

Innovation in a Team Environment

Karl A. Smith

Engineering Education – Purdue University
Technological Leadership Institute/ STEM Education Center/
Civil Engineering - University of Minnesota
ksmith@umn.edu - <http://www.ce.umn.edu/~smith>

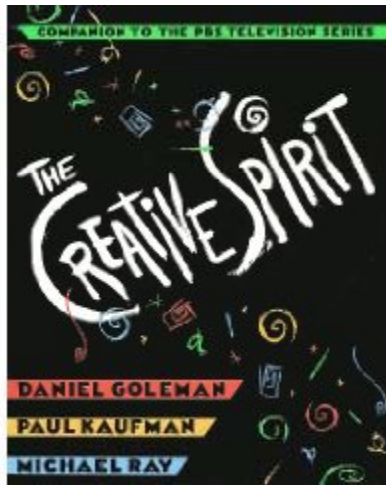
Nanyang Business School
Nanyang Technological University

Teaching Strategies for Cooperative Learning Workshop

December 12-15, 2011

Innovation and Creativity

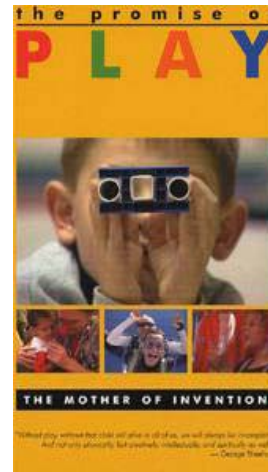
- Individually reflect on
 - Key features and how to cultivate innovation and creativity in a team environment
 - Record your ideas
- Turn to the person next to you
 - Exchange ideas
 - Develop a list to share with whole group
- Whole Group discussion



<http://www.amazon.com/Creative-Spirit-2Tie-PBS/dp/0525933549>

<http://www.danielgoleman.info/blog/>

<http://www.michael-ray.com/>

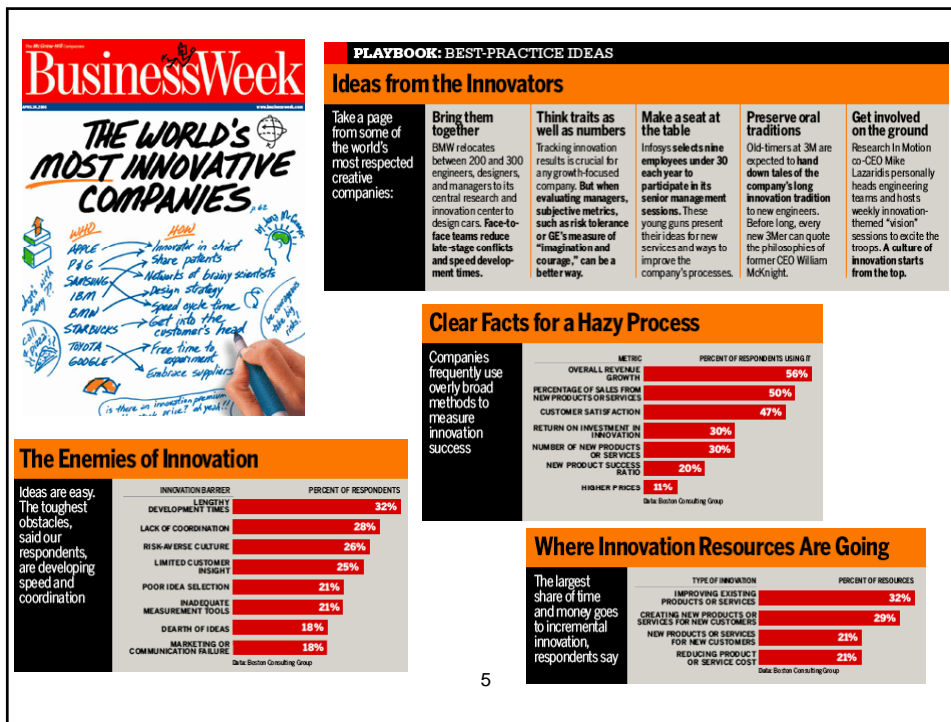


http://www.amazon.com/PROMISE-PLAY-Part-Mother-Invention/dp/B0018L45MO/ref=pd_bxgy_d_text_b

3

Guide to Increasing Innovation Amabile & Khaire (2008)

- If you're trying to enhance creativity:
 - Remember that you are not the sole fount of ideas
 - Enable collaboration
 - Enhance diversity
 - Map the stages of creativity and attend to their different needs
 - Accept the inevitability and utility of failure
 - Motivate with intellectual challenge



5



http://www.businessweek.com/magazine/content/06_17/b3981401.htm

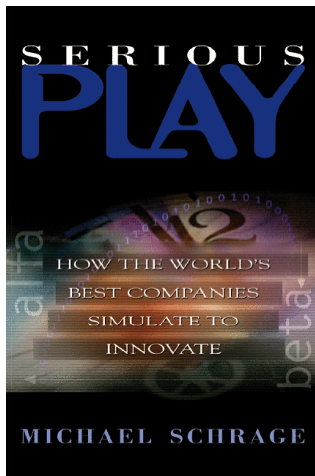
6

Jeong Kim – Director Bell Labs

- "There are people in the hedge-fund and financial sectors who have made so much money," he says. "But what have they created? What value?"
The goal of the innovator, as he sees it, is to have a positive impact on your company, your country, and yourself.
- By his estimation, Bell Labs' value is in its critical mass – a lot of researchers in close proximity, sharing insights and expertise. But he also points to two earlier Bell Labs inventions: "Remember, the transistor was invented by three people, not 30,000. The laser was invented by two."

Jon Gertner, *Fast Company*, February, 2008
<http://www.fastcompany.com/magazine/122/mad-scientist.html>

Serious Play



Prototyping Innovation Collaboration

Prototyping is probably the single most pragmatic behavior the innovative firm can practice

Innovation is more social than personal

Michael Schrage. 2000. *Serious Play: How the World's Best Companies Simulate to Innovate*



01 Our vision

"We believe great innovators and leaders need to be great design thinkers."

A bold new design institute at Stanford

We have a dream about building a place for design at Stanford.

We want to build a place where design thinking is the glue that binds people together, a place we call the d.school.

We want the d.school to be a place for Stanford students and faculty in engineering, medicine, business, the humanities, and education to learn design thinking and work together to solve big problems in a human centered way.

We want it to be a place where people from big companies, start-ups, schools, nonprofits, government, and anyone else who realizes the power of design thinking, can join our multidisciplinary teaching, prototyping, and research.

NEXT →

GET INVOLVED →

Sign up to join the design thinking movement

http://www.stanford.edu/group/dschool/big_picture/our_vision.html

THE GLOBAL INNOVATION 1000

Why Culture Is Key

BOOZ & COMPANY'S ANNUAL STUDY SHOWS THAT SPENDING MORE ON R&D WON'T DRIVE RESULTS. THE MOST CRUCIAL FACTORS ARE STRATEGIC ALIGNMENT AND A CULTURE THAT SUPPORTS INNOVATION.

BY BARREY JARZELSKI, JOHN LOEHR, AND RICHARD HOLLMAN

The elements that make up a truly innovative company are many: a focused innovation strategy, a winning overall business strategy, deep customer insight, great talent, and the right set of capabilities to achieve successful execution. More important than any of the individual elements, however, is the role played by corporate culture — the organization's self-orienting patterns of behavior, belief, thinking, and believing — in tying these all together. Yet according to the results of this year's Global Innovation 1000 study, only about half of all companies say their corporate culture robustly supports their innovation strategy. Moreover, about the same proportion say their innovation strategy is inadequately aligned with their overall corporate strategy. This disconnect, as the saying goes, is both a problem and an opportunity. Our data shows that companies with unresponsive cultures and poor strategic alignment significantly underperform their competition. Moreover, most executives understand what's at stake and what matters, even if their companies don't always seem to get it right. Across the board, for example, respondents identified "superior product performance" and "superior product quality" as their top strategic goals. And they agreed that their two most important cultural attributes were "strong identification with the consumer/customer experience" and a "passion/pride in products."

These assertions were confirmed by innovation executives we interviewed for the study. Fred Palenik, executive vice president of research and development and chief technology officer (CTO) at innovation leader 3M Company, for example, puts it this way: "Our goal is to

<http://www.strategy-business.com/media/file/sb65-11404-Global-Innovation-1000-Why-Culture-Is-Key.pdf>

Exhibit 1: The Alignment Advantage

Only 44 percent of companies surveyed have both highly aligned cultures and highly aligned innovation strategies, and it pays off in performance. They outperform on growth in both profits and enterprise value.

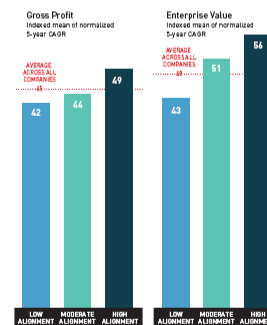
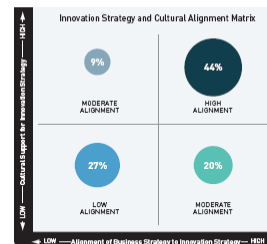
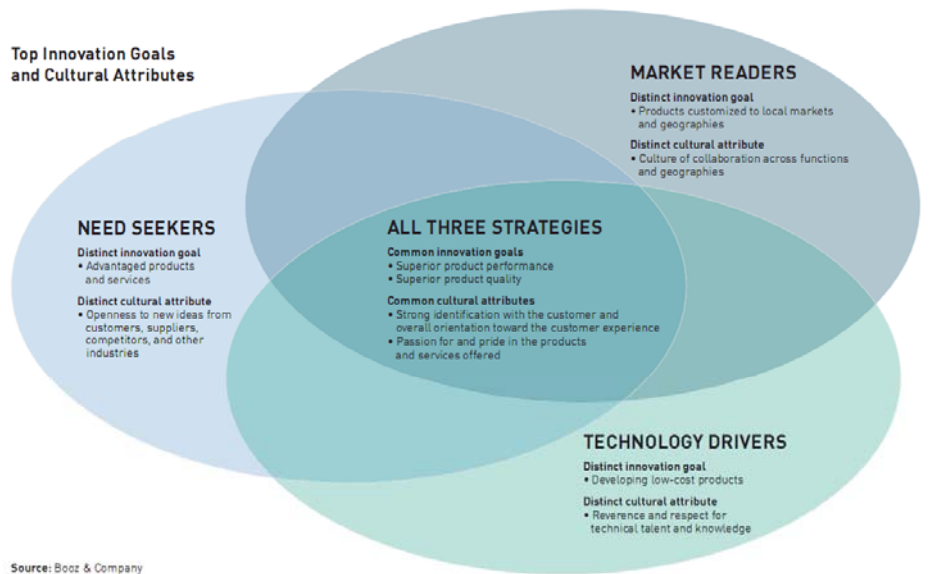


Exhibit 5: Top Goals and Attributes by Strategy

All companies following any of the three innovation models share some of the most important innovation goals and cultural attributes. Each model, however, also has distinct goals and attributes.



The Innovation Journey

VandeVen, Polley, Garud & Venkataraman, 1999.

The innovation journey is a nonlinear cycle of divergent and convergent activities that may repeat over time and at different organizational levels if resources are obtained to renew the cycle, p. 16.

IDEO – Deep Dive Video

ABC News
Nightline - 7/13/99

Available From
ABC News Store
www.abcnews.com

Kelley, Tom and Littman, Jonathan (2001) *The art of innovation: Lessons in creativity from IDEO, America's leading design firm.* New York: Random House

Kelley, Tom and Littman, Jonathan (2005) *The ten faces of innovation: IDEO's strategies ...* New York: Currency/Doubleday

IDEO - "The Deep Dive"

- # IDEO has been identified as America's Leading Design Firm.
- # IDEO's special ingredients:
 - Teams
 - Culture
 - Methodology

IDEO - "The Deep Dive"

Viewing Perspectives:

- Teams
- Culture
- Methodology
- Videographer

"THE DEEP DIVE"

Five Days at

I E
D O

Components of IDEO process

- # Creation of "Hot Teams"
- # Brainstorming
- # Rapid Prototyping
- # Observing & Listening from Customers
- # Thinking of products in terms of *verbs*, rather than *nouns*

IDEO's Teams

- # Named "Hot Teams."
- # Multidisciplinary.
- # Group leader is assigned based on their abilities to work with groups.

Seven Secrets for Better Brainstorming

1. Sharpen the focus
2. Playful rules
3. Number your ideas
4. Build and jump
5. The space remembers
6. Stretch your mental muscles
7. Get physical

Playful Rules

- # One conversation at a time
- # Stay focused on the task
- # Encourage wild ideas
- # Go for quantity
- # Be visual
- # Defer judgment
- # Build on the ideas of others

IDEO's Culture

- # Employees design their own working areas.
- # Employees have interest and skills to work with a wide range of people.
- # No hierarchies.

Build Your Greenhouse

- | | |
|---------------------------------|--|
| # Building Neighborhoods | # Watch Your Body Language |
| # Think Project, Think Personal | # Simple Team Space |
| # Building Blocks | # Hierarchy is the Enemy of Team Space |
| # Inspiration from Adversity | # Give Your Workers a View |
| # Prototype Your space | # Tell Stories |
| # Create a Team Icon | # Make Your Junk Sing |

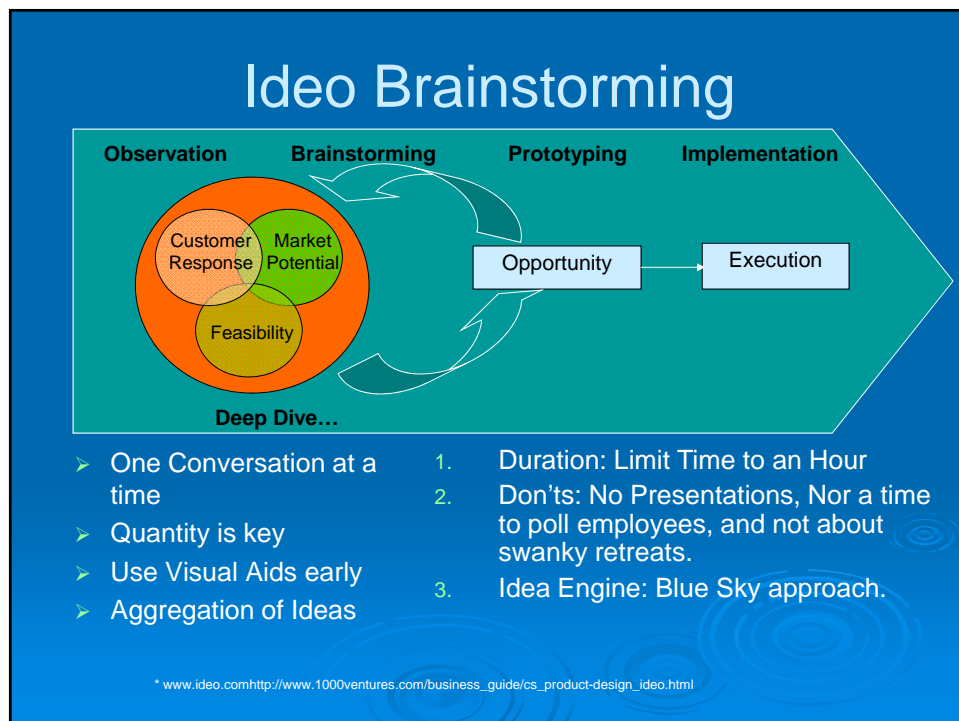
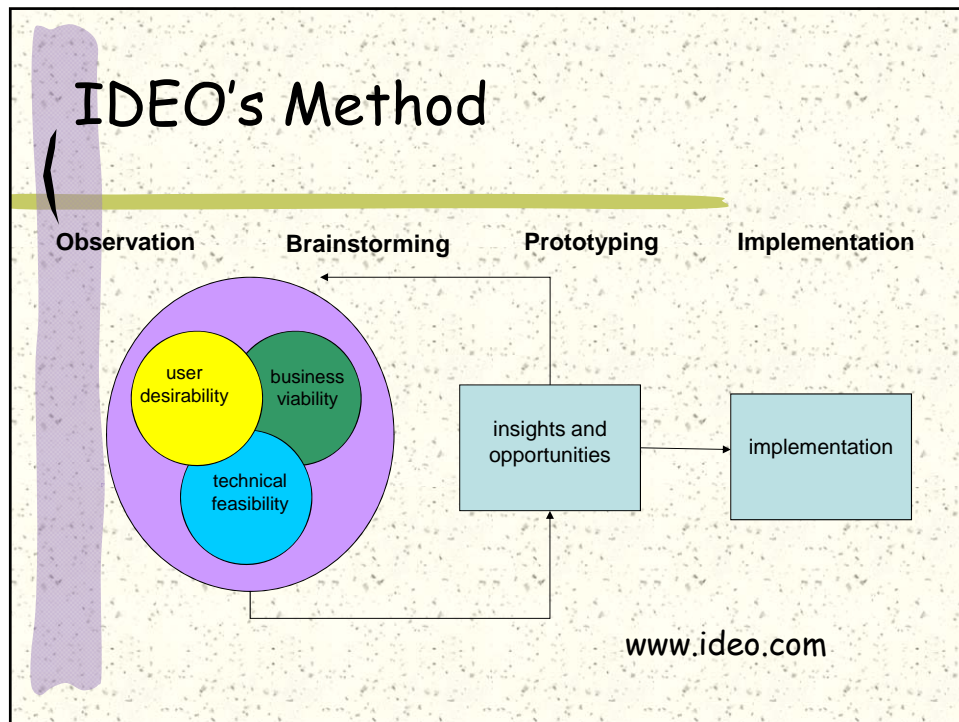
Build Your Greenhouse

Building Neighborhoods

- # Areas of Congregation
 - # Lounge / Common Area
- # Mainstreet
 - # Forced Interaction
- # Need for Privacy
 - # Quiet Areas
 - # Individuality

Five steps to IDEO's innovation

- # Understand the market/client/technology/constraints
- # Observe real people in real situations
- # Visualize new-to-the-world concepts & ultimate customers
- # Evaluate & refine prototypes
- # Implement new concept for commercialization

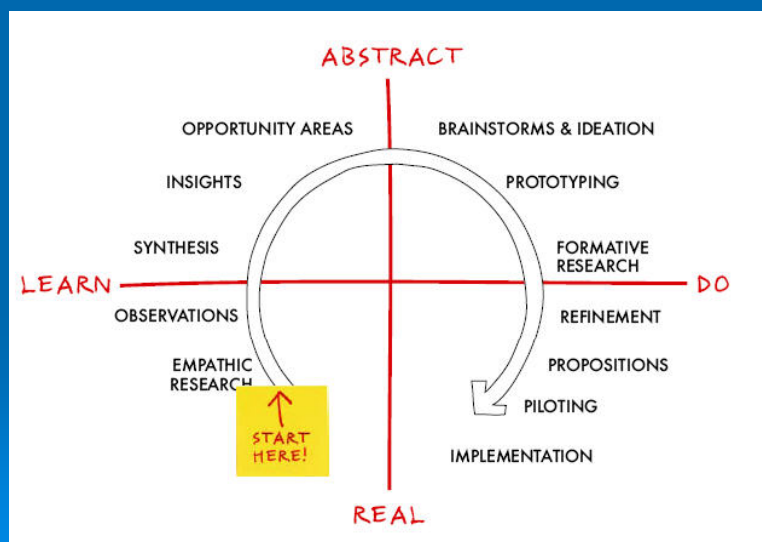


How to Kill Brainstorming

- The boss speaks first.
- Everybody gets a turn
- Experts Only – diversity trumps expertise
 - Kelley's Rule: 1 person who can build things, 1 with customer experience, and a sci-fi nerd.
- Off Site
- No Silly Stuff
- Document Everything

<http://www.qualityoflife.org/ich/IDEO/IDEO.cfm>

IDEO's Innovation Methodology



Source: <http://www.mediawerk.ch/nerve/category/visual-literacy/>

About Us

IDEO helps companies innovate. We design products, services, environments, and digital experiences.

"Head in the sky..." IDEO's teams, culture, and methodology are the special ingredients that fuel our approach to innovation and design. We begin with a deep exploration of business, human, and technical factors. Observe. Brainstorm. Prototype. Repeat.

Point of View. Essence. Heart. "...ness." Whatever you call it, it's there: a shared mind set, the place where the efforts of our problem-solving engine converge. Expressed in a visible and tangible way, it informs and inspires the design process.

"...feet on the ground." What's a good idea worth if it can't be realized? IDEO's world-class designers and engineers ensure that the power of the vision is preserved in the journey from concept to final production.

www.ideo.com

Engines of Innovation

THE ENTREPRENEURIAL UNIVERSITY IN THE TWENTY-FIRST CENTURY

Holden Thorp & Buck Goldstein

STEVEN JOHNSON

WHERE GOOD IDEAS COME FROM

THE NATURAL HISTORY OF INNOVATION

FROM THE BESTSELLING AUTHOR OF EVERYTHING BAD IS GOOD FOR YOU AND THE INVENTION OF AIR

Innovation is the adoption of a new practice in a community - Denning & Dunham (2010)



-
- | | |
|---|---|
| 1
MARKET/INDIVIDUAL
NON-MARKET/INDIVIDUAL | 2
MARKET/NETWORK
NON-MARKET/NETWORK |
| 3 | 4 |



Technology



Three definitions of technology (Arthur, 2009)

1. A means to fulfill a human purpose
2. An assemblage of practices and components
3. The entire collection of devices and engineering practices available to a culture

Three fundamental principles (Arthur, 2009):

1. All technologies are combinations
2. Each component of technology is itself in miniature a technology
3. All technologies harness and exploit some effect or phenomena, usually several



Innovation Resources

- Amabile, Teresa M. and Khaire, Mukti. 2008. Creativity and the role of the leader. *Harvard Business Review*, 86(10), 100-109.
- Prahalad, C.K. and Krishan, M.S. 2008. The New Age of Innovation. New York: McGraw-Hill. First chapter <http://www.newageofinnovation.com/>
- Berkun, Scott. 2007. *The myths of innovation*. Sebastopol, CA: O'Reilly.
- Chesbrough, Henry. 2006. *Open innovation: The new imperative for creating and profiting from technology*. Cambridge, MA: Harvard Business School Press
- Hargadon, Andrew. 2003. *How Breakthroughs Happen: The surprising truth about how companies innovate*. Cambridge, MA: Harvard Business School Press.

Innovation Resources

Additional Perspectives on Innovation:

- **DEC** - Schein, Edgar H., et.al. 2003. *DEC is dead: Long live DEC – The lasting legacy of Digital Equipment Corporation*. San Francisco: Berrett-Koehler.
- **The Innovation Journey** – Van de Ven, Andrew H., Polley, Douglas E., Garud, Raghu & Venkataraman, Sankaran. 1999. *The Innovation Journey*. New York: Oxford University Press.
- **Organizational Change and Innovation Processes** – Poole, Marshall S., Van de Ven, Andrew H., Dooley, Kevin, and Holmes, Michael E. 2000. *Organizational Change and Innovation Processes: Theory and Methods for Research*. New York: Oxford University Press.
- **Weird Ideas that Work** – Sutton, Robert I. 2002. *Weird Ideas that Work: 11-1/2 Practices for Promoting, Managing, and Sustaining Innovation*. New York: Free Press.