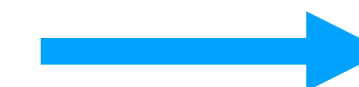
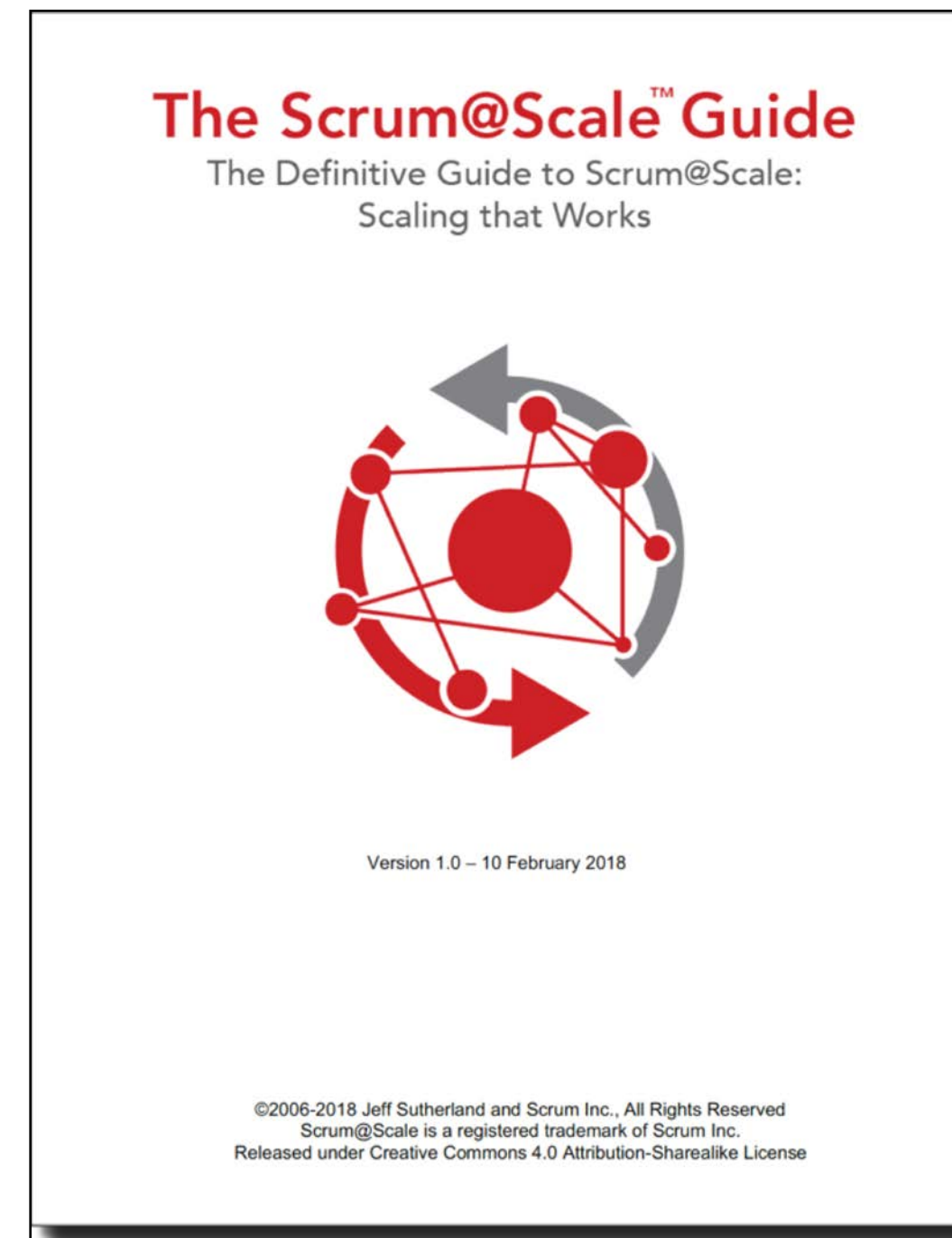
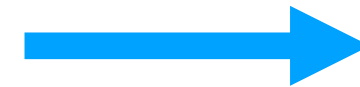
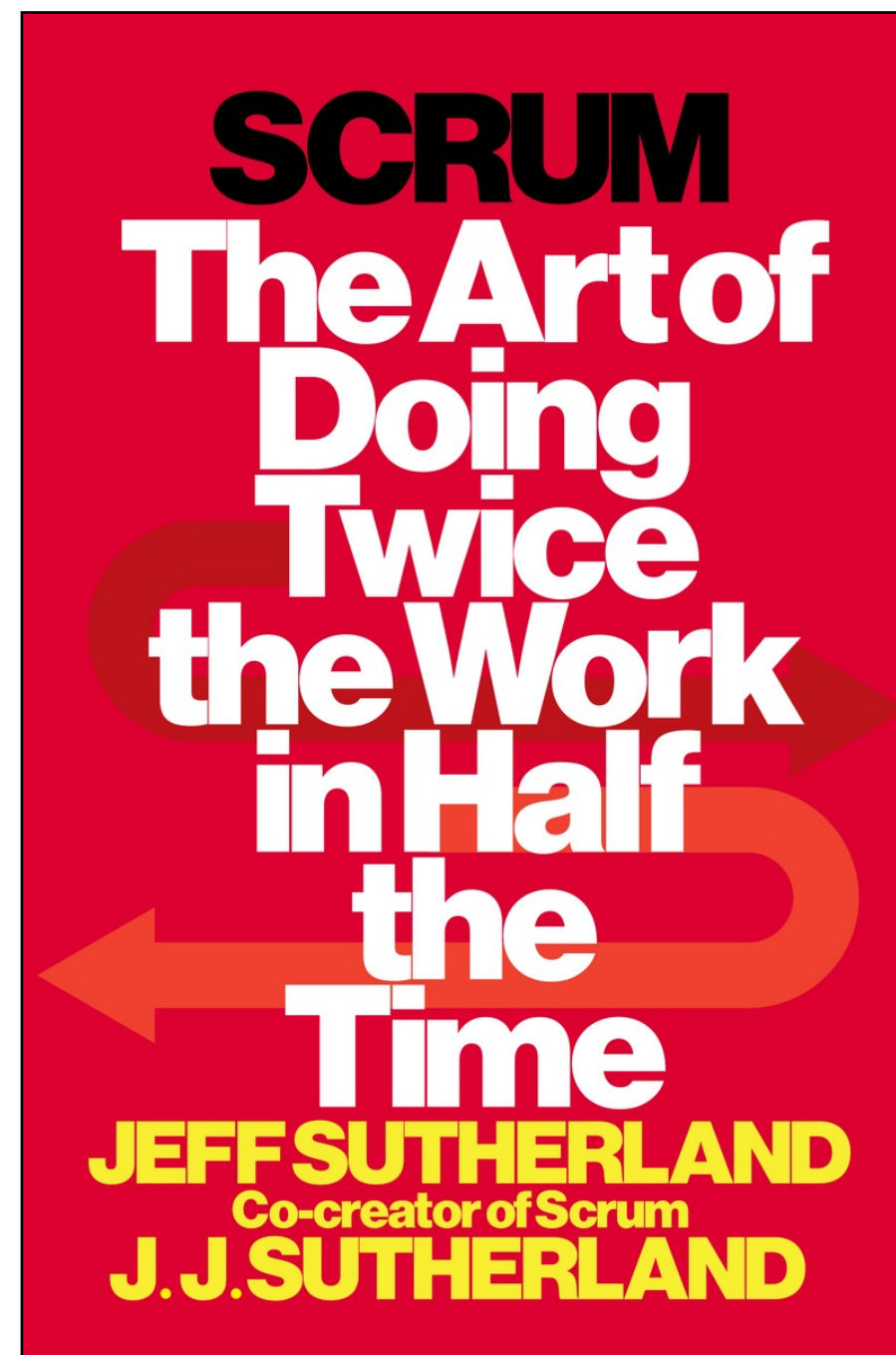




**SCRUMDAY 2018**



# Scrum at Scale Origins, Implementations, and Learnings



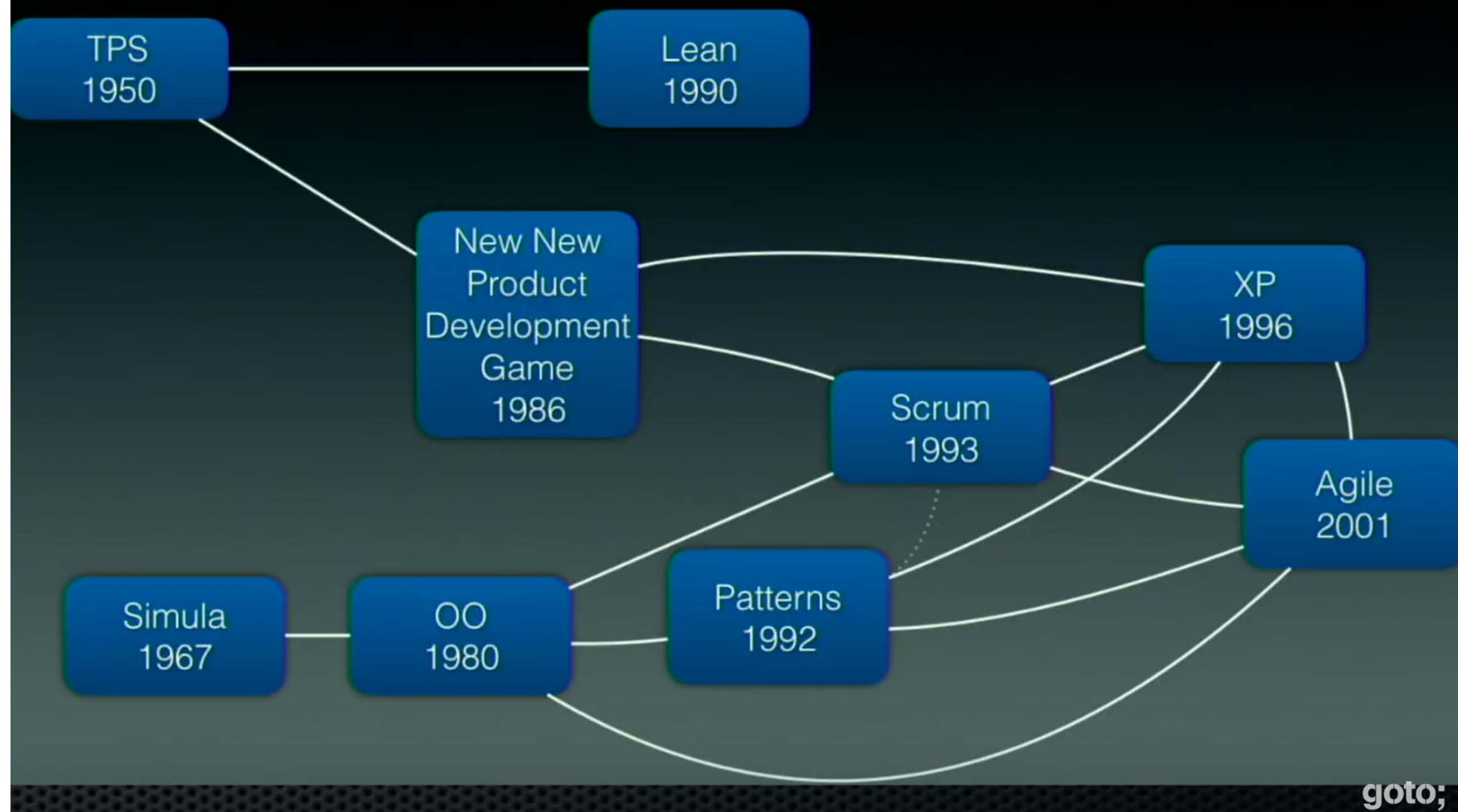
Jeff Sutherland, Avi Schneier, Jessica Larsen

# Scrum@Scale LLC

- Scrum@Scale LLC is a Joint Venture 50% owned by the Scrum Alliance and 50% owned by Scrum Inc.
- Scrum@Scale Training and Certification are offered worldwide  
<https://www.scrumatscale.com/find-course/>
- Train the Trainer sessions take place every quarter in the U.S. and Europe  
<https://www.scrumatscale.com/scrum-at-scale-trainer-program/>



# A Family Tree

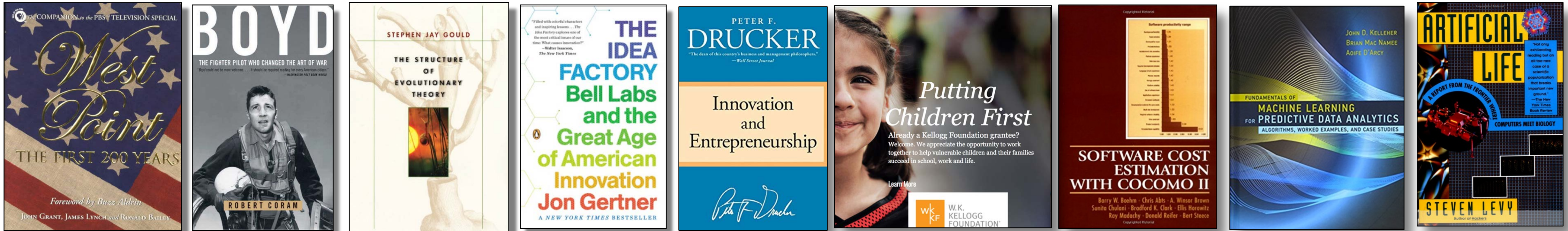


Source: Jim Coplien (2017)  
The Dehumanization of Agile  
and Objects. GOTO, Berlin.



# Scrum Is a Massive Research Project: 1983-2018

USMA USAF UCSM Bell Labs MidContinent Kellogg Saddlebrook Individual Graphael ODB iRobot Grameen Bank Easel VMARK IDX PatientKeeper OpenView Venture Partners ScrumInc



## Scrum Concepts

## Scrum Prototypes

### Jeff Sutherland

19.6 · Institute of Electrical and Electronics Engineers

Department  
Scrum Inc

Skills and Expertise

Scrum · Software · Agile Software Development

70

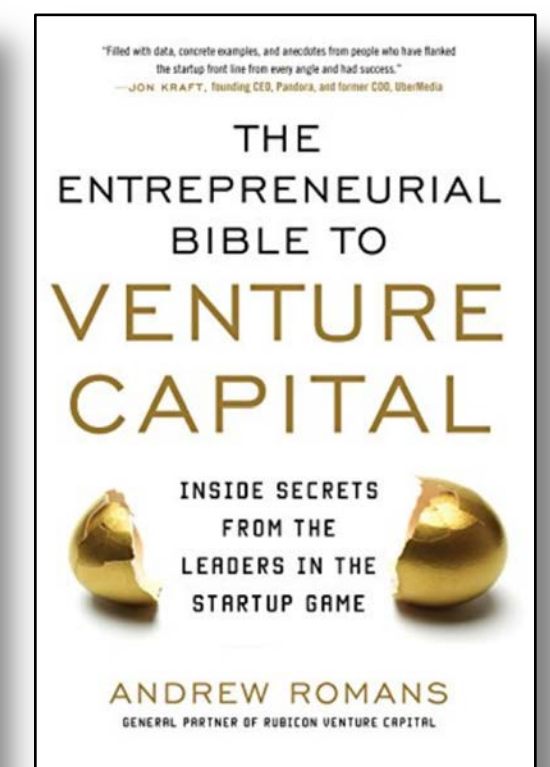
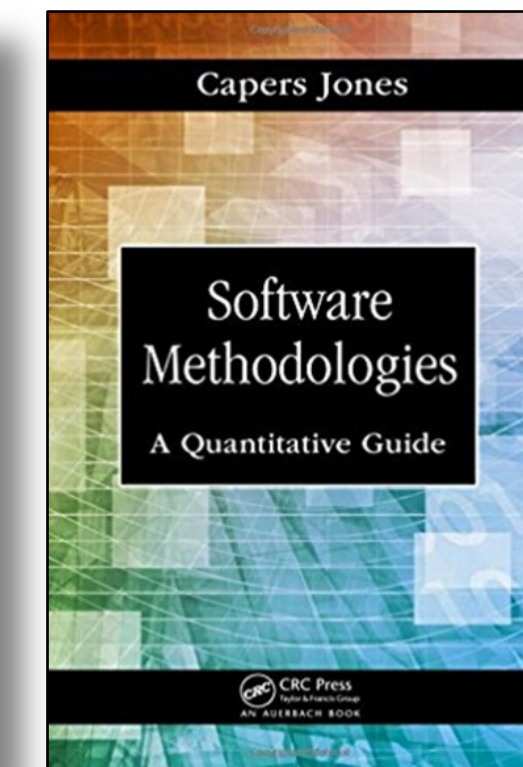
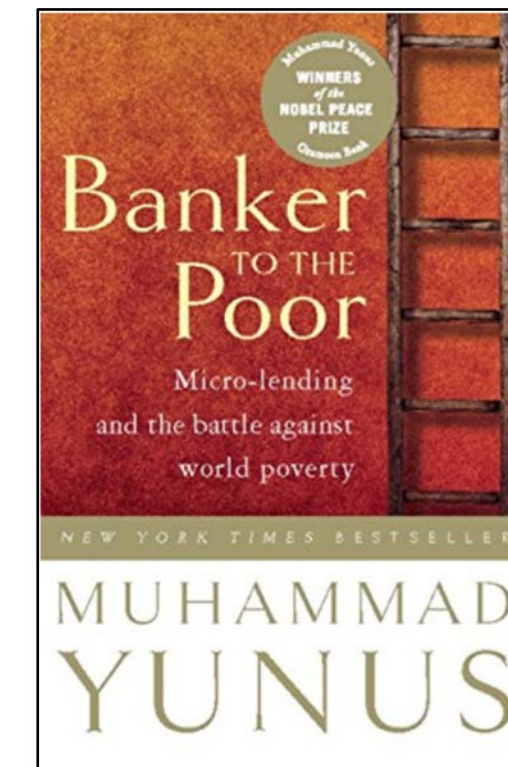
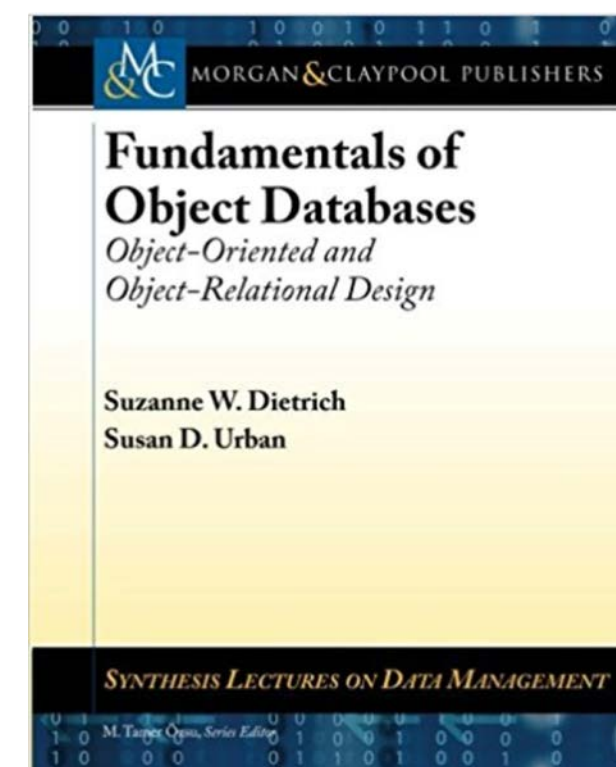
Research items

23,814

Reads ⓘ

1,335

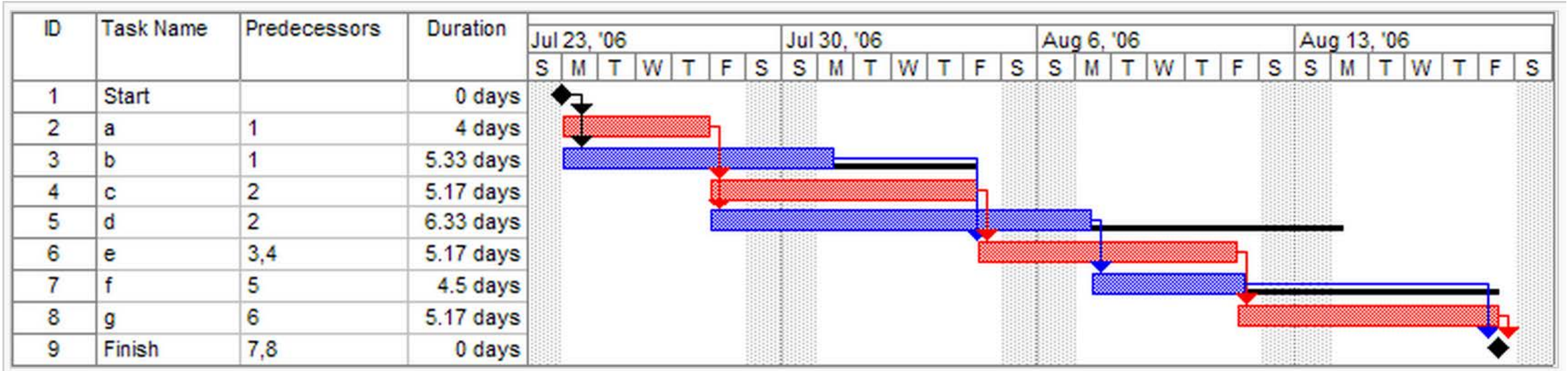
Citations



## Scrum Refinement

# Waterfall Doesn't Scale

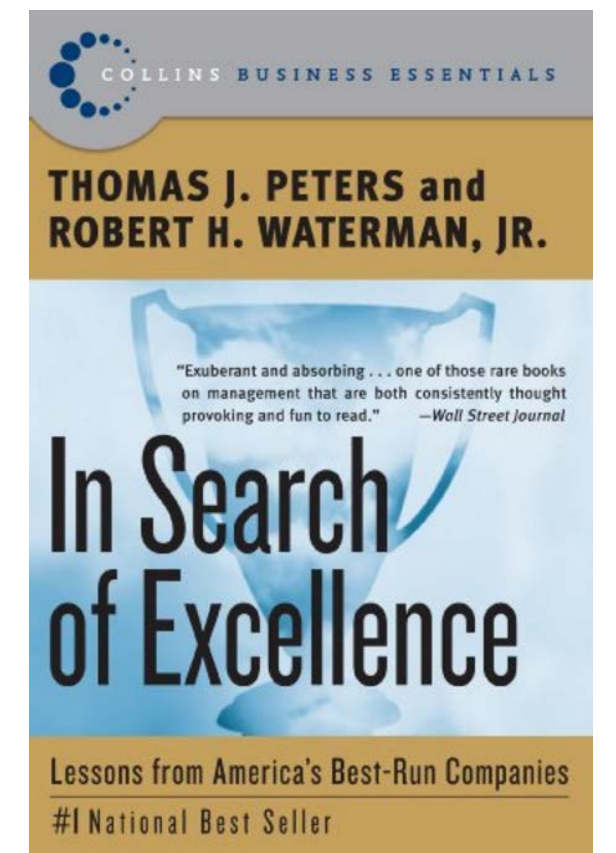
Mid-Continent Computer Services 1983



COBOL  
Programmers  
On Death March



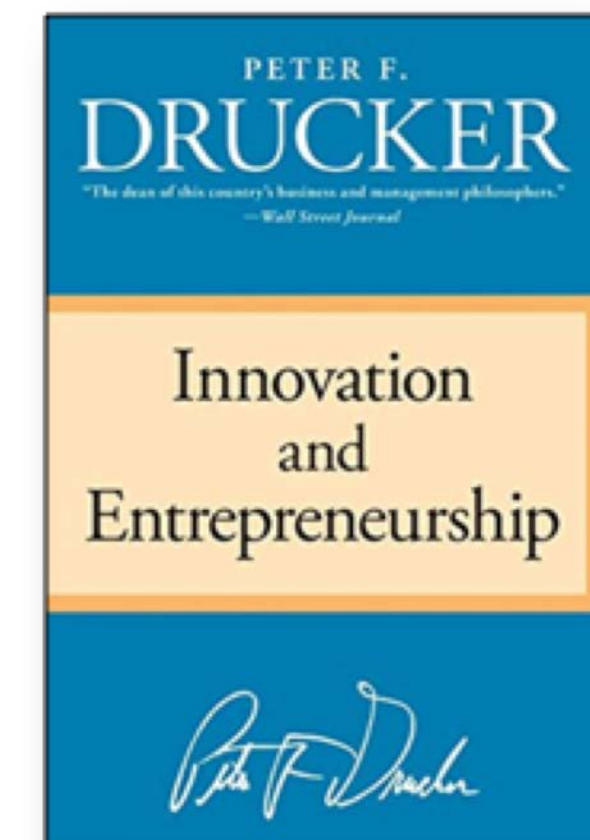
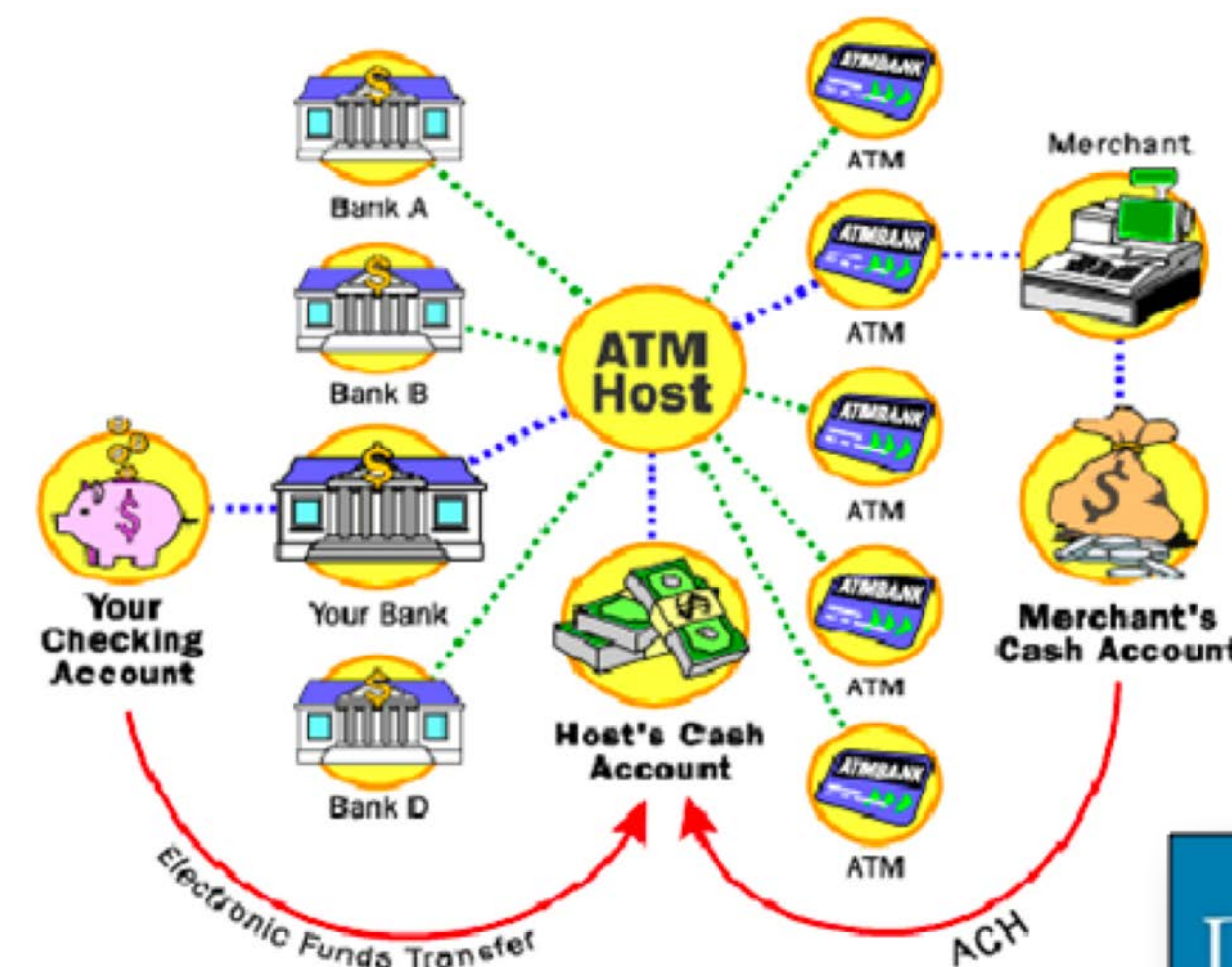
W.K.  
KELLOGG  
FOUNDATION®



# First Scrum@Scale Prototype

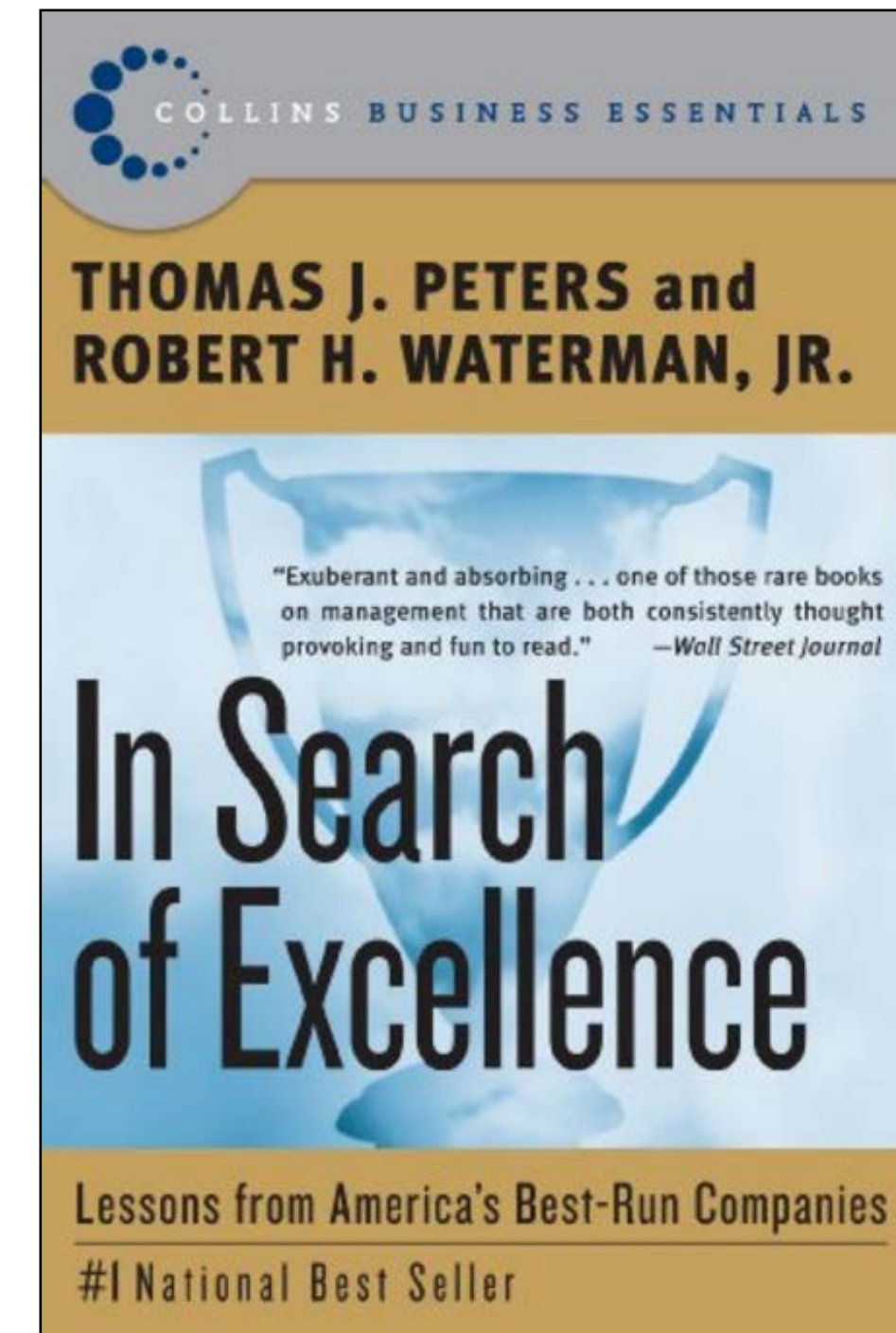
1983 MidContinent Computer Services (Denver, Seattle, San Diego, Kansas City)

- 150 Banks across United States and Canada
- Thousands of Teller Systems (all brands, Burroughs mainframes, Tandem network)
- Sutherland VP of Advanced Systems (CTO for all banks)
- Kellogg Leadership Business School Professor subgroup visited bank
- Recommendation - create a intrapreneurial company within the larger company with a radically different operating model



# A Better Operating Model

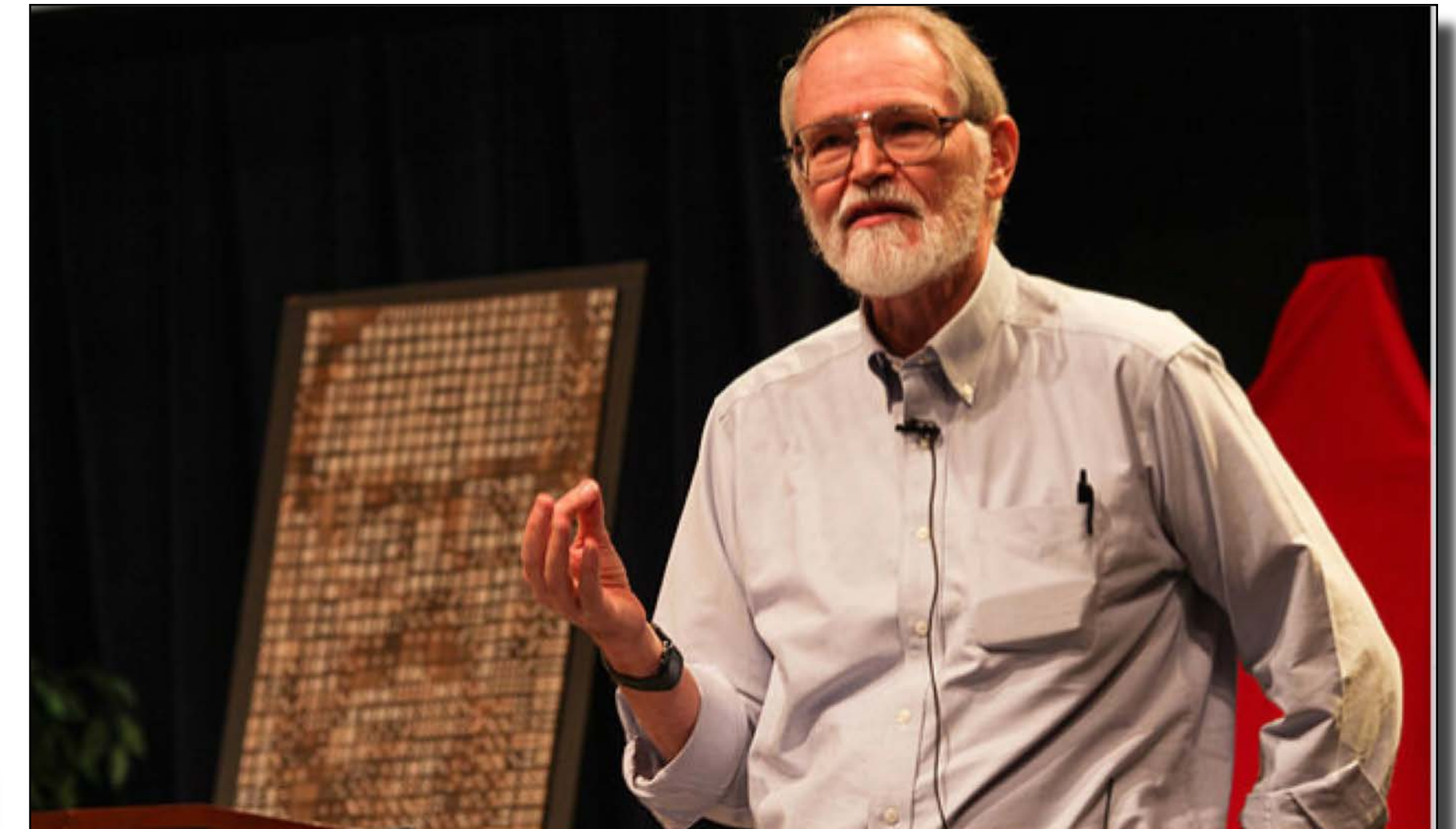
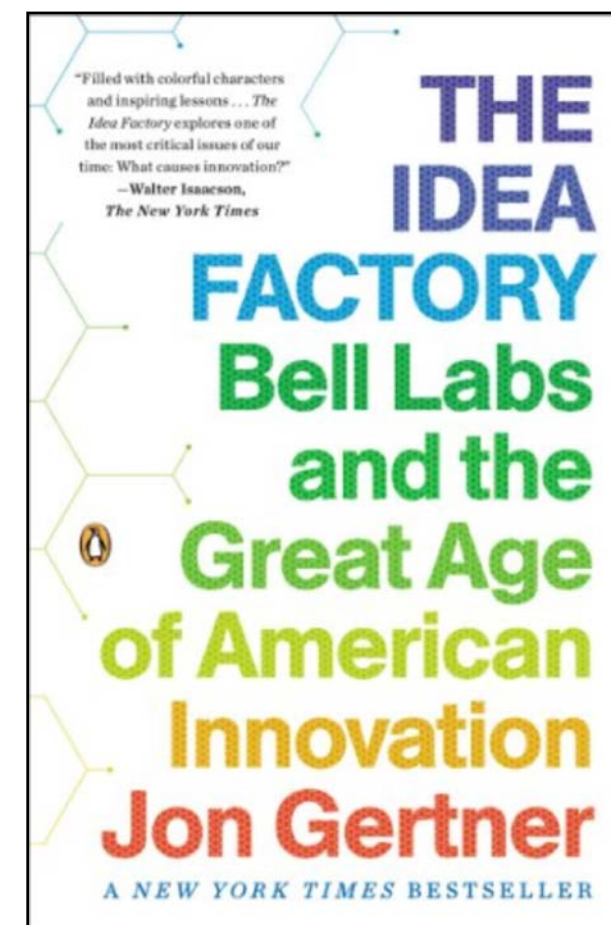
- A bias for action
- Close to the customer
- Autonomy and entrepreneurship
- Productivity through people
- Hands on, value driven
- Stick to the knitting
- Simple form, lean staff
- Simultaneous loose tight properties



*Innovative companies are especially adroit at continually responding to change of any sort in their environments. Tom Peters*

# Used Bell Labs Tools and Techniques

- Small, cross-functional teams
- Working production prototypes in short iterations
- One job title:  
Member, Technical Staff
- The right tools can spawn a radically better new operating environment

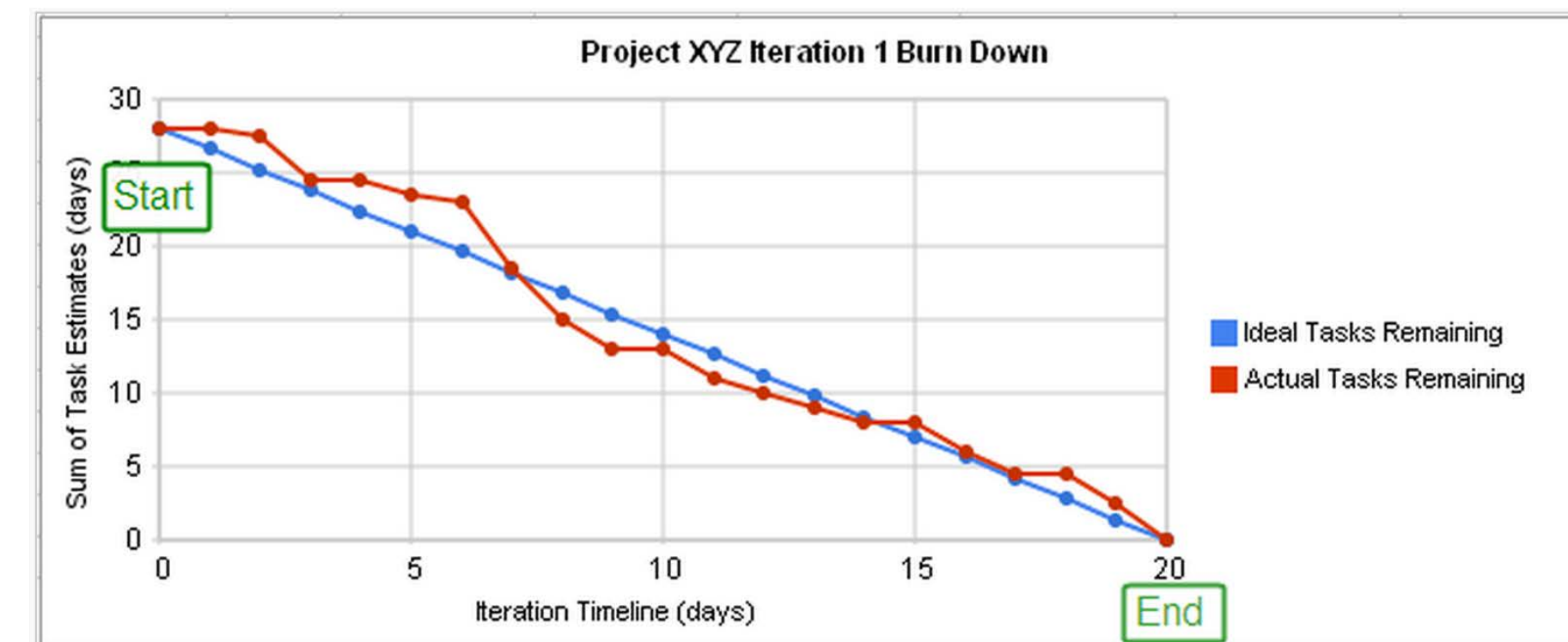


**Brian Wilson Kernighan** is a Canadian computer scientist who worked at Bell Labs alongside Unix creators Ken Thompson and Dennis Ritchie and contributed to the development of Unix. He is also coauthor of the AWK and AMPL programming languages.



# The Solution – First Scrum@Scale Prototype

- Put every employee that touched ATM systems in one business unit and run like a startup
- Small cross-functional teams of 4-5 people
- Product manager prioritized backlog in Monday morning sprint planning meeting
- Everything Done = deployed every Friday afternoon
- Monthly business unit retrospective and big room planning



# Radical Results

- Started with costs exceeding revenue by 30%
- In 6 months revenue exceeded costs by 30%
- 60% swing in margins created the most profitable business unit in the bank
- MidContinent in 1983 enabled Pegasystems in 2017



## Hitting the Wall: What to Do When High Performing Scrum Teams Overwhelm Operations and Infrastructure

Sutherland, J. ; Frohman, R.

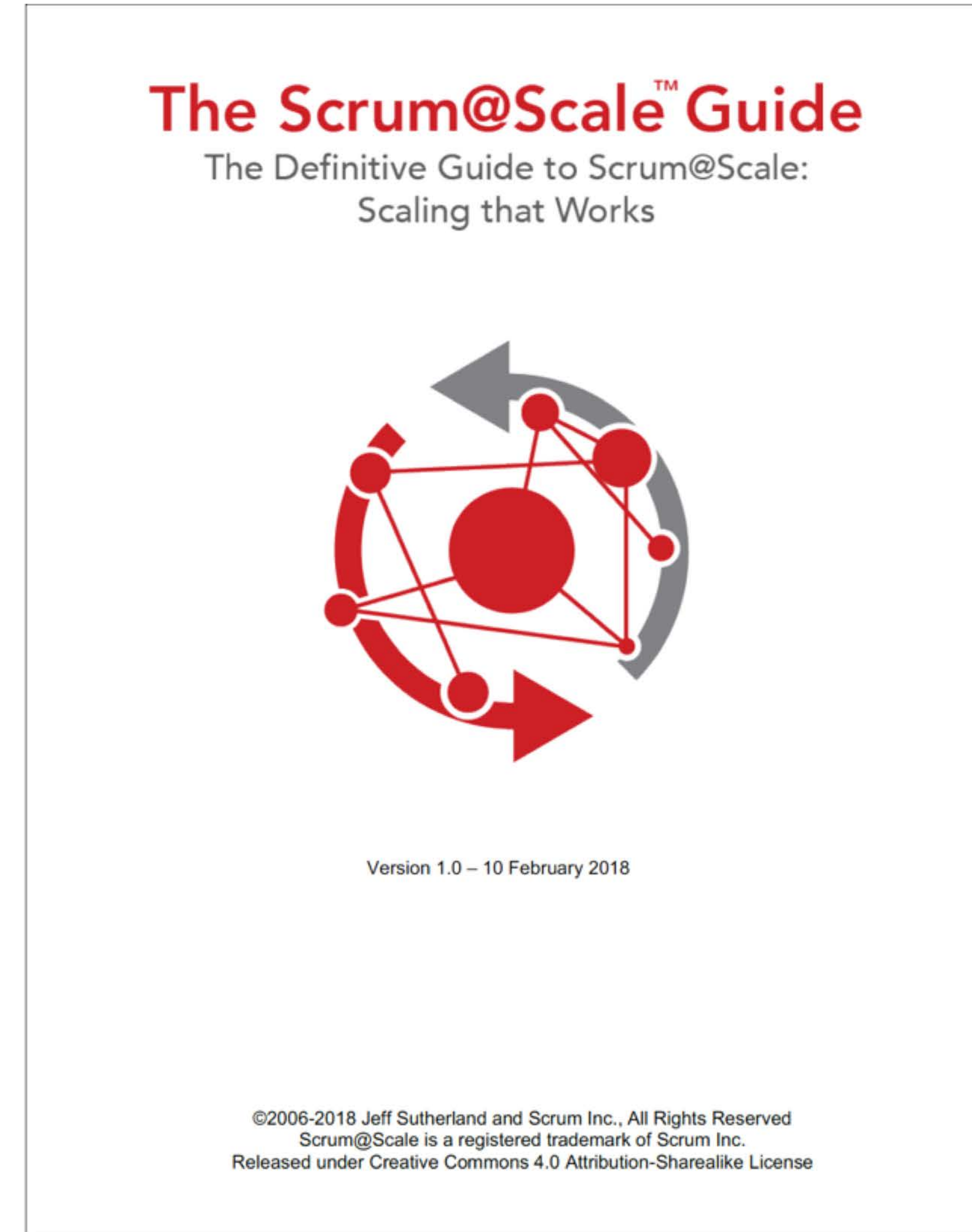
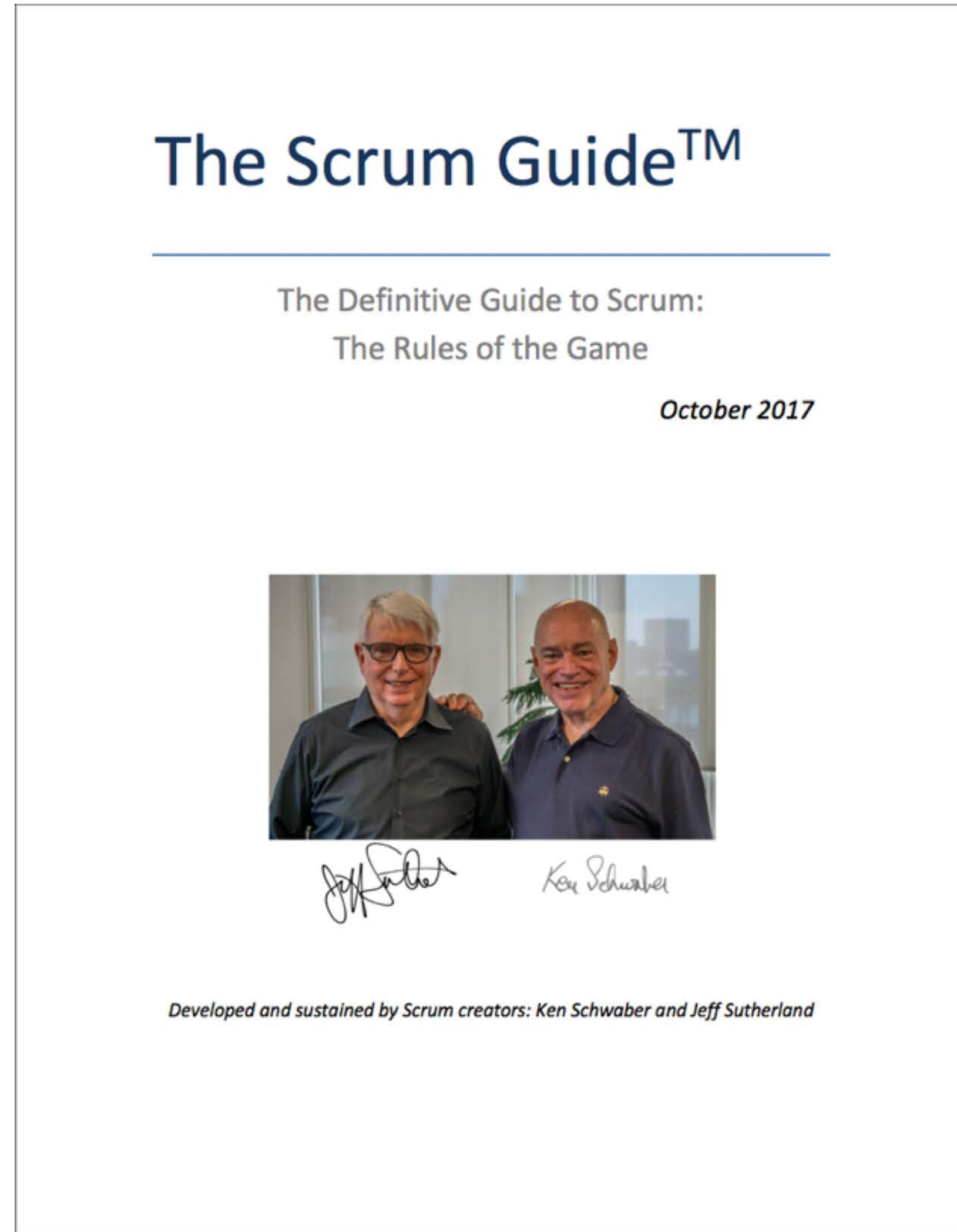
System Sciences (HICSS), 2011 44th Hawaii International Conference on

DOI: 10.1109/HICSS.2011.222

Publication Year: 2011 , Page(s): 1 - 6

**IEEE CONFERENCE PUBLICATIONS**

# Scrum@Scale Goal: Formalize What We Did During 1983-2017 So Others Can Achieve Strategic Agility In 2018!



# Linear Scalability - Is It Achievable?

**What if a company were to launch dozens, hundreds, or even thousands of agile teams throughout the organization? Could whole segments of the business learn to operate in this manner? Would scaling up agile improve corporate performance as much as agile methods improve individual team performance?**

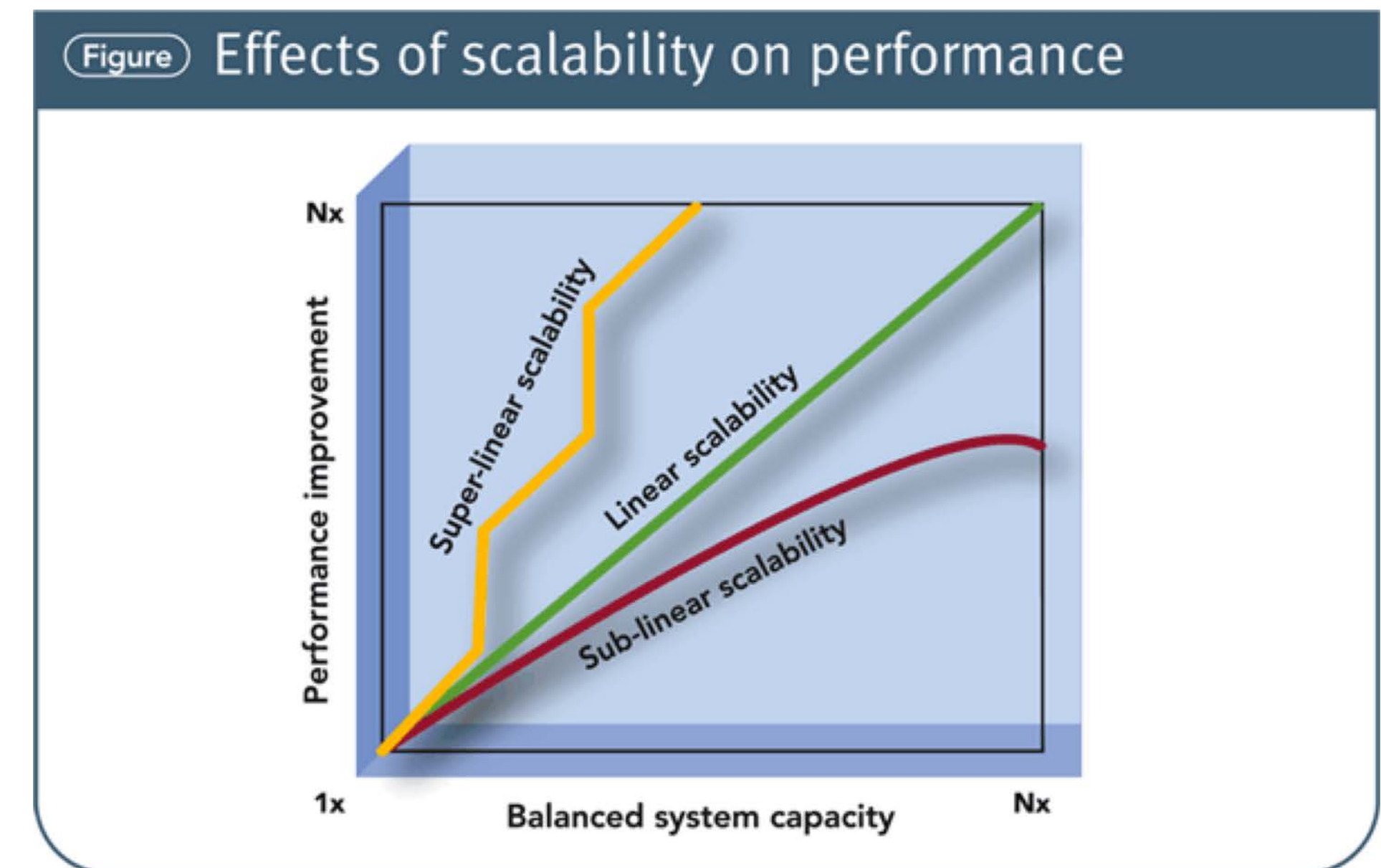
*Rigby, Sutherland, Noble HBR Apr-May 2018*

*"The terms "performance" and "scalability" are commonly used interchangeably, but the two are distinct: performance measures the speed with which a single request can be executed, while scalability measures the ability of a request to maintain its performance under increasing load. For example, the performance of a request may be reported as generating a valid response within three seconds, but the scalability of the request measures the request's ability to maintain that three-second response time as the user load increases." - Steve Haines*



# Linear Scalability: What Does It Mean?

- **Operational Scalability:**  
If one person can complete one story in one day, can 1000 people complete 1000 stories in one day?
- **Strategic Scalability:**  
More important, if a company can make \$1000 a day by selling a story created by one person, can it make \$1M a day with 1000 people?
- The Scrum Master can help the team achieve the first, but only a great Product Owner can achieve the second.



Teradata 2018

# Linear Scalability: Scale-Free Architecture

- If you want to linearly scale, you need a “scale-free” architecture
- Otherwise you risk introducing waste into the system and slowing the whole organization down
- **Scale-free architectures are pervasive in biology (ex. neural networks)**
- **They are able to evolve to perform new functions more rapidly than alternative network designs**

Digital Darwinian world reveals architecture of evolution

Source: <http://chronicle.uchicago.edu/061207/darwin.shtml>

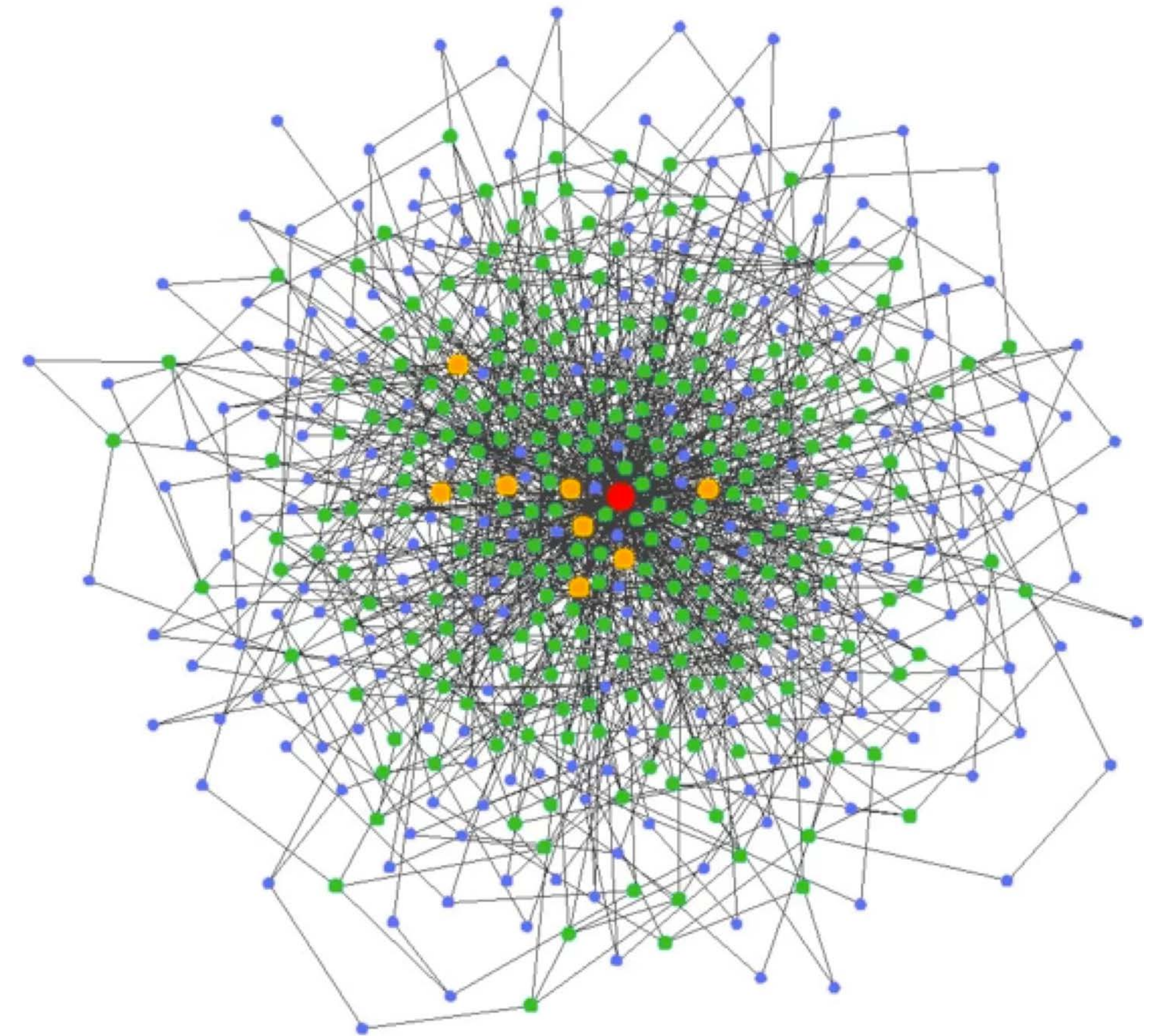
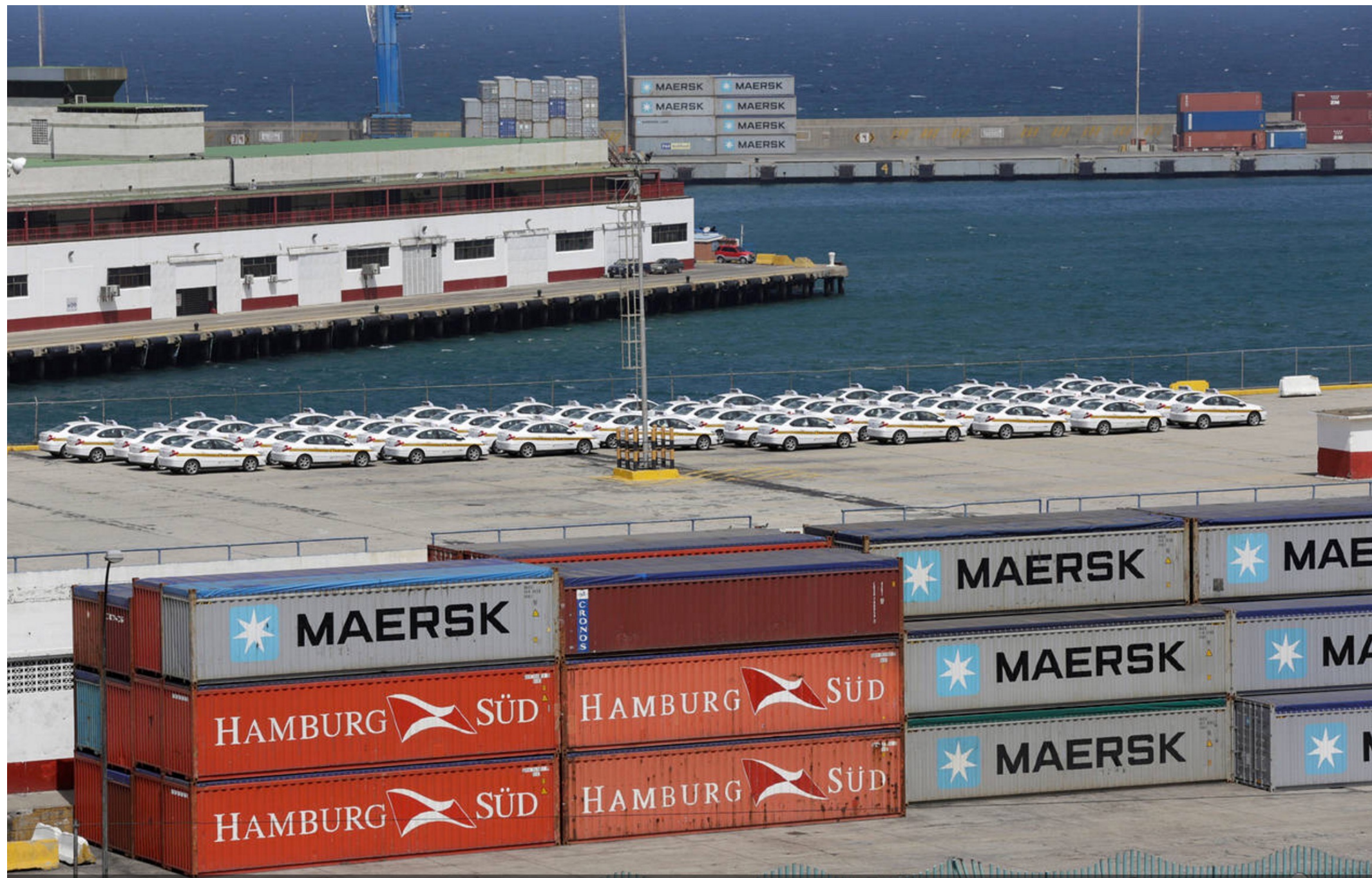


Diagram of a scale-free network that contains components with a highly diverse level of connectivity. Some components form highly interconnected hubs, while other components have few connections, and there are many levels of interconnectivity in between. Scale-free networks are pervasive in biology. Computer simulations at the University of Chicago show that scale-free networks are able to evolve to perform new functions more rapidly than an alternative network design.

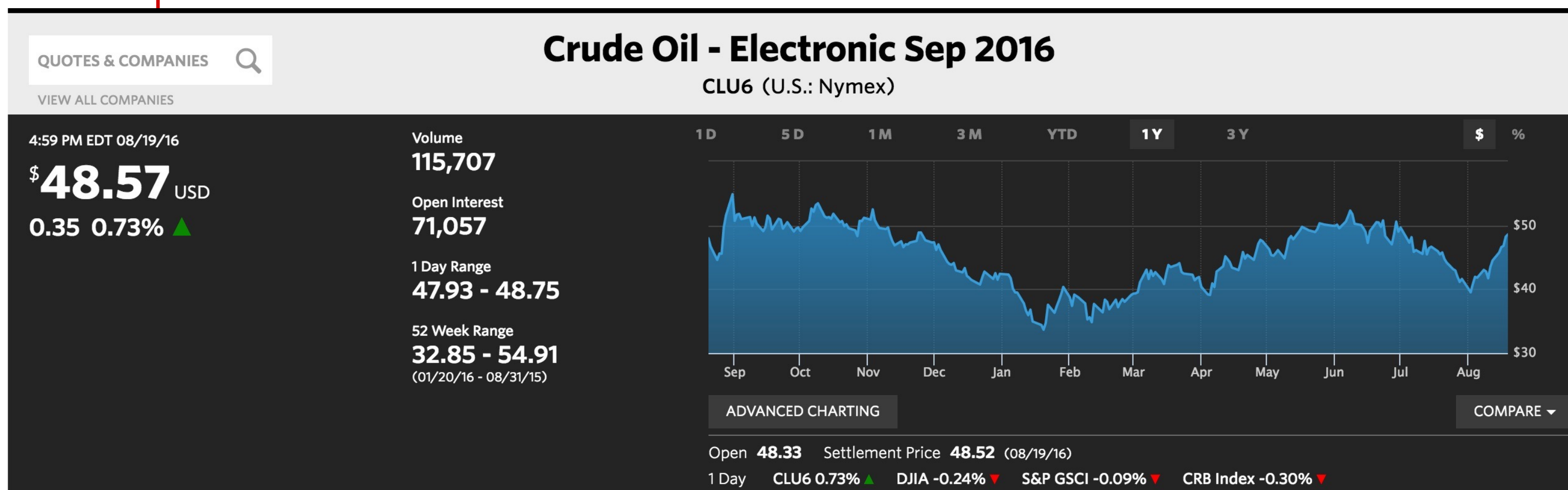
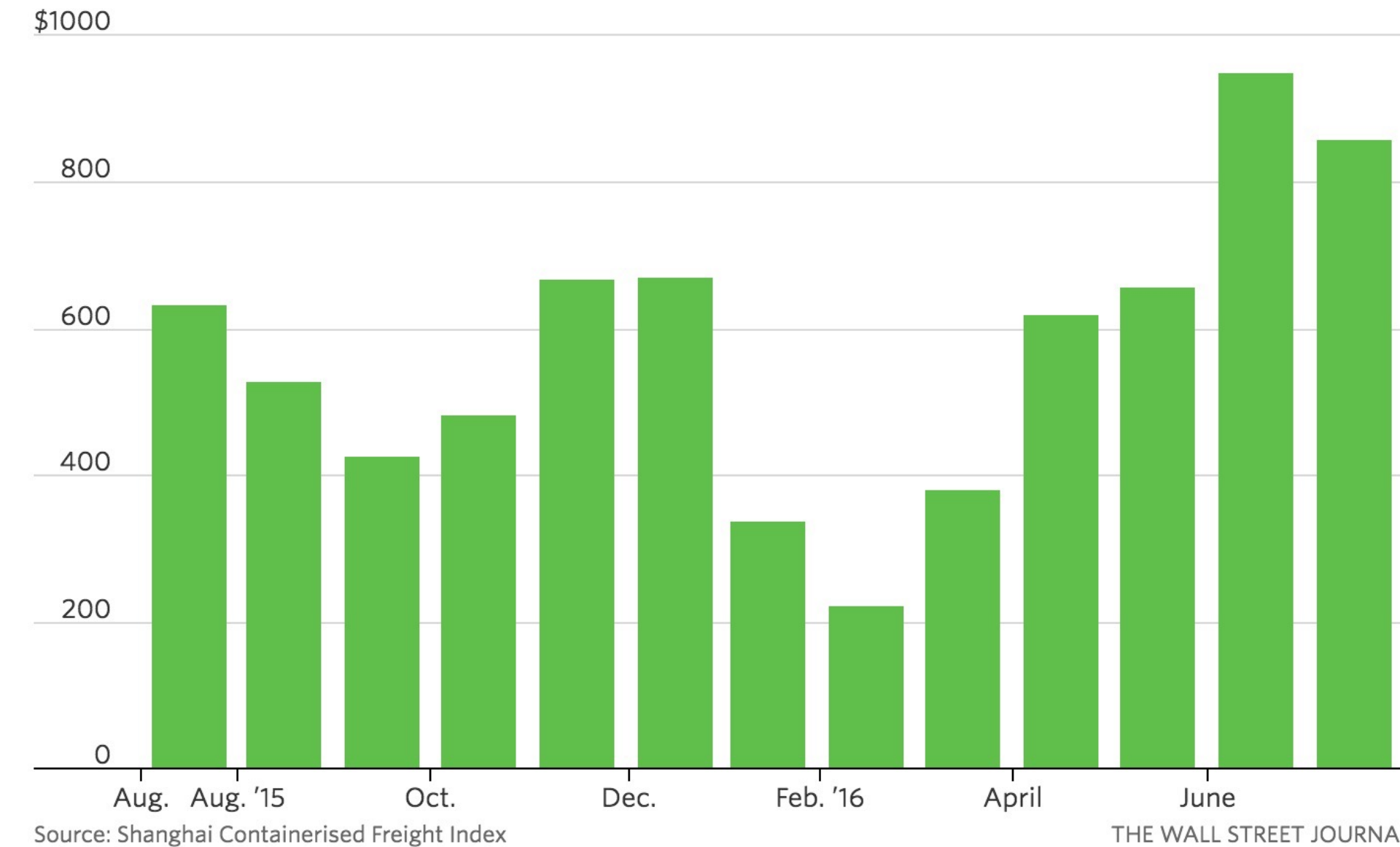
# Maersk Profit Drops on Weak Freight Rates

Lower oil prices also weighed on the Danish conglomerate's second-quarter earnings - WSJ 12 Aug 2016



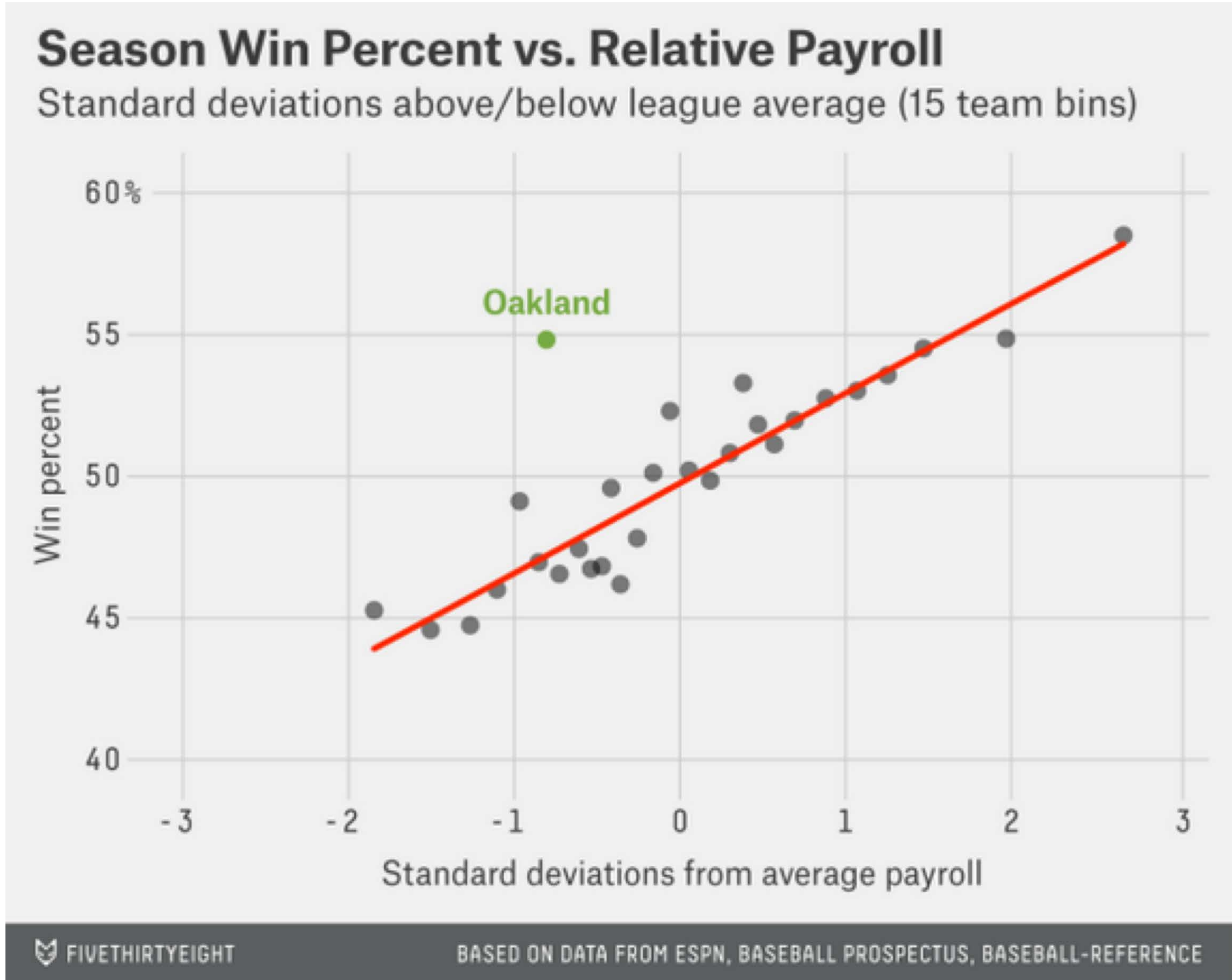
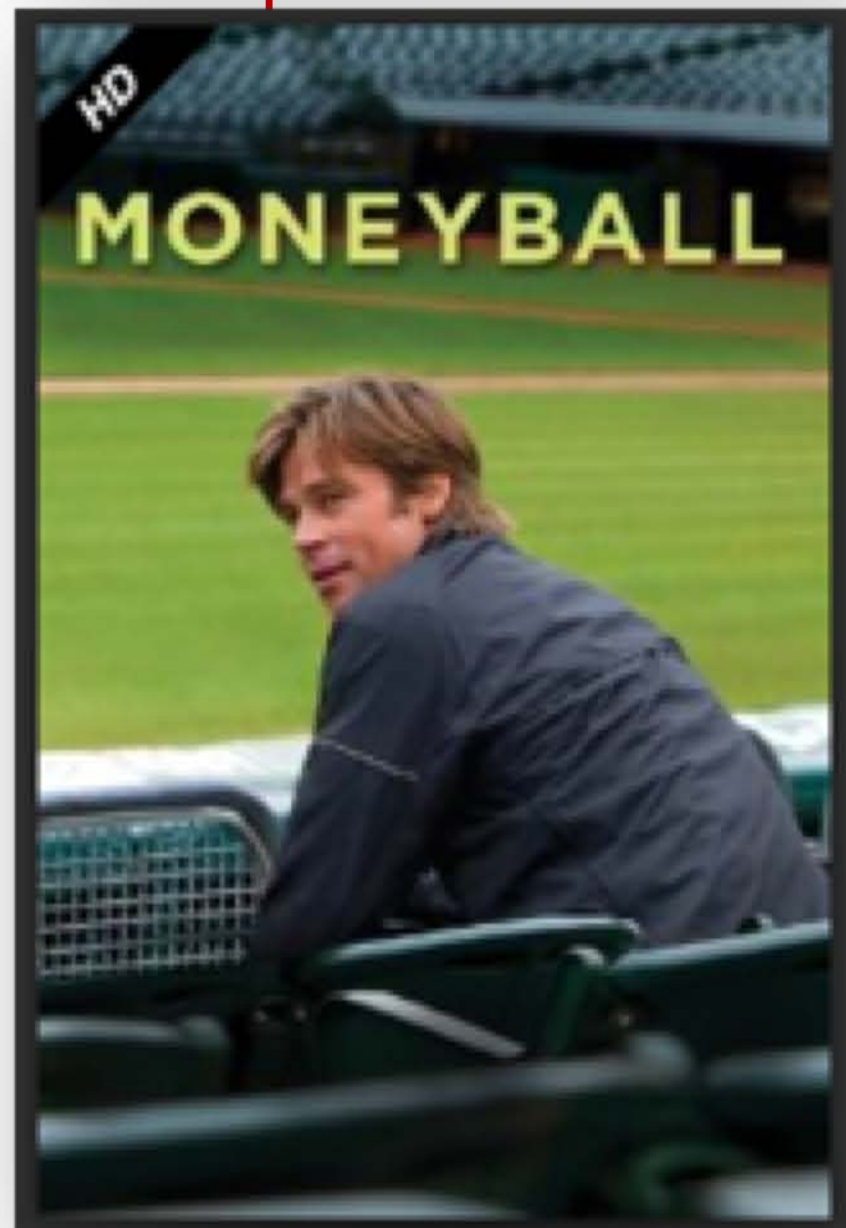
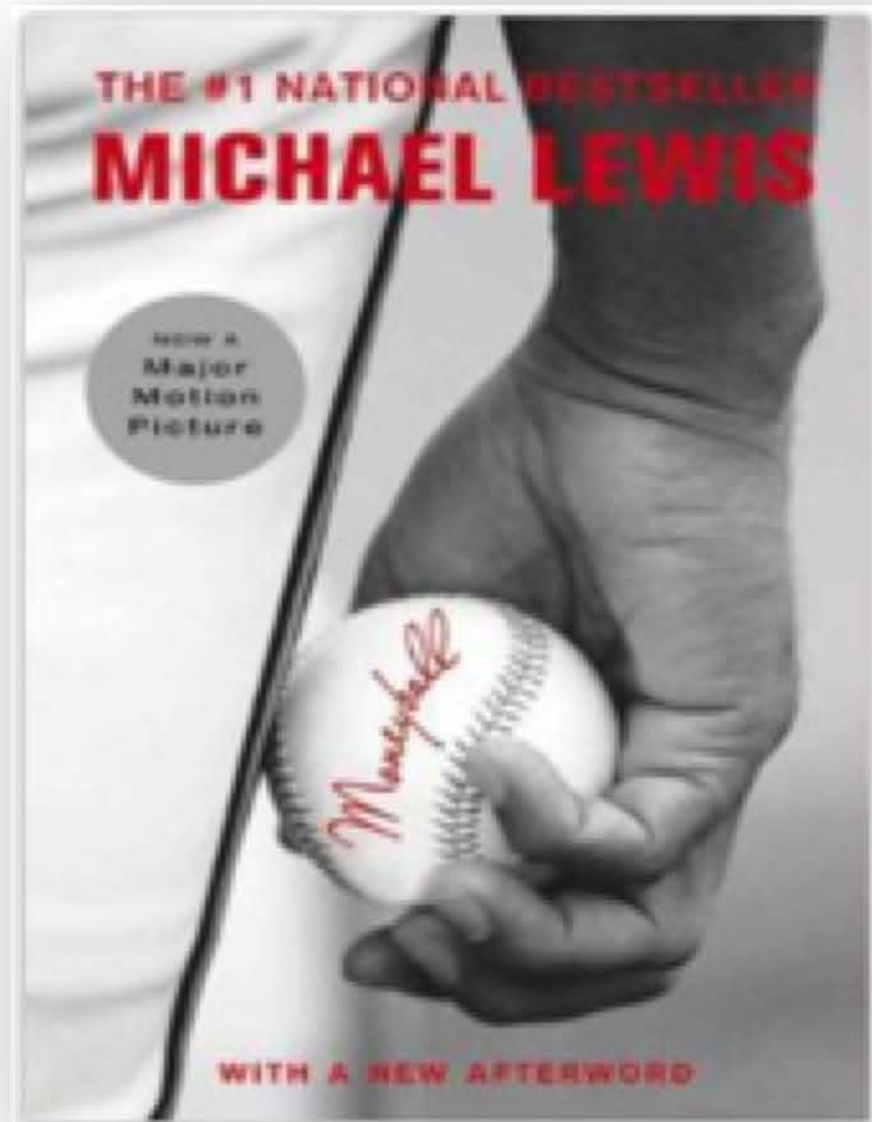
## Freight Rate Misery

Average Asia-Europe monthly freight rates per container. Operators say anything below \$1,400 is unsustainable.



**Mr. Skou said costs in Maersk Line were at an all-time low, dropping for the first time below \$2,000 per container. Maersk Oil has pushed down its break-even level to between \$40 and \$45 a barrel from around \$50 to \$55.**

# Money Ball





# Money Ball for Scrum Starts with Facing Reality

Seen at GE, Toyota, 3M, and many other companies



**25% of staff delivering stories customers will use**

**64%\*70% = 45% of staff delivering stories the customer will never or rarely use (Standish Group)**

**30% of staff working on zero value stories**

- **Lack of direction causes staff to make up work**
- **Unwillingness to prioritize proliferates useless projects**

# Process Efficiency = Work Time/Calendar Time

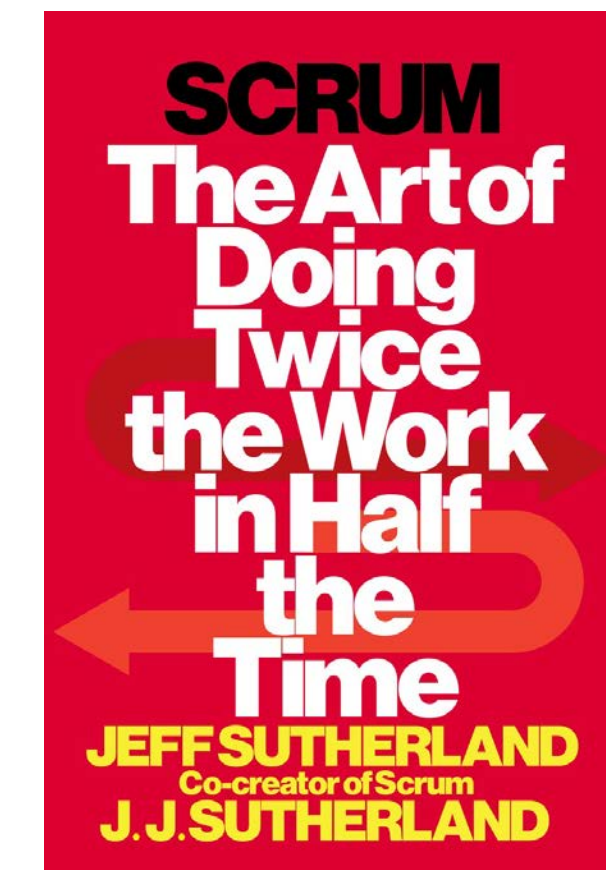
Customer  
Will Use

**25% of staff delivering useful stories**  
**5% process efficiency**

**Organizational delivery capacity - 1.25%**

**Initial Goal: Improve delivery capacity to 5%**

*“Twice the work in half the time”*



# ... Amazon is now “nuking” every business.

Last week it was nuking the fashion industry. This week, the armed ballistic missile is pointed at the global shipping industry. - Robin Lewis. *Amazon's Shipping Ambitions Are Larger Than It's Letting On. Forbes 1 Apr 2016*

- [Amazon](#) has caused pain for a lot of companies with its disruptive business model.
- But now it could disrupt entire economies, especially in emerging markets, according to a research note published by a team of analysts at Morgan Stanley.
- “Amazon is a disruptive dreadnought! I don’t know how to value a company that disrupts every market it enters.” - Wall Street Insider

**“Sellers will no longer book with DHL, UPS or Fedex but will book directly with Amazon.”**

**- Amazon 2013 Report**

**And Maersk will lose their Chinese-America shipping business!**

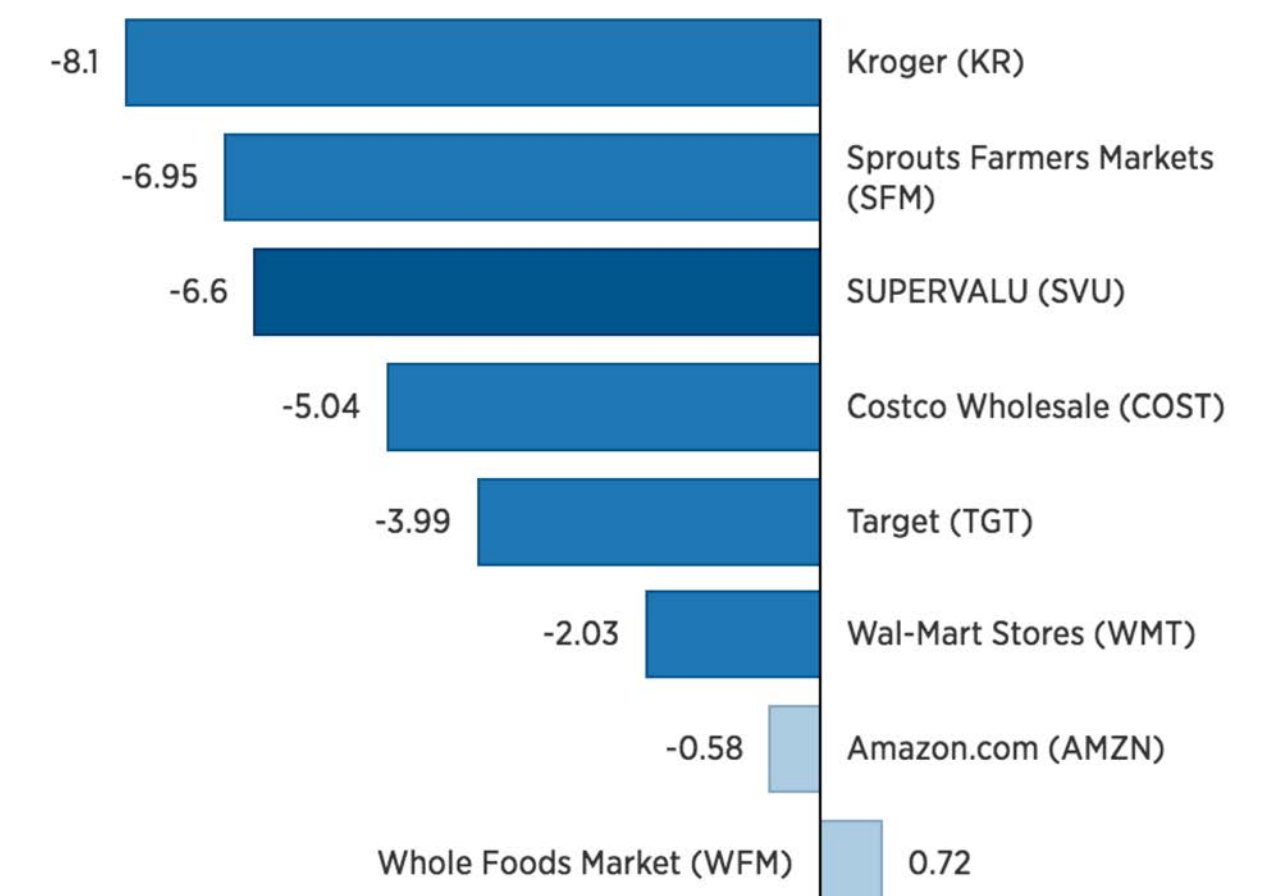
# Amazon's Implementation of Scrum@Scale

- 3300 Scrum teams (2-pizza teams focused on microservices) deliver a new feature to production more than once a second.  
*Roy Monica, Head of Engineering Amazon Devices Demand Forecasting, 2 Mar 2018*
- "People were saying that groups needed to communicate more. Jeff (Bezos) got up and said, 'No, communication is terrible!'"  
*Alan Deutschman, 1 Aug 2014, Fast Company*
- No executive support for Scrum ever emerged, and the transition was therefore limited primarily to the team level, with many organizational impediments still in place.  
*Alan Atlas, theagileexecutive.com, 20 Jul 2009*
- "Only 5% of teams are awesome."  
*Amazon ScrumInc Management Workshop, Oct 2016*
- The success of Scrum at Amazon is based on a frictionless way to begin a Scrum transition: establish stable teams, make Agile and Scrum information widely and easily available, give permission to adopt Scrum.  
*Alan Atlas, theagileexecutive.com, 20 Jul 2009*

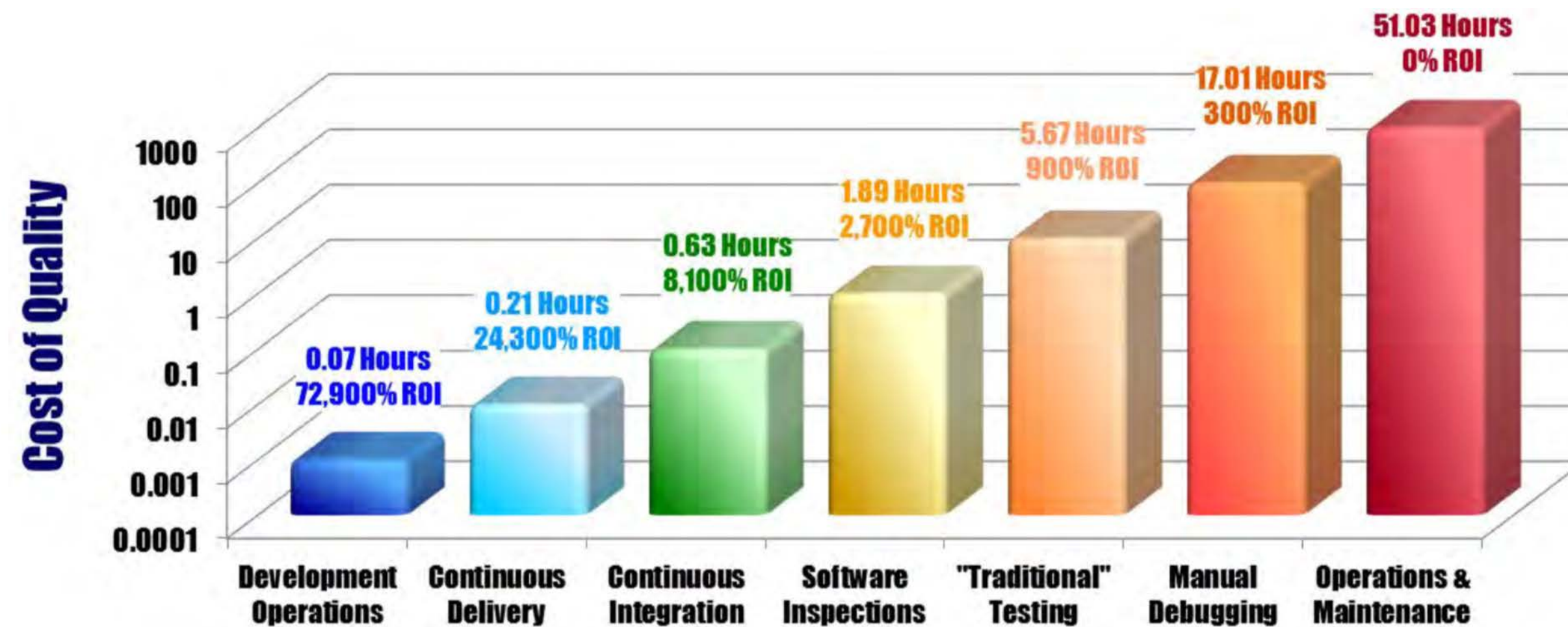
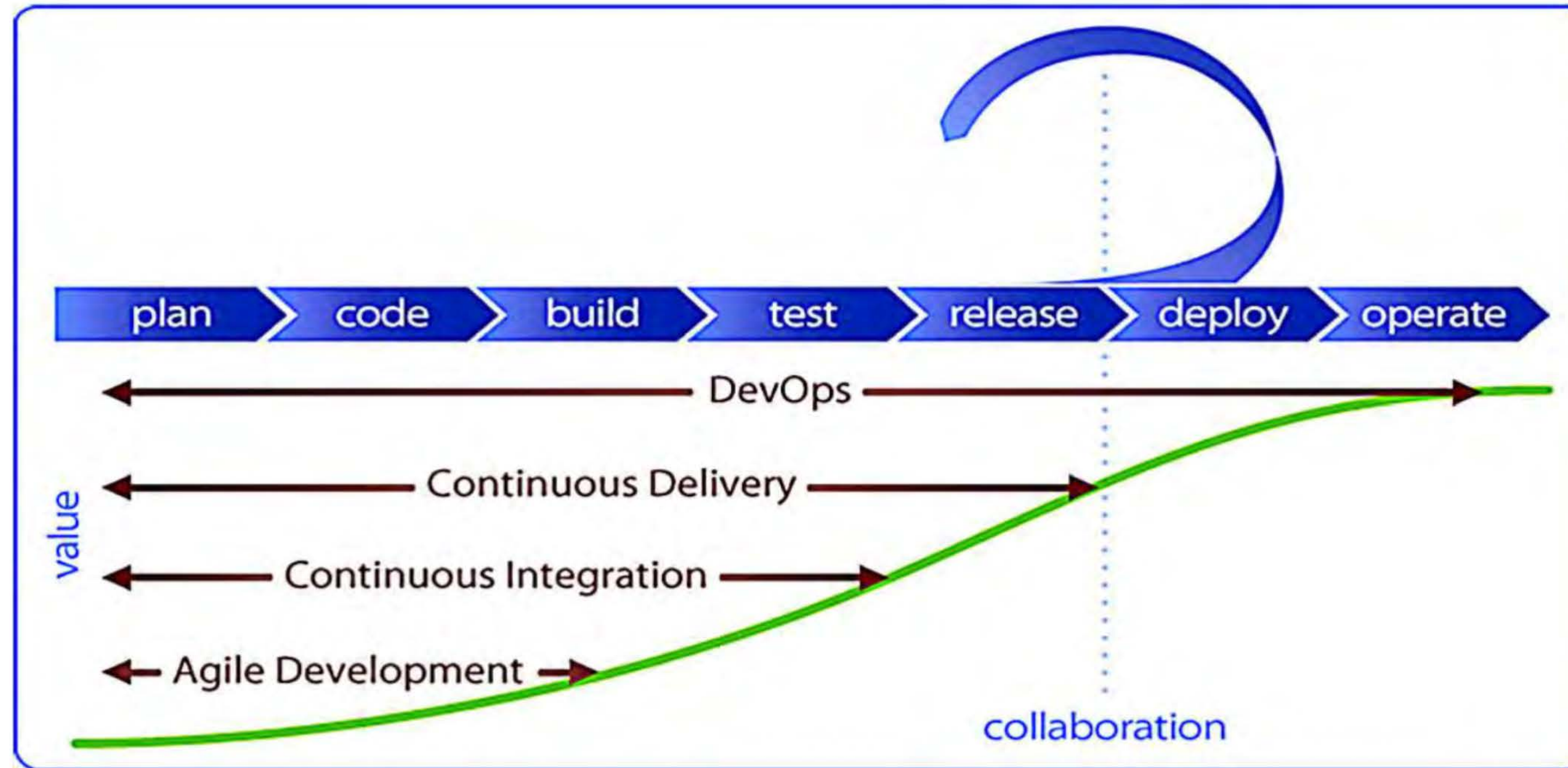
## Amazon Acquires Whole Foods

Food retailers % decline

Thursday, Aug. 24, 2017.



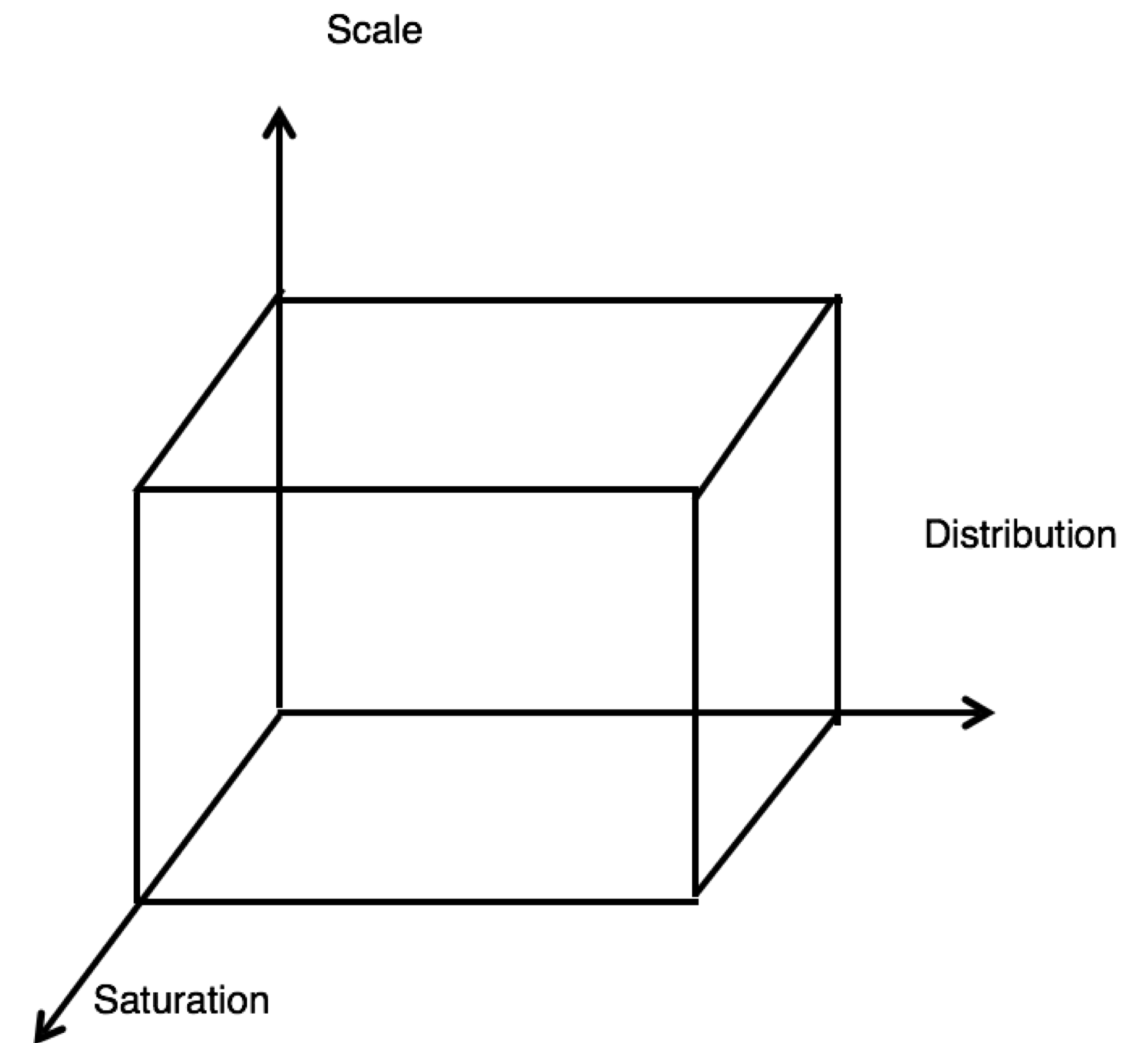
# Amazon Has a Strong Definition of Done



David Rico (2016) Business Value, ROI, and Cost of Quality (CoQ) for DevOps

# Scrum@Scale Considers All Dimensions

- Scale = number of coordinating teams; Complexity of projects
- Distribution = number of different coordinated geographic locations
- Saturation = Degree Agile principles have pervaded organization; Breaking down traditional “silos”
- Velocity = only well performing teams scale linearly



The fourth dimension is velocity

# Scaling Challenge: Bureaucracy & Hierarchy

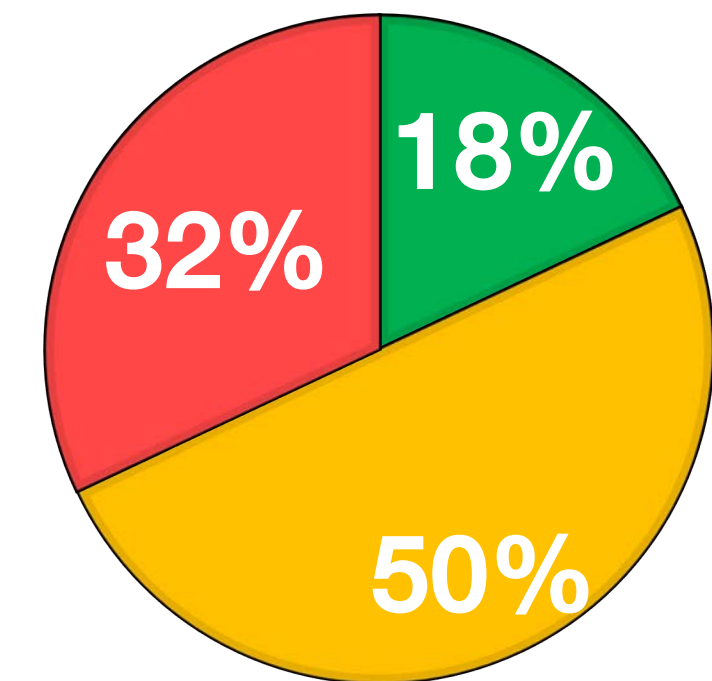
- Our bureaucratic processes create poor **decision latency**.
- Everything we do requires so many sign-offs that nothing gets done.
- We have layers upon layers of managers.
- Therefore, we need a **Minimum Viable Bureaucracy**.

# Decision Latency: Why the Standish Group Thinks Scrum Works

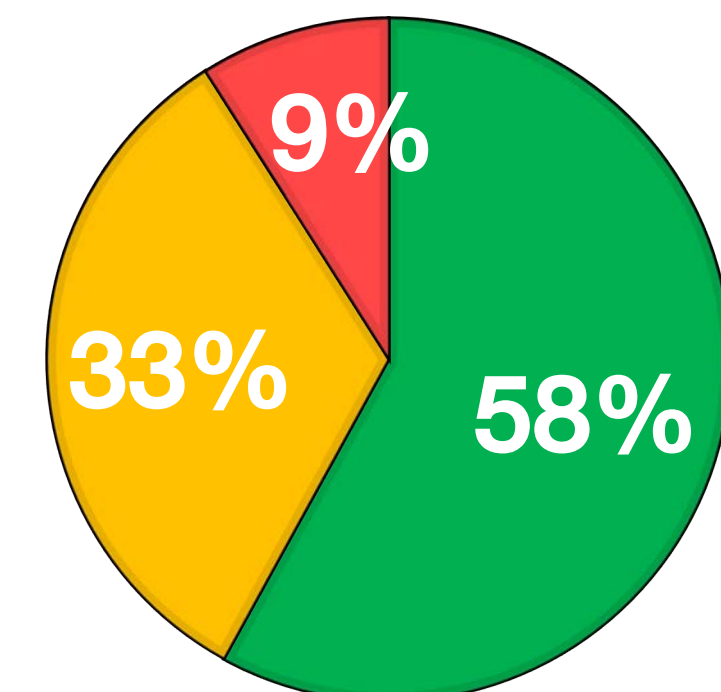
- **Time to make a decision is the primary driver of project failure and budget overrun**
- Scrum pushes decisions down to the team and small teams reduce decision latency
- Strong, decisive, available Product Owner is critical to short decision latency
- Scrum of Scrums, Executive Action Team, and MetaScrum shorten decision latency

***Decision latency is directly related to Process Efficiency!***

**Decision Latency > 5hrs**  
■ Success ■ Challenged ■ Failed



**Decision Latency < 1hr**



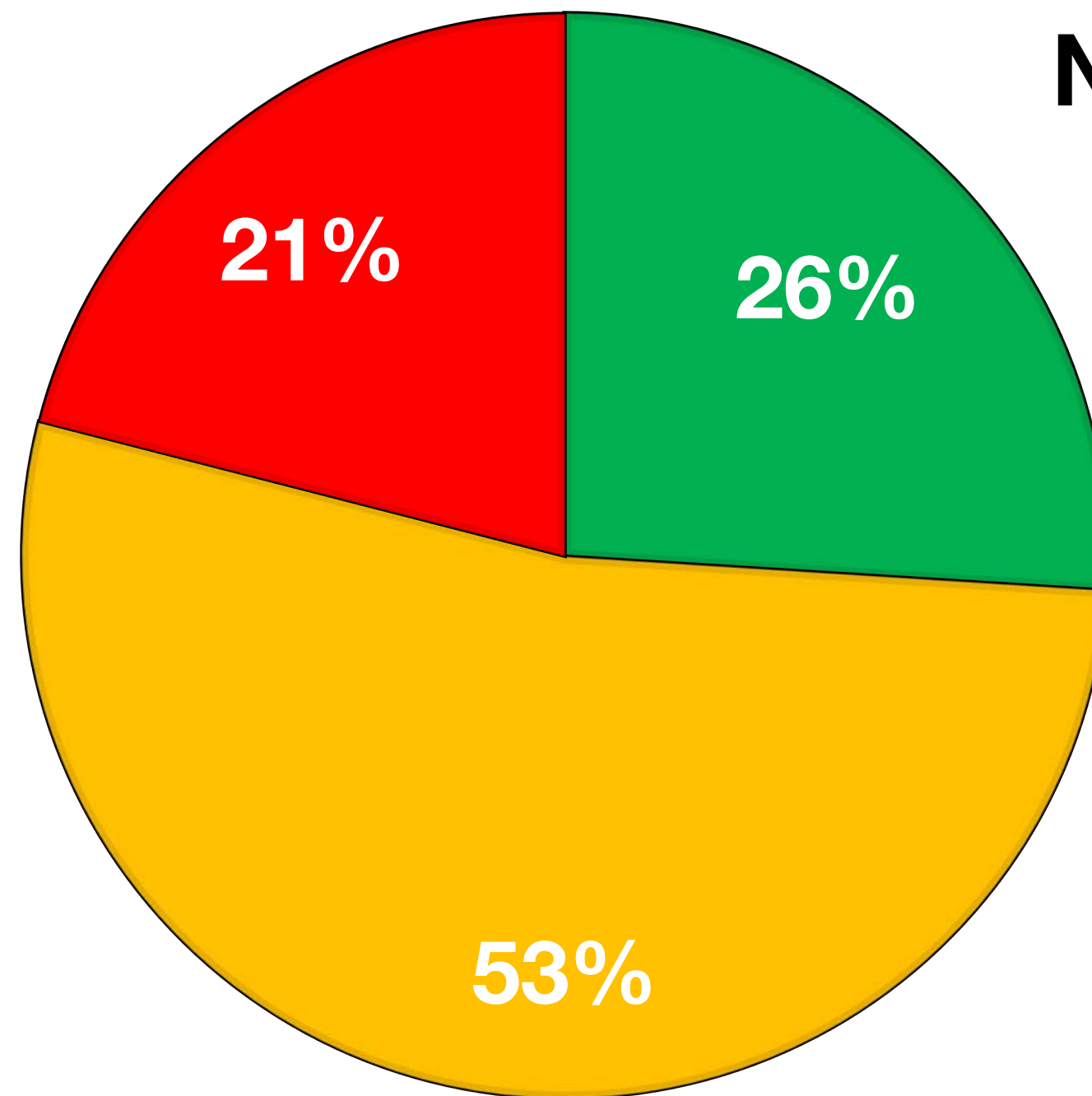
Standish Group Data 2013-2017



# Project Success Rates

## Traditional Projects

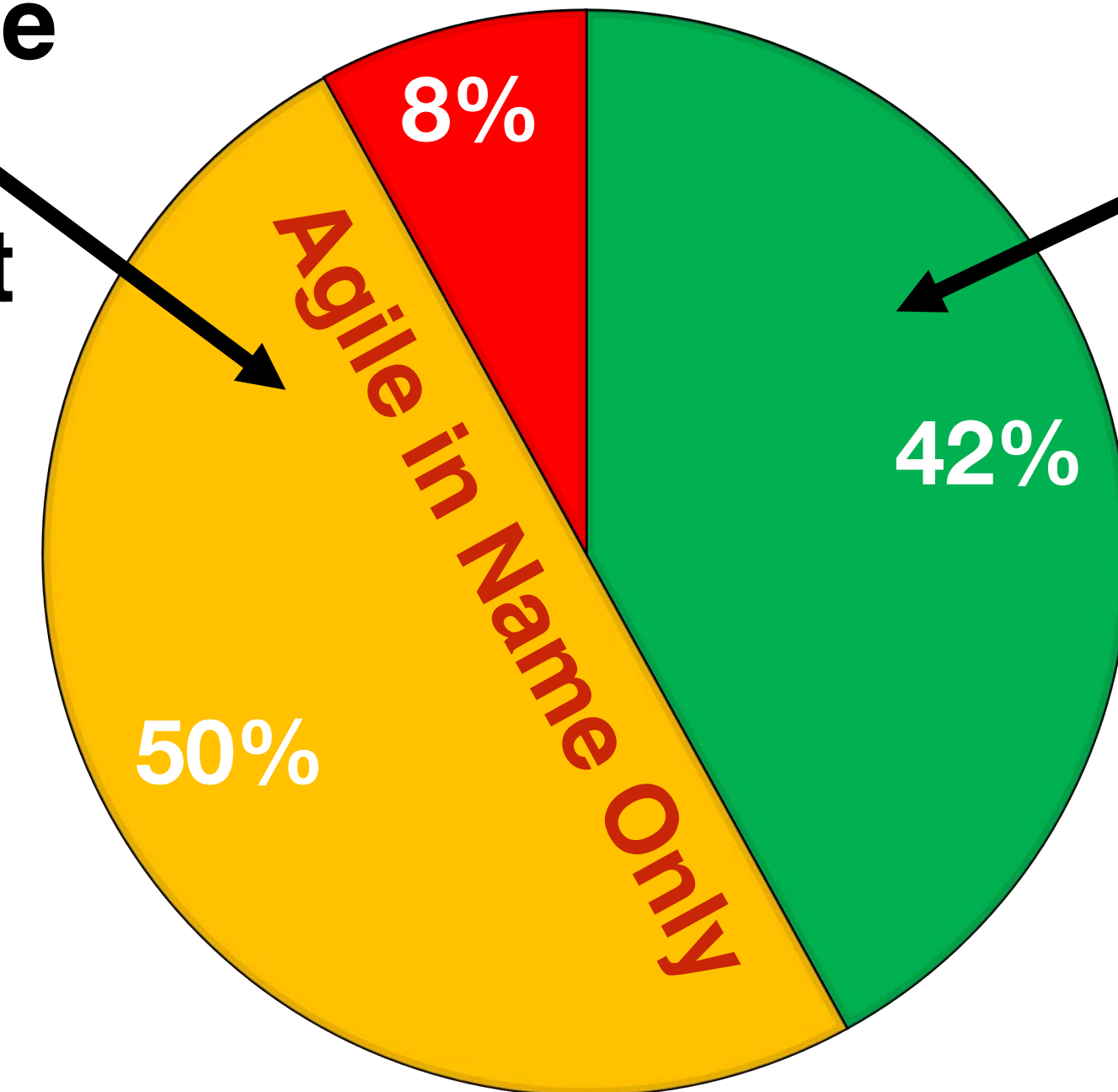
■ Success ■ Challenged ■ Failed



No Shippable Product Each Sprint

## Agile Projects

■ Success ■ Challenged ■ Failed



True Scrum

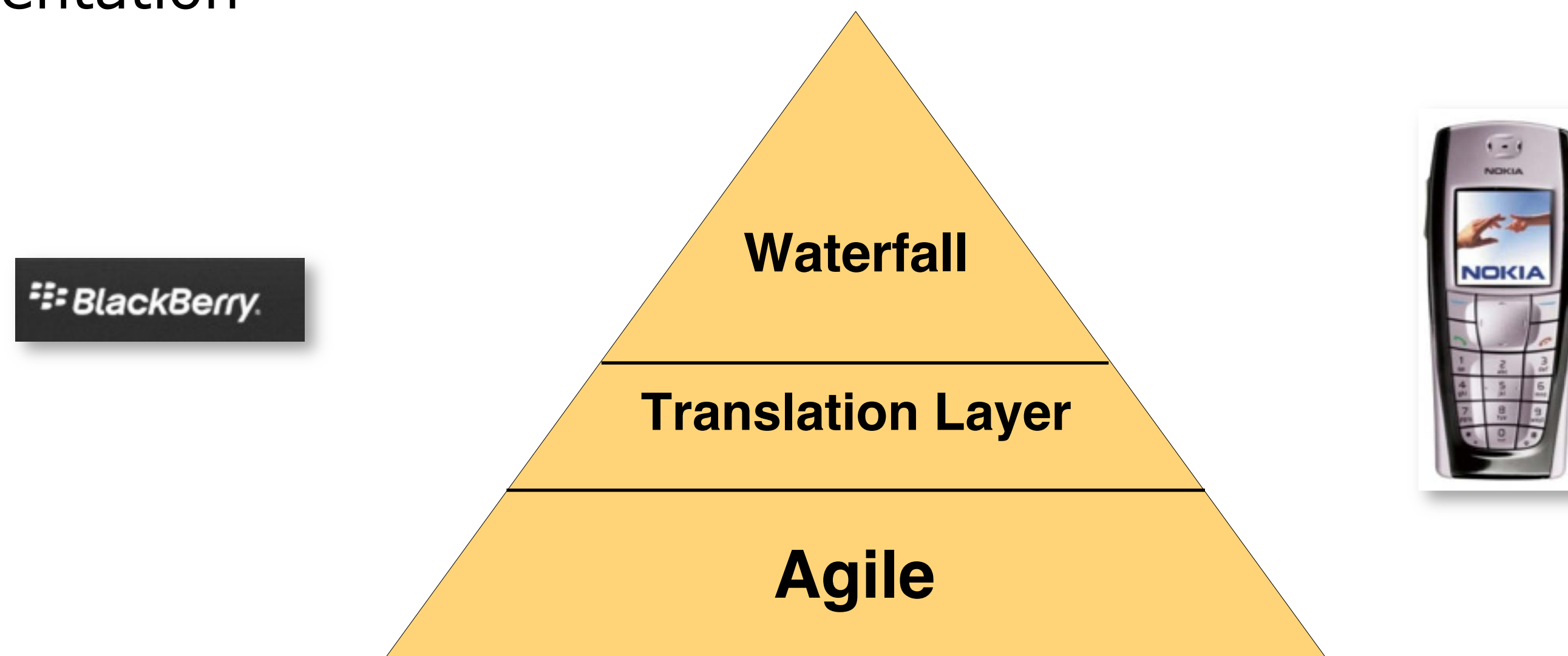
On average Agile Projects have a 42% success rate compared to only 26% for traditional projects from 2013-2017 .

Source: Jim Johnson, Standish Group, Chaos Report, 2018

# FrAgile Implementation - poor decision latency

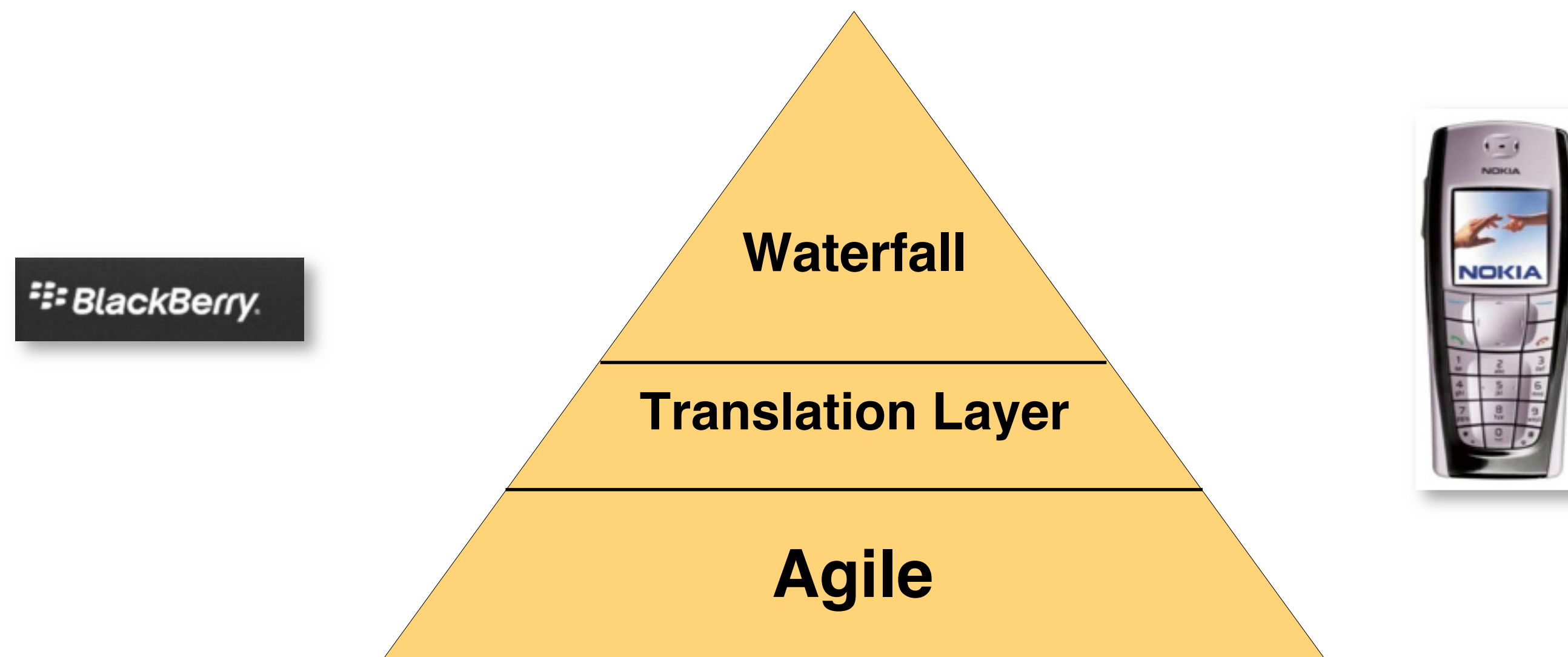
## Trying to run Mac App in Windows environment

- Traditional management hierarchy creates project teams
- “Scaling frameworks” are often used to provide scaffolding for the legacy organization until it can evolve
- **This is a translation layer that provides insulation and must ultimately be removed to get high performance**
- Bureaucracy or changes in management often cripple and/or destroy agile implementation



# FrAgile Implementation - poor decision latency

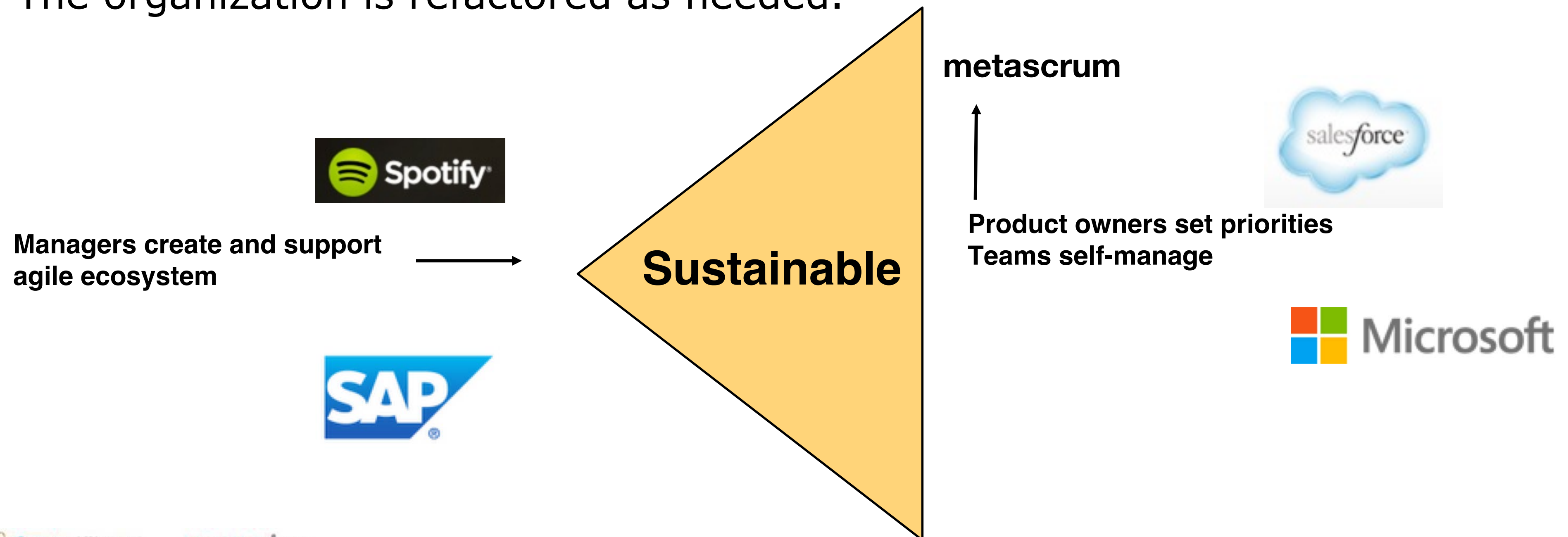
- Does not eliminate "Dark Work"
- Does not set up Product Owner driven organization to eliminate useless features
- **Does not get twice the work in half the time**
- Does not get linear scalability



# Sustainable Agile Implementation

## Install Agile OS - reduce decision latency

- Product Owners drive priorities, leadership supports their priorities.
- Teams self-organize in alignment with a prioritized backlog to maximize production.
- Leaders create virtual teams that drive communities of practice across the company.
- The organization is refactored as needed.

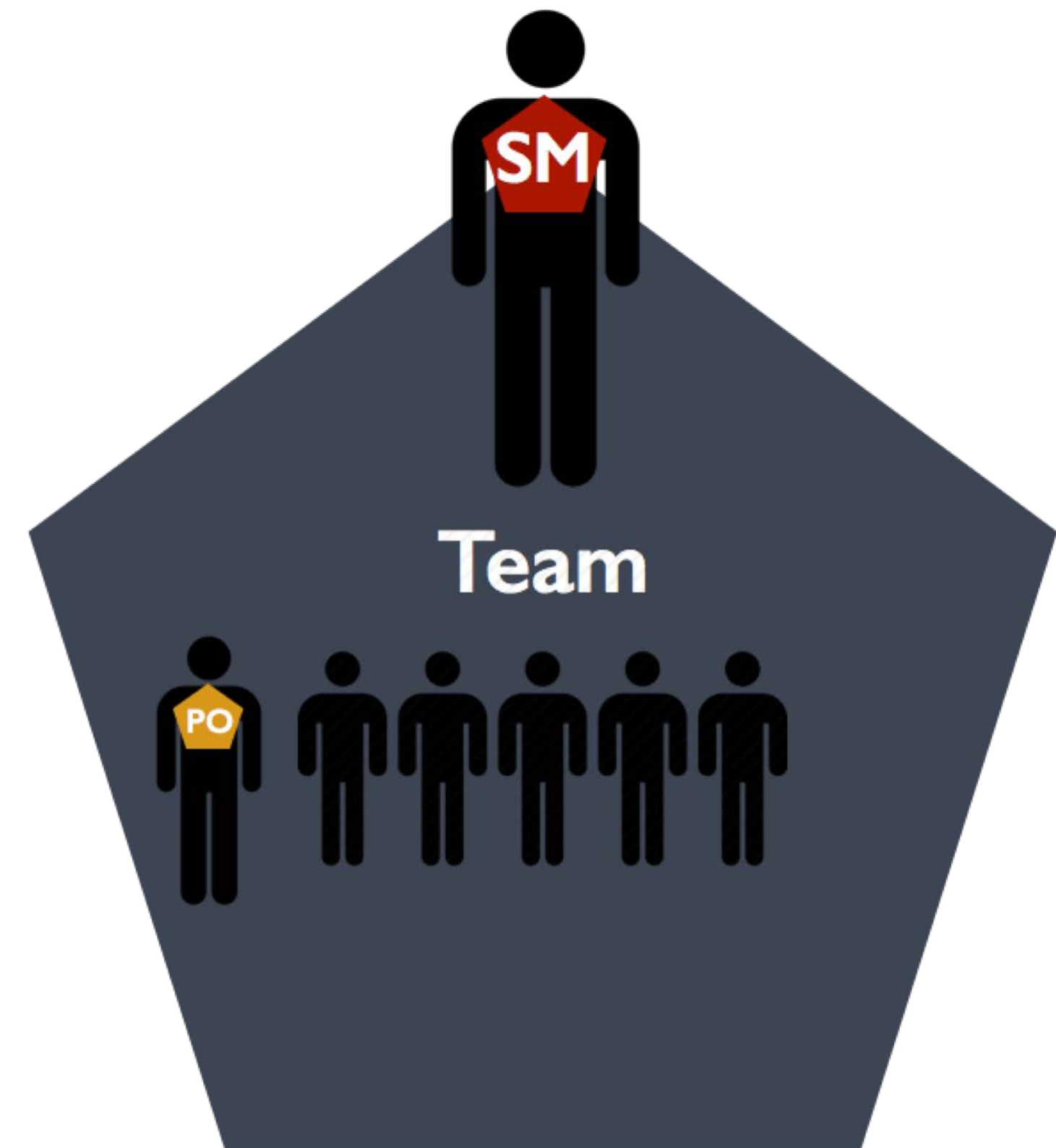


# Scrum@Scale: Minimum Viable Bureaucracy

- Scrum of Scrums (Team of Teams)
- Executive Action Team
- Executive MetaScrum

# Scaling the Scrum Master

- Servant leader
- Enhances team performance
  - Ensures work & impediments are made visible
  - Protects the Team from interruptions
  - Coaches the Team & Product Owner in Scrum
  - Implements the Scrum values & the Agile Manifesto
  - Promotes Kaizen thinking and waste reduction
- Facilitates Scrum events



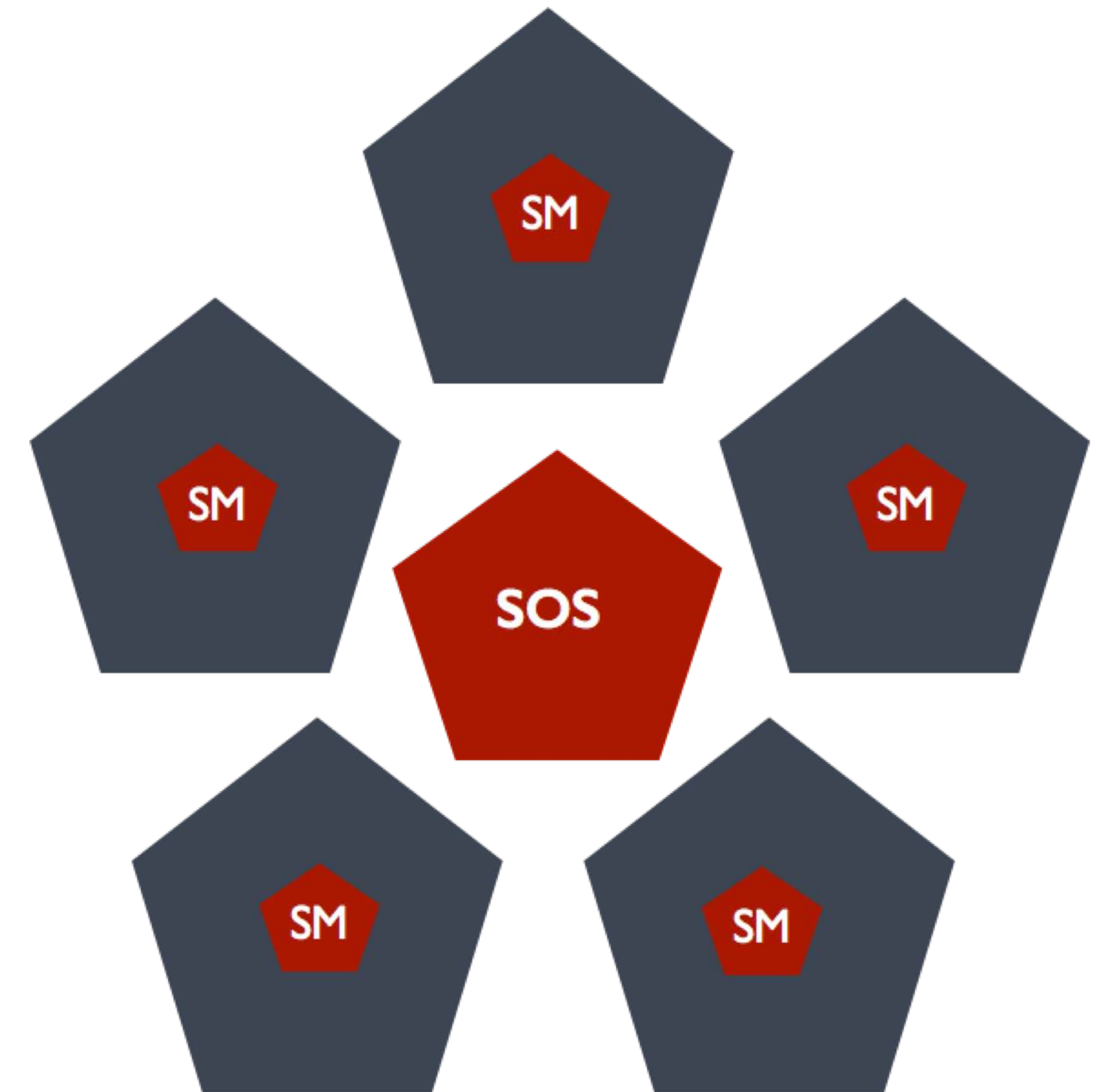
# Scrum of Scrums Perspective

## Scrum of Scrums

- Cross-Team Coordination: teams who deliver a common product join a SoS
- SoS is responsible for a shippable increment of product at the end of a sprint and must work closely with the Product Owner.
- SoS Master oversees the whole from the perspective of getting the product to market quickly and with high quality

## Scaled Daily Scrum

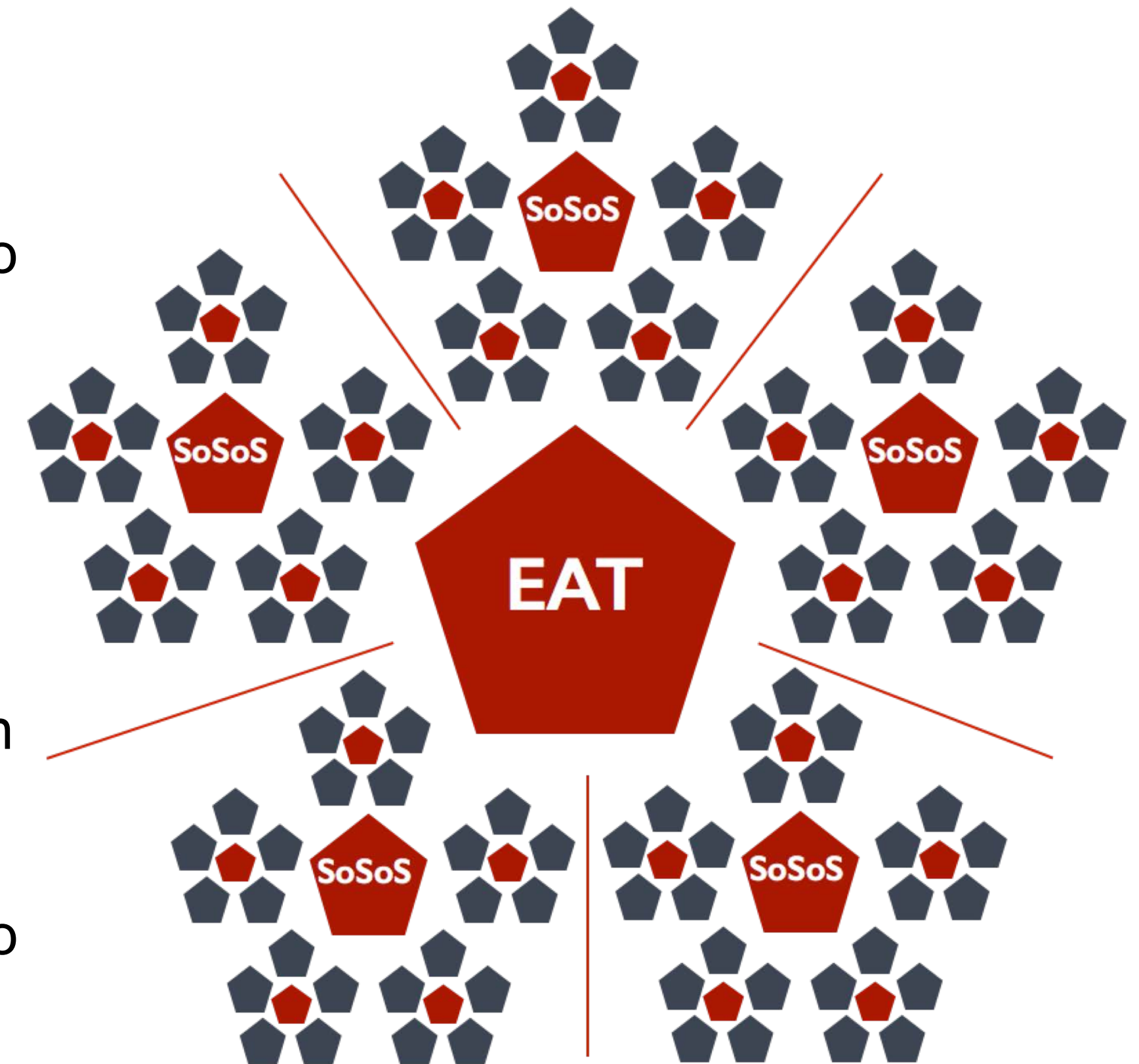
- Subset of SoS attends. Includes those needed to ensure potentially shippable integrated product at end of sprint (or more often)
- Mirrors Daily Scrum (15 mins or less). Surfaces & removes impediments
- Limits communication pathways while increasing communication saturation



Example: 5 teams  
delivering a product  
together

# The Executive Action Team Perspective

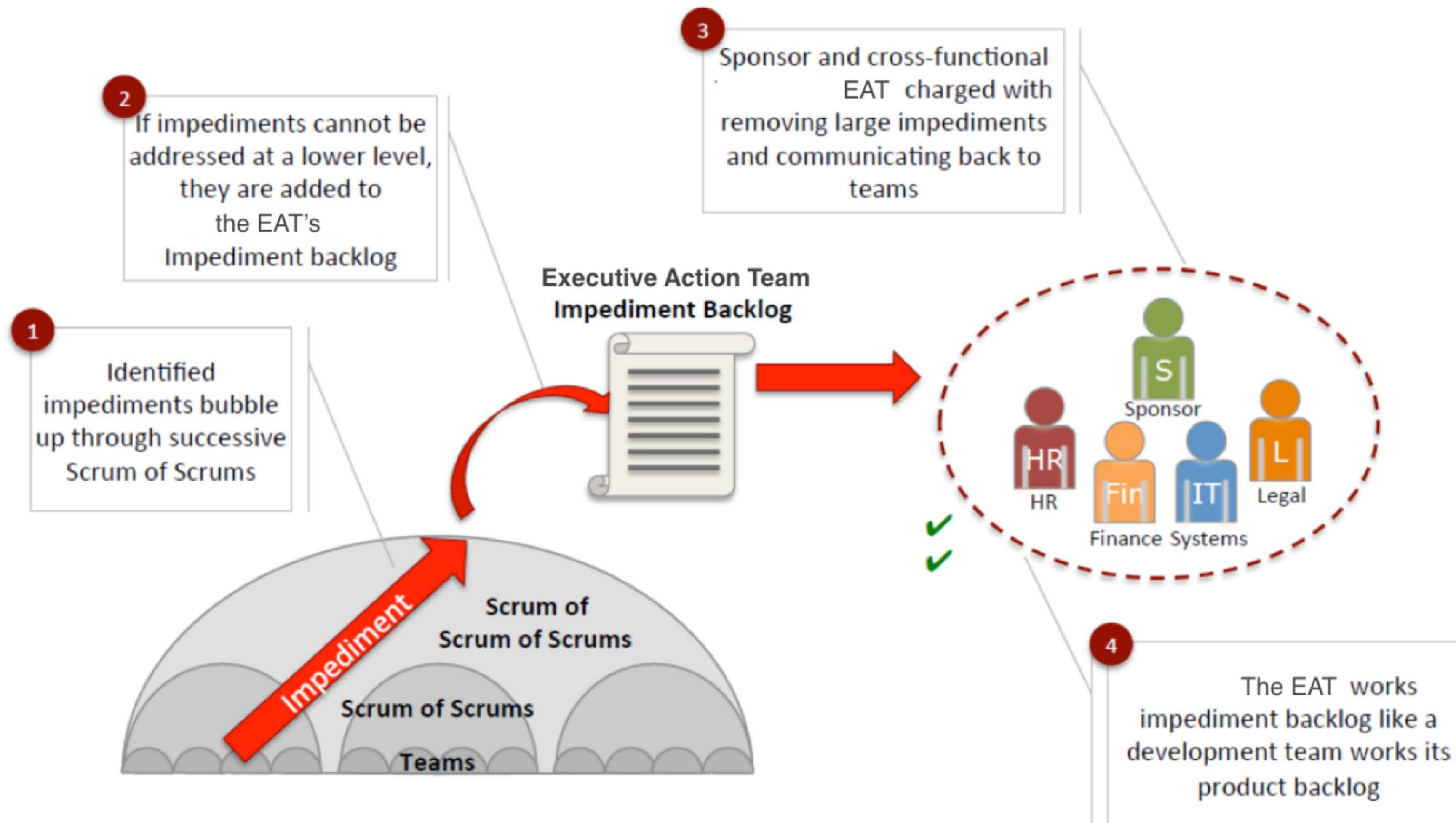
- The EAT owns the Transformation Backlog and “eats impediments” that block it
  - Removes those not handled at the Team level due to scope, budget, or corporate political power
- Their Daily Scrum may be more than 15 mins due to complexity of topics
- Cross-Value Stream Coordination: still limits communication pathways while keeping communication saturation high
- Executes the Transformation Strategy or delegates it to a center of expertise



Ex. 125 teams (625 people)  
delivering products together



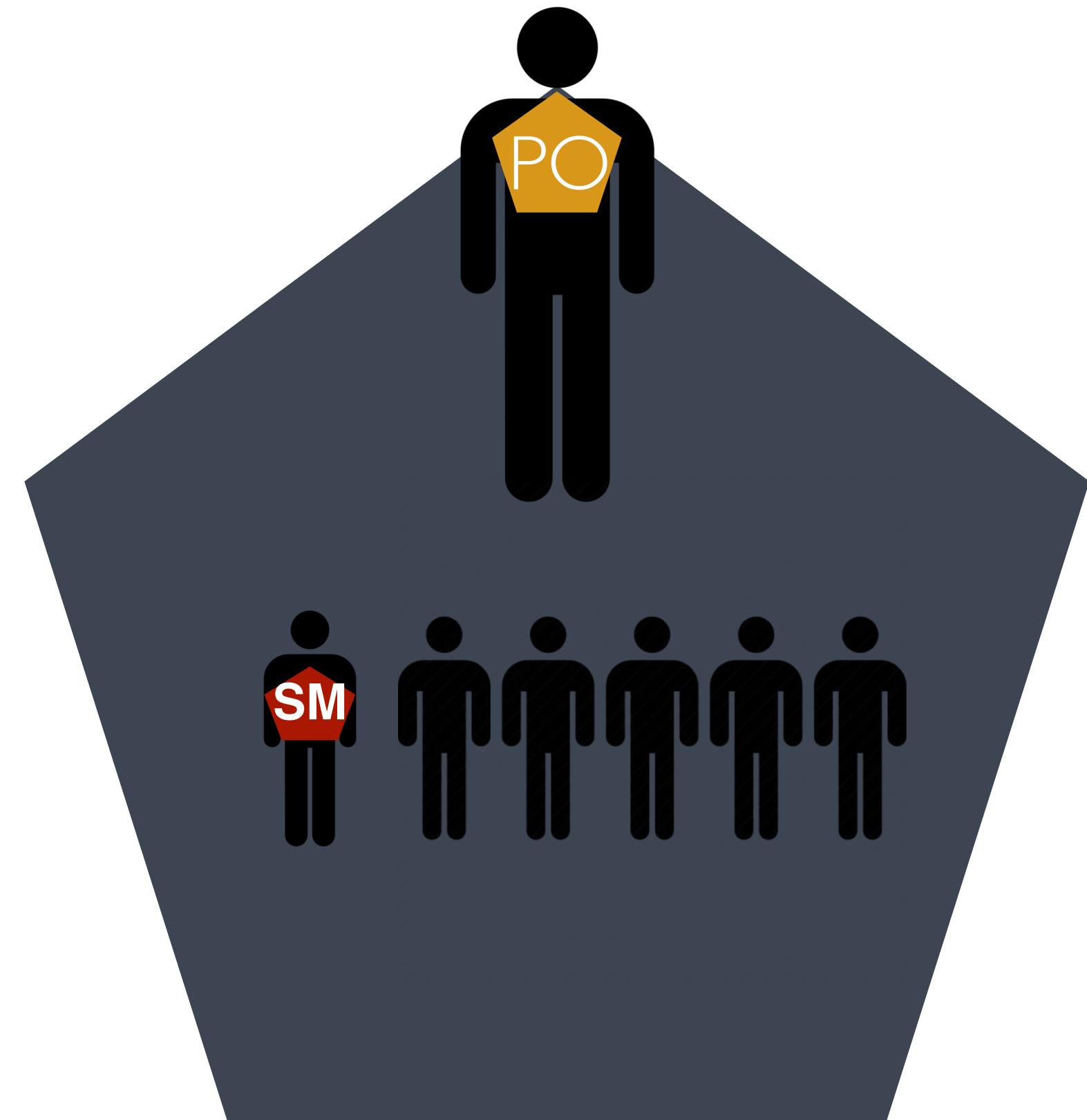
# Executive Action Team: Sets up and owns the Agile ecosystem



# The Team Product Owner

## Builds, Refines, Plans

- **Sets Team Priorities**
- Servant Leader
- 50% with Customer, 50% with Team
- Single Backlog
- “What” not “How”
- Complete Responsibility Through Trust
- Known Stable Interface to the Team



# CPO MetaScrum Perspective

Aligns, Refines, Plans

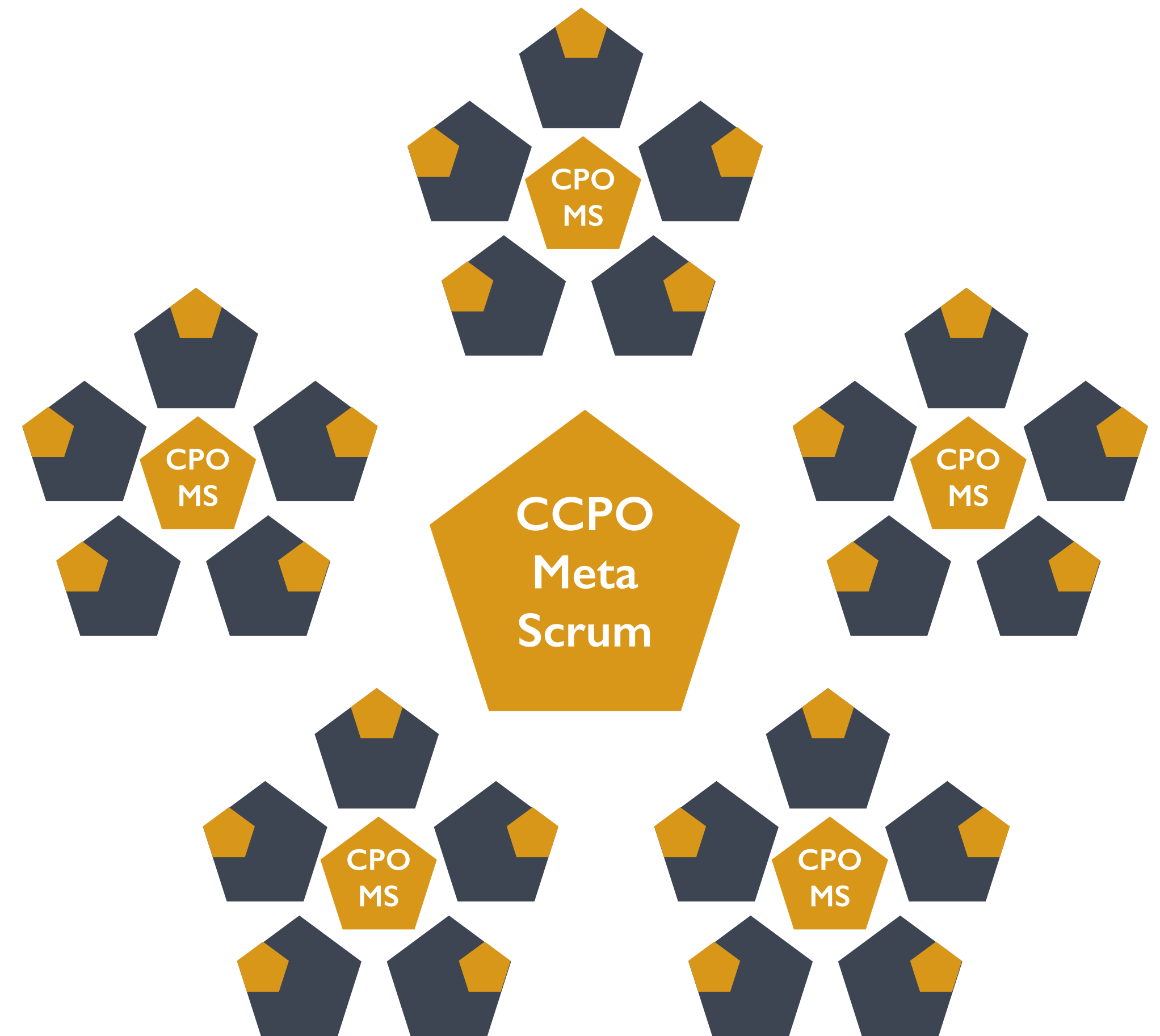
- **Sets Priorities for Multiple Teams**
- Mirrors Refinement and Planning
- Single Backlog Pulled by Team POs
- Cross-Team Backlog Coordination & Alignment



# CCPO MetaScrum Perspective

Aligns, Decomposes, Refines

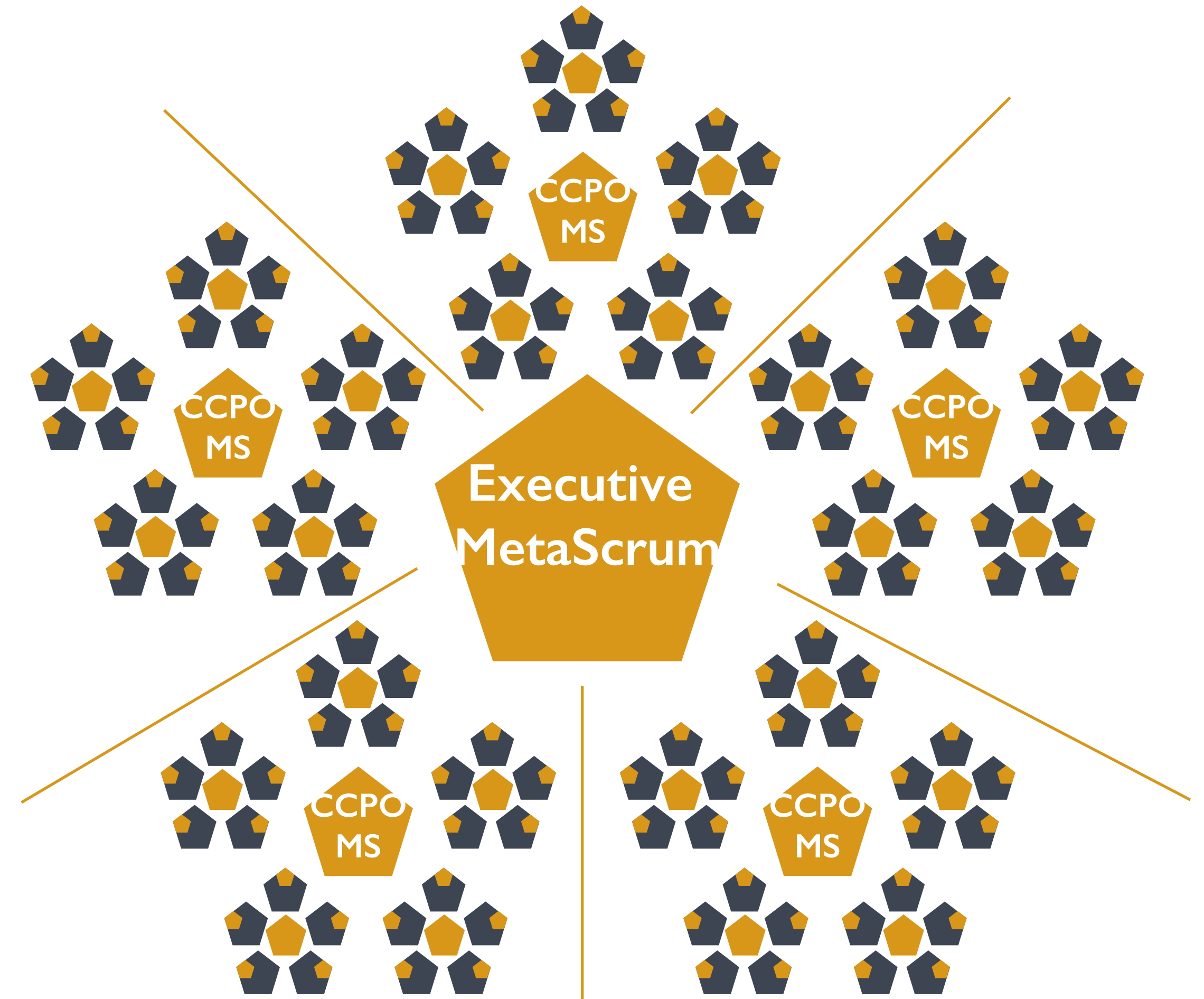
- **Sets Priorities for Multiple Groups of Teams**
- Mirrors Refinement and Planning
- Single Backlog Pulled by CPOs
- Cross-Team Coordination & Alignment



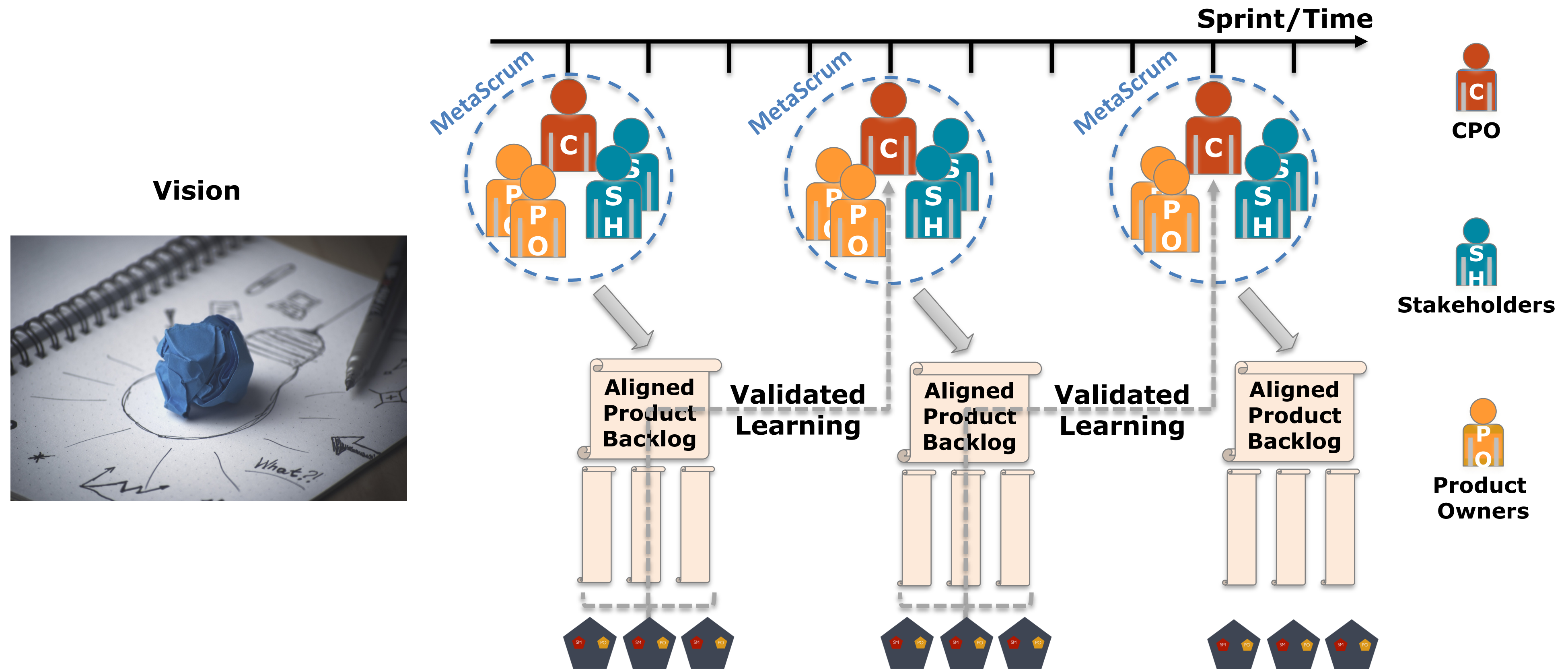
# Executive MetaScrum Perspective

Aligns and Sets Strategic Priorities for the Organization

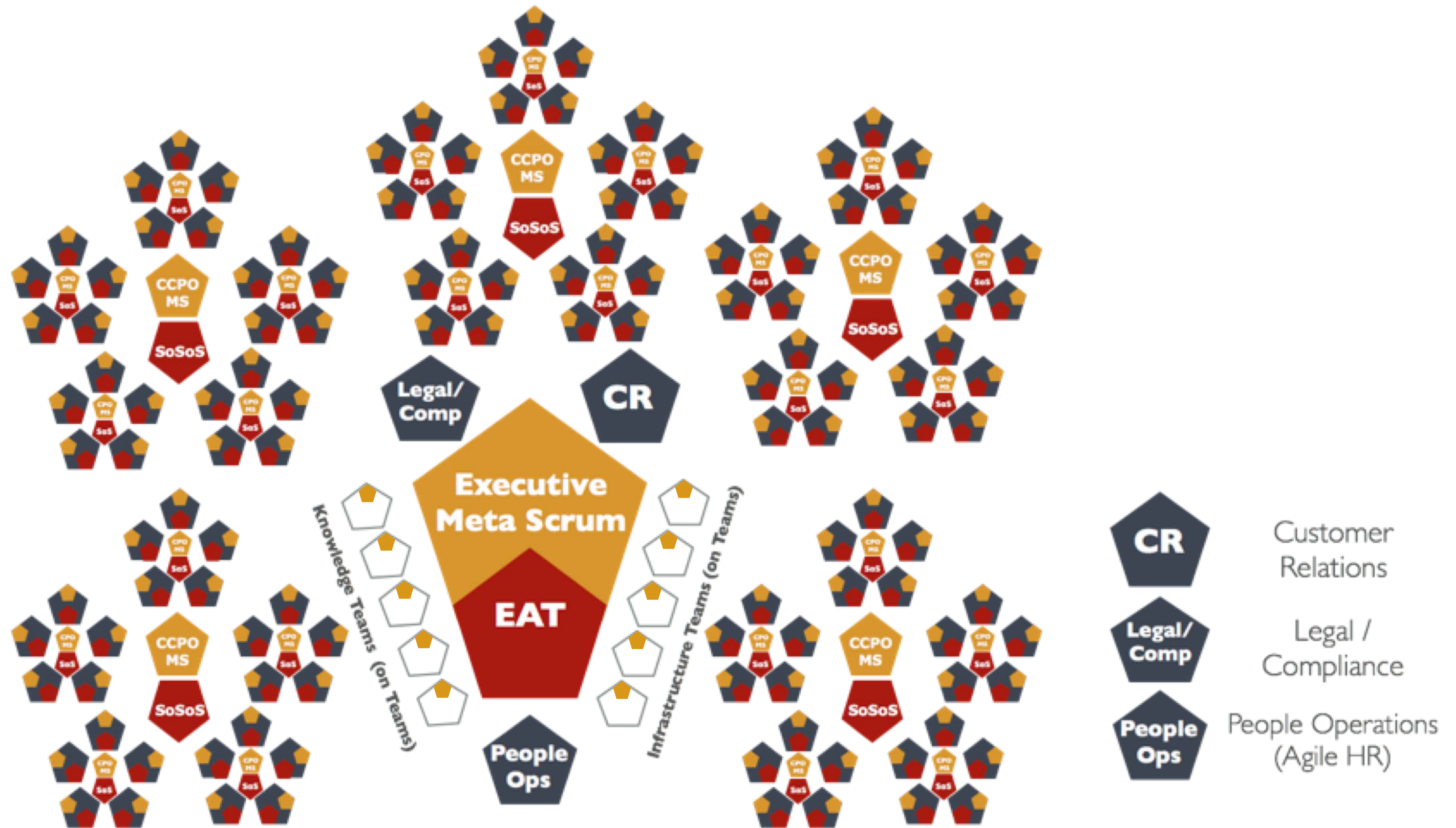
- **Owns Organizational Vision**
- Lead by a terminal CPO
  - CEO or SVP
  - Needs CFO or Finance Exec
- Single Backlog Pulled by CCPOs
- Sets Organizational Priorities
- Mirrors Refinement & Planning



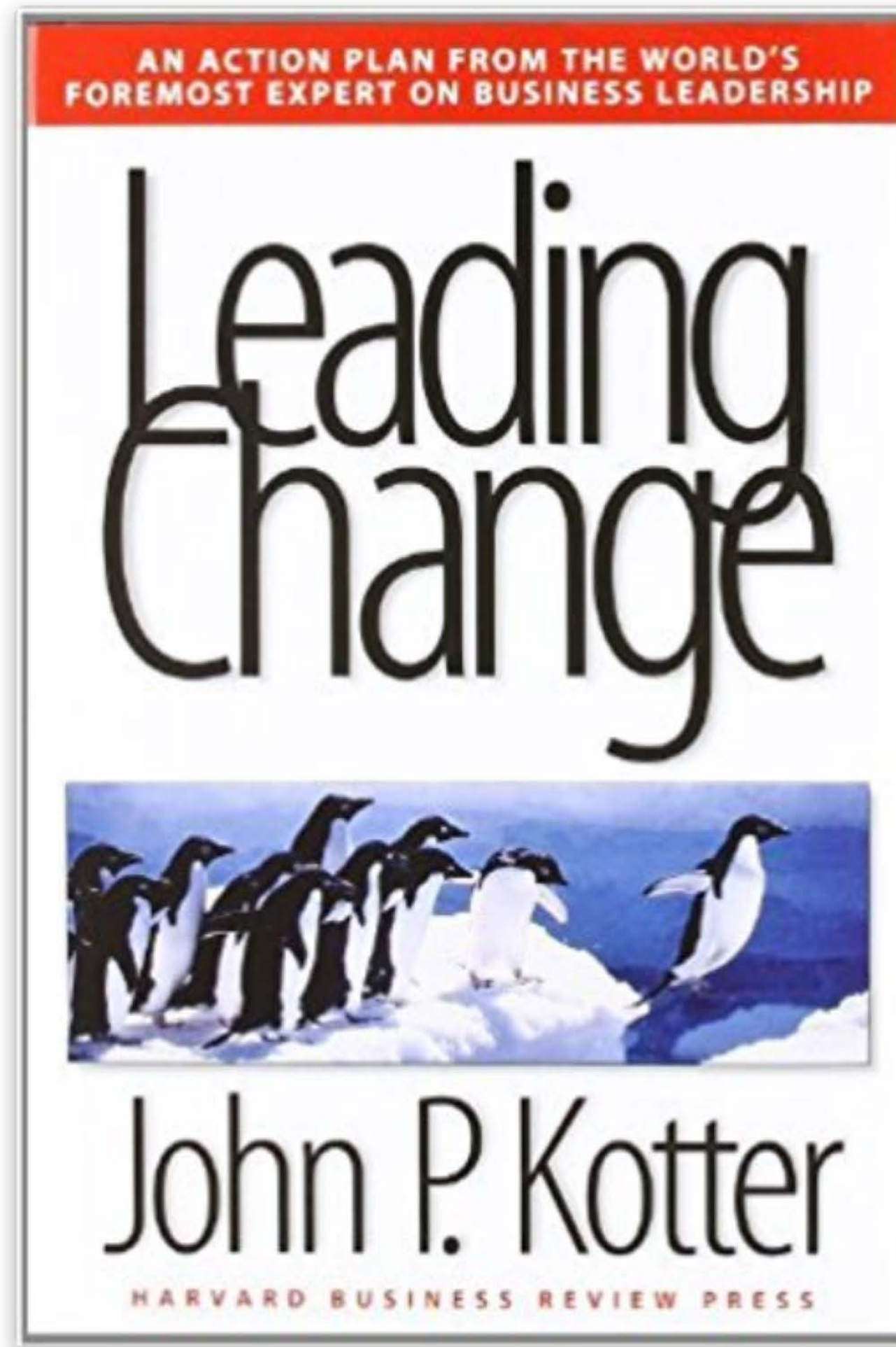
# The MetaScrum: Scaled Backlog Refinement



# Case Study: Putting It All Together



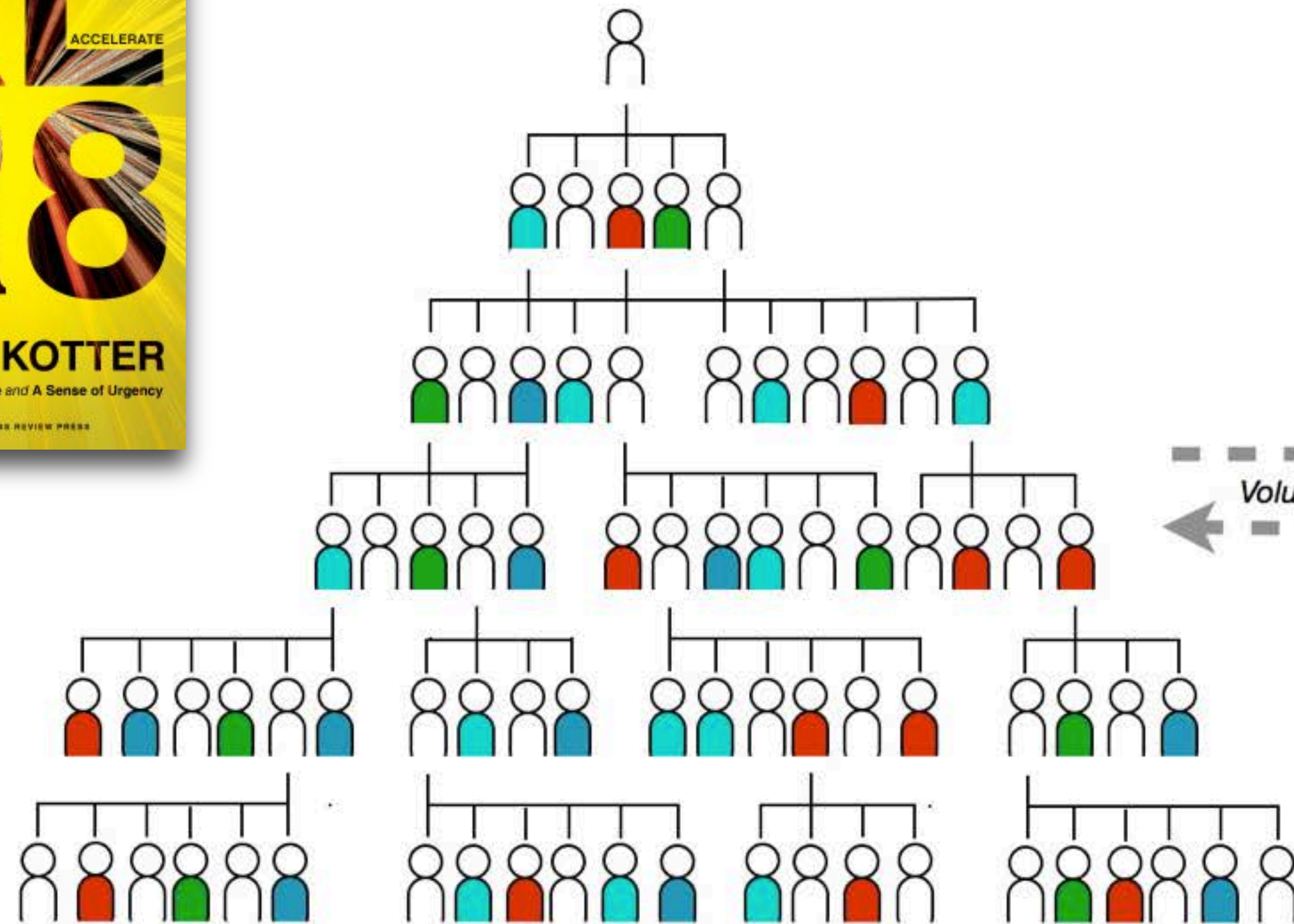
# Scrum@Scale Enables “Leading Change”



[www.kotterinc.com/8-steps-process-for-leading-change/](http://www.kotterinc.com/8-steps-process-for-leading-change/)

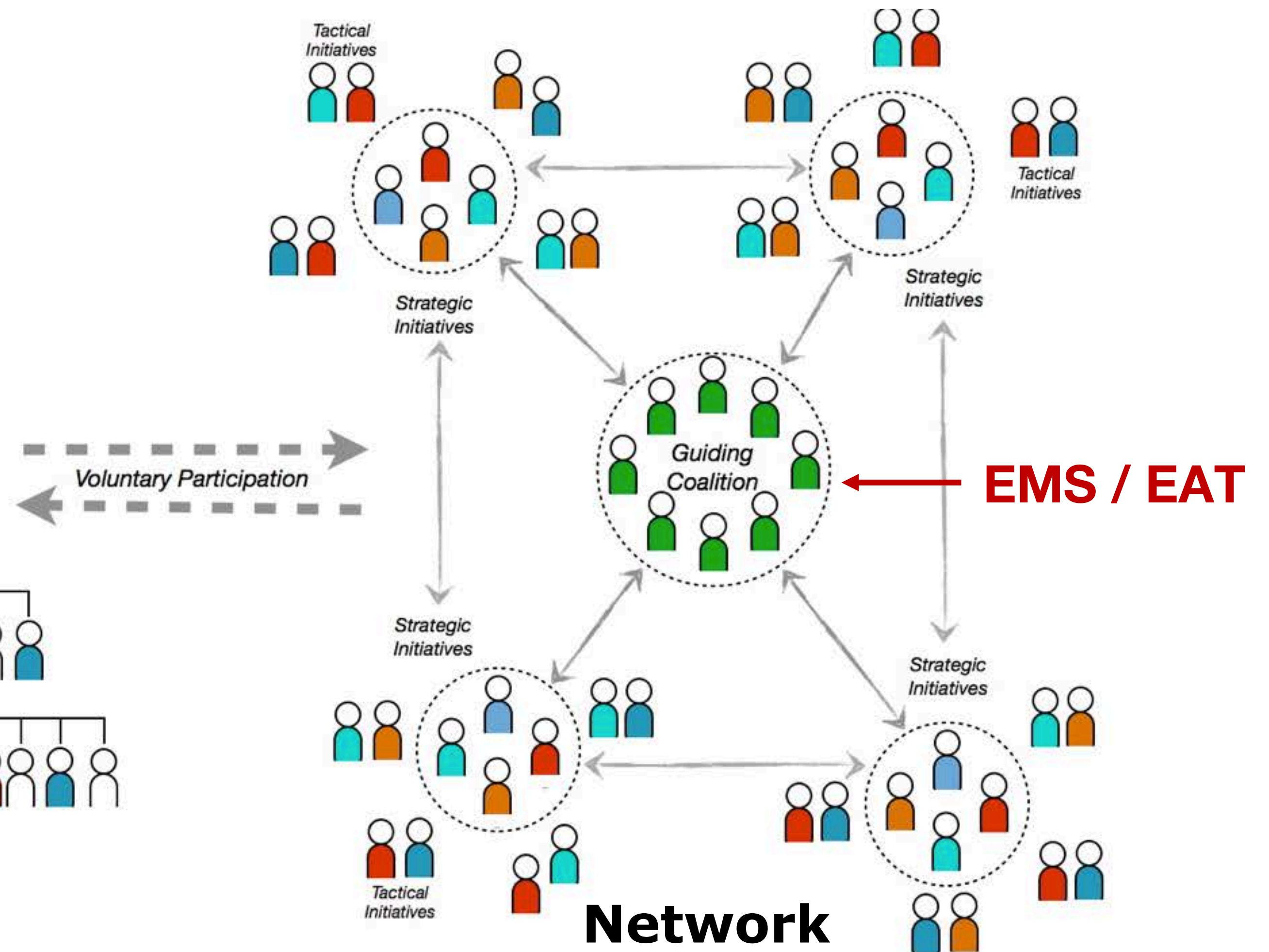


# The Dual Operating System



## Hierarchy

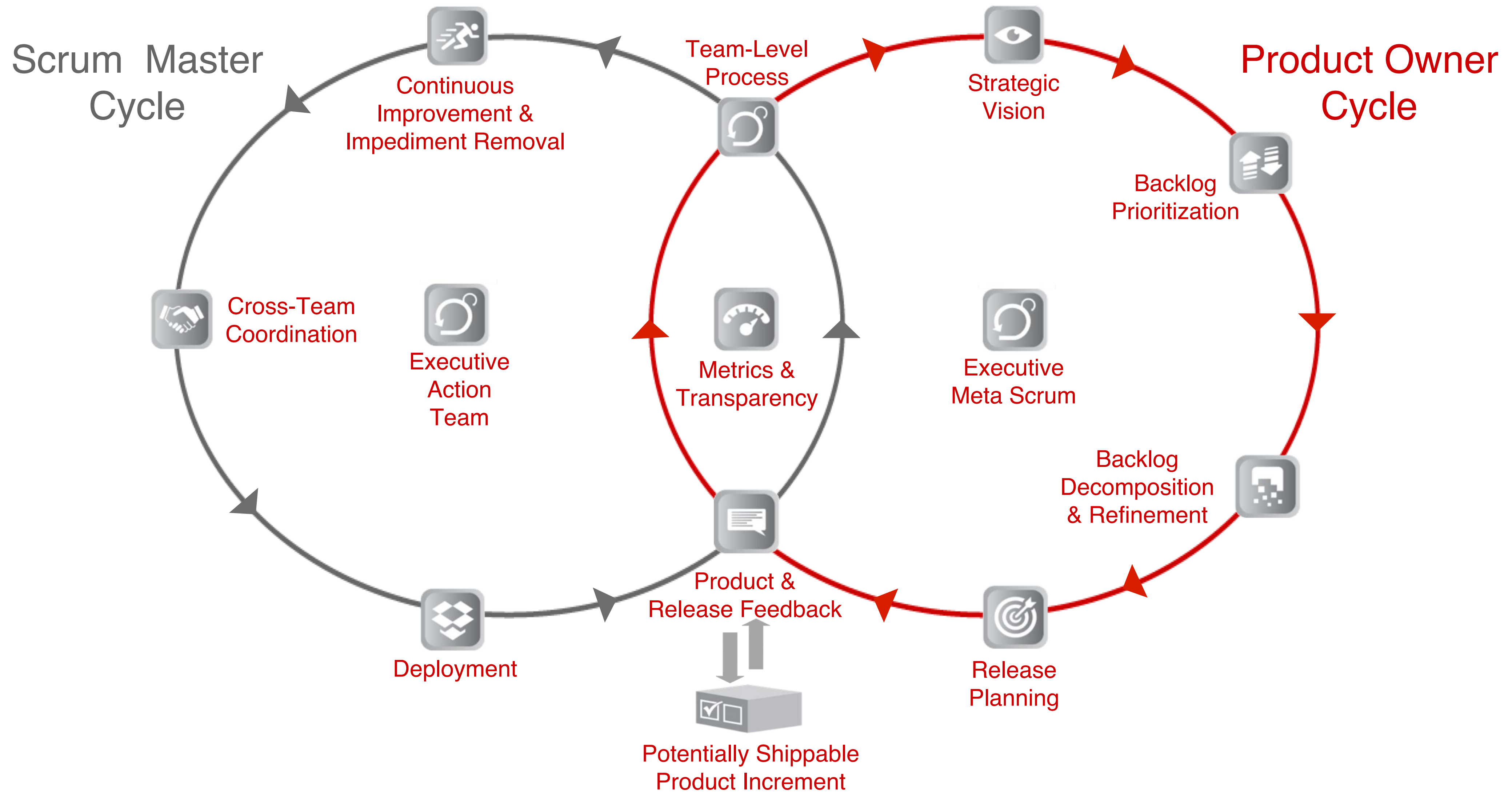
(KLO, Data Center Management, Service Desk)  
Tools like Kanban, ScrumBan, Lean etc



## Network

(Service delivery, new capability, enhancements, services, app support, tech uplift, removal of tech debt)  
Scrum, Scrum@Scale, Agile Techniques

# Components of the Scrum@Scale Framework



# S@S - Building a Scaling Map for Your Organization

- Rows are scaling components
- Columns are your company
- Sticky notes evaluate your company (or part of company where you have influence)
- Prioritize initiatives to form a scaling backlog



# Open Source S@S Case Studies Show Radical Reduction in Decision Latency

- Certified S@S Trainers
  - 47 Trainers Certified
  - 13 countries represented
  - 15 in London next week
- Next Scrum@Scale with Jeff
  - 1-2 Nov Houston
  - 6-7 Nov London
  - 13-14 Dec Stockholm
- For other classes see [www.ScrumAtScale.com](http://www.ScrumAtScale.com)

