

Organisation, Governance and Methodology

Oxford University
Software Engineering
Programme
December 2019



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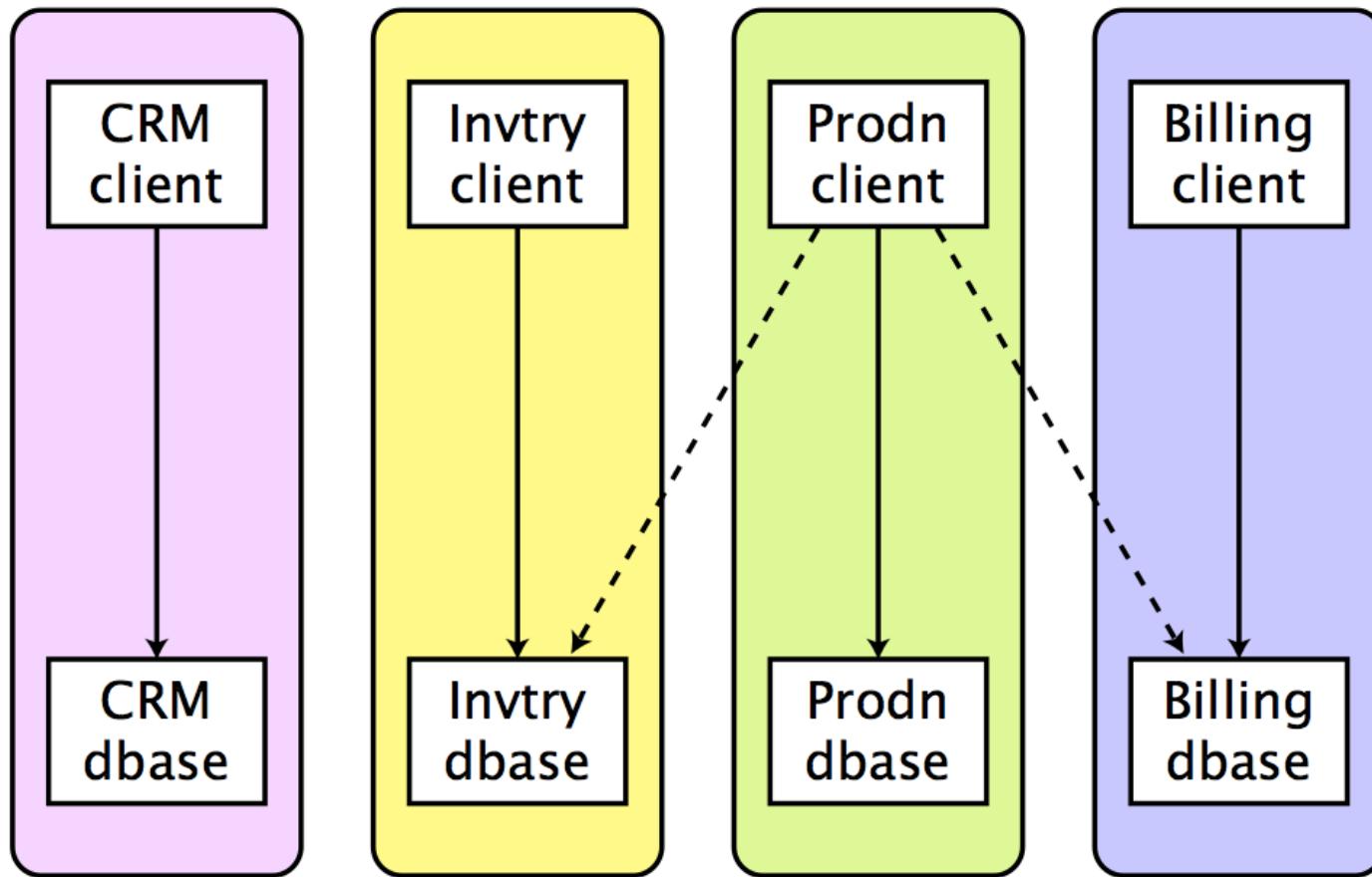
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- Software Development Lifecycle
- Registries
- Design Governance
- Runtime Governance

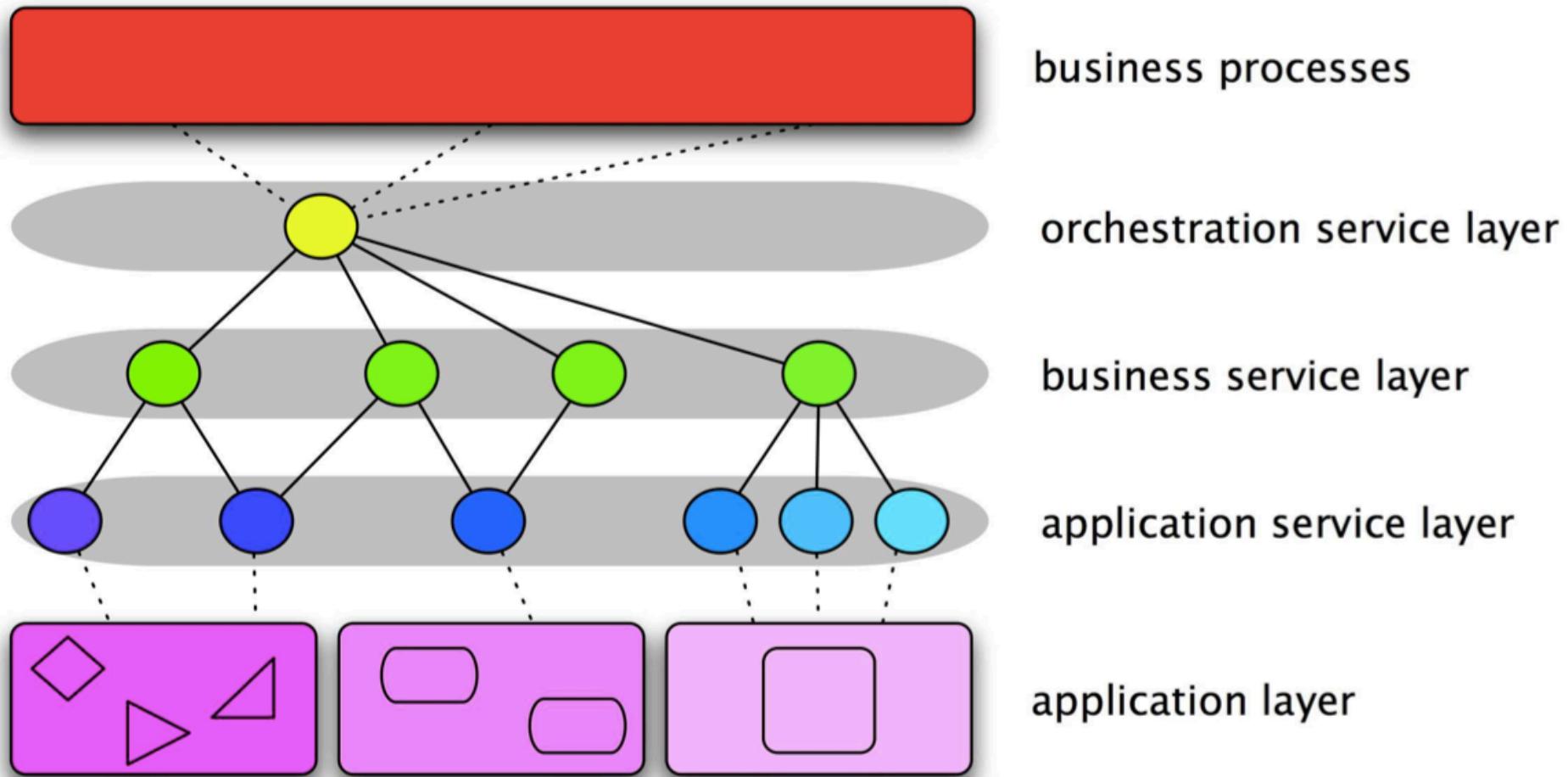


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Before SOA



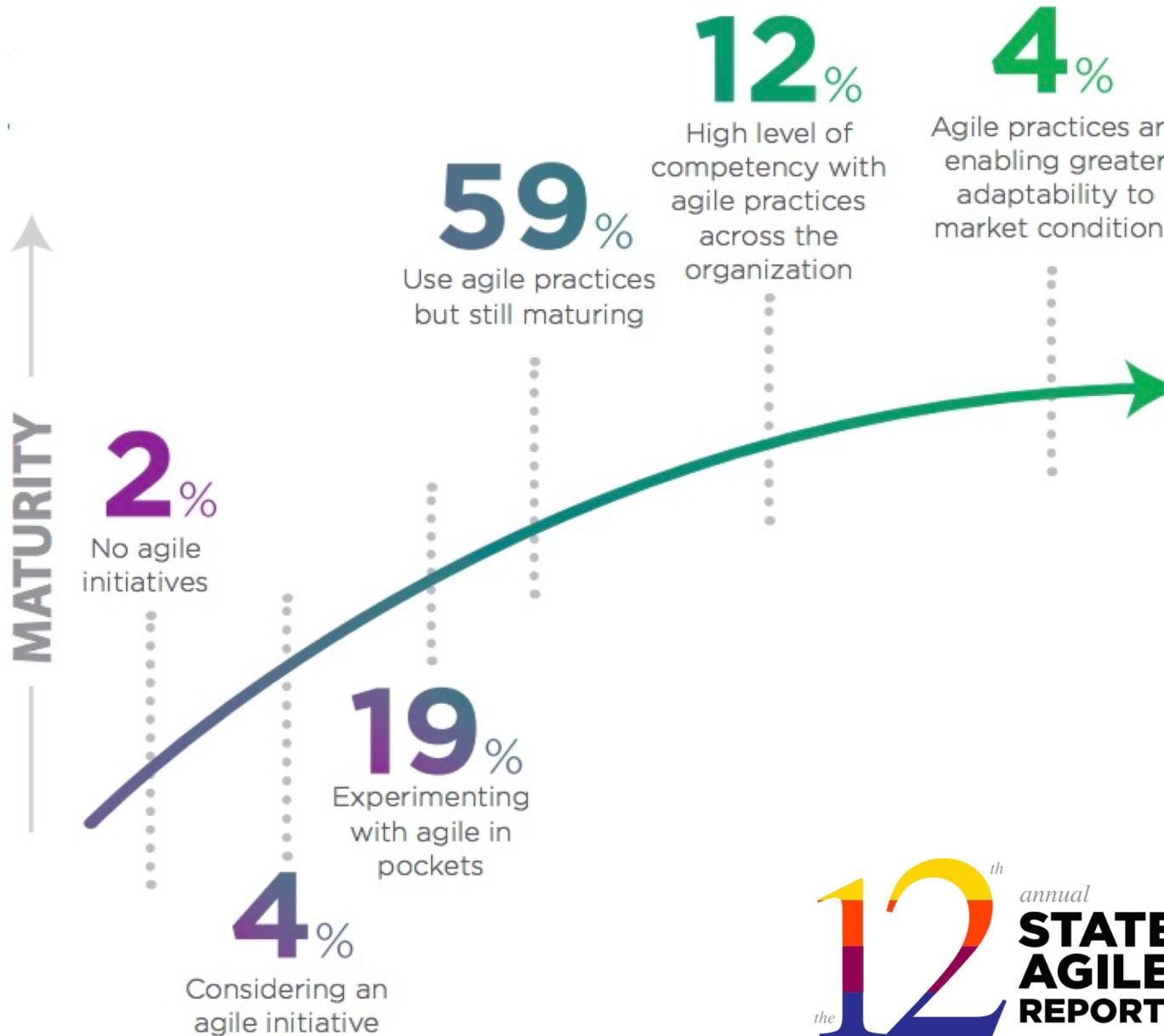
With SOA



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





the 12th annual
STATE OF AGILE™ REPORT



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Developer Flow



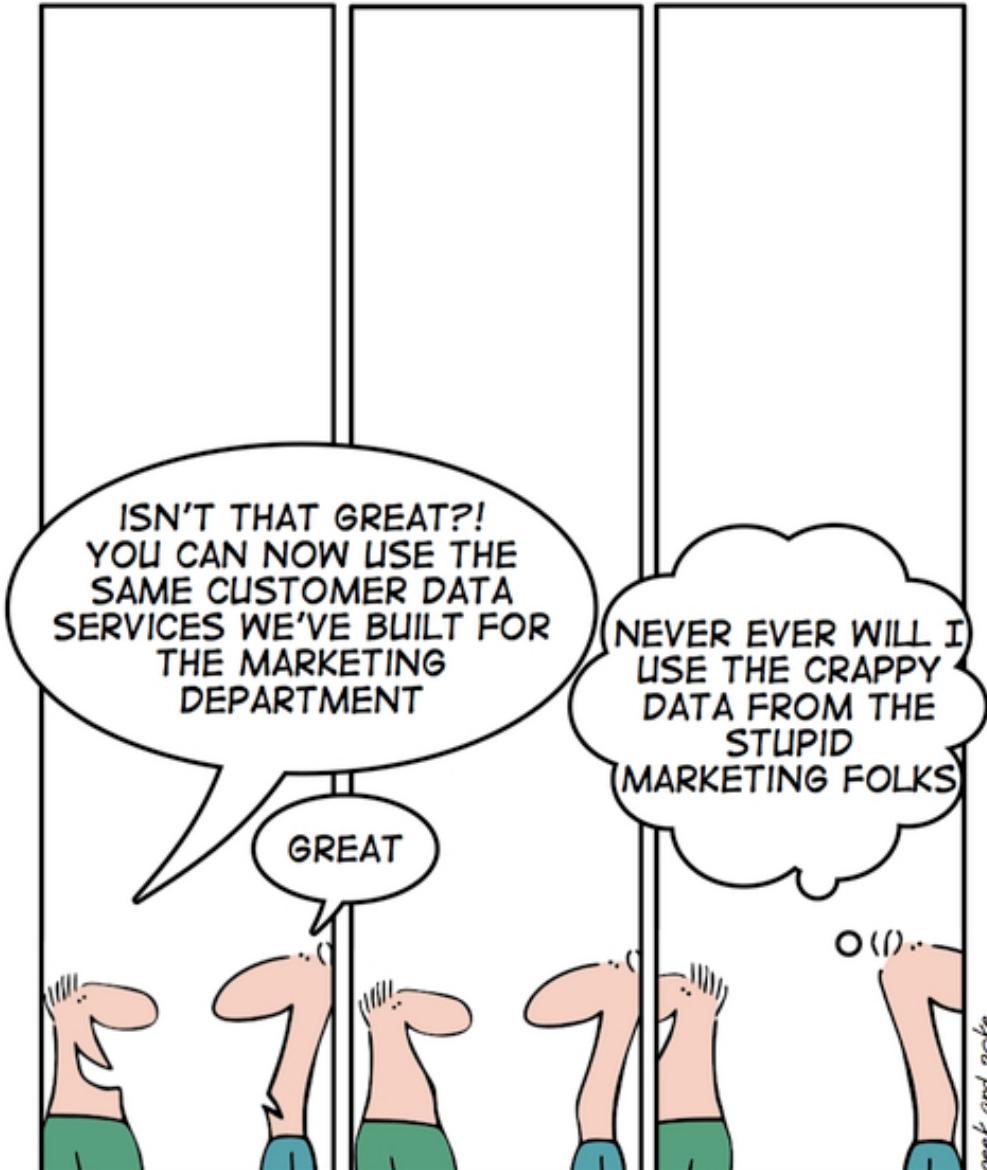
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The wrong organization interrupts flow



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THE BENEFITS OF A SOA



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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

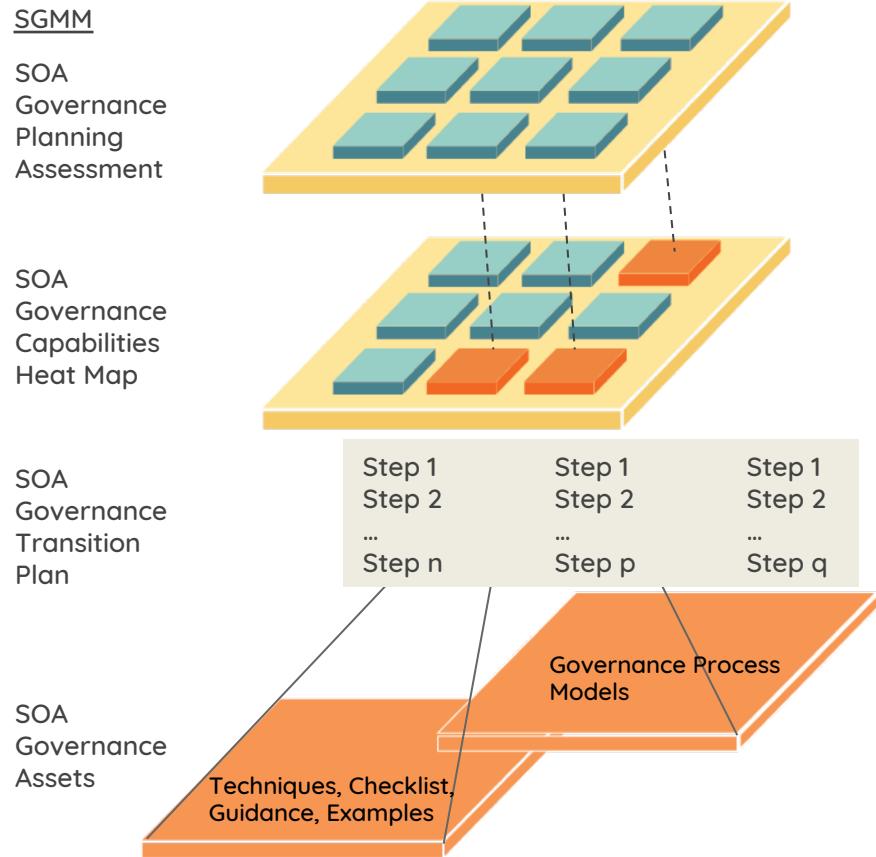
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10



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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

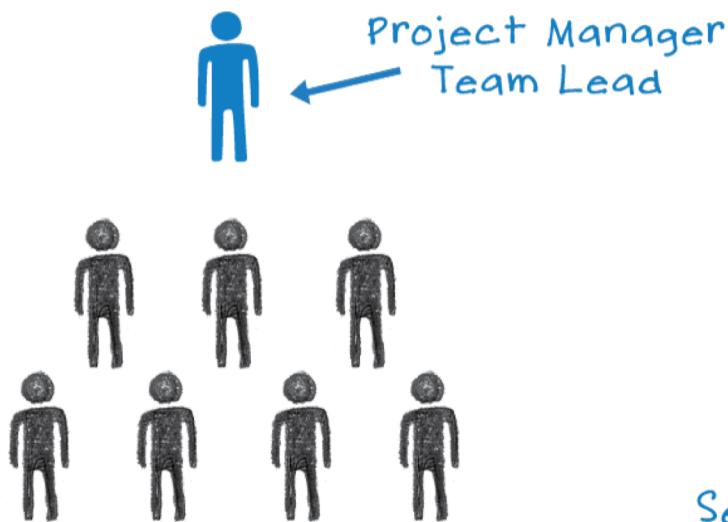
<https://www.scrumalliance.org/community/articles/2013/january/self-organizing-teams-what-and-how>



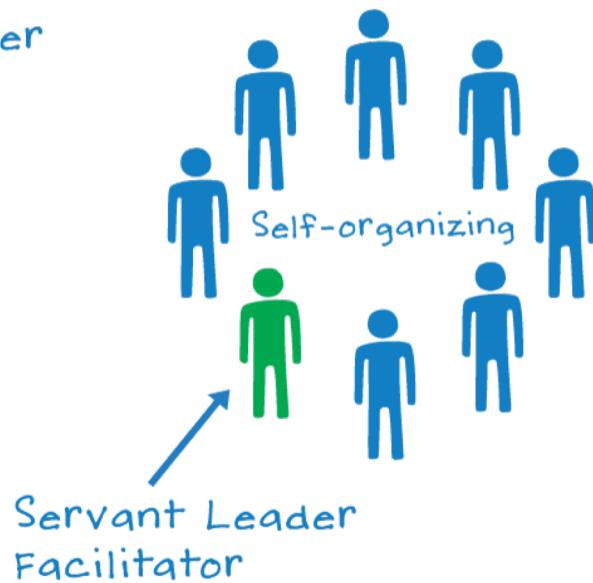
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Self Organizing Teams

Traditional Teams



Agile Teams





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Why individuals in larger teams perform worse

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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.

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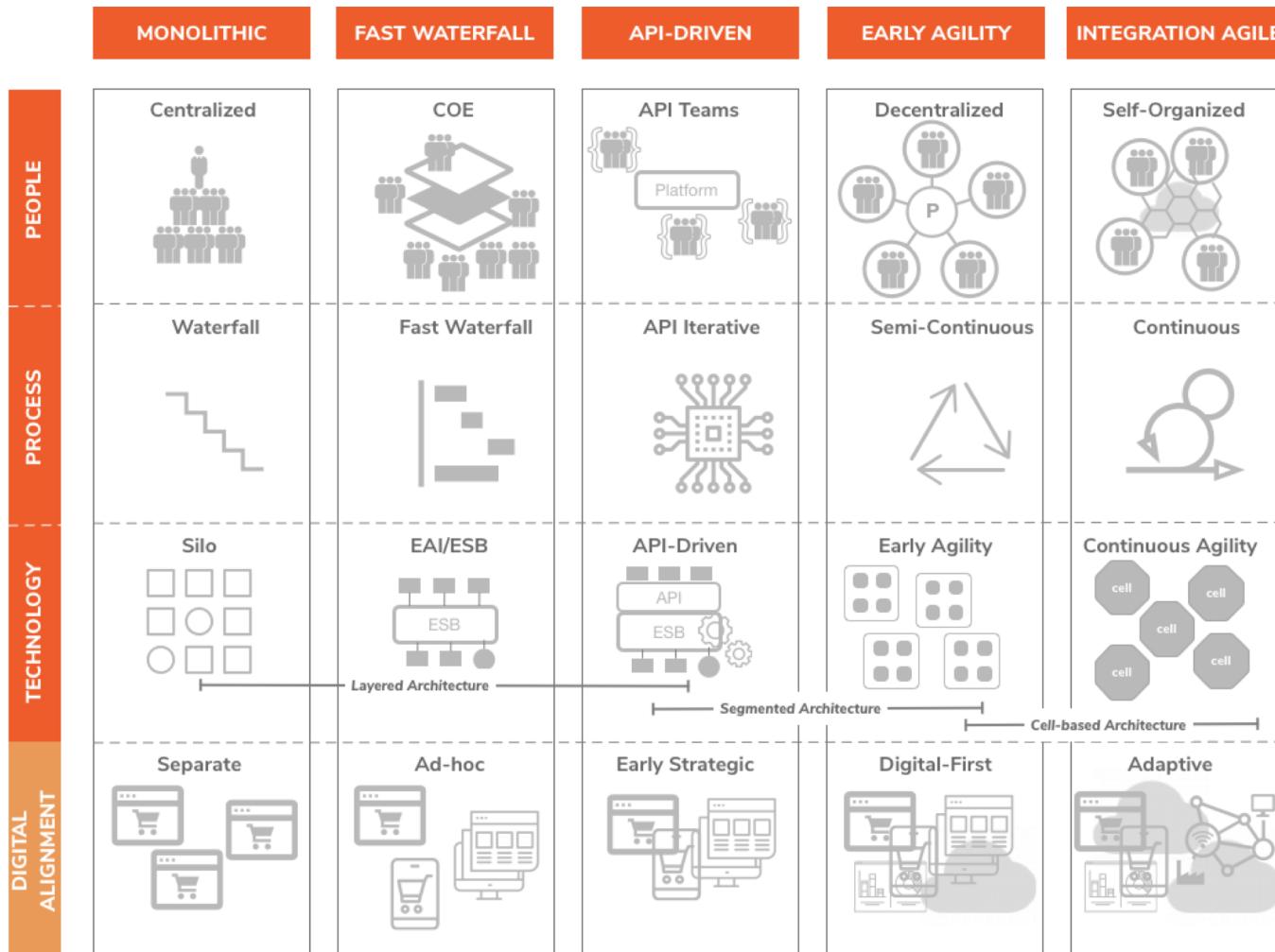
$$\frac{n(n-1)}{2}$$

2



Reference Methodology

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



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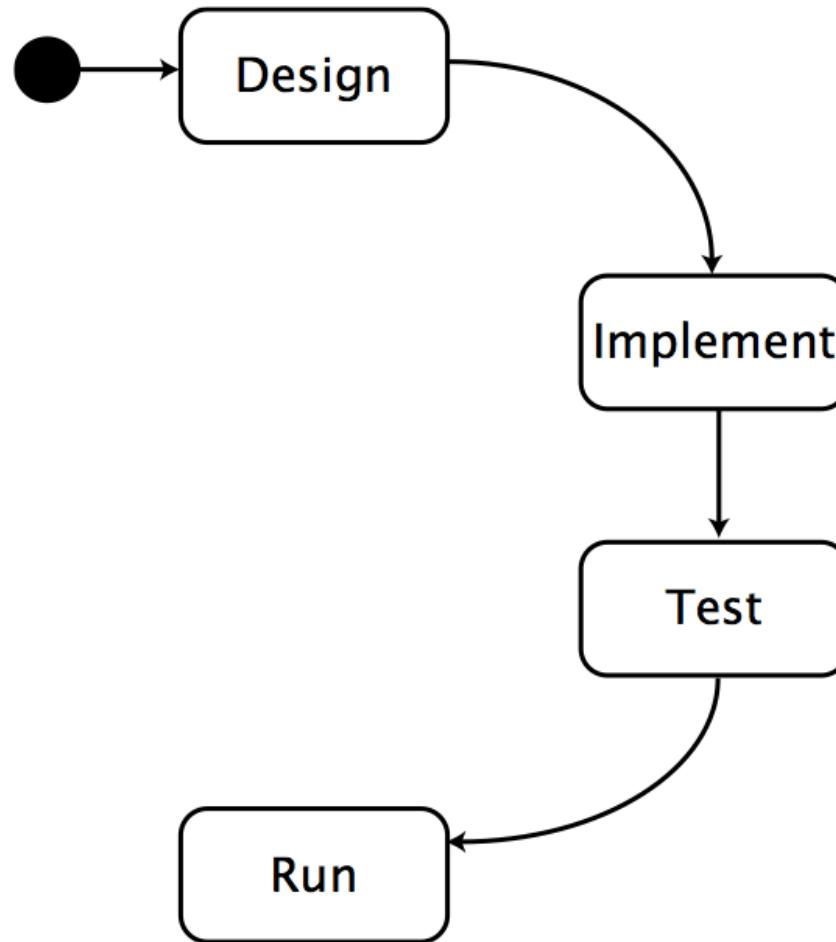
Conway's Law

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

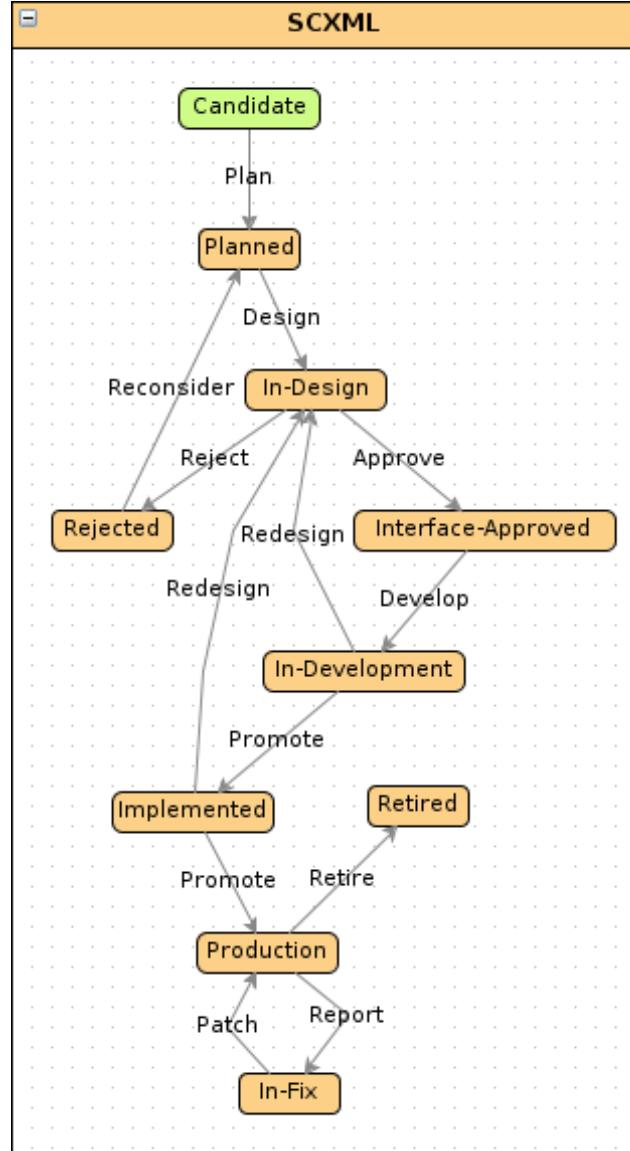
Melvin Conway,
How Do Committees Invent?,
Datamation Apr 1968,
<http://www.melconway.com/law/>
- Popularized and named by Fred Brooks in
 - *The Mythical Man-Month*
- Eric Raymond:
 - “If you have four groups working on a compiler, you'll get a 4-pass compiler.”



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





logstash

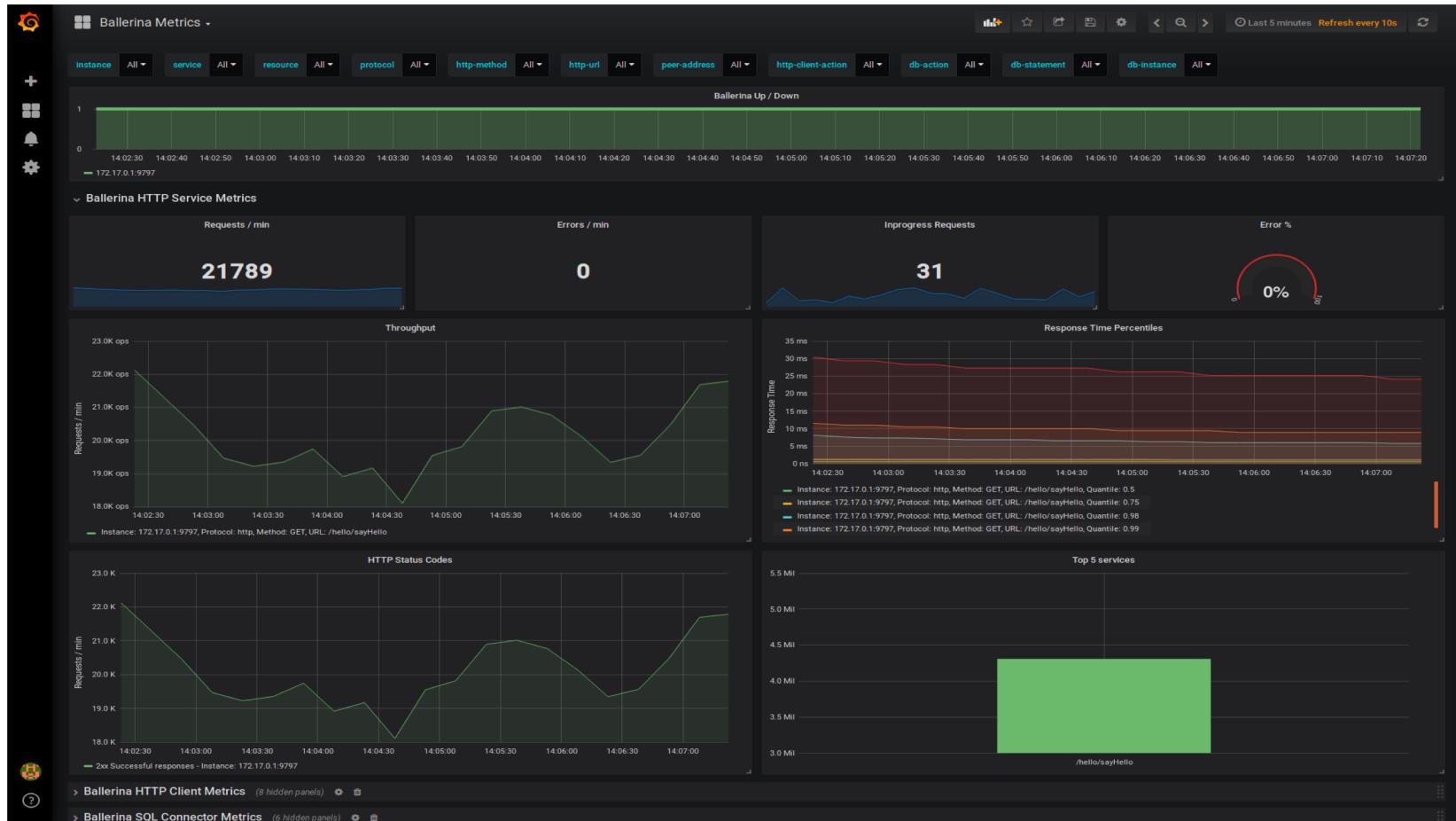


**ELASTIC
SEARCH**

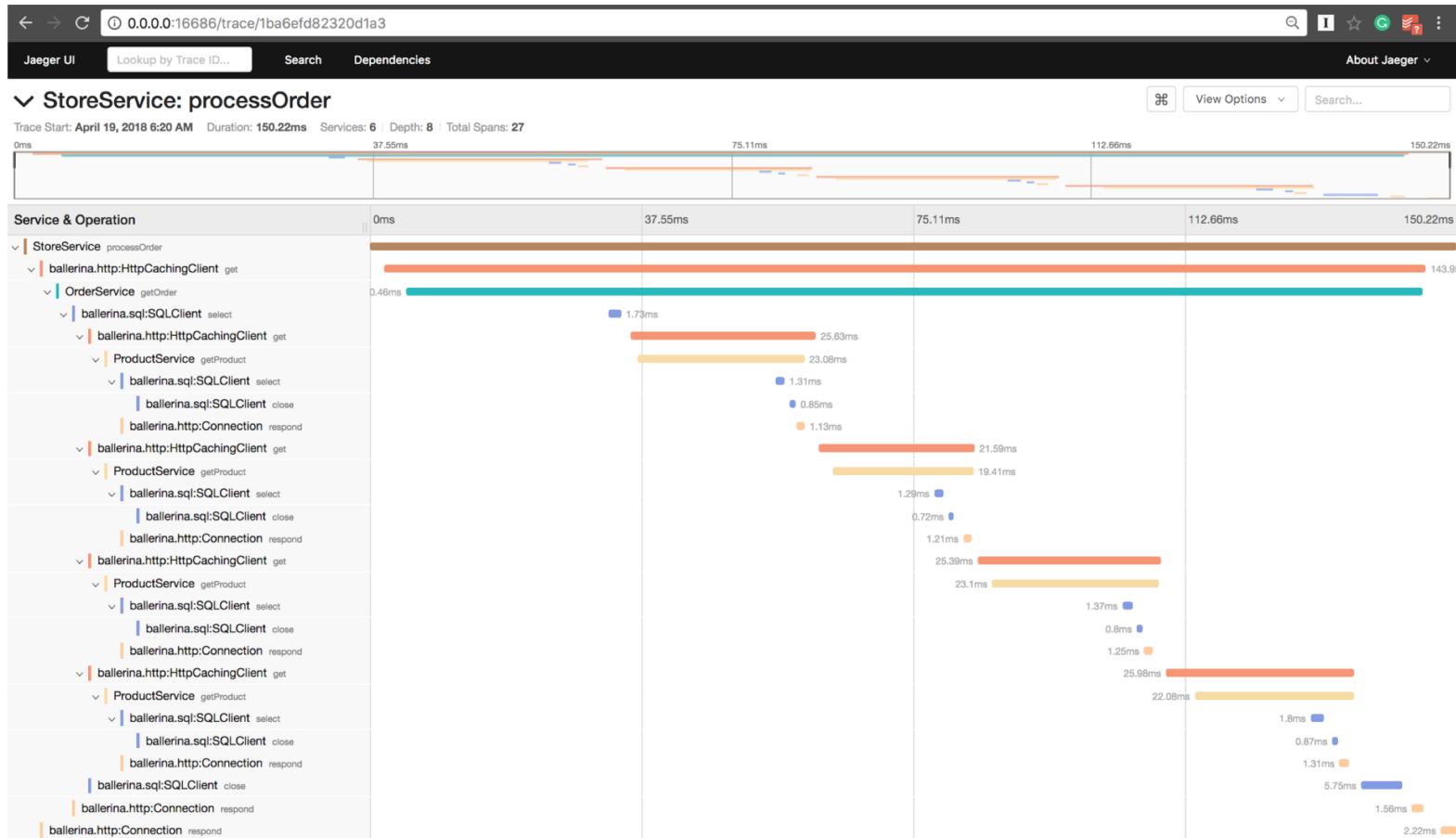


Kibana

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...



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Questions?



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