one error or multiple errors
  - Can be of little importance or material impact
- Bad Data Output (errors can be due to bad input or processing errors)

Errors can occur in 1 or more areas at the same time.
Spreadsheet Concerns & Comments

Some examples of Problems & Issues:

• Data Input Errors:
  o Human error in manual data input
  o Linked data (from other spreadsheet(s)) not correct
  o Systemic data does not match expected data input
  o Unexpected values not caught by input validation
  o Data validation could be weak or non-existent.
Spreadsheet Concerns & Comments

Some examples of Problems & Issues:

• Processing Errors:
  o Processing in Spreadsheet not understood
  o Logic errors in calculations (doesn’t satisfy business requirement)
  o Incorrectly linked values (from copying / pasting)
  o Cells designated only for processing are inadvertently changed through input (if not properly locked down)
Spreadsheet Concerns & Comments

Some examples of Problems & Issues:

• Lack of General IT Controls:
  o Access not appropriate
    • Spreadsheet access not limited to those with need
    • Cell access is not limited to input-only cells
  o Segregation of Duties problems
    • Often the spreadsheet designer is also the user and approver
    • Spreadsheet may not be locked down, allowing the user to change cells that should only be available to the designer
Spreadsheet Concerns & Comments

Some examples of Problems & Issues:

• Lack of General IT Controls (cont.):
  o SDLC (planning before execution) missing
    o Spreadsheet requirements should be defined up front before design begins.
    o There are often no corporate guidelines for designing a spreadsheet (color-coding, locking cells for input only, etc.)
  o Change control lacks evidence trail and approval
    o Spreadsheets can be easily changed. This can be done without requirements, approval and audit trails.
    o There are often no corporate guidelines for defining generations and storage of past spreadsheets.
  o Replacement of spreadsheet may not be possible (Backup & recovery)
Spreadsheet Concerns & Comments

Mitigating & Compensating Actions:

• Thorough planning of Spreadsheet Design
  o Corporate guidelines for Spreadsheet development

• Independent parallel check of spreadsheet operations
  o An independent person (through a separate process) should verify separate process results match spreadsheet results.

• Manual review of each operation (formula) in all spreadsheet cells
  o There can be 1000’s of formulas in a spreadsheet.
Can We Properly Audit Spreadsheets?

• Is there Business Stakeholder buy-in (Tone at the Top)?

• What controls are required to be in place per corporate policy / procedure?

• What controls should be in place (manual / automated) to ensure valid results?
Can We Properly Audit Spreadsheets?

• Are spreadsheets in scope for auditing? If so, which spreadsheets should be audited?

• Does the organization follow a SDLC methodology?

• Should the Spreadsheet exist? Or should it be a candidate for IT replacement?
Conclusion

• Spreadsheets can be useful tools when used appropriately

• They are often used for applications where they are not scalable.

• Business needs to understand the risk associated with using spreadsheets.
Conclusion

Each spreadsheet application (deemed important) should be reviewed to determine:
• whether its operation is effective with compensating controls in place or
• if it should be replaced with another IT system.
Questions
Diana H Shutt Consulting, LLC
109 Elgin Drive
Greensburg, PA 15601
412-554-2106
dshutt@dianashutt.com
www.dianashutt.com