Continuous Improvement and Constructive Criticism

For Software Professionals

Disclaimer

- This is based on my understanding of the subject
- Some of the content might be obvious to some
- There will be some oversimplifications involved
- Happy to receive questions and feedback during the talk

Natural language is awful to communicate

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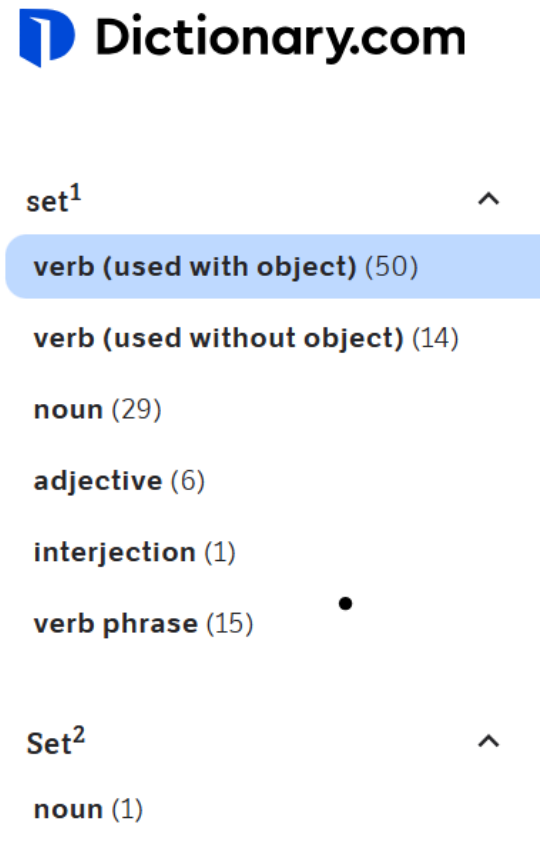

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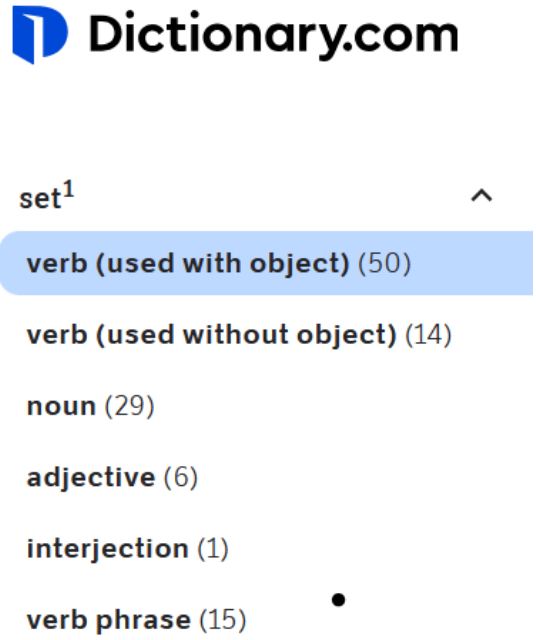

- **Awful** – Literally "full of awe", originally meant "inspiring wonder (or fear)", hence "impressive". In contemporary usage, the word means "extremely bad".

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The meaning changes with time

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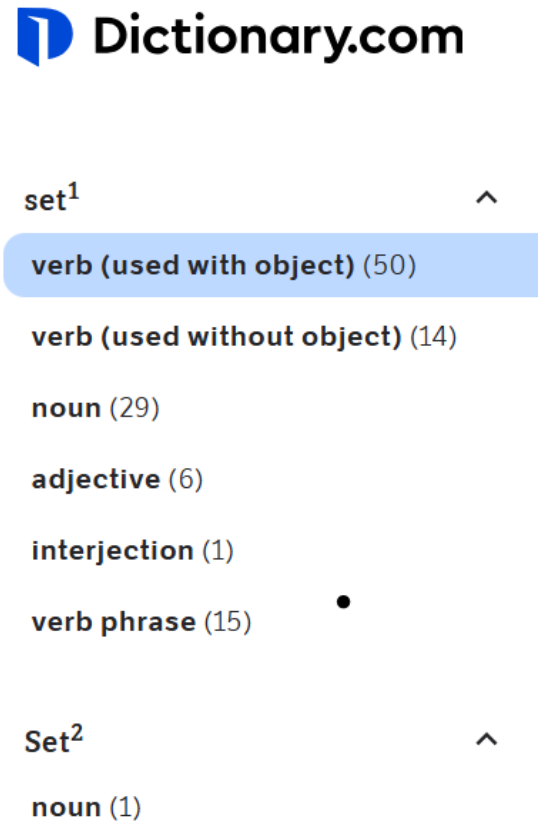

•**Awful** – Literally "full of awe", originally meant "inspiring wonder (or fear)", hence "impressive". In contemporary usage, the word means "extremely bad".

"Snout-fair", for example, means "having a fair countenance; fair-faced, comely, handsome", while "sillytonian" refers to "a silly or gullible person, esp one considered as belonging to a notional sect of such people".

https://www.bbc.co.uk/news/uk-41266000

It's ambiguous and dependent on the context

The meaning changes with time

Some words get lost with time

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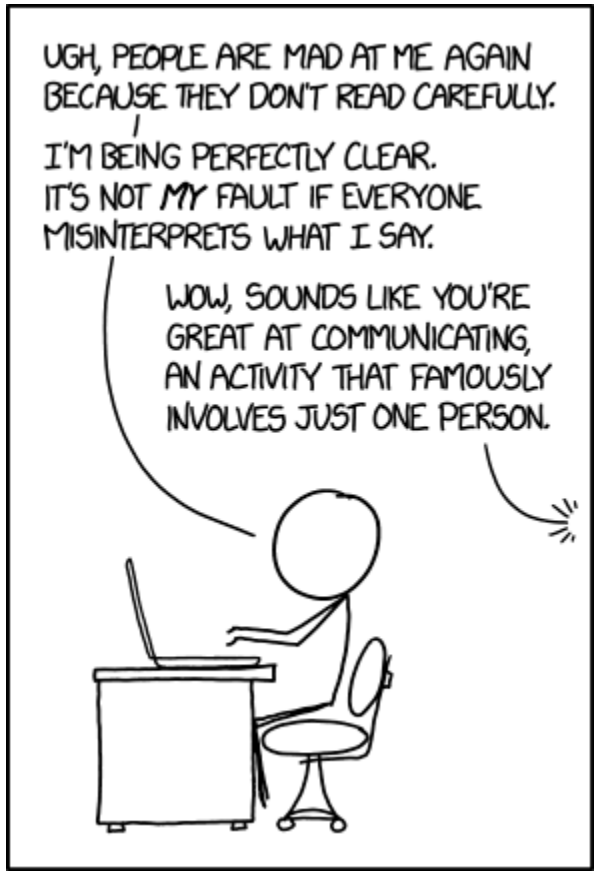

But computers do exactly what you tell them to!

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Do they?

A simple program

```
import time
import custom

def Dosomething(thing):
    x = time.clock()
    y = time.clock()
    return (y-x)/x + custom.scaling * thing
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This is a user defined module – could be different for each system

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This is a dependency – functions defined here could change with newer versions

A simple program

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```
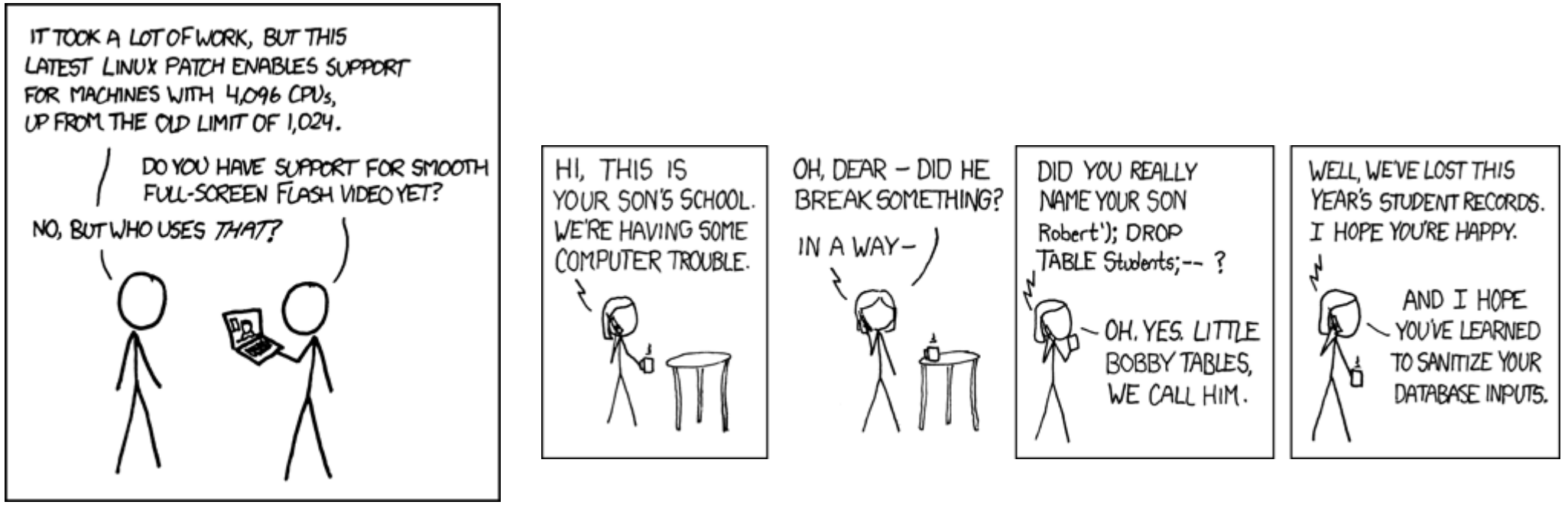
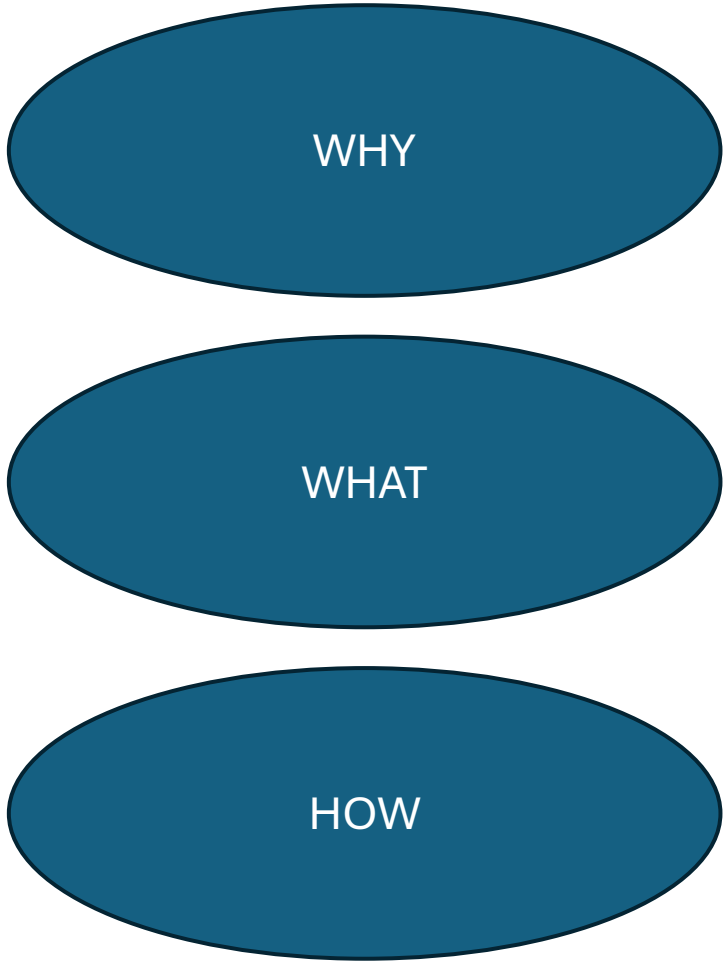

In fact, this function has been deprecated since python 3.3 and was removed in 3.8

And this is without getting into kernel/OS limit overrides, hardware interactions, poor documentation or user inputs...



So what can we do?

I find it useful to break it down into 3:



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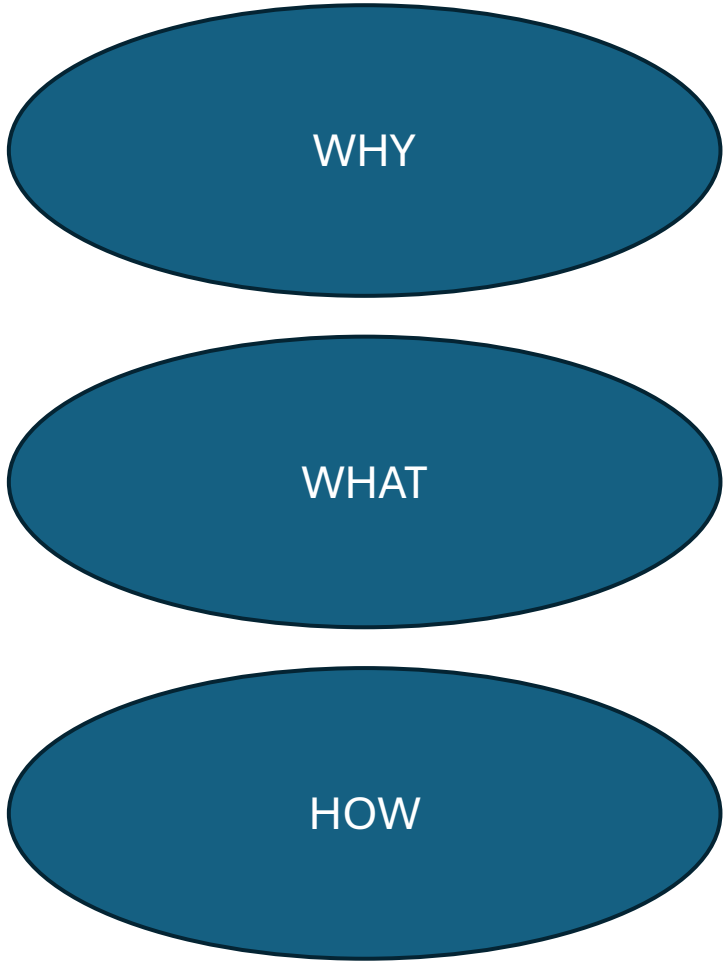

Why was this made? Who does this affect?
What are the current circumstances?

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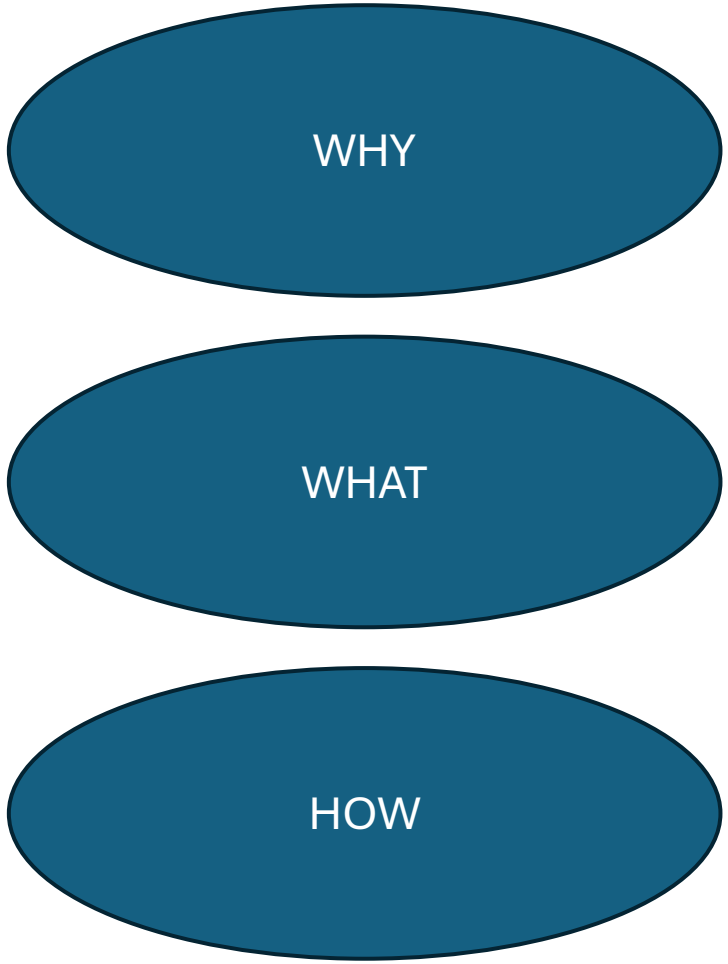

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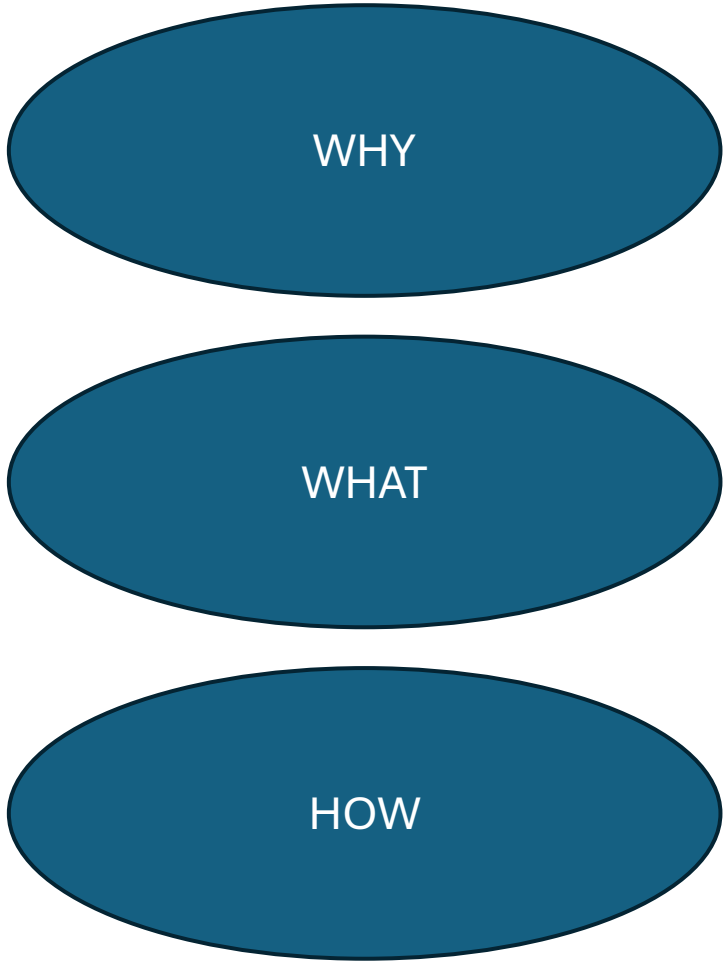


Why was this made? Who does this affect?
What are the current circumstances?

What's the core task this is doing?

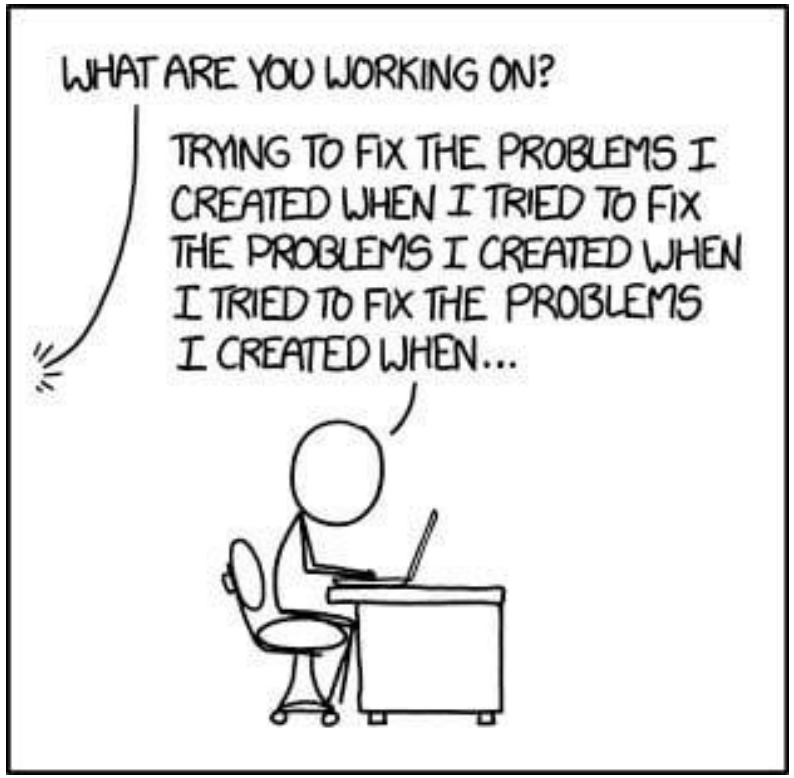
What's the specific implementation of it?

WHY – why was this made?

The motivation for this software or section of software

Is there some historic/political/legal background

What is it trying to do/fix?



WHY – who does this affect?

EVERY CHANGE BREAKS SOMEONE'S WORKFLOW.

stakeholders include:

- users
- admins
- contributors

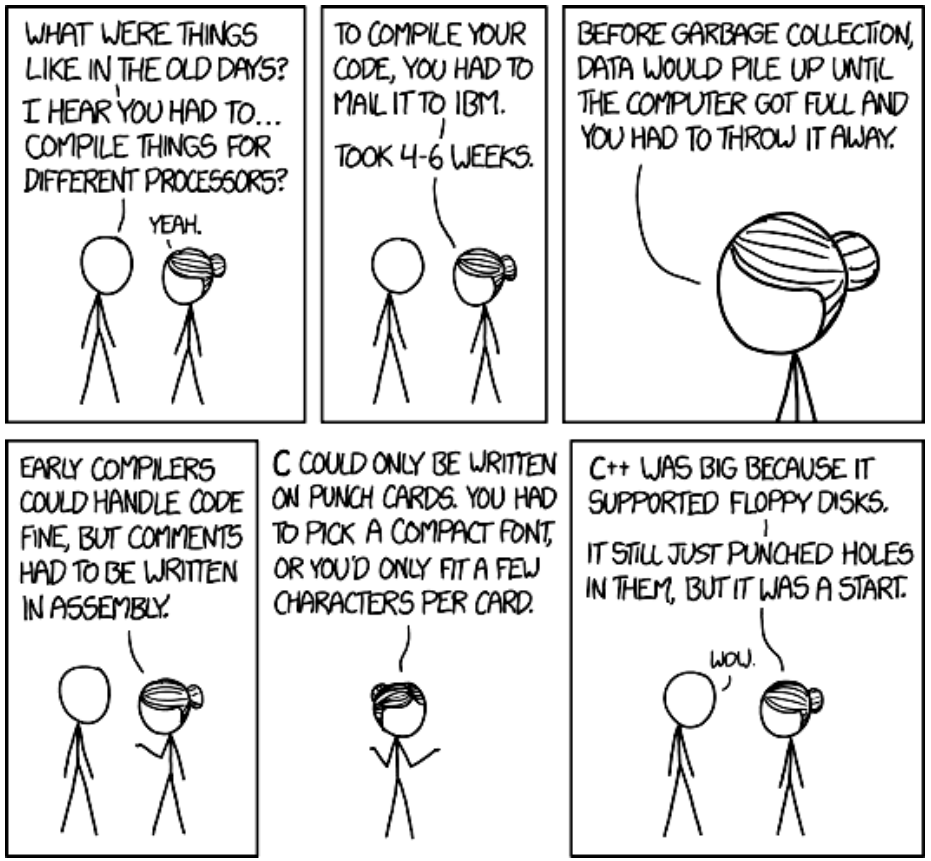
of this software.

Ideally if a change does not affect a group, it should be invisible to them, as this mean

WHY – what are the current circumstances?

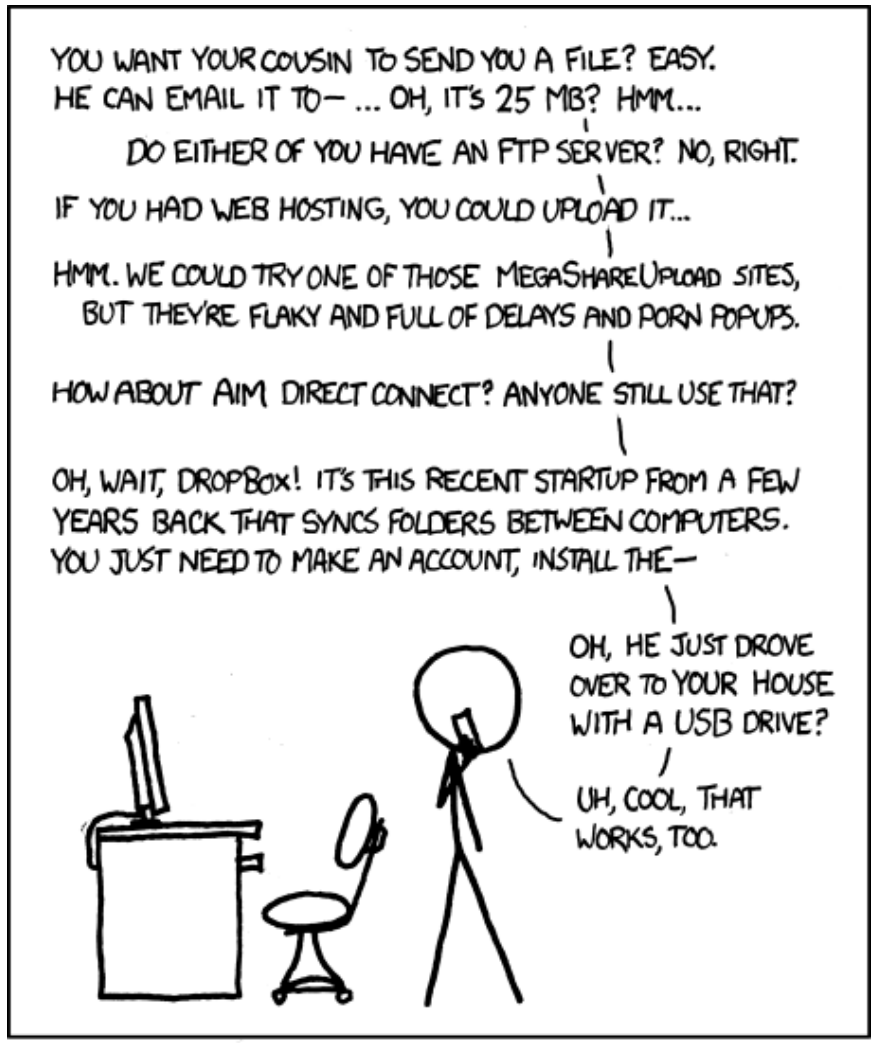
Any external factors affecting this software, e.g.

- Hardware capability
- Usage intensity
- Operational costs
- Available effort
- Running costs



WHAT – what's the core task this is addressing

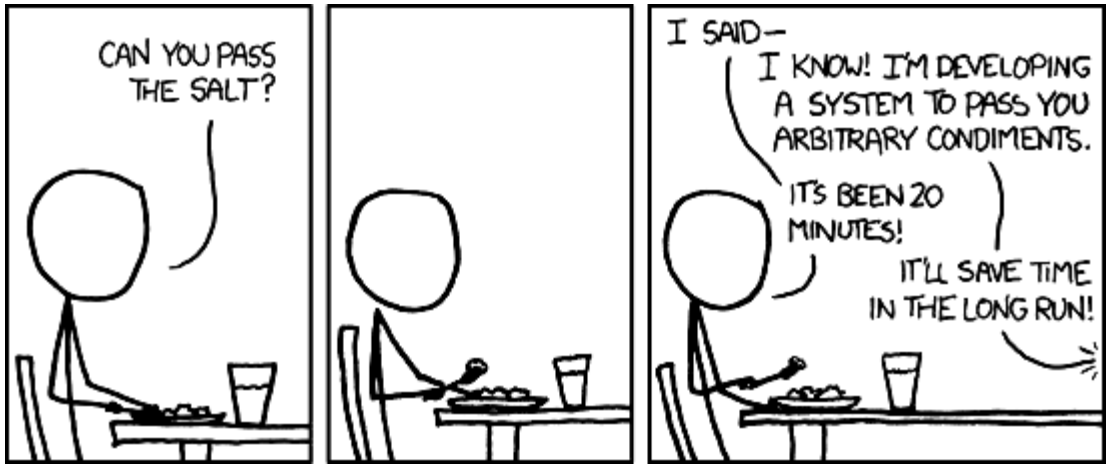
- Try to keep it as detached to the implementation / technical details as possible. This should be understandable by all stakeholders.
- E.g. a way to transfer data between two endpoints
- Sometimes a WHEN, WHERE or WHO might be part of this, e.g. if the task is time critical or needs to fit a pre-existing specification.
  - E.g. a way to sustain 100Gb/s of data between all sites part of the CERN collaboration



I LIKE HOW WE'VE HAD THE INTERNET FOR DECADES, YET "SENDING FILES" IS SOMETHING EARLY ADOPTERS ARE STILL FIGURING OUT HOW TO DO.

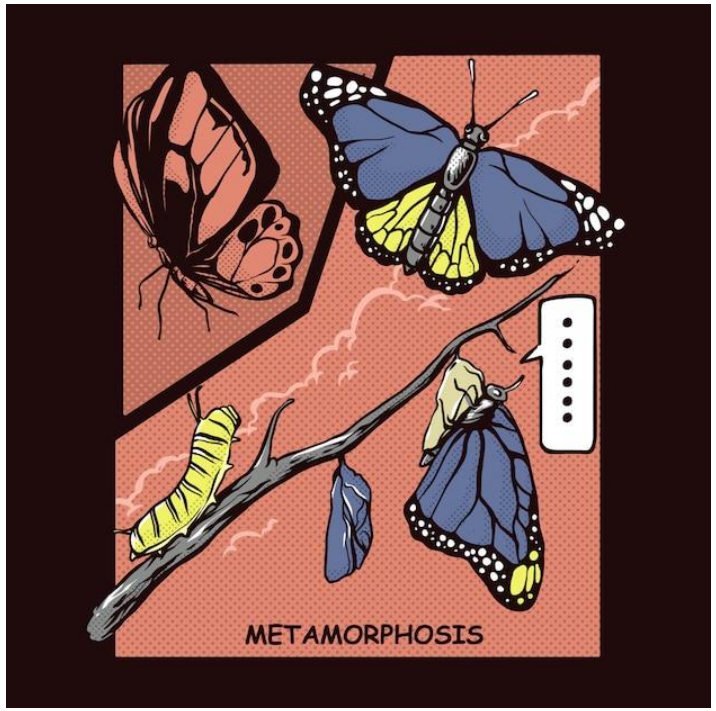
HOW – what's the specific implementation of this task

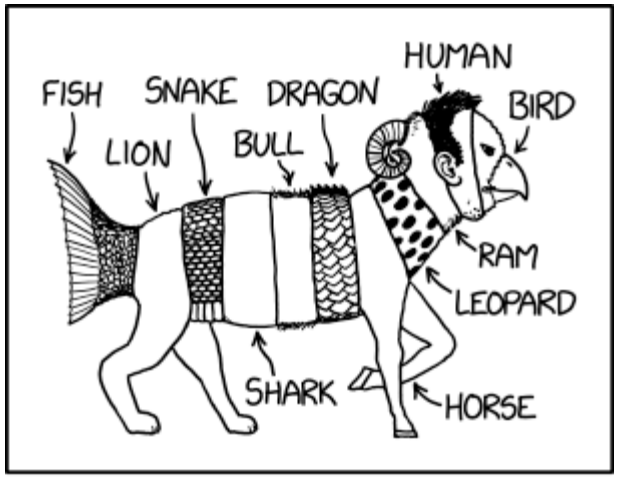
- The implementation doesn't have to be technical
- Depending on the situation, this could be addressed as:
  - A technical problem, e.g. by implementing interfaces to all supported technologies involved,
  - A policy issue, e.g. by agreeing on all sites using the same technology stack
  - Or a combination of both
- There may be valid reasons to pursue either approach
- This WILL change with time, either trough improvements or new feature, or by obsolescence of programming languages or dependencies



Sometimes, the WHAT and the WHY change…

- New communities join in
- A software finds an unexpected use in a different field
- Scope creep…





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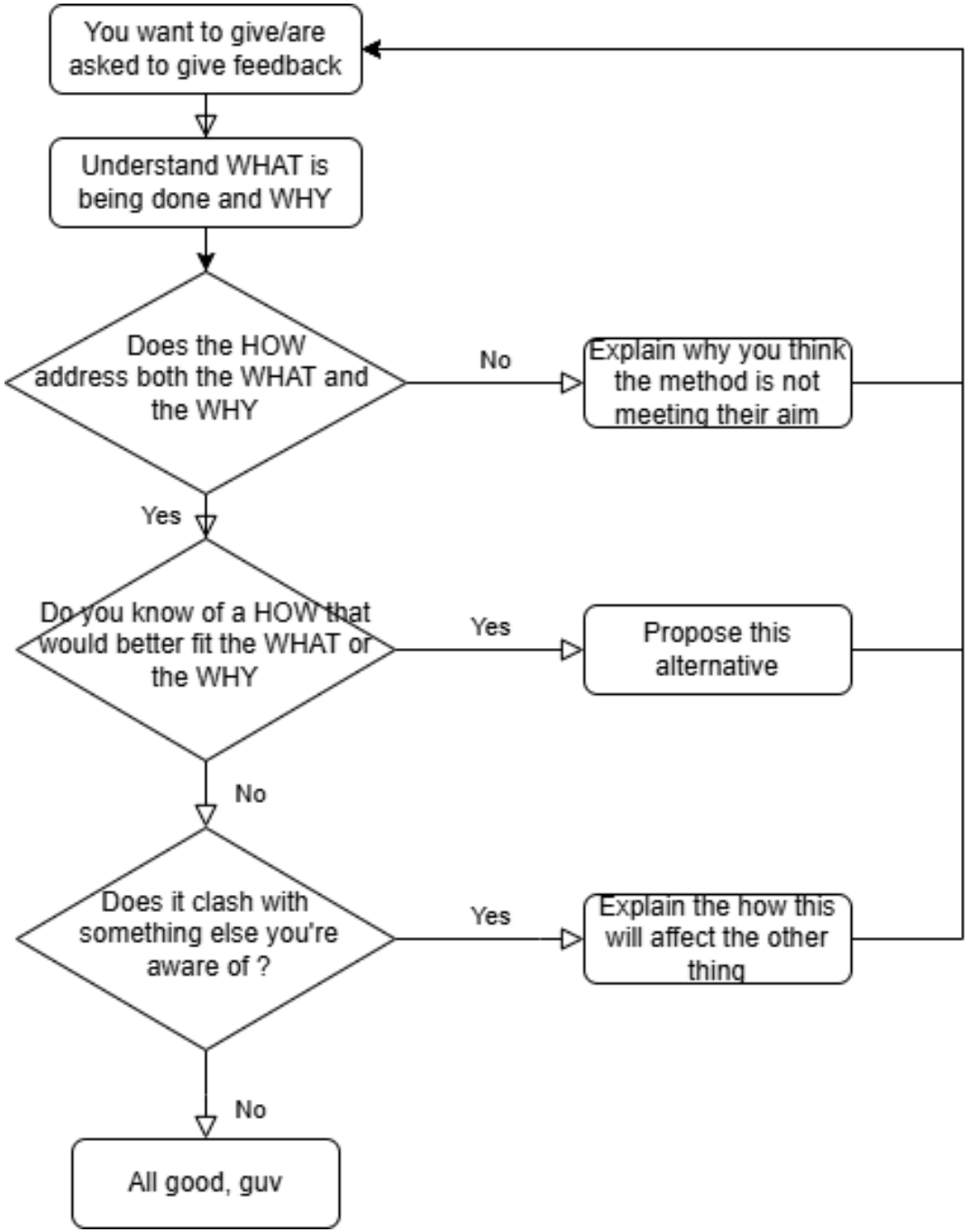

Constructive Criticism

- This is not about micro-optimization
- Often the best solution is not feasible in the circumstances
  - E.g. technical debt mean the effort involved is higher than can be given for this priority
- If you have a method you think would work, you can propose it, but it's up to the actioner if they want to do it that way or a different way.
- This can be used to have a critical look at your own work too

Continuous Improvement

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Is a series of implemented Constructive Criticisms

Thank You

Any feedback/questions?