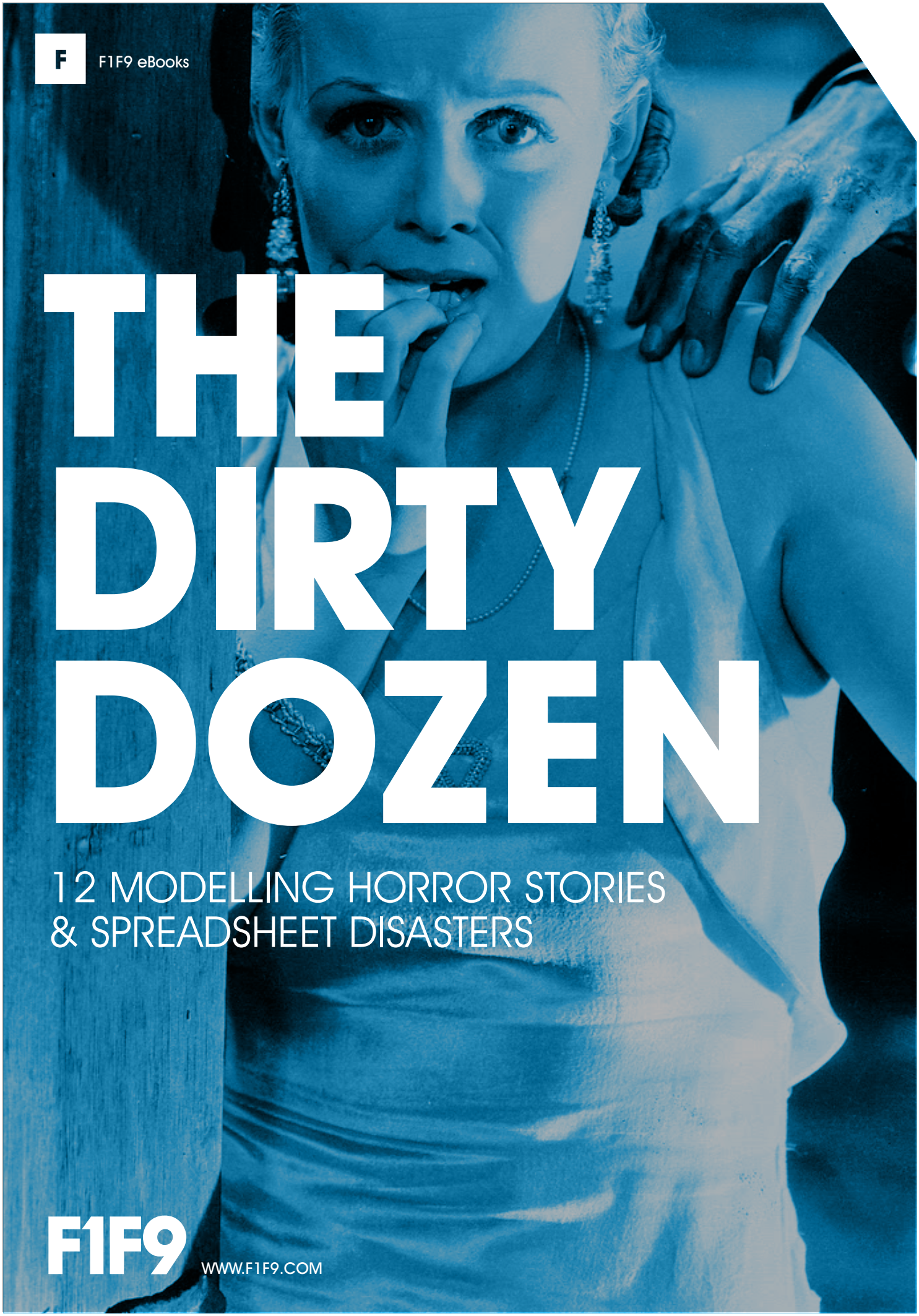
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THE DIRTY DOZEN
12 MODELLING HORROR STORIES & SPREADSHEET DISASTERS
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SPREADSHEET DISASTERS...
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6 REASONS
TO CARE ABOUT SPREADSHEET ERRORS

Your business relies on information in spreadsheets and financial models to make key business decisions.	This guide will give you an idea of some of the things that can go wrong with spreadsheets and how to prevent them.
These problems are widespread.	It is reported that close to 90% of spreadsheets contain errors and that approximately 50% of spreadsheet models in use operationally in large businesses have material defects.
The impact can be huge: into £billions.	Errors are not just costly in terms of time and money wasted but also lead to damaged reputations, lost jobs and disrupted careers.
Errors happen easily.	Spreadsheeting software, and for most people this currently means Microsoft Excel, is flexible and easy to use. But dangers lie in this freedom, particularly if spreadsheets are large and complex, more so if a business is not using standards and procedural controls.
Forewarned is forearmed.	If you are responsible for financial control in your organisation, it is your responsibility to take action to avoid these sorts of problems. By reading this guide you can learn what happens when things go wrong and receive advice on how to avoid this happening
These are only the reported horror stories.	Imagine how many problems there are that receive no publicity at all. We hope that by exposing these issues that it will encourage businesses to be more open about these problems and take prompt action to avoid them.

This guide may help you put the case to your boss that your business needs to invest in better spreadsheeting control through use of standards and procedures.

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Useful, practical information about FAST financial modelling, managing modelling projects and good modelling practice.

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Targeted at, but not exclusive to, banking and advisory practice areas, exploring modelling topics like credit analysis, debt structuring etc...

PF

PROJECT FINANCE

Focussing on the kind of transactional modelling typically associated with the development of infrastructure, PFI and PPP projects.

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Useful information and practical guidance on the apllication of modelling discipline and standards to improve business decision making.

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Insight and practical guidance on the aplication of good modelling practice specifically related to these often complicated business areas.

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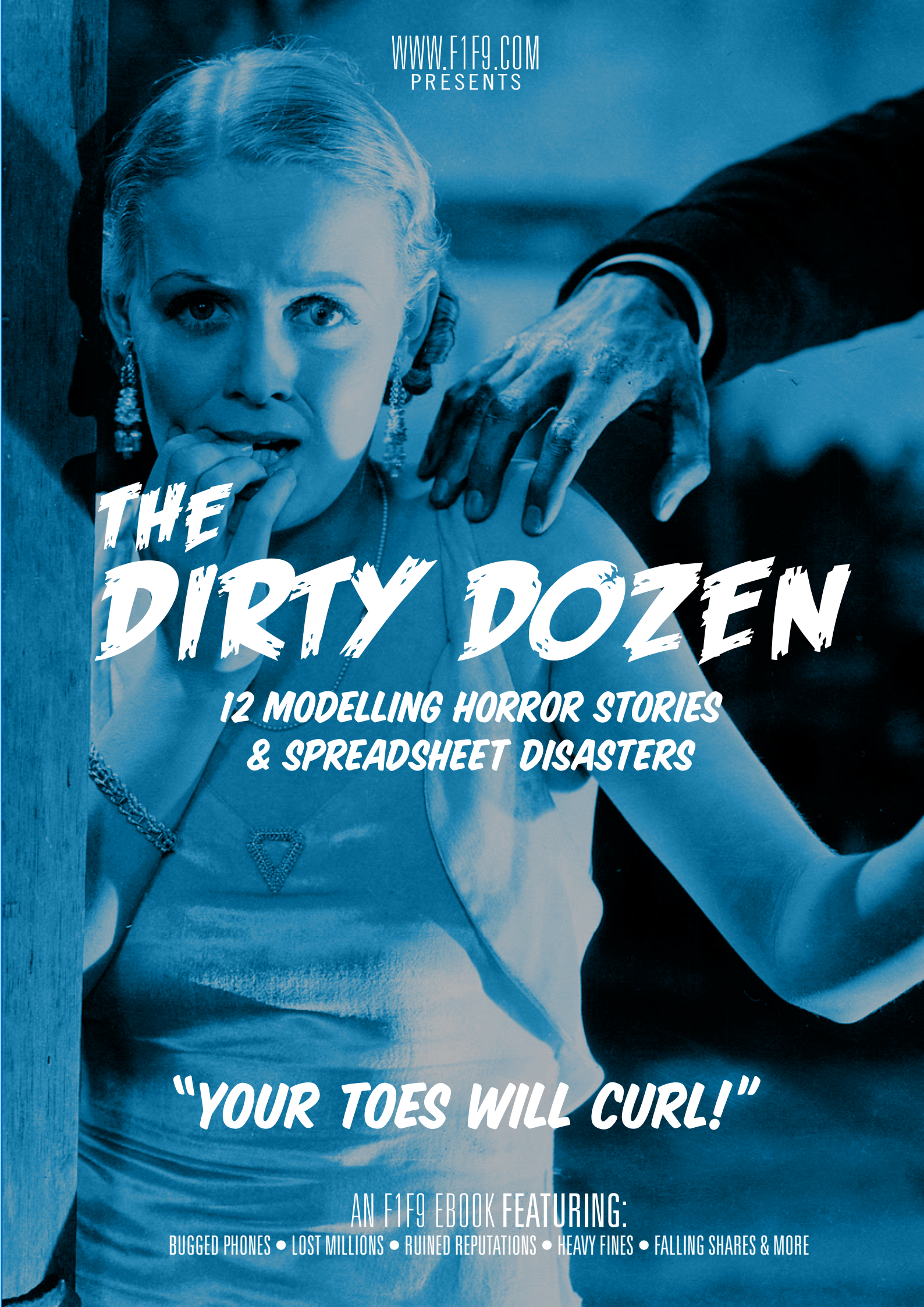
SPREADSHEET ERRORS HAVE BEEN GOING ON FOR YEARS WITH IMPACTS IN THE £BILLIONS... IT HAS BEEN ESTIMATED THAT 88% OF SPREADSHEETS HAVE SOME SORT OF ERROR IN THEM.



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ABOUT F1F9

F1F9 provides financial modelling and business forecasting support to blue chip clients and medium-sized corporates. We also teach financial modelling skills to companies around the world. Our clients have access to high quality, low-cost modelling support delivered by 40 professional modellers.

F1F9 co-developed the FAST Standard that allows modellers and non-modellers to work together and understand financial models. Transparency is the core value that drives our modelling and our business activities.

ABOUT THE AUTHOR

Robin Aitken is an Associate Director who leads the Corporate and Private Equity sectors at F1F9. He helps businesses improve their performance through better use of management information. As an experienced Finance Director he has used models for raising funds, reporting and forecasting financial performance. He understands the challenges and importance of administering spreadsheet models accurately and efficiently. When not working he likes to walk his dog, read books and get together with friends and family for good food and trips to the movies.

INTRODUCTION

The recent spreadsheeting gaffe by the eminent Harvard economists, Reinhart & Rogoff received a large amount of press attention. This was not only embarrassing for them, but could have deeper consequences for many others as the resulting austerity policies followed by many Governments were apparently based on their analysis to some degree.

This story, which features in our Dirty Dozen of financial modelling horror stories and spreadsheet disasters, is far from being the only time that basic mistakes in spreadsheets have caused problems. Spreadsheet errors have been going on for years with impacts in the £billions. Indeed, it has been reported that 88% of spreadsheets have some sort of error in them and that approximately 50% of spreadsheet models in use operationally in large businesses have material defects.

This all seems a little surprising given that Microsoft Excel has been around for over 25 years. It is the most widely used spreadsheeting software in the world, being relied on by virtually every organisation that has to perform any complex calculation. Despite Excel's ubiquity and its importance in adding up the figures that underpin our day-to-day affairs, there are no widely accepted standards for its use. Acceptance of such standards could help avoid some of the errors that take place when modellers and spreadsheet jockeys mess up.

To illustrate the scale of the problem F1F9 has compiled its top 12 financial modelling horror stories and spreadsheet errors of the last 25 years. It is worth considering that this list only includes problems that have received publicity. There are many, many more that have gone unreported: costing money, wasting time and impacting people's lives.

Once you've read the list you might want to consider for a minute what is preventing your business, or one of your clients, from becoming a future entry. To bring your blood pressure down, you can then take a look at our suggestions of preventions and cures to these modelling nightmares and spreadsheet problems. One reaction that you may have is to avoid Excel spreadsheets altogether. Although there are software tools out there which are effective in the right place, we think that the flexibility and ease of use of Excel make it the right choice in so many situations. This is why it is so prevalent. By adopting the right procedures and a standard approach to operating spreadsheets you will increase productivity and reduce risk, making it a safe, flexible and efficient option.

We hope that you enjoy our Dirty Dozen and also learn from it.

We would like to express our thanks to EuSpRiG, the European Spreadsheet Risks Interest Group. EuSpRiG maintain their own list of Modelling horror stories: see http://www.eusprig.org/horror-stories.htm. With the exception of item 7 UK Department of Transport and 1 on Harvard University, all stories and sources in our list have been researched via the EuSpRiG list. These news stories illustrate common problems and errors that occur with the uncontrolled use of spreadsheets, and EuSpRiG include comments on the risk and possible avoidance action.

THE DIRTY DOZEN

F1F9'S FAVOURITE FINANCIAL MODELLING HORROR STORIES & SPREADSHEET DISASTERS OF THE LAST 25 YEARS.

12

Organisation:	**Oxford University**
Description:	**Entrance interview chaos after spreadsheet muddle**
Value:	**Unknown**
Impact:	**Delays in allocating students interview places**
Date:	**December 2011**

Administrators at Oxford University confused history entrance candidates' registration numbers with their marks in a spreadsheet leading to delays and upheaval in arranging entrance interviews.

http://www.cherwell.org/news/academic/2011/12/07/test-errors-impede-history-applications

11

Organisation:	**MI5**
Description:	**Spreadsheet formatting error leads to bugging muddle**
Value:	**Unknown**
Impact:	**Bugging the wrong phones**
Date:	**2010**

In their Communication Commissioner's Annual Report for 2010 MI5 confessed that they had bugged 134 of the wrong phones inadvertently owing to a misunderstanding about the format of numbers entered into a spreadsheet.

http://national-security.governmentcomputing.com/news/2011/jul/01/mi5-data-collection-errors

10

Organisation:	**London 2012 Olympics**
Description:	**10,000 tickets over-sold for synchronised swimming event**
Value:	**Estimated £0.5m**
Impact:	**Cost and hassle of contacting ticket-holders to re-assign tickets**
Date:	**January 2012**

A simple input error in a spreadsheet led to 10,000 tickets being over-sold for synchronised swimming events at London 2012. The box-office organisers did not spot the mistake for some months. At some expense they then needed to contact these 10,000 ticket-holders to arrange tickets for alternative events.

http://www.telegraph.co.uk/sport/olympics/8992490/London-2012-Olympics-lucky-few-to-get-100m-final-tickets-after-synchronised-swimming-was-overbooked-by-10000.html

9

Organisation:	**Mouchel, UK support services provider**
Description:	**Spreadsheet error of £4.3m in pension fund valuation**
Value:	**£4.3 million**
Impact:	**CEO resigns, profits downgrade of £8.6 million, share price collapse**
Date:	**October 2011**

A £4.3m error in a spreadsheet prepared by an independent firm of actuaries led to a profits downgrade of £8.6m. This unwelcome announcement led to the resignation of the CEO and the share price falling by a third.

http://www.accountingweb.co.uk/article/accounting-error-leads-mouchel-meltdown/519682
http://www.express.co.uk/posts/view/276053/Mouchel-profits-blow

8

Organisation:	**C&C Group, Irish drinks manufacturer of Magners cider**
Description:	**Correction of investor announcement: revenue down—not up**
Value:	**Estimated at £9 million**
Impact:	**Share price fell by 15%, a reduction in market capitalisation of over £170 million**
Date:	**July 2009**

C&C Group, a drinks business had to change an investor announcement made a week earlier to explain that their total revenue had actually fallen by 5% not risen by 3% as first announced. The change led to a fall in the share price of 15%. The error was traced to incorrect calculations in a number of spreadsheets.

http://drinksdaily.com/2009/07/cc-group-admit-to-mistake-in-revenue-results/

7

Organisation:	**UK Government's Department of Transport**
Description:	**West Coast Mainline Rail Franchise Bid**
Value:	**Not yet known but latest estimate of at least £50million**
Impact:	**Cost to UK taxpayer in excess of £50 million & damage to First Group's business plan**
Date:	**October 2012**

A new financial model had been deployed by the Department of Transport to assess bids by rival companies looking to operate the UK West Coast Rail Line. The Laidlaw Report found that fundamental mistakes in the communication of assumptions in the Department's model led to rival bids being inconsistent and incorrect conclusions being drawn about the relative merits of the bids. Having awarded the new franchise to run the railway to First Group, a change in operator from the incumbent Virgin Trains, the UK Government was forced into an embarrassing and costly climbdown. The whole franchise tender is being re-run while Virgin have kept the franchise for another 4 years. Total cost to the UK taxpayer is estimated to be in excess of £50million.

http://www.bbc.co.uk/news/uk-politics-21577826

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/29866/report-of-the-laidlaw-inquiry.pdf

6

Organisation:	**The King's Fund, healthcare think tank**
Description:	**Revision to critical analysis of cuts in Welsh NHS spending**
Value:	**Estimated at approximately £130 million, 2.4% of annual Welsh health spend**
Impact:	**Embarrassment and reputational damage when the King's Fund had to apologise and revise its announcement of % reduction of health spend downward by 2.4%**
Date:	**May 2011**

The respected health think tank, the King's Fund, had to announce a revision to their critical analysis of cuts in NHS spending in Wales on finding a calculation error in a spreadsheet. Although cuts of 8.3% remained, the reduction was 2.4% less than the 10.7% originally announced, lessening the impact of their critique & leading to red faces all round.

http://www.leftfootforward.org/2011/05/kings-fund-apologise-for-error-on-health-spending-in-wales/

5

Organisation:	**AXA Rosenberg, global investment manager**
Description:	**The cover-up of a spreadsheet error led to a US$242 million fine**
Value:	**£150 million**
Impact:	**Cover up, fine and reputational damage**
Date:	**February 2011**

A spreadsheet error caused an over-estimate of client investment losses. Management then did not declare this mistake. As ever, it was the cover-up that got them, leading to a fine of US$242million for this global investment manager.

http://www.businessweek.com/ap/financialnews/D9L5I5I00.htm

4

Organisation:	**JP Morgan Chase**
Description:	**Mis-statement of Value at Risk for Basel II.5 valuations.**
Value:	**Hard to say, but at least £250 million**
Impact:	**Reputational damage and loss of confidence in banking practices**
Date:	**January 2013**

Reliance on the work of one over-worked spreadsheet modeller led to JP Morgan Chase mis-stating value at risk presented by trades in their Basel II.5 model by at least an estimated £250 million. This problem highlighted a lack of review and the risks of having a complex model that is only understood by one person.

http://files.shareholder.com/downloads/ONE/2261602328x0x628656/4cb574a0-0bf5-4728-9582-625e4519b5ab/Task_Force_Report.pdf

http://ftalphaville.ft.com/2013/01/17/1342082/a-tempest-in-a-spreadsheet/

3

Organisation:	**Fidelity Magellan Fund**
Description:	**Simple omission of a minus sign led to over-stating of capital gains**
Value:	**£1.6 billion (USD 2.6 billion)**
Impact:	**Failure to make promised distribution to investors with damage to reputation of this global investment manager**
Date:	**January 1995**

It beggars belief that such a large error could arise by the simple omission of a minus sign in an accounting calculation. But that is exactly what happened, meaning that the President of the Fidelity Magellan Fund had to write to shareholders explaining that an expected distribution could not be made owing to a hitherto undetected spreadsheet error.

http://catless.ncl.ac.uk/Risks/16.72.html#subj1

2

Organisation:	**The US Federal Reserve**
Description:	**A spreadsheet error in calculation of Consumer Revolving Credit**
Value:	**Up to £2.5 billion (USD 4 billion)**
Impact:	**Unclear, but it does not build confidence in the financial control practices of this organisation at the heart of US Government**
Date:	**August 2010**

A vigilant reader of the backup information to the Fed's August 2010 Consumer Credit statement spotted an error in a spreadsheet that was worth up to US$4bn. Although arguably immaterial in the context of the US consumer credit mountain, it was worrying to think that an organisation at the heart of the world economy could allow an error of this size to go unnoticed.

http://www.zerohedge.com/article/blatant-data-error-federal-reserve

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THE MONSTER OF ALL SPREADSHEET BLUNDERS

1

Organisation:	**Harvard University**
Description:	**A spreadsheet error in influential analysis of international Government debt to GDP ratios**
Value:	**Hard to assess. Latest UK Government cuts alone are worth £10 billion**
Impact:	**This flawed research has been quoted as a basis for various European Government austerity measures, which are having profound impacts on millions of its citizens. Although there is some debate about the why's and wherefore's of the economics, the discovery of the spreadsheet error has been well publicised and is highly embarrassing for the 2 eminent academics involved, Carmen Reinhart & Kenneth Rogoff.**
Date:	**April 2013 (original research published 2010)**

A review by a PhD student of the analysis performed by leading Harvard economists in an influential paper on Government debt to GDP ratios found basic mistakes in their spreadsheets. This paper had been used to back up many Governments' decisions, including in the UK, to undertake austerity programmes to cut levels of Government spending. Reinhart & Rogoff have acknowledged the error and in so doing have called into question the causal link they had made between the two. While the debate around the economics continues, the spreadsheeting error has done nothing for the reputations of these two eminent economists.

http://www.washingtonpost.com/blogs/wonkblog/wp/2013/04/16/is-the-best-evidence-for-austerity-based-on-an-excel-spreadsheet-error/

http://www.newyorker.com/online/blogs/johncassidy/2013/04/the-rogoff-and-reinhart-controversy-a-summing-up.html http://blogs.reuters.com/lawrencesummers/2013/05/06/the-lessons-of-reinhart-rogoff/

PREVENTION & CURES

So we've taken a look at the dark side and seen what happens when spreadsheets go wrong. We don't want to stand and snigger as these sorts of errors are all too easy to make. We want to help by explaining what can be done to stop your business from featuring in the next instalment of this book. In fact we don't want there to be a next edition!

Preventions and cures can be grouped into 3 categories:

1. **Adopt a standard approach**
2. **Implement clear processes**
3. **Use appropriate skills.**

These are explained in more depth below:

1. ADOPT A STANDARD APPROACH

There are just about as many different approaches for designing spreadsheets as there are spreadsheets themselves. This is because nearly everyone who builds a spreadsheet is self-taught and is applying a variety of different techniques that they have picked up along the way. The resulting diversity of designs makes it hard for anyone picking up a reasonably complex spreadsheet that has been built by someone else to start working with and check it for errors.

If everyone in your organisation were to follow the same standard approach to their spreadsheet design, imagine how much easier it would be for them to pass around and check each other's work.

The FAST Standard for spreadsheet design has been developed for exactly this reason. As in most walks of life, when it comes to spreadsheet design, the simpler the better. The FAST Standard encourages a Flexible, Appropriate, Structured and Transparent approach that creates understandable spreadsheets and reduces errors. Adoption of this standard increases efficiency in build-time and subsequent use of the resulting model.

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2. IMPLEMENT CLEAR PROCESSES

In some ways clear processes are an extension of the standard design approach, but they are worthy of their own category. The purpose is to make spreadsheet models as understandable and secure as possible. To operate a healthy spreadsheet environment in your organisation you should have processes that are followed by everyone for:

Clearly defining assumptions.
A spreadsheet can be perfectly wrong if it works from incorrect assumptions. A clear process for documenting and checking assumptions to commercial reality should be established.

Version control.
Errors happen when more than one version of the truth gets saved. Make sure that there is clear responsibility for control of the spreadsheet at any one time with a protocol for naming files.

Back-up.
Problems occur when either no back-up or only the wrong version of a spreadsheet can be found. Make sure that work is saved in a systematic manner in a secure location.

Review.
Even when a lot of care has been applied to the spreadsheet build and a standard design approach has been taken, errors happen. It's all too easy to type in the wrong data or copy the wrong formula into a spreadsheet. To spot these errors good review is vital including: commonsense checks of commercial logic; reconciliation of key numbers (e.g. cashflow) back to a known or likely outcome; using graphs to quickly check rows of figures for weird outliers; taking a standard design approach makes review easier. There are software packages such as the Operis Analysis Kit, http://www.operis.com/oak.htm, to help find errors.

Collaborate.
Having more than one person involved in building and reviewing a spreadsheet can be efficient and iron out problems. This reduces the risk of a 'single point of failure' where there is only one spreadsheet engineer who understands how a particular model works. This approach is only possible where a standard design approach is used.

Communicate regularly.
Problems can occur when a spreadsheet build is protracted and diverges from commercial reality. Regular communication between the spreadsheet engineer and commercial decision -makers should take place to avoid this problem.

To learn more about how we approach the management of model build assignments, check out our free ebook *10 Principles of Agile Financial Modelling*

3. USE APPROPRIATE SKILLS.

Most people who build and operate spreadsheet models are largely self-taught. Some have developed their skills through training and on-the-job experience to become spreadsheet experts.

To build and operate robust and efficient spreadsheet models appropriate for your business means it is important that you deploy the right mix of expert skills. These skills include:

Commercial analysis and review:
This skill set requires a good knowledge of the business and its financial dynamics. Specific skills include: an ability to breakdown the business into its key drivers and outputs; drafting commercial requirements; knowledge of existing information systems and processes; review of modelling outputs to confirm that these fit the commercial logic of the business.

Conceptual design:
This is the skill to take the commercial requirements for a business and design the structure of a model, mapping the key logic flows that it will contain.

Spreadsheet engineering:
This is the expertise to actually construct the spreadsheet cell-by cell and formula-by-formula.

Model operation:
This requires sufficient proficiency in Excel to upload and input data and run update procedures for the spreadsheet model that has been created.

Division of labour:
It is advisable, if not always mandatory, to have some division of labour between skills. It is best if the person responsible for performing commercial analysis and review is different to the person designing and engineering the spreadsheet. This allows for a more objective check on the accuracy of results and, possibly, a review of the techniques applied.

Recruit, train or outsource:
Many of these skill sets are not needed on a full-time basis. It can make commercial sense to outsource some of these activities when they are needed or internal capacity for them is tight. By outsourcing, you only pay for the skills when you need them and you can focus on developing your staff to be excellent at running your business.

Find out more about how F1F9's team of dedicated financial modellers can help you improve your organisation's spreadsheet modelling

DOWNLOAD OUR MODEL BUILD BROCHURE HERE

REFERENCES:

References to websites reporting each of these stories have been quoted under each item. With the exception of items 7 UK Department of Transport and 1 on Harvard University, all stories and sources have been researched via http://www.eusprig.org/horror-stories.htm. These are news stories collated by the European Spreadsheet Risks Interest Group. They illustrate common problems and errors that occur with the uncontrolled use of spreadsheets, with comments on the risk and possible avoidance action.

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