

The Typical ELN journey (In two Acts)

Act I

- Chemists are the most vocal, and can demonstrate some kind ROI
- And you can buy one! From multiple vendors!
- *Let's do that then... I'm sure once we've done that we can re-use it for our other scientists*
 - *Because they all use notebooks, right?*

Meanwhile...

Everyone else is getting on with business

Act II

- Happy chemists
- Generally, band-aided the Patent problem
- Now, we've got an ELN
 - The rest of them want one too
 - So given we've already got one
 - Easy decision?

Typical Reactions

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- “Very Expensive”
- “You’ve made Excel harder to use”

What's going on?

Why an ELN?

- Because the existing solution sucks
 - Cut & Stick computer printouts
 - Can't search (like Google)

Why an ELN?

- “Easily use computer applications in the course of our work”
- “Search our work”
- “See other people’s work”
- “If our discipline does special stuff, deal with that”

The “special stuff”

- Organic Chemistry has a clear, widely-used notation which rewards specific support
 - There’s a Cheminformatics industry!
- Other disciplines do too
 - But they’re much more specialised
 - Can often be represented as text of graphics

What they didn't say

- “Replace the applications I use day-to-day”
 - In fact, they want an ELN to make using those easier!
- “Make my life more complex”
- “Give me stuff I don't need”

The result

- Chemistry-centric ELNs don't tend to be well received outside of Chemistry
- Frustrating for involved

Note

- Science is very broad
- I am generalising
- Your mileage may vary
- I'm just trying to help people think

Science is huge

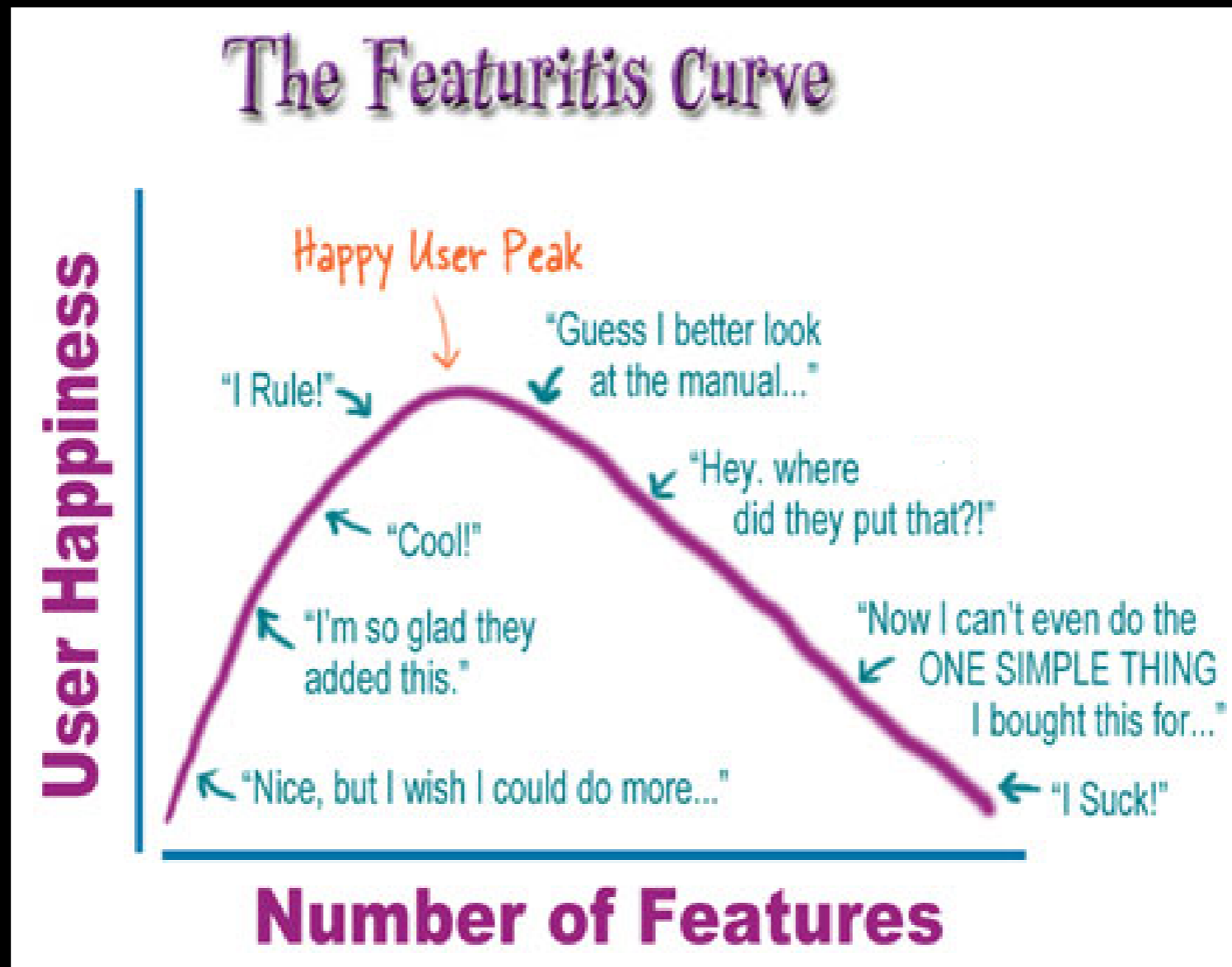
Different Styles

- Chemistry tends to be pretty structured and routine
- Other disciplines have much greater variation in the work

Tools

- Chemistry tends to focus on the structures, reactions, properties, drawing & animating them etc.
- Other disciplines have a much wider set of tools
 - And use Excel as a “Swiss Army Knife”
- Scientists are knowledge workers too

Less is more



From http://headrush.typepad.com/creating_passionate_users/2006/week30/index.html

Part of the problem is
the term
“ELN”

Questions

- If the paper notebook didn't exist would we coin the term "Electronic" notebook?
- If it wasn't for the term "ELN" would we look for one system?
- Why are all the "ELN" vendors (outside of chemistry) so different?
- Where are the non-chemistry ELNs?

Where do they work?

- Excel
- Word
- Filemaker
- InfoPath/SharePoint
- ISIS/Draw
- Wikis
- Blogging tools (e.g. Wordpress)
- In-house experiment planning tools
- Lotus Notes
- OneNote
- LIMS
- ERP

What are they doing?

- Experiments - just like everyone else
- Just because they aren't working in a product with "ELN" stamped on it, doesn't mean it isn't proper science

As a rule, it is much
better if you pay
attention to each
discipline individually

Biology & ELNs

Biology & ELNs

- Biology has some specific issues which make it different from Chemistry
- What worked in “Chemistry” won’t work in “Biology”

“Chemistry”

- When we say “Chemistry” we generally mean a fairly small set of activities -
Medicinal Chemistry
- The requirements of Medicinal Chemistry are fairly common
- Which is why there are a lot of Chemistry ELNs around

“Biology”

- When we say “Biology” this covers a much wider range of activity
- Both within a specific company, and across the industry

Biology Vs Chemistry

- It tends to be relatively easy to buy/deploy a chemistry ELN
 - Your users work in similar ways - you might have 200 people doing the same thing
 - Work practices are similar across companies
 - Just buy one!
 - (even then it doesn't always go smoothly)

Biology Vs Chemistry

- A multitude of activity is covered under the term “Biology”
- Some of this might be specific to your company
- Lots of Biotechs have their own in-house developers writing Bioinformatics code
- This means finding out what you need, and identifying how to meet that need, is tricky

ELNs & Biology

- “One System” death magnet
- Approaches to looking at functionality
- The Toaster Problem
- User adoption in a TALC-sensitive way

The “One System” death magnet

One System

- “You all use the same *Paper* notebook don’t you?”
- “So surely you can all use the same *Electronic* notebook?”

One solution?

User quote:

*Anyone who claims one
solution solves all problems...*

One solution?

User quote:

*Anyone who claims one
solution solves all problems...*

...is a salesman

Do you need one solution?

- Not unless you buy something crazily proprietary
- In which case you probably don't want it anyway
- Integration is a fact of life

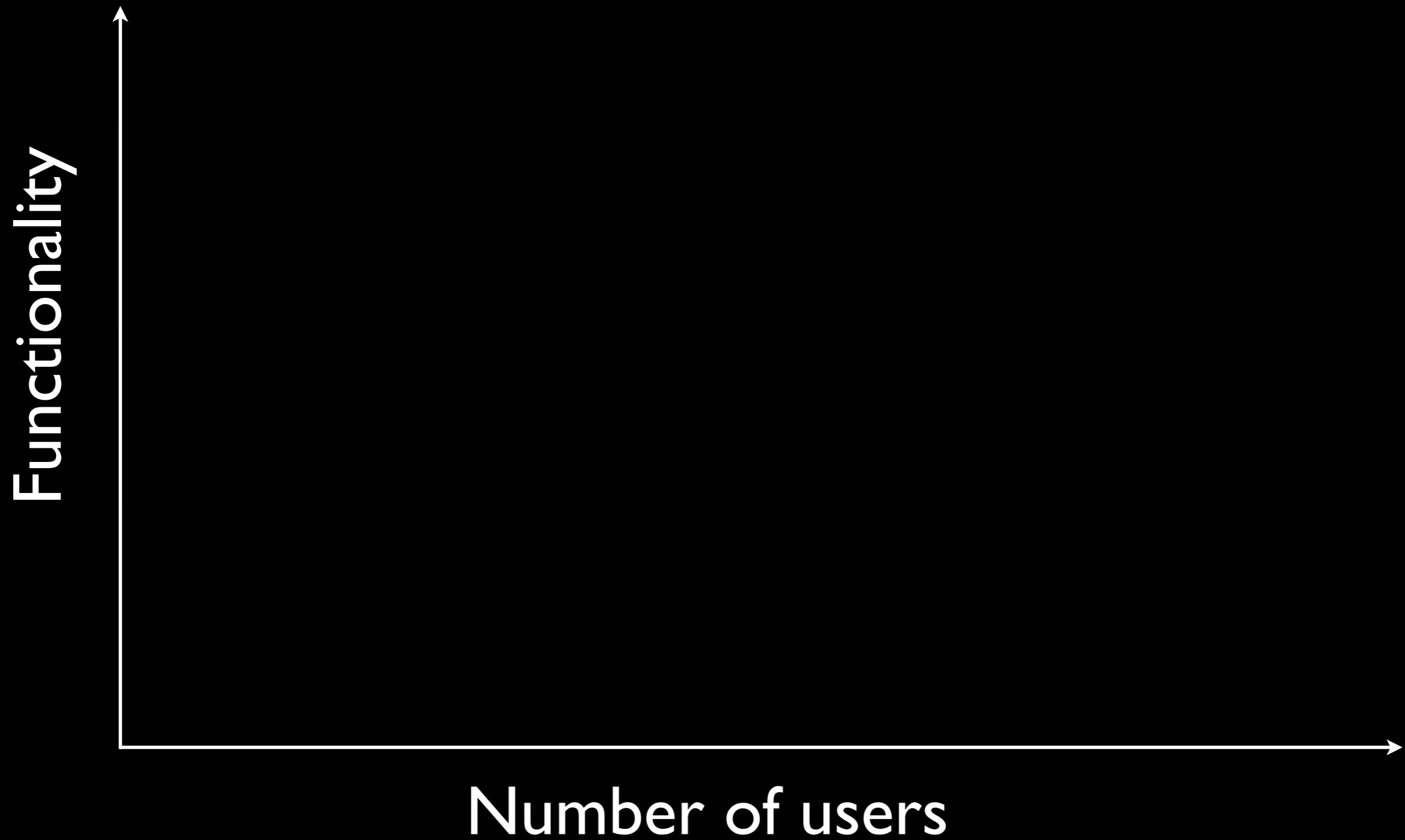
Can you buy One Solution?

- Yes, if you only do one kind of science
- Yes, if you are prepared to do an awful lot of customisation
- Yes, if architecture is more important than users
- Yes if you will never change what you do

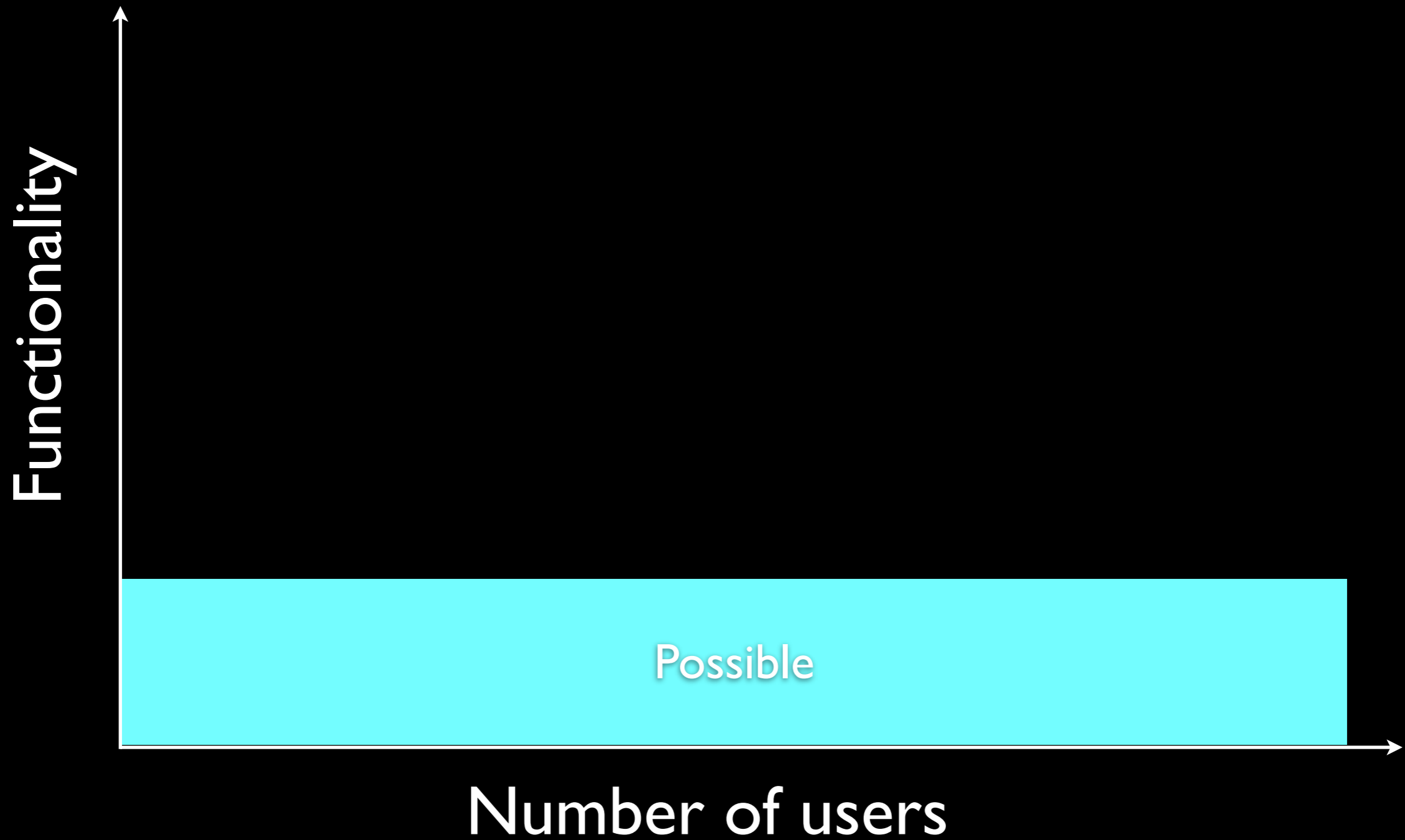
General Purpose ELNs

- You can do it for small numbers of users and certain styles of work
- Where workflow is important
- For large numbers of users
 - The diversity in process will kill you
 - You end up building an expensive version of Word & Excel

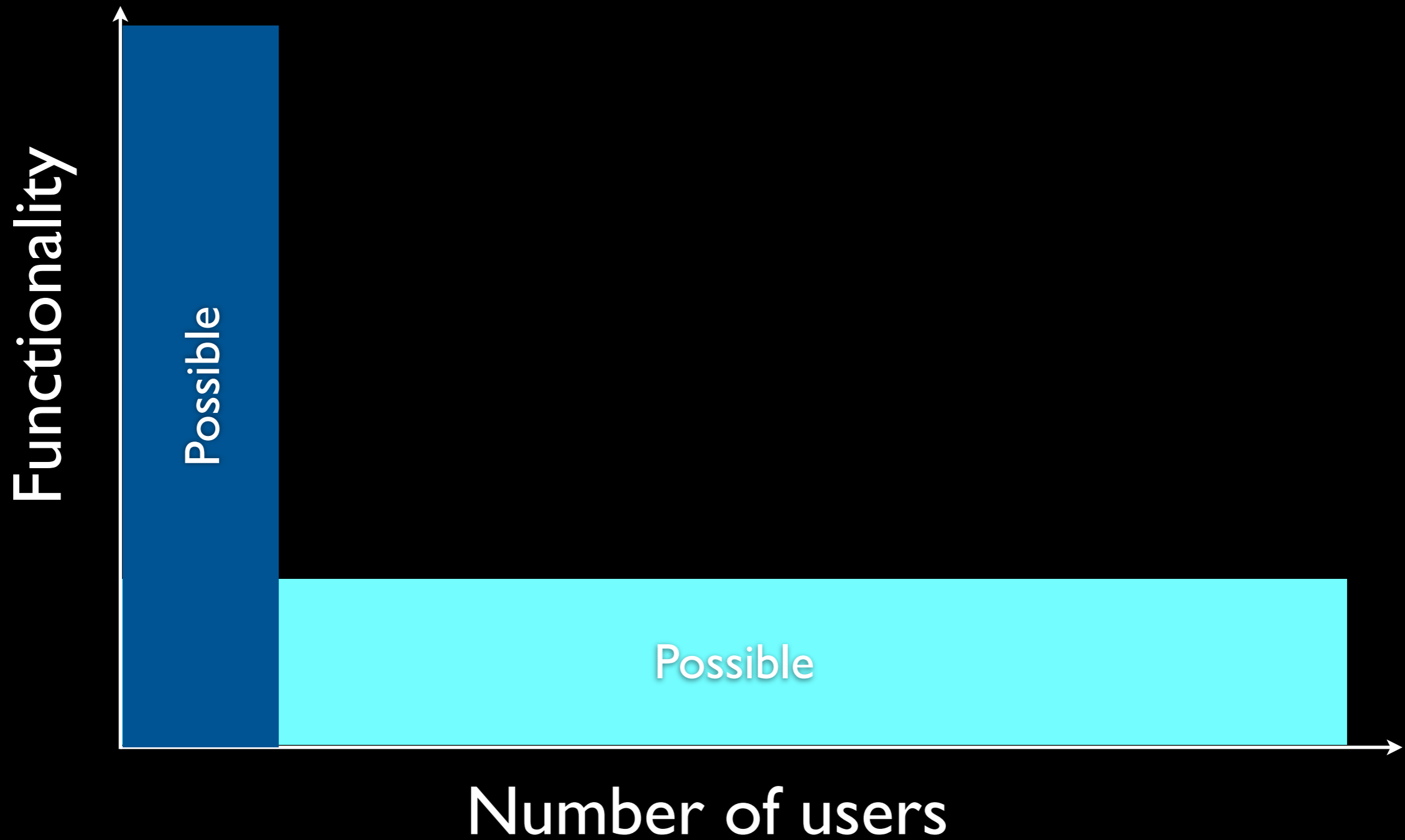
General Purpose ELNs



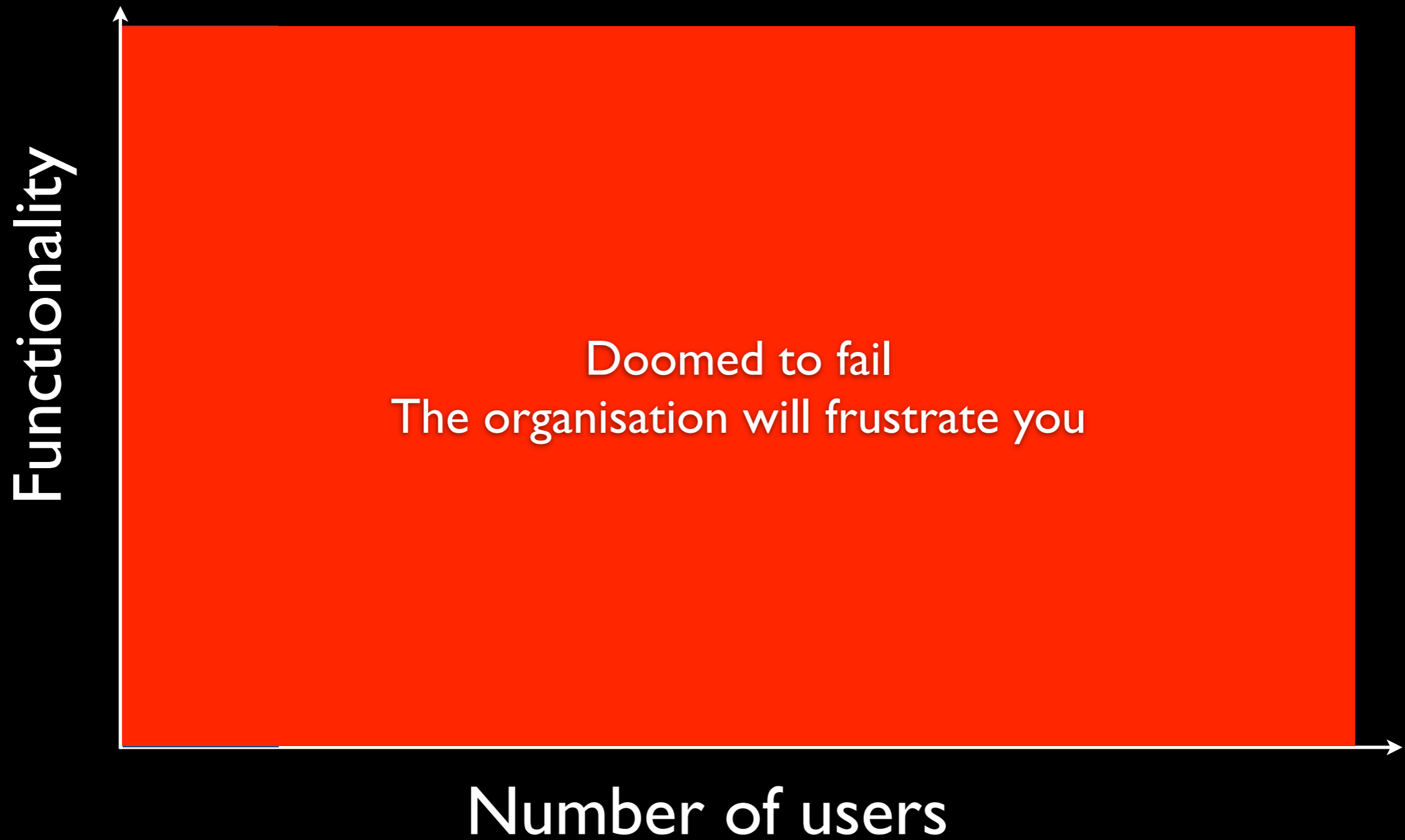
General Purpose ELNs



General Purpose ELNs



General Purpose ELNs



Some Suggestions

Project Structure

- Divide your problem into
 - Corporate aspects
 - Different disciplines
- Solve the corporate stuff centrally
- Let the different user groups do what they need to do
- Encourage/enforce collaboration

A framework

Corporate aspects

(Records, IP protection, Sharing)

Medicinal Chemistry

Process Chemistry

Molecular Biology

Pharmacology

Etc.

Patent Evidence

- Typically this is a broad, thin layer
- Consistently applied across the whole company
- Keep it out of the scientific systems
 - Single, well defined place
 - Under the control of Custodian

Patent Evidence

- Typically this is a broad coverage
- Consistently applied across the whole company
- Keep it out of public systems
 - Single place
 - Under the control of Custodian



Records Management

- The Cinderella of ELN projects
- Desperately important
- Clearly something that's dependent on your own processes

The “Deep” systems

- If they use structures, they’ll probably want one of the Chemistry-centric ELNs
- If they aren’t look at what they have already
 - You might be able to leave them alone
 - Just give them something to keep the lawyers happy
 - This will hopefully be low-impact

“Deep Systems”

- More than one group might find the same system acceptable - great!
- You might want tools from Rescentris, IDBS, Klee etc. to support specific aspects of their work

“Deep Systems”

- If you do a good job
 - Everyone gets their ideal work environment
 - You disrupt them as little as possible
 - You’ve left the door open for future improvements

Sources of solutions

Chemistry

- Chemistry is pretty structured
- Buy (or build) them a Chemistry-centric ELN and let them get on with it
- The selection process is detailed but at least the work relatively consistently

Sources of Chemistry ELNs

- If you're a big pharma, you're probably already set
 - With varying success - this isn't easy
- Solutions
 - Buy off the shelf
 - Build from what you have
 - Vendor capture

Sources of Chemistry

- In Biotechs, you probably can't afford to build or do vendor capture
- Unless Cheminformatics is a core strength
- So you're going to have to do as much as you can with off-the-shelf (customised as needed)
- Nice selection of vendors, have fun!

Biology

- Massive diversity
- Lots of Microsoft Office and other “non ELN” applications
- Best approach is to get out of their way

Example

- Biology in Janssen (J&J) (IQPC Brussels 2007)
- Really good example of in-depth analysis of process
- 98% approval rate on a project that size is pretty stunning

Some questions you
might ask...

What about GxP

- The needs of GxP & 21CFR11 mandate record keeping at the activity level
- You can't do this Broad Vs Deep model
- I'm not sure there's such a thing as a Generic ELN for regulated areas

What about Raw Data?

- ELN isn't the place for raw data
 - From a records aspect
 - From a practical aspect
- ELN can provide metadata
- But store it somewhere else (filesystems are nice!)
- Records Retention matters...!

Patent Reform

- The US will never move away from a need to prove invention (that pesky constitution)
- Paradoxically, the current versions of Patent Reform will lead other Patent jurisdictions to require Notebooks too!

Isn't this expensive?

Isn't this expensive?

- Not if you've already got perfectly acceptable solutions already

Isn't this expensive?

- Not if you've already got perfectly acceptable solutions already
- The ROI on software you don't have to buy is outstanding!

Are you Mad?

- A large number of end-user companies have similar approaches
- Most of the case studies are “Deep” systems
- Ultimately, this is a much-simplified version of the CENSA architecture

Benefits of taking a Broad & Deep approach

You get to be a
hero/heroine

Finding the money is
easier

Training is easier/non-existent

You have a balanced
relationship with your
vendors

You can roll out in
phases

Your lawyers won't
dictate what you do