

# The Subversive Spreadsheet

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“The personal computer has allowed humankind to make more and bigger mistakes than any other invention in history, with the possible exceptions of tequila and handguns” Technology Magazine, 1994

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## Why “The Subversive Spreadsheet”?

- Academic Research shows
  - 25 - 80% error rate
  - 20 - 30% have errors even after testing / debugging
- UK TAX Experience indicates
  - > 10% in error
  - 70 - 80% high risk applications have errors

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## Spreadsheet Risk Areas

- Uncontrolled Development
  - Design Errors
    - Mechanical
    - Domain
  - Poor Documentation
- Uncontrolled Use
  - Changes Saved ?
  - Overwritten Cells
- Difficult to Audit
- Deliberate Manipulation

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## Uncontrolled Development

- "Traditional" Development
  - Analyst
  - Programmer
  - Input Staff
  - Data Control
  - Users

**Check each other & the data**  
Still gives a 5% error rate
- Spreadsheet
  - Users

**Who Checks?**  
Enormous error rate

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## Uncontrolled Development

- Errors in design of worksheet
  - Has the user programmed the worksheet to do the right things ?
  - Has the user included & updated the key variables ?
- DOMAIN errors
  - 40% - 55% undetected

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## Uncontrolled Development

- Errors in design of worksheet

- Domain Errors (Has the user programmed the worksheet to do the right things with the right constants?)
- Mechanical Errors
  - Are all the Calculations Correct ?
  - Do the formulas refer to the right numbers ?
  - Are all the numbers reflected in the totals ?

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## Uncontrolled Development

- Hidden Areas

- You can hide
  - Individual Cells
  - Ranges of cells
  - Whole Columns
  - Whole Worksheets
  - Whole versions or Scenarios

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## Uncontrolled Development

- Poor Documentation

- What Happens when the designer of a complex worksheet leaves ?
- Or when changes need to be made....?

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### Uncontrolled Use

- Figures may be Changed without being Saved
  - Is the worksheet a "What-If" Calculation ?
  - Is What you see on the print what you get on the disk ?
  - Is Recalculation set to manual ?

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### Difficult to check

- In Experiments...
  - 40-54% of errors **not** found
- How do you .....
  - Check a formula like  
123-456+7909+546756+345678  
(=900010)
  - Keep track of Multi-Page or multi-file applications?

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### Deliberate Manipulation

- How do we spot (right figure - 1,000) on a printout ?

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### Beware Of Spreadsheets!

- Most large spreadsheets will contain errors (Prof. Ray Panko, University of Hawaii, 2000)
- One error in a Spreadsheet will subvert **all** the controls in **all** the systems feeding into it

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### Why does this happen ?

- Human Nature
  - Hunter-Gatherer Ancestry
- Human Memory Capacity
  - $7 \pm 2$  simultaneous concepts
- Human Over-Confidence

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### What's been done about the problem ?

- Publicity
  - Papers and Articles since at least 1983
- Audit Tools
  - Spreadsheet Auditor
  - Cambridge Spreadsheet Analyst
  - Spreadsheet Professional
  - SpACE
  - Audit tools in major spreadsheets
- Development Tools
  - OAK



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- Founded 2000
- First International framework for research
- Five successful Conferences
- Getting to Regulators
  - Financial Services Authority
  - Tax Authorities
- Getting to trainers...
  - Academia
  - ECDLF

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### Beware Of Spreadsheets!

- You **CAN** counter these Risks...
- Prevention
  - Using & promoting good practice & standards in your organisation's spreadsheets
- Detection & Correction
  - Testing and Auditing

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### Some Recent Examples from [www.eusprig.org](http://www.eusprig.org)

- Allied Irish Bank / Allfirst
  - 2002, US\$691.2 Million
- Fannie Mae
  - 2003, US\$1.136 Billion
- MCI Billing
  - 2003, US\$2.1 Million
- TransAlta Power Hedging
  - 2003, US\$24 Million
- Toledo University
  - 2004, US\$2.4 M

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## Allied Irish Bank / Allfirst

- Cause
  - Fraud involving (among other things) falsification of spreadsheets used for monitoring alleged perpetrator's work
    - Transaction entries in Value At Risk spreadsheet
    - Exchange Rates ostensibly downloaded into spreadsheet from Reuters on-line feed
- Impact
  - Total US\$691.2Million
  - False Bonus US\$549,000 (not all paid)

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## Allied Irish Bank / Allfirst

- Detection
  - False entries – by accident when fraud already detected
  - False exchange rates – manual spreadsheet review by internal audit
- Prevention
  - Don't believe spreadsheets !
  - Monitoring / checking regularly
  - Source documents : spreadsheet check would have found false transactions
  - SpACE would have found the false rates

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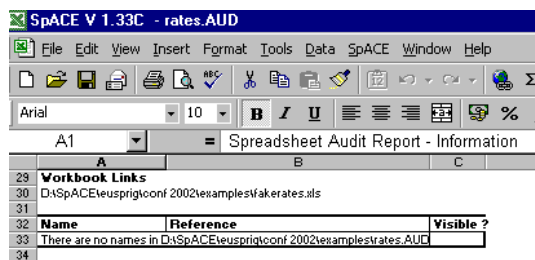
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## Allied Irish Bank / Allfirst

- Audit Tools would have found the Existence of Links....



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## AIB / Allfirst

- .And highlighted them

Country	Currency	1=
Argentina	ARS	5.3007
Australia	AUD	0.6314
Indonesia	IDR	17797.5
Iran	IRR	2.5672
Italy	EUR	1.5672
Japan	JPY	135.272
South Korea	KRW	1033.88

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## Allied Irish Bank Outcome

- Rusnak was sentenced in January 2003
  - 7 ½ years in prison
  - 5 years' probation on release
  - Repay US\$ 691 Million



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## Fannie Mae Balance Sheet

- Amended press release about third quarter results...
- Errors in reported unrealised gains...
  - Securities \$1.279 Billion
  - Other comprehensive income \$1.136 Billion
- Total shareholder equity out by \$1.136 Billion
- Cure ? CHECK, CHECK, CHECK



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### MCI WorldCom

- Alleged fraud against US government
- Invoices summarised on spreadsheet....
- ...amounts overstated by \$2.1 Million
- History of "padding" allegations
- Cure – DON'T Trust other peoples' spreadsheets



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### TransAlta

- US\$ 24 Million SNAFU in power transmission hedging
- Cut-and-paste error
- Cure ? CHECK, CHECK and CHECK again.



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### Toledo University

- Showed Increase in student numbers instead of 10% decline...
- Overestimated Enrolment and therefore revenue..
- Error in formula by employee..
- Cure
  - Train the users
  - CHECK !!!



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### Common Threads

- Lack of checking until it was too late
- Lack of control over development
- Lack of checks within the spreadsheets used
- Poor training of users..
- ...In fact the usual suspects

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### Finding Out More

- Ray Panko's Spreadsheet Research website  
[www.cba.hawaii.edu/panko/ssr/](http://www.cba.hawaii.edu/panko/ssr/)  
If it's not here, there's a link to it from this site
- European Spreadsheet Risks Interest Group  
[www.EuSpRIG.org](http://www.EuSpRIG.org)
- PWC *Spreadsheet Modelling Best Practice*  
[www.pwcglobal.com/uk/eng/about/svcs/bd/pub.html](http://www.pwcglobal.com/uk/eng/about/svcs/bd/pub.html)

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