Governance of Innovation: Key Issues and Research Agenda

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Fall 2019

Seoul, South Korea

Why Does Innovation Matter?

2018 Best Selling Drugs

Company	Names	Sales
AbbVie	Humira (Adalimumab)	21 billion
Celgene	Revlimid (Lenalidomide)	9.2 billion
Amgen/Pfizer	Enbrel (Etanercept)	7.3 billion
Regeneron/Bayer	Eylea (Aflibercept)	6.5 billion
Roche	Avastin (Bevacizumab)	6.4 billion
Roche	Herceptin (Trastuzuma)	6.4 billion
Roche	Rituxan (Rituximab)	6.4 billion
Jonhson& Johnson	Remicade (Infliximab)	6.3 billion
Jonhson& Johnson/Bayer	Xarelto (Rivaroxaban)	6.1 billion
Merck	Keytruda (Pembrolizumab)	6.1 billion

PLC: WHERE IS IDEATION?

Early adopters
13.5%

Innovators
2.5%

Laggards
16%

Early majority
34%
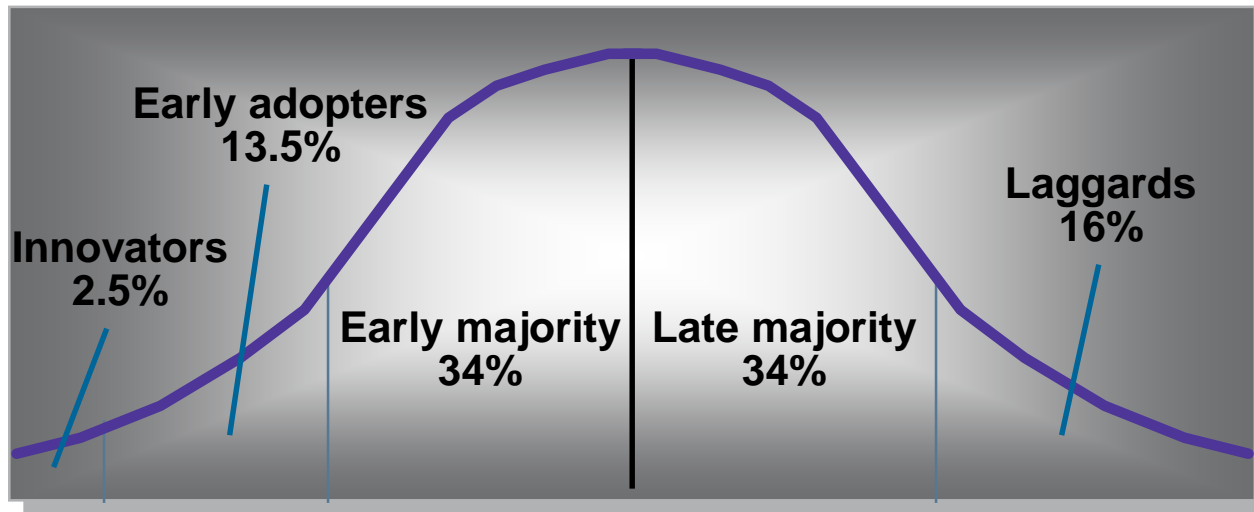
Late majority
34%

Time →

Innovators:
   Venturesome, higher educated, use multiple information sources

Early majority:
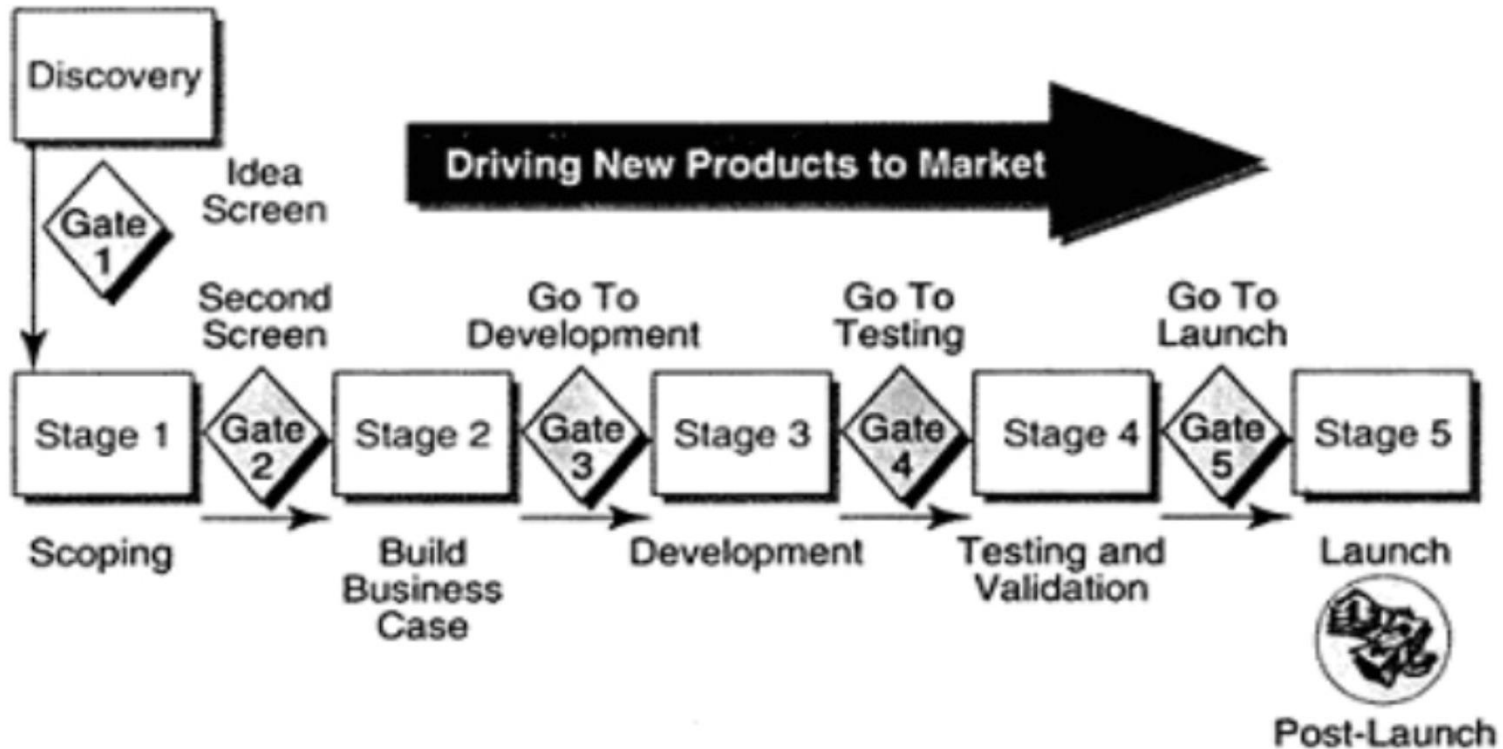   Deliberate, many informal social contacts

Laggards:
   Fear of debt, neighbors and friends are information sources

Early adopters:
   Leaders in social setting, slightly above average education

Late majority:
   Skeptical, below average social status

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Stage – Gate™ model by R. Cooper

From "Optimizing the stage gate process: What best practice companies do" by Cooper, Edgett, and Kleinschmidt.

Stage-Gate Process (https://www.stage-gate.com/our-story/)

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The case of Post-it

The case of Apple Mouse

Post-it

- 1968 - Spencer Silver invents weak adhesive

- 1973 – Art Fry uses it for sticking notes in church choir book

- 1977 – Commercial sales begin, failure

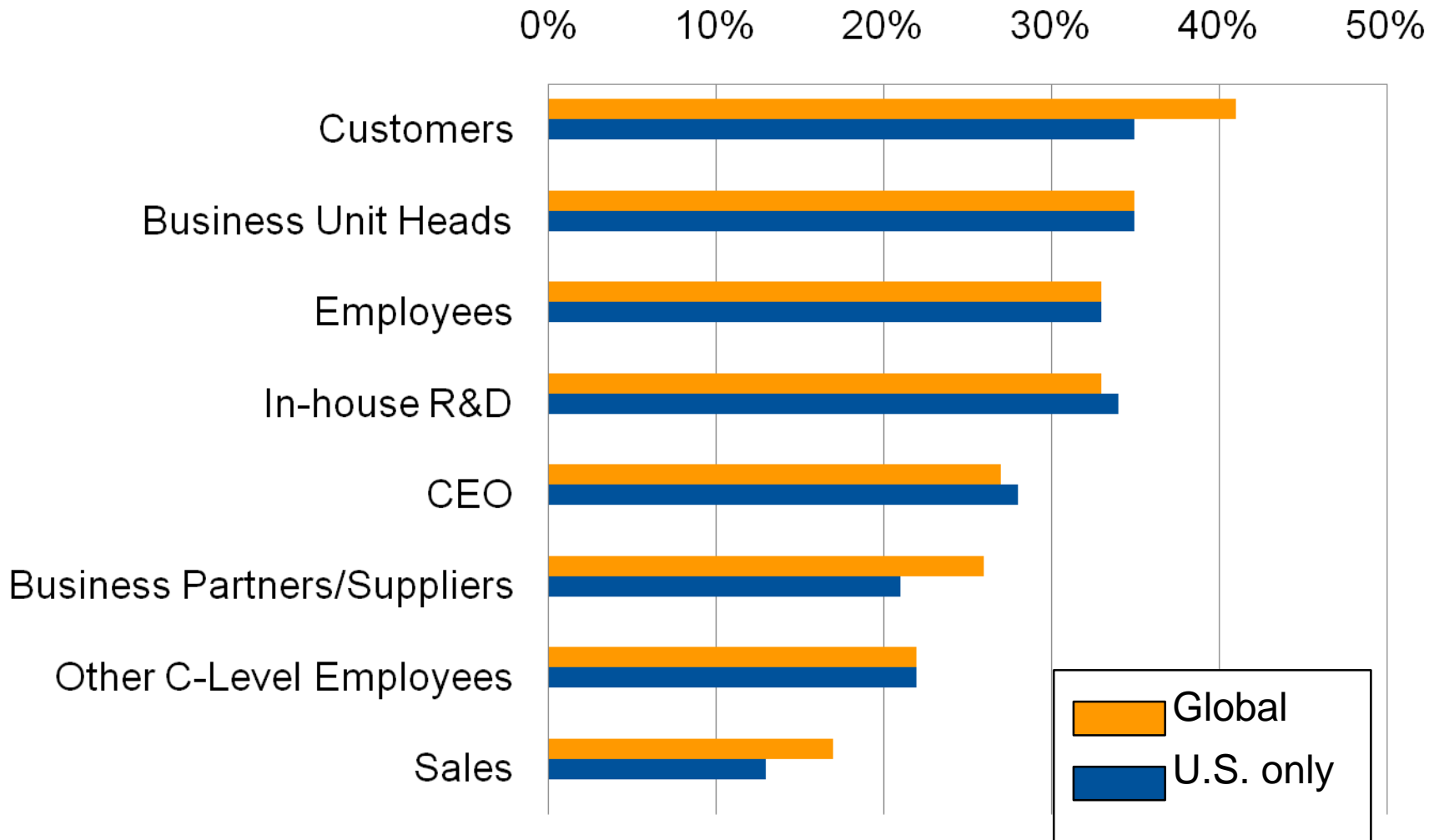- 1978 – Free samples distributed, success

- 2018 Revenue: $ 2.3 Billion

Mouse (https://dynamis.no/apple-mouse-collection/)

- 1946 – Trackball, Ralph Benjamin, radar plotting

- 1979 – Apple's visit to XEROX PARC

- 1983 – Apple Lisa Mouse, inspired by PARC

- 1998 – Apple USB Mouse with iMac

- 2003 – Apple Cordless Mouse

- 2009 – Apple Magic Mouse

The Engelbart mouse
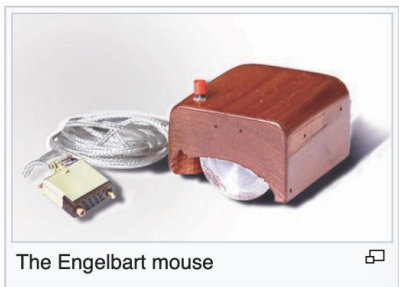
Sources of Innovation

Economist Intelligence Unit and Grant Thornton survey of Business Exec, June 2010
"Innovation: The Key to Future Success?" Global results shown here.
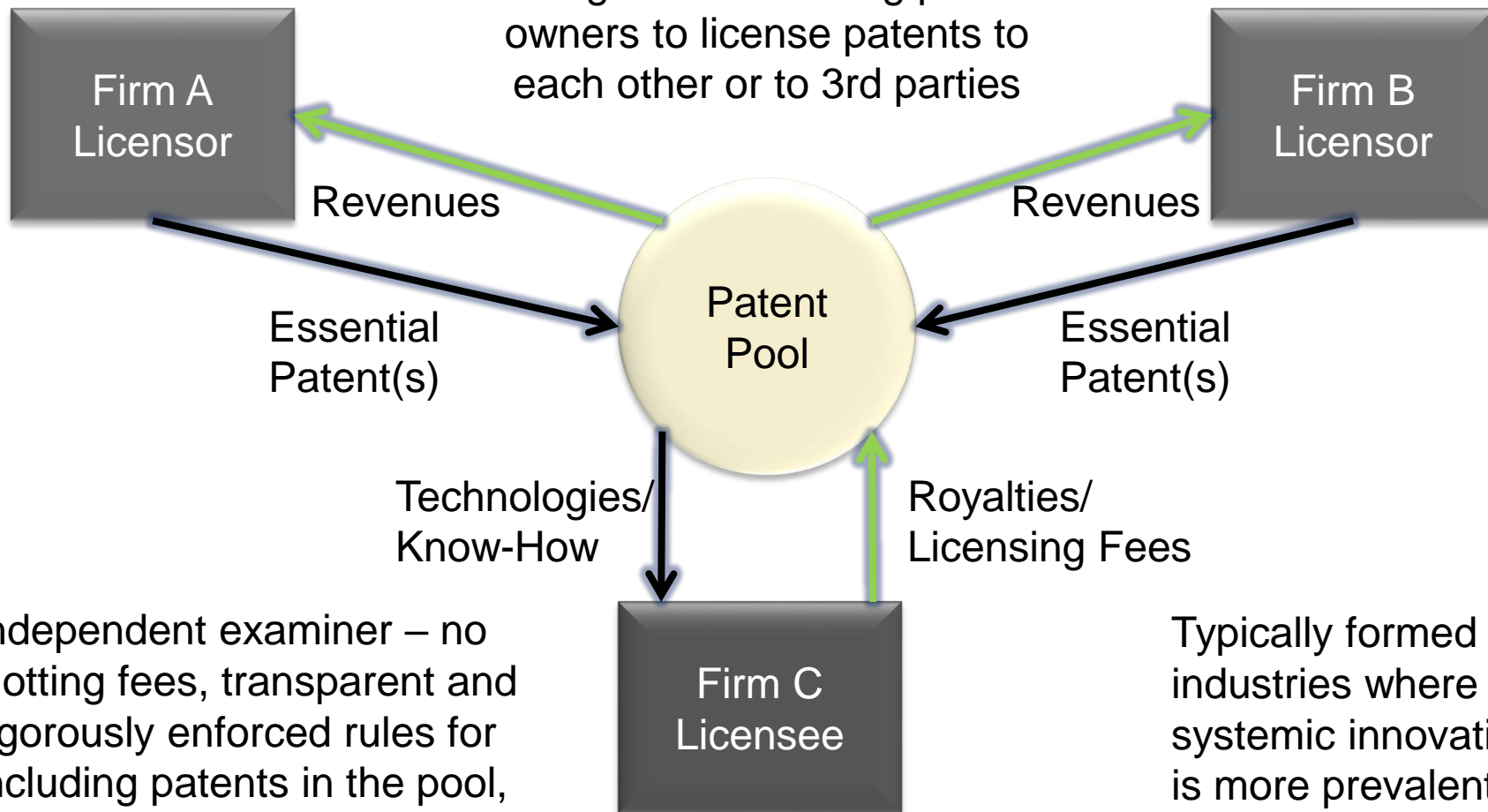
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Patent Pools

Open Source

Crowdsourcing

Patent Pools

What is a Patent Pool?
An agreement among patent owners to license patents to each other or to 3rd parties

Firm A
Licensor

Firm B
Licensor

Revenues

Revenues

Patent
Pool

Essential
Patent(s)

Essential
Patent(s)

Technologies/
Know-How

Royalties/
Licensing Fees

Firm C
Licensee

Independent examiner – no slotting fees, transparent and rigorously enforced rules for including patents in the pool, licensing must be Reasonable and Non-Discriminatory (RAND)

Typically formed in industries where systemic innovation is more prevalent than autonomous innovation

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- Open is not free
  - Linux (RedHat, IBM)
  - Android (Google, Samsung)

  Free as in "free speech" not "free beer"

3. Crowdsourcing

Crowdsourcing: Harnessing resources from the crowd

Ideation: Dell's Ideastorm

Curation: Wikipedia

Ideation & Curation: SourceForge, Github

Crowdfunding: Kickstarter, Indiegogo

Tournaments: Innocentive

Crowdvesting: Prosper.com, lendingtree.com

Charity/help: kiva.org, gofundme.com

Does it matter

$4,568,421,834

total dollars pledged to Kickstarter projects

171,034

Successfully funded projects
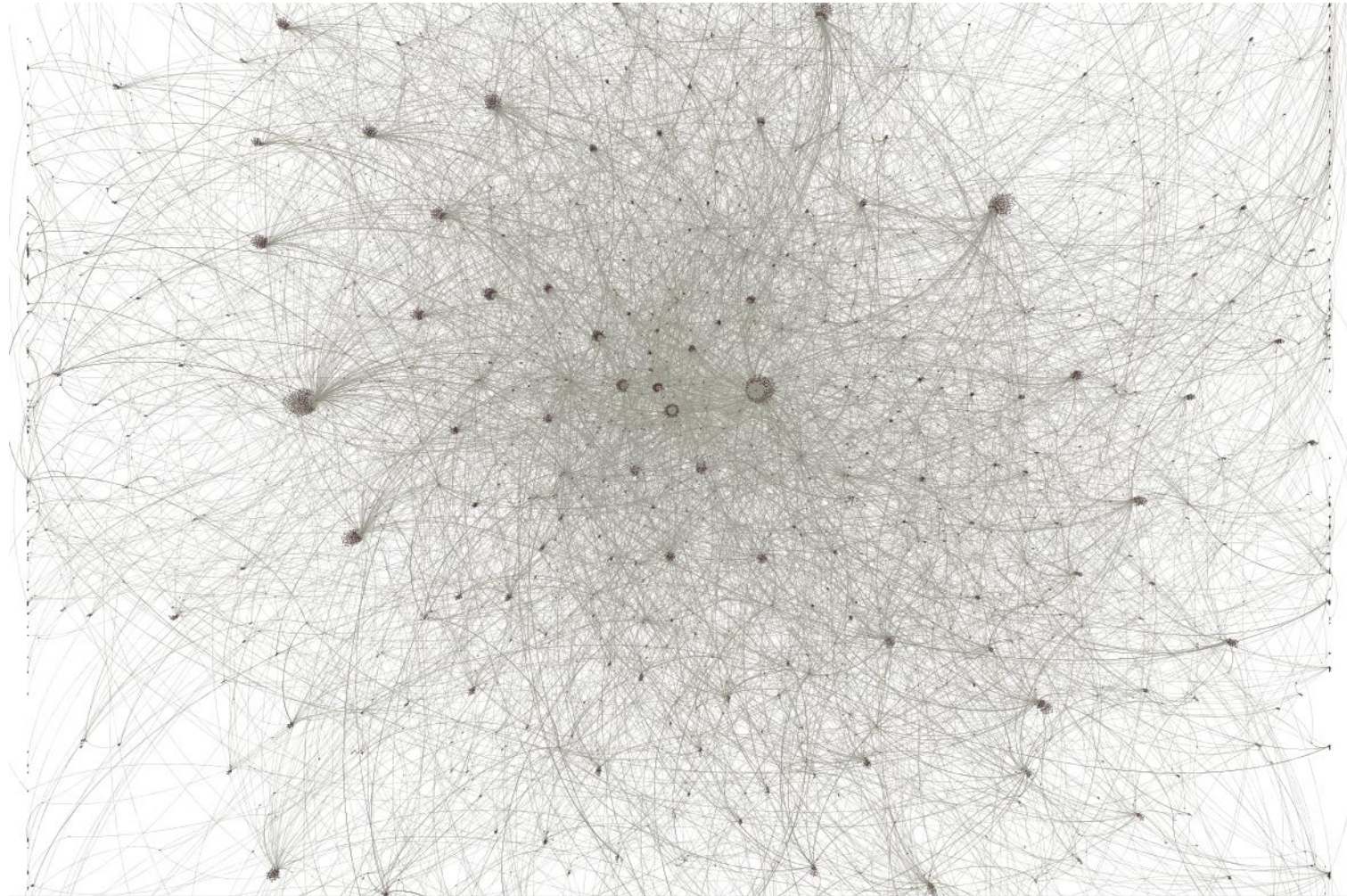
16,921,230

Total backers

5,565,471

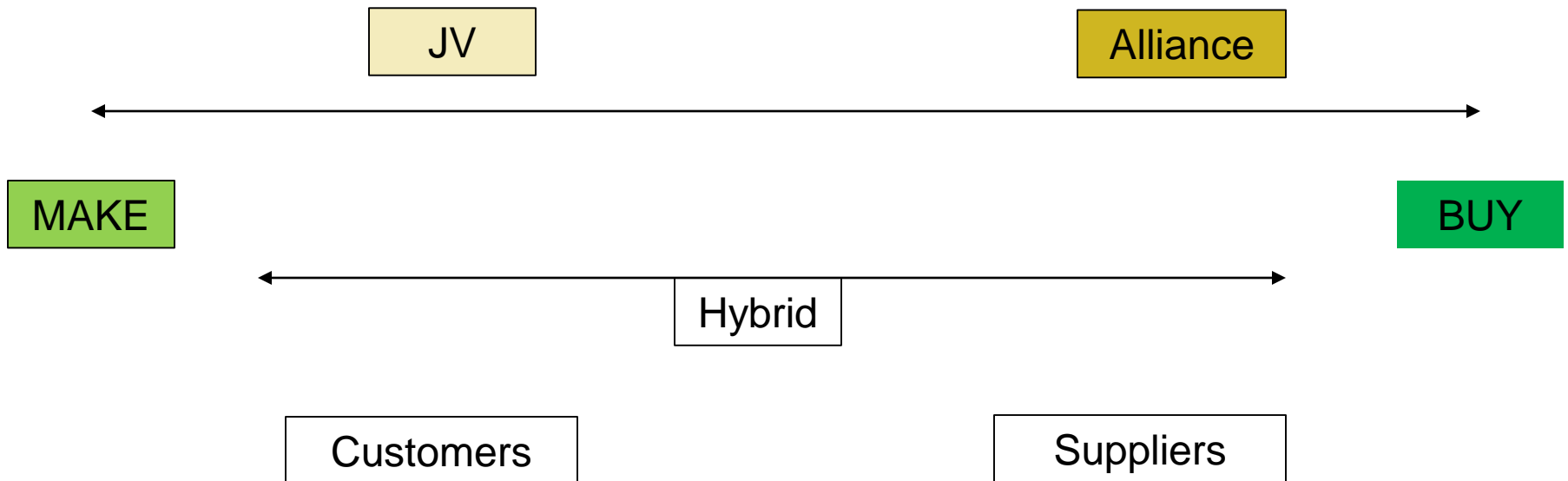Repeat backers

56,686,083

Total pledges

Sources of Innovation

- Customers
  - Lead User Innovation (e.g., 3M)
  - Netflix and Amazon
- Distributors
  - McDonald's (Big Mac, egg McMuffin)
- Employees
  - IBM's Skunkworks
- Users
  - Linux Operating System (e.g., RedHat – Intel, Google, IBM)
  - Android Operating System (Google, Intel)
  - Hadoop (Big Data storage – Google, Yahoo)
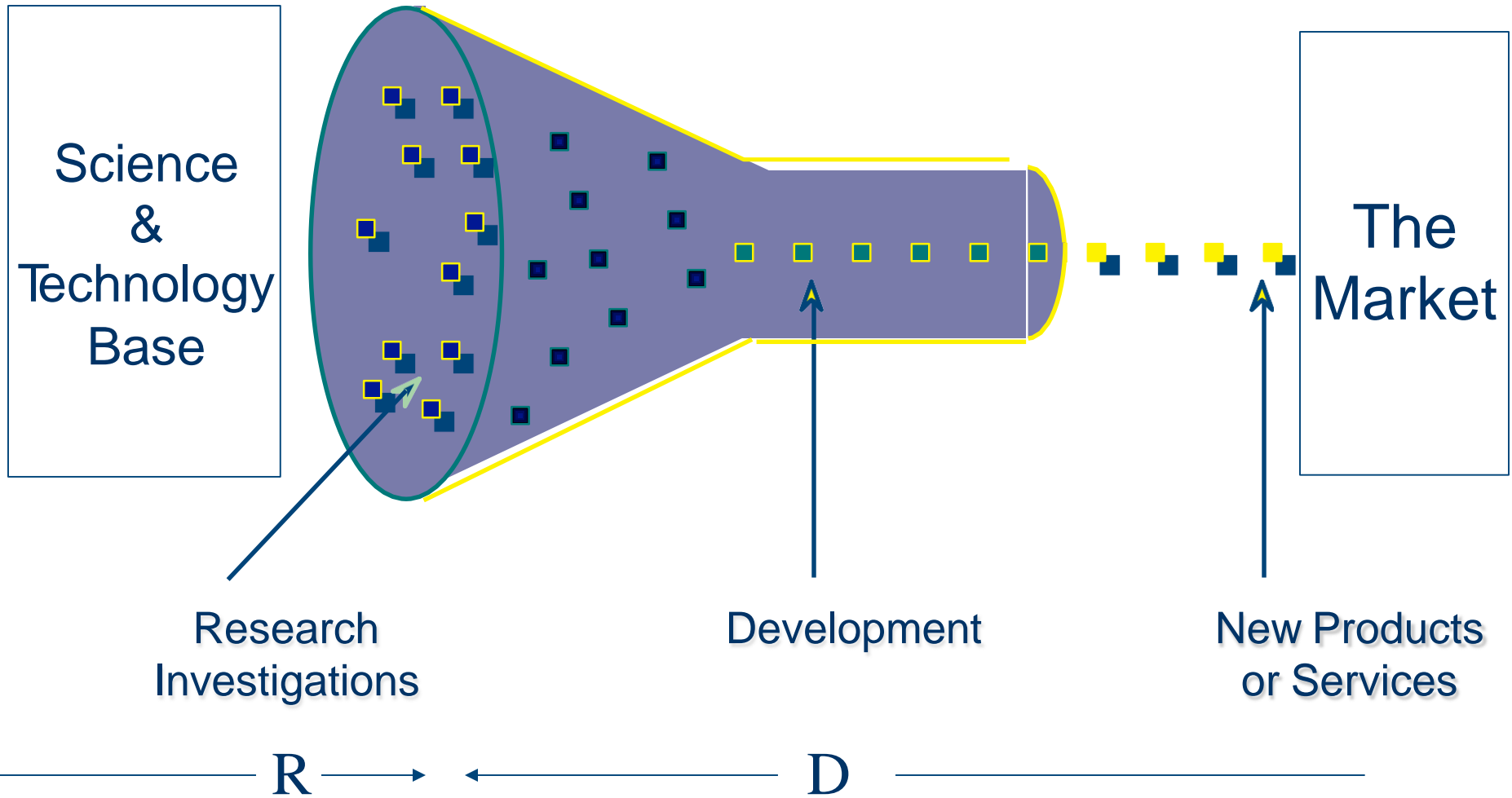 - Kickstarter, Indiegogo
  - Innocentive, Dell's Ideastorm

JV

Alliance

MAKE

BUY

Hybrid

Customers

Suppliers

Science & Technology Base

The Market

Research Investigations

Development

New Products or Services

R → ← D

Source: Henry Chesbrough

KELLEY SCHOOL
OF BUSINESS

INDIANA UNIVERSITY
Kelley Executive Partners
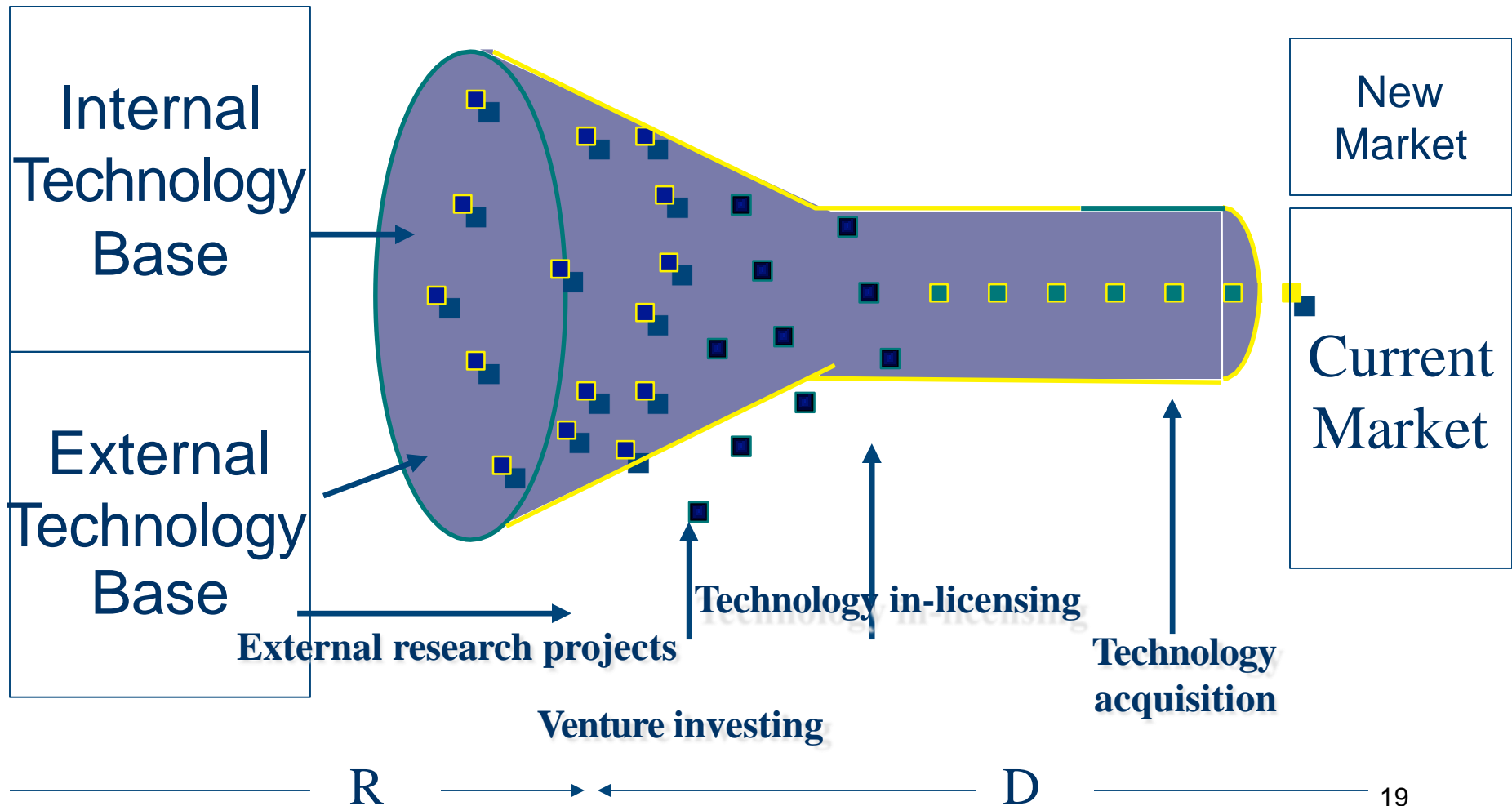
"Open innovation is the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively."

Chesbrough, Vanhaverbeke, West
Open Innovation: Researching a New Paradigm (2006)

KELLEY SCHOOL OF BUSINESS
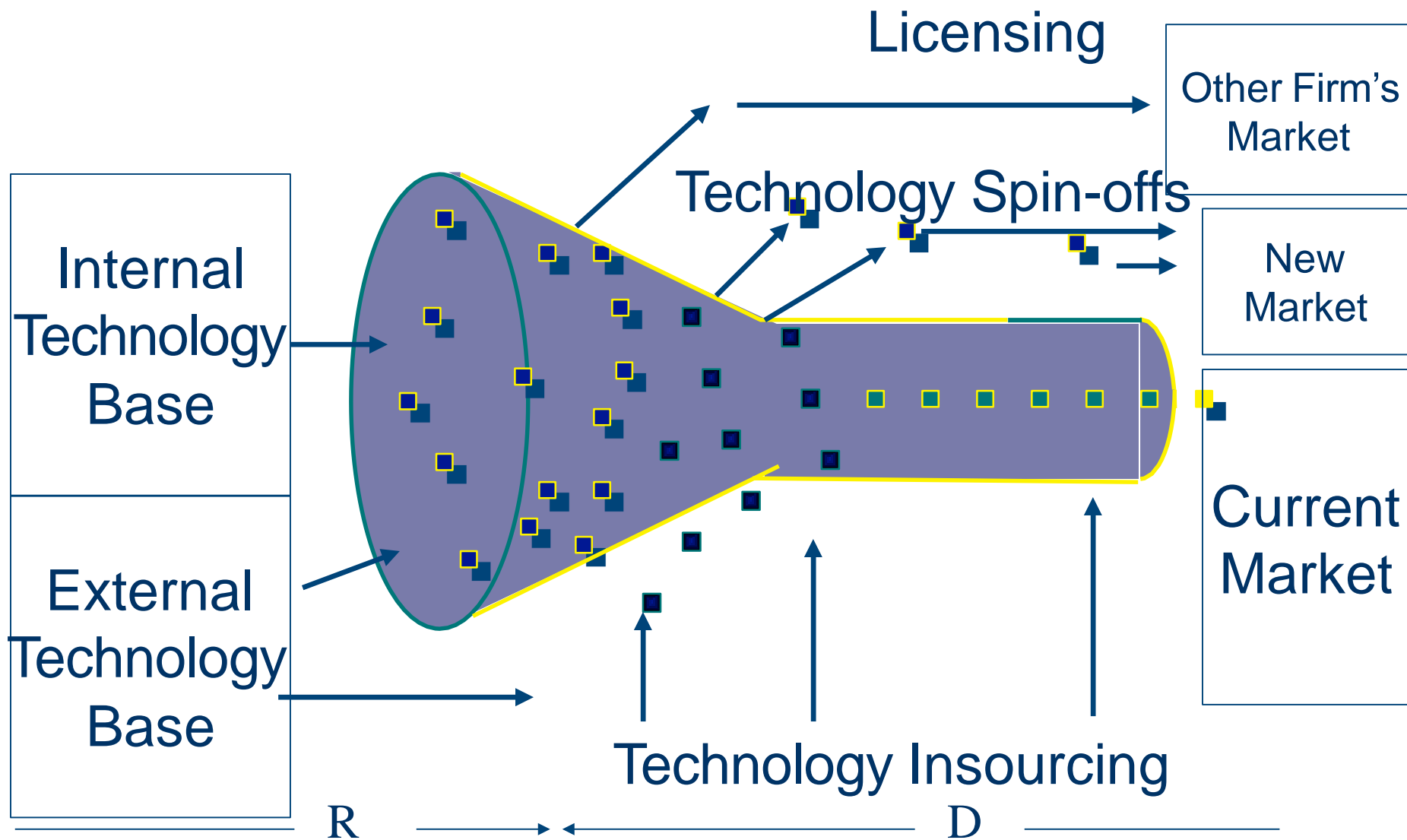INDIANA UNIVERSITY
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Internal Technology Base

External Technology Base

New Market

Current Market

Technology in-licensing

External research projects

Venture investing

Technology acquisition

R

D

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Licensing

Other Firm's Market

Technology Spin-offs

New Market

Internal Technology Base

External Technology Base

Current Market

Technology Insourcing

R   D

Adapted from Prof Henry Chesbrough UC Berkeley, Open Innovation: Renewing Growth from Industrial R&D, 10th Annual Innovation Convergence, Minneapolis Sept 27, 2004

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Creative Destruction: Joseph Schumpeter (1934)

1999	2009	2019
Microsoft (583)	PetroChina (376)	Microsoft (1090)
GE (504)	*Exxon (341)*	Apple (980)
Cisco (353)	ICBC (257)	Amazon (950)
Exxon (283)	Microsoft (212)	Alphabet (778)
Walmart (283)	China Mobile(201)	Facebook (546)
Intel (271)	Walmart (189)	Berkshire Hathaway (507)
NTT (262)	China Co Bank (182)	Alibaba (435)
Lucent (252)	Petrobras (165)	Tencent (431)
Nokia (197)	J&J (157)	Visa (379)
BP (196)	*Shell (156)*	J&J (376)

- Innovation is difficult, but pays off
- Many paths to success
  - Apple vs. Samsung
- Threats loom everywhere
  - Uber, Netflix, Tesla