



School of Business
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Core Concepts of Creativity and Innovation(2)

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What we will do today...

- Understand basic concepts of innovation
 - Sync. our vocabulary
- Understand the nature of technical change
- Understand the importance of market in innovation
- Architecture and Design Structure Matrix

Innovation – Much More Complicated than Invention

- Invention & Innovation: Difference?
- Generation of Ideas → Problem-solving (Design) → Implementation (Mfr, Mkt, Dist) → Diffusion
- Basic Science → Applied Science → New Product Development → User Innovation
 - What is the role of the basic science?

Which is better & more prevalent?

- **Market-oriented innovation**

(market or demand “pull” ??)

or

- **Manufacturer/service provider-driven innovation**

(technology or supply “push” ??)

A sample of innovations

- Web learning
- Television
- Penicillin
- Third generation (3G) wireless
- Hand calculators
- Polyester
- Digital cameras
- Tupperware
- Touch screens
- Internet gambling
- Financial options
- Transistor
- Peer-to-peer computing
- Satellite telephony
- Electronic ink
- Web-based social networking
- DARPA-net
- Alternative fuel automobiles
- Virtual Reality (Second Life)

Demand-pull and supply-push

Market Take-off

No/Not Yet

Yes

Demand Pull

Supply Push

Demand-pull and supply-push

Market Take-off

No/Not Yet

Yes

Demand Pull

•Web learning

Hand calculators

Digital cameras

Tupperware

Penicillin

Internet gambling

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Supply Push

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Electronic ink?

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Financial options

Television

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Peer-to-peer computing

Touch screens

Web-based social networking?

Conventional wisdom?

Table 2. A comparison of studies of the proportions of innovations stimulated by market needs and technological opportunities.

Author	Proportion from market, mission, or production needs (%)	Proportion from technical opportunities (%)	Sample size
Baker <i>et al.</i> (38)	77	23	303*
Carter and Williams (11)	73	27	137
Goldhar (37)	69	31	108
Sherwin and Isenson (17)	61	34	710†
Langrish (20)	66	34	84
Myers and Marquis (7)	78	22	439
Tannenbaum <i>et al.</i> (33)	90	10	10
Utterback (31)	75	25	32

* Ideas for new products and processes. † Research events used in 20 developments.

The best innovations are customer/needs/demand-driven.

- Common thoughts:

- Nothing is worse than “a technology in search of an application,” or “a solution in search of a problem and a customer”
- “Necessity is the mother of invention”
- “How many billions of dollars has this company spent on R&D that goes nowhere?!”

Internal vs. External Sources

Of the 157 cases studied by Myers and Marquis, how many innovations are evoked by information from sources outside the firm?

98 = 62%

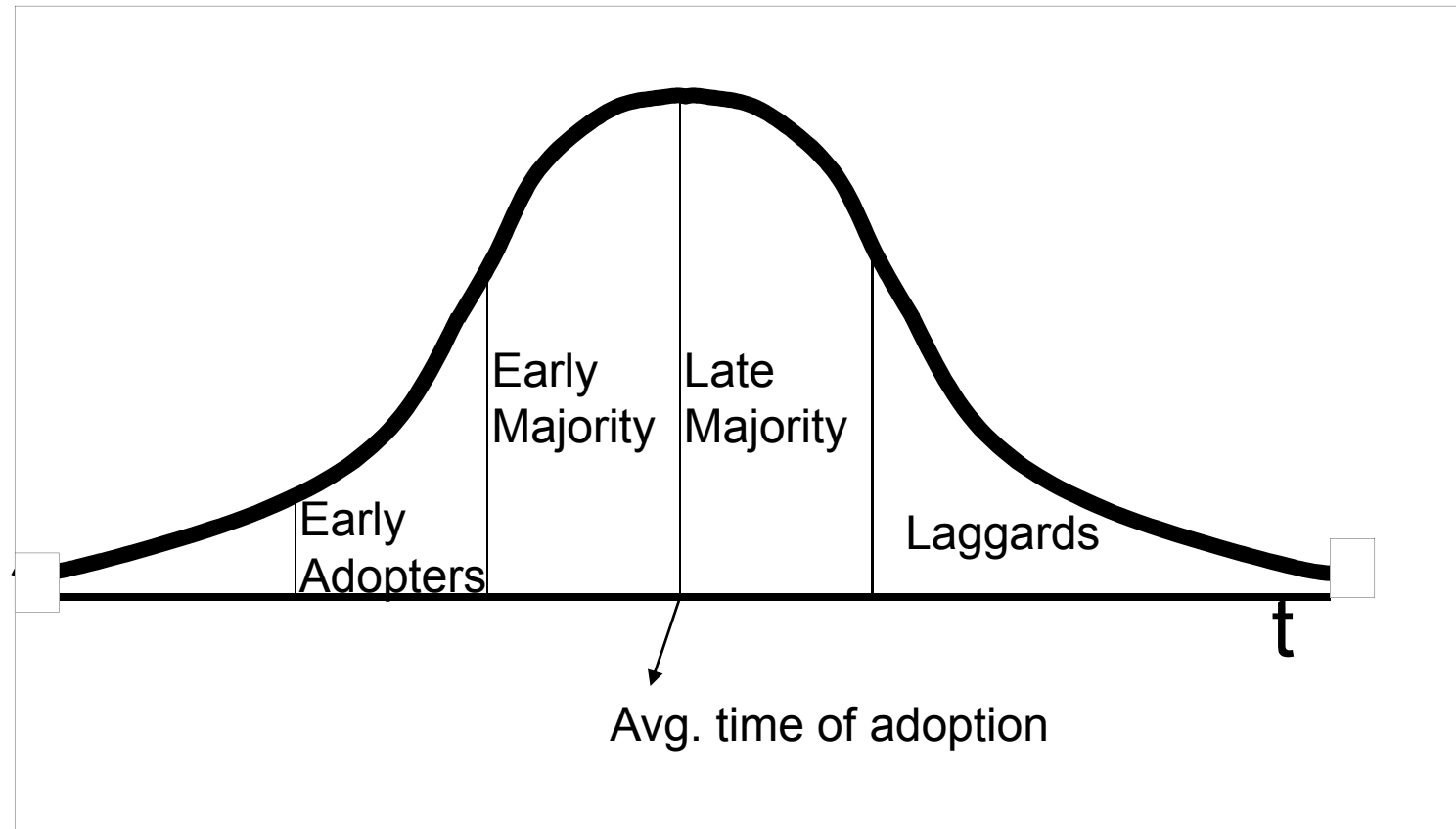
How about in the case of new scientific and measuring instruments?

39/59 ideas = 66%

Case of DuPont's major product and process innovations?

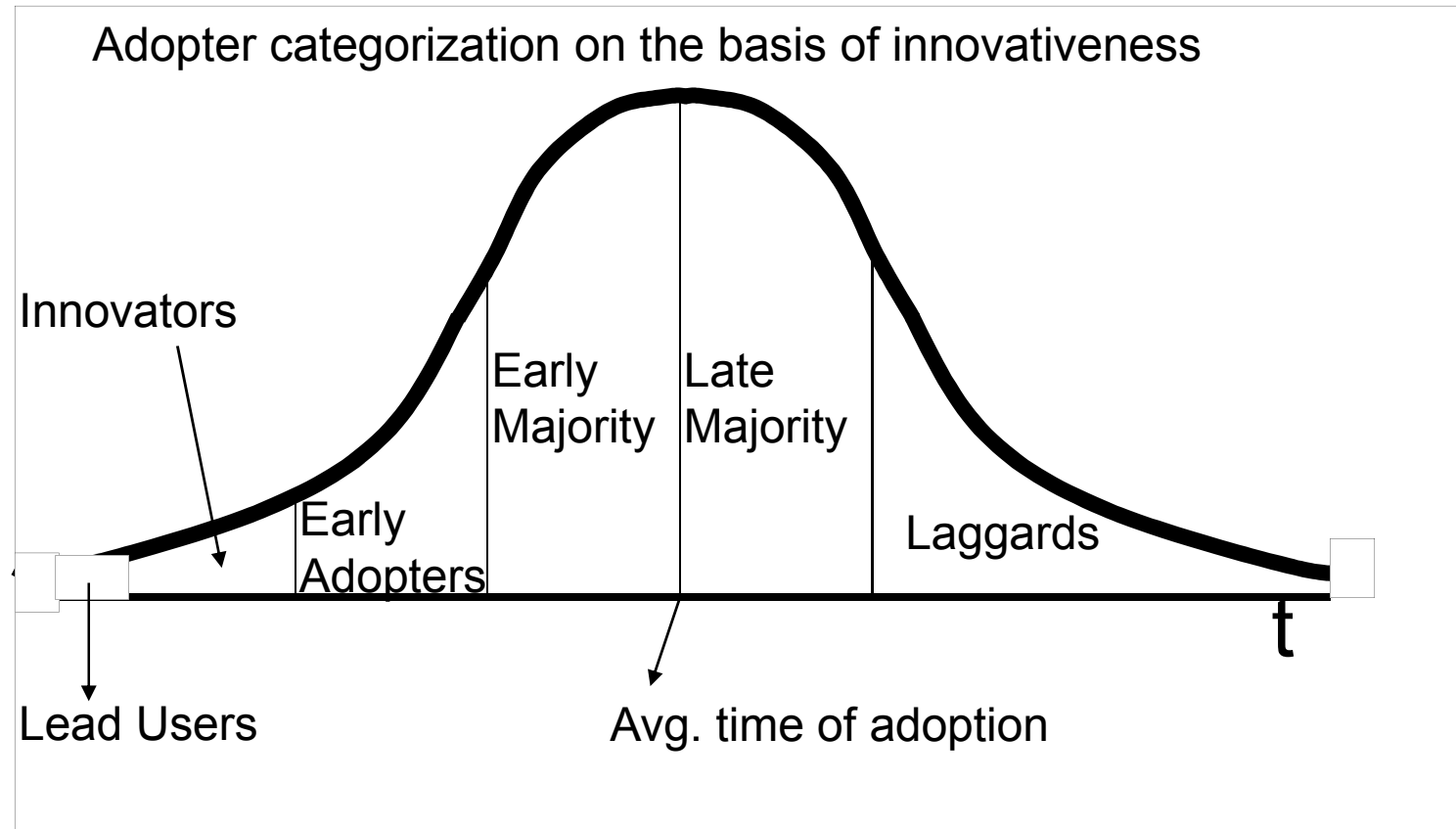
14/25 = 56%

Diffusion – An important part of the technological innovation



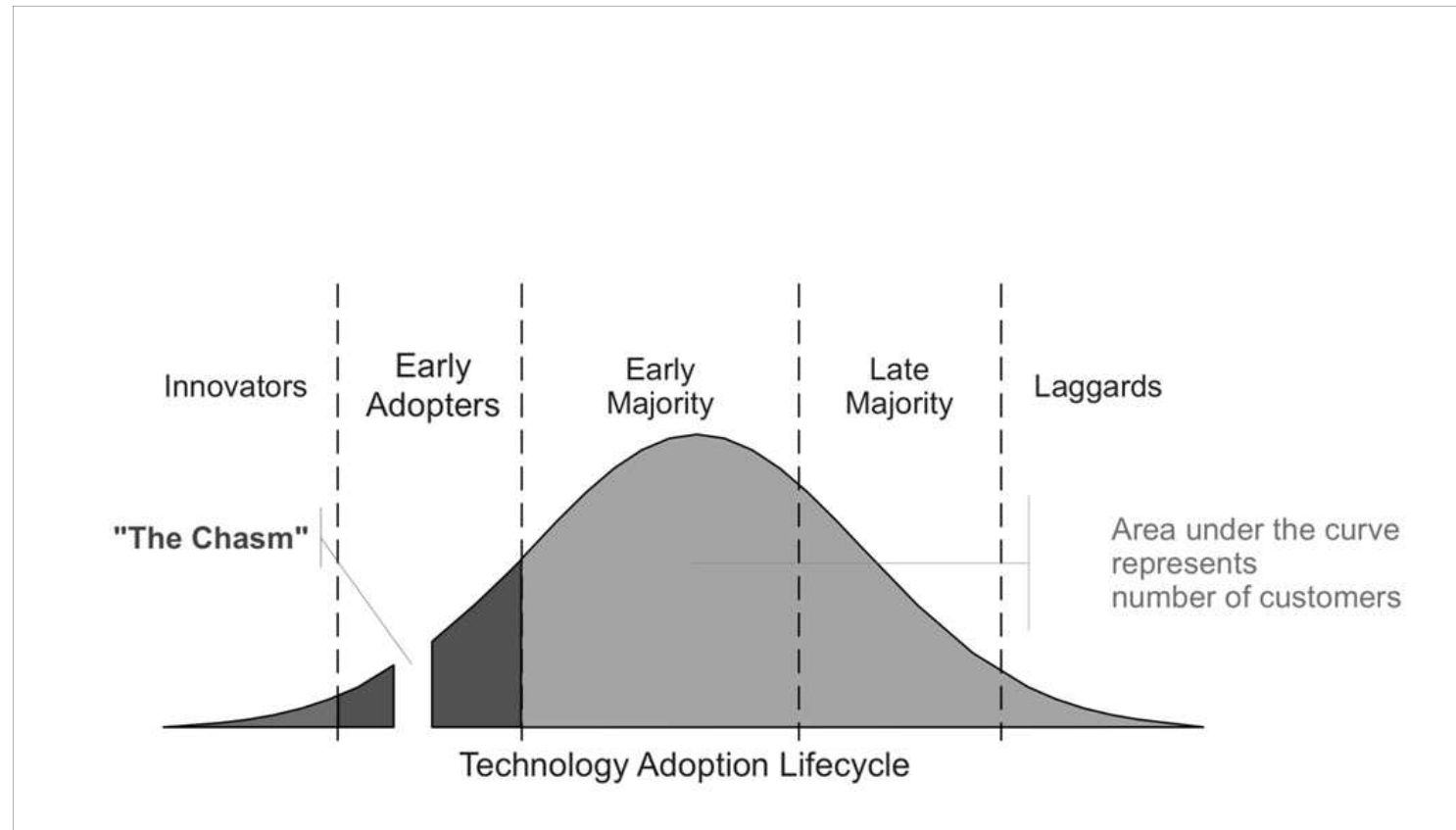
Source: Rogers (Diffusion of Innovation)

User Innovation - Another Important Factor



Source: Rogers (*Diffusion of Innovation*)

Chasm?



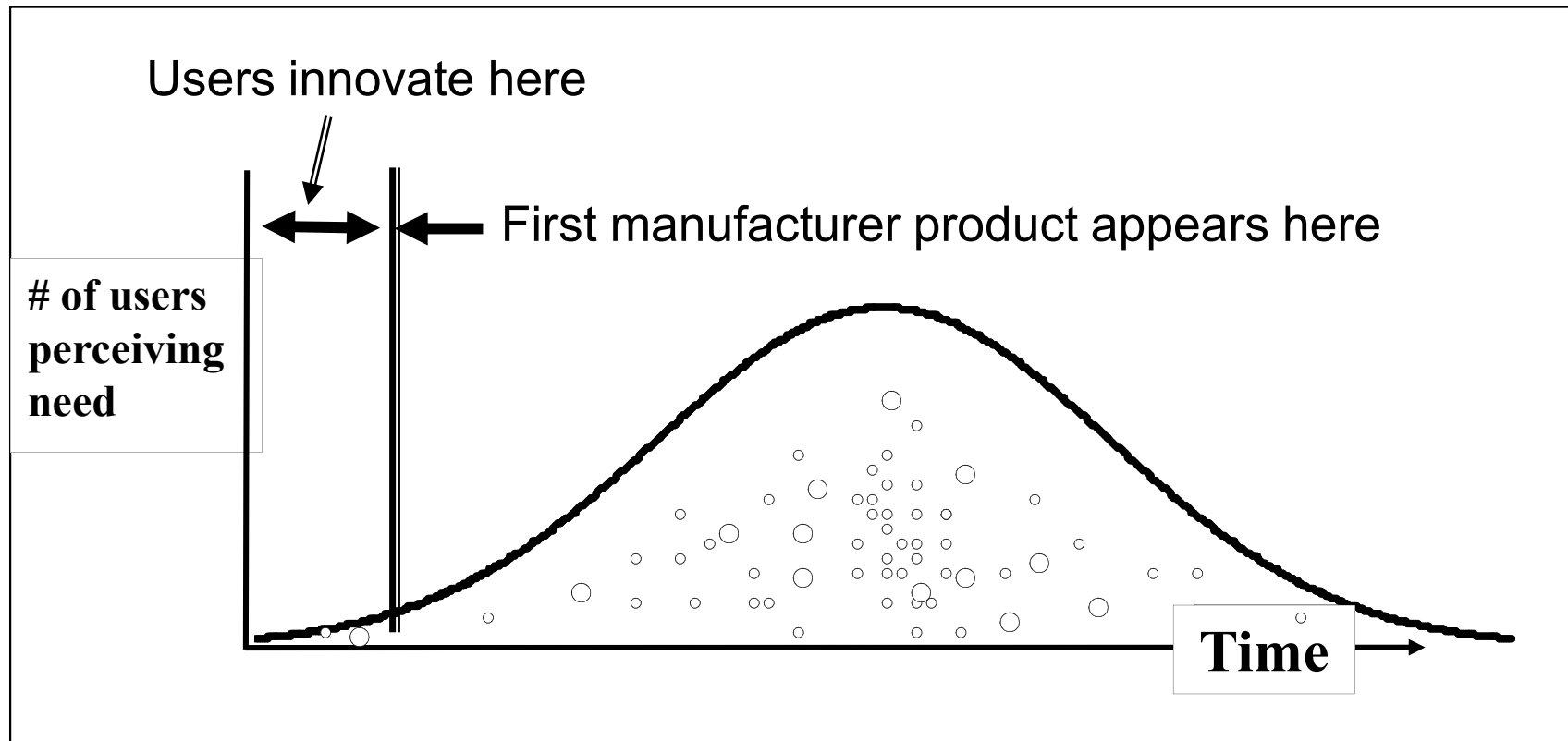
Source: Rogers (*Crossing the Chasm*)

Traditional, Manufacturer-Centered Innovation Paradigm

Manufacturers identify user needs, develop products at private expense, And profit by protecting and selling what they have developed.

User-Centered (Democratized) Innovation Paradigm

Lead Users innovate to solve their own needs at private expense - and then freely reveal their innovations



What is meant by “Innovation is becoming democratized?”

- **Increasing numbers of users are able to develop innovations *for themselves* at a steadily more professional level.**

Why?

- **Improvements in design tools via computing (like simulation)**
- **Improvements in communication (like the Internet)**
- **All being provided at lower costs**

Harnessing the Capability of Users

The screenshot shows the Threadless website interface. At the top, there is a navigation bar with the Threadless logo, a 'Teens' badge, and links for 'tVPeTE@s', 'Select KIDS!', 'Login', and 'JOIN NOW!'. Below this is a secondary navigation bar with the Threadless logo and 'Nude No More' tagline, and dropdown menus for 'Guys', 'Girls', 'Participate', and 'Info'. A shopping cart icon shows '0 Items in your cart!' with a 'CHECKOUT' button and links for 'ORDER STATUS' and 'SERVICE & HELP'. A search bar with 'Google Custom Search' and a 'Search' button is present, along with a link to 'Search options'. The main content area features a section for 'New tees for THURSDAY, OCTOBER 1' with a grid of six t-shirt designs. Each design includes a price tag (e.g., '\$18 Reprint' or '\$18 Classic') and a title with the designer's name. Below the grid is a section for 'New tees for MONDAY, SEPTEMBER 28'. On the right side, there are three promotional banners: one for a '\$2,500+ Fame' contest for the Tate Modern, one for 'HUH? THREADLESS?' explaining the community-based model, and one for 'Annual Bestee awards' offering '\$2,500+ \$500 PER REPRINT'. At the bottom right, there is a 'New tees and prints EVERY MONDAY!' banner with a newsletter sign-up form.

threadless tVPeTE@s Select KIDS! Login JOIN NOW!

threadless Teens
Nude No More

Guys ▾ Girls ▾ Participate ▾ Info ▾

0 Items in your cart!
CHECKOUT

ORDER STATUS | SERVICE & HELP

Google Custom Search Search
→ Search options

New tees for THURSDAY, OCTOBER 1

\$18 Reprint
ON WOLVES by Dick Firestorm and Aled Lewis

\$18 Reprint
The Gaming Revolution by Sean Mori

\$18 Reprint
Let It Grow by Florence

\$18 Classic
Rock Out! by Simon Massey Di Vallazza

\$18 Classic
Pandamonium by Ross Zietz

\$2,500+ Fame.
Design the next 'POP' masterpiece for the Tate Modern! ▶
Submit Ideas now – October 29th

HUH? THREADLESS?
Threadless is a community-based tee shirt company with an ongoing, open call for design submissions.

IF YOUR DESIGN IS CHOSEN FOR PRINT, GET PAID UP TO
\$2,500+
\$500 PER REPRINT

With a chance to win over \$22,500 in our Annual Bestee awards!

→ LEARN HOW TO GET STARTED!

New tees and prints
EVERY MONDAY!
Join the newsletter to stay in the loop!
Enter your email address... Join

New tees for MONDAY, SEPTEMBER 28