



FORENSIC

# Spreadsheet Fraud ISACA/ACFE Joint Meeting

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# Agenda

- **Increasing use of spreadsheets**
- **What is spreadsheet fraud?**
- **Current detection and prevention techniques**
- **Assessing the Risk of spreadsheet fraud**
- **Case studies**



# Increasing use of spreadsheets

# Increasing use of spreadsheets

**Raise your hand if ...**

**Your company uses Microsoft Excel ® or a similar spreadsheet tool as part of its everyday business?**



# Increasing use of spreadsheets

**Raise your hand if ...**

**You consider yourself to be proficient enough with Excel  
to catch an error in someone else's work?**

# Increasing use of spreadsheets

- **Past studies found that a significant percentage of large spreadsheets used by companies contained errors**
- **Many errors go undetected and can cost companies money**
- **Why?**
  - **Errors in spreadsheets are difficult to detect**
    - Increased complexity and flexibility of spreadsheets
    - Increased computing power
  - **As a result, any fraud contained in a spreadsheet is difficult to detect**

# Increasing use of spreadsheets

- **There is an increased use of end user computing (EUC)**
- **Essentially there is nothing stopping an employee from creating a spreadsheet as part of their everyday work (unless company policy specifically prohibits it)**
  - What policies does a company have in place over its EUC?
  - How does the company monitor compliance with the policy?
  - Are the company's internal controls effective?

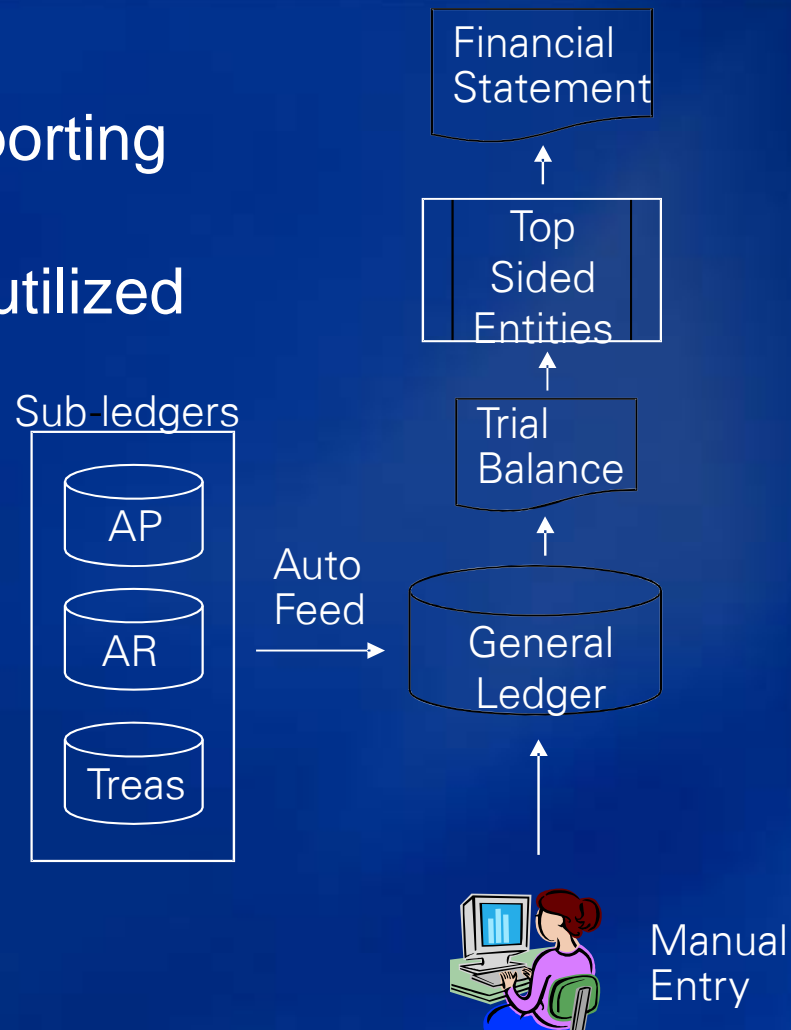
# Increasing use of spreadsheets

**What functions are spreadsheets used for in a business?**

- **Accounting**
- **Finance**
- **Budgeting/Forecasting**
- **Scenario based calculations**
- **Financial analysis**
- **Other non-financial related purposes**
- **Other?**

# Increasing use of spreadsheets

In which financial reporting processes are spreadsheets being utilized (in or out)?



# Increasing use of spreadsheets

**Raise your hand if...**

**You consider spreadsheet fraud a risk within your organization?**



# Increasing use of spreadsheets

- Recent headline on August 17, 2010
- “Cohmad Fined \$200K in Madoff Case for Failure to Keep Spreadsheet Records”
- Spreadsheet fraud can expose a company to fines from regulators (SEC, DOJ etc.)

(Source: <http://endusercomputing.org/2010/01/08/spreadsheet-fraud-linked-to-madoff-case/>)





# What is spreadsheet fraud?

# What is spreadsheet fraud?

- **No generally accepted definition of Spreadsheet Fraud**
- **Spreadsheets are simply a tool used to commit a fraud**
- **Typical characteristics of spreadsheet fraud**
  - Falsification of inputs
  - Manipulation of formulas to alter output
  - Concealing relevant information

# What is spreadsheet fraud?

- **Ralph Baxter of ClusterSeven describes five types of spreadsheet fraud:**
  1. **Presentation fraud**
  2. **Data fraud**
  3. **Incremental fraud**
  4. **Burial fraud**
  5. **Function fraud**

(Source:<http://blogs.bankinfosecurity.com/posts.php?postID=677> )

# Examples of types and methods of spreadsheet fraud

## Concealing information

- Hidden rows
- Background color text
- General formatting and conditional formatting tricks
- Hard coded values

## Manipulation of data

- Hyperlinks altered
- Macros
- Sort data to rearrange specific inputs
- ‘Wrong’ spreadsheet uploaded to system

This list is not intended to be a comprehensive list of all possible methods.

# Hidden rows (what they look like)

	A
1	Example
2	2
3	5
4	8
5	3
6	8
7	
8	4
9	3
10	42

	A
1	Example
2	2
3	5
4	8
5	3
6	8
7	
8	4
9	3
10	=SUM(A2:A9)

Row 7 is hidden; if you did not notice and were merely checking formulas for coverage of cells, printing the document or manual selections from the spreadsheet will result in loss of records.

# Background cell color

	A
1	Example
2	2
3	5
4	8
5	3
6	8
7	9
8	4
9	
10	42

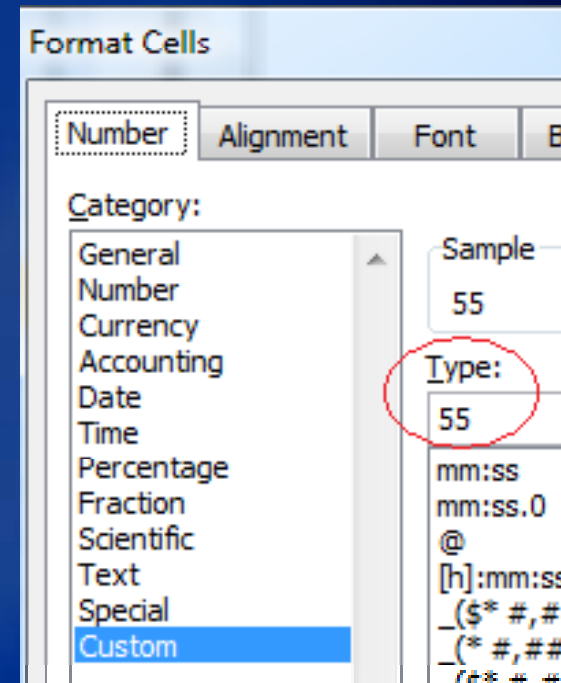
	A
1	Example
2	2
3	5
4	8
5	3
6	8
7	9
8	4
9	3
10	42

When looking carefully at the numbers to the right, you can see the number “3”. You can see it there because the highlighting of cells gives a light-blue color background to where the white font of the number can now be seen; however in normal view (as on the left), you can not see it.

# General formatting trick

	A	B
1	Example	
2	2	
3	5	
4	8	
5	3	
6	8	
7	9	
8	4	
9	3	unformatted
10	55	42

	A	B
1	Example	
2	2	
3	5	
4	8	
5	3	
6	8	
7	9	
8	4	
9	3	unformatted
10	=SUM(A2:A9)	=SUM(A2:A9)

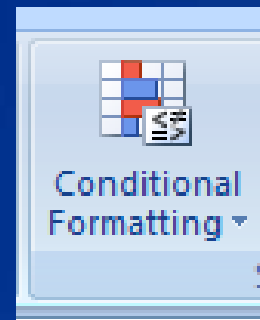


The value from the formula [=SUM(A2:A9)] appears to say “55”, but when compared to the exact formula in the next cell over, the value shows “42”. This is done by formatting the resulting cell and inputting a number in a “Custom” type.

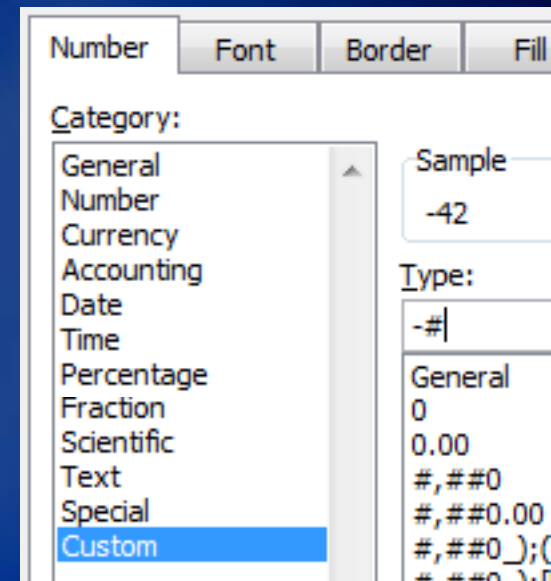
# Conditional formatting trick

	A
1	<b>Example</b>
2	2
3	5
4	8
5	3
6	8
7	9
8	4
9	3
10	-42

10 =SUM(A2:A9)



Edit the Rule Description:  
**Format values where this formula is true:**  
= \$A\$10 > 0



The sum of the numbers appears to result in a negative, but obviously couldn't be. There is not anything in the formula causing this either. Similar to the last slide, it is being caused by a conditional formatting telling the view of the result to show it with a negative.

# Hard coded numbers

	A
1	Example
2	2
3	5
4	8
5	3
6	8
7	9
8	4
9	3
10	47

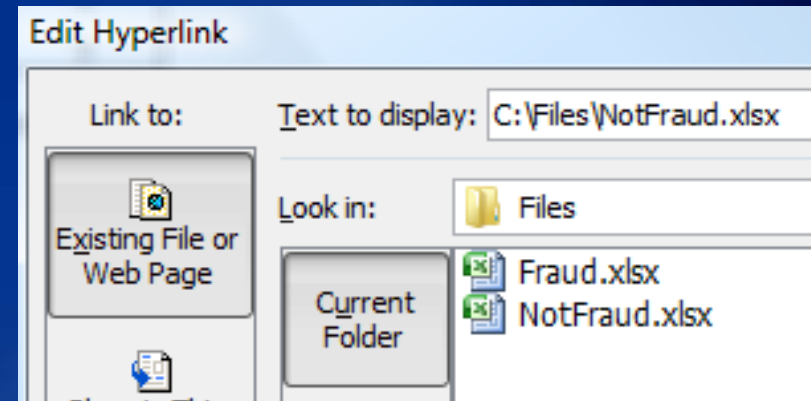
	A
1	Example
2	2
3	5
4	8
5	3
6	8
7	9
8	4
9	3
10	=SUM(A2:A9)+5

The value of 5 is added to the end of the sum. In a large spreadsheet this would be more difficult to uncover without a thorough review.

# Hyperlinks

	A	B	C	D	E
1	<b>Example</b>				
2	2				
3	5				
4	8				
5	3				
6	15	<a href="C:\Files\NotFraud.xlsx">C:\Files\NotFraud.xlsx</a>			
7	9				
8	4				
9	3				
10	49				

file:///C:  
\\Fraud.xlsx - Click once to follow. Click and hold to select this cell.



The 'text to display' can be disguised to be coming from the correct server/folder spot but actually may have been manipulated to pull from a different place.

# Other manipulation of data methods

- **Macros** – due to complexity of scripting for macro creations, it is likely a challenge for the average individual / Excel-user to fully understand what the macro is actually doing.
- **Sort data** to rearrange specific inputs – By sorting only one column (ignoring pop-up warnings from Excel), values assigned to one parameter will likely be exchanged for another.
- **'Wrong' spreadsheet** uploaded to system – With the weak controls around spreadsheets, even if one is made with no errors (or fraud for that matter), it is possible that an individual can upload a completely separate spreadsheet.

# Why does spreadsheet fraud occur?

## What spreadsheets typically do not offer:

- Strong internal control environment
- Procedural standards
- IT accountability

## What spreadsheets do offer:

- Ease of use
- Fast processing
- Flexibility to alter to needs
- Low cost

# Why does spreadsheet fraud occur?

- **Spreadsheets are generally not created with**
  - Diligent requirements
  - Code review
  - Testing process

(Source: <http://accounting.smartpros.com>)



# Current detection and prevention techniques

# Current detection and prevention techniques

**Raise your hand if ...**

**You feel that your organization has sufficient controls and/or procedures in place to audit spreadsheet contents and usage?**

# Current detection and prevention techniques

- **Spreadsheet applications such as Excel offer some built-in techniques to detect fraudulent behaviors:**
  - using manually built scripts/macros
  - viewing small spreadsheets where it is feasible to remove all formatting and see all formulas efficiently (ex. remember the highlighting of cells to see ‘white text’)
  - dependent and precedent auditing to show formula sources

# Current detection and prevention techniques

- **Technologies:**

- Various products in the market exist that will systemically run through your spreadsheets and return a report on where known 'issues' exist.
- And some that may assist in managing your spreadsheets (including user access, change management, etc)

- **Companies may maintain a log book or inventory of spreadsheets being used in critical processes such as financial reporting**

# Current detection and prevention techniques

## Critical controls:

- Access controls – passwords / user management, etc.
- Change management controls – keeping track of changes (logs)
- Frequent backups
- Security of the network space where the spreadsheet resides

## Expected procedures:

- Document your procedures and enforce them (do not allow one-off situations)
- Ensure an independent and qualified person reviews spreadsheets
- Conduct reasonable analysis of results

# Current detection and prevention techniques

- **Alternative methods to avoid the use of spreadsheets such as:**
  - Developing pre-programmed management reports
  - Building the analysis into the company ERP system
- **Steps like this can prevent information and data from being altered and also prevent changes to the functionality of the analysis**



# Assessing the risk of spreadsheet fraud

# Some things to consider when assessing the risk of spreadsheet fraud

## What is the primary use:

- Financial analysis for decisions
- Financial reporting
- Individual performance records
- Ad-hoc analysis

## Current practices:

- How many spreadsheets are maintained and relied on?
- Does the business have procedures in place to review/audit the spreadsheets?
- How many people have access to the spreadsheets and are any access-based controls in place?



# Case Studies

# Case Study 1 – The Green Button

- Executive received inventory valuations from his various subsidiaries
- He forwarded them to his assistant
- The assistant entered them into a spreadsheet and ran a macro that was created by the executive
- The assistant pressed The Green Button
- The macro manipulated the valuation of inventory by moving any losses into a 'bucket account' and then reallocated the sums to one of the company's hundreds of stores in the form of increased inventory costs.

# Case Study 1 – The Green Button

- **Financial statements were produced off the new numbers**
- **How was the fraud detected?**

# Case Study 1 – The Green Button

- **Internal Audit detected the fraudulent activity several years after it started by comparing inventory levels at several stages of the quarter-end close process to the information in the spreadsheet and discovered discrepancies.**
- **The assistant indicated that she was not aware that she was participating in a fraud when she was performing the tasks she was asked to do.**

## Case Study 2 – The 17<sup>th</sup> Floor

- **Information from article in FinancialTimes.com, September 4, 2009**
  - Investigators believe that Bernie Madoff used historical stock trading data to create fictitious transactions
  - Bernie Madoff allegedly only traded in blue chip stocks, therefore, trade information was readily available
  - He looked at past transactions and worked backwards to achieve his desired gain (for example 1 percent)
  - He used spreadsheets to update his clients accounts to divide the predetermined gains among them
  - Then fictitious trade confirmations were created

## Case Study 2 – The 17<sup>th</sup> Floor

- How was this fraud perpetrated for so long?
- According to the [FinancialTimes.com](#) article:
  - access to the 17<sup>th</sup> Floor in the building where Madoff operated was heavily restricted
  - The people working on the 17<sup>th</sup> floor were not professional stock traders who may have questioned and discovered Madoff's scheme
  - There is evidence that incorrect stock prices were used by Madoff and a professional trader would have likely noted that certain high profile stocks did not trade at those prices



**Questions?**



## **Presenter's contact details**

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