Social Media for the Busy Scientist
Felienne Hermans (@felienne)
In this slidedeck I’ll help you, the busy scientist to share your ideas on social media.
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If you are a scientist, you’ll probably feel like this guy ->

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Papers, reviewing, grant proposals, teaching. No time for anything, let alone Twitter.

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Twitter is not the easiest social network to start with.
By the end of this deck, you’ll know 3 easy ways to start on social media
By the end of this deck, you’ll know 3 easy ways to start on social media. And the best thing about it these tips: you already did most of the work anyway.
Quickstart 1) Slides!
If you are a researcher, you make slides. Quick start number 1 is to just put those slides online.

As you have already made the presentation, it is hardly any additional work to put them online.
Here are the slides that summarize my PhD dissertation. I have put what I say during the presentation in a grey overlay (just as with this presentation).
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Funny story: I wasn’t hired to research spreadsheets at all. When I started my PhD project, I was supposed to research the gap between business users and programmers.
After you have added the notes, just upload the presentation to slideshare (or speakerdeck) and you are good to go.

So now you might wonder: does this work?

**Analyzing & visualizing spreadsheets**

Felienne Hermans (@felienne)
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Also, many people have liked, tweeted and shared it.
So, you see: content is king!

Don’t worry about tweets and likes. If you share nice content, ‘social’ will follow.

<- this is our actual king, King Willem-Alexander during his coronation last April.
The slides are not a summary of my thesis.

The basic quick start is just to upload your slides with notes.

But if you want to go a bit further, think about adding a storyline to your presentation. Always a good idea, but especially for slides you put online, it is useful to think about engaging your audience.
The slides are not a summary of my thesis.
Look at the difference between the first page of my dissertation and the first slide of my presentation.

The slides are not a summary of my thesis.
Look at the difference between the first page of my dissertation and the first slide of my presentation.

The first slide tells a story: ‘I wasn’t hired to work on spreadsheets’.

It makes you wonder how on earthe I ended up writing a dissertation on them.

The slides are not a summary of my thesis.
Tip 1: story, story, story, story
Quickstart 2) Progress reports
Quickstart 2 concerns progress reports. If you are involved in any projects, you’ll probably have to write progress reports (that no one reads...)

Put them online to make writing more fun, this makes awesome social content to keeps your fans updated.
Here’s an example of one of our project kickoff meetings.

The website is nothing fancy, just a simple Wordpress that you have up and running in 5 minutes.
The next step is to build an audience for these reports. You can create a newsletter (mailchimp is nice for this) and have people subscribe on your website.
The next step is to build an audience for these reports. You can create a newsletter (Mailchimp is nice for this) and have people subscribe on your website.

LinkedIn is also great for building an audience. If people connect with you, ask them whether they want to receive updates on your research and place them on your mailing list too.
Tip 2) Build an audience
Detecting Code Smells in Spreadsheet Formulas

Felienne Hermans, Martin Pinzger and Arie van Deursen
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Abstract—Spreadsheets are used extensively in business processes around the world and just like software, spreadsheets are changed throughout their lifetime causing maintainability issues. This paper adapts known code smells to spreadsheet formulas. To that end we present a list of metrics by which we can detect smelly formulas and a visualization technique to highlight these formulas in spreadsheets. We implemented the metrics and visualization technique in a prototype tool to evaluate our approach in two ways. Firstly, we analyze the Euses spreadsheet corpus, to study the occurrence of the formula smells. Secondly, we analyze ten real life spreadsheets, and interview the spreadsheet owners about the identified smells. The results of these evaluations indicate that formula smells are common and that they can reveal real errors and weaknesses in spreadsheet formulas.

Keywords—spreadsheets; code smells; refactoring;

I. INTRODUCTION

The use of spreadsheets is very common in industry. Winston [1] estimates that 90% of all analysts in industry perform calculations in spreadsheets. Spreadsheet developers are in fact end-user programmers that are usually not formally trained software engineers. There are many of those end-user programmers, more than there are traditional programmers, and the artifacts they create can be just as important to an organization as the software itself. Spreadsheets have become a standard interface for accessing, displaying and analyzing data. The data may be structured and unstructured, and may include both context of constant arguments, conditional statements and references to other parts of the software. It therefore seems logical to research what principles from software engineering are also applicable to spreadsheets.

In previous work [2] we have defined code smells between worksheets, such as high coupling between worksheets and middle men worksheets. The evaluation of those smells showed that they can indeed reveal weak spots in a spreadsheet’s design. In this paper we follow that line of thought, but focus our attention on smells within spreadsheet formulas. To that end we present an set of formula smells, based on Fowler’s code smells. We subsequently define metrics for each of the formula smells, to enable the automatic detection of the smells. We then describe a method to detect these formula smells. Our detection approach uses thresholds to divide the severeness of each formula smell into low, moderate, and high. The thresholds are based on

Theorenc we address the issue of communicating identified smells to spreadsheet users. We choose to do this within the spreadsheet itself, with a spreadsheet risk map, a colored overlay on the spreadsheet, indicating risk in the spreadsheet formulas. Finally we evaluate the catalog of smells in two ways, with a quantitative and qualitative evaluation. We perform a quantitative evaluation on the Euses spreadsheet corpus. The qualitative analysis was performed with ten real life spreadsheets and their developers from industry. With both studies we aim to answer the three research questions: R1 What formula smells are most common, and why? R2 To what extent do formula smells expose threats to spreadsheet quality? R3 To what extent are risk maps an appropriate way to visualize formula smells?

The results of these evaluations show that formula smells can indeed reveal weaknesses, and even find real mistakes in a spreadsheet. The risk maps, although not yet perfect, are a good aid in helping to locate and understand formula smells.

II. FORMULA SMELLS

We define a number of formula smells, based on the existing work in the field of source code smells, initiated by Fowler [4]. Smells in source code indicate suspicious code, which might want to refactor to improve it. Smells increase the chance of future errors. Formula smells are inspired by source code smells: they indicate formulas that are suspicious, not easy to read or error-prone. In the following we present our set of formula smells plus ways to refactor them.

A. Multiple Operations

One of the most well-known code smells is the Long Method. Inspired by this code smell, we define the formula smell Multiple Operations. Analogous to a long method, a formula with many different operations will likely be harder to understand than a shorter one. Especially since in most spreadsheet programs, there is limited space to view a formula, causing long formulas to be cut off.

A corresponding refactoring is the division of the Multiple Operations over multiple cells in a spreadsheet. For instance, instead of putting \( \text{SUM}(A1:A6) \times (B1+S)/100 \) in one cell, this could be split into two cells, one for the SUM, and one for the multiplication.
Detecting Code Smells in Spreadsheet Formulas

Felienne Hermans, Martin Pinzger and Arie van Deursen
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Abstract—Spreadsheets are used extensively in business processes around the world and just like software, spreadsheets are changed throughout their lifetime causing maintainability issues. This paper adapts known code smells to spreadsheet formulas. To that end we present a list of metrics by which we can detect smelly formulas and a visualization technique to highlight these formulas in spreadsheets. We implemented the metrics and visualization technique in a prototype tool to evaluate our approach in two ways. Firstly, we analyze the Euses spreadsheet corpus, to study the occurrence of the formula smells. Secondly, we analyze ten real life spreadsheets, and interview the spreadsheet owners about the identified smells. The results of these evaluations indicate that formula smells are common and that they can reveal real errors and weaknesses in spreadsheet formulas.

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In previous work [2] we have defined code smells between worksheets, such as high coupling between worksheets and middle men worksheets. The evaluation of those smells showed that they can indeed reveal weak spots in a spreadsheet’s design. In this paper we follow that line of thought, but focus our attention on smells within spreadsheet formulas. To that end we present an set of formula smells, based on Fowler’s code smells. We subsequently define metrics for each of the formula smells, to enable the automatic detection of the smells. We then describe a method to detect these formula smells. Our detection approach uses thresholds to divide the severeness of each formula smell into low, moderate, and high. The thresholds are based on

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The third easy quickstart are papers. You are writing them anyway. Just put a summary on your webpage and they are way more accessible than they are now. Even if you have a pdf on your website, a post is better, as it is easier to share and easier to read on mobile devices.
Detecting Code Smells in Spreadsheet Formulas

We just learned this paper is accepted at ICSM 2012.

The idea

The basic idea of this paper is to investigate whether we could apply the known code smells investigated by Martin Fowler in his book Refactoring to spreadsheet formulas. You could view a formula as a small piece of code, so it makes sense to assume this can ‘smell’ just as code can.

The smells

But, not all smells on his catalog are applicable to spreadsheets. Some, like Refused Bequest, have to do with inheritance, and that concept does not really exist in spreadsheets. And in a previous paper, we have already investigated smells between worksheets. This leaves us with the following smells that could occur in formulas:

1. Multiple Operations Analogous to a long method, a formula with many different operations will likely be harder to understand than a shorter one. Especially since in most spreadsheet programs, there is limited space to view a formula, causing long formulas to be cut off.
2. Multiple References Another code smell we use as a basis is the Many parameters code smell. A method that uses many input values might be split into multiple methods to improve readability. The formula equivalent of this smell occurs when a formula references many different other cells, like SUM(A1:A5; B7;C18;C19:F19).
3. Conditional Complexity Fowler states that the nesting of many conditional operations should be considered a threat to code readability, since conditionals are hard to read. Since spreadsheet systems also allow for the use of conditional, spreadsheet formulas are at risk of this treat too.
4. Long Calculation Chain Spreadsheet formulas can refer to each other, hence creating chains of calculation. To understand the meaning of such a formula, a spreadsheet user has to trace along multiple steps to find the origin of the data. This is a task that spreadsheet users find tedious.
5. Duplicated Formula This smell indicates that similar snippets of code are used throughout a class. This is a concept common in spreadsheets too, where some formulas are partly the same as others.

Sidenote: As you can see, I am also new to this, we all are.
Here is the first paper I put on my website, in the summer of 2012.

Sidenote: As you can see, I am also new to this, we all are.

As you can also see, this post really looks like a paper still, is even has a table. Not really for the general public yet.
Let me remind you what the general public knows about our field
If you missed it for a lack of video, this is what they say.
This is in real-time

So far, so good
I’ll create a GUI interface using visual basic to track the killer’s IP address

This is in real-time

OMG are you serious???
I’ll create a GUI interface using visual basic to track the killer’s IP address.

This is in real-time.

Tip 3) Simple is better
New paper: BumbleBee, a tool for spreadsheet formula transformations

Some spreadsheets can be improved.

While looking at spreadsheet and how they are used, over the past years, I have noticed that many users don’t make their spreadsheets as easy as they could be. For instance, they use A1+A2+A3+A4+A5 instead of the simpler SUM(A1:A5). Sometimes because they are unaware of a simpler construct, or because the spreadsheet evolved over time. For instance, in used to be A1+A2, then A3 was added and so forth. Such complex formulas were exactly the aim of our previous work on smell detection.

If you say smell, you say... refactorings!

So in order to improve spreadsheets, we and other researchers have developed a number of refactorings to improve spreadsheet formulas. Over the last few months, I have been working on BumbleBee, a tool to perform not only refactorings, but more general transformations on spreadsheet formulas.
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This is how my newest paper blog post looks like. Images, tag lines as section heads. Nothing like a paper.

I add screenshots
This is how my newest paper blog post looks like. Images, tag lines and community directly.

And communicate with the reader directly.

If you have questions, drop me an email or ask below. If you want to know more, here is a preprint of our paper about Bumblebee. A few refactorings come pre-loaded with Bumblebee, but you as a user can use our refactoring language to express your own transformations of choice.

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Absolutely, here is an installer for Excel 2010. By adding your own transformations to the worksheet transformations and hitting 'update', you can create your own rules and play around with them. This spreadsheet contains all transformations needed to migrate to Excel 2010.

Additionally, here is a refactoring guide to help you understand the transformation.

That last transformation does not look like something as section heads. Nothing like a paper.
This is how my newest paper blog post looks like. Images, tag lines as section heads. Nothing like a paper.

I add screenshots

And communicate with the reader directly.

For inspiration on how to write, I look at websites that my audience (developers) frequent for information.
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It works!

And it works. One of my most recent posts went ‘viral’ and was covered on several websites (Reddit, BoingBoing, Washington Post)
Turing Machine in Excel

It works!
It works!

Is Richmond’s mortgage seizure scheme even legal? "The arguments will now proceed to the two parts of eminent domain law: demonstrating public purpose for the takings and offering fair-value. Since this is the furthest an eminent domain case has made it, it might be useful to step back and walk through the arguments. If the case succeeds, it is likely other cities, which have been hesitant, will consider going forward." Mike Konczal in The Washington Post.

CompSci is cool interlude: Building a Turing machine in Excel.

5) What grade for America’s schools?

Do American public schools really stink? Maybe not. "The drumbeat is hard to miss: Our schools are failing. Public education is in crisis. Our students are falling further and further behind. The rhetoric comes from the left and right, from educators and politicians and lobbyists and CEOs and even Education Secretary Arne Duncan. The deep dysfunction of our public schools is said to threaten not only America’s economy but also its national security. But a vocal group of contrarians is challenging that conventional wisdom. The latest weapon in their arsenal: A new book out this week by education historian Diane Ravitch, who argues that the biggest crisis facing public education is the relentless message that public education is in crisis." Stephanie Simon
It works!

Again, likes and tweets follow content.
I promised you 3 easy ways to start social media
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Slides: you make them anyway. For level 1, just add notes and upload.
I promised you 3 easy ways to start social media:

- **Slides**: you make them anyway. For level 1, just add notes and upload.
- If you want to go the extra mile, think about what ‘story’ your presentation told and add that.
I promised you 3 easy ways to start social media

Progess reports: you write them anyway. For the basic coverage, just put them on a simple website.
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Progress reports: you write them anyway. For the basic coverage, just put them on a simple website.

Want more? Think about who you want to share those notes with and build an audience.
I promised you 3 easy ways to start social media

Papers: you write them anyway. Put a simple summary online.
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Papers: you write them anyway. Put a simple summary online.

Level 2: Make it understandable for the general public, by simplifying and looking like other magazine/blogs your audience reads.
Want to know more? Feel free to have a look at my website and imitate what you like (or comment on what you don’t)

Or send me a tweet, I’m at @felienne and also still learning.

Content is king

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