Linear Scalability: The Holy Grail of Project Management

SCORUM
The Art of Doing Twice the Work in Half the Time
JEFF SUTHERLAND
Co-creator of Scrum J. J. SUTHERLAND

The Scrum@Scale® Guide
The Definitive Guide to Scrum@Scale: Scaling that Works

Harvard Business Review
AGILE AT SCALE
How to Create a Truly Flexible Organization

NETS Agile Meetup and GOTO Copenhagen – 21 Jan 2019 - Jeff Sutherland, Jens Ostergaard
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

TPS 1950

Lean 1990

New New Product Development Game 1986

Simula 1967

OO 1980

Patterns 1992

Scrum 1993

XP 1996

Agile 2001

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 Refinement

Scrum Prototypes
Why Did It Take $250M to Invent Scrum?

Brooks Law: Adding People to a Late Project Makes It Later!
When and Where Was Linear Scalability Achieved?

Distributed Scrum: Agile Project Management with Outsourced Development Teams

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Waterfall Doesn’t Scale
Mid-Continent Computer Services 1983

COBOL Programmers
On Death March
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 (4-5 people), 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 organizational Scrum@Scale**

- Churches – Scrum In Church, IEEE Digital Library
  - ABN AMRO Bank -> ING
- OpenView Venture Partners – Take No Prisoners, IEEE Digital Library
  - Management training on how to run dozens of venture companies since 2006
- Pegasystems – Hitting the Wall, IEEE Digital Library
- Scrum Inc training since 2006 – hundreds of companies, dozens of publications
Scrum@Scale Goal: Formalize What We Did During 1983-2017
So Others Can Achieve Strategic Agility In 2019!
Scrum@Scale Framework
Scrum@Scale Implementation Roadmap

1. "Go See" Business Challenges
2. Leadership Workshop
3. Prioritize and Select Agile Initiatives
4. Create Executive Action Team
5. Create Scrum of Scrums as Release Team
6. Form Teams Around Backlog
7. Train Everyone
8. Create Executive MetaScrum
9. Build Reference Model
10. Deliver Every Sprint
11. Reprioritize Enterprise Backlog At Least Every Quarter
12. Expand Agile Initiatives
13. Until Whole Organization is Scrum
14. Rinse And Repeat
Scrum@Scale: Minimum Viable Bureaucracy

- Scrum of Scrums (Team of Teams)
  - Release Team
- Executive Action Team
  - Owns organizational structure and performance
- Executive MetaScrum
  - Owns enterprise priorities, revenue, and profitability
Decision Latency: Why we need Minimum Viable Bureaucracy

• **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!*

Standish Group Data 2013-2017
Toyota Dealer Network Commissions System
200 people, 5 years, nothing delivered

CEC and Certified S@S Trainer Dan LeFebvre
S@S Case Study

Toyota Dealer Network Commissions System
20 people, 6 months, live

Harvard Business Review

The Contradictions That Drive Toyota's Success
by Hirotaka Takeuchi, Emi Otomo, and Norihiko Shinzui


How to Do It

Enterprise Backlog

Volunteers

EMS

EAT

Agile Operating System

SoS
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
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
Linear Scalability: What Does It Mean?

- **Waterfall teams and most “Agile” teams are lose productivity per person as you add people.**

- **Operational Scalability:**
  Success = if one person can complete one story in one day, can 1000 people complete 1000 stories in one day?

- **Strategic Scalability:**
  Success = 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 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.
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’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 Has a Strong Definition of Done

David Rico (2016) Business Value, ROI, and Cost of Quality (CoQ) for DevOps
FrAgile (WaterScrumFall) - poor decision latency
Creates high failure rate and unsustainable Agile

- 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 yielding high failure rate
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.
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
To learn more:

- Courses Worldwide
  - ScrumatScale.com
- S@S Certification
- 24-25 Jan 2019 Copenhagen
- Contact
  - info@scruminc.com
“Jeff, you need to explain where the magic come from!” Ken Schwaber

- Scrum Values anchor our culture
- Empiricism is how we make changes
  - Transparency
  - Inspect
  - Adapt
Until there is commitment

There is hesitancy, drawing back, ineffectiveness
There is one elementary truth - at the moment one definitely commits providence moves. All sorts of things happen to help. A whole stream of events flows from the point of commitment. Raising in one’s favor all manner of incidents and meeting and material assistance which noone could believe could come their way.
Scrum Start-Up for Teams
Laying the foundation for an agile transformation

www.scruminc.com/ss4t  online-learning@scruminc.com

OVERVIEW

Whether you need training for 10 people or 10,000, the Scrum Start-up for Teams online course offers a scalable online Scrum education experience that teaches everything needed for a Scrum team member to hit the ground sprinting.

The curriculum and content has been developed in collaboration with the co-creator of Scrum, Dr. Jeff Sutherland, so your students are getting training informed by the latest research and thinking based on real-world experience.