The Good, the Bad and the Ugly of the Engineering Mindset

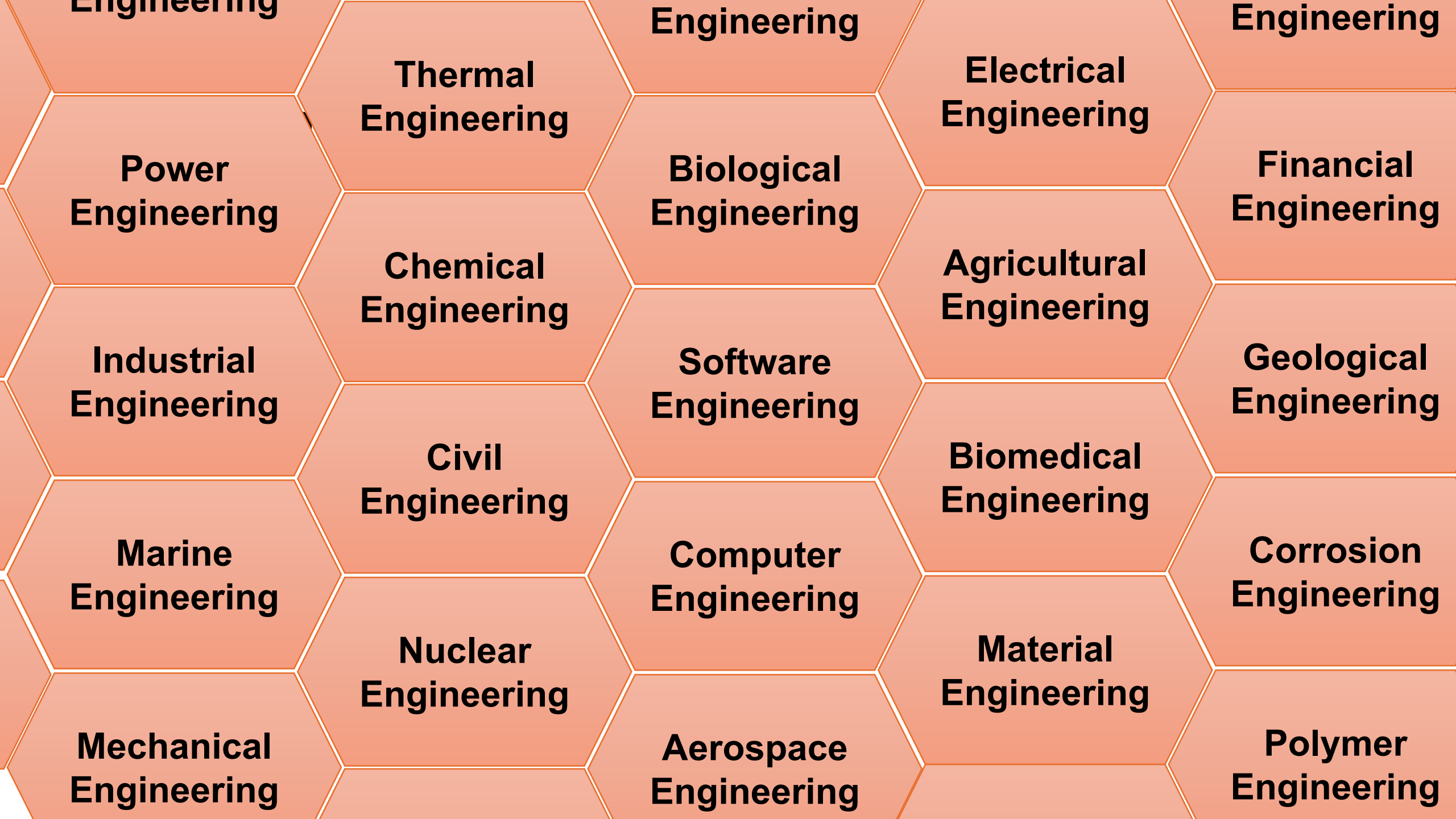
Allan Kelly

allan@allankelly.net

https://www.allankelly.net

Oredev 2026




Engineering
Thermal Engineering
Engineering
Electrical Engineering
Engineering
Power Engineering
Biological Engineering
Financial Engineering
Chemical Engineering
Agricultural Engineering
Industrial Engineering
Software Engineering
Geological Engineering
Civil Engineering
Biomedical Engineering
Marine Engineering
Computer Engineering
Corrosion Engineering
Nuclear Engineering
Material Engineering
Mechanical Engineering
Aerospace Engineering
Polymer Engineering

Engineering is the discipline and profession that applies scientific theories, mathematical methods, and empirical evidence to ...

... design, create, and analyze technological solutions, ...

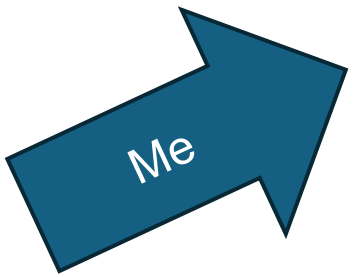
... balancing technical requirements with concerns or constraints on safety, human factors, physical limits, regulations, practicality, and cost, and often at an industrial scale.

Maintain
Sustai
n



Engineers solve problems within constraints

Allan Kelly



Do engineers see the world differently?



Or is it me?

Because I'm neuro-divergent (dyslexic)?

Engineering mindset

Let us talk about...



Problem-Solution

Maintenance/Sustainability

Learning to not stand still

Engineers & Managers

Good: Problem -> Solution

Engineers make the world a better place

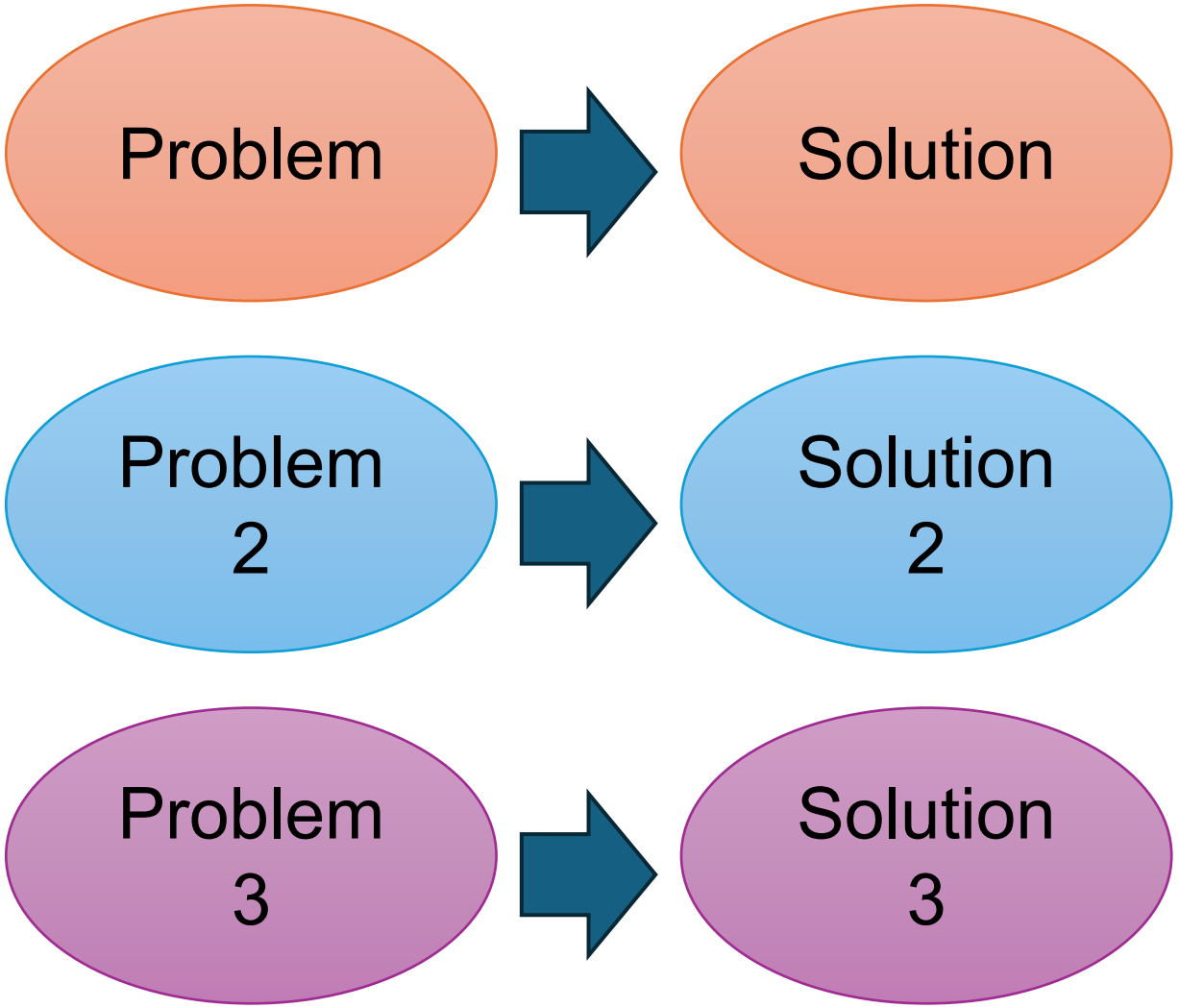
Engineers see problems

Engineers solve problems

... and repeat



Engineers see: Problem -> Solution



Here is a problem
Here is my solution

Here is another problem
Here is my solution

Another problem...
Another solution

Another...

Multiple possible solutions to any problem

Solutions are product of time, hypothesis of future known & unknown constraints



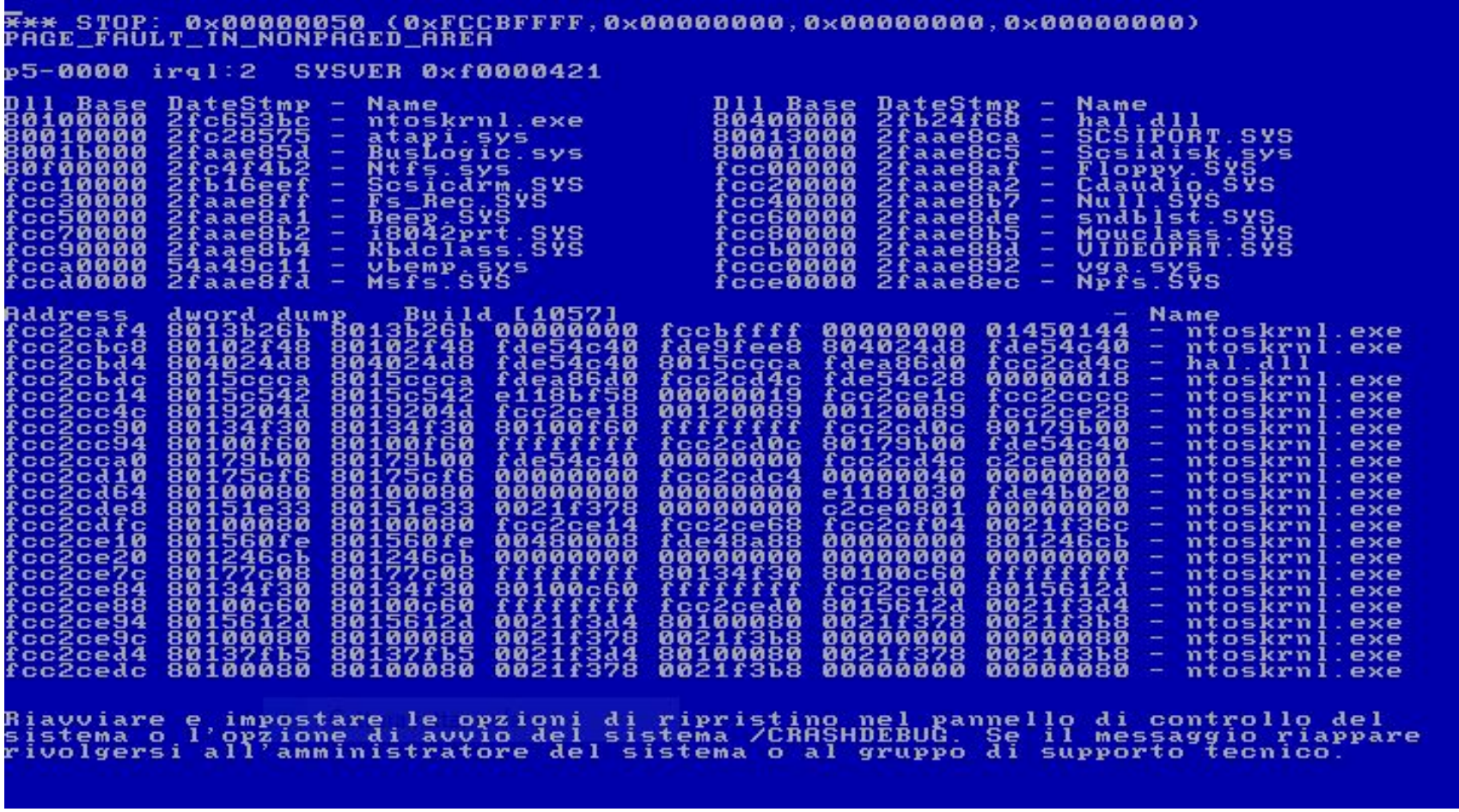
Bad: Solution no-one needs?

Do engineers' solutions always make things better?

Do engineers see problems others don't?



Problem design



Problems need design too - “Framing” - “Shaping”

Fixing the problem too early limits solution options

The elevator problem



Are you solving the right problems?
T. Wedell-Wedellsborg,
Harvard Business Review, 2017.

Ugly: problems are negative

problem | ˈprɒbləm |

noun

1 a matter or situation regarded as unwelcome or harmful and needing to be dealt with and overcome: *they have financial problems* | *the problem of ageism in Hollywood.*

- a thing that is difficult to achieve: *motivation of staff can also be a problem.*

Is it right to talk about problems?

Why not opportunities?

Maintenance & Sustainability

Engineers think forward

Usage & success demands change

- Wear and tear
- Keep clean
- Keep oiling
- Inspect

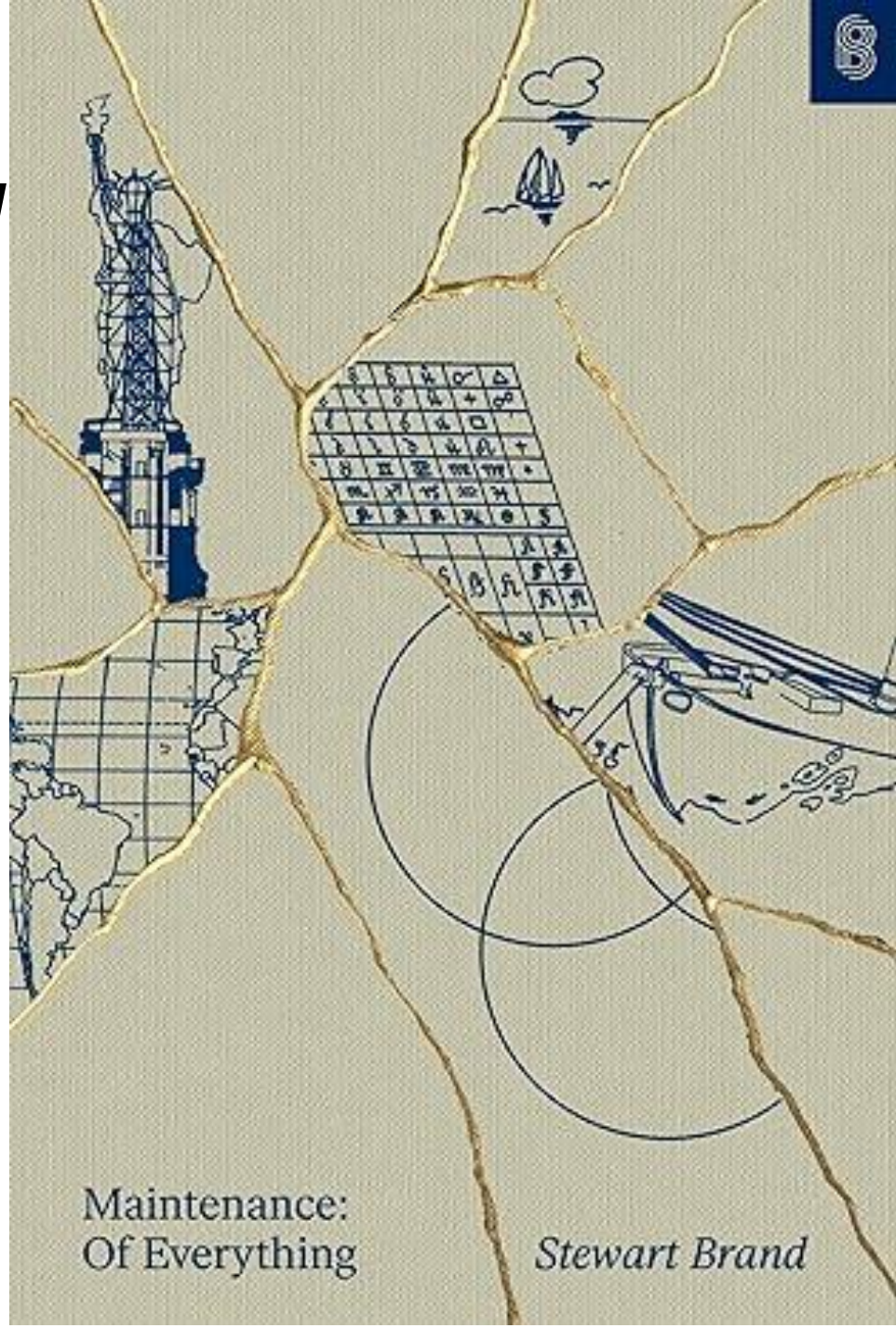
Good engineers are systems thinkers



Sankey Viaduct on the Liverpool-Manchester railway
Opened 1830, used daily

Maintenance of Everything

Stuart Brand, 2026





The ugly side of sustainability

- Few like maintenance
  - People get bored
- Sustainability quickly discarded
- Costs unattractive
  - Pay once and last forever preferred
- Sustainability seen as gold plating
  - Engineers seen negatively for raising it

RAILTRACK

1994 - 2002

Hatfield crash
October 2000
4 dead
70 injured



Learning: engineers value learning

Problem solving is learning

Technology advances

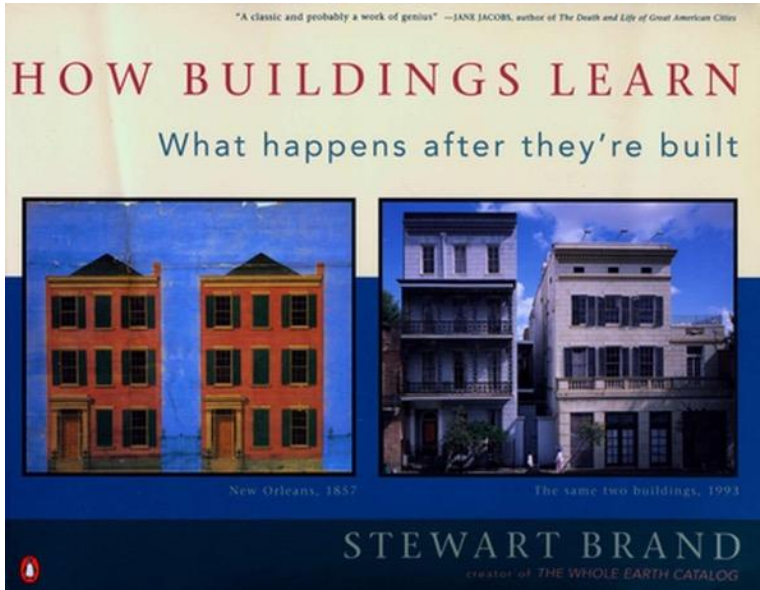
Customers learn

- Use our solutions differently
- Solutions need to learn

Ugly

- We can be hard on those before us
- We can be hard on ourselves
- We can be hard on our customers

How Buildings Learn
Stuart Brand, 1994





Engineers v. Managers?



Engineers  Managers

Both problem solvers

Both work within constraints (especially cost & time)

Many big management thinkers studied as engineers

Many Silicon Valley entrepreneurs are engineers

Future

Still a need to engineer systems

- Systems work together in a bigger system

The unspoken

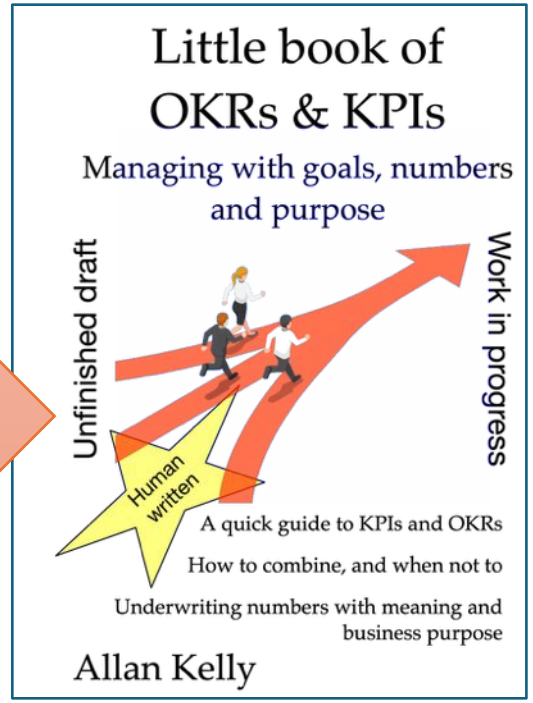
- Not all considerations are documented
- Requires engineer to flush them out

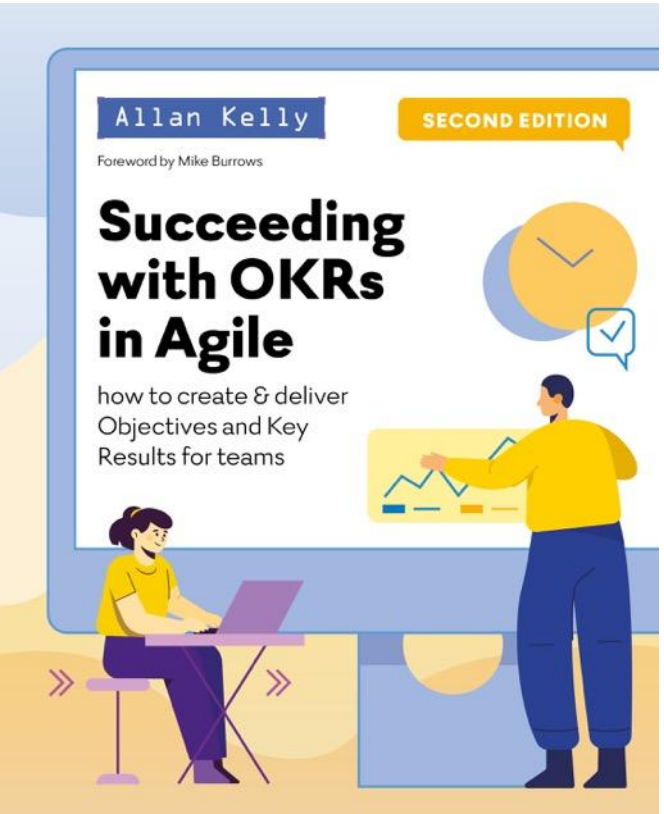
D-O-S attack story



The end

Work in progress
https://leanpub.com/OkrsKpis







Allan Kelly
allan@allankelly.net
http://www.allankelly.net/blog
https://allankellynet.substack.com

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