



l e a n
software development

Learning to Surf

The Lean Mindset



Our Two Minds



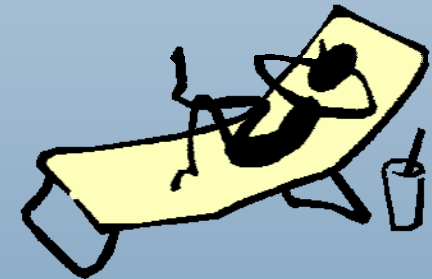
System 1:

- Fast
- Reflexive
- Responsive
- Expertise
- Intuition
- Habit
- Tacit Knowledge
- Autopilot
- Makes Most Decisions
- Overrides System 2



System 2:

- Slow
- Deliberate
- Rational
- Analysis
- Evidence
- Plans
- Explicit Knowledge
- Manual Mode
- Checks up on System 1
- Basically Lazy





Learning to Surf

Tacit Knowledge

Responsive

Reflexive

Expertise

Autopilot

Intuition

Habit

Fast

"Instead of learning to surf, conventional organizations try to control the waves! This almost never works." --- Allen Ward



Learning to Surf

Expertise

10 Years / 10,000 hours of Deliberate Practice

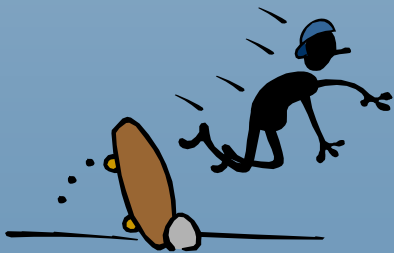
Coach



Challenge



Feedback



Progress



Cognitive Biases

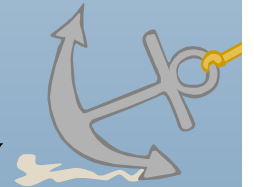
Confirmation Bias

Tendency to seek out or interpret information in a way that will confirm preexisting viewpoints.



Anchoring

Tendency to “anchor” or rely heavily on the first trait or piece of information that was observed.



Loss Aversion

Tendency to strongly prefer avoiding losses to acquiring gains.



Dealing With Cognitive Biases



Options

Teenage Decision-making*

- ✓ Weather-or-Not
- ✓ Either-Or

Widen the Frame

- ✓ Both – And
- ✓ None of the Above



Develop Multiple Options

- ✓ Learn as Much as Possible
- ✓ Decide as Late as Possible

Look for Patterns

- ✓ Find the Bright Spots
- ✓ Look for Analogies



* *Decisive* by Chip and Dan Heath

Opinions

The Wisdom of Crowds

- ✓ Multi-discipline Team
- ✓ Voting Customers



Widen the Perspective

- ✓ Invite Disagreement
- ✓ Look at the Adoption Chain



Zoom in – Zoom out

- ✓ Get Close
- ✓ Attain Distance



"Go to the Gemba"

Look at Base Rates

- ✓ What are the odds?
- ✓ What makes you different?



Can Big Companies Surf?



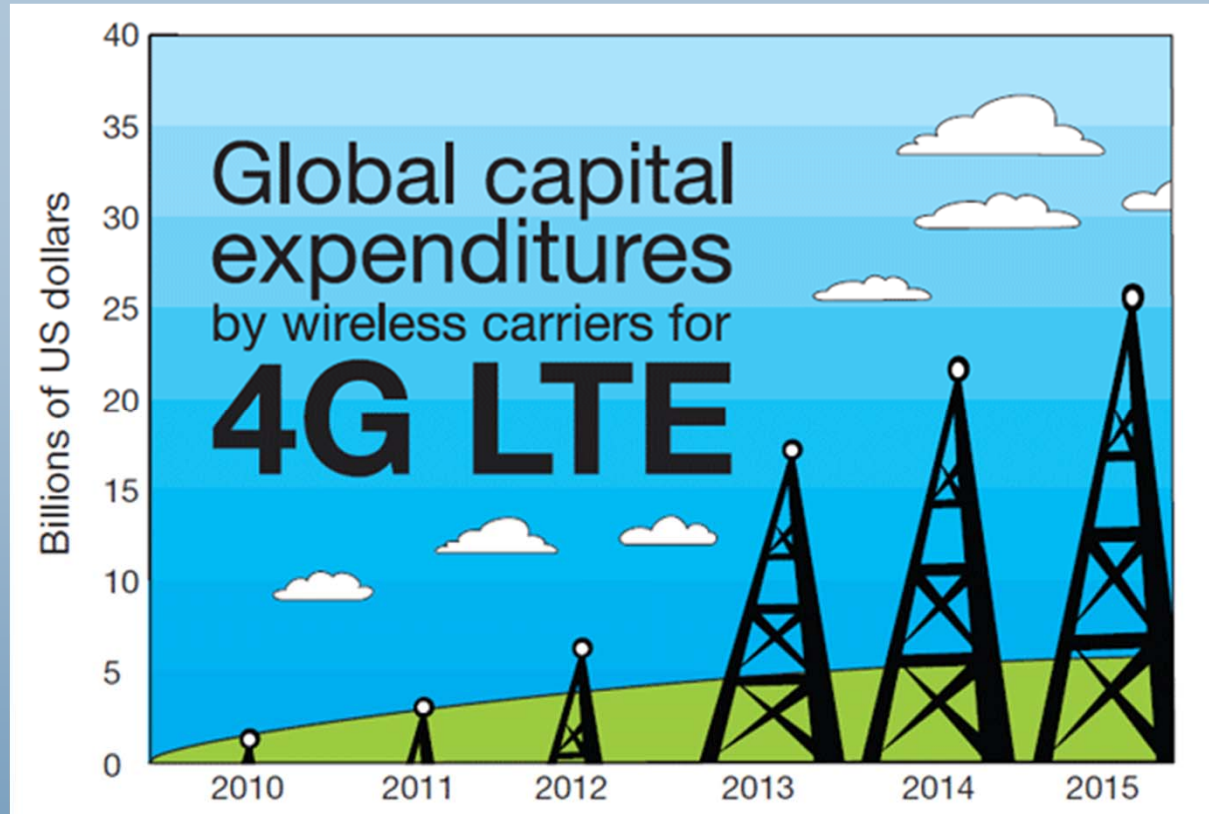
ERICSSON

\$33 Billion

110+ Employees

Sells ~ 40% of mobile network equipment.

It supplies software and operations, and manages infrastructure build-out projects.



ERICSSON 

Will supply much of the equipment and software, installation and operation.

Faster Time to Market



The past was not good enough for the future.

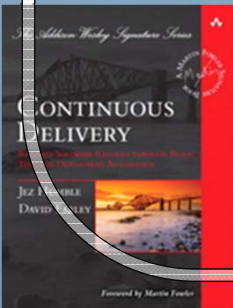
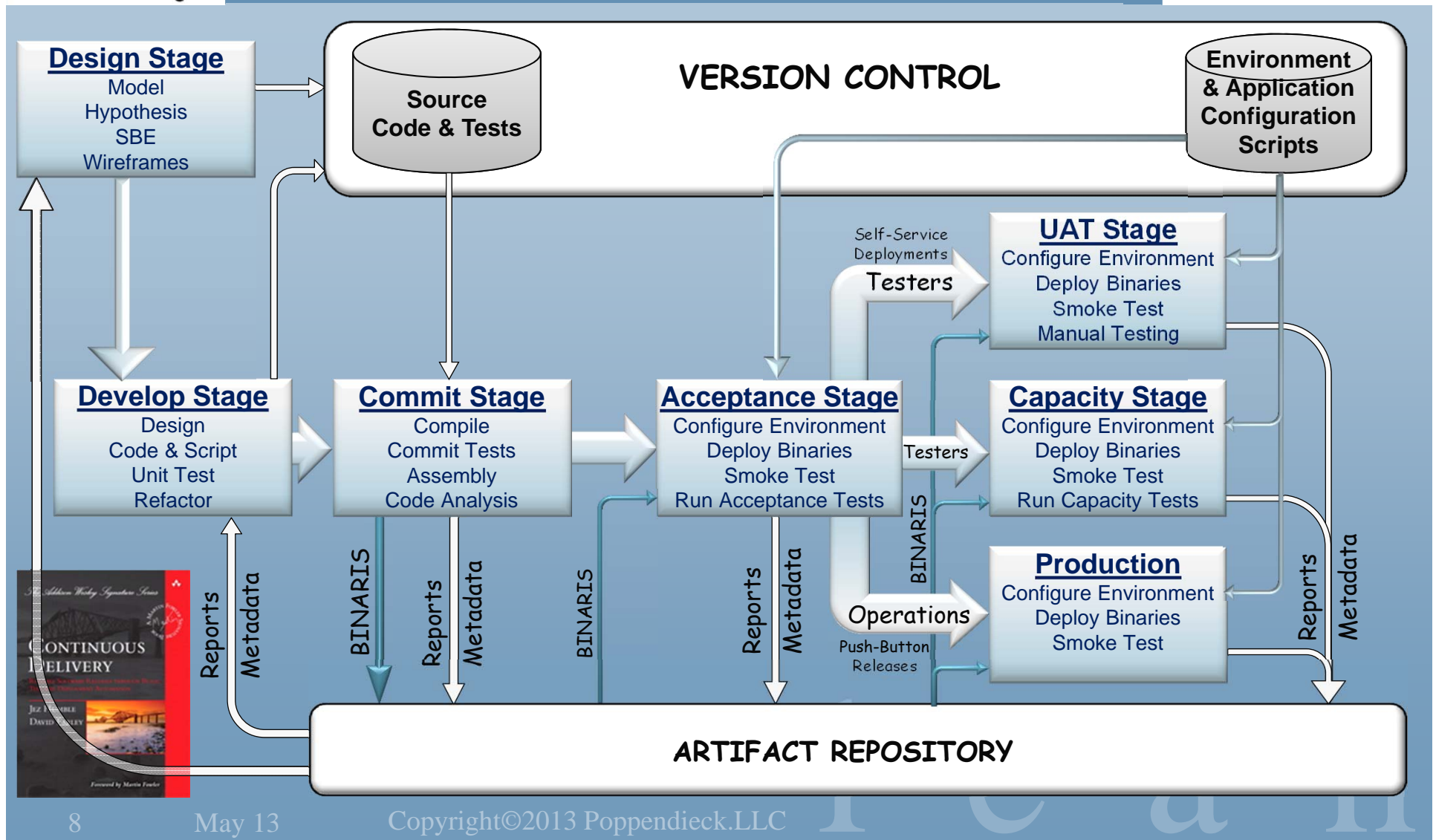
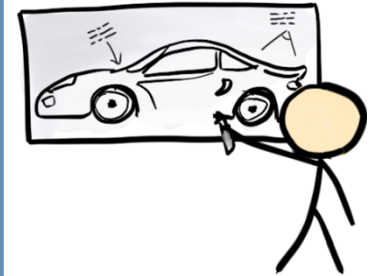
Results:

1. Manage features, not projects.
2. Decouple releases from development.
3. Small, multi-discipline feature teams.
 - a) Product and technical leadership.
 - b) Autonomy and responsibility.
4. Component specialists were consultants
5. Central planning coordinates features
 - a) One feature (~3 weeks) at a time
 - b) Set date and allow content to vary
 - c) Team worked with customer engineer to determine detailed scope

- ✓ Twice as fast
- ✓ Higher hit rate
- ✓ Significantly higher quality
- ✓ More engaged engineers



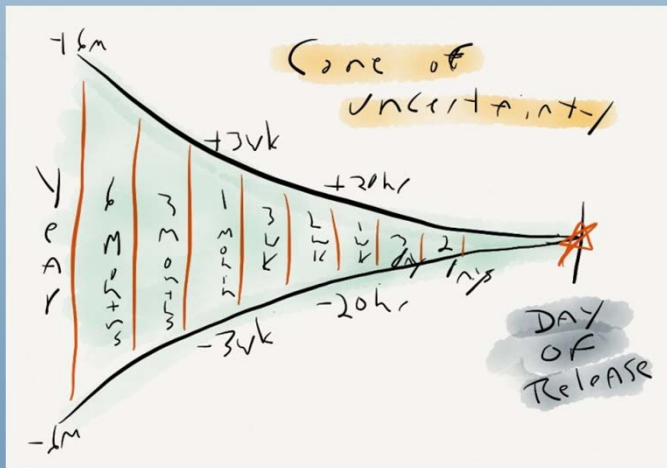
Both Speed And Quality



Reliable Promises

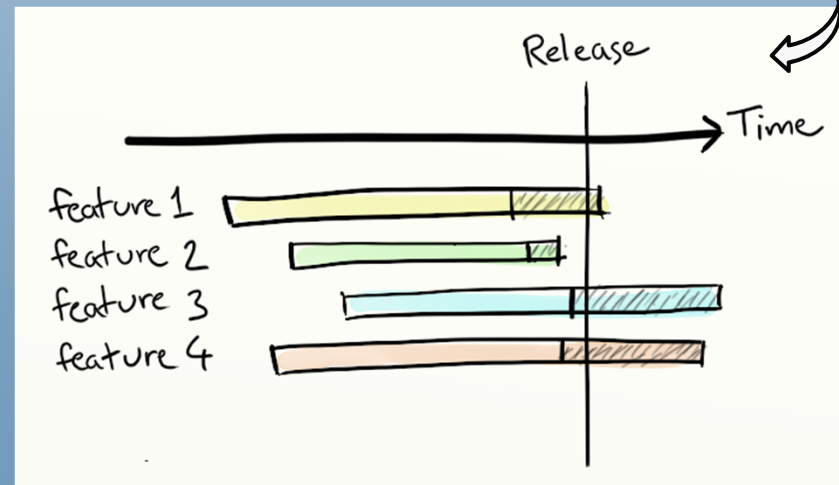


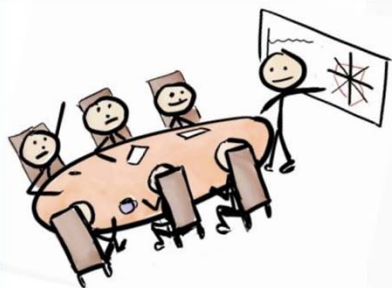
The past was not good enough for the future.



Accept uncertainty and learn how to live with it.

1. Manage features, not projects.
2. Decouple releases from development.
3. Small, multi-discipline feature teams.
 - a) Product and technical leadership.
 - b) Autonomy and responsibility.
4. Reorganized management jobs
5. Central planning coordinates features
 - a) Sets content and allow date to vary





Both Predictability And Autonomy



Managing Complexity

1. Probe



2. Observe



3. Adjust



Achieving Predictability

1. Flow



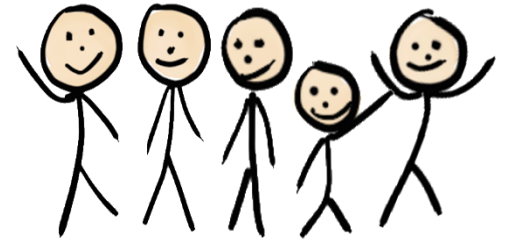
2. Obstacle



3. Adjustment



Energized Workers



Remember times when:

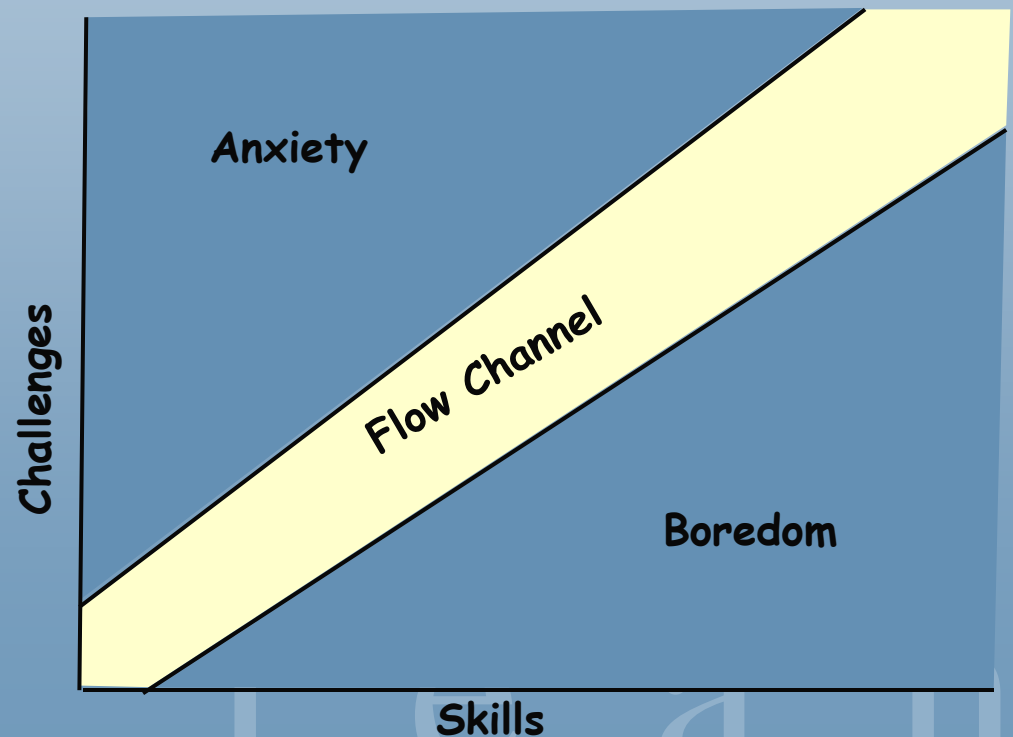
- ✓ You are deeply engaged
- ✓ Distractions disappear
- ✓ Time evaporates

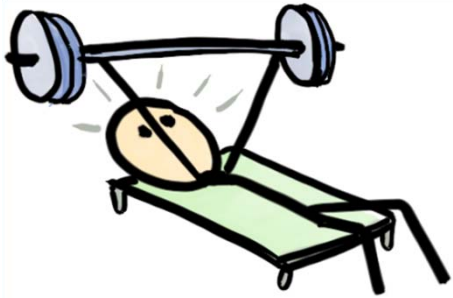
This is called *FLOW*.



Mihaly Csikszentmihalyi
(me-high chick-sent-me-high-ee)

*People are Energized by
A Challenge to Reach
Their Full Potential*





What is a Challenge?

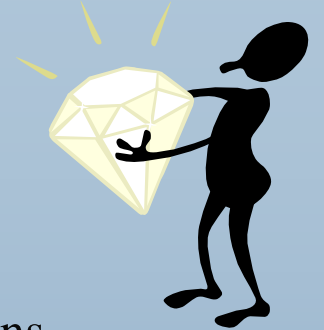
Safety-Focused Goals (Prevention Focus)

- ✓ Prevent Failure
 - ✗ Is it safe?
 - ✗ Find the safest option
- ✓ Duty and Obligation
 - ✗ Setbacks => redoubled efforts
 - ✗ Praise => more relaxed efforts



Aspirational Goals (Promotion Focus)

- ✓ Create gains
 - ✗ Let's do it!
 - ✗ Explore all the options
- ✓ Aspirational Goals
 - ✗ Praise => redoubled efforts
 - ✗ Setbacks => discouragement

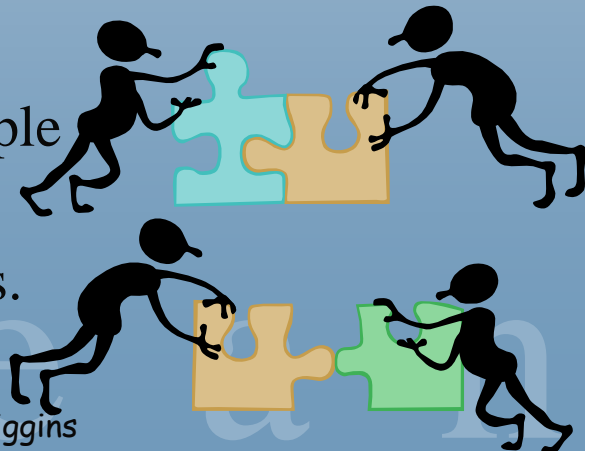


Regulatory Fit Theory*

- ✓ People learn from childhood to favor a focus
- ✓ Use goals that fit the regulatory focus of the people

Goal Conflict

- ✓ Large companies struggle with aspirational goals.
- ✓ Startups struggle with safety-focused goals.



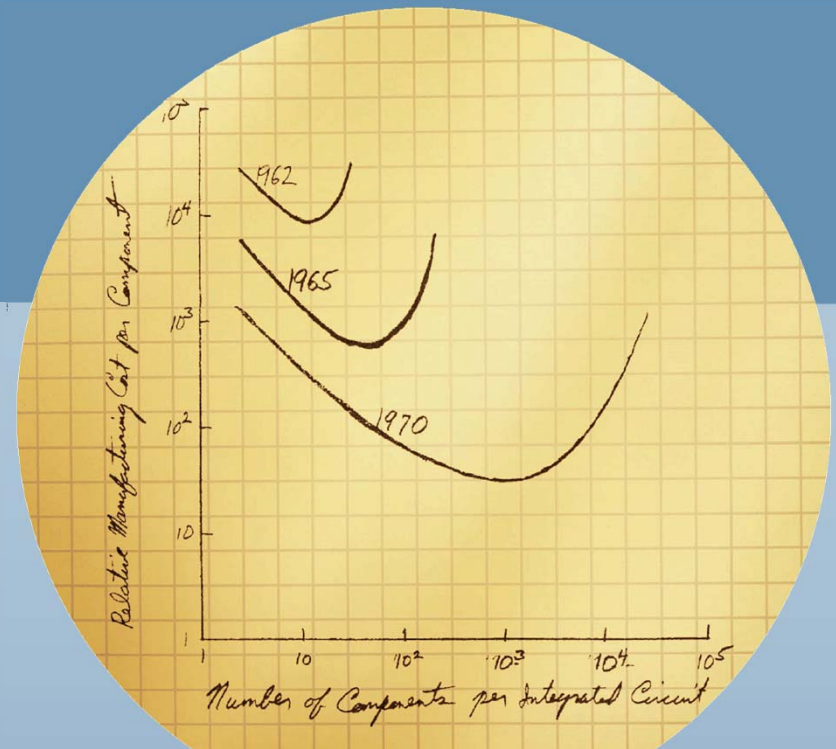
Moore's Law

Cramming more components onto integrated circuits

By Gordon E. Moore

Director, Research and Development Laboratories, Fairchild Semiconductor
division of Fairchild Camera and Instrument Corp.

Electronics, Volume 38, Number 8, April 19, 1965



If transistors were people

If the transistors in a microprocessor were represented by people, the following timeline gives an idea of the pace of Moore's Law.



2,300

Average music hall capacity



134,000

Large stadium capacity



32 Million

Population of Tokyo



1.3 Billion

Population of China



Now imagine that those 1.3 billion people could fit onstage in the original music hall. That's the scale of Moore's Law.

Constant Improvement On Steroids



At Intel, every department is involved in Moore's Law.

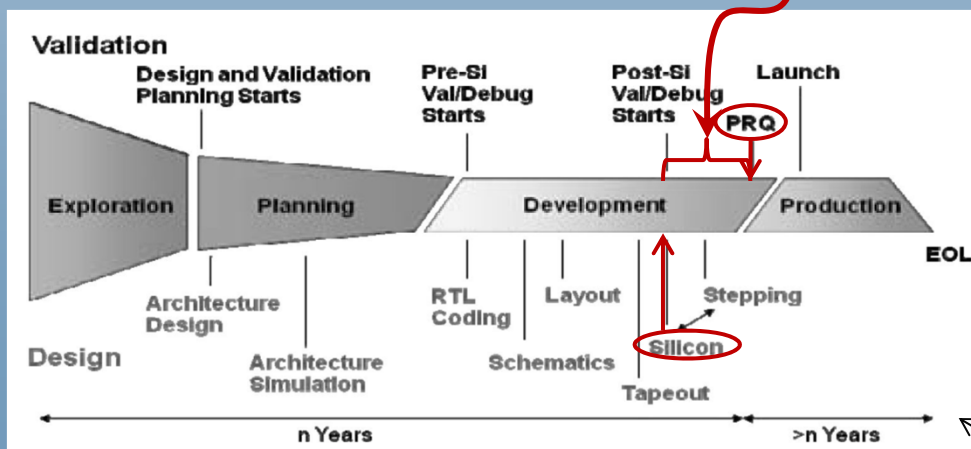
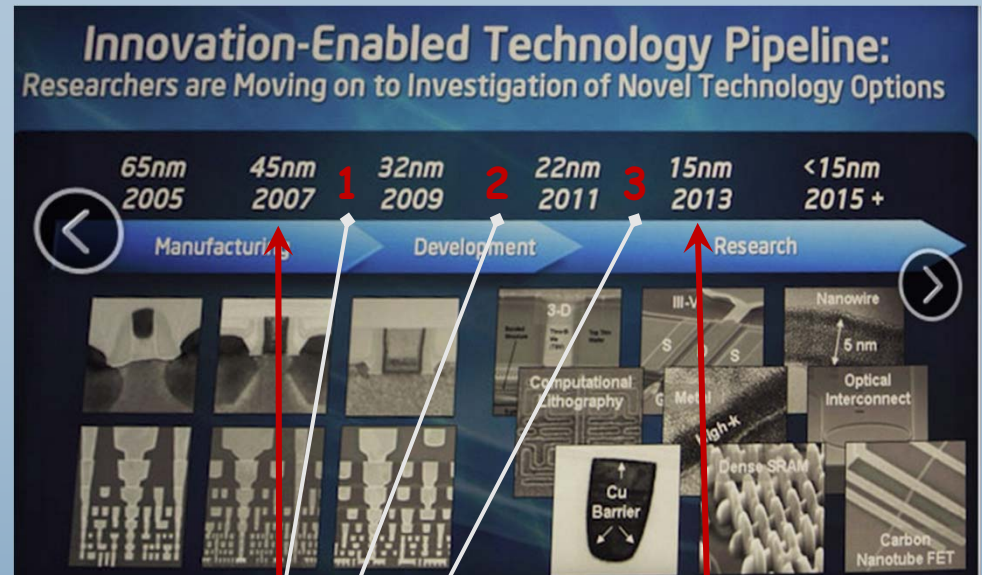
Even PDE.

(Product Development Engineering)

Especially PDE!

From First Silicon to PRQ

(Product Readiness Qualification)



← Timeline →

1. 2007-2008: Early Agile
2. 2009-2010: Advanced Agile
3. 2011-2012: Beyond Agile

Post-silicon Validation Challenges, by Keshava, Hakim, & Prudvi (Intel), presented at DAC '10, Anaheim, 2010

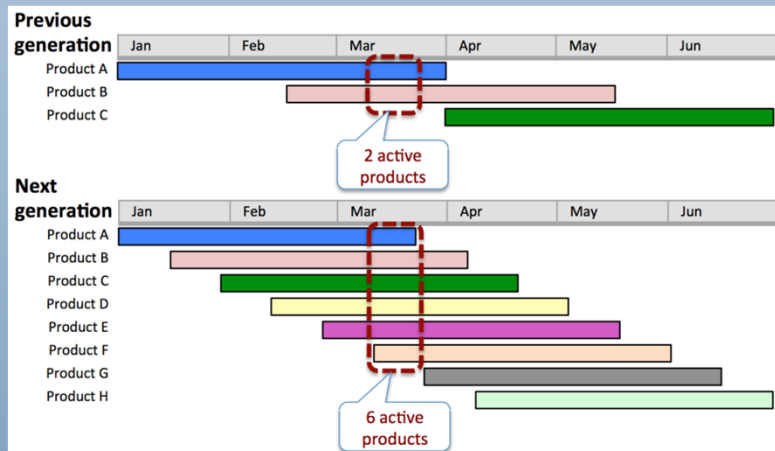
Triple Productivity in Eighteen Months



20011 – 2012: Beyond Agile

Moore's Law required:

3X More Validation Cycles



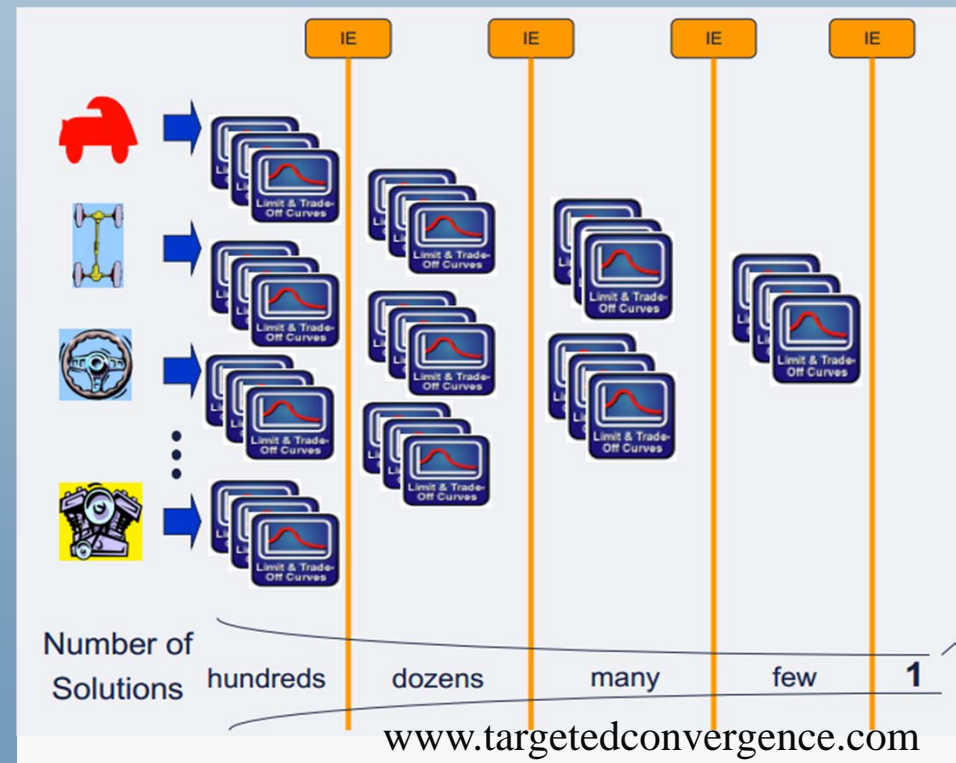
Same Funding and Time
18 months to figure it out.

3X Working Group:

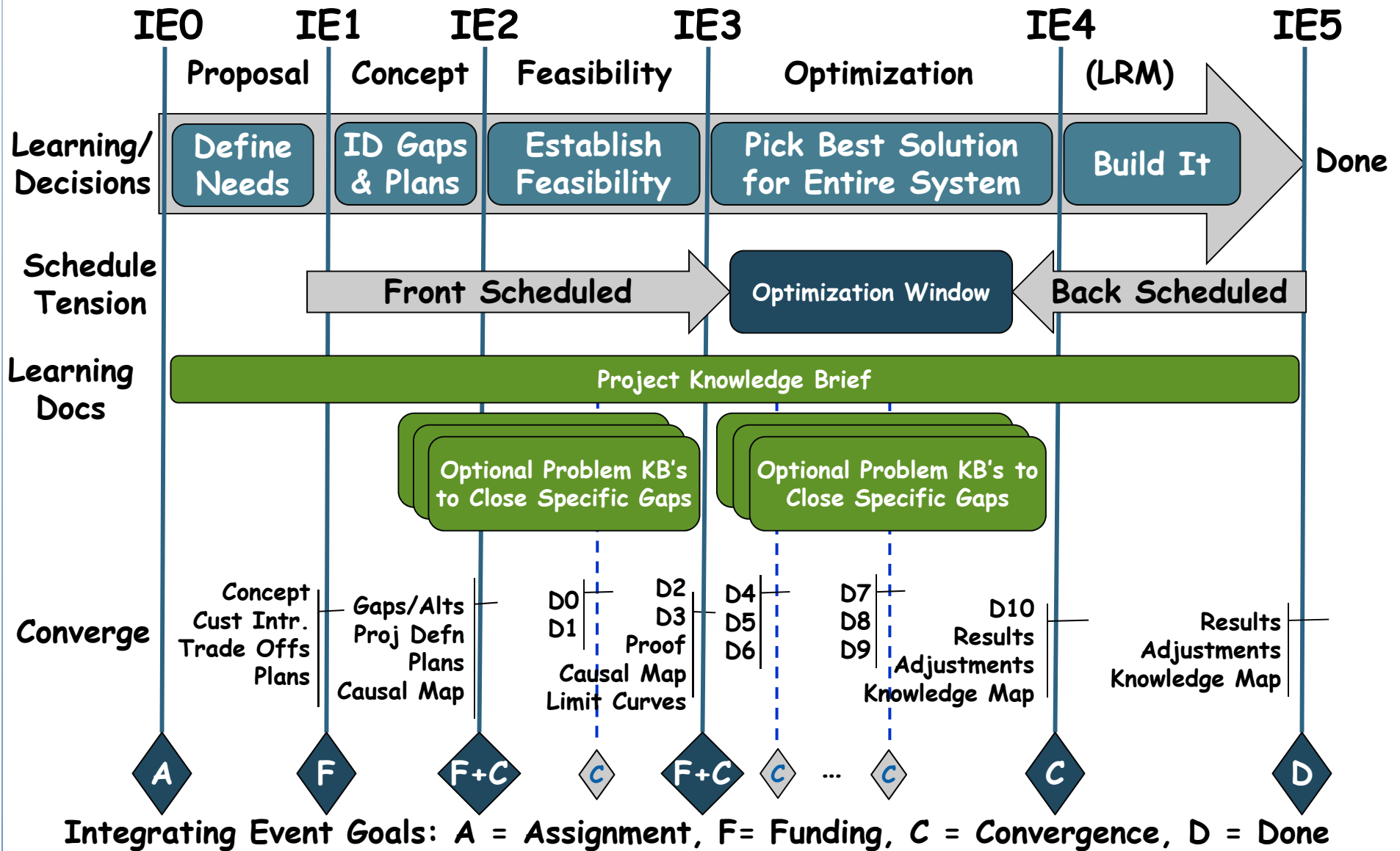
Translate 3X to Specific Targets

Lean Product Development

Solution sets converge through a series of Integrating Events (IE's).



Integrating Events Drive Learning



Test-Frist Engineering



Goal: Every two weeks, over a 48 hour weekend, software will be validated by placing 55,000 units in test sockets.

Feasibility: Robot specs show it is capable of doing this.

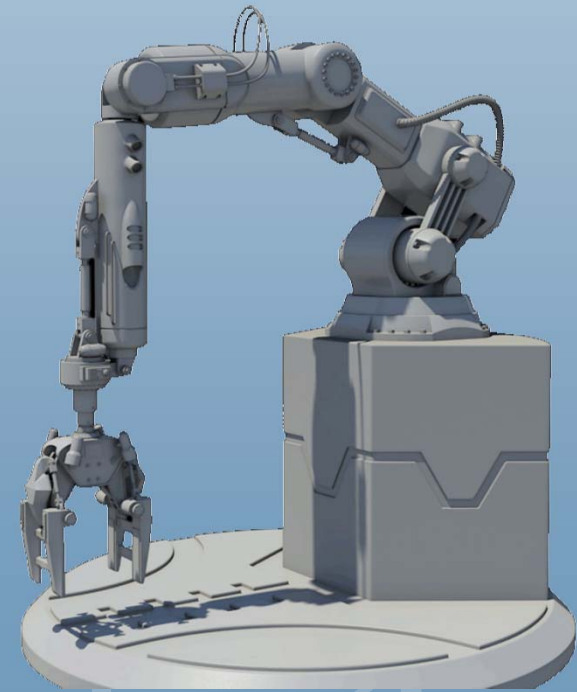
Coach: Have you *tested* it?

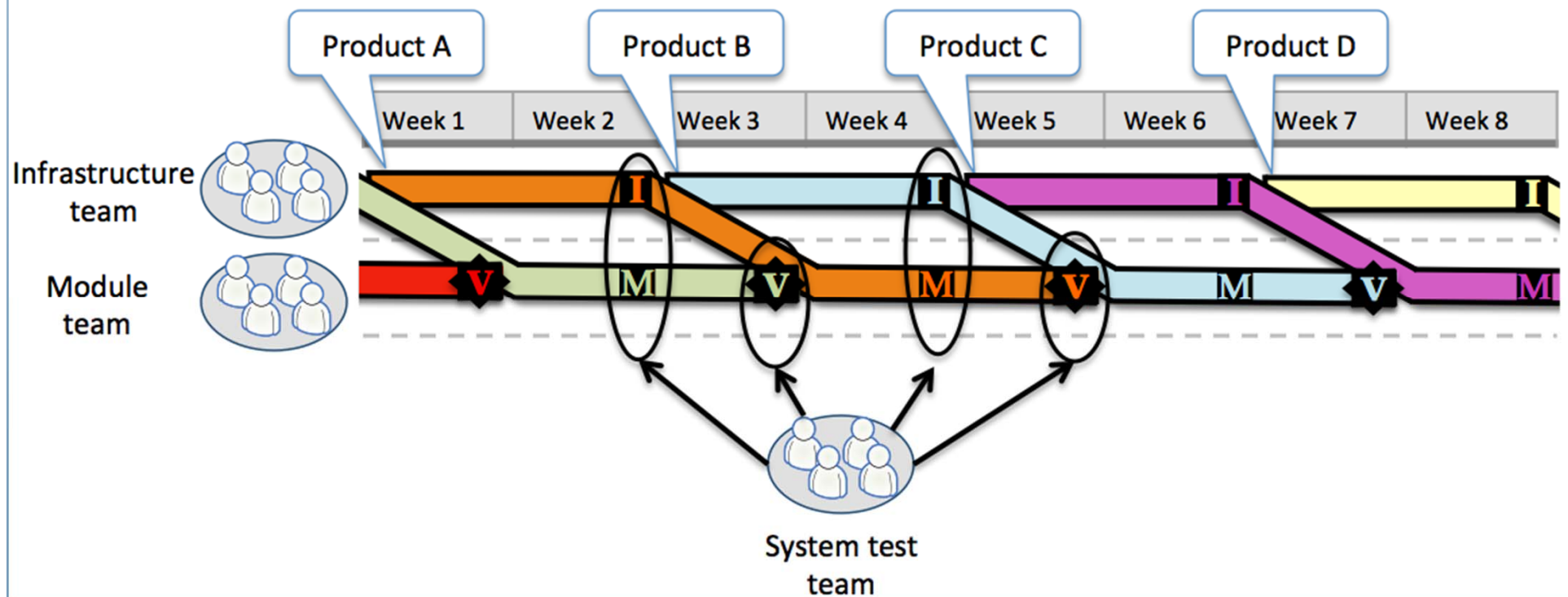
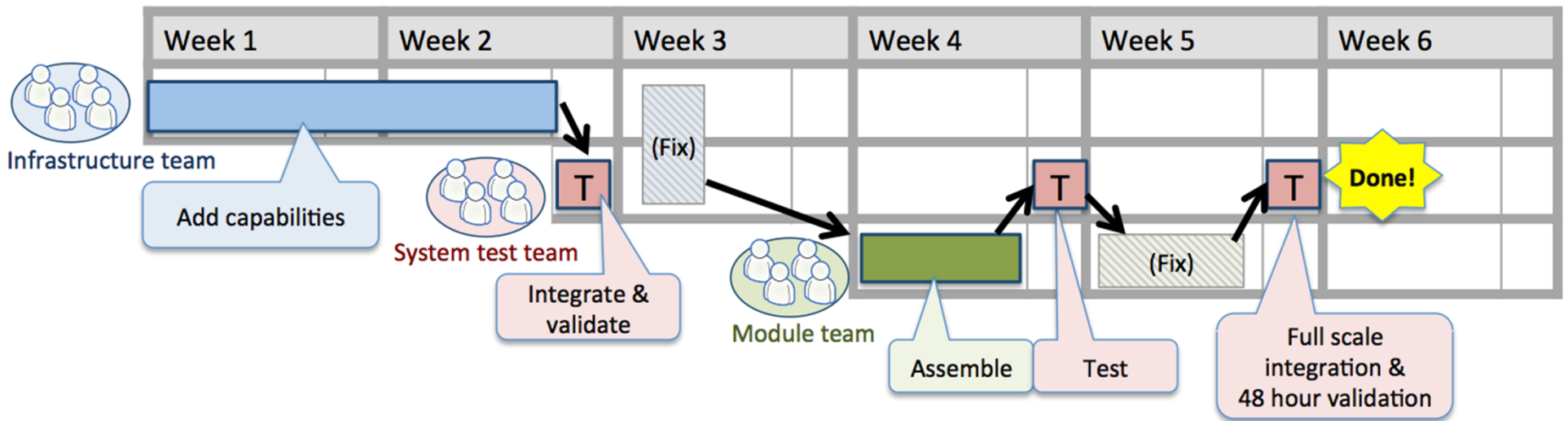
Team: No...but –

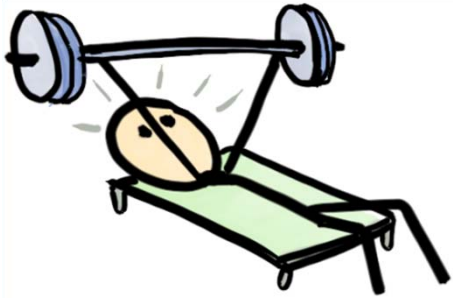
Team decided to test 1500 parts.

Robot broke down after 80....

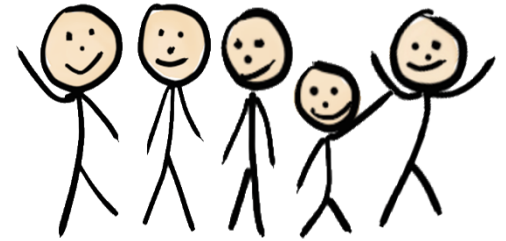
It took a year of improvements for the robot to work reliably at the needed volume and speed.







Meaningful Challenge



Beware of Metrics



Yes, the planet got destroyed.
But for a beautiful moment in
time we created a lot of value
for shareholders.

Great results happen when:

- *People know **why** they are doing their work*
- *Organizations focus on delivering **outcomes and impacts** rather than features*
- *Teams decide what to do next based on **immediate and direct feedback** from the use of their work*
- *Everyone **cares***

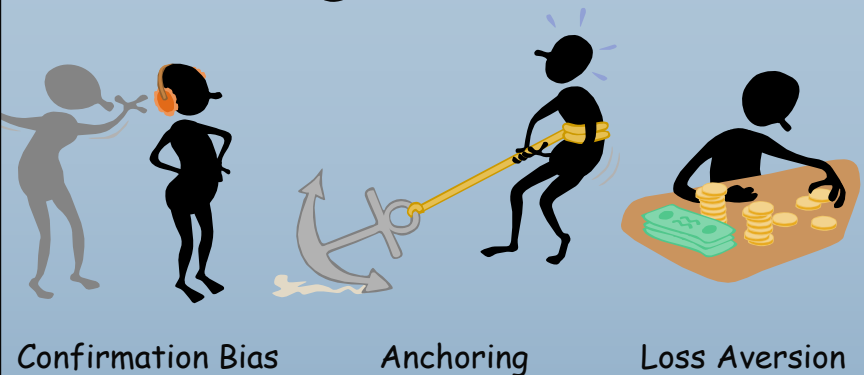


Learning to Surf

Develop Expertise



Guard Against Bias



Try Multiple Options

- ✓ All of the Above
- ✓ None of the Above
- ✓ Exactly the Opposite
- ✓ Set-Based Design
- ✓ Bright Spots
- ✓ Analogies



Seek Multiple Opinions

- ✓ Multi-discipline Team
- ✓ Customer Votes
- ✓ Invite Disagreement
- ✓ Adoption Chain
- ✓ Front Line
- ✓ Base Rates





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software development

Thank You!

The Lean Mindset

Book Available Fall, 2013

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