# Architectural Skills

*CSSE6400* 

Richard Thomas

May 26, 2025

### Quote

Architecture is the stuff you can't Google.

- Mark Richards [Richards and Ford, 2020]

## Quote

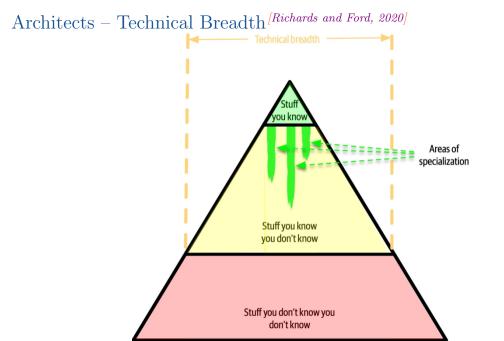
There are no right or wrong answers in architecture—only trade-offs.

- Neal Ford [Richards and Ford, 2020]

## $Architectural\ Design$

Architects use knowledge and experience to analyse trade-offs to design architectures appropriate to the system context.

# Developers – Technical Depth [Richards and Ford, 2020] Technical depth Stuff you know Stuff you know you don't know Stuff you don't know you don't know



# Definition $\theta$ . Conway's Law

Organisations design systems whose structure is inevitably a copy of the organisation's communication structure [Conway, 1968] [MacCormack et al., 2012].

#### Conway's Law Consequences

- Business Process Management
- Microservices to reflect organisation structure
- Teams formed around services

## Conway's Law Consequences

Team insularity – more loyal to team than organisation.

# Conway's Law Issues

- Cross-cutting concerns
  - e.g. Security
- Organisation structure should align with market structure
- Physical location of teams

# Definition $\theta$ . Peopleware

People involved in development of systems.

- Peter G. Neumann (1977)

# Stakeholders [Coplien and Bjørnvig, 2010]

- End users
- Organisation
- Customers / Sponsors
- Domain Experts
- Developers

## Communication

- Written
  - For those who are not there
- Oral
  - Immediate & interactive

# Circumventing Conway's Law [Woods, 2017]

- Cloud Platforms
- Microservices
- APIs
- Culture

## Evidenced-Based Software Engineering

Don't follow fads, seek evidence for good practice.

### Let's hear from an expert

# Software Engineering's Greatest Hits

what we actually know about software development and why we believe it's true



**Greg Wilson** 

http://third-bit.com/talks/greatest-hits/



1/47

#### References

```
[Conway, 1968] Conway, M. E. (1968).
How do committees invent?
Datamation.
```

[Coplien and Bjørnvig, 2010] Coplien, J. O. and Bjørnvig, G. (2010).

Learn Architecture for Agile Software Development.

Wiley.

https://www.amazon.com/

Lean-Architecture-Agile-Software-Development/dp/0470684208.

[MacCormack et al., 2012] MacCormack, A., Baldwin, C., and Rusnak, J. (2012). Exploring the duality between product and organizational architectures: A test of the "mirroring" hypothesis.

Research Policy, 41(8):1309–1324.

[Richards and Ford, 2020] Richards, M. and Ford, N. (2020).

Fundamentals of Software Architecture: An Engineering Approach.

O'Reilly Media, Inc.

[Woods, 2017] Woods, D. (2017).

How platforms are neutralizing conway's law.

https://www.forbes.com/sites/danwoods/2017/08/15/how-platforms-are-neutralizing-conways-law/.