



Innovation – OIDD 614

Managing the Threat of Disruption due to Technological Change

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As successful incumbent firms...



Offensively

How do we best discover and pursue opportunities for future growth?

Defensively

How do we mitigate the risk of disruptive innovation?



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Home Commitment Products and Services Community Contact

Established 1852. Re-established 2018 with a recommitment to you.

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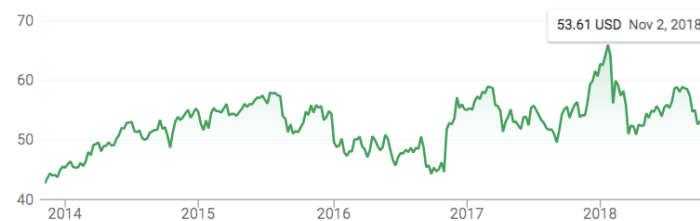
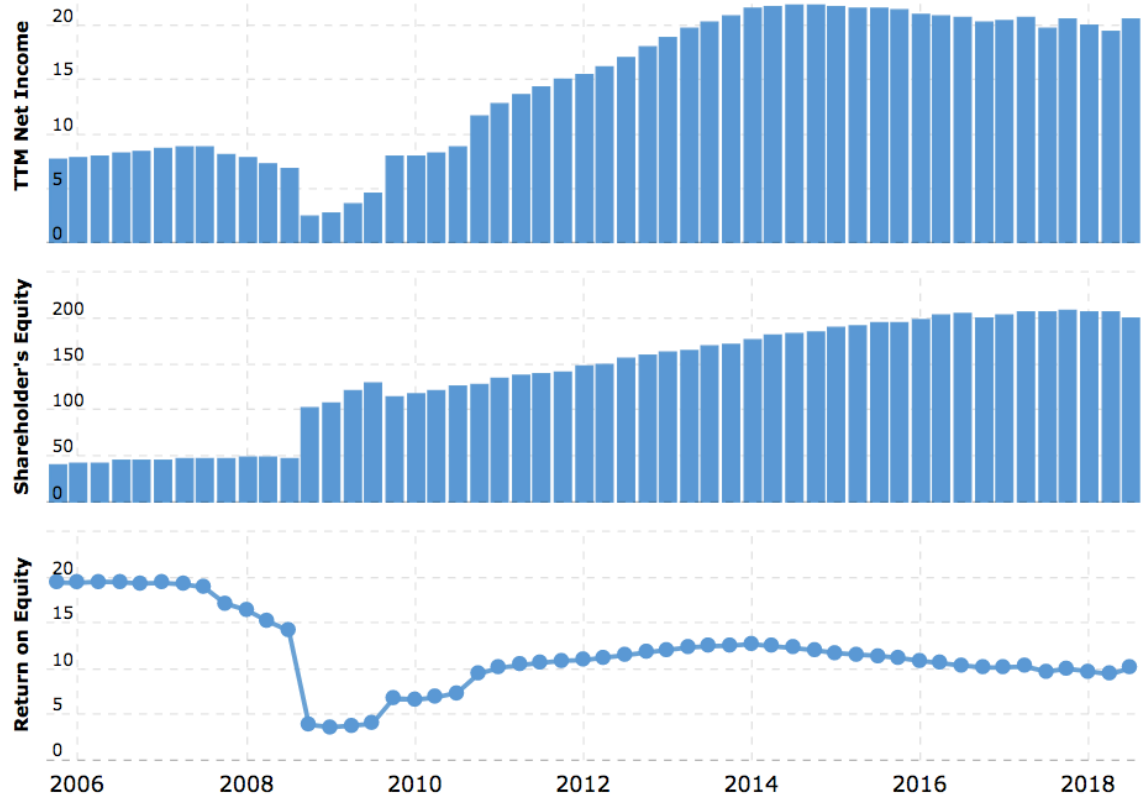
See what's new at Wells Fargo:

- Building a better bank
- Putting service first
- Upgrading our banking features
- Increasing community impact

Wells Fargo uncovers up to 1.4 million more fake accounts

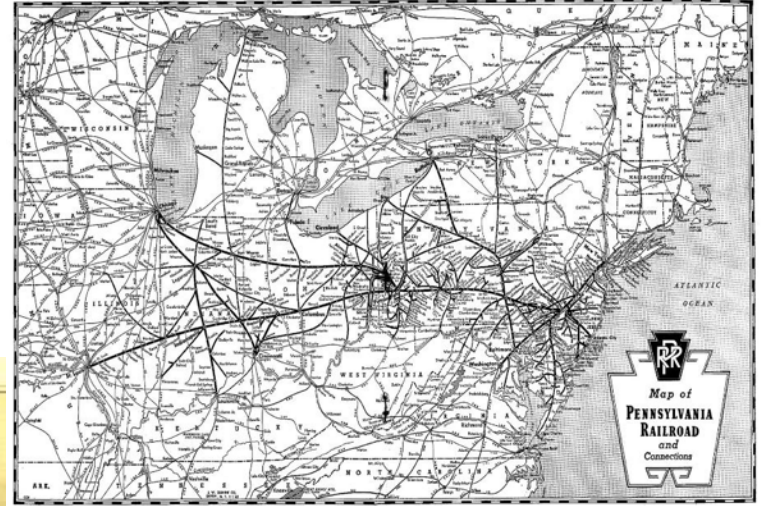
by Matt Egan @MattEganCNN

August 31, 2017: 12:34 PM ET

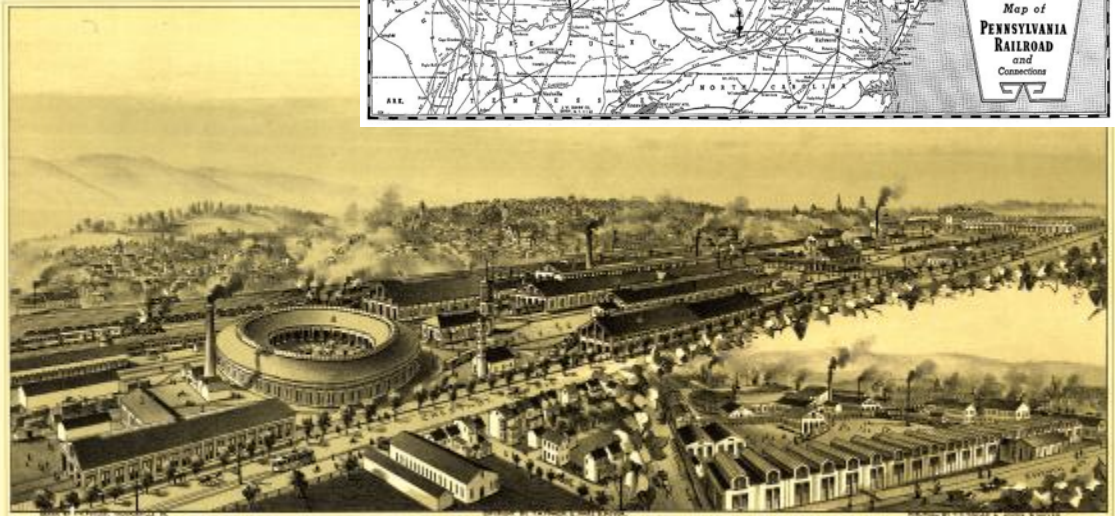


share price

Sustained advantage is often the result of reinforcing “core rigidities”



- c1870, the Pennsylvania Railroad was the largest business in the world.
- Market cap c1900 comprised more than 10% of the value of all public companies (roughly equal to combination of Apple, Microsoft, ExxonMobil, and Berkshire Hathaway).
- Dividends paid for over 100 years in a row.
- Peak employment (1920) of 279,787.



ALTOONA, PENNSYLVANIA
1895

PENNA R.R. CAR SHOPS,
ALTOONA, PENNSYLVANIA,
1895.

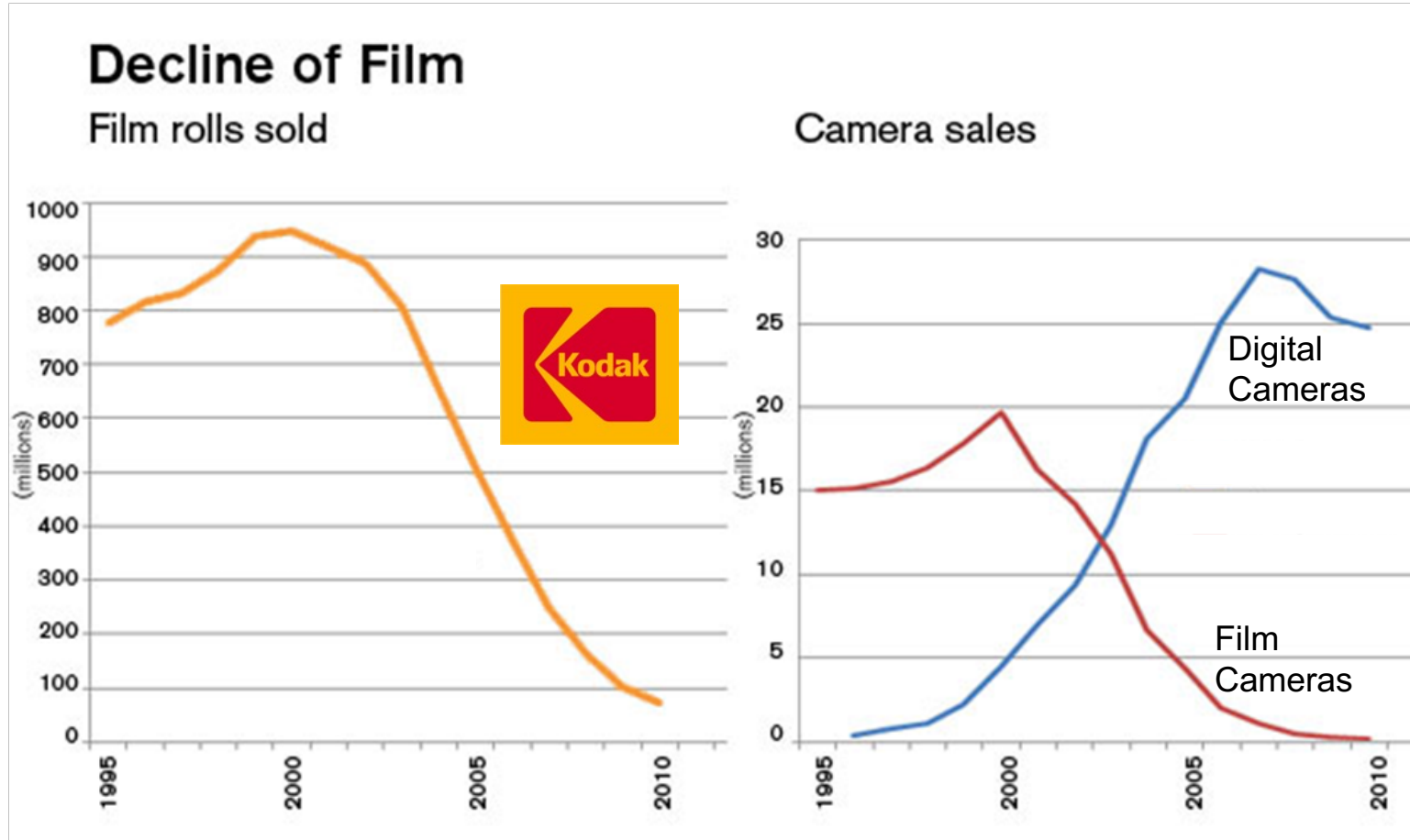
ALTOONA, PENNSYLVANIA
1895

Source: Hooversworld.com

Disrupt 1. interrupt (an event, activity, or process) by causing a disturbance or problem.



The Disruptive Threat of Technological Change



Source: PMA (photo marketing association)

Three Sources of Disequilibrium

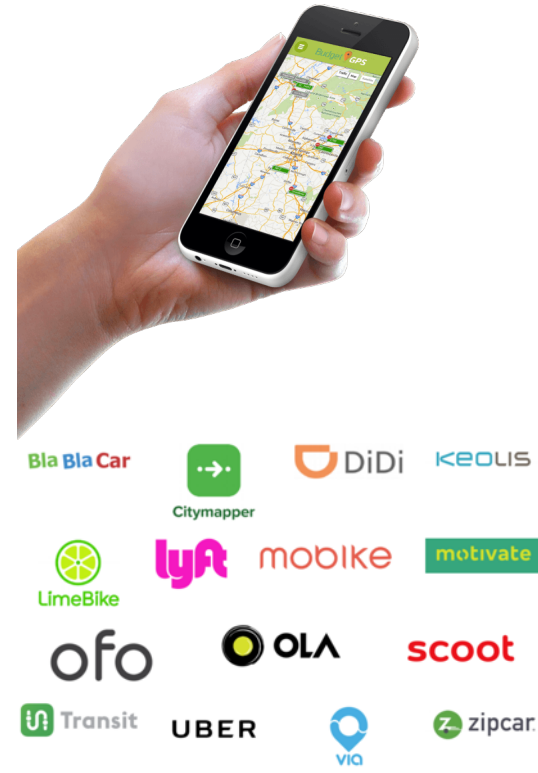
1

Invention of Superior Solutions



2

Enabling Technologies



3

Shift in Macro Environment



Tastes, trends, demographics, regulation, environment, politics.

YOUR READING LIST




The World's Most Influential Business Thinkers 2013



7 Ways To Get Ready For Retirement If You're 50 And Haven't Started Saving




9 Tips To Start Living, From A Woman Who Fired Herself

 Active on LinkedIn



How To Answer Six Tricky Interview Questions

 Active on LinkedIn



How Do Terrible Managers Keep Their Jobs?

The World's Most Influential Business Thinkers 2013



Susan Adams, FORBES STAFF

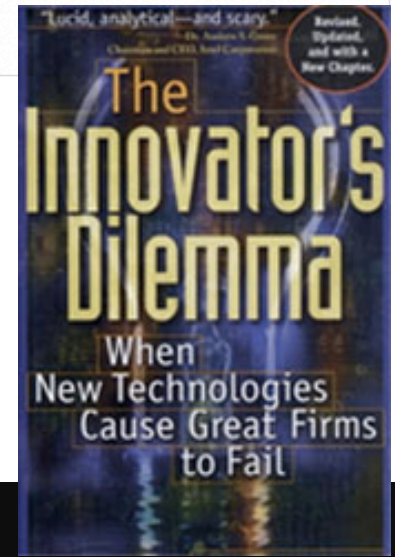
I write about entrepreneurs, small business owners & what drives them [FULL BIO](#)

Clayton Christensen is still the most influential business thinker in the world, according to Thinkers50, a just-released ranking put out every other year by the consulting team [Crainer Dearlove](#).

Christensen, a professor at Harvard Business School and the author of business best-sellers including *The Innovator's Dilemma*, is familiar to Forbes readers. He has written for the magazine and Forbes has put him on the [cover](#). The Thinkers50 awards announcement says:

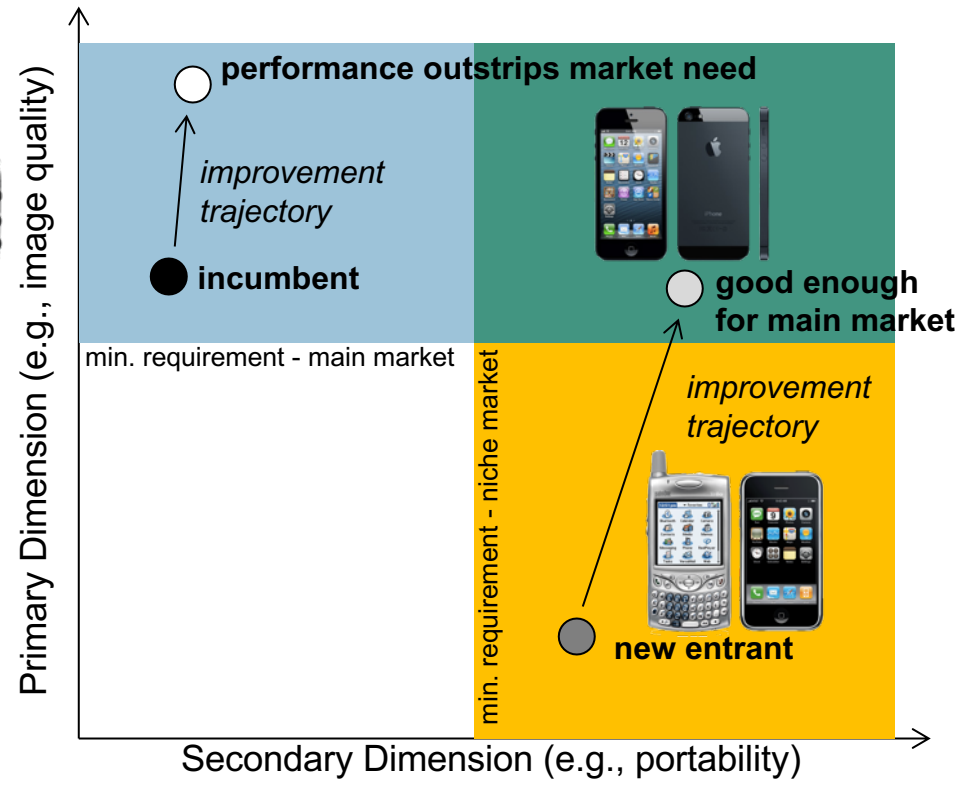


Clayton Christensen: Still the most influential (photo: [+])



Generalization of the Christensen Phenomenon

- Incumbent focuses on consensus performance dimension (e.g., image quality)
- New entrant enters a niche market with a product that is inferior on traditional metrics, but much better relative to some *previously latent* need (e.g., portability). This product also has lower unit price.
- Eventually “inferior” product becomes “good enough” for the mainstream market.
- Incumbent is disrupted.



Creative Destruction – Imaging

“job to be done” = record images



B. Franklin

Drawing &
Painting

c30,000BC – present



B. Pascal

Death Mask

c1000 - c1865



Silver Halide
Plates

c1837 - c1910



Silver Halide
Film

c1887 – c2005



CCD Chip
in Cameras

c1990 -



Embedded in
Mobile Computer

c2008 -



Pro/Prosumer
Cameras



Image
Management

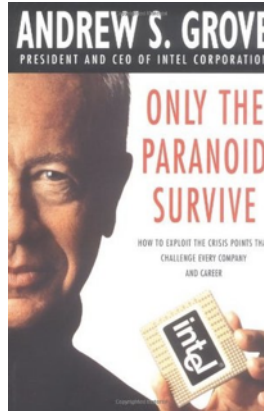
Current Prescription for Best Practice

- “Only the paranoid survive.”
- Disrupt yourself before you are disrupted.

Implication

You as manager should be preparing to adopt discontinuous innovation to secure the enterprise's future.

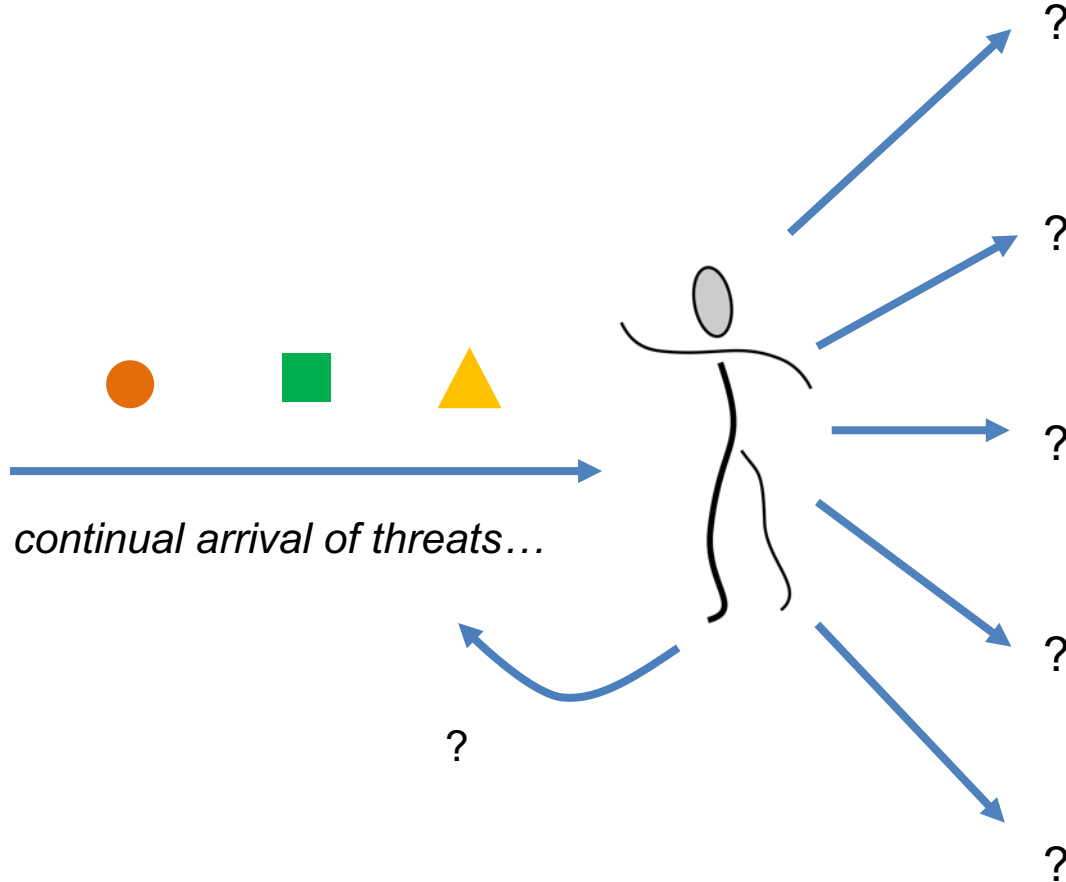
Fundamentally a critique of myopic managers.





Nokia CEO said We didnt do anything wrong, but somehow, we lost

What should the incumbent manager do?



Desirable Qualities of Policy

- Robust prospectively across all incoming threats, not based on a retrospective analysis of those threats that *did* result in disruption.
- Explicit acknowledgment of the economic costs of responding to threats.
- Contingent on firm assets and capabilities.
- Recognition that there may be conditions under which there is no winning move.

Disruption of Incumbents Due to *Technological Change* is Exceedingly Rare

- About 5000 active publicly traded companies in the U.S.
- From 2005 – 2015, about 16 bankruptcies substantially driven by disruption from technological innovation. (Total of about 500 bankruptcies; many driven by the great recession.)
- Yearly base rate of bankruptcy from disruption due to tech change is therefore ~ 0.00032

Retailing

Circuit City
Tweeter
Borders

Blockbuster

Photos

Kodak

Media / Print

Ziff Davis
Tribune Co.
Sun-Times Media
Readers Digest

Muzak Holdings

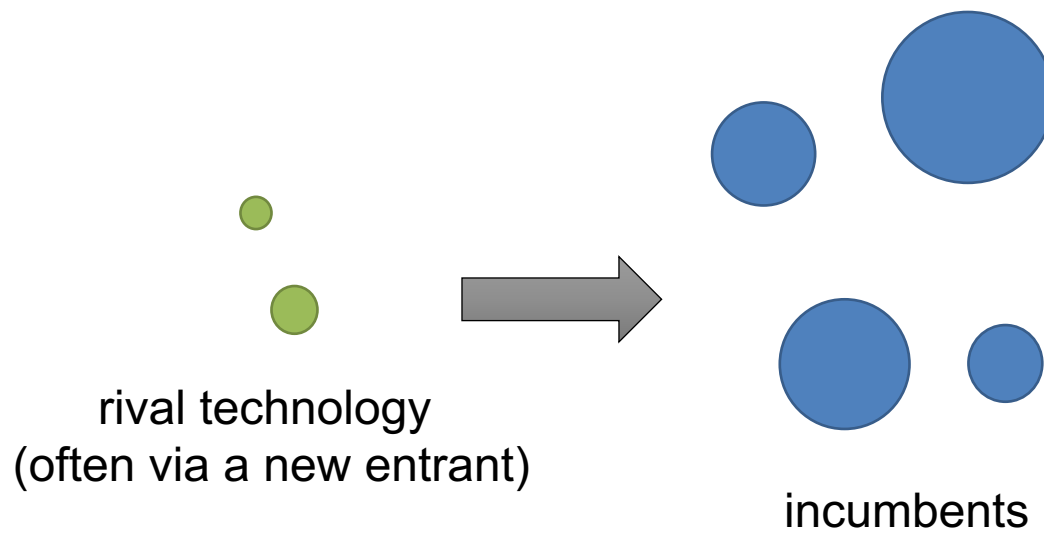
Standard Register
(printed forms)

Computing & Telecom

Silicon Graphics
Nortel Networks



Focus on incremental improvement of activity network of firm without significant investment in chasing technological threats is probably a very good default strategy.



Conditions for Disruption

- 1 A substantial fraction of the market must prefer the new product or service. (i.e., The rival technology must prevail.)
- 2 The incumbent must be unable to profit by providing the rival technology.

Condition 1:

New technology is *better*, preferred by a majority of the market.



How would you bet?

What about in 1960?

rivals to blade and razor

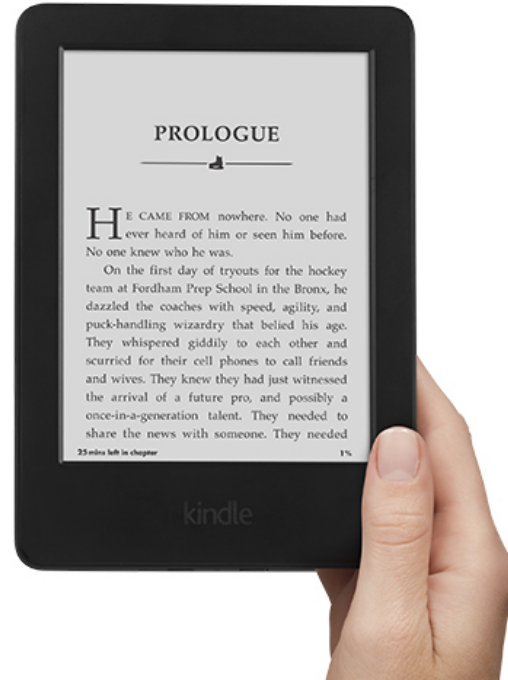
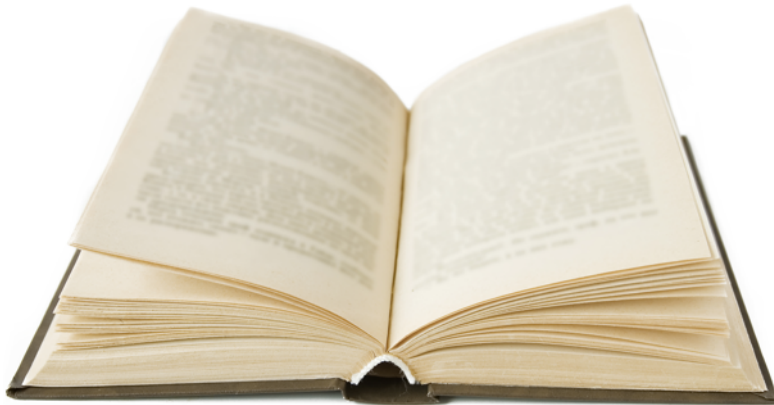


(How to think about Harry's, Dollar Shave Club, et al.?)

Condition 1:

New technology is *better*, preferred by a majority of the market.

How would you bet?

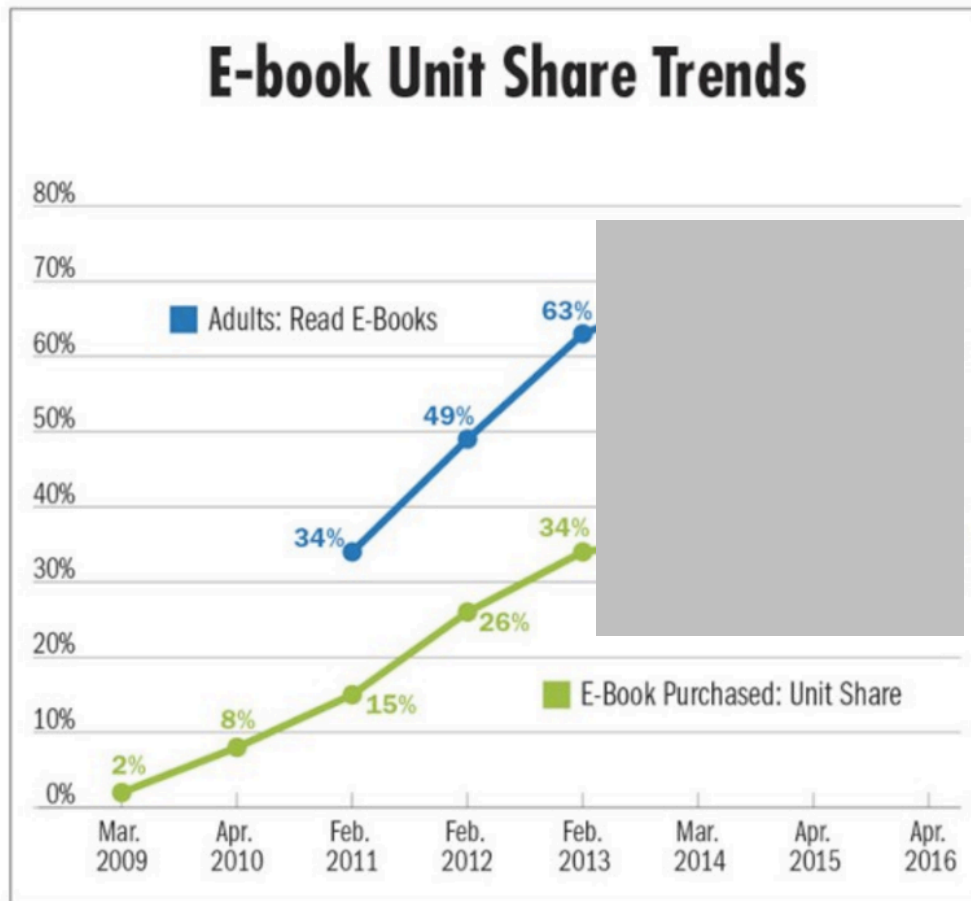


Poll

What share of books sold in the U.S. in 2020 will be in ebook form?

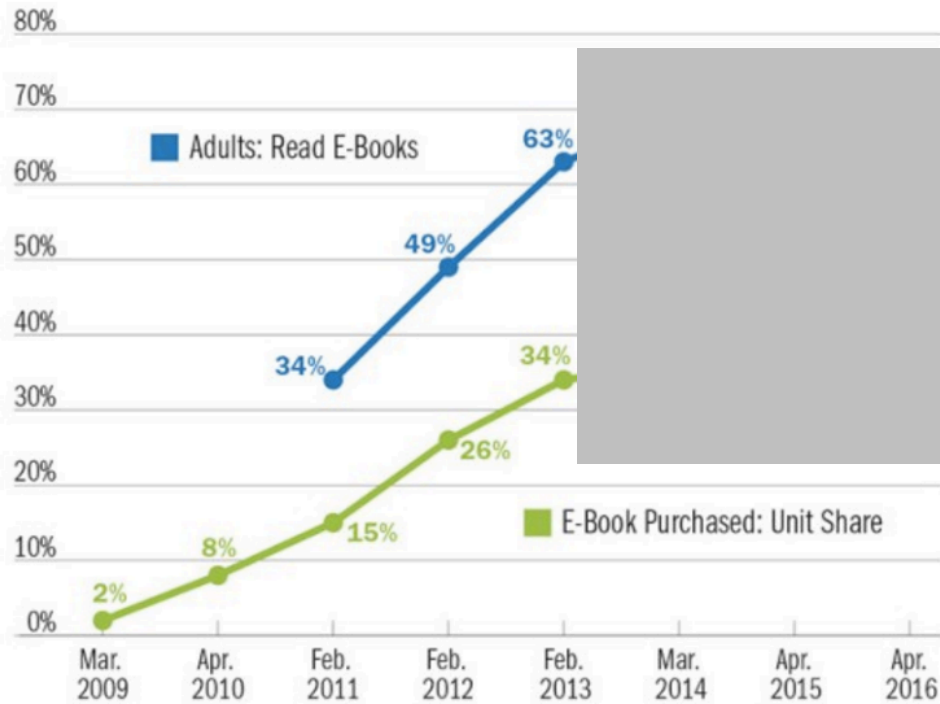
- <20%
- 20-30%
- 30-40%
- 40-50%
- 50-60%
- 60-70%
- 70-80%
- >80%

U.S. Data



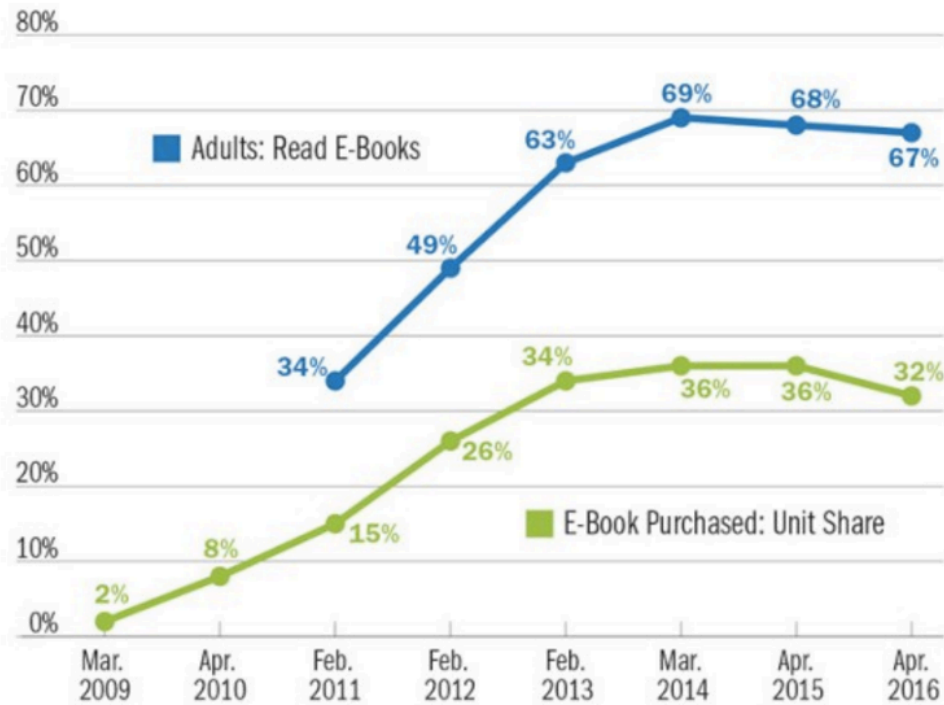
Source: Statista

E-book Unit Share Trends



Source: Statista

E-book Unit Share Trends



Source: Statista

BUSINESS DAY

Tesla Passes Ford in Market Value as Investors Bet on the Future

By BILL VLASIC and NEAL E. BOUDETTE APRIL 3, 2017



How would you bet?



		Valuation				
	Company name	Price	Change	Chg %	d m y	Mkt Cap
TSLA	Tesla Inc	344.57	-2.59	-0.75%		57.91B
DDAIF	Daimler AG	91.00	+0.33	0.36%		97.31B
F	Ford Motor Company	12.07	-0.11	-0.90%		47.95B
GM	General Motors Co...	43.86	-0.17	-0.39%		62.30B
RNSDF	RENAULT SA	109.70	0.00	0.00%		32.44B
HMC	Honda Motor Co Lt...	35.86	-0.47	-1.29%		65.07B
AUDVF	AUDI AG	1,025.95	+63.95	6.65%		41.37B

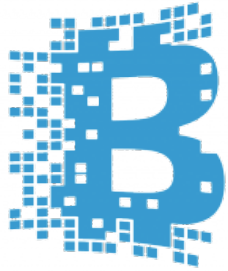
is in the United States is slowing
ish on auto stocks.

[tric-vehicle](#) upstart, continues to

in market value for the first time

neral Motors, starkly illustrating

How would you bet?



BLOCKCHAIN



How would you bet?

JUST

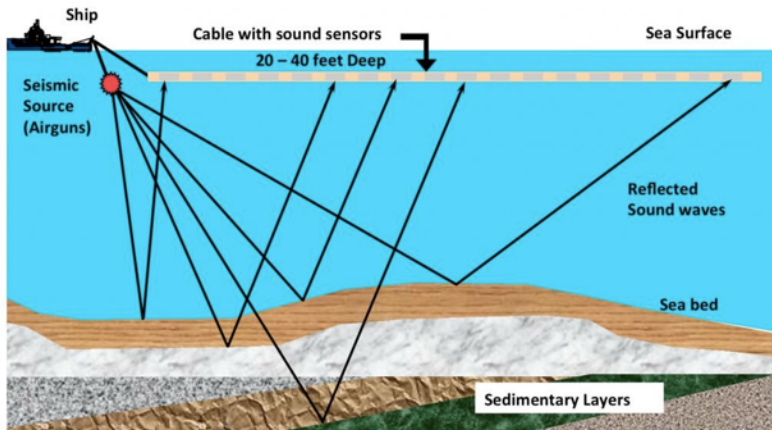


Exploration vs. Exploitation

James March (1991) defined organizational concept of *exploration* and *exploitation*.

Exploration:

Where is the next oil well location?



Exploitation:

How do we best extract and refine the oil?

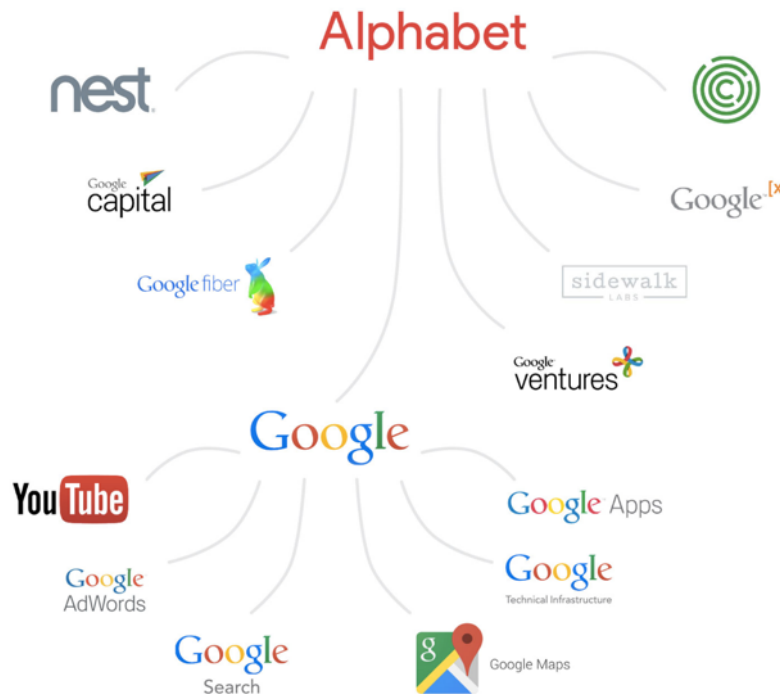


James G. March. 1991. Exploration and Exploitation in Organizational Learning. *Organization Science*.
<http://dx.doi.org/10.1287/orsc.2.1.71> p. 71 - 87.

Exploration vs. Exploitation

There is a cost to “ambidexterity” in organizations. Exploration is not free.

Core rigidities confer significant advantage.



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Chris Ciaccia

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Other assets



TRENDING

Under Armour Just Released
Sneakers That Are the First-E
Designed by 'The Rock'

Condition 2:

Incumbent *can not/does not* profit by supplying the rival technology.

- a. Value is redistributed fundamentally and surplus largely goes to consumer.
- b. The rival technology can not be imitated because it is controlled by others (e.g., patents, trade secrets, standards).
- c. The rival technology is not successfully adopted by the incumbent firm. (The incumbent does not possess or can not acquire the relevant alpha assets.)

2a. The new technology may radically redistribute value – and the surplus may go to the consumer.

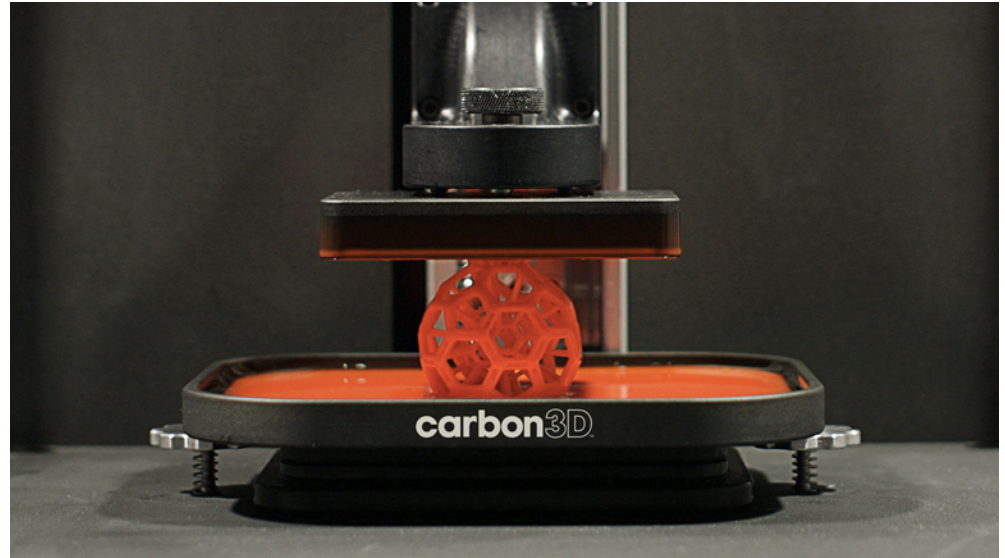


Kodak peak value ~ 47B USD (2017 dollars)

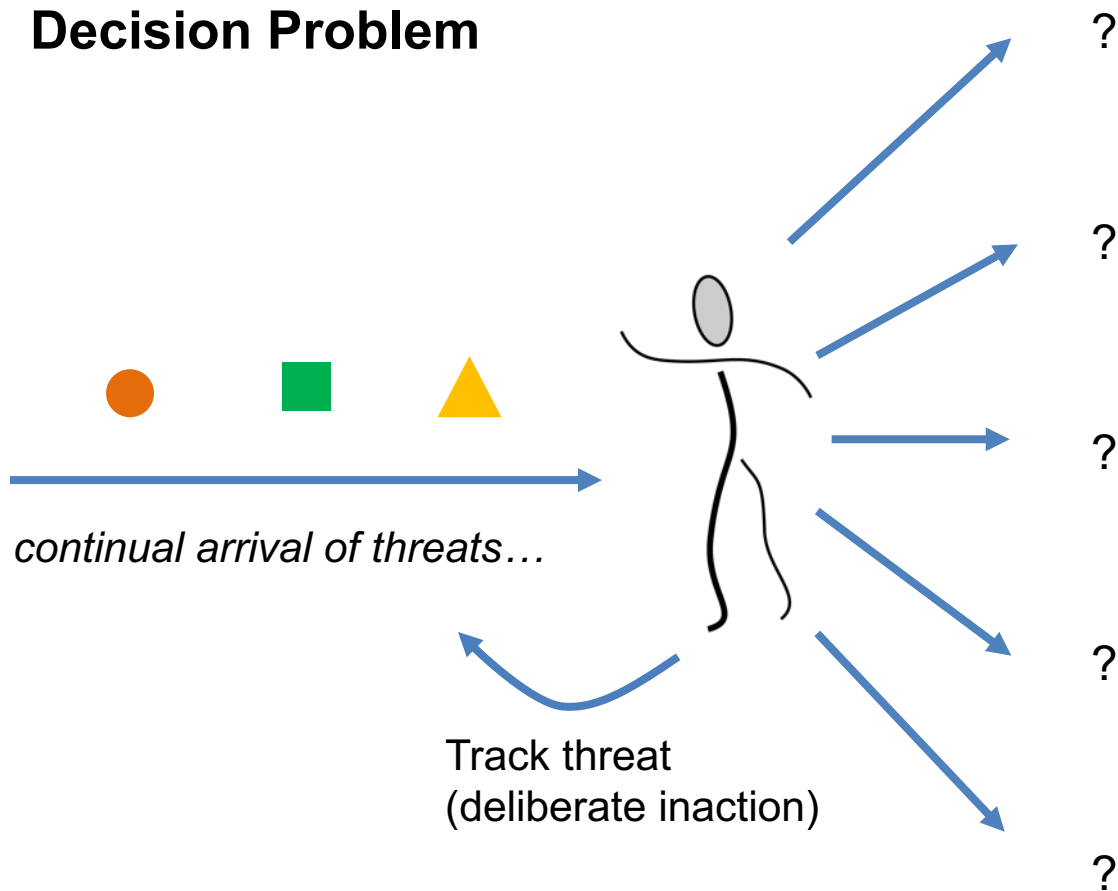


Shutterfly market cap ~2B USD

2b. The technology can not be adopted by any incumbent because it has been *appropriated* by the rival, usually via patents or trade secrets. (Rare.)



Decision Problem



If and when the technological threat is clearly real, what does an incumbent do?

In the face of potential disruption by Amazon,
what could Borders have done in 2000?

amazon.com[®]
and you're done.[™]

c2011



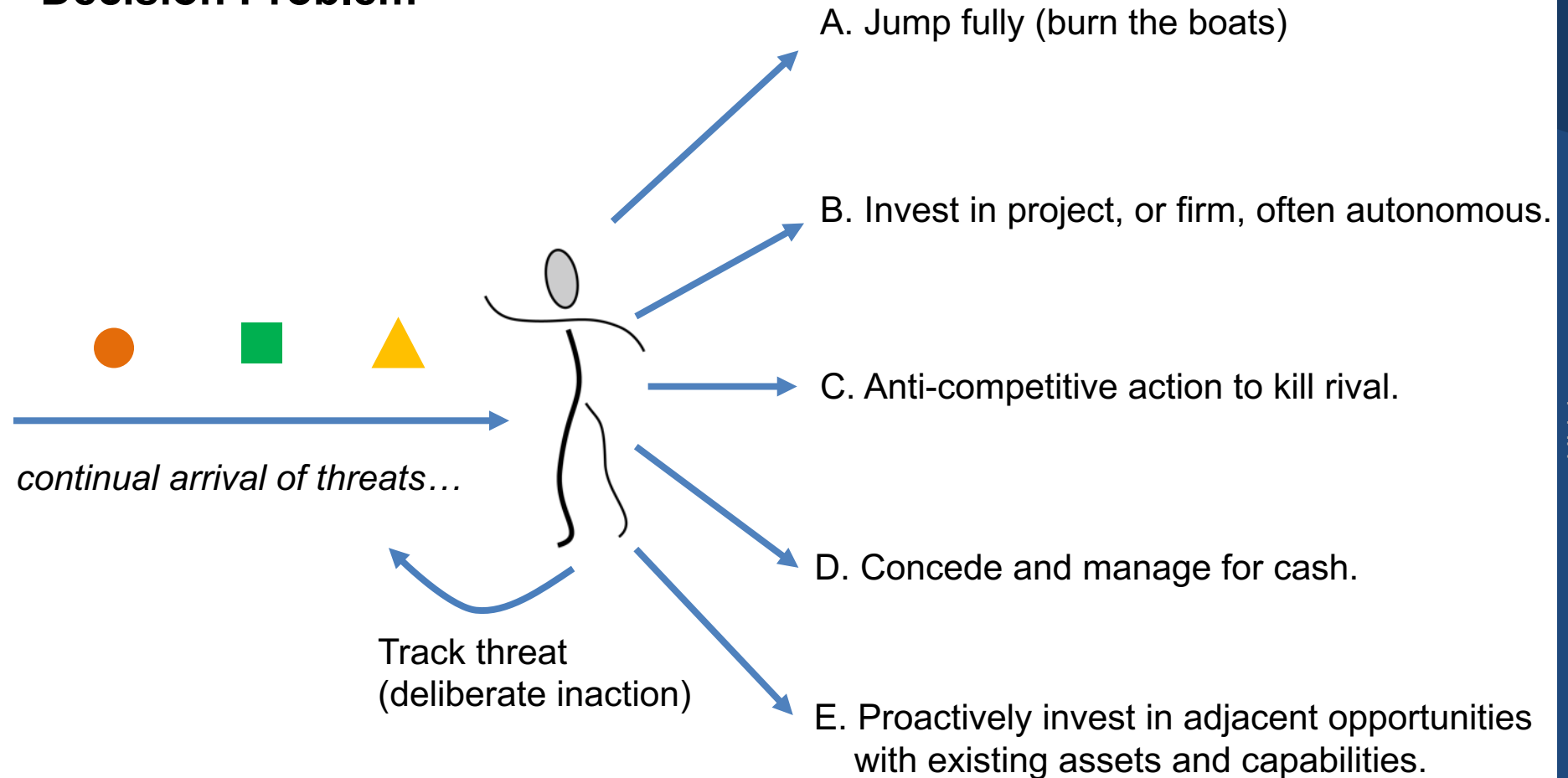
Borders Assets and Capabilities c2000

- Brand “Borders” with high customer satisfaction and significant brand equity.
- Excellent retail locations.
- Capabilities in:
 - Managing temporary workforce.
 - High variety inventory management.
 - Retail environment design.
 - Store location analysis.
- Strong balance sheet and cash flow.



(Which of these are true *alpha* assets?)

Decision Problem



A. Jump Fully

Bill Gates 1995 “Internet Tidal Wave” Memo

<http://www.lettersofnote.com/2011/07/internet-tidal-wave.html>



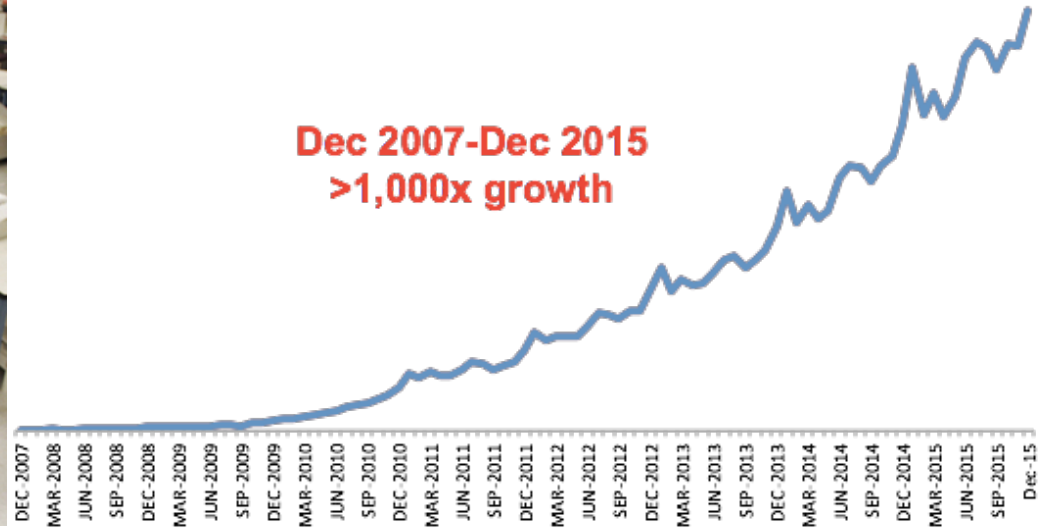
B. Hedging Initiative (investment in project or firm)

e.g., Netflix DVD by mail vs. streaming



Monthly Streaming Hours

**Dec 2007-Dec 2015
>1,000x growth**



Source: Netflix

(Large Company) Shareholder Perspective

- Your job as manager is not to diversify my portfolio. I can do that myself (e.g., I can buy AMZN).
- Your job is to maximize value (future cash flows) using our assets and capabilities.
- The last thing I want you to do is invest our cash and other assets in the rival technology – if those investments do not have positive NPV.

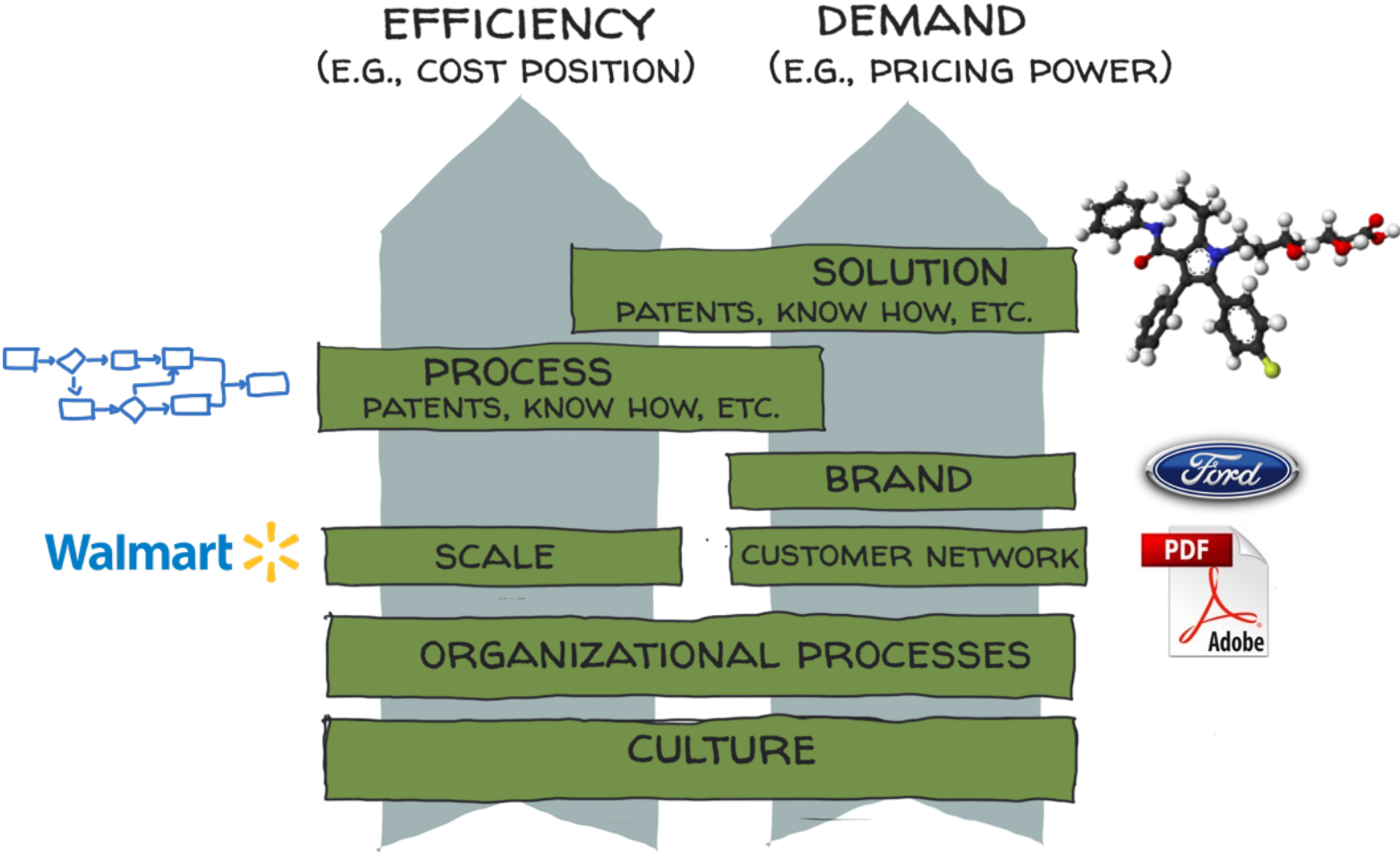
Going head to head with Jeff Bezos in internet retailing and ebooks is probably the wrong answer!



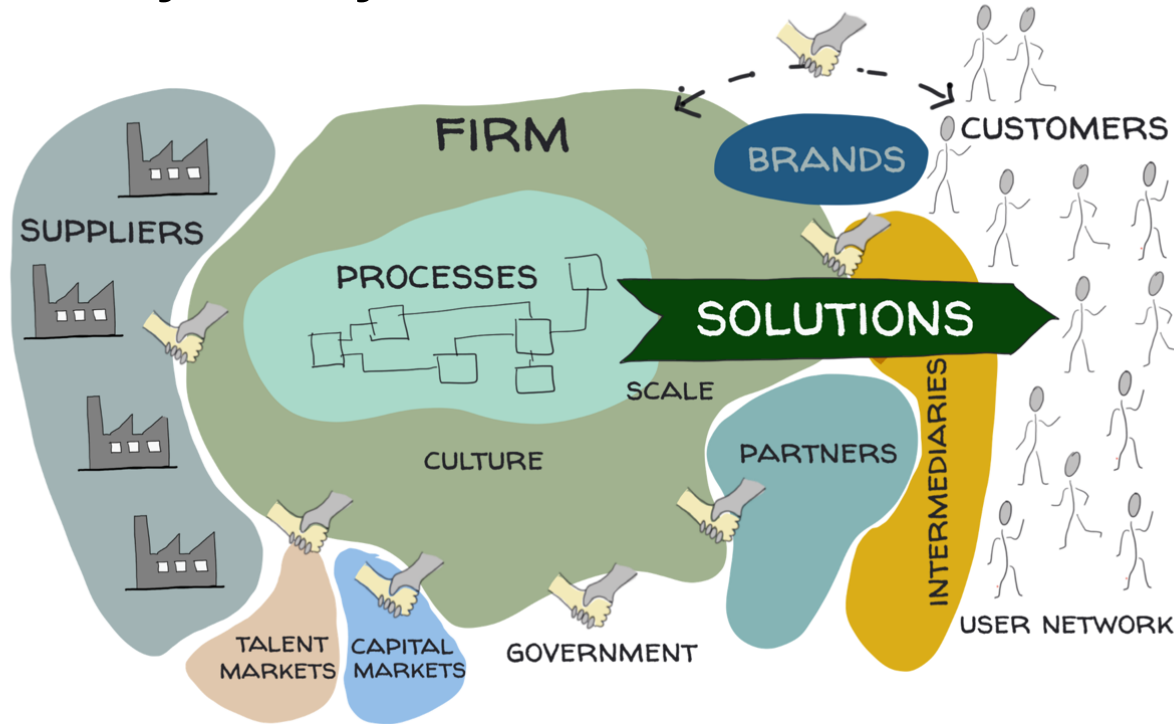
amazon.com[®]
and you're done.[™]



Alpha Asset Template



How much of my activity network is relevant to the new technology?



The "business plan" test:

Would a venture capitalist finance the incumbent's business plan to launch the rival technology?

Does the incumbent bring *alpha assets* to the opportunity?

Questions for Incumbents facing potential Disruptive Threats

1. When faced with disequilibrium, will our alpha assets remain alpha?
2. If not, can we obtain the newly relevant alpha assets? Build or buy?
3. For what other jobs might my “beta” assets be alpha?



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C. Anti-Competitive Actions

Paris Taxi Drivers vs. Uber





incredible! American Egg Board



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Check out the latest facts

Top egg
producing
states



THE EGG P

BUSINESS

The egg industry launched a secret two-year war against a vegan
mayonnaise competitor

EA
Times

By GEOFFREY MOHAN

OCT 07, 2016 | 2:15 PM

ent insights

Shell
eggs
produced



You Call That Meat? Not So Fast, Cattle Ranchers Say



A conveyor belt of Impossible Burgers. Impossible Burger



D. Concede and Manage for Cash

Borders?

Watch industry?

Satellite TV?



This may be the end of the Swiss watch as we know it



Dennis Green

Jul. 28, 2016, 10:03 AM 9,209



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PRINT

To those that lived through the "quartz crisis" of the '70s — when cheap Japanese quartz watches threatened to overtake the market, pushing Swiss watches into luxury territory — this message is going to sound a little familiar.

The Swiss watch industry is in trouble.



E. Proactive Investment in Adjacent “Push” Opportunities

“Push” – take an assets and capabilities perspective.

What do we have?

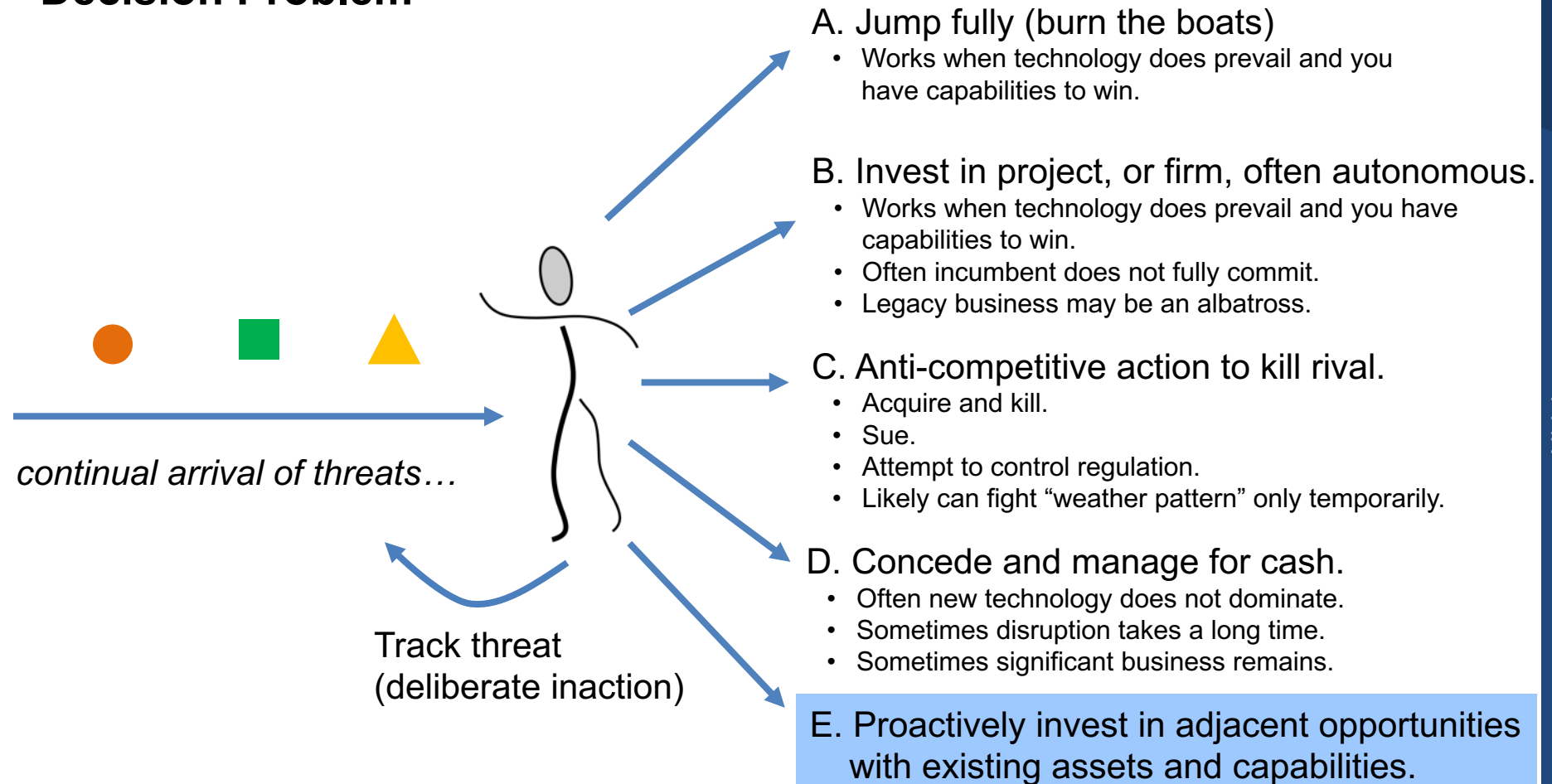
What can we do?

What do we have that is *rare and necessary*?

What other needs and markets can we address successfully with those assets and capabilities?



Decision Problem



Learning More

Clayton Christensen. 1997. *The Innovator's Dilemma*. Harvard Business Press.

Henry C. Lucas Jr. 2012. *The Search for Survival: Lessons from Disruptive Technologies*. (Largely argues that failures were the result of managerial myopia).

George Day. 2007. "Is It Real? Can We Win? Is It Worth Doing? Managing Risk and Reward in an Innovation Portfolio." *Harvard Business Review*. (Reviews literature on success probabilities for H1, H2, H3 innovation.)

James G. March. 1991. Exploration and Exploitation in Organizational Learning. *Organization Science*. <http://dx.doi.org/10.1287/orsc.2.1.71> p. 71 - 87.

Salsa Items

Jill Lepore, "What the Theory of 'Disruptive Innovation' Gets Wrong", *The New Yorker*, June 23, 2014. (Scathing and not totally fair critique of Christensen.)

Interview with Borders CEO about bankruptcy and final options.

http://www.mlive.com/business/index.ssf/2016/02/borders_5_years_after_bankrupt.html

Poll

What fraction of new cars sold globally in 2025 will utilize only a battery-electric-motor powertrain?

- <20%
- 20-30%
- 30-40%
- 40-50%
- 50-60%
- 60-70%
- 70-80%
- >80%

Poll

What share of financial transaction value globally in 2050 will be captured by blockchain technology (e.g., distributed ledger)?

- <10%
- 10-20%
- 20-30%
- 30-40%
- 40-50%
- 50-60%
- 60-70%
- 70-80%
- >80%

Poll

In 2050, what fraction of the (now 256B USD) egg market will be served by plant-based “eggs”?

- <10%
- 10-20%
- 20-30%
- 30-40%
- 40-50%
- 50-60%
- 60-70%
- 70-80%
- >80%