



ca World[®] '17

DEVOPS: APIS & MICROSERVICES

API Academy: Microservices – How to Safely Speed Up Your Digital Innovation

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API Academy

DO1T56T



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Agenda

1 INTRODUCTION

2 MICROSERVICES

3 APIS

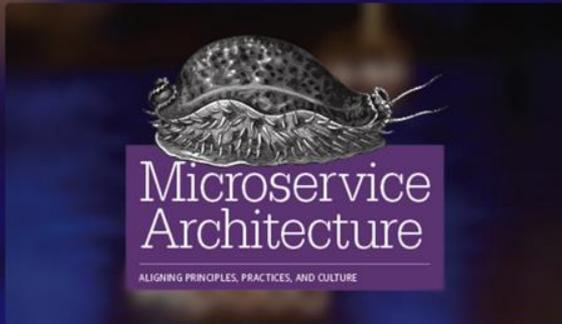
4 INNOVATION

5 ONE MORE THING...



Mike Amundsen
@mamund

EBOOK



MICROSERVICE ARCHITECTURE: ALIGNING PRINCIPLES, PRACTICES & CULTURE

DESIGN AND APPLY MICROSERVICES TO EMBRACE CONTINUAL
CHANGE IN THE DIGITAL ECONOMY

[READ MORE](#)

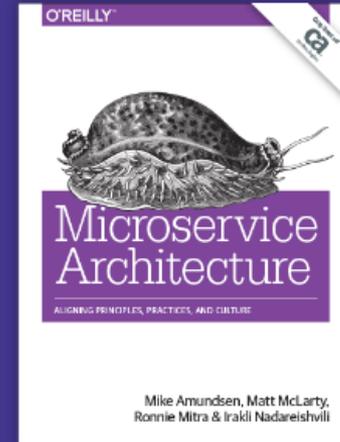


Microservice Architecture: Aligning Principles, Practices, and Culture

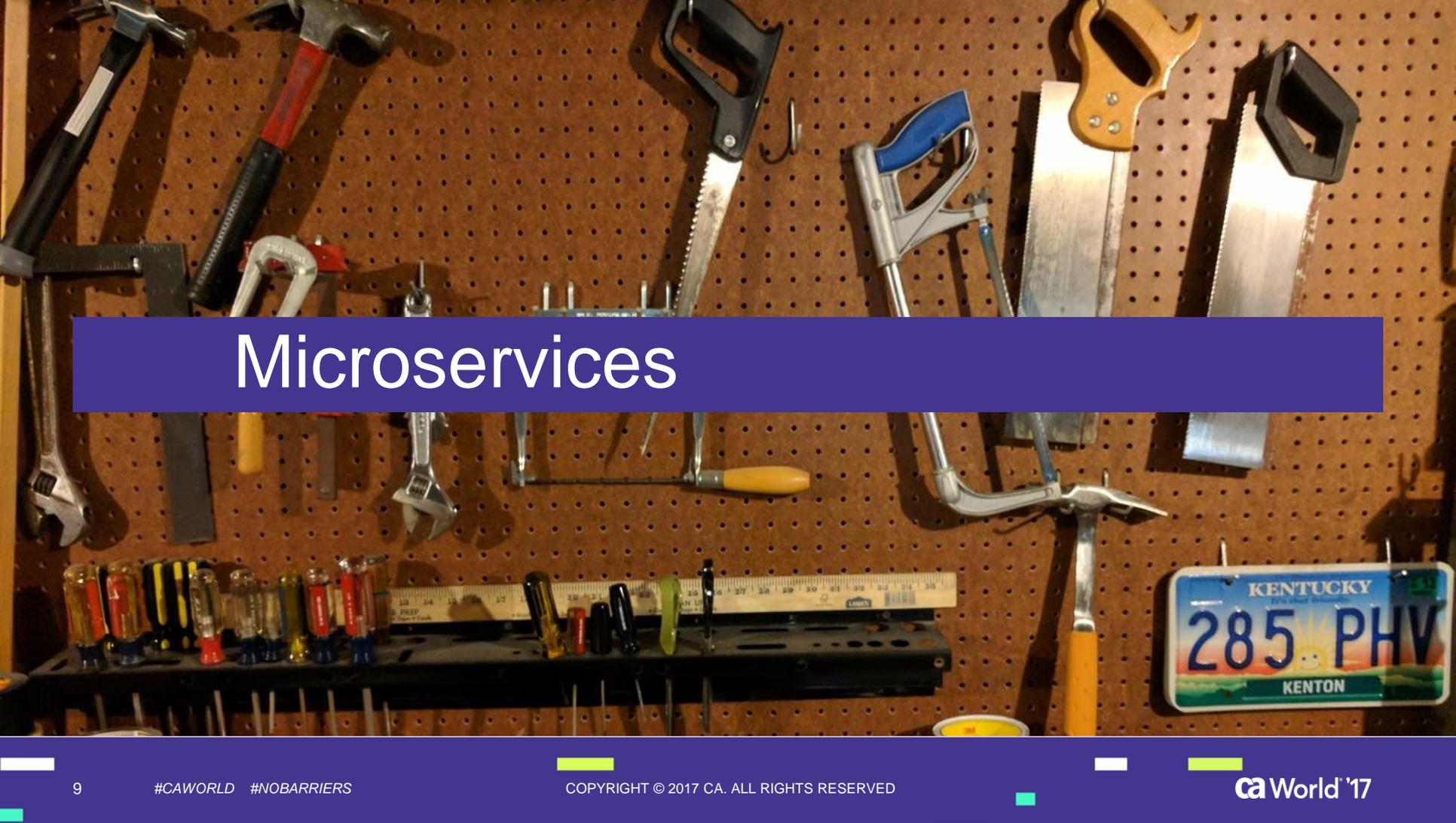
Microservices is the next evolution in software architecture designed to help organizations embrace continual change in the digital economy. But how do you design and apply an effective microservice architecture?

This book provides comprehensive guidance through seven valuable chapters that give you a deep-dive into:

- The benefits and principles of microservices
- A design-based approach to microservice architecture
- Lessons for applying microservices in practice





A workshop wall with various tools hanging on a pegboard. The tools include hammers, saws, wrenches, and a license plate. The license plate is from Kentucky, with the number 285 PHV and the name KENTON. The word 'KENTUCKY' is at the top and 'KENTON' is at the bottom. The license plate also features a small graphic of a person and a landscape.

Microservices

A workshop wall with various tools hanging on a pegboard. The tools include hammers, saws, wrenches, and a license plate. The license plate is from Kentucky, with the number 285 PHV and the word KENTON. A ruler and a set of screwdrivers are also visible on a shelf in the foreground.

Microservices === Toolmaking

Toolmaking

1. Make each program do one thing well
2. Expect the output of every program to be the input of another program
3. Design and build software to be tried early
4. Use tools to lighten the programming task



Toolmaking -- Unix Operating Principles (1978)

1. Make each program do one thing well
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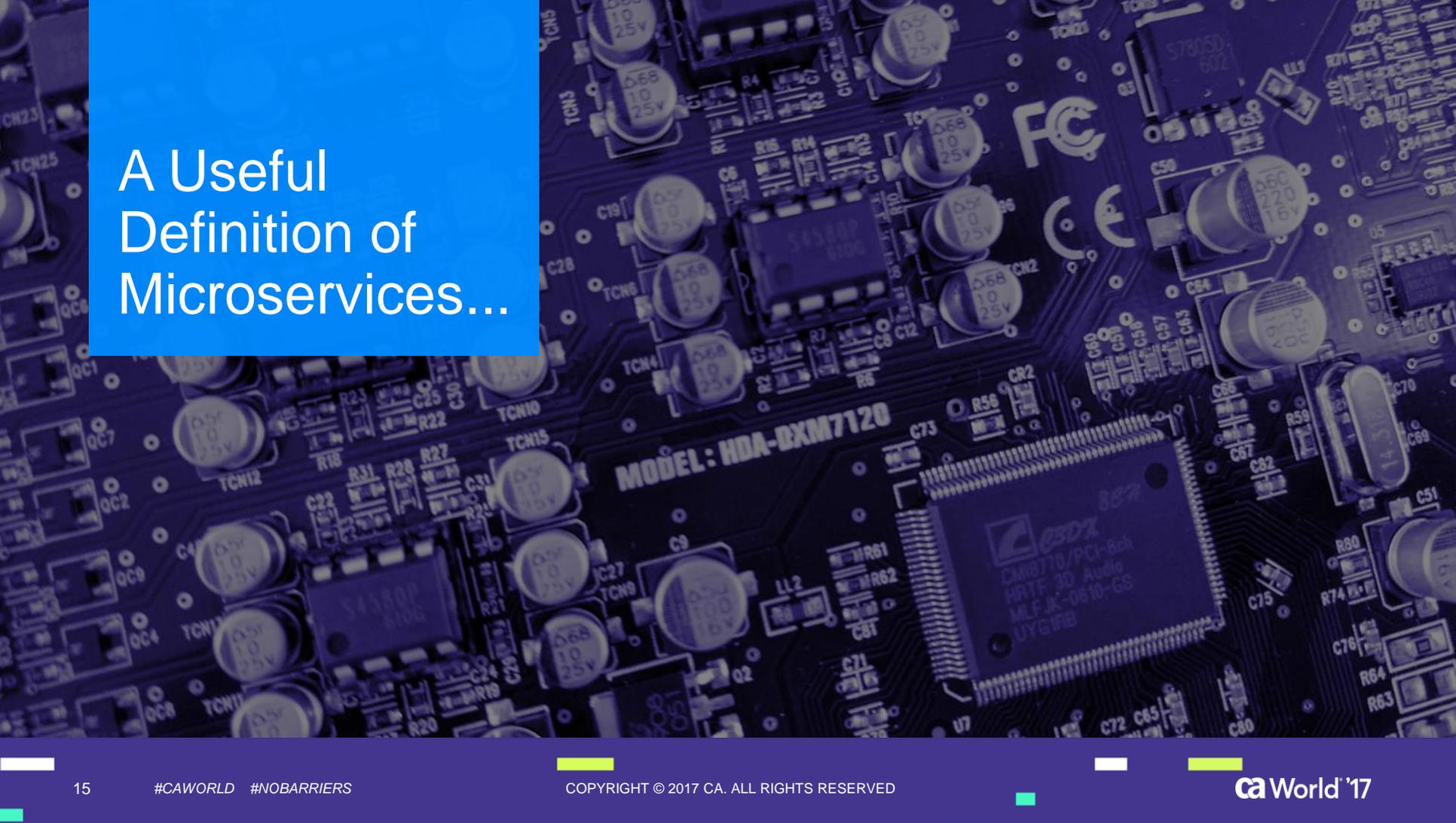


Microservices Is All About Toolmaking

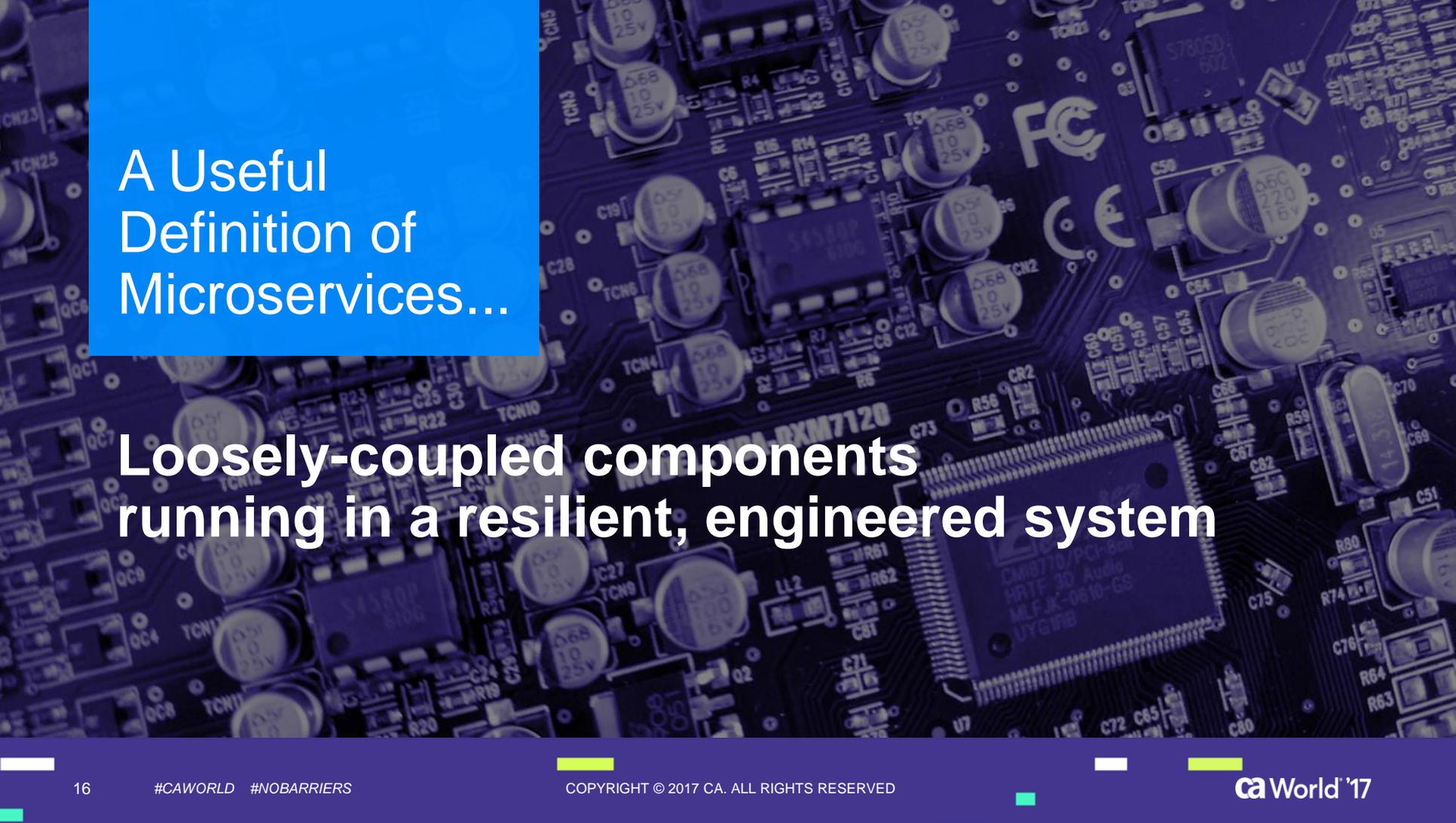


A Useful Definition of Microservices...





A Useful Definition of Microservices...



A Useful Definition of Microservices...

Loosely-coupled components running in a resilient, engineered system

Harmonizing Speed and Safety at Scale





Harmonizing Speed and Safety at Scale





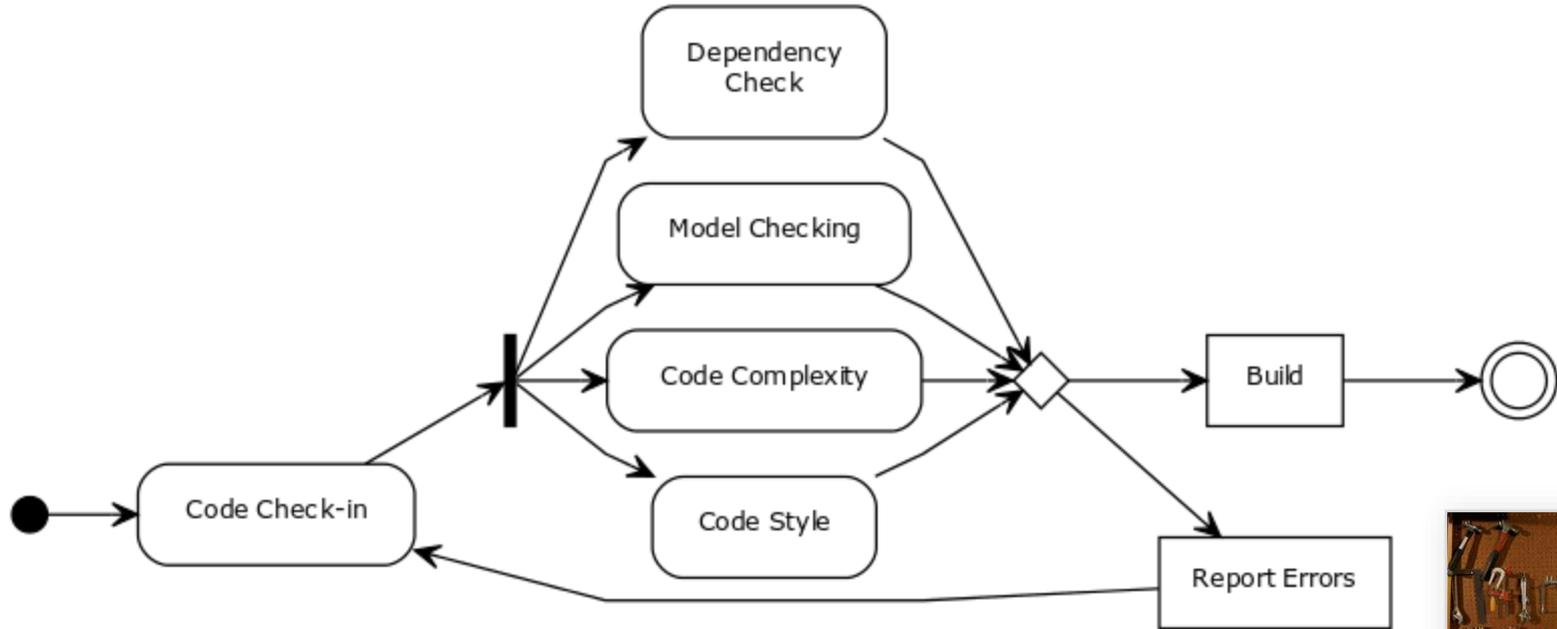
Three Things You Can Do Now...

1. Build Pipelines
2. Engineered Deployments
3. Reduce Work in Progress (WIP)



Three Things You Can Do Now...

Build Pipelines



Three Things You Can Do Now...

Engineered Deployments



Three Things You Can Do Now...

Reduce Work In Progress



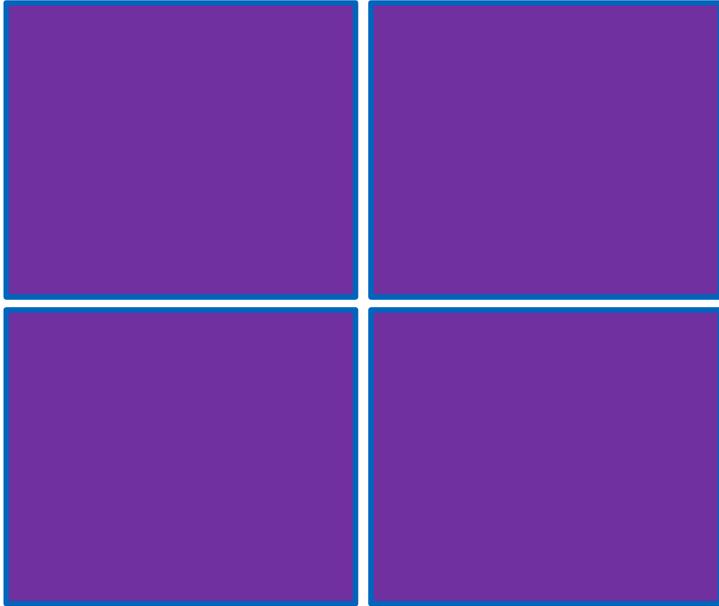
Three Things You Can Do Now...

Reduce Work In Progress



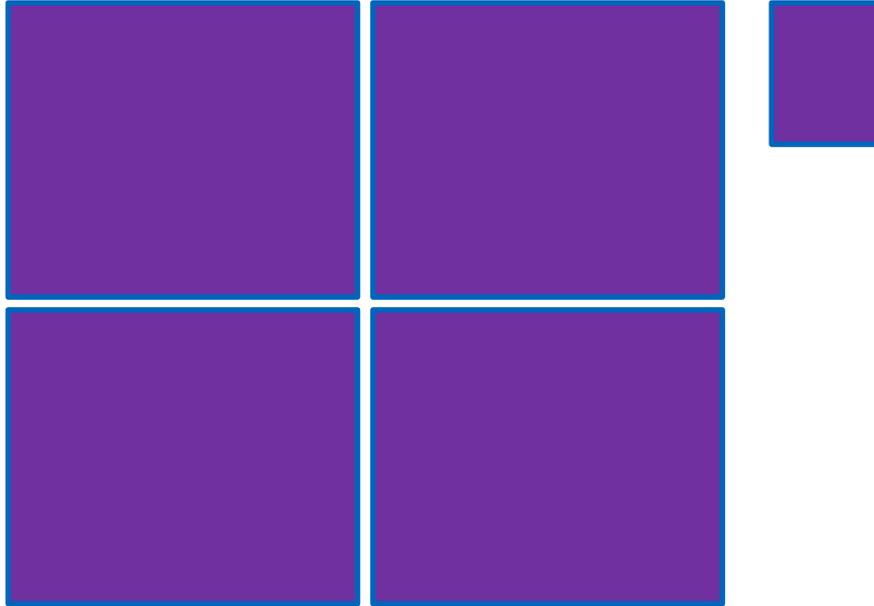
Three Things You Can Do Now...

Reduce Work In Progress



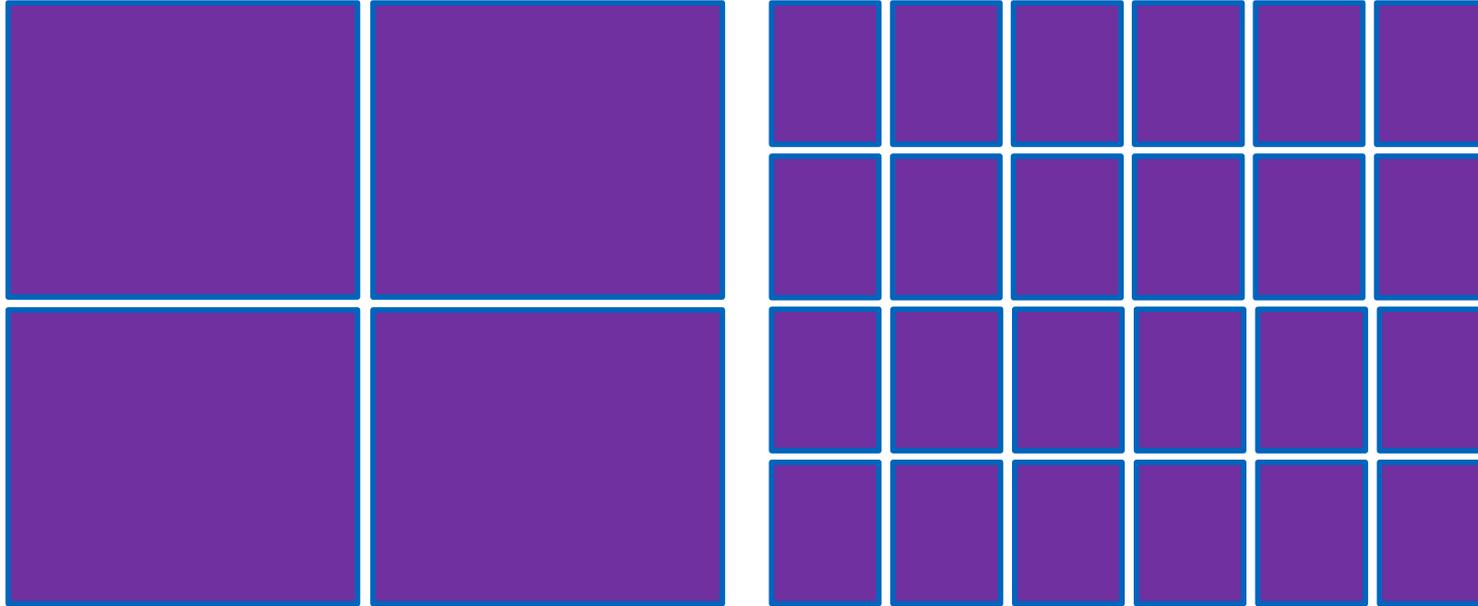
Three Things You Can Do Now...

Reduce Work In Progress



Three Things You Can Do Now...

Reduce Work In Progress



Ask Yourself...

"How long would it take your organization to deploy a change that involved just one line of code? Do you do this on a repeatable, reliable basis?"

-- Tom and Mary Poppendieck, "Implementing Lean Software Development"







APIs



APIs === Multi-Channel

Interface Design



Interface Design

```
// query template sample
{
  "queries" :
  [
    {
      "href" : "http://example.org/search",
      "rel" : "search",
      "prompt" : "Enter search string",
      "data" :
      [
        {"name" : "search", "value" : ""}
      ]
    }
  ]
}
```



Interface Design

1. Design interfaces for the consumer (machine/human)
2. There is no single (“canonical”) API
3. Make your API design/implementation process...
 - Safe
 - Cheap
 - Easy



Ask Yourself...

*How long would it take your organization to release
a new **API**?*

Do you do this on a repeatable, reliable basis?



Design APIs for Interop, Not Integration



Three Things You Can Do Now...

1. Move beyond HTTP
2. Adopt machine-friendly formats
3. Support domain vocabularies



Three Things You Can Do Now...

Move Beyond HTTP

1. HTTP
2. FTP
3. WebSockets
4. MQTT/CoAP

Plan to support multiple protocols



Three Things You Can Do Now...

Machine-friendly Formats

1. Atom
2. HAL
3. Siren
4. Collection+JSON

Plan to support multiple formats



Three Things You Can Do Now...

Domain Vocabularies

1. ALPS
2. DCAP
3. JSON Home
4. RDFS/OWL

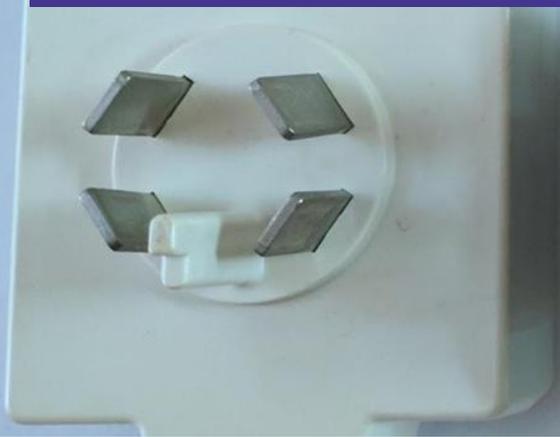
Plan to support multiple vocabularies





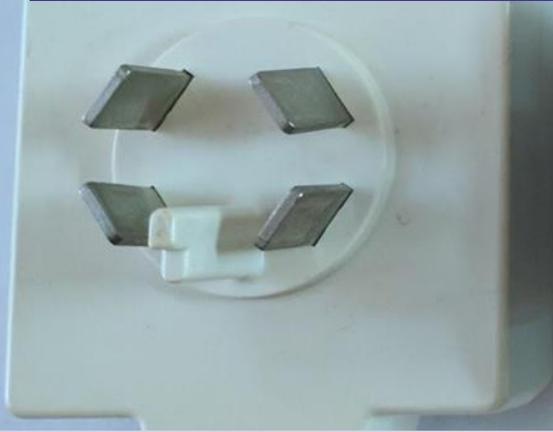


Innovation



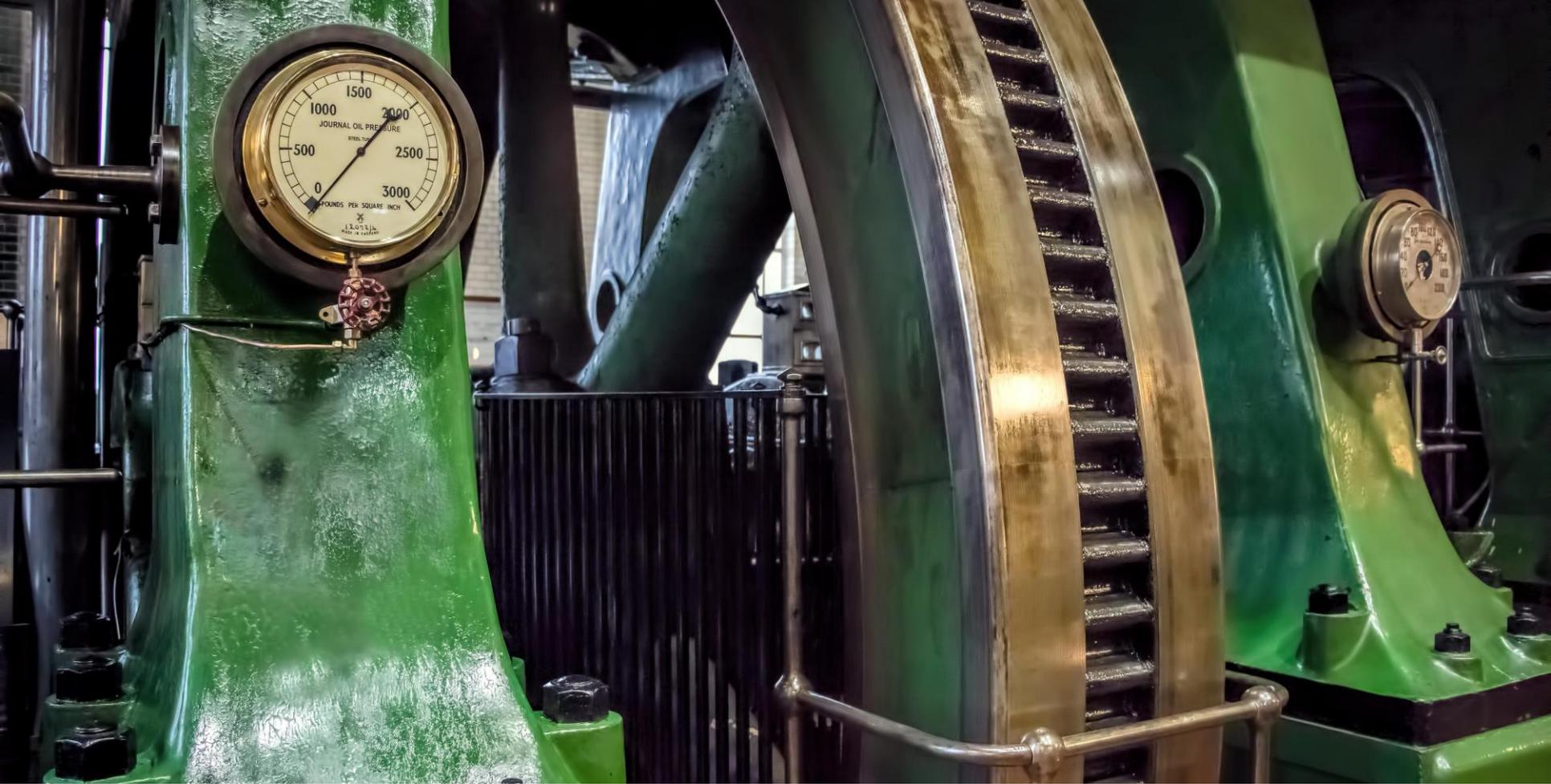


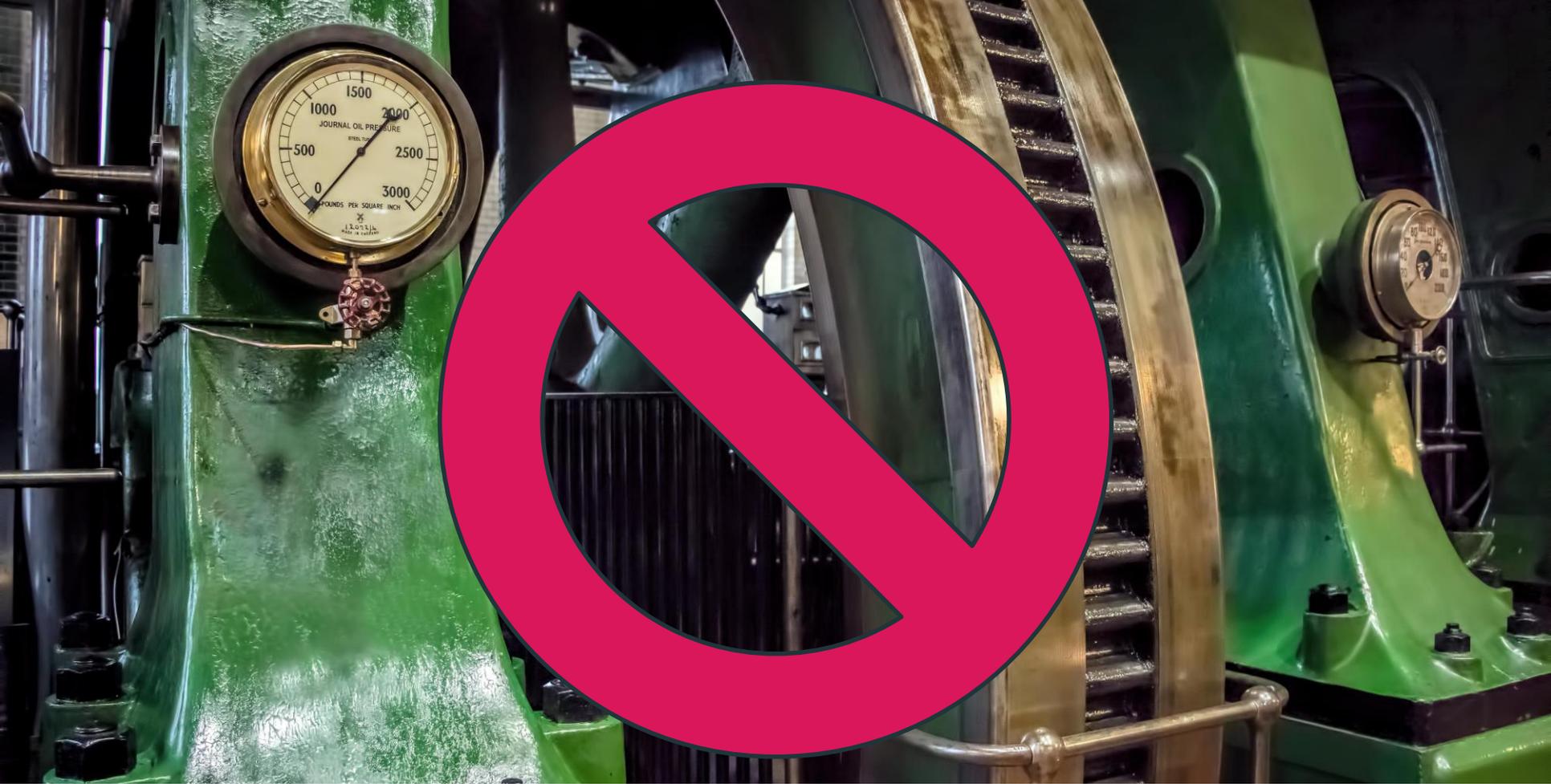
Innovation === Adapting



What does innovation look like?







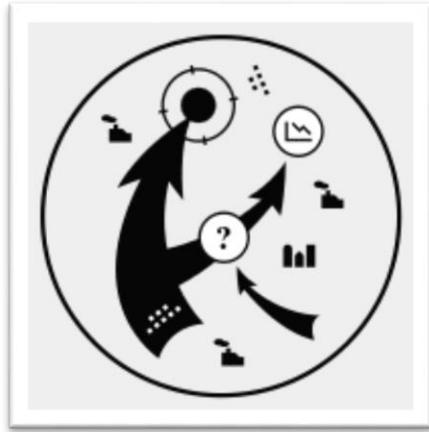


Harvard Business Review

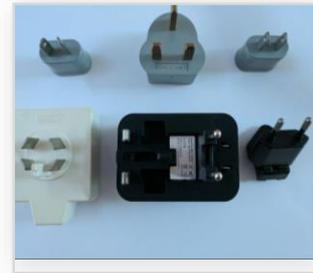
“Your Innovation Team Shouldn’t Run Like a Well-Oiled Machine”

-- Ashkenas and Speigel, October 2015





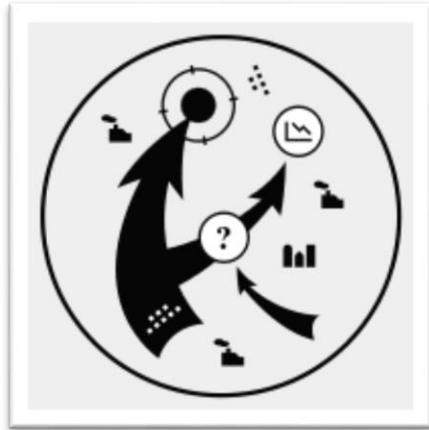
Culture Beats Strategy





Culture Beats Engineering

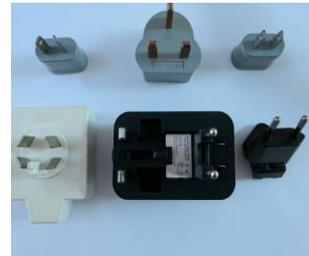


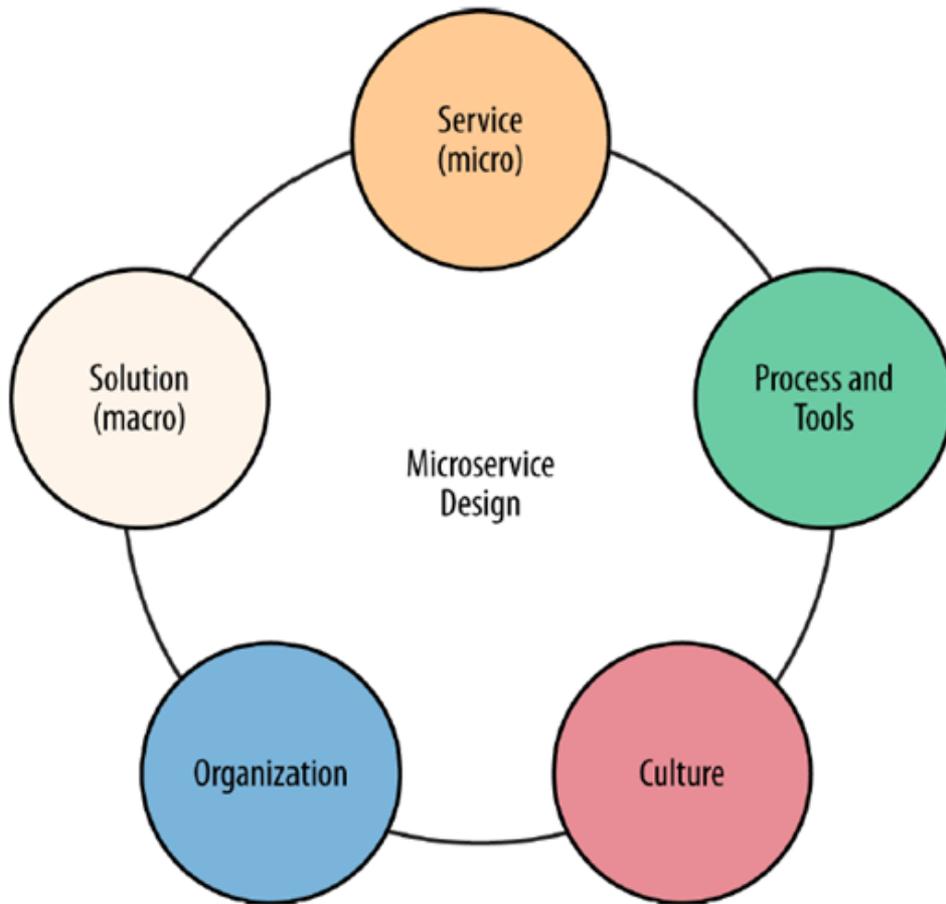


```
/**
 * Simple HelloButton() method.
 * @version 1.0
 * @author john doe <doe.j@example.com>
 */
HelloButton()
{
    JButton hello = new JButton( "Hello, wor
    hello.addActionListener( new HelloBtnList

    // use the JFrame type until support for t
    // new component is finished
    JFrame frame = new JFrame( "Hello Button"
    Container pane = frame.getContentPane();
    pane.add( hello );
    frame.pack();
    frame.show();           // display the fra
}
```

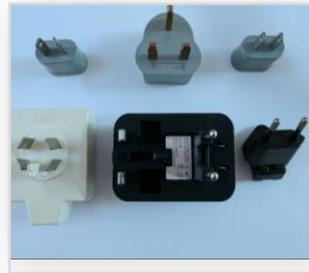
Culture Beats Code





Three Things You Can Do Now...

1. Right-size your teams
2. Recognize Conway's Law
3. Enable unplanned innovation



Three Things You Can Do Now...

Right-sizing Teams

5

15

35

150

500

1500

Dunbar's Number



Three Things You Can Do Now...

Right-sizing Teams

***Aim for a team size of
Dunbar Level 1 (5),
possibly
Dunbar Level 2 (15)***



Three Things You Can Do Now...

Conway's Law

“A system’s design is a copy of the organization’s communication structure.”

-- Mel Conway, 1967



Three Things You Can Do Now...

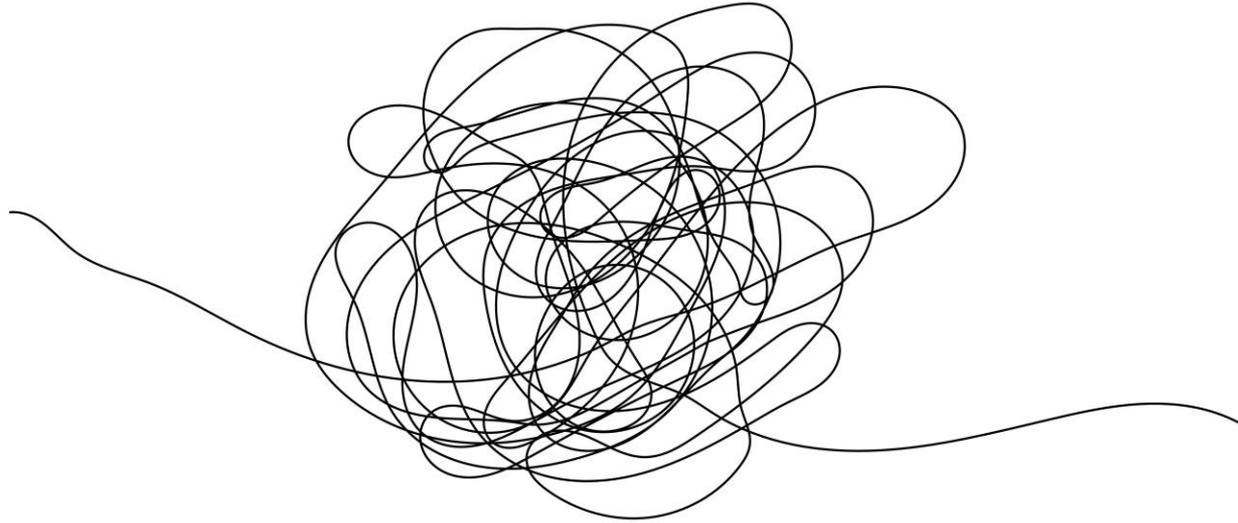
Conway's Law

***If you have to hold a release
until another team is ready,
you are not an independent team.***



Three Things You Can Do Now...

Unplanned Innovation



Three Things You Can Do Now...

Unplanned Innovation

***“If you want to achieve greatness,
stop asking for permission.”***



Ask Yourself...

*How long would it take your organization to launch
a new product?*

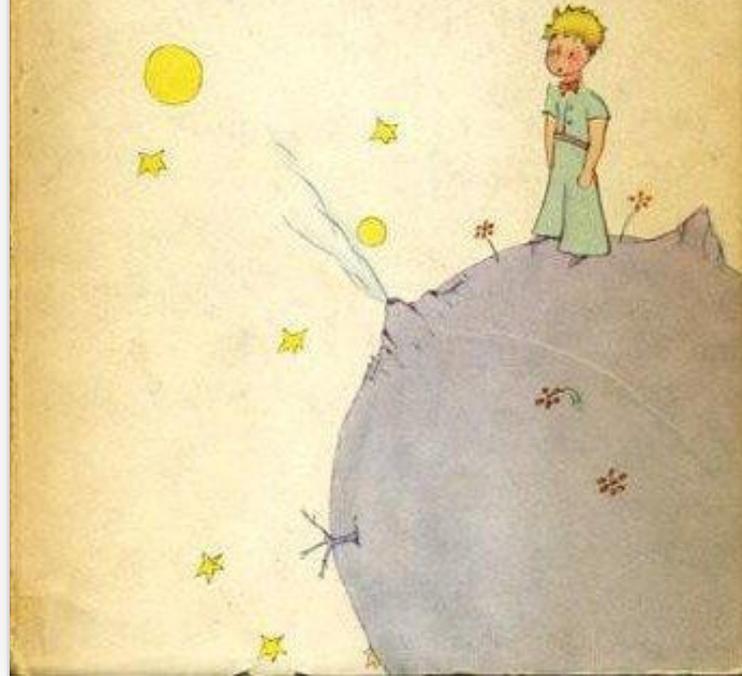
Do you do this on a repeatable, reliable basis?



One More Thing...

ANTOINE DE SAINT-EXUPÉRY

The Little Prince



Antione de Saint-Exupery (1900-1944)

“If you want to build a ship, don’t drum up people together to collect wood and don’t assign them tasks and work, but rather teach them to long for the endless immensity of the sea.”

So...

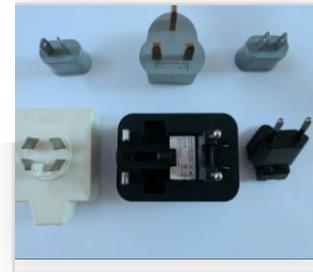
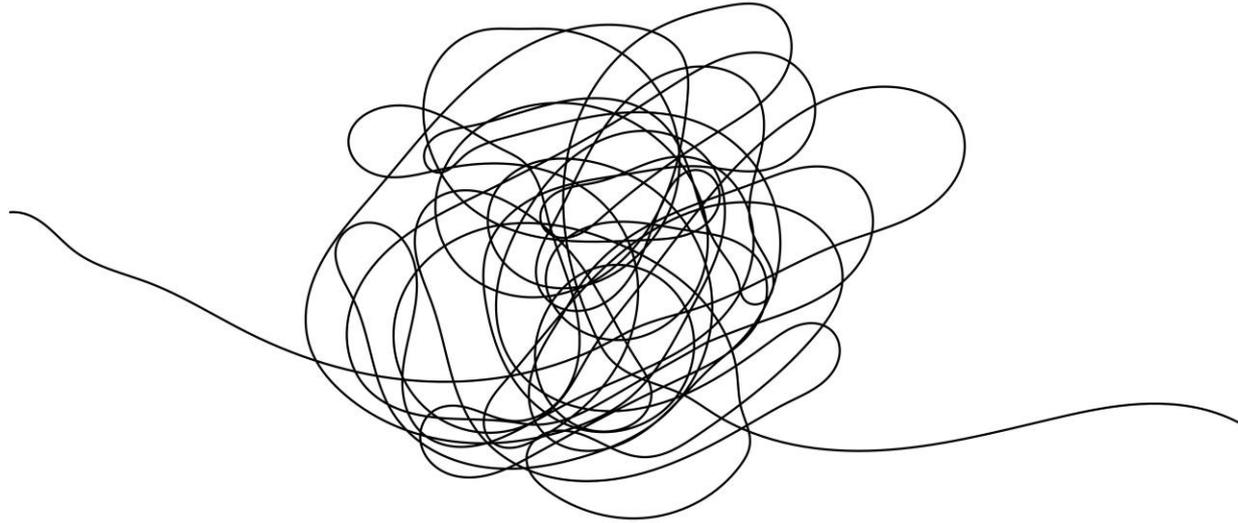
Follow the Microservice Way



Leverage the Power of API Design

```
// query template sample
{
  "queries" :
  [
    {
      "href" : "http://example.org/search",
      "rel" : "search",
      "prompt" : "Enter search string",
      "data" :
      [
        {"name" : "search", "value" : ""}
      ]
    }
  ]
}
```

Recognize the Power of Unplanned Innovation





Ask Yourself...



Ask Yourself...

How long would it take?

Must See Demos

Mobile

CA Mobile API
Gateway
Ped 10

EuroSport

CA API
Management
Ped 11

Protect

CA Rapid App
Security
Ped 4

Aggregate

CA Microgateway
Ped 5

Orchestrate

CA API Gateway
Ped 6

Questions?

Thank you.

Stay connected at communities.ca.com

DevOps: APIs and Microservices



For more information on DevOps: APIs and Microservices,
please visit: <http://cainc.to/CAW17-APIM>