Wharton
UNIVERSITY of PENNSYLVANIA

Innovation – OIDD 614
Entrepreneurial Innovation, Lean Strategies, Culture of Innovation

Professor Karl T. Ulrich

Vice Dean of Entrepreneurship & Innovation

@ktulrich | ktulrich.com | ulrich@wharton.upenn.edu

Dowza Update

November 2014	April 2015	Summer 2015	March 2016	April 2016	Fall 2016

$200k Convertible Note Invested (18 months, 8% interest, 1.5mm valuation cap)

Dowza launches beautiful "Shopify" for Dive Shops.

Customers love it.

CAC > LTV (Can't acquire customers efficiently)

$100k in the bank.

2 Weeks in the Moroccan Desert

PIVOT!
Turbotax for US Visa Forms

"Pulling a Dowza"

CAC << LTV !!!

Tuning conversion funnel and product.

Google shuts down Adwords experiments

Schools signing up.

$25k in bank.

Rebrand as Oliver.
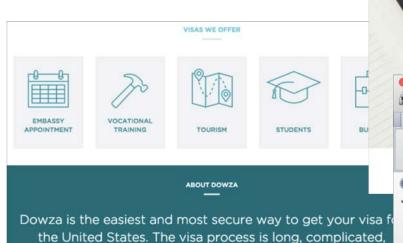
Raise $750k at $3mm cap.

Original angels still accruing 8% interest.

Jonathan Moyal, CEO

VISAS WE OFFER

EMBASSY APPOINTMENT   VOCATIONAL TRAINING   TOURISM   STUDENTS   BU...

ABOUT DOWZA
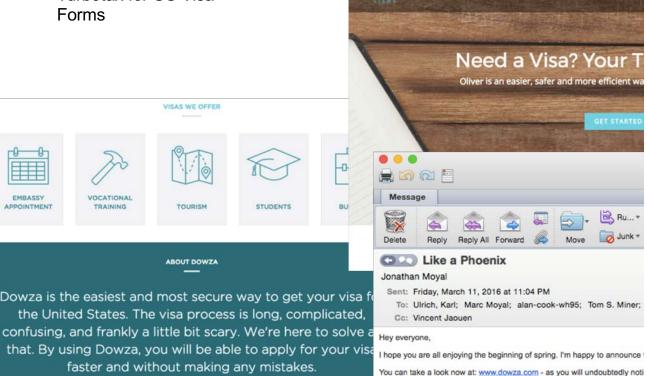
Dowza is the easiest and most secure way to get your visa fo... the United States. The visa process is long, complicated, confusing, and frankly a little bit scary. We're here to solve a... that. By using Dowza, you will be able to apply for your visa... faster and without making any mistakes.

OLIVER
VISAS

Need a Visa? Your T...
Oliver is an easier, safer and more efficient wa...

GET STARTED

Message

Delete   Reply   Reply All   Forward   Move   Junk

Like a Phoenix
Jonathan Moyal
Sent: Friday, March 11, 2016 at 11:04 PM
To: Ulrich, Karl; Marc Moyal; alan-cook-wh95; Tom S. Miner;
Cc: Vincent Jaouen

Hey everyone,

I hope you are all enjoying the beginning of spring. I'm happy to announce t...

You can take a look now at: www.dowza.com - as you will undoubtedly noti...

What we've done

We've already run 2 visas through the platform (Business Visas) - they wer...

Improve Innovation, Problem Solving, and Design in Society

Teaching	Institution Building	Doing

Teaching

Product Design

Innovation

Coursera
Design: Creation of Artifacts in Society
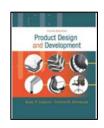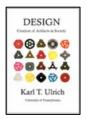
Writing

Scholarship

The Importance of the Raw Idea in Innovation: Testing the Sow's Ear Hypothesis

Idea Generation and the Quality of the Best Idea

Opportunity Spaces in Innovation: Empirical Analysis of Large Samples of Ideas

Institution Building

PENN WHARTON ENTREPRENEURSHIP
UNIVERSITY of PENNSYLVANIA

ipd INTEGRATED PRODUCT DESIGN

Business RADIO
POWERED BY THE WHARTON SCHOOL

details:
ktulrich.com

Doing

terrapass

Wins

- Xootr (great product, luck with Razor)
- Terrapass (idea, team, luck with macro factors)
- Scoopfree (idea/pain, team)
- JUMP (idea, team, luck with Mobike)

Bloomberg Businessweek

Xootr Scooter
Year: 2000
Silver Award
Client: Nova Cruz Products
Design: Lunar Design, Nova Cruz
From $199

The Xootr scooter folds down in 10 seconds. Its light weight and portability made it a hit in urban areas and helped stoke the scooter fad. In 2003, Nova Cruz was sold and renamed Xootr, which continues to manufacture the product today.

COOPER HEWITT

NATIONAL DESIGN AWARDS

Search 🔍

Xootr

Engineering, Industrial Design

PROJECT BY

LUNAR
📍 City, California, United S...
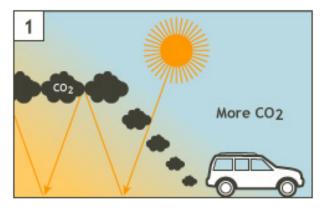
⊕ Follow on Behance
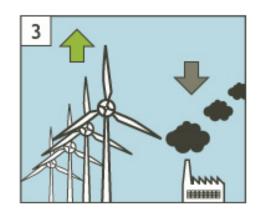
↪ Share Project ›

ABOUT PROJECT

LUNAR cofounded the company that brought this contemporary interpretation of the classic kick scooter to market. The product's modular product architecture, a basic aluminum frame that can be augmented with different wheels and deck materials, accommodates a wide range of tastes, budgets and performance needs. It is ideally suited to make public transportation more convenient to use. A commuter can cruise to a bus stop or train station, fold-up the Xootr, store it under a bus or train seat, unfold it, and then ride it to the final destination. The memorable design uses authentic materials and
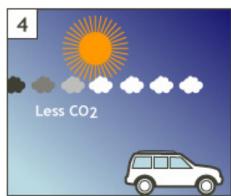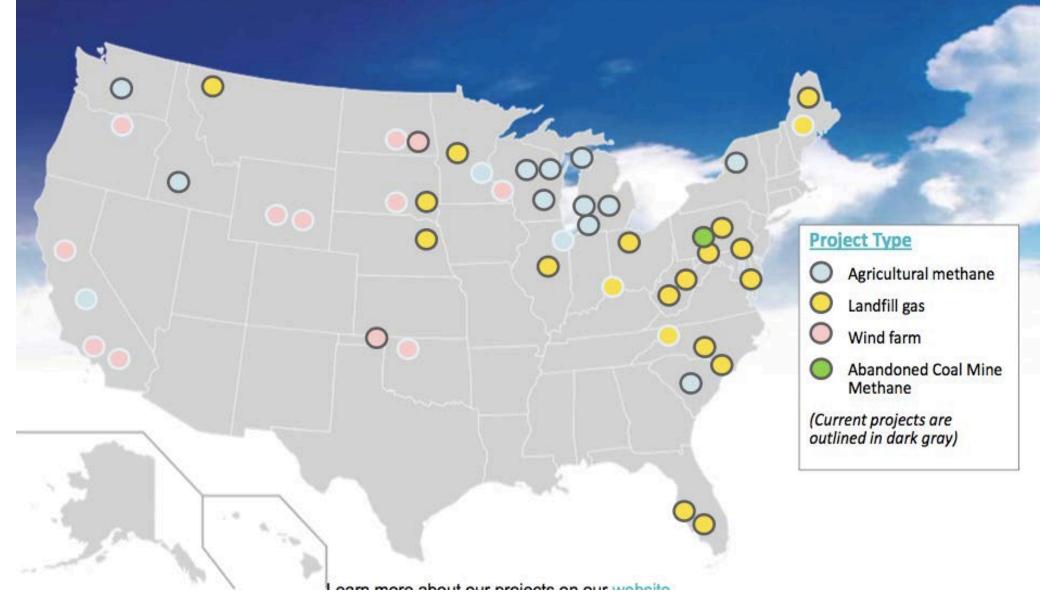
Innovation Course – Fall 2004
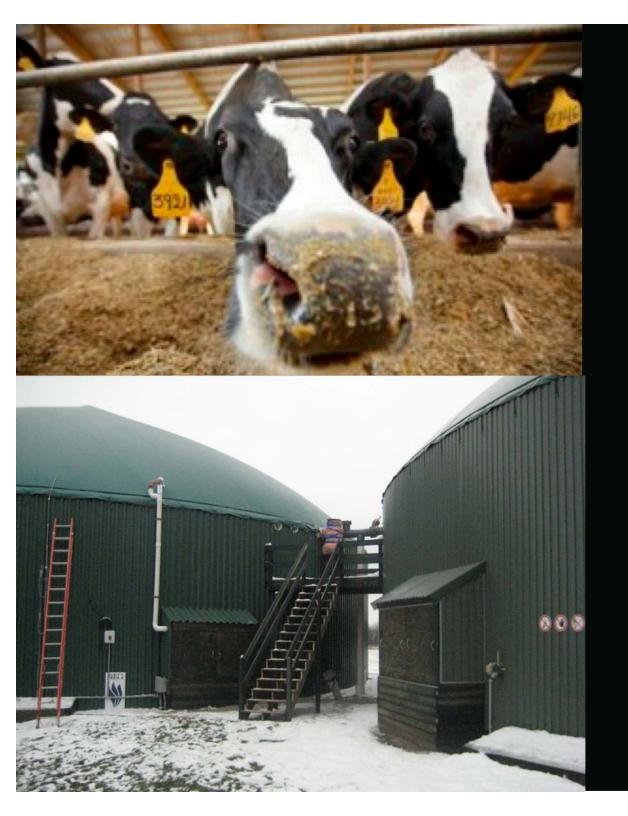
TerraPass in Action

We are fighting climate change by destroying greenhouse gases and putting clean energy on the grid. Our projects are made possible by your offset purchases.

Project Type

- Agricultural methane
- Landfill gas
- Wind farm
- Abandoned Coal Mine Methane

(Current projects are outlined in dark gray)

Learn more about our projects on our website

Certified

B

Corporation™

The Difference You've Made

In the past seven years, our projects have destroyed Greenhouse Gases equal to over **4,400,000,000** pounds of CO_2.

That's the equivalent of:

440,000 cars off the road for a year.

57,000,000 tree seedlings grown for 10 years.

5,500,000 laptops turned off for a year.

PetSafe®

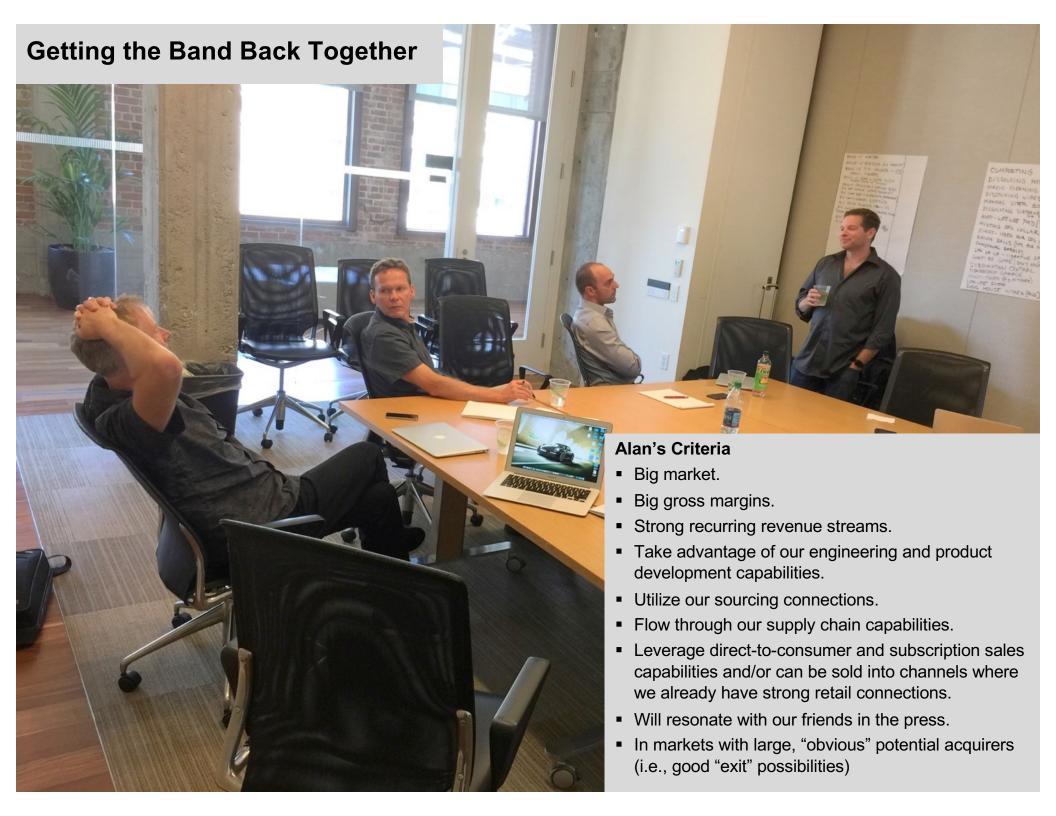Shop   Learn   Support

Simplify Your Life.

ScoopFree self-cleaning litter boxes with disposable trays give your cat a box that's always clean and keep your home smelling fresh. No scooping needed!

ScoopFree®

Exclusive deal

10% off ScoopFree litter box, lavender litter trays, & meal-dispensing cat toy. **Shop now.**

Alan J. Cook
Founder and former CEO
ScoopFree

Ulrich

Getting the Band Back Together

Alan's Criteria
- Big market.
- Big gross margins.
- Strong recurring revenue streams.
- Take advantage of our engineering and product development capabilities.
- Utilize our sourcing connections.
- Flow through our supply chain capabilities.
- Leverage direct-to-consumer and subscription sales capabilities and/or can be sold into channels where we already have strong retail connections.
- Will resonate with our friends in the press.
- In markets with large, "obvious" potential acquirers (i.e., good "exit" possibilities)

BrilliantPad: Self-Cleaning Indoor Dog Potty

Easy, Clean, Convenient. Automatic, Self-Cleaning Potty System For Puppies and Small Dogs.

Alan Cook
Chicago, United States   +
About

Arrow Electronics
Certification
Learn more

$85,556 USD raised by 729 backers

171% of $50,000 flexible goal   11 days left

BACK IT   ♡ (f) (y) (🔗) (</>)

Failures

- Voloci / Nova Cruz (technology push, technology timing/readiness)
- Blend8 (exogenous factors, kidnapping)
- Epodia (team dysfunction)
- Bruxcare (team not all in)
- Smatchy (intangible need/pain)

Lessons Learned

- Team doubts? Turn and run.
- Be careful about skimping on lawyers.
- You can be the world's expert in an emerging category.
- Solve your own problem, but…not a guarantee of a big market.
- To get started, just make and sell 1000 (hardware) or "wizard of oz" beta (services)

- (Little markets just as hard as big markets.)

Graphic: MIT Martin Trust Center

Fun

- Your creation solving problems for customers.
- Working with highly competent people.
- Positive cash flow.
- Controlling your own destiny.
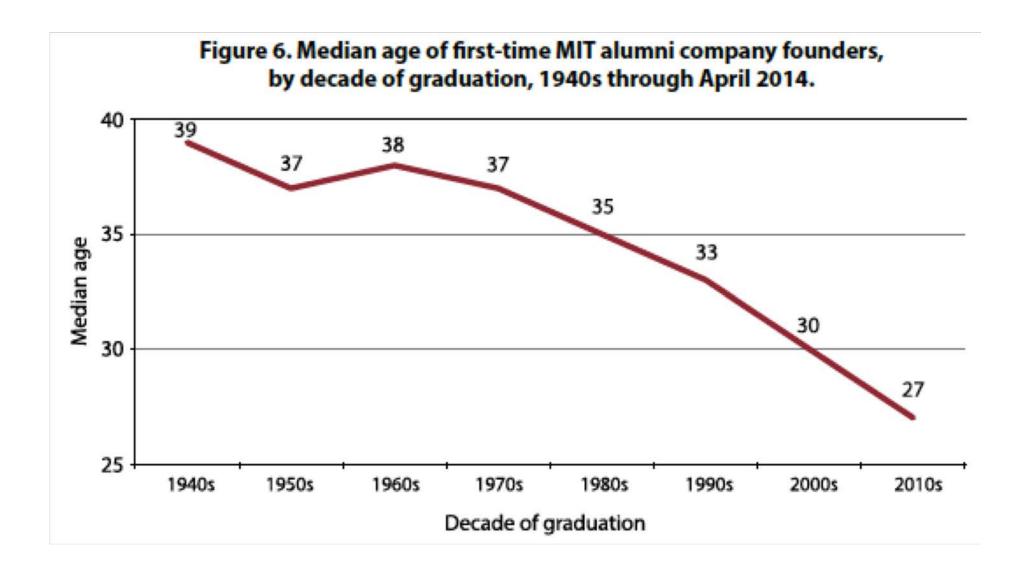- Getting things done efficiently.

Ulrich

Not Fun

- Product not perfect.
- Loaning the company money and guarantees of third-party loans.
- Laying off a factory workforce.
- Being sued.
- A customer falling and suffering injuries.
- A safety recall.
- Knock offs and trademark violations.
- Cyberfraud.
- Homeless employee living in back of factory.
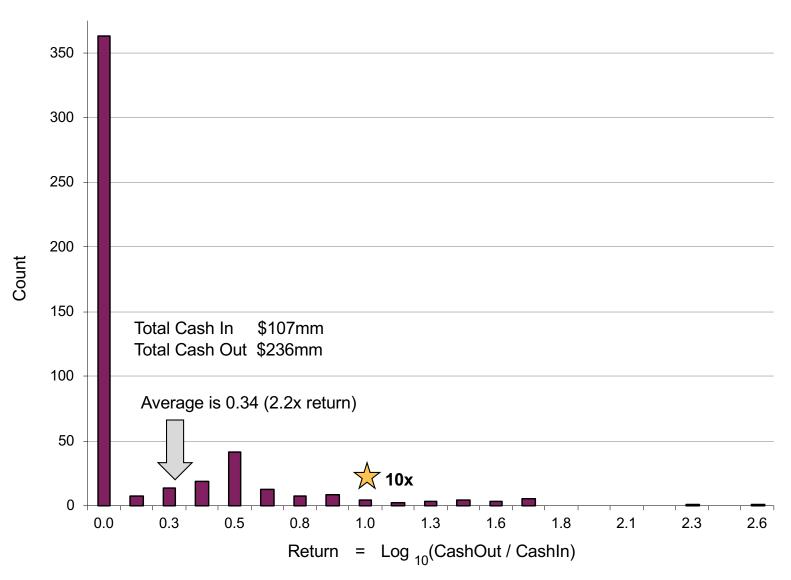- Fake reviews.

Note for later in your careers:

Participating as an angel and/or advisor gives >50 percent of the excitement for <5 percent of the anxiety. Can even get started now via WeFunder.

Figure 6. Median age of first-time MIT alumni company founders, by decade of graduation, 1940s through April 2014.

Source: Edward B. Roberts, Fiona Murray, and J. Daniel Kim, Entrepreneurship and Innovation at MIT Continuing Global Growth and Impact. MIT Sloan School of Management, 2015.
http://web.mit.edu/innovate/entrepreneurship2015.pdf

Ulrich

Histogram of Returns for 499 Ventures by Angel Investors

Total Cash In $107mm
Total Cash Out $236mm

Average is 0.34 (2.2x return)
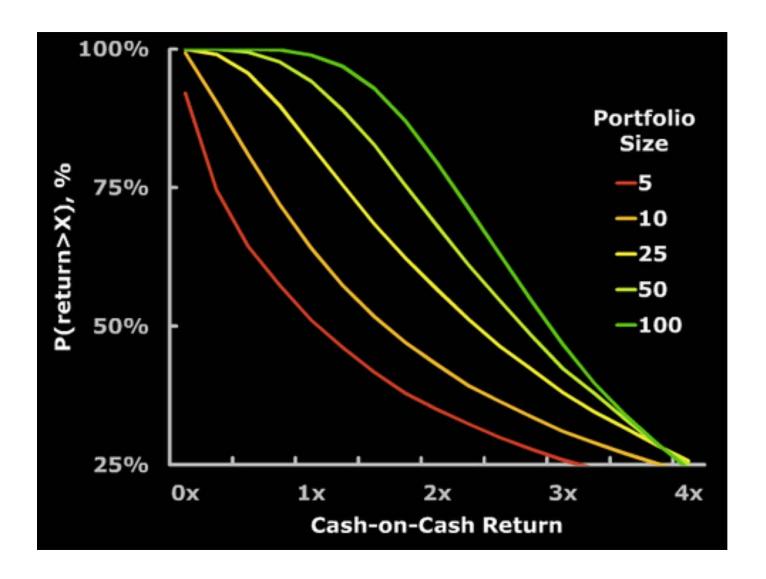
10x

Count

$Return = Log_{10}(CashOut / CashIn)$

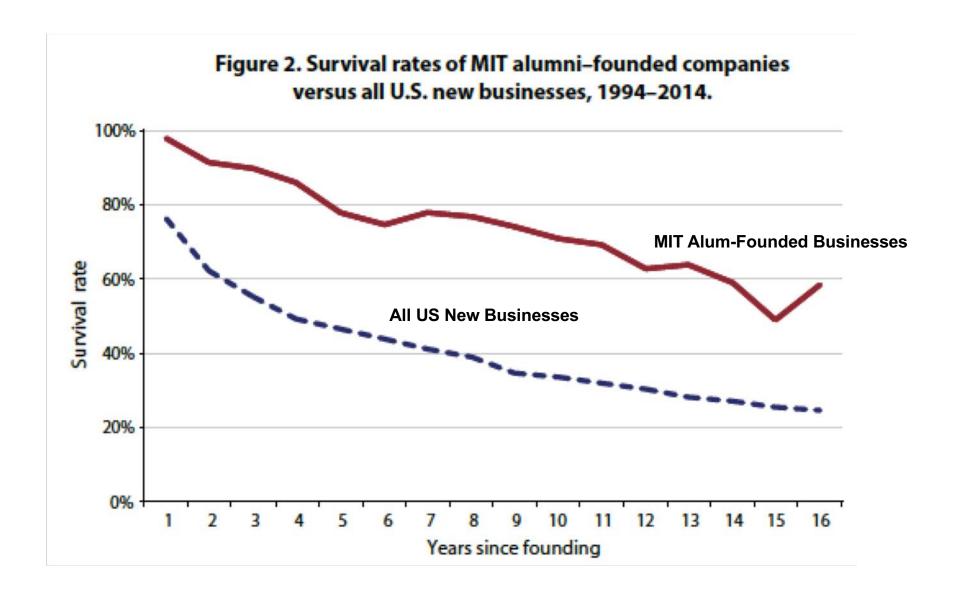e.g. 1,000,000 cash out on 100,000 cash in has Return of 1.0

Note: Negative or undefined returns set to 0.

Source: Kauffman Foundation Angel Investor Performance Project. Sample is 499 ventures for which cash investments were made.

Ulrich

Angel Investing Returns as a Function of Portfolio Size
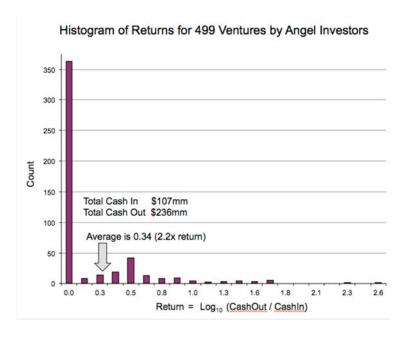
Source: David Rose, *The Gust Guide to Angel Investing*.

Figure 2. Survival rates of MIT alumni–founded companies versus all U.S. new businesses, 1994–2014.

MIT Alum-Founded Businesses

All US New Businesses

Survival rate

Years since founding

Source: Edward B. Roberts, Fiona Murray, and J. Daniel Kim, Entrepreneurship and Innovation at MIT Continuing Global Growth and Impact. MIT Sloan School of Management, 2015.
http://web.mit.edu/innovate/entrepreneurship2015.pdf

Ulrich

Managing Risk as an Entrepreneur

- You can't really get sufficiently diversified as an entrepreneur. (Need >25 deals.)
- You do it because you feel the calling.
  - *mission* and/or *process.*
- If your primary goal is a 95+% chance of being very comfortable financially, join a large established enterprise and work hard.

Histogram of Returns for 499 Ventures by Angel Investors

Total Cash In $107mm
Total Cash Out $236mm

Average is 0.34 (2.2x return)

Return = Log_{10} (CashOut / CashIn)

- Can get *some* of the adrenaline by being a post-funding "joiner."
- Downside is not that bad.
  - Opportunity cost of 6-12 months of no salary, and 12-24 months of lower salary.
  - Evidence that "failed" entrepreneurs have higher post-failure earnings. (Manso, Gustavo, Experimentation and the Returns to Entrepreneurship, 2015. http://ssrn.com/abstract=2527034
- And of course, it helps a lot to start rich (from birth, marriage, luck, previous work, etc.)

Culture

The set of shared mental assumptions that guide interpretation and action.
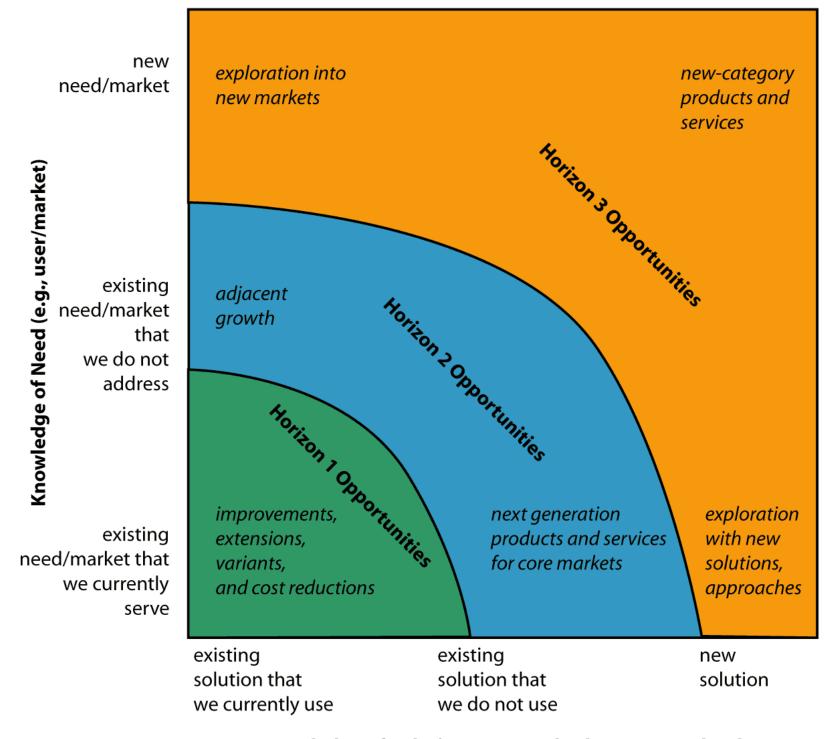
Typical Challenges for "Innovation Culture"

1. We are risk averse.

    - We prefer a 90% chance of 10mm RMB to a 25% chance of 40mm RMB.

    - Our managerial systems punish project failure.

2. If we can't precisely quantify the pay-off, we treat it as worth zero.

3. We have a short-term perspective.

    - We are not willing to invest today's resources towards ensuring/growing future resources.

4. We are slow and bureaucratic in responding to opportunity.

Universally Desirable Elements of Culture
- *Respect for the individual*
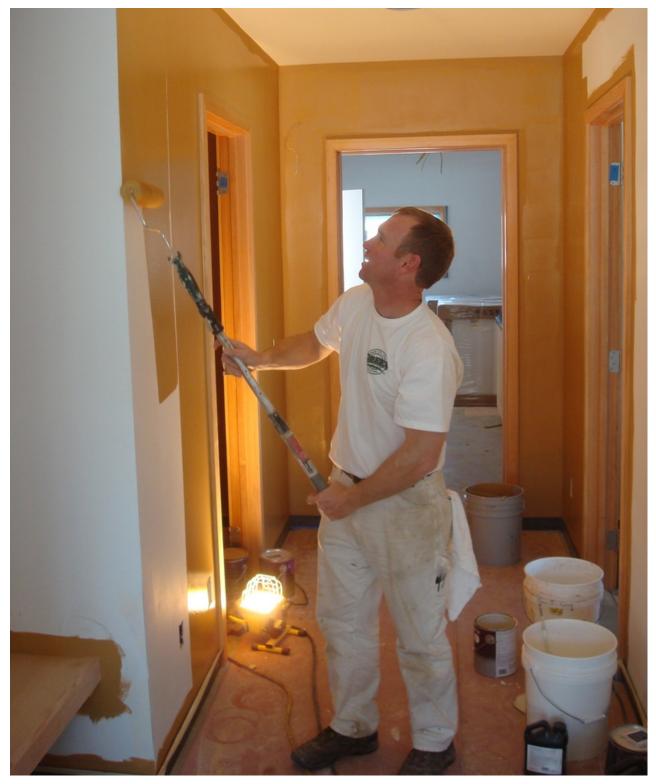- *Reliability*
- *Opportunities for personal development*
- *Accountability*
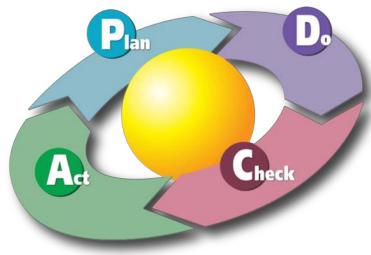
- *Autonomy*
- *Trust*
- *Recognition*
- *Cooperation*

Knowledge of Need (e.g., user/market)

new need/market

exploration into new markets

new-category products and services

Horizon 3 Opportunities

existing need/market that we do not address

adjacent growth

Horizon 2 Opportunities

Horizon 1 Opportunities

existing need/market that we currently serve

improvements, extensions, variants, and cost reductions

next generation products and services for core markets

exploration with new solutions, approaches

existing solution that we currently use

existing solution that we do not use

new solution

Knowledge of Solution (e.g., method/process/technology)

	H1	H2	H3
Objective	*Improvement* *75-100% success*	*Adjacent Growth* *25-75% success*	*New Category* *<25% success*

Elements of Culture

- *Customer focus.*
- *Continuous improvement.*
- *Problem solving.*
- *Measurement, analysis.*
- *Standardization*

Elements of Process

- *Six Sigma / TQM.*
- *PDCA/problem solving.*
- *Phase-gate development process.*

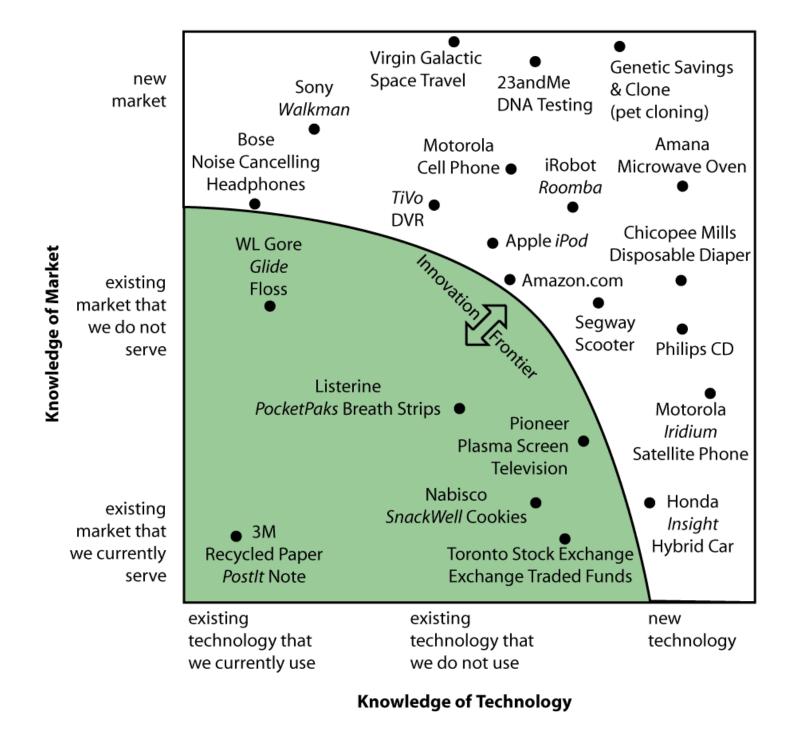**Metrics**

- *Project outcomes.*
- *Cost, quality, time.*

Foundation of universally desirable elements of culture

Organizations Benefit from Defining an Innovation Frontier

Is Apple a pioneer; a first mover?
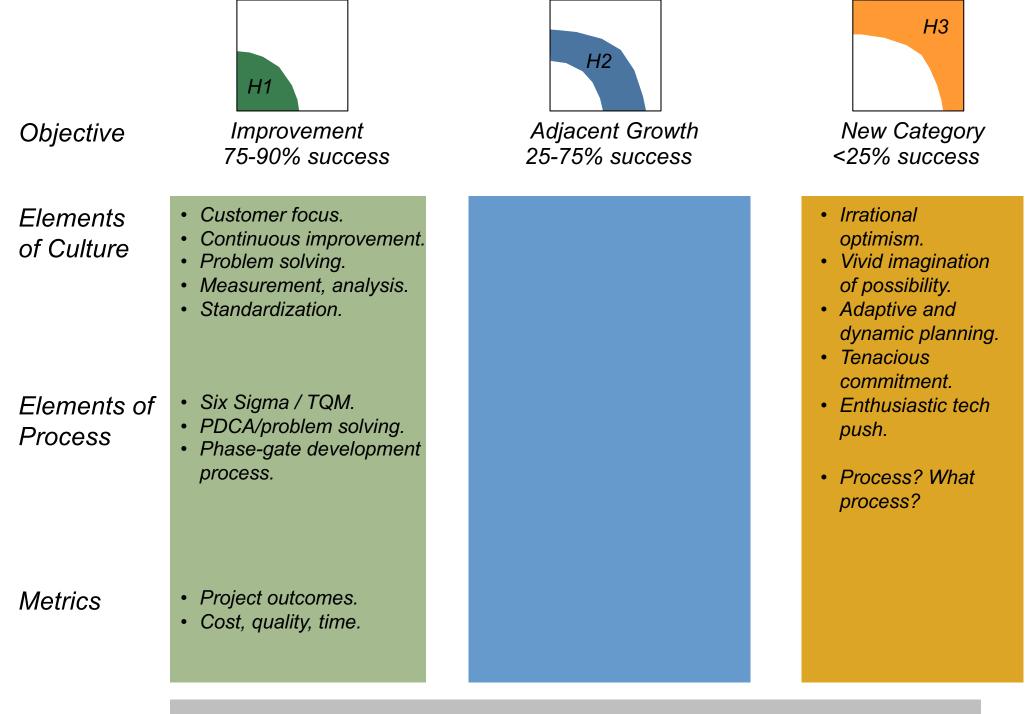
RepRap founded c2009 – becomes Makerbot

	Improvement 75-90% success	Adjacent Growth 25-75% success	New Category <25% success
Objective	H1	H2	H3
Elements of Culture	• Customer focus. • Continuous improvement. • Problem solving. • Measurement, analysis. • Standardization.		• Irrational optimism. • Vivid imagination of possibility. • Adaptive and dynamic planning. • Tenacious commitment. • Enthusiastic tech push.
Elements of Process	• Six Sigma / TQM. • PDCA/problem solving. • Phase-gate development process.		• Process? What process?
Metrics	• Project outcomes. • Cost, quality, time.		

Foundation of universally desirable elements of culture

	Improvement 75-100% success	Adjacent Growth 25-75% success	New Category <25% success

Objective — *Improvement 75-100% success* — *Adjacent Growth 25-75% success* — *New Category <25% success*

H1 / *H2* / *H3*

Elements of Culture

- *Customer focus.*
- *Continuous improvement.*
- *Problem solving.*
- *Measurement, analysis.*
- *Standardization.*

✔

?

🚫

Elements of Process

- *Six Sigma / TQM.*
- *PDCA/problem solving.*
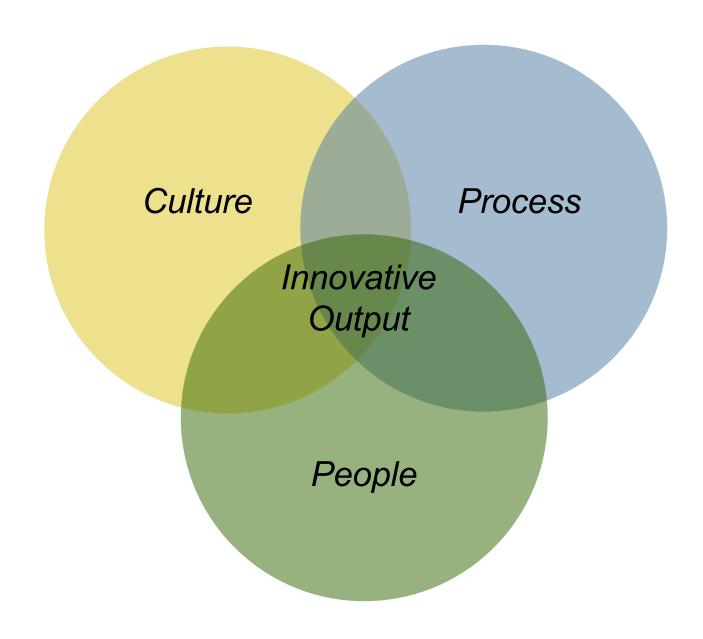- *Phase-gate development process.*

Metrics

- *Project outcomes.*
- *Cost, quality, time.*

✔ *Foundation of universally desirable elements of culture*

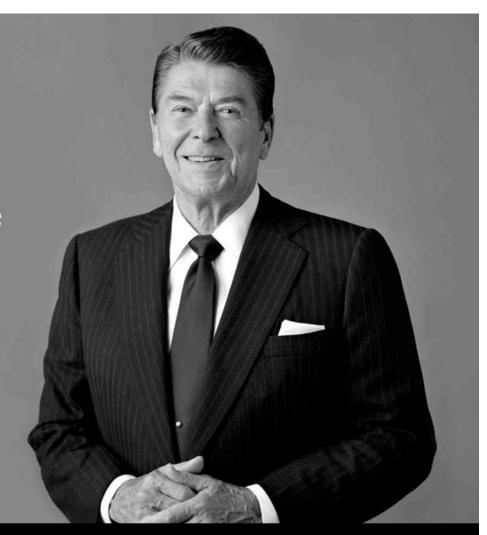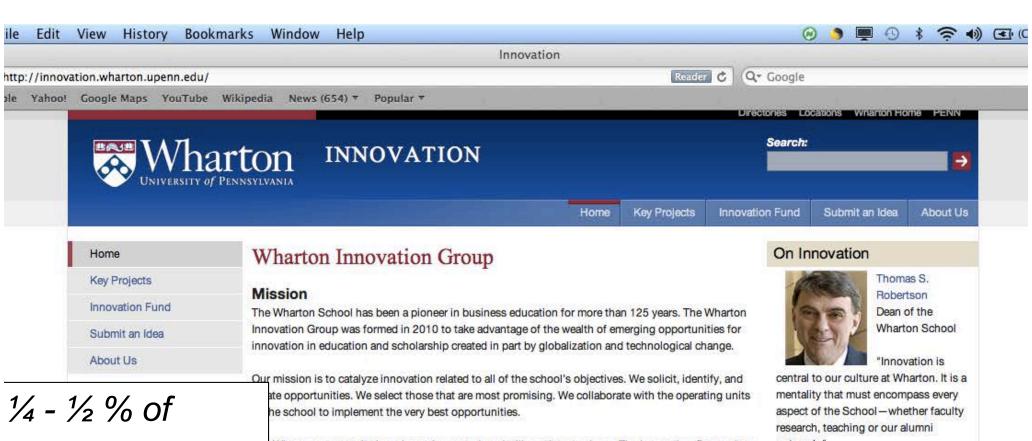# Factors Driving Innovation Performance in Organizations

Four Mechanisms for Mitigating Barriers to Innovation

1. Commitment of central innovation resource (1/4 – 1% of revenues) without specification of projects.

2. Partnership with operating units.

3. Explicit pipeline of opportunities.

4. Portfolio perspective – aggregation of results across multiple projects.

http://innovation.wharton.upenn.edu/   Reader ⟳   Q⟩ Google

ole   Yahoo!   Google Maps   YouTube   Wikipedia   News (654) ▾   Popular ▾

Directories   Locations   Wharton Home   PENN

Wharton INNOVATION
UNIVERSITY of PENNSYLVANIA

Search: →

Home   Key Projects   Innovation Fund   Submit an Idea   About Us

Home

Key Projects

Innovation Fund

Submit an Idea

About Us

Wharton Innovation Group

Mission

The Wharton School has been a pioneer in business education for more than 125 years. The Wharton Innovation Group was formed in 2010 to take advantage of the wealth of emerging opportunities for innovation in education and scholarship created in part by globalization and technological change.

Our mission is to catalyze innovation related to all of the school's objectives. We solicit, identify, and ate opportunities. We select those that are most promising. We collaborate with the operating units he school to implement the very best opportunities.

e Wharton community has always innovated, and will continue to do so. The Innovation Group aims t to accelerate that organic activity. However, we will also take a leadership role in pursuing longer-n opportunities that span organizational boundaries and whose promise is clouded by significant ertainty.

ar Approach

actively engage the entire Wharton community, and even the public at large, to identify opportunities for innovation. We make many small investments in exploring opportunities, and encourage members of our community to explore opportunities on their own based on their own passion and enthusiasm. We aim to make major investments in a few exceptionally promising areas each year.

Leadership

The Innovation Group is charged with pursuing medium- and long-term opportunities to improve the performance of the Wharton School with respect to its educational, scholarly, and social objectives. The group is led by Karl Ulrich, Vice Dean on Innovation and CIBC Professor of Entrepreneurship and eCommerce. For more information on Professor Ulrich and the team that makes up the Innovation Group, please see our About Us page.

On Innovation

Thomas S. Robertson
Dean of the Wharton School

"Innovation is central to our culture at Wharton. It is a mentality that must encompass every aspect of the School—whether faculty research, teaching or our alumni outreach."

More »

Karl T. Ulrich
Vice Dean, Innovation

Wharton Professor Karl Ulrich

▶   0:00 / 1:16   You Tube

¼ - ½ % of revenues for unspecified exploration

Search

CENTER FOR HEALTH CARE INNOVATION
Accelerating Ideas to Transform Health Care

About   People   Portfolio   Publications   News   Collaborate

Home » Portfolio

Portfolio

The Center for Health Care Innovation is dedicated to reimaging health care delivery for dramatically better value and patient outcomes. In the end, our goal is to make better health more attainable by improving the quality, affordability, and accessibility of care; and by making it easier for people to become healthier in their everyday lives.

Learn more about our approach here. Learn more about our projects and collaborative efforts below.

| All Projects | Patient Outcomes and Experience | Connected Health | Care Coordination | Enabling Innovation |

43

Portfolio Perspective

Hits

- Semester in San Francisco.
- Wharton Business Radio on SiriusXM Ch. 111.
- Lifelong Learning.
- Massively Open On-Line Courses.
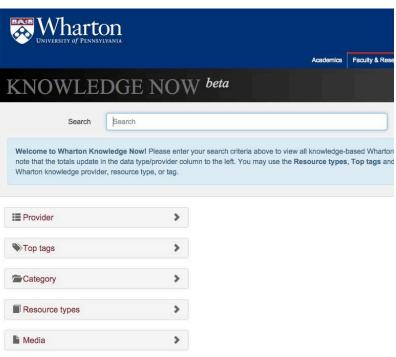- Wharton Innovation Fund.

Modest Successes

- Knollop school-wide knowledge database and search.
- Skypebot.
- Cisco telepresence classroom.

Failures or TBD

- Brainstorm idea management software.
- Admissions process changes.
- Dean's dashboard.
- Wharton venture fund.

Your Big Idea — Penn Medicine's Innovation Tournament

The UPHS Tournament of Ideas

1739 IDEAS (online submission)

200 IDEAS (idea screening)

40 IDEAS (workshops part 1)

1 Week Penn Provider Guarantee
Airline Scheduling for Radiology and Beyond
Almost Home
Artwork for patient rooms and high stress areas
Bereavement room
Community Health Workers
Customer Service Training
Discharge Prescription Concierge Service
Electronic Check In
ER Communication Board
Family room for progress to home
How's the food?
Interactive Map of Hospital
Interactive Patient Way finding
iPads for Patients
IV Team
Personalized Navigation Kiosks
Managing Patient Expectations (Restaurant Buzzer)
My Penn Radio - music for patients
On line patient registration
Online Bill Pay and Statements
Open Access
PaCt Project
Patient centered family videos posted to You tube
Penn Care Key Medical Card
Penn Medicine Navigation System
Penn Passport - a universal schedule
Penn Transport Link
Penn Virtual Visits
RX at Discharge
Schedule Appointments online (My Penn Scheduler)
Skype
Smart Card
Streamline Medication Reconcilliation
Their Big Idea: Patient Innovation Tournament
UPHS Food Service Now
Virtual whiteboard for the patient
Warming blankets
Wayfinding for Patients and Families
Who Are You: Identifying the staff to the patient
Your schedule for the day (what tests are coming up)

10 CONCEPTS (workshops part 2)

1 Week Penn Patient Guarantee
Almost Home
Bereavement Room
Discharge Prescription Concierge Service
My Penn Scheduler
Patient Education Videos
Patient Service Kiosks
Penn View
Their Big Idea
Way Finding

46

Almost Home

One Week Penn Patient Guarantee

Discharge Prescription Concierge Service

Bereavement Room

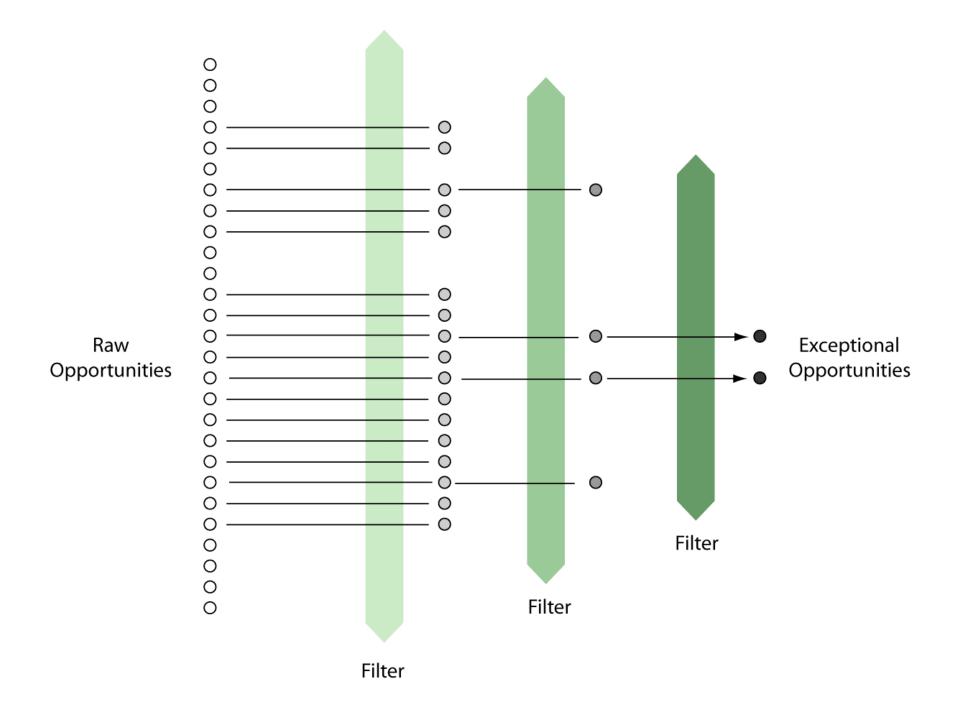**MyPENN Scheduler**
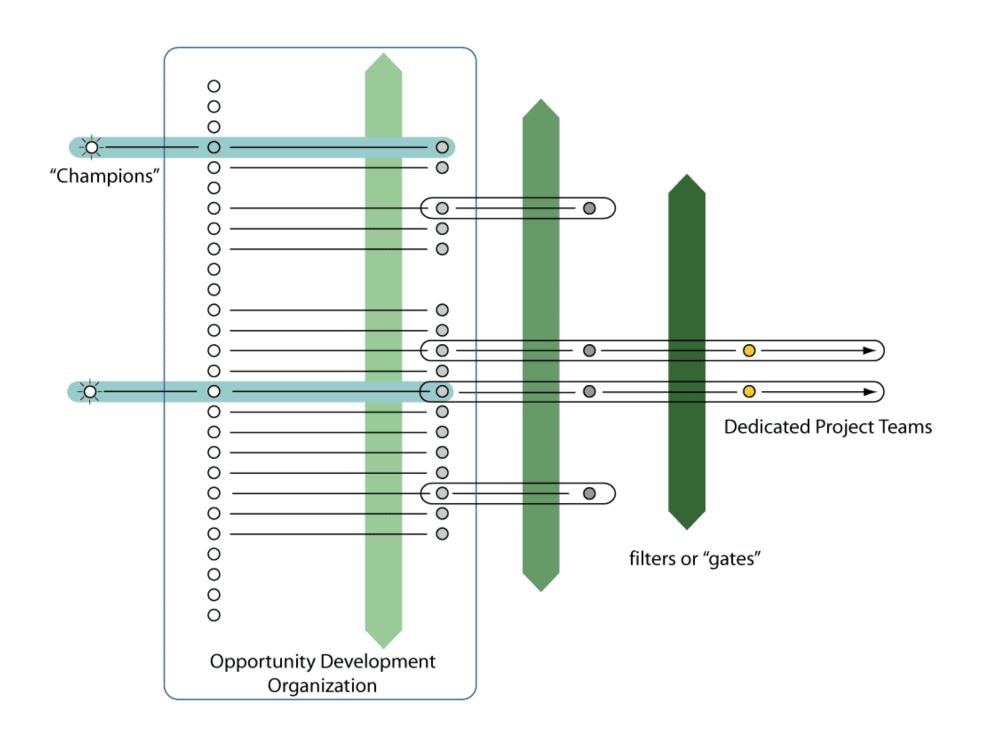
Patient Education Videos

Patient Services Kiosks

Their Big Idea

Way Finding

Raw
Opportunities

Exceptional
Opportunities

Filter

Filter

Filter

"Champions"

Opportunity Development Organization
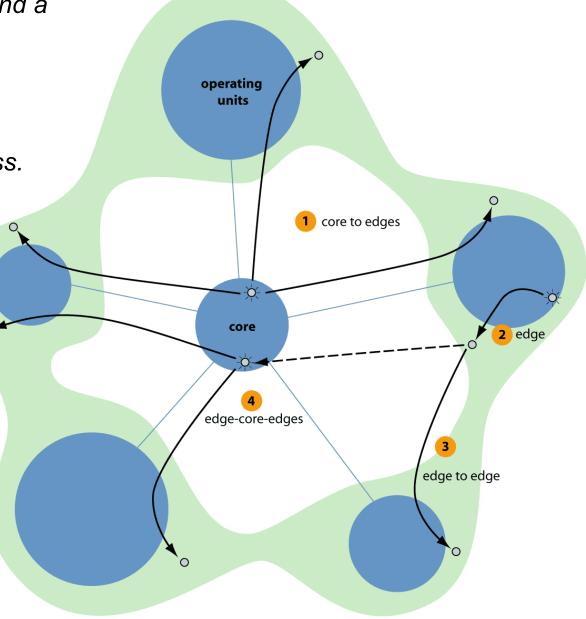
filters or "gates"

Dedicated Project Teams

The Importance of the Central Innovation Function

1. *Aggregation of opportunities, and a transparent pipeline.*

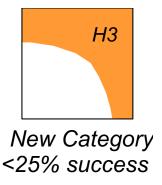2. *Efficient allocation of the ¼ - ½ percent investment.*

3. *Portfolio perspective on success.*

4. *Managing the tension between autonomy and coordination.*

operating units

1 core to edges

core

2 edge

4 edge-core-edges

3 edge to edge

50

|	**H1** Improvement 75-90% success	**H2** Adjacent Growth 25-75% success	**H3** New Category <25% success
Objective	Improvement 75-90% success	Adjacent Growth 25-75% success	New Category <25% success
Elements of Culture	• Customer focus. • Continuous improvement. • Problem solving. • Measurement, analysis. • Standardization.	• "Yes and…" • Inexpensive exploration of feasibility and value.	
Elements of Process	• Six Sigma / TQM. • PDCA/problem solving. • Phase-gate development process.	• Resources for unspecified exploration. • Centralized innovation function. • Portfolio perspective. • Tournament/Pipeline approach.	
Metrics	• Project outcomes. • Cost, quality, time.	• Average (portfolio) outcomes. • Process inputs (N ideas generated, etc.).	

Foundation of universally desirable elements of culture
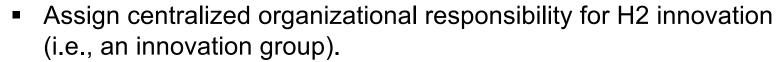
Summary

- Fix *Continuous Improvement Process* first (i.e., Horizon 1 processes).

- Define your innovation frontier, probably letting go of Horizon 3.

- Process is the most direct lever on culture.

- If you will pursue Horizon 2 innovation (Adjacent Growth),

  - Make an aggregate, general investment in exploration (e.g., ¼ – ½ % of revenues/budget).

  - Assign centralized organizational responsibility for H2 innovation (i.e., an innovation group).

  - Explicitly and transparently manage the opportunity portfolio and pipeline.

  - Take a portfolio perspective on success and failure.

  - Work with operating units from the start.