The Lean Mindset

Ask the Right Questions
The Lean Mindset

- Delighted Customers
  - Solve the Right Problem
  - Measuring Customer Delight
  - The Role of Design and Engineering
  - Case Study: Product Development

- Genuine Efficiency
  - The Fastest Learner Wins
  - Resource Efficiency vs. Flow Efficiency
  - Product Development Flow
  - Modern Software Engineering

- Energized Workers
  - Thriving on Challenge
  - Motivation
  - Do Incentives Work?
  - Case Study: Telecom

- Great Organizations
  - The Myth of the Selfish Gene
    - Start with WHY
    - Case Study: Government
    - The Science of Cooperation

- Breakthrough Innovation
  - Living With Black Swans
    - Why Good Companies Die
    - Case Study: Newspapers
    - Reverse Innovation
How Great Leaders Inspire Action

Start With Why

People don’t buy WHAT you do, they buy WHY you do it.

Simon Sinek

http://www.ted.com/talks/simon_sinek_how_great_leaders_inspire_action.html
Todd Park
Inspiring Government Workers

Harvard Graduate (Economics)
Booz Allen Hamilton Consultant (Managed Care)
Athenahealth (1997)
  ✓ Maternity Clinic (Opps…)
  ✓ Health Care Records (Got it right!)
  ✓ Very successful IPO (2007)

Retirement ...........
Act II

US Health and Human Services CTO (2009)
  Purpose: Improve the health, safety, and well-being of America
  ✓ The Job: Bring Entrepreneurial Mindset to HHS
  ✓ Reluctance: A Step Backward in lifestyle and compensation
  ✓ No Surprise: Lots of dedicated workers in the government
  ✓ The Surprise: The amazing databases of HHS
How? Data Liberation

**NOAA**
National Oceanic and Atmospheric Administration

**Health Data Initiative Forum**
The Health Datapalooza

**iTriage Mobile and Web Consumer Solution**
Comprehensive functionality:
- Personalizes healthcare needs
- Saves lives
- Saves time
- Saves money
- Improves outcomes

**Todd Park – Federal Government CTO**

*Give people permission and tools to pursue their passion.*
The team dropped everything to help and then stayed as long as it took.

Steven Brill

...we really didn’t need to be pumped up much. This is what we do. And this job had special meaning.

I loved every minute of it ... I believe in getting people health care. I am so proud of this.
Impossible Public Goods

Why do so many people make so many small, “free” contributions?
The Science of Cooperation

The Tragedy of the Commons

Self-Governing Communities

or

THE KUHLS OF KANGRA
COMMUNITY-MANAGED IRRIGATION IN THE WESTERN HIMALAYA

J. MARK BAKER

CULTURE, PLACE, AND NATURE • STUDIES IN ANTHROPOLOGY AND ENVIRONMENT
Successful self-governing communities have these principles in common:

1. There are clearly defined community boundaries.
2. There are rules of use that are well matched to the local conditions.
3. Most individuals affected by these rules can participate in modifying the rules.
4. Community members set up a system for monitoring compliance.
5. A system of graduated sanctions is used.
6. Low-cost conflict resolution mechanisms are available.
7. External authorities respect the right of the community to devise its own rules.
8. Governance activities are organized in multiple layers of nested enterprises.
**What is the Best Group Size for Cooperation?**

Robin Dunbar

The *human social channel capacity* limit is ~150.

**Group Sizes**

- An ‘inner circle’ of about 3-5 very close friends or family members
- A ‘sympathy group’ of 12-15 close friends who care about each other’s fate
- A ‘hunting group’ of 30-50 colleagues who cooperate to accomplish something
- A ‘clan’ of 150 people who maintain stable inter-personal relationships
- A ‘tribe’ of about 500-2500 people who speak the same language or dialect

**Clans are found in:**

- Pre-Industrial Villages
- Amish & Hutterite Communities
- Most Military Companies
- University Departments
- Gore & Associates

**The Hunting Group:**

- Product Teams
- Startup Companies
- Open Source Projects
- Conference Organizations

Hunting groups have a trusted leader.
Stable Squads

“One of the most scalable organizations in human history was the Roman army. Its defining unit: The squad — eight guys. The number of guys that could fit in a tent.”

“As a manager, your focus should really be creating these high-performing squads of people who have good chemistry, who can get things done. Then you figure out how to apply them to problems.”

1. Squad members sit together.
2. Squads have an internal leader.
3. Squads are stable over time.
4. Problems are assigned to squads.
5. Squad dependencies are minimized.

Chris Fry SVP of Engineering at Twitter
Previously led development at Salesforce
Case Study

Jeff Bezos: “We don’t need communication, we need decentralization! If a team can’t be fed with two pizzas, it’s too large.”

2001: Amazon’s monolithic architecture hit the wall – it would not scale. Moved to a service architecture that could be sold as a product.

Each service is owned by a 2-Pizza team (8-10 people) with end-to-end responsibility for the service – from contract to operations.

2006: Amazon Web Services released.

2014: Current revenue ~ $1 billion per quarter.

Conway’s Law: Organizations which design systems are constrained to produce designs which are copies of the communication structures of these organizations.
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Self-fulfilling Prophecy

Our Beliefs
(about ourselves)

Our Actions
(toward others)

Others Actions
(toward us)

Others Beliefs
(about us)

Self-fulfilling Prophecy
Does Incentive Pay Work?

1. Money doesn’t motivate for tasks that require:
   - Cognitive skill  
   - Collaboration  
   (In these cases, money degrades performance.)

2. People have a great need for fairness, and will not give their best efforts if they think they are paid unfairly.

3. You get exactly what you measure with bonus systems, but it is impossible to measure exactly what you need.

4. Engagement works much better than money.
The Three M’s of Motivation

Meaning

Membership

Mastery

NOT Money!

Rosabeth Moss Kanter
Harvard Business School

May 14

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The Four Elements of Deliberate Practice

1. Coach
2. Challenge
3. Feedback
4. Progress
Thriving on Challenge

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

1970
Intel 4004

134,000
Large stadium capacity

1990
Intel 286

32 Million
Population of Tokyo

2000
Pentium III

1.3 Billion
Population of China

2011
Core i7 Extreme Edition

Now imagine that those 1.3 billion people could fit onstage in the original music hall. That’s the scale of Moore’s Law.
Double Output Every 2 years

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 18 Months

20011 – 2012: Beyond Agile

Moore’s Law required:
- 3X More Validation Cycles
- Same Funding and Time
- 18 months to figure it out.

Lean Product Development
Solution sets converge through a series of Integrating Events (IE’s) before detailed design begins.

3X Working Group:
Translate 3X to Specific Targets

www.targetedconvergence.com
Have You Tested It?

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.
The Growth Mindset

Fixed Mindset

✓ Talent is fixed
  ✗ You are born with it
  ✗ You are either good at something or you aren’t

✓ Avoid Challenges
  ✗ Don’t do anything that might make you look bad.
  ✗ Those who have to work hard at something are not very talented.

Growth Mindset

✓ Skills can be learned and improved
  ✗ Genetics are only a starting point

✓ Welcome Challenges
  ✗ Failure is a learning opportunity
  ✗ Hard work generates improvement
Survey after survey has reached the same conclusion: About 70% of Employees are Not Engaged.
Measuring Engagement

For close to a decade, the Gallup Organization has used a 12-question survey to measure employee engagement. Results from the survey show that high scores are strongly correlated to superior job performance.

1. Do you know what is expected of you at work?
2. Do you have the materials and equipment you need to do your work right?
3. At work, do you have the opportunity to do what you do best every day?
4. In the last seven days, have you received recognition or praise for doing good work?
5. Does your supervisor, or someone at work, seem to care about you as a person?
6. Is there someone at work who encourages your development?
7. At work, do your opinions seem to count?
8. Does the mission/purpose of your company make you feel your job is important?
9. Are your associates (fellow employees) committed to doing quality work?
10. Do you have a best friend at work?
11. In the last six months, has someone at work talked to you about your progress?
12. In the last year, have you had opportunities at work to learn and grow?

Questions are from http://www.dandbconsulting.com/12-questions-to-measure-employee-engagement/
Engagement Matters

Employee Engagement Meta-Analysis: Outcomes
Difference between top and bottom engagement quartiles

More Gains

Less Absenteeism
Less Turnover Orgs.
Less Shrinkage
Less Safety Incidents
Less Patient Safety Incidents
Less Quality (Defects)

Fewer Losses

More Customer
More Productivity
More Profitability

Data aggregated from 199 research studies conducted 1994-2008

TO WIN CUSTOMERS — and a bigger share of the marketplace — companies must first win the hearts and minds of their employees.

Top 10% companies had 3.9 times the Earnings Per Share (EPS) growth rate.
What Makes People Happy?

Three Happy Lives (Martin Seligman, Psychologist)

1. The Pleasant Life
   - Pursuit of Pleasure
2. The Good Life
   - Engaged (Flow)
3. The Meaningful Life
   - Contribute to something larger than oneself

Meaning and engagement are the most satisfying. Pleasure rapidly habituates (gets old).
Remember times when:
- You are deeply engaged
- Distractions disappear
- Time evaporates

This is called *FLOW*.

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

"The best moments [in people’s lives] usually occur when a person’s body or mind is stretched to its limits in a voluntary effort to accomplish something difficult and worthwhile."
Birthdays

Elite hockey players in Canada probably have birthdays toward the beginning of the year.*

In any elite group of Canadian hockey players
  ✗ 40% were born between January and March
  ✗ 30% were born between April and June
  ✗ 20% were born between July and September
  ✗ 10% between October and December.

The same pattern exists in Football.

What might account for this anomaly? 

The age cut-off date for youth hockey in Canada is January 1.

*Outliers, by Malcolm Gladwell, 2008, p
Where Does Expertise Come From?

10 Years / 10,000 hours of Deliberate Practice

- Identify a specific skill that needs improvement.
- Devise (or learn from a teacher) a focused exercise: – designed to improve the skill.
- Practice repeatedly.
- Obtain immediate feedback: – adjust accordingly.
- Focus on pushing the limits: – expect repeated failures.
- Practice regularly & intensely: – perhaps three hours a day.
Case Study

Reconfigured the Development Process

1. Manage features, not projects
2. Decouple releases from development
3. Architects and specialists become consultants
   a) Architectural runway work
4. Leaders decide which features to do next
5. Engineers reassigned from functions to teams
   a) Small, multi-function feature teams
   b) Product and technical leadership
   c) Access to customer engineer
   d) Determine their own process
6. Teams Assigned Features
   a) One feature (~3 weeks) at a time
   b) Date is fixed, team determines content
   c) Feature is expected to pass release verification
   d) Figure out how to get it done – get help if necessary

The past was not good enough for the future.

What Happened:

✓ Twice the speed
✓ Higher hit rate
✓ Significantly higher quality
✓ More engaged engineers
✓ Reciprocity between teams

Thanks to Mats Lindén, Ericsson
Why aren’t we predictable?

Understand how the work works.

No more point estimates!
All estimates must be best-case / worst-case.

Manage features, not projects.
Fix scope, let deadline vary.

Accept uncertainty and learn how to live with it.

Thanks to Hendrik Esser, Ericsson

On Time Deliveries
Superior Quality
The Lean Mindset

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All Profits are Not the Same

Bad Profits – Profits that annoy customers.

- Nuisance Fees
- Exploitive Pricing
- Onerous Contracts

Good Profits – Profits from enthusiastic customers.

- Great Experience
- Delighted Customers
- Top Recommendations

Bad Profits

- Create Detractors
- Demoralize Employees
- Undermine Loyalty Economics

Good Profits

- Create Promoters
- Energize Employees
- Fuel Sustainable Growth

The Ultimate Question 2.0
by Fred Reichheld

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Measuring Customer Delight

1. Would you recommend our product (or company) to a friend or colleague?

2. What is the main reason for your answer?

✓ Follow-up is the heart and soul of the program!
For Wicked Technical Problems
Engineering Leads Development

The FBI Case Management System*

2001-04 Virtual Case File System @ $170 million – abandoned
2005-10 Sentinel developed under contract – largely abandoned
2010-12 Sentinel developed internally with agile methods – success

Three Wicked Problems

Not understood by FBI personnel
  ✓ Lacked Engineering Skill
  ✓ Focused on Program Management
  ✓ : Ignored by the Contractor

Finally addressed – FBI development team given responsibility

Ask the Right Questions. Solve the Right Problems.

*Jerome Israel, “Why the FBI Can’t Build a Case Management System” IEEE Computer, 6/2012
Control projects with the critical-few results that define value. One page! Make sure those results are business results, not technical results.

Most so-called functional requirements are not actually requirements, they are designs to meet unarticulated, high-level, critical requirements.

Give developers the freedom to discover how to deliver those results.

The worst scenario I can imagine is when we allow real customers, users, and our own salespeople to dictate ‘functions and features’ to the developers, carefully disguised as ‘customer requirements’. If you go slightly below the surface of these false ‘requirements’ you will find that they are not really requirements. They are really bad amateur design for the ‘real’ requirements.
The Role of Engineering

Decades of successful software development without detailed specifications, a backlog of stories, or long list of features and functions.

Requirements for a Process Control System

1. It has to make good product.
2. It MUST be on time.
3. Operators must find it convenient to use.
4. It will be maintained by the plant engineer.
5. It should contain the latest technology.

Everything else is design!
When Customer Experience is Central, Design Leads Development

Doug Deitz, Principal Designer, GE Healthcare

80% of Children ages 3-7 required sedation.
Solve the Right Problem

What is the biggest waste in Software Development?

Building the Wrong Thing

What’s the 2nd biggest waste in Software Development?

Complexity caused by all that extra stuff.

How do we stop building the wrong thing?

Build a Minimum Viable Product

Try it with real customers

Measure the Response

Learn

Repeat
How Spotify Builds Products

By Henrik Kniberg
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Alison thinks she has cancer

Flow Efficiency = 2 hours /1008 hours =0.2%

From *This Is Lean*, by Modig and Åhlström
Sarah feels a lump in her breast

Flow Efficiency = 80 minutes / 120 minutes = 67%

From *This Is Lean*, by Modig and Åhlström
Where is the Camera?

On The Resource

On The Flow Unit

From *This Is Lean*, by Modig and Åhlström
Sources of Inefficiency

1. Long Throughput Times
   a. New Needs Arise
   b. Windows of Opportunity Close

2. Many Flow Units
   a. Handling, Scheduling
   b. Storing, Finding

3. Many Restarts
   a. Get-up-to-Speed Time
   b. Mistakes, Defects

From This Is Lean, by Modig and Åhlström
Busy ≠ Efficient

Resource Efficiency is not as efficient as you think

- Failure
- Demand
- Superfluous Work
- Valuable Work
Lesson:
Stop trying to maximize machine utilization.

Lesson:
Stop trying to maximize “resource” utilization.
Building the Wrong Thing

The Biggest Waste in Software Development

Features / Functions Used in a Typical System

- Often / Always Used: 20%
- Sometimes: 16%
- Rarely / Never Used: 64%
- Always: 7%
- Never: 45%

Cost of Complexity

Standish Group Study Reported at XP2002 by Jim Johnson, Chairman

Cost

Time

Clean, Simple Code

Lean
Defect Injection Process

Specifications

① Code  ?Match?  Test

% of Release Cycle Spent “Hardening”

Top Companies:  <10%

Typical:  30%

Sometimes:  50%

Release Cycle
The Efficiency Paradox

1. You think you are here.
2. You are probably here.
3. Start with Flow Efficiency.
4. Then add Resource Efficiency.

Efficient islands

Lean (The perfect state)

Wasteland

Efficient ocean

Resource efficiency

Flow efficiency
Lower Risk
More Predictability

Risk Profile of a Typical Project
Risk Profile of a Lean Product
Shortening Product Development Cycle Time

- Even out the Arrival of Work
- Minimize the Size of Things In Process
- Minimize the Number of Things In Process
- Establish a Regular Cadence
- Limit Work to Capacity
- Use Pull Scheduling
Use Pull Scheduling

(Wishful Thinking)

Input Flow

Never

(Wishful Thinking)

Output Capacity
Modern Software Engineering

Software Development Process

- Acceptance test driven development process
- Tight collaboration between business and delivery teams
- Cross-functional teams include QA and operations
- Automated build, testing, db migration, and deployment
- Incremental development on mainline with continuous integration
- Software always production ready
- Releases tied to business needs, not operational constraints

Product Development Process

Build a Minimum Viable Product

Measure the Response

Learn

- Acceptance test driven development process
- Tight collaboration between business and delivery teams
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- Automated build, testing, db migration, and deployment
- Incremental development on mainline with continuous integration
- Software always production ready
- Releases tied to business needs, not operational constraints
It’s ~ 2004 in Atlanta…

We have to BUILD!
Building is HARD!
How often do we Build?
How about every day?

Time passes….

✓ Build every hour

× Deploy Last Good Build at End of Day in Atlanta

✓ Deploy EOD Shanghai
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**Why Good Companies Die**

### Disrupted Technologies

1. Film
2. VCRS
3. Record stores
4. Movie rental
5. Payphones
6. Landlines
7. Long distance charges
8. Fax machines
9. Phone books
10. Newspaper classifieds
11. Maps
12. Travel guide books
13. Dictionaries, encyclopedias
14. Mainframes, Minicomputers
15. Floppy disks, CDs
16. Mail, e-mail

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**Disruptive Technology**

Digital consumer cameras
The market values most: high quality images.

At this point, camera phones supply
- sufficient quality images for the old market values, and also,
- ultra-high availability.

Camera phones
The market values most: always-at-hand availability.

In *The Innovator's Dilemma*, Clayton M. Christensen shows that the supply quality improves more quickly than the demand requires.

**Disruptive Technology unmasked**

Infographic © 2005 Simon Woodside <sbwoodside@yahoo.com>
This version is 1.0: 2005/01/30
http://simonwoodside.com

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Newspaper Advertising Revenue Adjusted for Inflation, 1950 to 2012

Billions of 2012 Dollars

Source: Newspaper Association of America

Carpe Diem Blog
1996: A newspaper alliance to meet the internet challenge

SCHIBSTED MEDIA GROUP

Christian Printzell Halvorsen
CEO FINN.no
1st attempt: Non-disruptive (1996)

- Focus: Defending print revenue
- Newspaper sub-brand
- Non-dedicated resources (project)
- Bundled business model

FAILURE
2nd attempt: Disruptive (2000)

- Focus: Attacking print revenue
- New brand, supported by the newspapers
- Separate entity, dedicated organization, new people, new culture

SUCCESS

SCHIBSTED MEDIA GROUP

Christian Printzell Halvorsen
CEO FINN.no
Massive co-branding in the newspapers’ classifieds sections

Ads for FINN in the newspapers, often promoting the benefits of the web over the newspapers.
FINN has an impressive position in the everyday life of Norwegians

2012

- #1 position in jobs, real estate, cars, general merchandise, display advertising. #2 in travel, craftsmen
- Brand awareness: 96% aided / 82% unaided
- 2-3 million unique visitors per week. Norway’s 2nd-3rd largest website.
- 550 524 830 visits on FINN or 110 visits per Norwegian
- 4 319 888 days spent on FINN or 21 hrs per Norwegian
- 3.8 million ads with a total value of 562 BNOK or >20% of GDP
Schibsted has managed the digital transformation well

Revenues, BNOK
EBITDA margin, %

- Revenues 2001: 8,0
  - Online: 8,3%
  - Offline: 15,2%

- Revenues 2011: 14,4
  - Online: 98%
  - Offline: 2%

- EBITDA 2001: 0%
  - Online: 100%

- EBITDA 2011: 45%
  - Online: 55%
  - Offline: 45%

SCHIBSTED MEDIA GROUP

Christian Printzell Halvorsen
CEO FINN.no

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Not just a transformation, but also entirely new revenue streams

Revenues from car vertical, MNOK

Revenues from general merchandise, MNOK

SCHIBSTED MEDIA GROUP

Christian Printzell Halvorsen
CEO FINN.no
Key takeaways

- A will to cannibalize own revenues has made Schibsted a global leader in transforming from traditional media to online
- It’s easier to act before market changes, than to play catch-up after
- Disruptive innovation is not only a way to transformation, but to entirely new revenue streams
Case Study

High End Infotainment Systems
2007: 70% Automotive Market Share
⇒ $2b of $3b in sales
BUT: How do we grow?

2008: Commissioned Saras
✓ Headed by Sachin Lawande
✓ Aimed at emerging markets
✓ ½ the price; ⅓ the cost
✓ 1 year to market

So the product had to be:
⇒ Simple, modular, inexpensive
⇒ Standard technologies
⇒ Third party solutions
⇒ No after-sale customization

Software group in India
✓ Led by Arvin Baalu*

Hardware group in China
✓ Led by Kelei Shen*
* leaders with established credibility at Harman

Reported to Sachin Lawande
✓ Rather than automotive head

Organized around major subsystems
✓ Eg. Navigation system
✓ Radical shift from company tradition
✓ Competency managers help their people contribute to a high quality subsystem

Rest of company skeptical
✓ Engineers expected inferior product
✓ Sales reps had to be ordered to sell it
✓ First sale to Toyota changed everything

2009 Launch. $3b in profitable sales in 18 months.

Vijay Govindarajan - Reverse Innovation
The Lean Mindset

1. Great Companies
   ✓ Start with Why?
2. Energized Workers
   ✓ The Power of Challenge
3. Delighted Customers
   ✓ Don’t Guess – Experiment!
4. Genuine Efficiency
   ✓ Flow Efficiency Over Resource Efficiency
5. Breakthrough Innovation
   ✓ Small, experienced, decision-empowered teams
Thank You!

More Information:  www.poppendieck.com