Linear Scalability of Teams: The Holy Grail of Agile Project Management

Jeff Sutherland, Co-Creator of Scrum
Scrum@Scale LLC – Agile 2018 Sponsor

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  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

TPS 1950

Lean 1990

New New Product Development Game 1986

Simula 1967

OO 1980

Patterns 1992

Scrum 1993

XP 1996

Agile 2001

Scrum Inc.

Scrum Concepts

1. BOYD - The First 30 Years
2. THE IDEA FACTORY - Bell Labs and the Great Age of American Innovation
3. Innovation and Entrepreneurship
4. Putting Children First
5. Scrum Refinement

Scrum Prototypes

1. Fundamental of Object Databases
2. Banker to the Poor
3. Object Studio
4. Software Methodologies

Scrum Refinement

Jeff Sutherland
Institute of Electrical and Electronics Engineers
Scrum Inc.
Skills and Expertise
Scrum - Software - Agile Software Development

https://brainandbehaviorclinic.academia.edu/JeffSutherland

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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
Value Cannot Come Through the Scrum Cycle Without Velocity

ScrumPlop.org - Scrumming the Scrum
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 a 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.
Linear Scalability: Scale-Free Architecture

• If you want to linearly scalability 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 an alternative network design

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.
## Scale Free Anti-Pattern

**Mid-Continent Computer Services 1983**

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**COBOL Programmers On Death March**

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**W.K. Kellogg Foundation**

**In Search of Excellence**

**Scrum @Scale**

**Scrum Alliance**

**scruminc.**
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
Scrum@Scale Goal: Formalize What We Did During 1983-2017 So Others Can Achieve Strategic Agility In 2018!
Maersk Profit Drops on Weak Freight Rates
Lower oil prices also weighed on the Danish conglomerate’s second-quarter earnings - WSJ 12 Aug 2016

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

Season Win Percent vs. Relative Payroll
Standard deviations above/below league average (15 team bins)
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

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 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.

-8.1 Kroger (KR)
-6.95 Sprouts Farmers Markets (SFM)
-6.6 SUPervalu (SVU)
-5.04 Costco Wholesale (COST)
-3.99 Target (TGT)
-2.03 Wal-Mart Stores (WMT)
-0.58 Amazon.com (AMZN)

Whole Foods Market (WFM) 0.72
Amazon Has a Strong Definition of Done

David Rico (2016) Business Value, ROI, and Cost of Quality (CoQ) for DevOps
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.
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
Countermeasure: Executive Action Team
Sets up and owns the Agile ecosystem

1. Identified impediments bubble up through successive Scrum of Scrums

2. If impediments cannot be addressed at a lower level, they are added to the EAT's Impediment backlog

3. Sponsor and cross-functional EAT charged with removing large impediments and communicating back to teams

4. The EAT works impediment backlog like a development team works its product backlog
The MetaScrum Backlog Refinement Meeting
Prioritizes everything - eliminates Dark Work

- A gathering of Key Stakeholders, Leadership, and Product Owners
- Run by Chief Product Owner
- Aligns enterprise around single backlog
- The forum for stakeholders to express preferences and remove blocks (they should not try to alter product vision between MetaScrums)
- Can be held at regular intervals or on an ad-hoc basis
- Allows teams to progress efficiently down a single work path
Sustainable Agile Implementation
Install Agile OS - reduce decision latency

- Product Owners drive priorities, leadership supports their priorities
- Teams self-form against a prioritized backlog. Teams are organized to maximize production.
- Leaders create virtual teams that drive communities of practice across company.
- Leadership refactors the organization
Secret Sauce of Scrum

“All complex systems evolve through a series of stable states.”

• Continuous Integration
  • Test inside the sprint

• Continuous Deployment
  • Deploy inside the sprint

• “The Future of Scrum” as “DevOps”
  • Run operations inside the sprint
Scrum@Scale Minimum Viable Bureaucracy

- Three Scrum teams
  - Executive Action Team
  - Enterprise MetaScrum
  - Scrum of Scrums
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

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

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 Scrum Master oversees the whole from the perspective of getting the product to market quickly and with high quality

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
- Mirrors Daily Scrum (but 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 (often called the Agile Practice)

Ex. 125 teams (625 people) delivering products together
The Team Product Owner
Builds, Refines, Plans

- **Sets Team Priorities**
- Servant Leader
- 50% with Customer, 50% with Team
- Single Backlog
  - **Stories**
  - **Epics**
- “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
  - **Epics**
  - **Features**
- Cross-Team Backlog Coordination & Alignment
CCPO MetaScrum Perspective
Aligns, Decomposes, Refines

- Sets Priorities for Multiple Team Groups
- Mirrors Refinement and Planning
- Single Backlog Pulled by CPOs
  - Features
  - Value Streams
- 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
  - **Initiatives**
  - **Value Streams**
- Sets Organizational Priorities
- Mirrors Refinement & Planning
Case Study: Putting It All Together
Scrum@Scale Enables “Leading Change”

CREATE a sense of urgency
BUILD a guiding coalition
FORM a strategic vision and initiatives
ENLIST a volunteer army
ENABLE action by removing barriers
GENERATE short-term wins
SUSTAIN acceleration
INSTITUTE change

www.kotterinc.com/8-steps-process-for-leading-change/
On average Agile Projects have a 42% success rate compared to 26% for traditional projects during 2013-2017.

Source: Jim Johnson, Standish Group, Chaos Report, 2018
Decision Latency: Why 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, Enterprise Action Team, and Metascrum shorten decision latency

*Decision latency is directly related to Process Efficiency!*

Powered by: [ScrumAlliance](https://scrumalliance.org) [scruminc](https://scruminc.com)
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 Trainer
- 45 Trainers Certified
- 20 on waiting list
- Next Scrum@Scale
- 13-14 Aug - Sunnyvale, CA
- See ScrumAtScale.com