

Architects live in the First Derivative

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No organization ever complained that their IT department was delivering too fast. However, as technologies evolve ever more quickly and product cycle times keep shorting, it's difficult for any development team or IT organization to be fast enough. As these organizations try many things to move faster, from adopting Lean and Devops approaches, moving to the cloud, to working weekends or paying bigger bonuses. Slowly many of them realize that increasing velocity is about more than just moving a bit faster. It takes a fundamentally different mindset – one that looks at the first derivative.

The Role of Architecture

Change Changes Everything

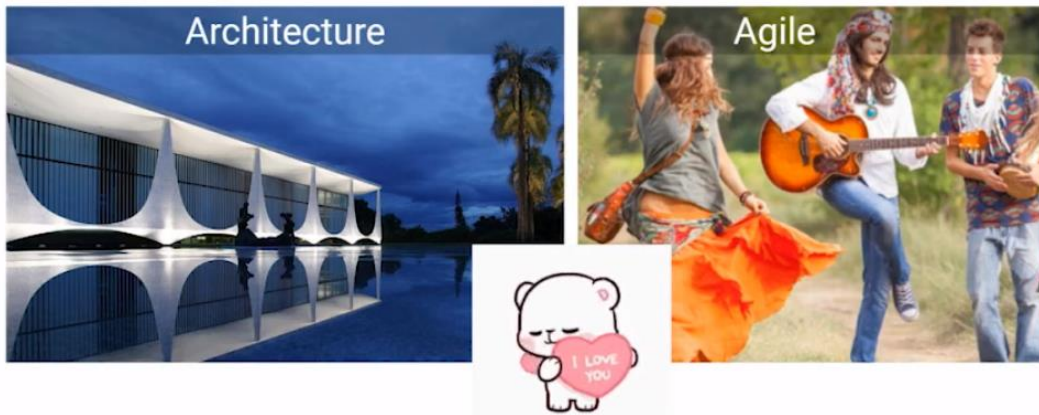
Speeding Up

Architecture Creates Options

$$C(S_t, t) = N(d_1)S_t - N(d_2)Ke^{-r(T-t)}$$
$$d_1 = \frac{1}{\sigma\sqrt{T-t}} \left[\ln\left(\frac{S_t}{K}\right) + \left(r + \frac{\sigma^2}{2}\right)(T-t) \right]$$
$$d_2 = d_1 - \sigma\sqrt{T-t}$$

Architecture creates and sells options to the business; it allows them to defer the option of making certain decisions (like server sizing, scaling, etc) in the future while designing for it today. But the option is not for free today.

The higher the uncertainty, the more valuable the options



Architecture is finding stability in an unstable world



When do we not need any architects?



(and no architecture)?

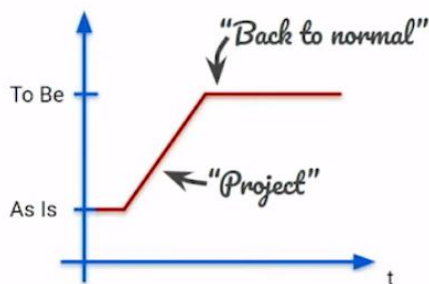


The Role of Architecture

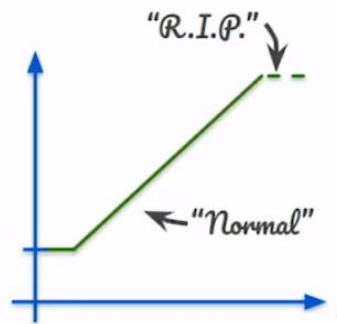
Change Changes Everything

Speeding Up

Is Change Normal?



"Guessing Right"



"Learning Fast"

Speeding up



Disruption:

A development that you cannot fight by putting more coals on the fire or by putting more pressure in the boiler.



Don't burst the boiler!

The Role of Architecture

Change Changes Everything

Speeding Up

Speeding Up Software Delivery?



Reduce Friction



DevOps



Reduce Inventory



Lean

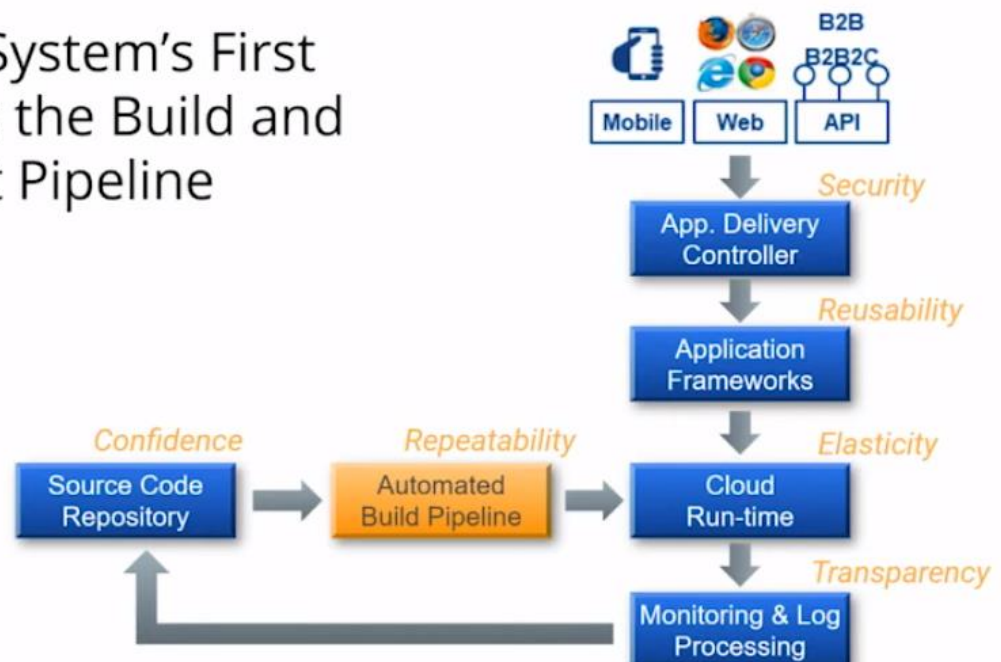


Avoid Unneeded Work



Agile

A Software System's First Derivative is the Build and Deployment Pipeline



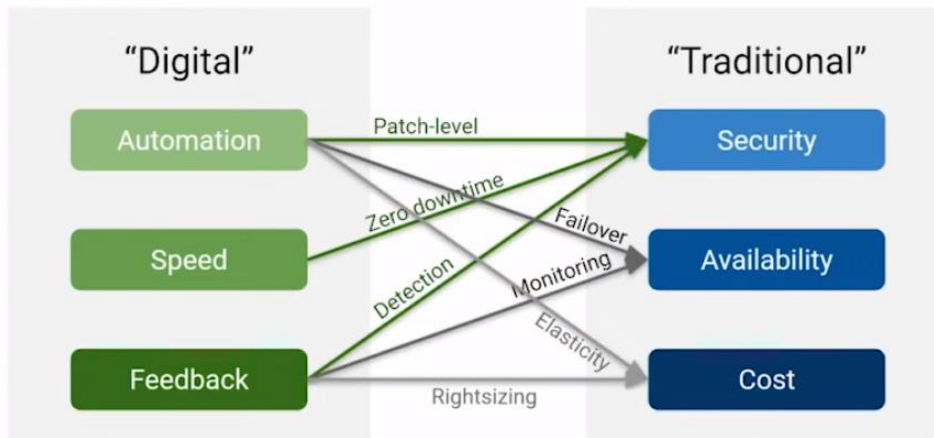
If you live in the first derivative, your tool chain needs to be production grade.

The Role of Architecture

Change Changes Everything

Speeding Up isn't just going faster

Rethinking IT Architecture



<https://cloud.google.com/blog/products/gcp/connecting-dots-how-cloud-operating-model-meets-enterprise-cio-needs>

Speed enables disposability



Speed increases quality: Automation

Speed

Launch products in days, not months.

Confidence

If you wonder whether it'll work, you'll hesitate and not fix what's broken,

Quality

Humans are error-prone.
Software is repeatable.

Continuous Improvement

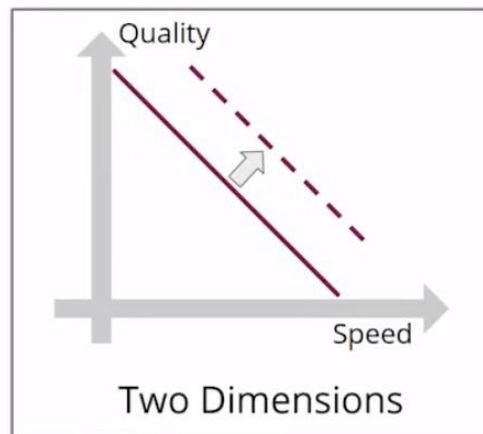
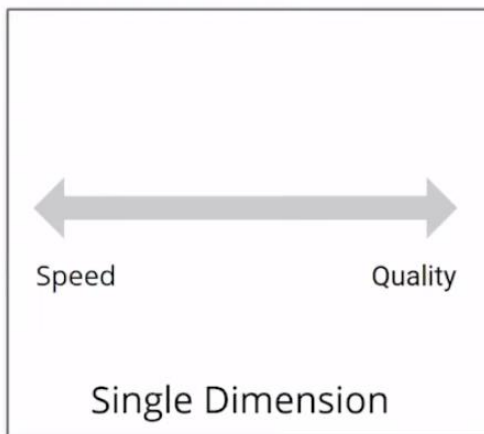
Easy to measure and to improve.

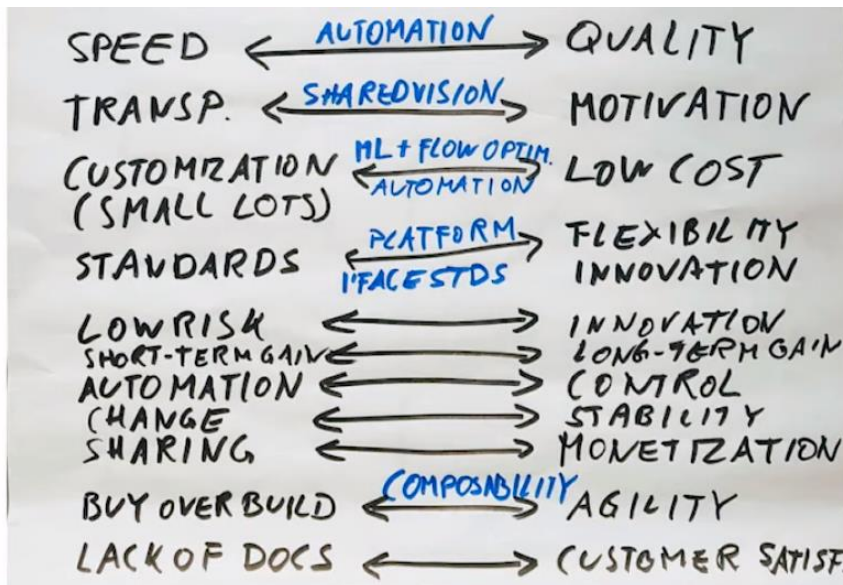
The Role of Architecture

Change Changes Everything

Speeding Up the Org

Dimensionality





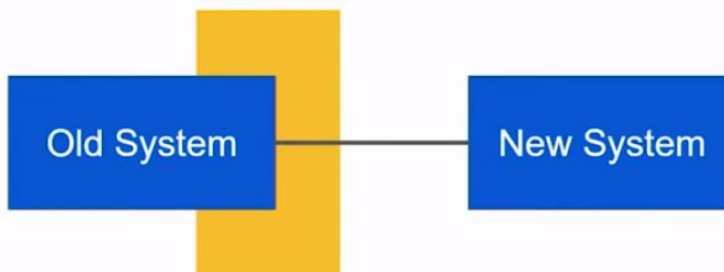
These are all the things organizations believe are opposites but architects know are not.

Shifting Gears - Need a Clutch



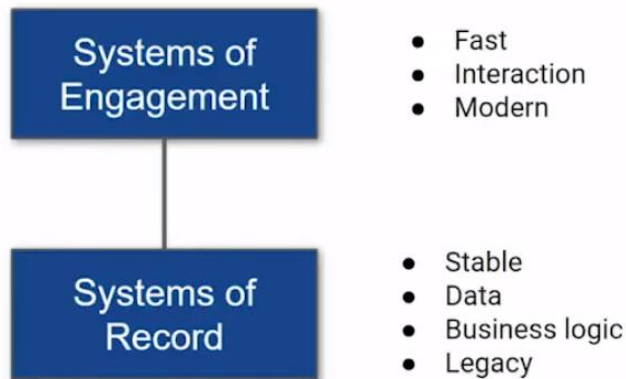
Speeding up is not linear, you need to change gears.

Anti-corruption layer



The way we do this in technical architecture is to build an anti-corruption layer/wrapper between the legacy/slow-moving system and the new/agile system that moves at a higher speed. You always need a clutch/an intermediary between the old and the new teams within your organization.

Two-Speed Architectures?



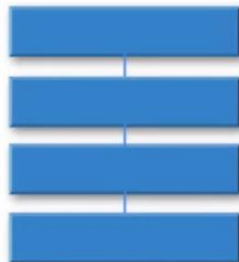
Two-Speed Architectures - Grinding the Clutch



Layering



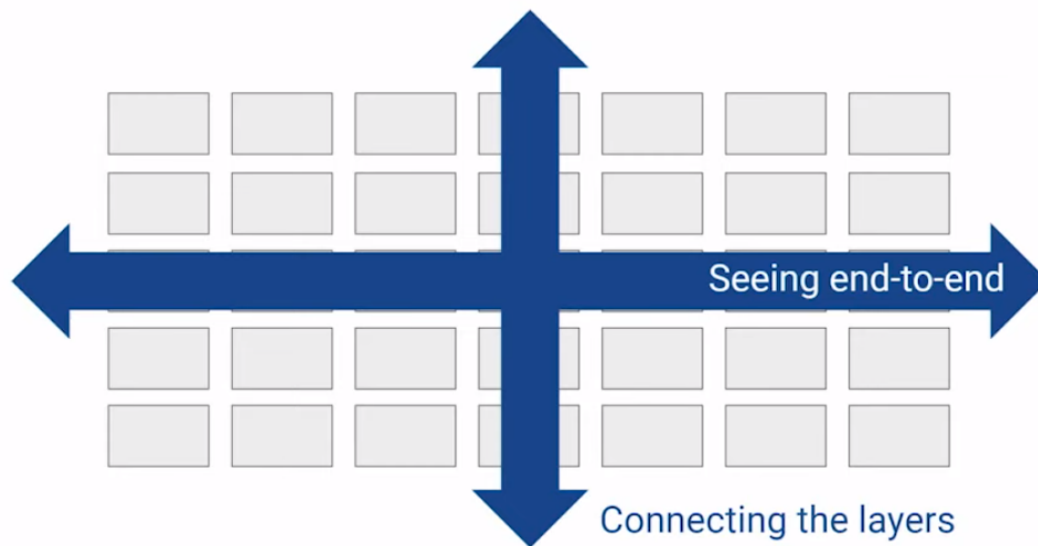
- Separation of concerns
- Abstract Details
- Clear dependencies
- Well-defined Interfaces
- Replaceability



- Overhead
- Local optimization
- Runtime latency
- Own complexity
- Changes propagate

"Structural"

"Behavioral"



You need to start looking at the global picture as against the locally optimized picture. Start optimizing globally, between the local boxes across the layers of abstraction.

Seeing End-to-end

Local Optimization

- Product selection
- Dev and Ops
- Departments
- Projects
- Optimize Utilization
- Cost

Global Optimization

- System integration
- DevOps
- Tribes / Squads
- Products
- Optimize Flow
- Impact