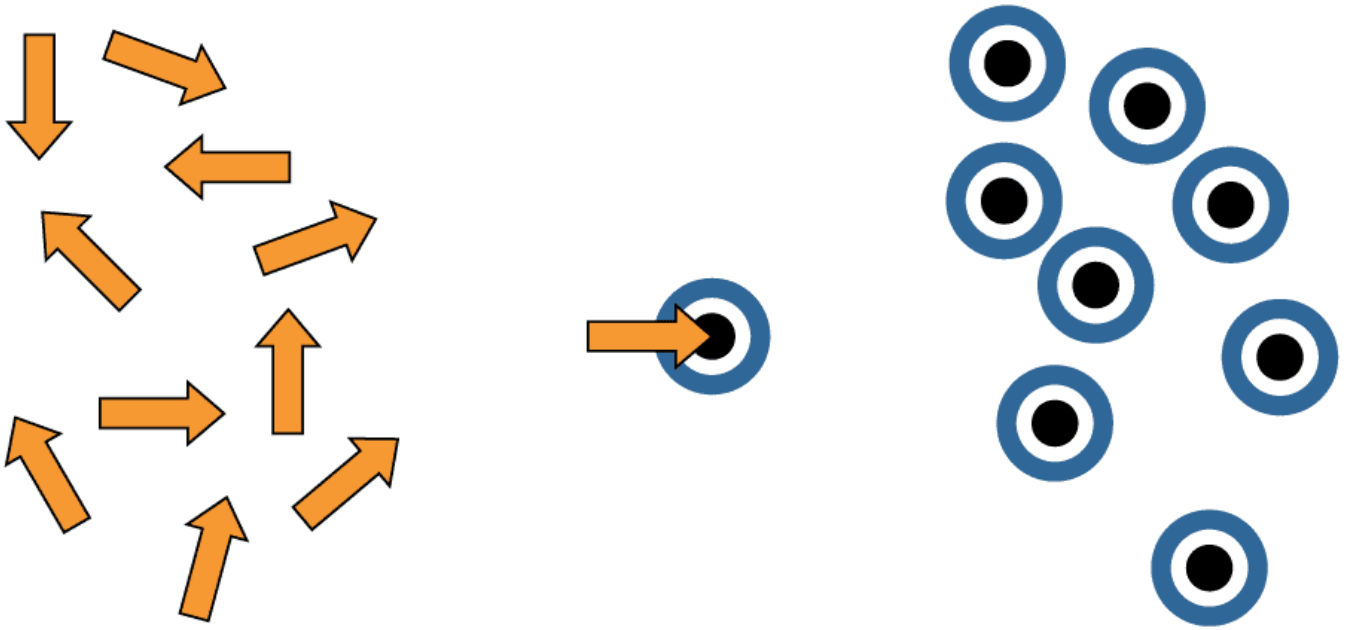

# Innovation – OIDD 614
# Summary

Professor Karl T. Ulrich
Vice Dean of Entrepreneurship & Innovation

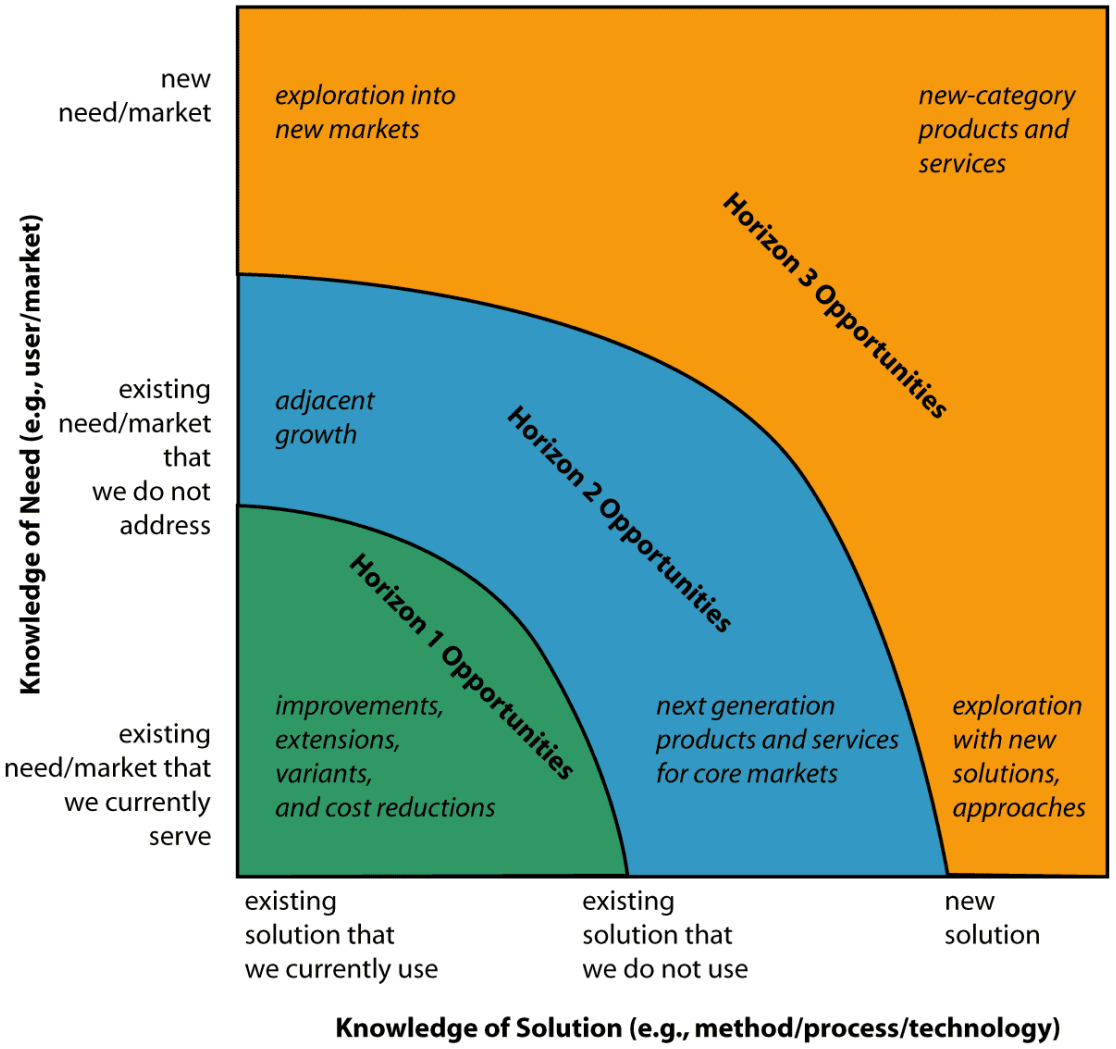
@ktulrich | ktulrich.com | ulrich@wharton.upenn.edu

# innovation

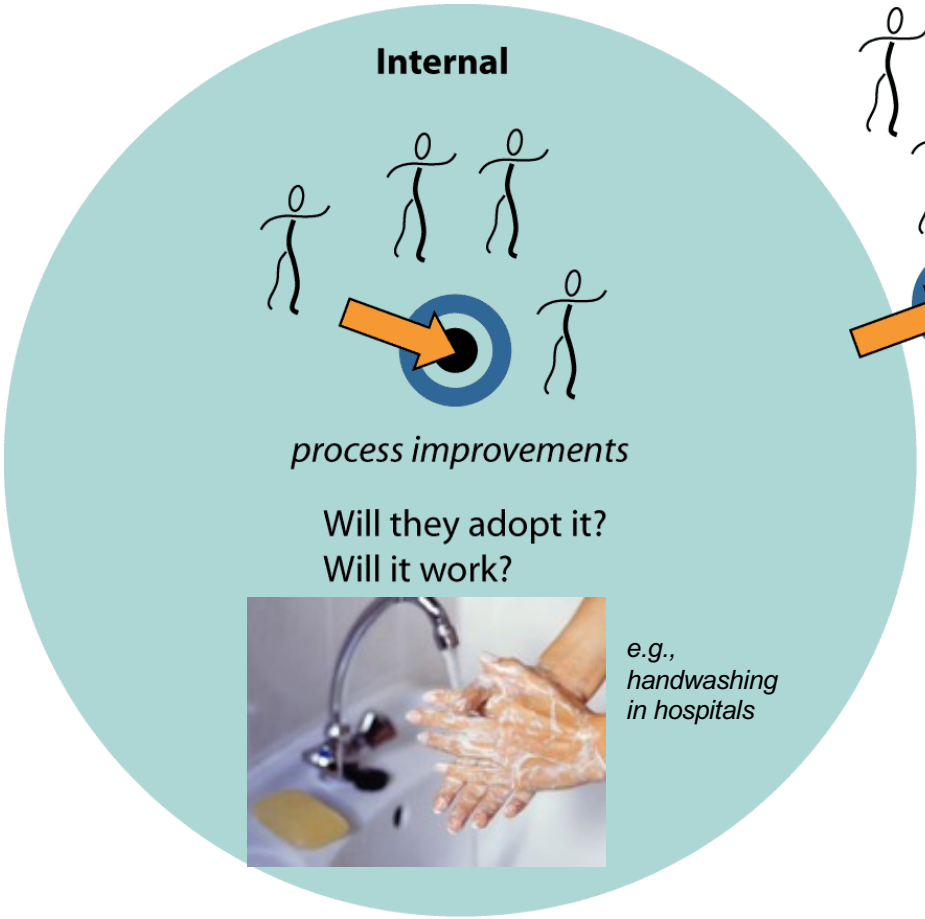
**A new match between a solution and a need.**



# Three Innovation Horizons



# Internal vs. External Innovation



## Value Creation and Capture in Innovation

1. How significant is the need?

2. How well does the solution meet the need?

3. Does the organization delivering the solution possess the required *alpha assets*?

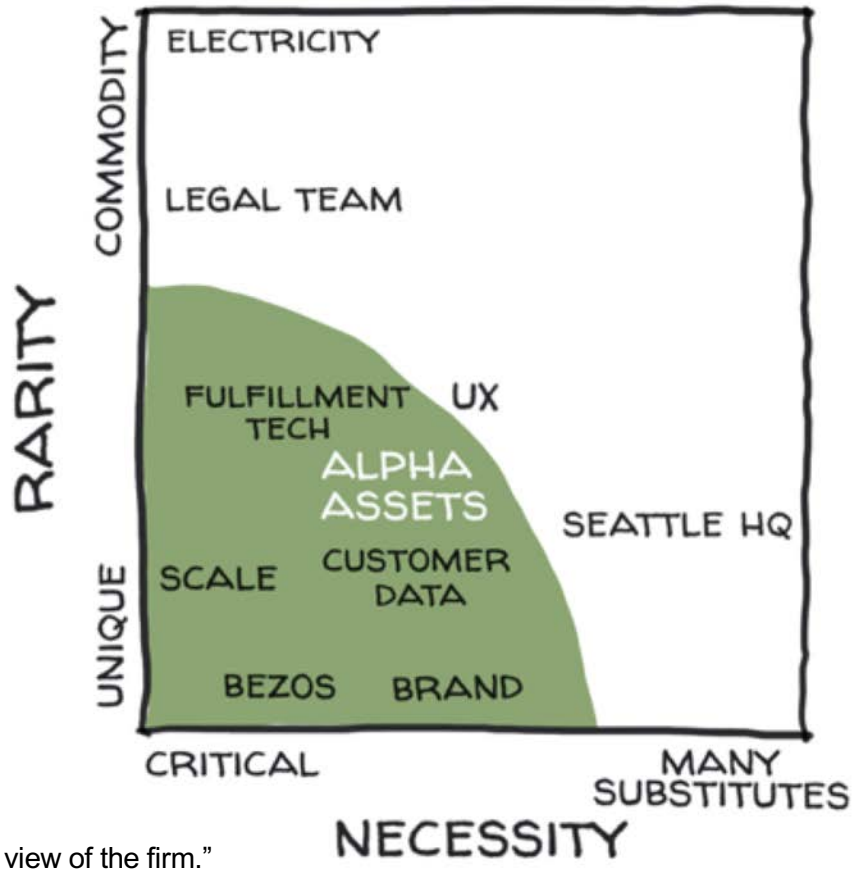
**Price – Cost >> 0**

## *Alpha Assets*: the *rare* and *necessary* resources to do the job.

Rare = How difficult would it be for a competitor to acquire the resource?

Necessary = To what extent is the resource required to do the job?
(i.e., To what extent is the resource non-substitutable?)

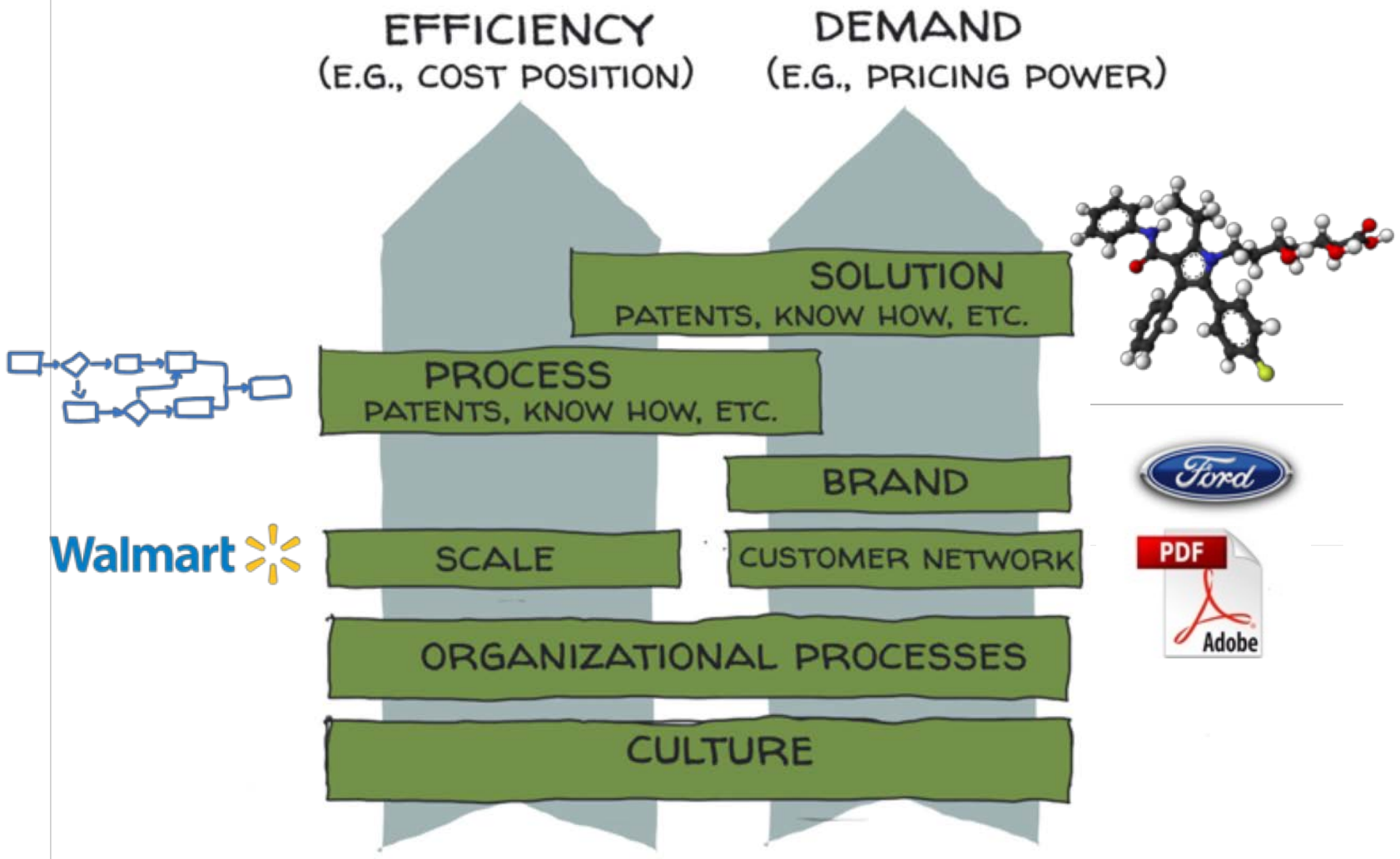
α β



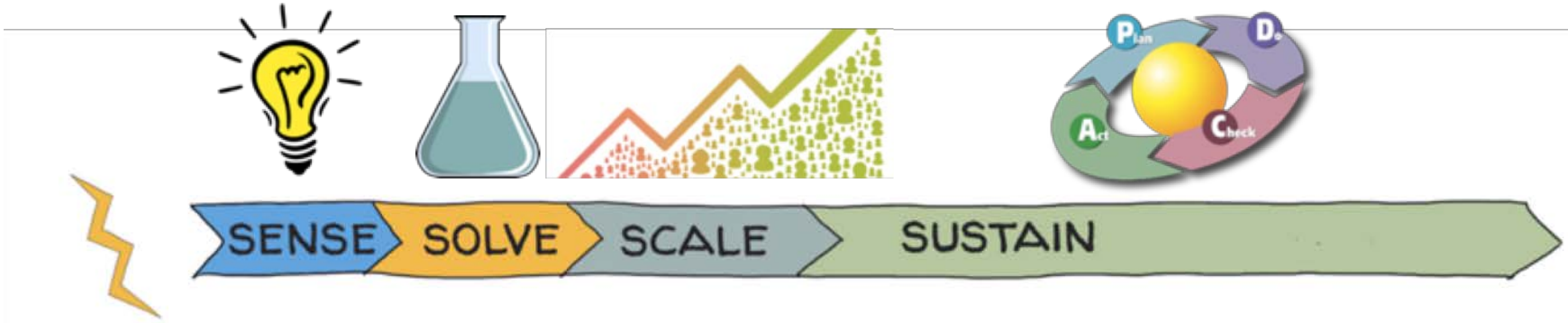

amazon

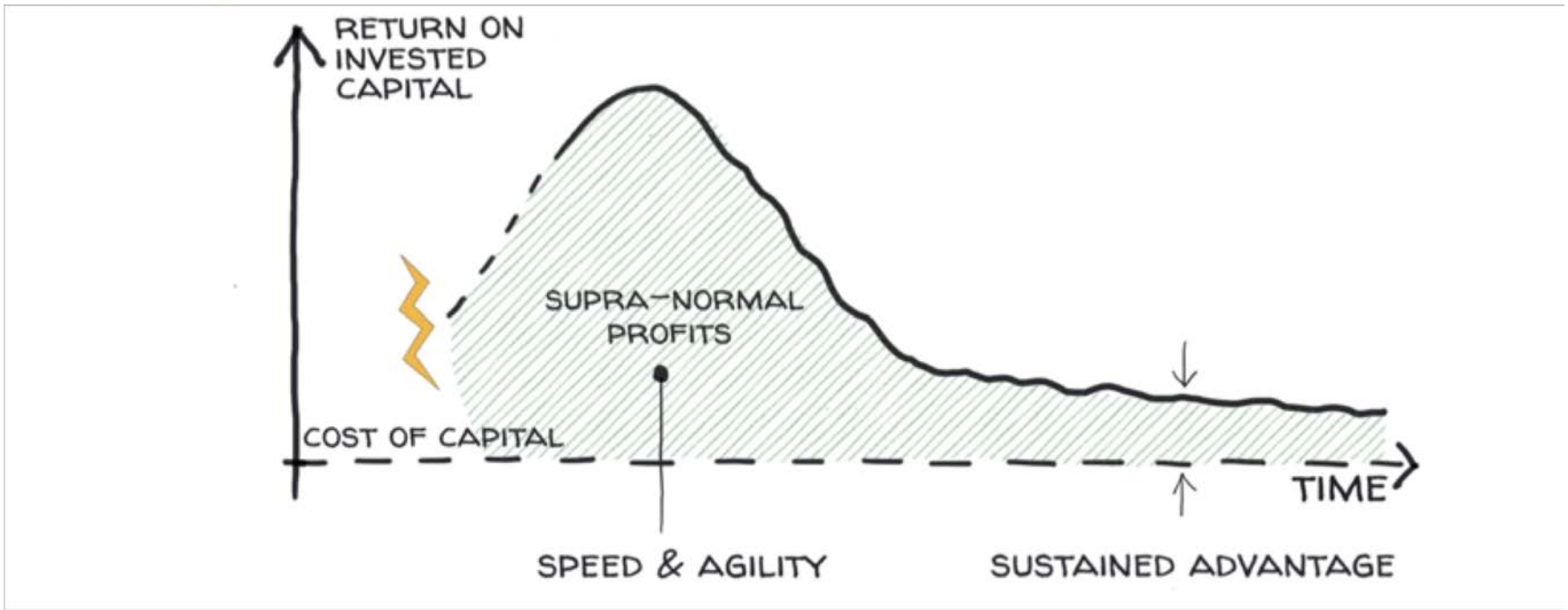
**More:** Jay Barney. "Resource-based view of the firm."

# Alpha Asset Template

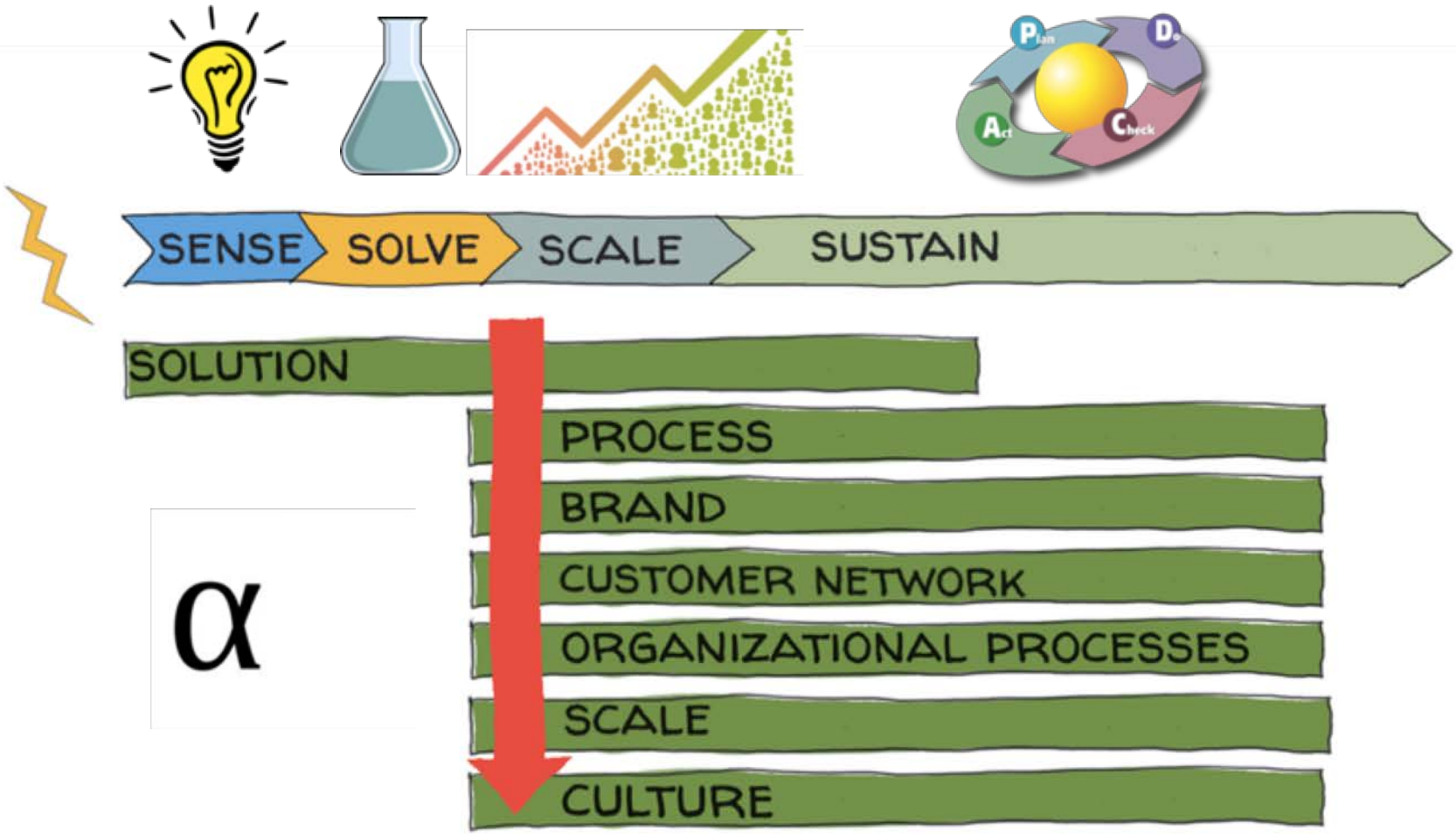


# The Lifecycle of an Innovation in Response to Disequilibrium

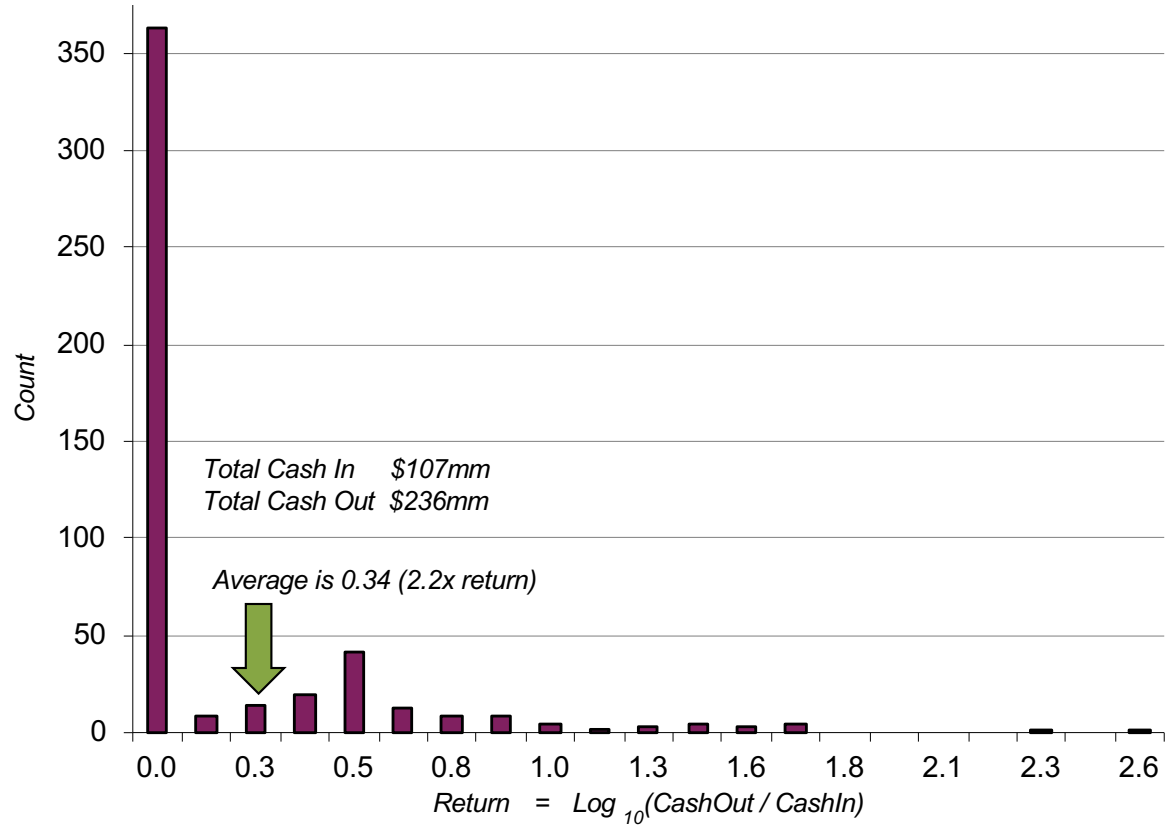


## Transition in Importance of Categories of Alpha Assets



# Histogram of Returns for 499 Ventures by Angel Investors

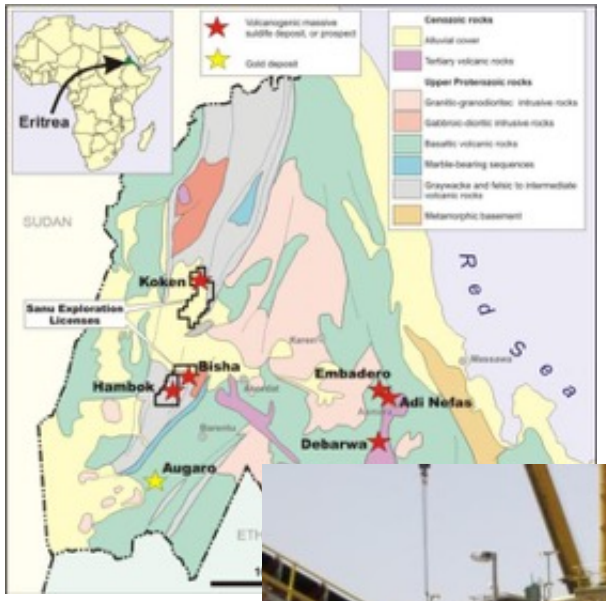



*e.g. 1,000,000 cash out on 100,000 cash in has Return of 1.0*

**Note:** Negative or undefined returns set to 0.
**Source:** Kauffman Foundation Angel Investor Performance Project.

**I**dea

$V = f( I, D, E )$

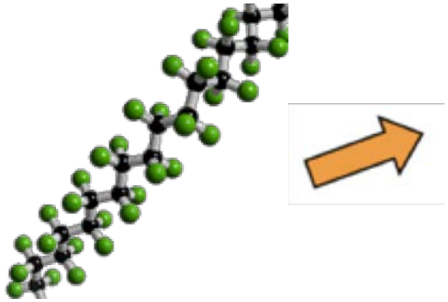



**D**evelopment

**E**xogenous *F*actors

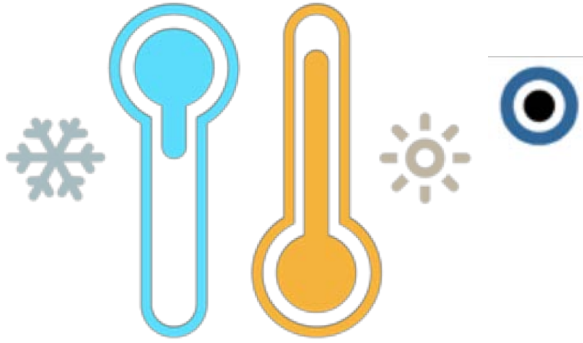
## *Push*

*Start with the solution and look for a need it can address.*




## *Pull*

*Start with the need and look for a solution to address it.*

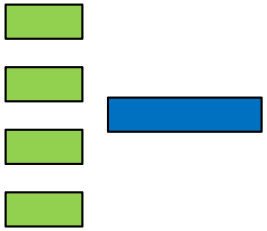


# Groups vs. Individuals in Idea Generation

*Group Approach*

30 minutes
4 people working together

*Hybrid Approach*

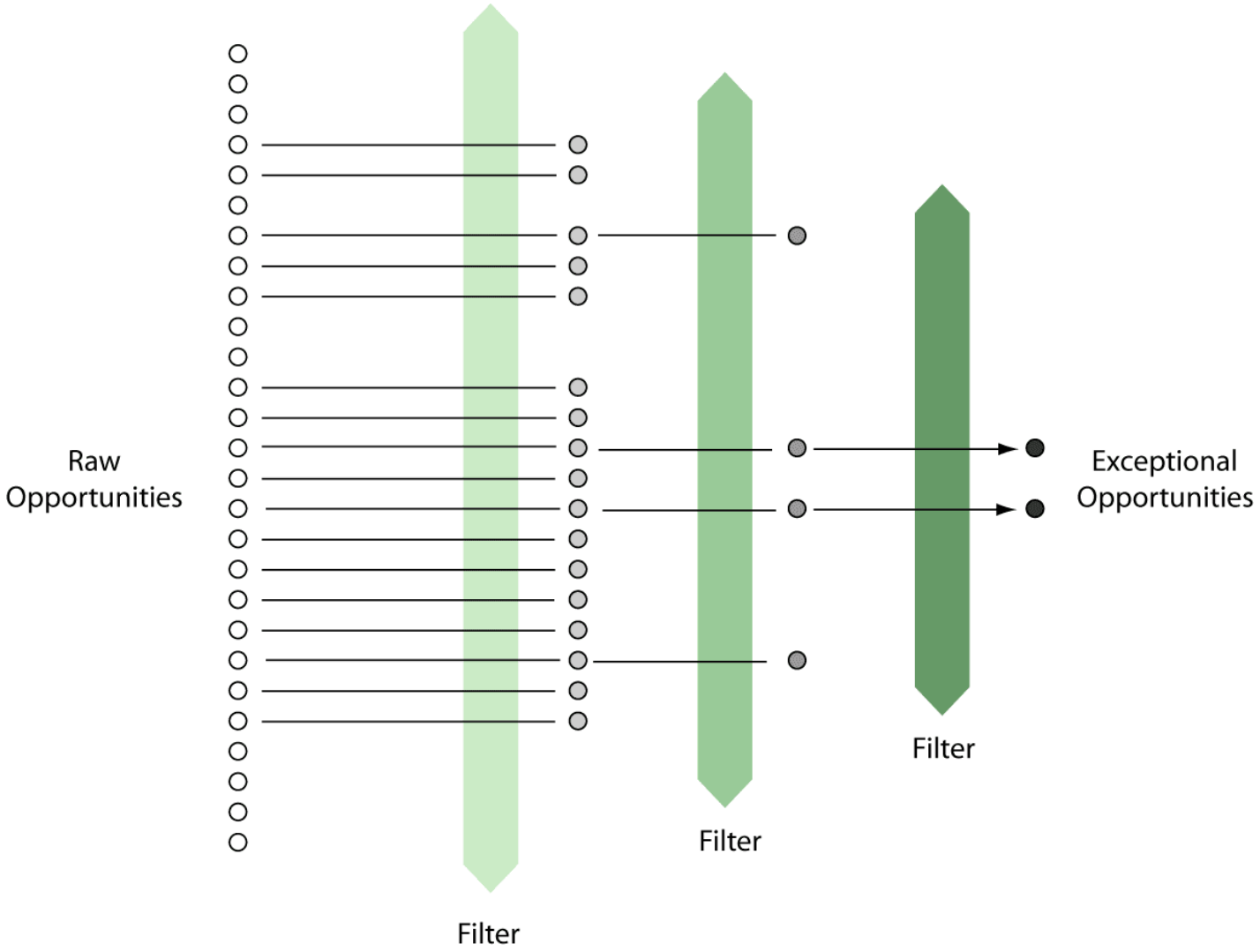


10 minutes
4 people working alone

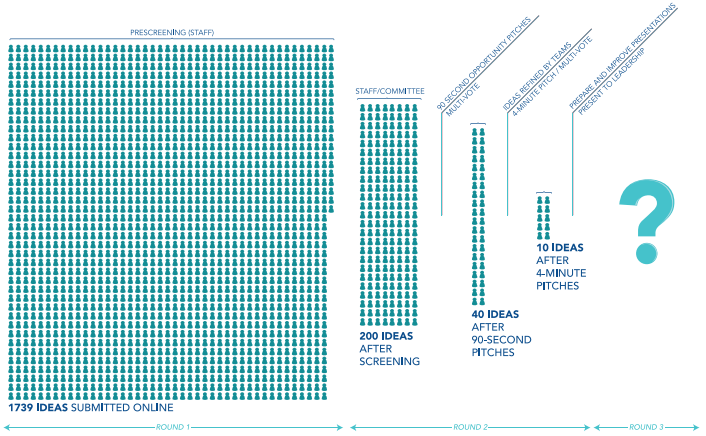
20 minutes
4 people working together

- 2.5 x more ideas
- Better quality ideas

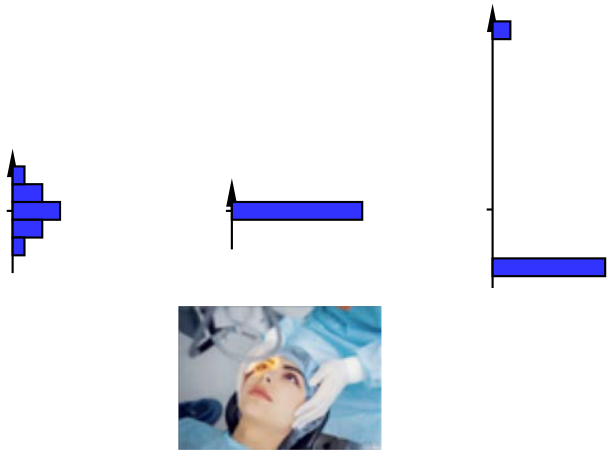
**Source:** Girotra, Terwiesch, and Ulrich. 2010. Idea Generation and the Quality of the Best Idea. *Management Science*. Vol. 56, No. 4, pp. 591–605. (Available via ktulrich.com.)


Raw
Opportunities
Filter
Filter
Filter
Exceptional
Opportunities

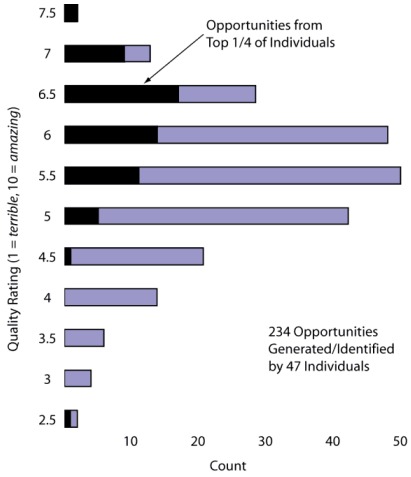
# Improving Performance of Tournaments



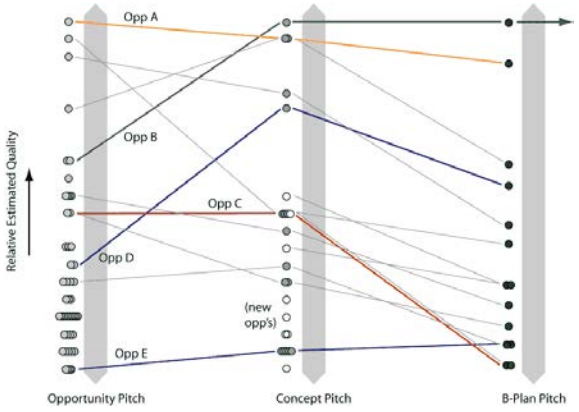

***Many*** **and** ***diverse*** **ideas via independent, parallel exploration.**



**Variance is your friend.**



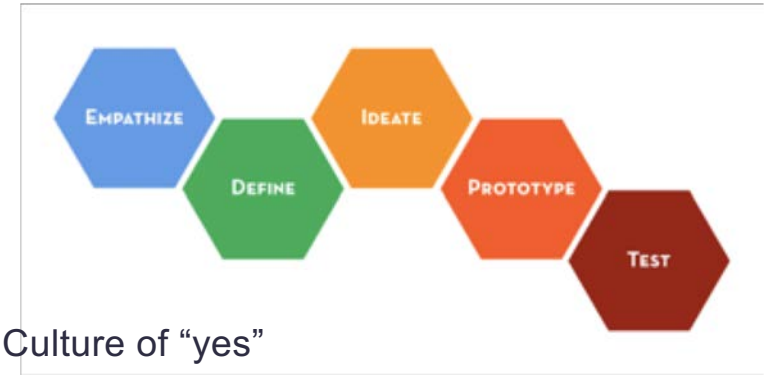

**Solicit participation from proven high performers.**




**Filters generous early in process and ruthless later in process.**

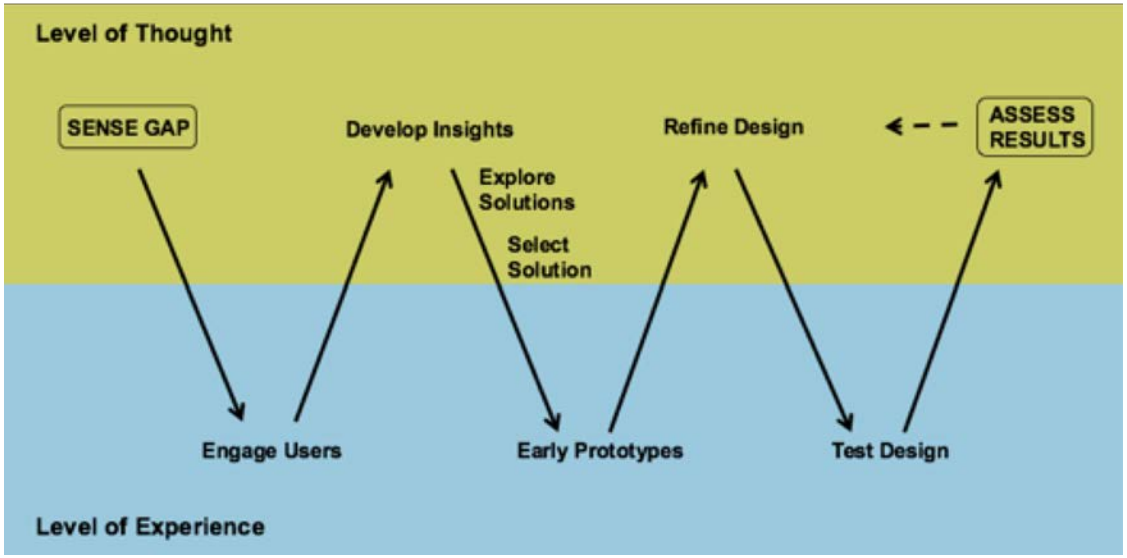
## Hallmarks of “Design Thinking”

- 5 Whys – abstracting problem deliberately
- User orientation, focus on empathy
- Observational methods
- Early prototypes
- Iterative refinement
- Visual expression

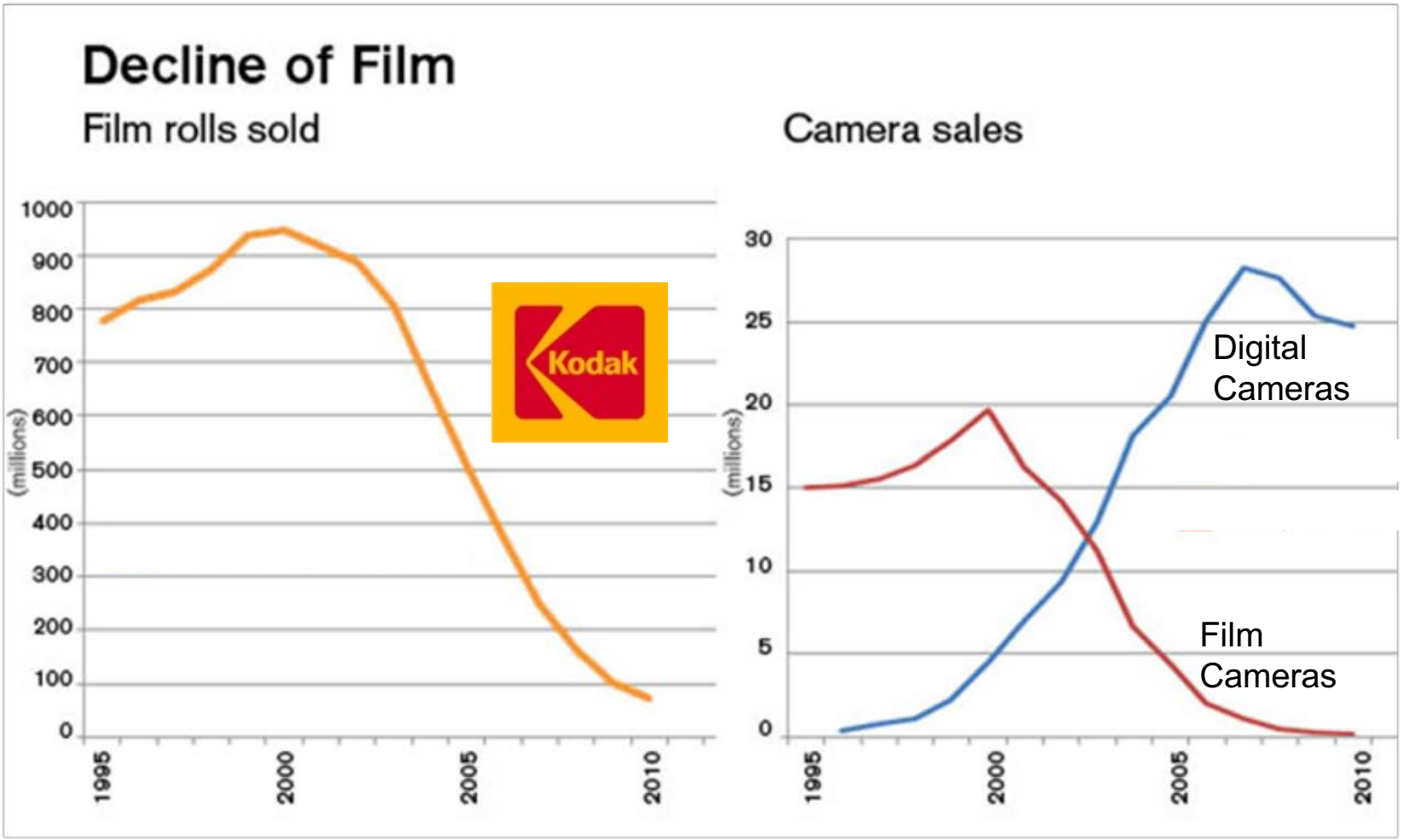



- Culture of “yes”
- Bias for action

Plus beauty, elegance, craft, and care.

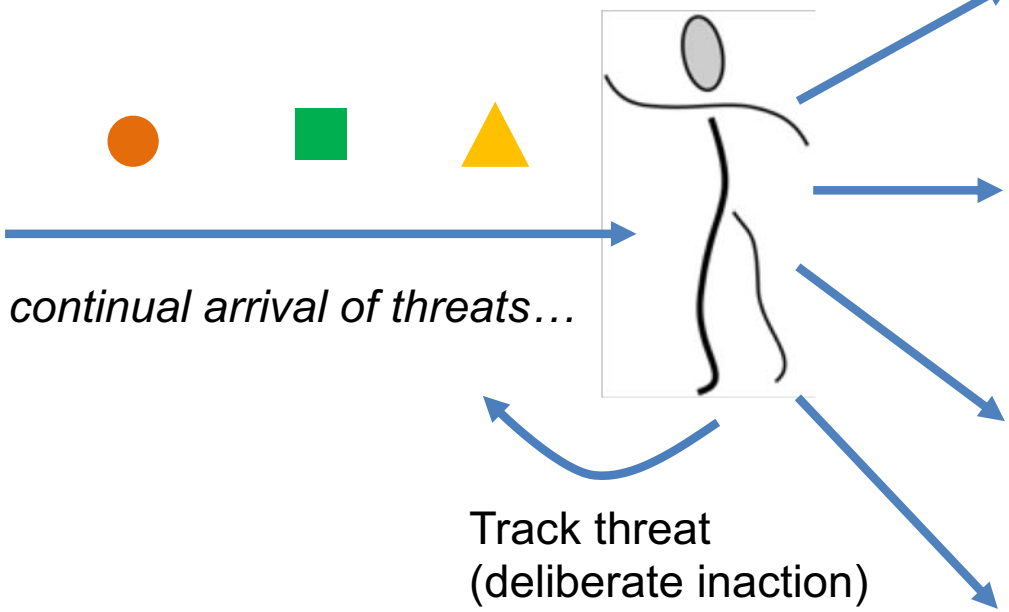


# The Disruptive Threat of Technological Change




*Source: PMA* (photo marketing association)

## Decision Problem




A. Jump fully (burn the boats)
- Works when technology does prevail and you have capabilities to win.

B. Invest in project, or firm, often autonomous.
- Works when technology does prevail and you have capabilities to win.
- Often incumbent does not fully commit.
- Legacy business may be an albatross.

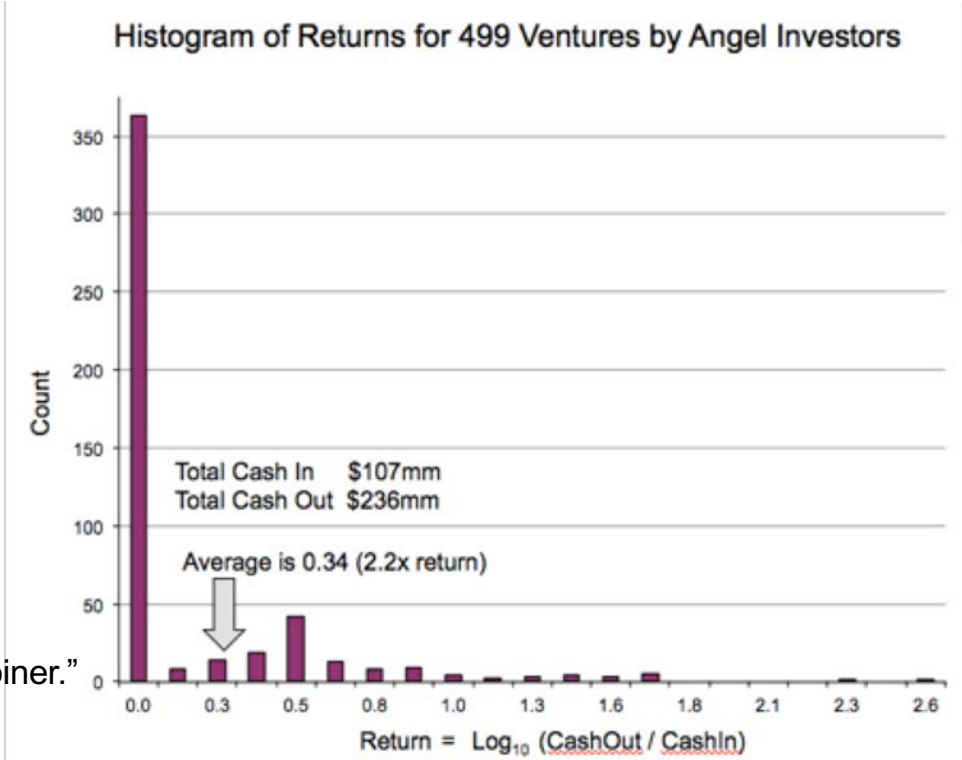
C. Anti-competitive action to kill rival.
- Acquire and kill.
- Sue.
- Attempt to control regulation.
- Likely can fight "weather pattern" only temporarily.

D. Concede and manage for cash.
- Often new technology does not dominate.
- Sometimes disruption takes a long time.
- Sometimes significant business remains.

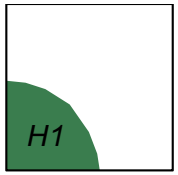
E. Proactively invest in adjacent opportunities with existing assets and capabilities.

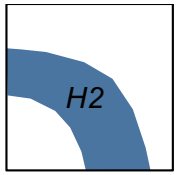
# Managing Risk as an Entrepreneur

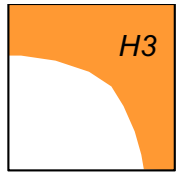
- You can't really get sufficiently diversified as an entrepreneur. (Need >25 deals.)
- You do it because you feel the calling.
  - *mission* and/or *process.*
- If your primary goal is a 95+% chance of being very comfortable financially, join a large established enterprise and work hard.




- 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.)




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

*Foundation of universally desirable elements of culture*

## Creating a Culture of Innovation

- 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.