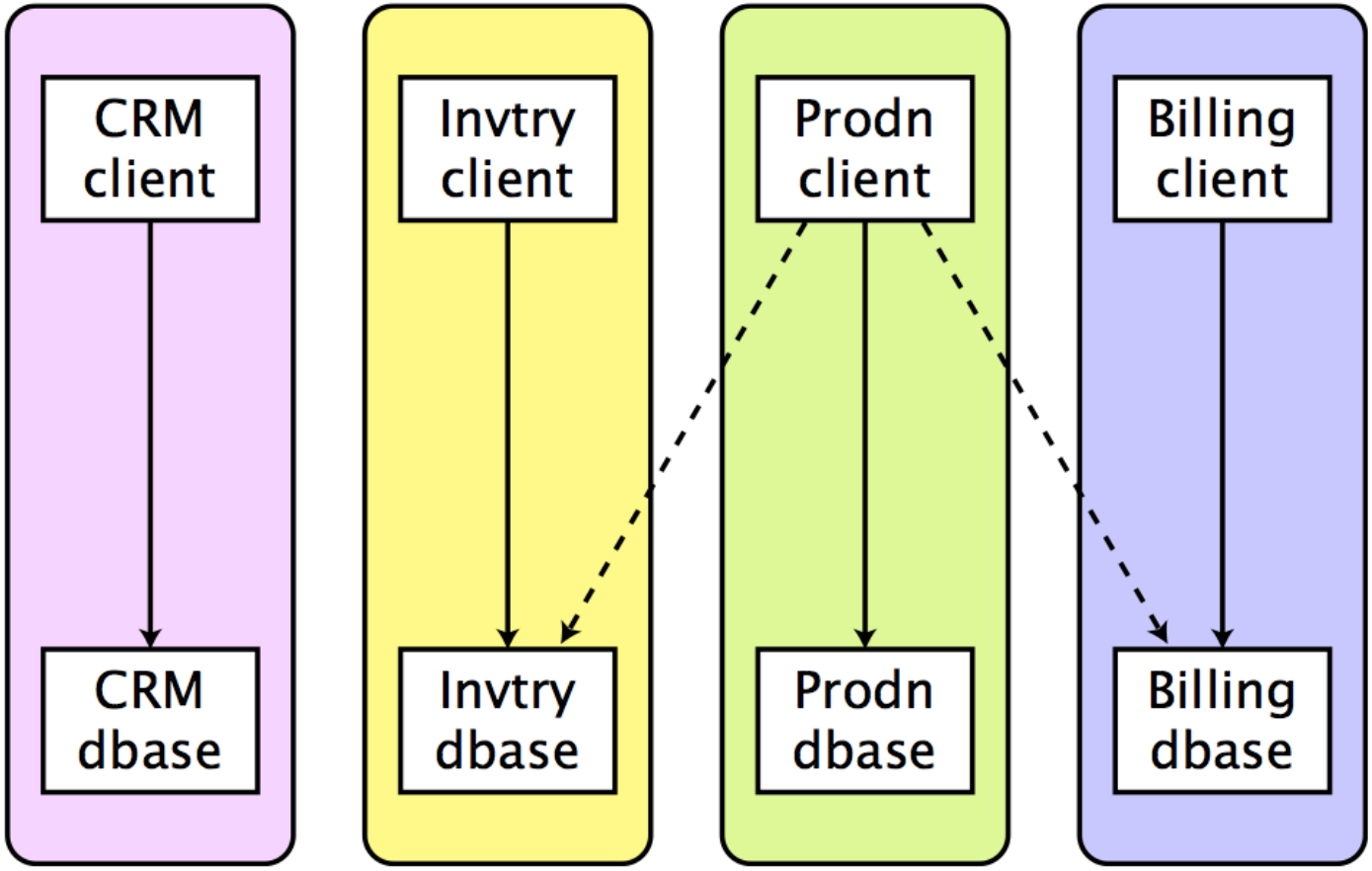
Organisation, Governance and Methodology

Oxford University
Software Engineering
Programme
December 2018

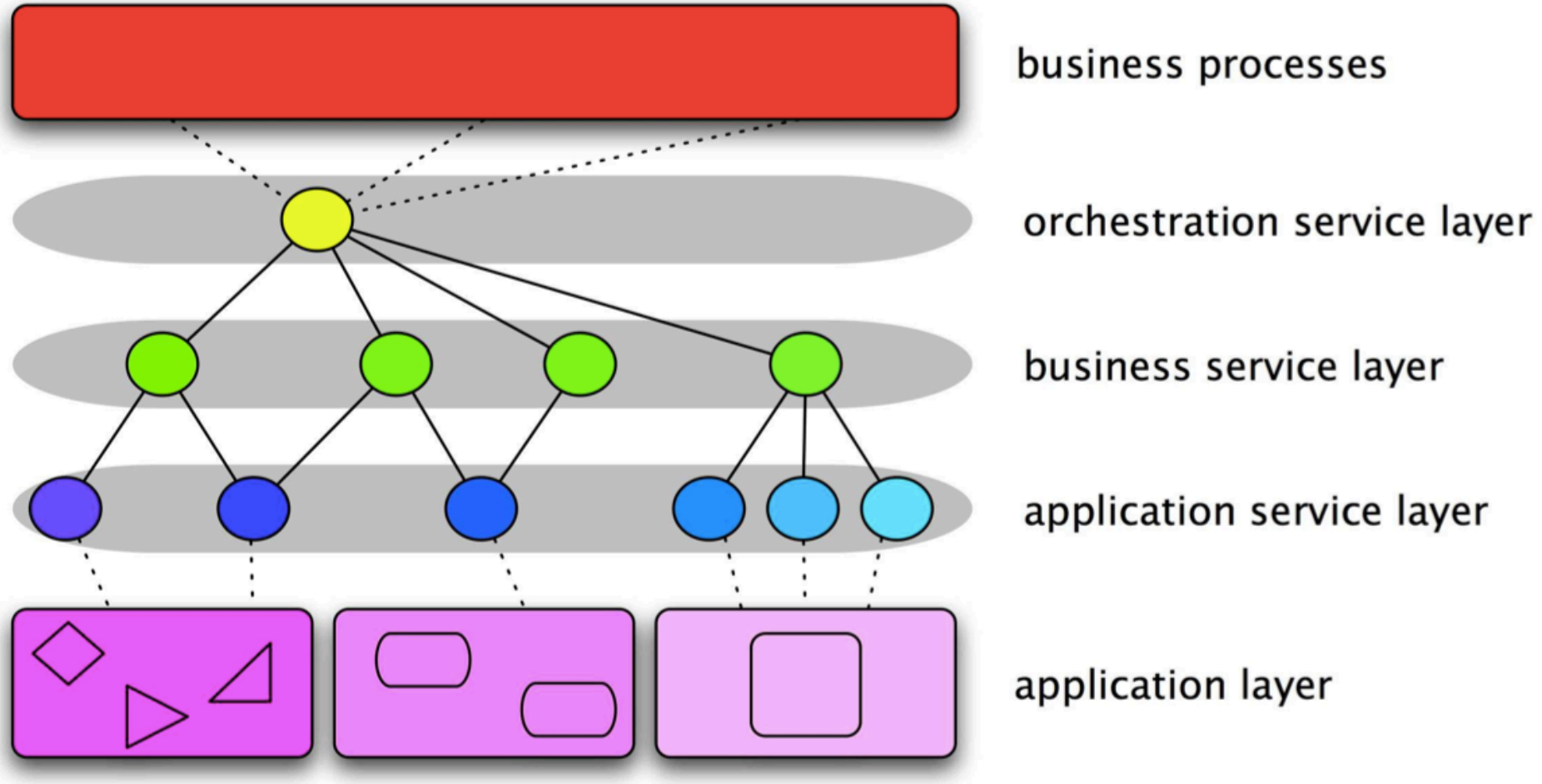
Contents

- Software Development Lifecycle
- Registries
- Design Governance
- Runtime Governance

Before SOA

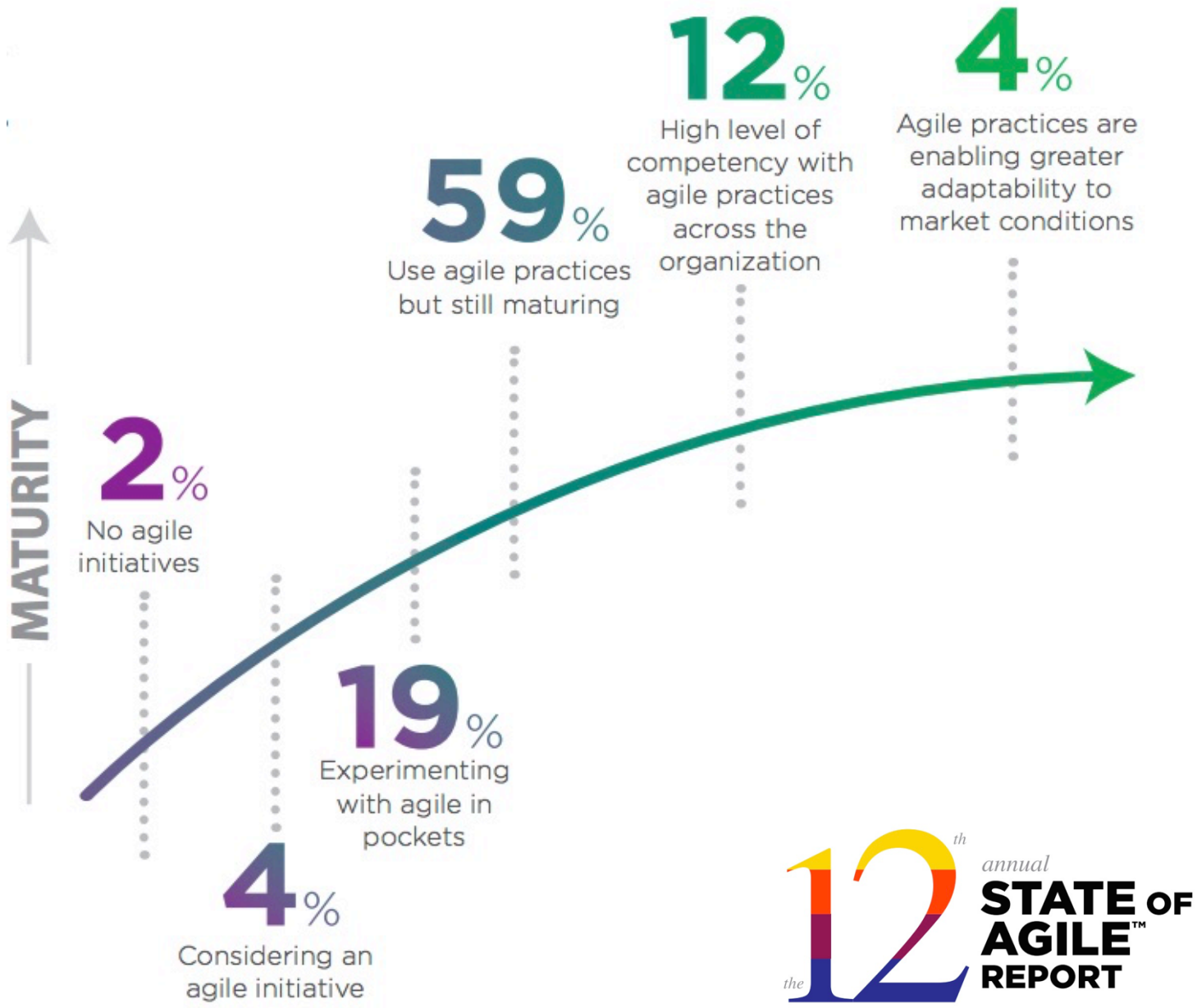


With SOA



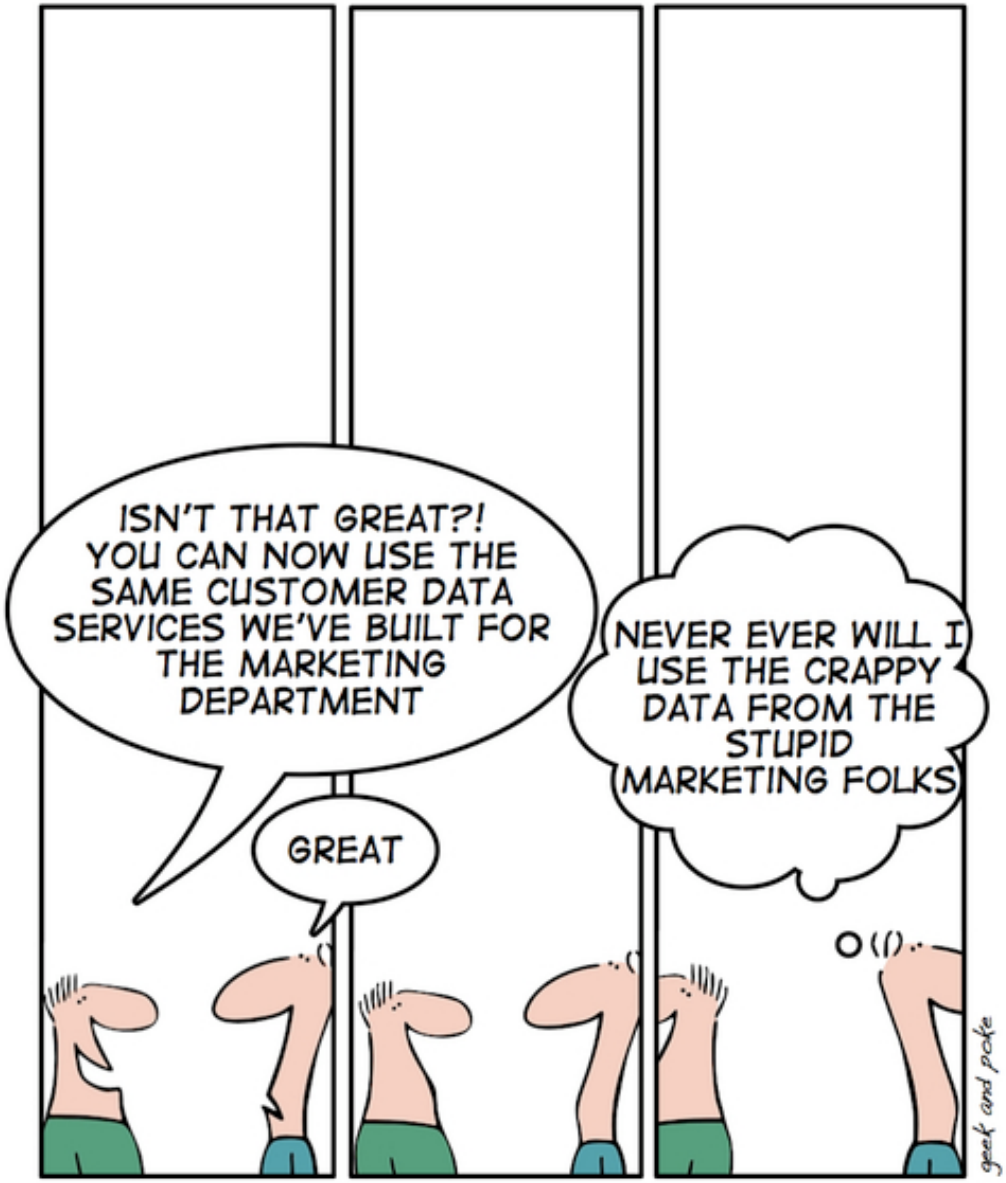
SOA has an impact on organization

- Refactoring of fiefdoms:
  - backend departments
  - cross-domain departments - frontend departments
  - "solutions managers"
- Requires collaboration and trust
- May change the funding model
  - That will pull in resistance



Developer Flow

The wrong organization interrupts flow



THE BENEFITS OF A SOA

Donnie Berkholz
@dberkholz

Following

You say "center of excellence," I hear "new silo."

8:01 PM - 23 Feb 2018

40 Retweets **118** Likes 

16 40 118

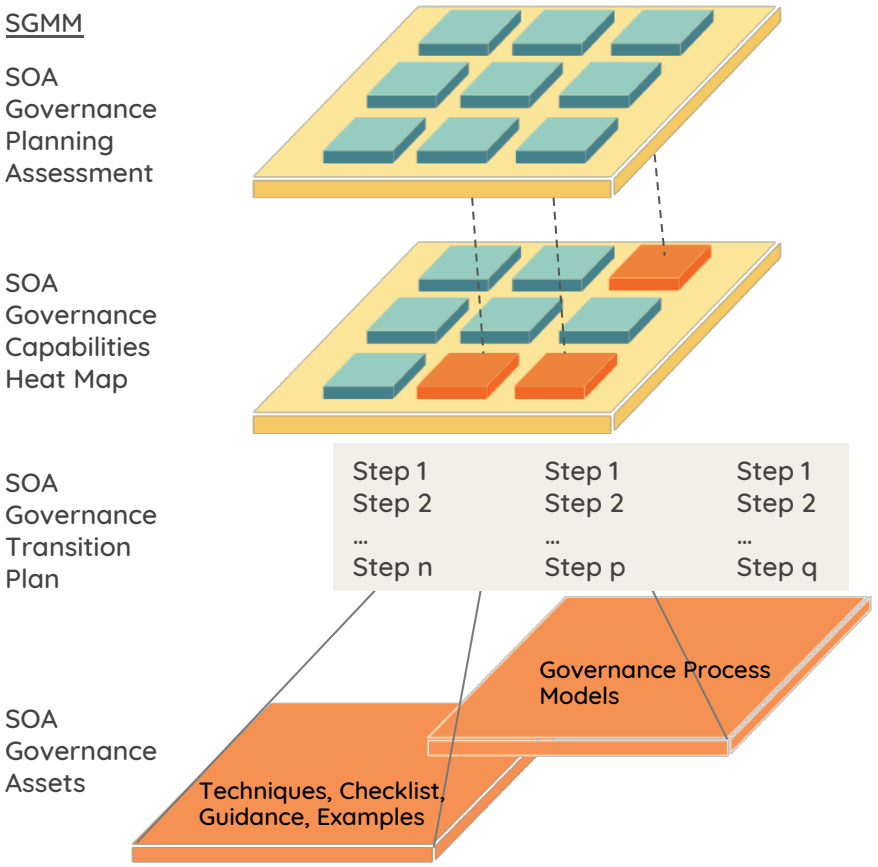
Tweet your reply

Donnie Berkholz  @dberkholz · Feb 23

We're creating Communities of Practice at CWT. Bringing together expertise from across the company, with people sharing practices, patterns and code.

1 2 10

Complex processes interrupt flow



The Agile Manifesto

The best architectures, requirements, and designs emerge from self-organizing teams.

Agile processes promote sustainable development. The sponsors, developers, and users should be able to maintain a constant pace indefinitely.

Deliver working software frequently with a preference to the shorter timescale.

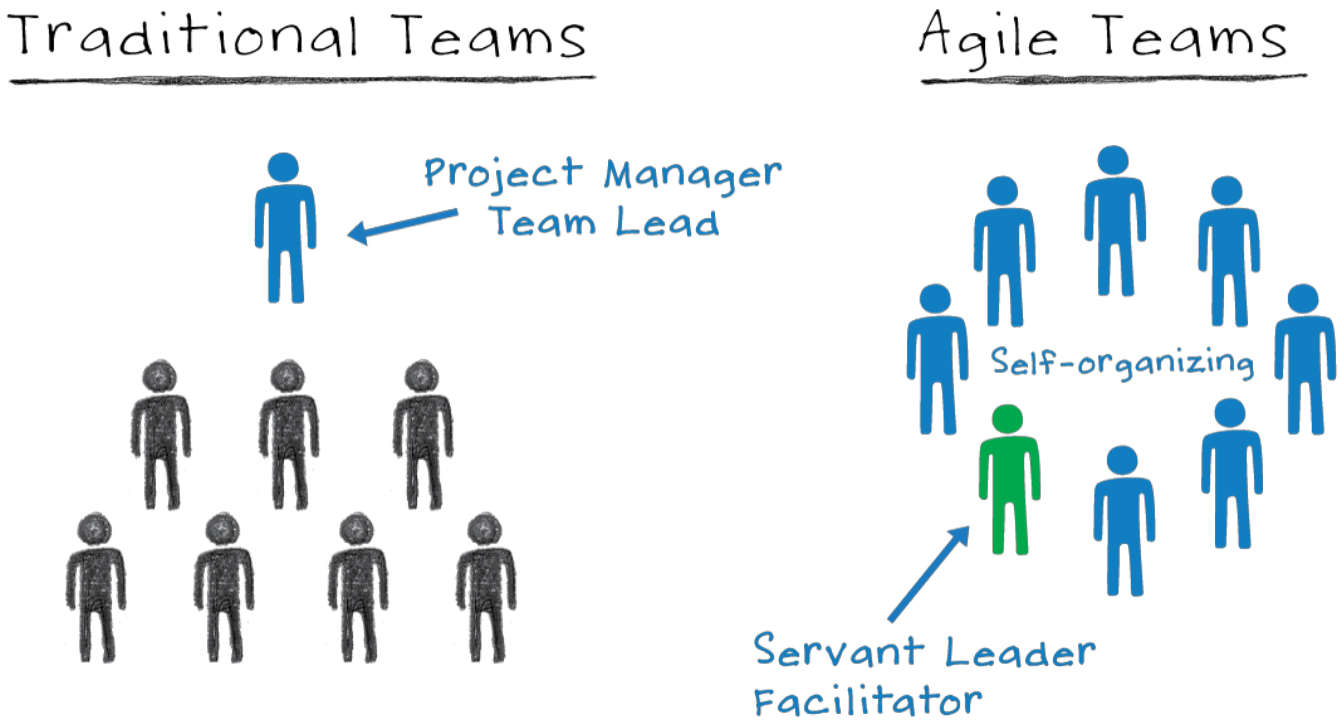
What is a “self-organizing” team?

A team which:

- Manages its own work
- Pulls work
- Doesn’t require “command and control”
- Communicates effectively with each other
- Is not afraid to ask questions
- Continuously evolves skills and capabilities

https://www.scrumalliance.org/community/articles/2013/january/self-organizing-teams-what-and-how

Self Organizing Teams



Why individuals in larger teams perform worse

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ARTICLE INFO

Article history:
Received 15 July 2009
Accepted 17 August 2011
Available online 29 September 2011
Accepted by Linn Van Dyne

Keywords:
Team size
Individual performance
Perceived social support
Appraisal theory
Multi-level theory
Process loss
Coordination

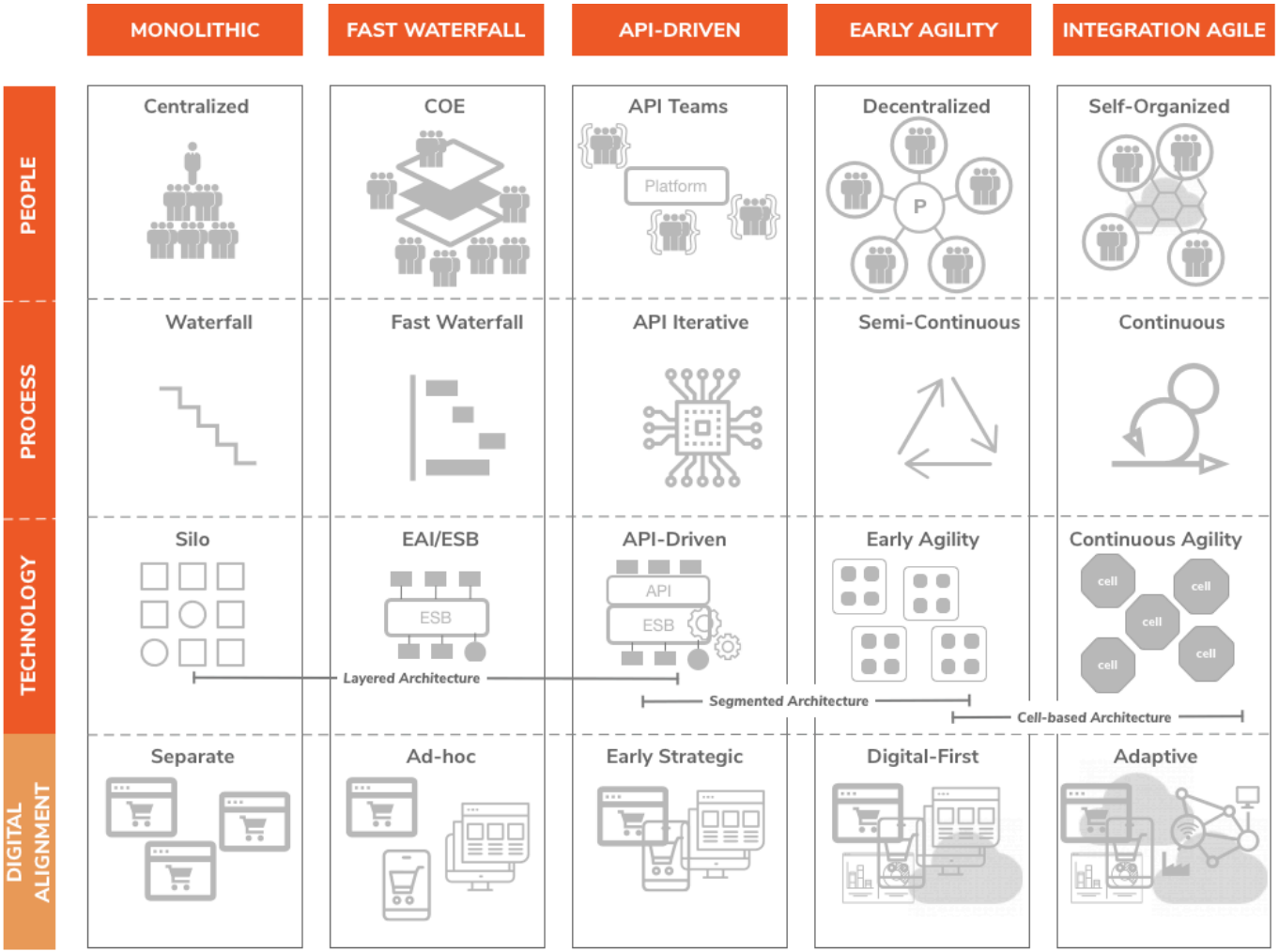
ABSTRACT

Research shows that individuals in larger teams perform worse than individuals in smaller teams; however, very little field research examines why. The current study of 212 knowledge workers within 26 teams, ranging from 3 to 19 members in size, employs multi-level modeling to examine the underlying mechanisms. The current investigation expands upon Steiner's (1972) model of individual performance in group contexts identifying one missing element of process loss, namely relational loss. Drawing from the literature on stress and coping, relational loss, a unique form of individual level process, loss occurs when an employee perceives that support is less available in the team as team size increases. In the current study, relational loss mediated the negative relationship between team size and individual performance even when controlling for extrinsic motivation and perceived coordination losses. This suggests that larger teams diminish perceptions of available support which would otherwise buffer stressful experiences and promote performance.

$$\frac{n(n-1)}{2}$$

Reference Methodology

https://github.com/wso2/reference-methodology



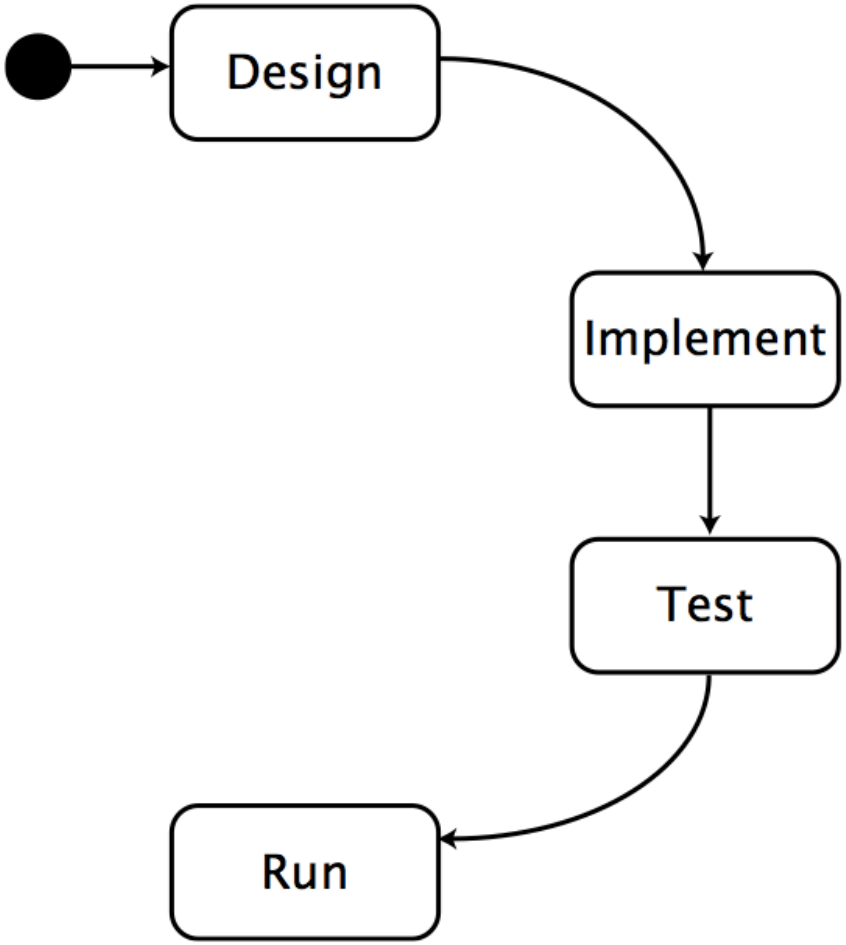
Conway's Law

- Any organization that designs a system will inevitably produce a design whose structure is a copy of the organization's communication structure.

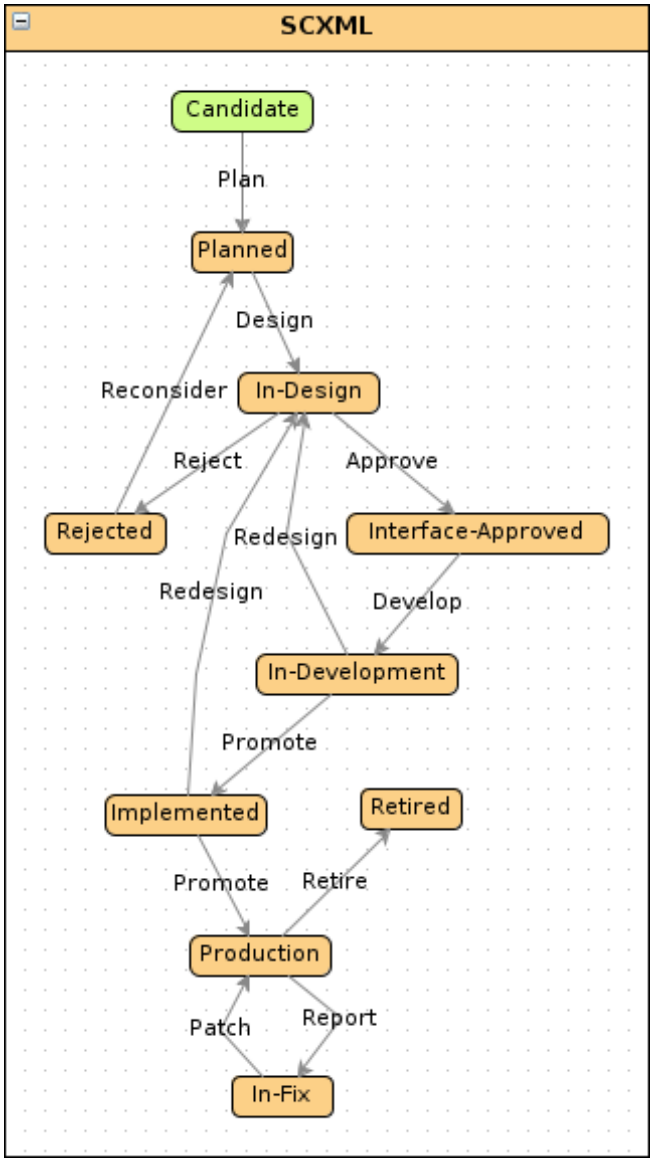
  Melvin Conway, *How Do Committees Invent?*, Datamation Apr 1968, http://www.melconway.com/law/

- Popularized and named by Fred Brooks in *The Mythical Man-Month*: "If you have four groups working on a compiler, you'll get a 4-pass compiler."

Software Development Lifecycle



Not that simple!



High level governance

- *Visions, objectives, business case, funding model*
  - Why are we doing this? How will we pay for it?
  - *Reference architecture*
    Fundamental decisions: preferred technology, message exchange patterns, metamodel, etc
- *Rules and responsibilities*
  - who drives and cares about issues
- *Policies, standards, formats, processes, lifecycles*
  - decide and document, in standard notations

Technical Governance

- *Documentation*
  - important for transparency; promotes non-technical issues
- *Service management*
  - repositories and registries for services and contracts
- *Monitoring*
  - conformance to policies, meeting SLAs, preparing for withdrawal
- *Change and configuration management*
  - Code lifecycle, DevOps, SOA, the intersection

Establishing SOA

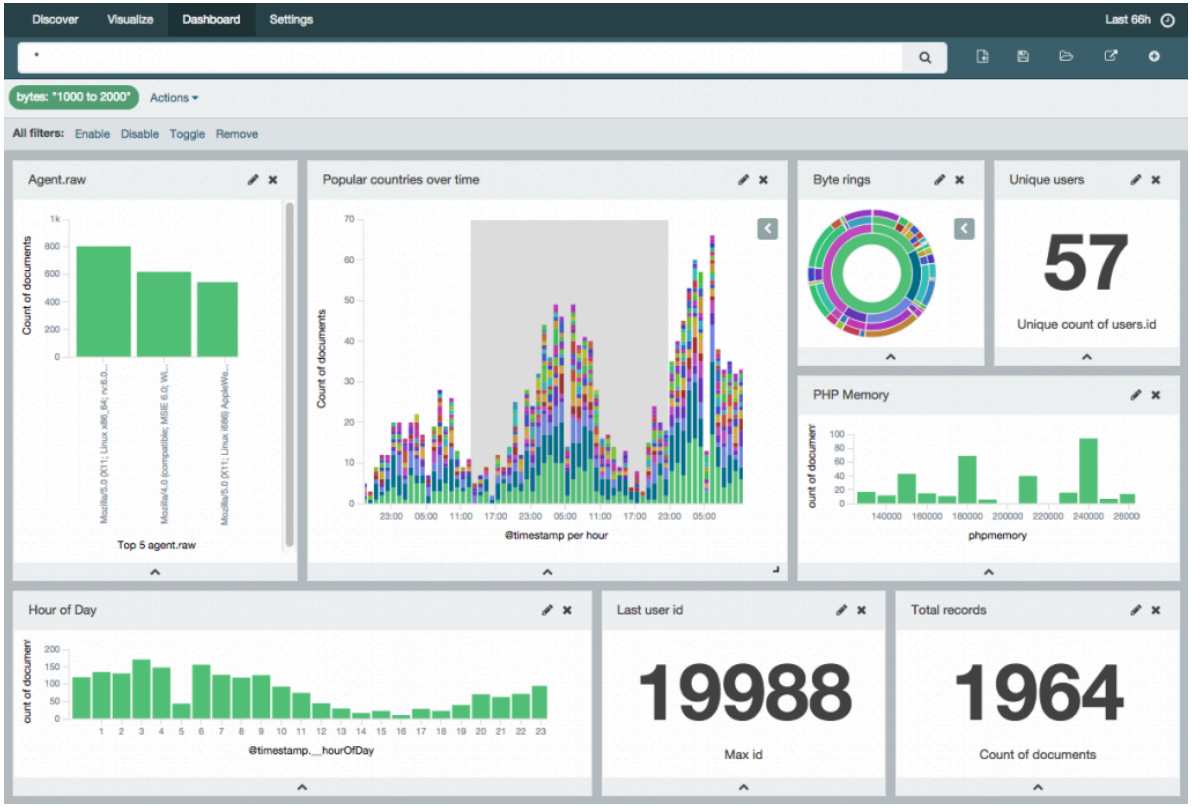
- *Developer-driven, grass-roots*
  - leads to technological experience; likely to be uncoordinated
- *Business-driven*
  - proof of concept helps adoption; limited benefit from early projects
- *IT-driven*
  - effective for infrastructure; focus on technical aspects
- *Management-driven*
  - top-down coordinated, driven by business priorities; expensive, disruptive, risky

Registry, DevOps, SCM

- Want a holistic flow between:
  - The Source Code Management (CVS, SVN, Git)
  - The build and test environment
    - Hudson, Jenkins, Bamboo
    - Selenium, JUnit, etc
  - The production management process
    - DevOps, Puppet, Chef
  - The design time registry
    - API Management
  - The runtime registry
    - Consul, etcd, etc

Runtime Governance

- Discovery
  - Finding services at runtime
- Managing SLAs
  - Service Mesh, Blue-Green, Canary
- Correlation and Tracing
  - Zipkin, Jaeger
- Observability
  - Log management, Monitoring, Metrics
- Acting on situations
  - Autonomous management


Discover
Visualize
Dashboard
Settings
Last 66h
bytes: "1000 to 2000"
Actions
All filters: Enable Disable Toggle Remove
Agent.raw
Count of documents
Top 5 agent.raw
Popular countries over time
Count of documents
@timestamp per hour
Byte rings
Unique users
57
Unique count of users.id
PHP Memory
phpmemory
Hour of Day
@timestamp._hourOfDay
Last user id
19988
Max id
Total records
1964
Count of documents

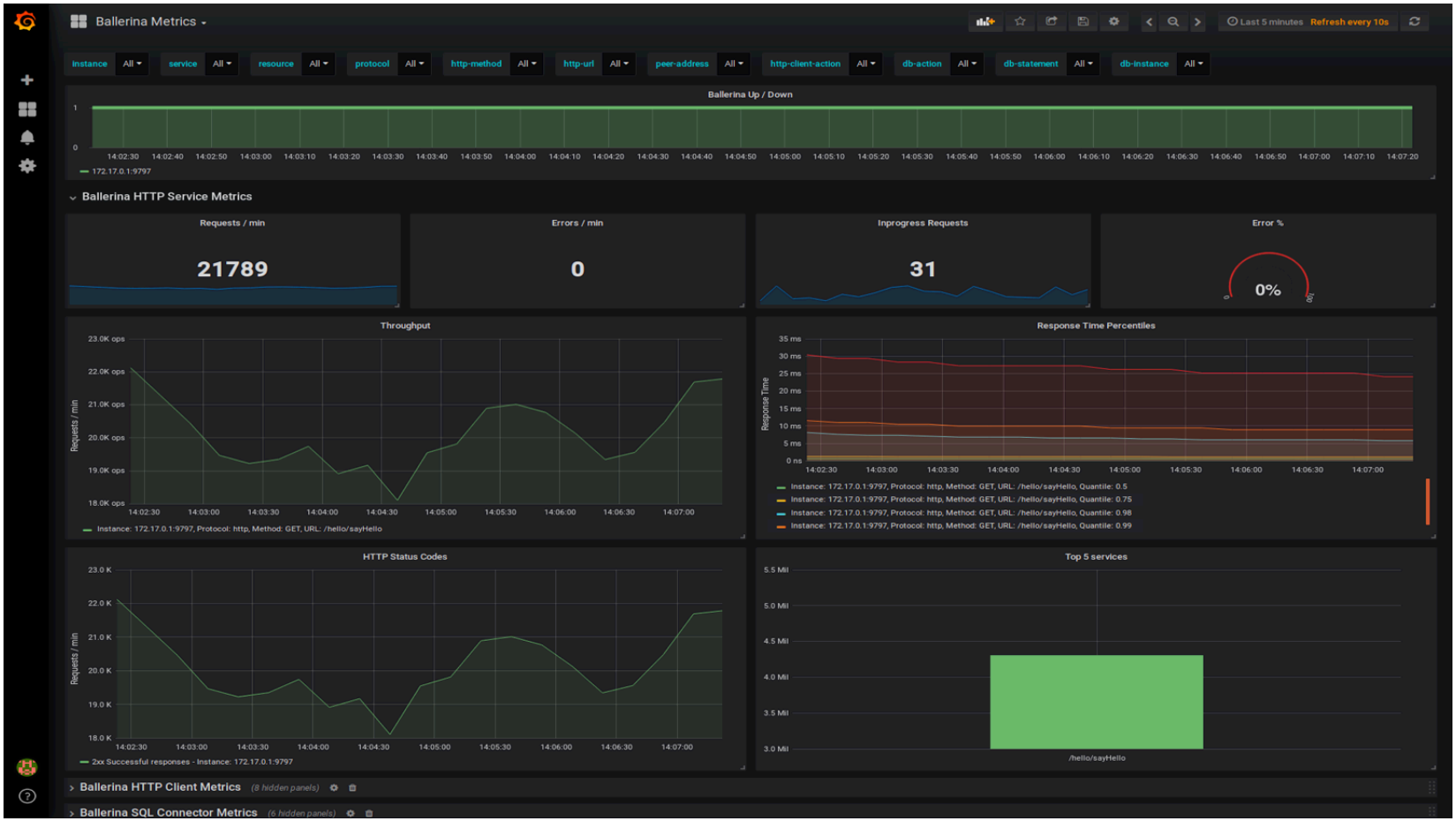

LOG


logstash

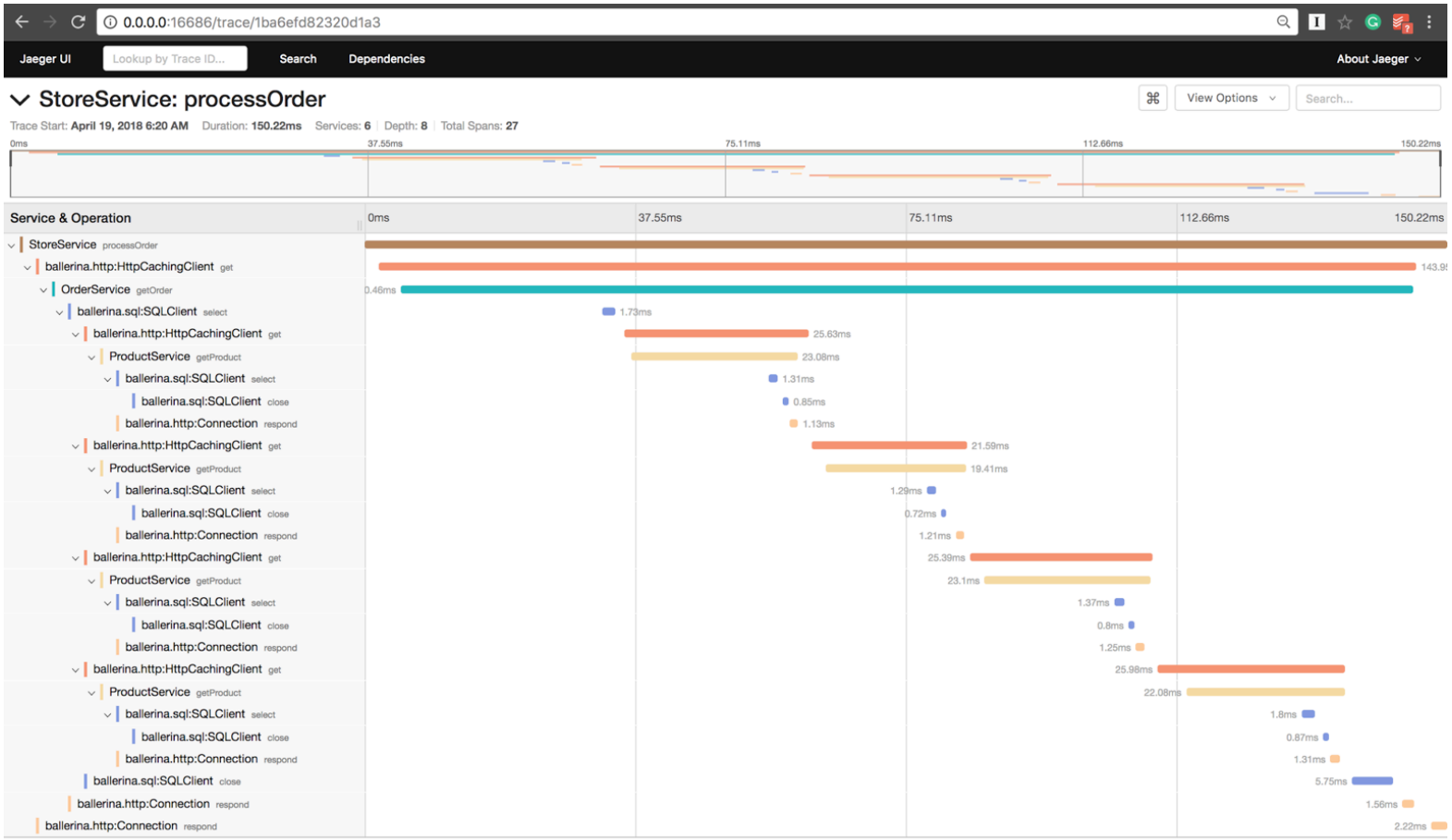

ELASTIC
SEARCH


Kibana

Monitoring / Metrics



Tracing



“Shift to the Left”

- Start each project with:
  - Git / SCM
  - Build / Test
  - DevOps
  - Cloud Orchestration
  - Observability
  - GitOps
  - etc
- Then start writing code…

Questions?