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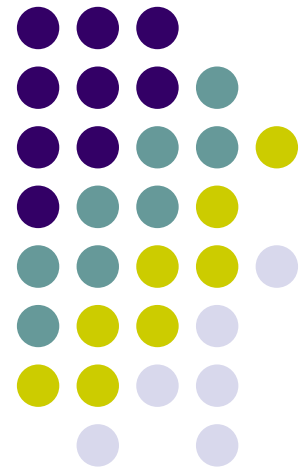
15.351 Managing Innovation and Entrepreneurship
Spring 2008

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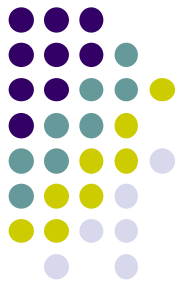
15. 351 Managing Innovation & Entrepreneurship

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Spring 2008

Competitive Implications of
Technology & Market dynamics



RECAP Challenges => Mind the gap...



Transition

Key Challenges

**Innovator →
Early Adopters**

Can you make product improvements that are necessary?
Do the visionaries really reference the techies? E.g. are you working with the right techies?

**Early Adopters →
Early Majority**

Can you transform a visionary project into a product outcome for the majority? Defense projects are hard for this. Can you do this in another segment? E.g. hand tools to cars at A123. Can the mainstream really make it work?

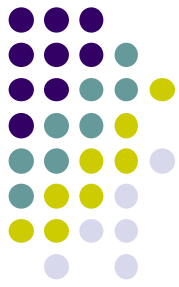
**Early Majority →
Late Majority**

Can you shift to a turnkey product?
Can you build the right channel e.g. EMI's failure in CT scanners

**Late Majority →
Laggards**

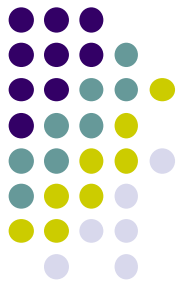
Does it matter?

Summary



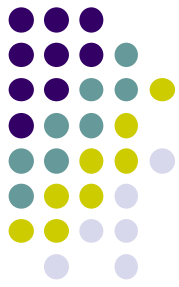
- When attempting to fully analyze market segment need to consider the following dynamics:
 - Role/importance of information flow – referencing among customers, network brokers etc, thought leaders etc.
 - Role of different cultures, social-psychological factors
 - Changing customer preferences – different economics
 - Changing customer buying behaviors
 - Changing technology – what is needed by sub-segment, can it be achieved etc.
 - Changing infrastructure- complementary products, institutions, legal rules etc.

AGENDA

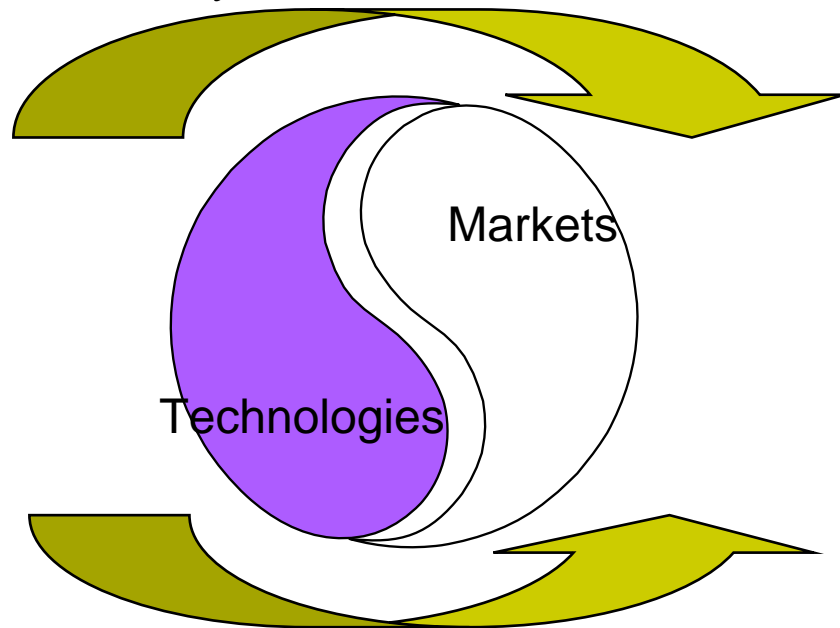


- Motivation for today's material: Market & technology S curves provide an important foundation for competitive opportunity analysis.
- Interaction of market & technology dynamics leads to different opportunities & different competitive outcomes

Typical analyses often fail to put the opportunity in competitive context



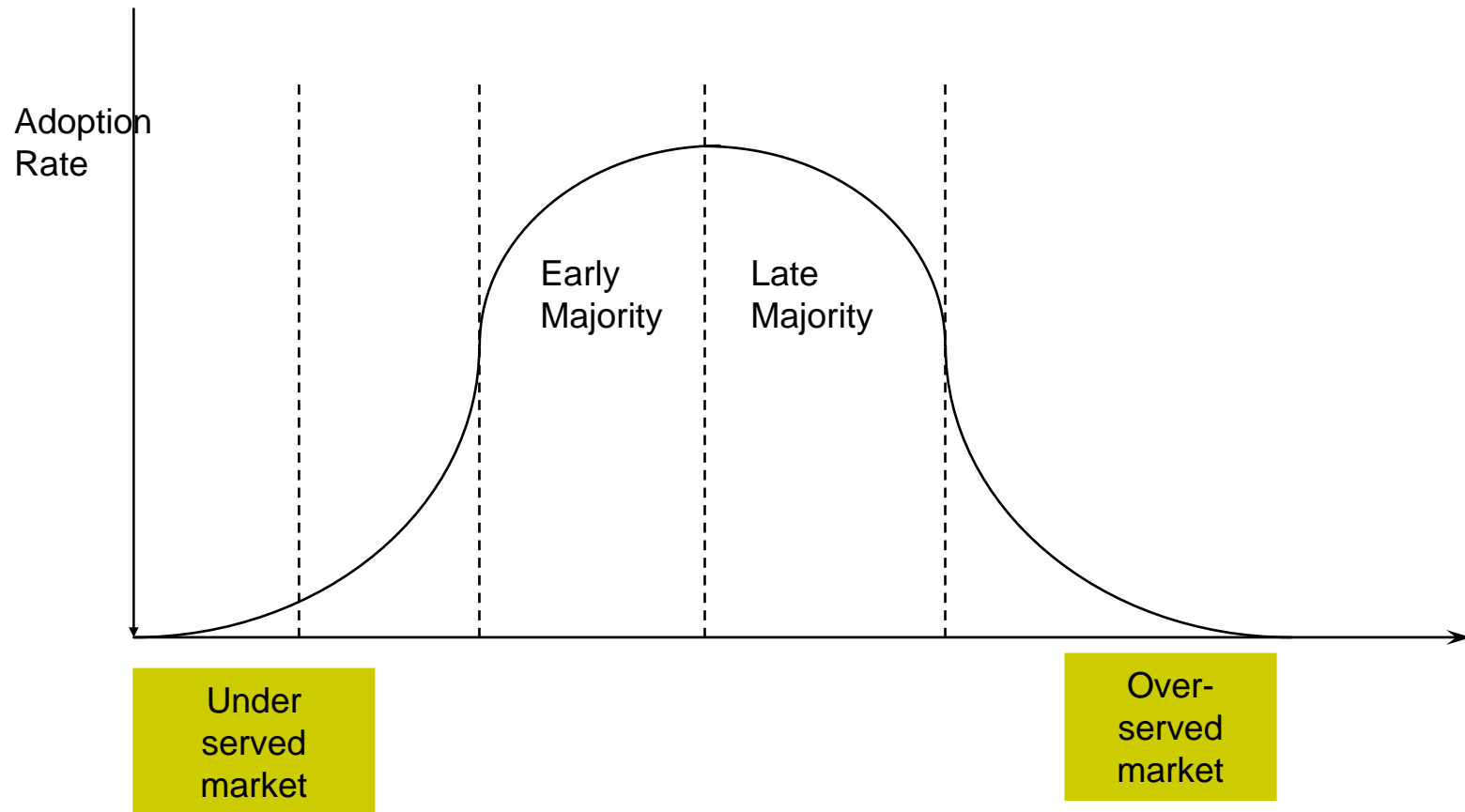
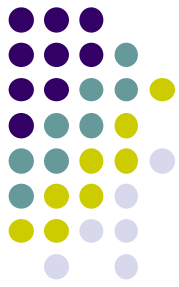
Technology assessment,
dynamics & choices



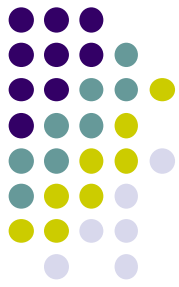
Market assessment ,
dynamics & choices

How do technology & market dynamics together provide competitive opportunities?

Where are the opportunities when competition is serving the mainstream?



Opportunities: over & under served customers



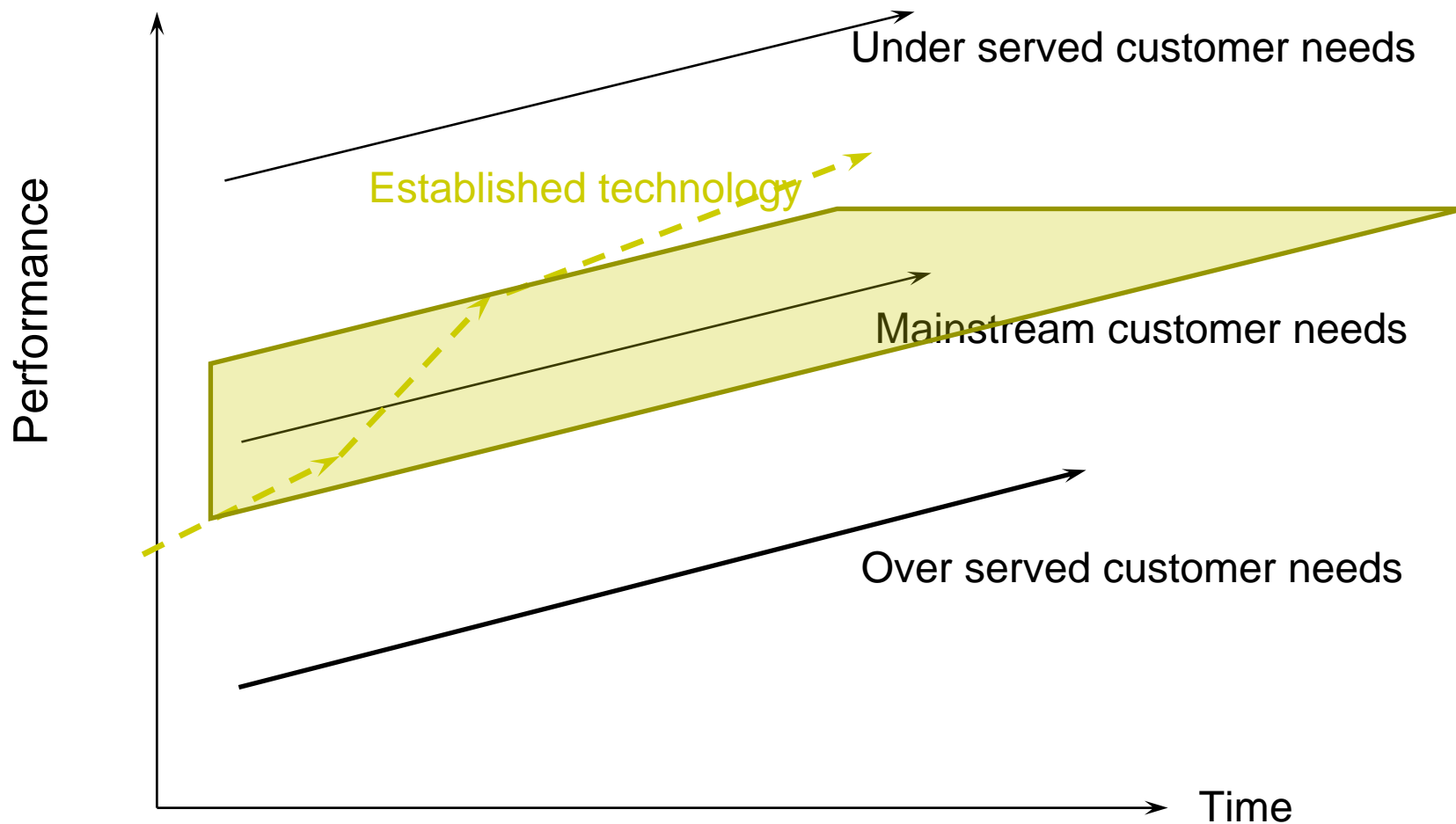
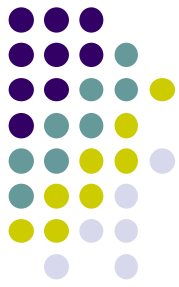
● Under served

- Referred to as lead customers
- Frustrated with current technology
- WTP for enhancements & upgrades
- Often changing the technology themselves
- Can be hard to give them entirely new technology unless they can “tinker”
- Prefer fully integrated solutions

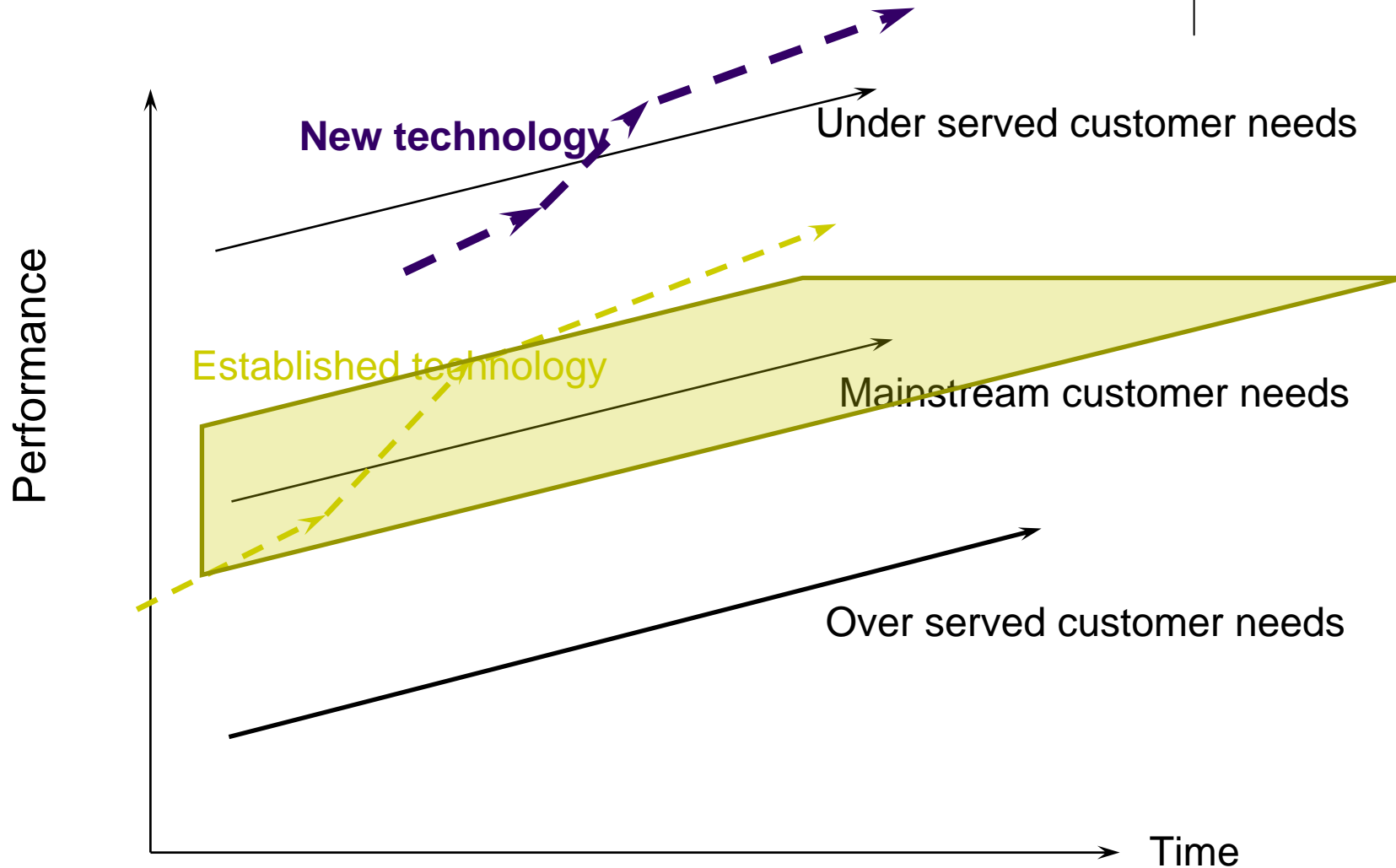
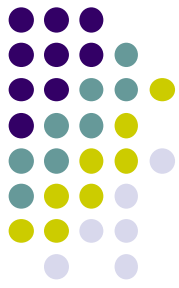
● Over served

- Customers who stop paying for improvements
- Diminishing marginal benefits
- May benefit when more “control” is put in their hands
- Good place for stripped down alternatives
- May value other attributes

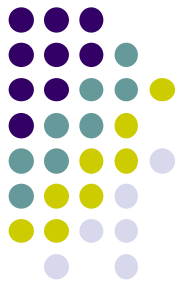
An alternative map of the technology S curve & market dynamics



New technology S curve for under served customers

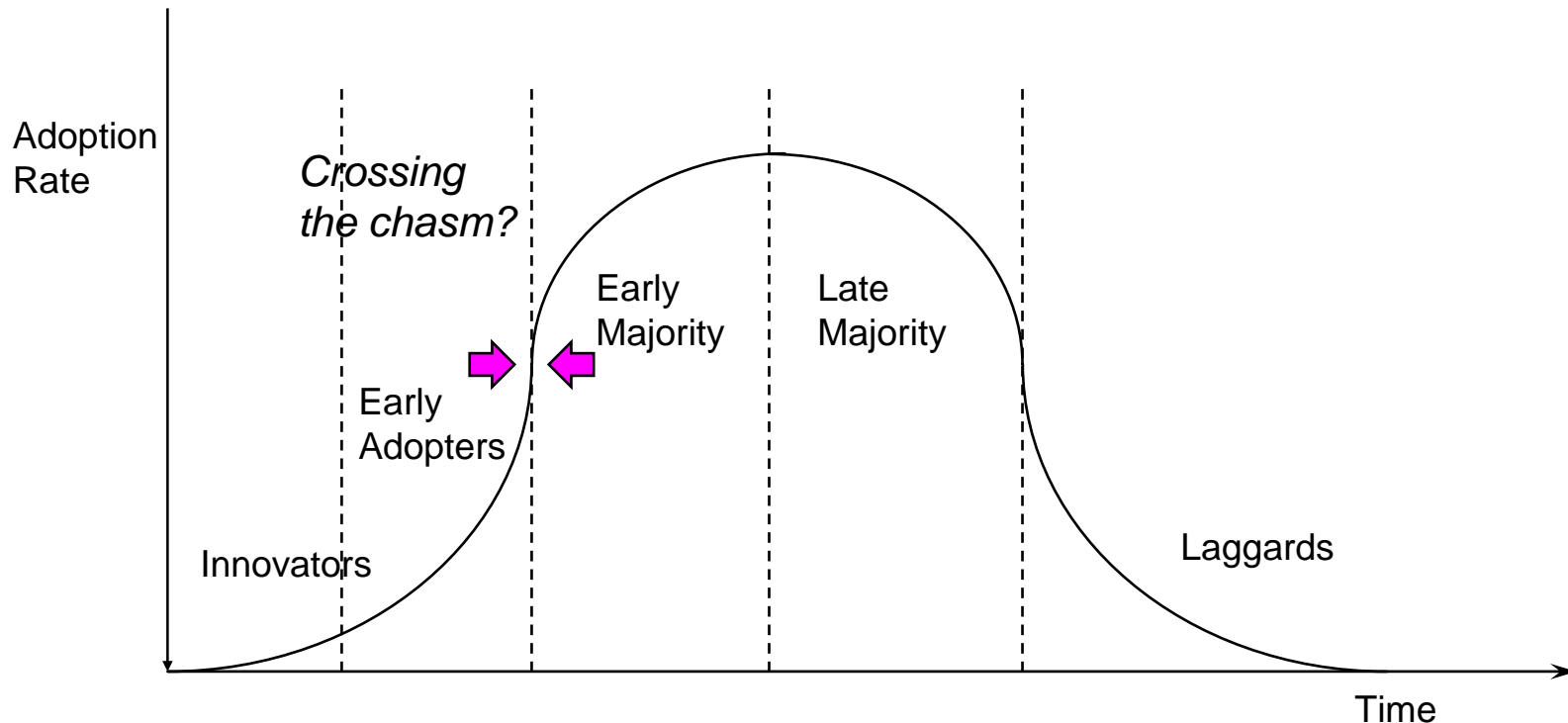
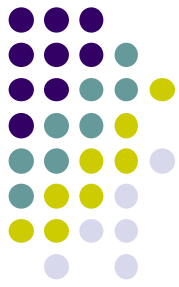


Opportunities for under-served customers?



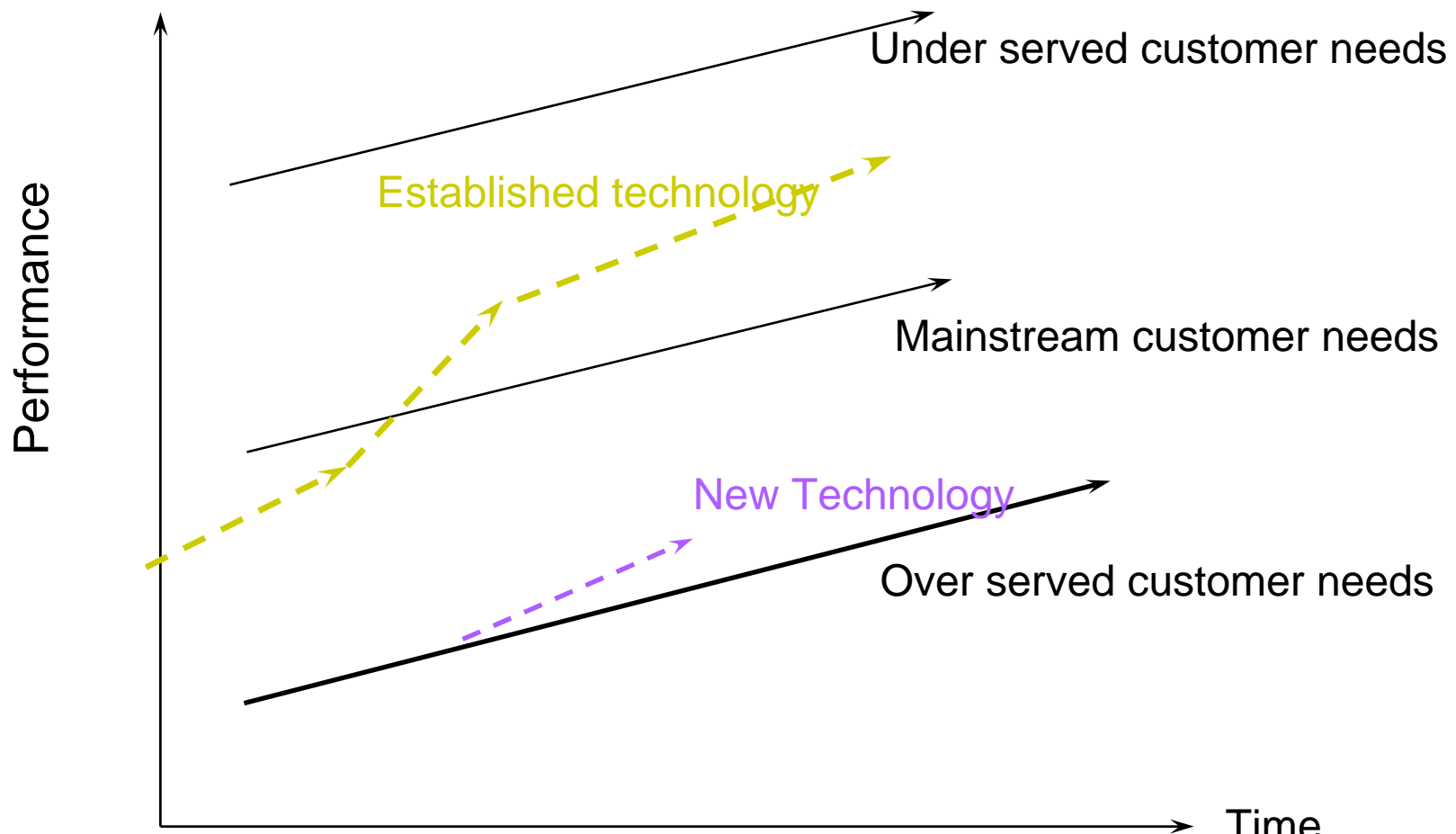
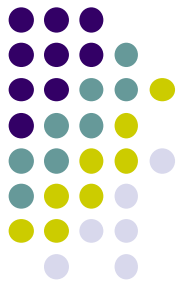
- May be served by new S-curves
- NOTE: not all technology S-curves come “up” from below – some are simply better
- May be easier to identify – firms are looking to their lead users for continual stream of ideas...
- BUT – some new ideas seem unreliable, too costly – hard to risk incumbent reputation...
- Beware of **small niches** here...

Crossing the chasm from under served niche into mainstream



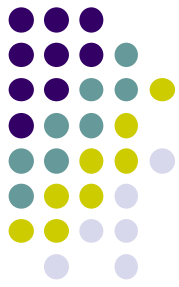
Making the transition from “early adopters” to “early majority” users often requires the development of quite different competencies: e.g. service, support capabilities, much more extensive training.

New technology S curve for over-served customers?



Adapted from: Christensen, Clayton M. *The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail*. Boston, MA: Harvard Business School Press, 1997.

How to identify these “low end” innovations?



- Existing solutions are too costly or complex
- There may be other dimensions of interest
 - for example, speed in the case of home diagnostics or convenience in the case of cell phones
- Business model has low overhead and high asset utilization
- Potential business areas where it is unattractive for the major incumbent to respond
 - If you are in strategy you will recognize this as “JUDO STRATEGY”

EXAMPLES

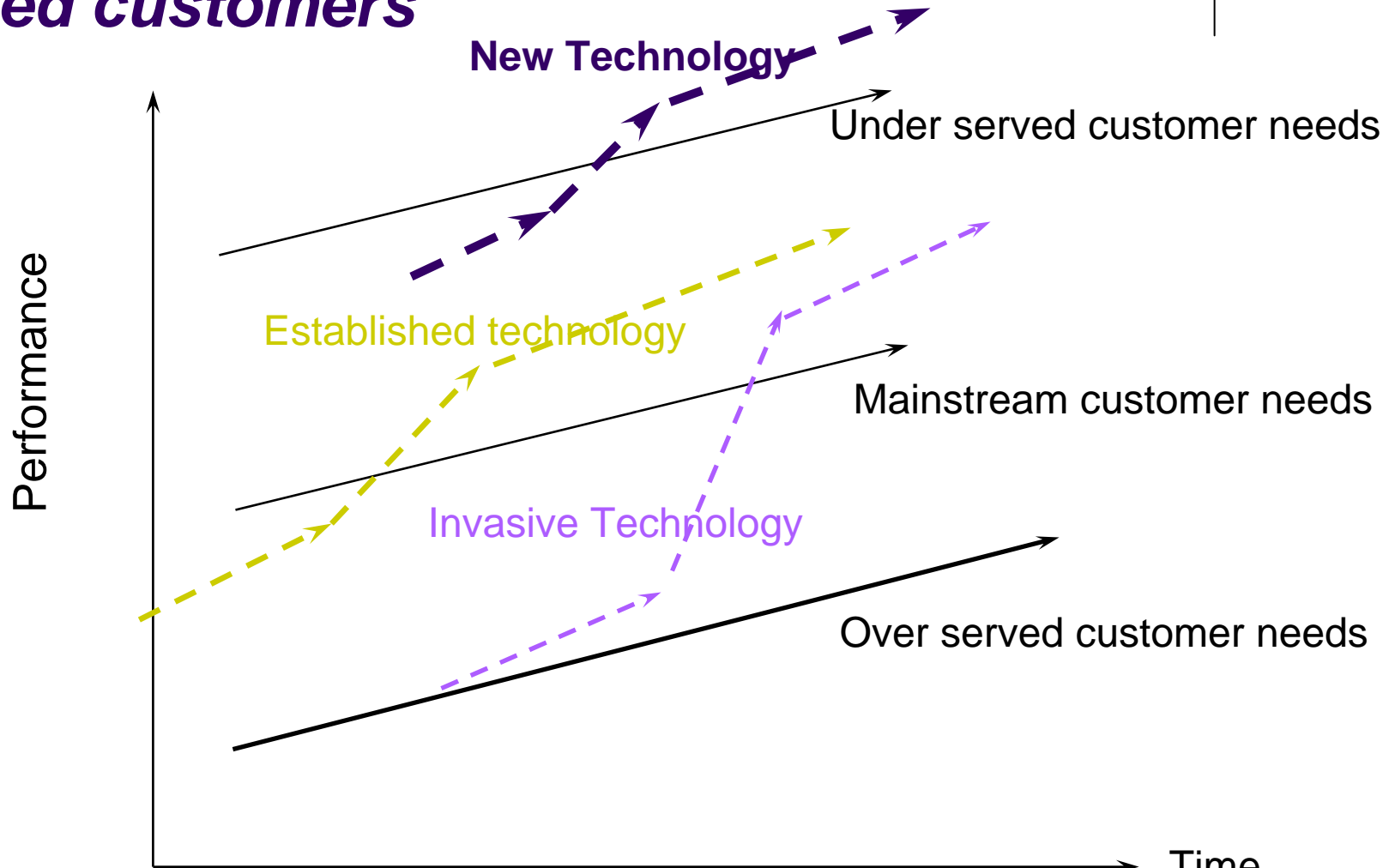
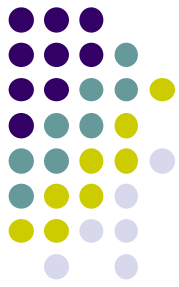
Red Bull: Instead of head to head with Coke etc. (which is what virgin Cola did), they entered with a niche, unconventional outlets – new dimension of energy drinks. Similarly power bars...

Jakks Pacific: (CA-based toy and action figure maker) Entered the video game industry but did not confront Sony and Nintendo. Instead, has a cheap controller to plug into the TV with well known video figures (targets pre teen kids). Poor quality but inexpensive and fun! Compare this to Microsoft entering at the same time with the Xbox – direct head to head competition, very costly.

Motorola Razr: Low end innovation

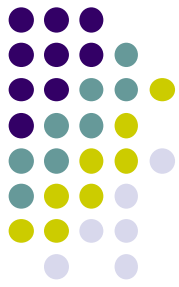
SKYPE: Low end innovation for telephone calls. Inconvenient but cheap....ignored by the telecom giants

Christensen's Insight: Impact of new technology S curve for over- served customers



Adapted from: Christensen, Clayton M. *The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail*. Boston, MA: Harvard Business School Press, 1997.

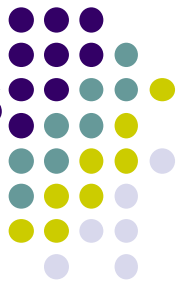
Impact of new technology S curve for over-served vs. under-served customers



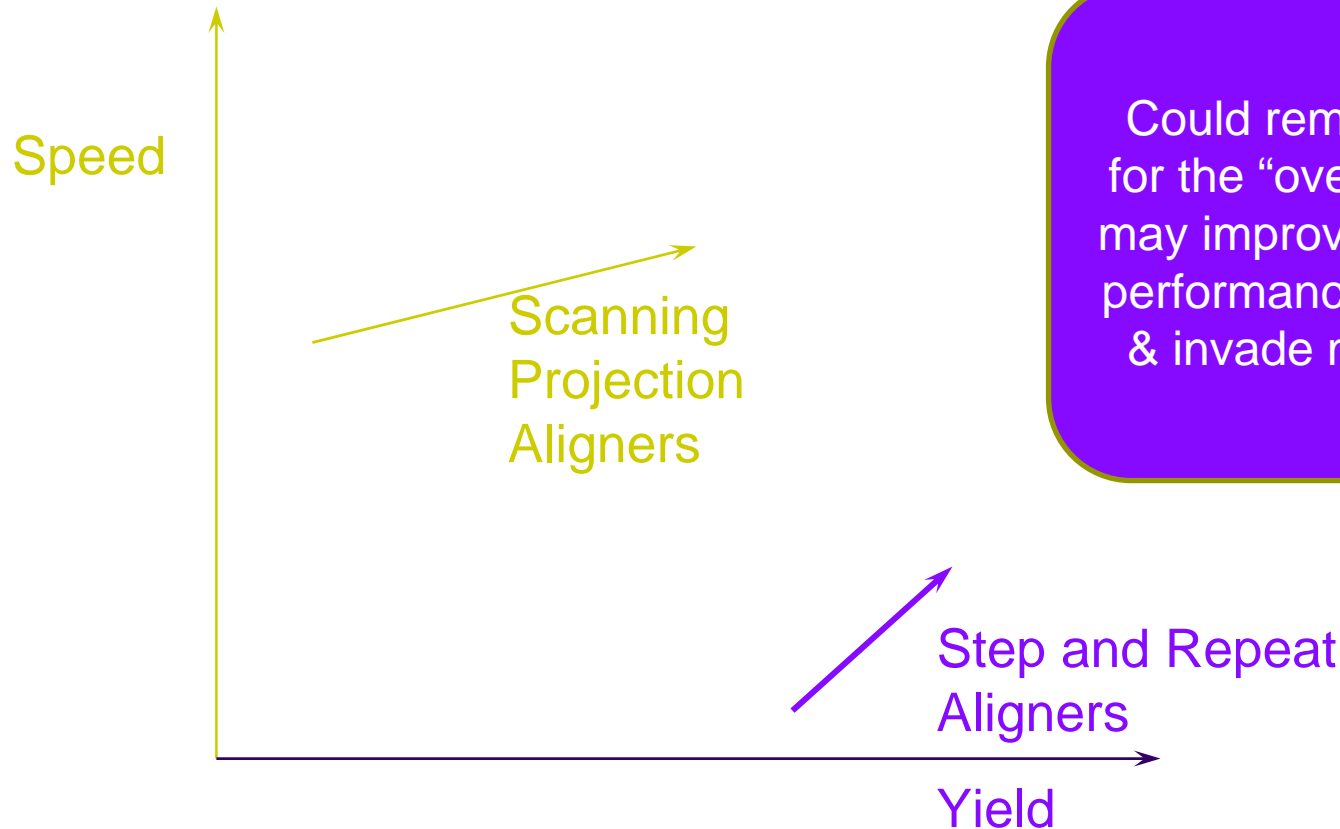
Good example of both approaches: digital photography

- Kodak tried to apply it to the high end – to professional photographers.
- Fuji applied it to the low end to children's toys etc.

Innovations for “over served” customers may be valuable on another dimension



For example: *Semiconductor Photolithography*



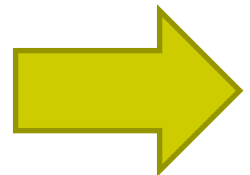
Could remain a niche for the “over served” or may improve on original performance dimension & invade mainstream

Industry Dynamics

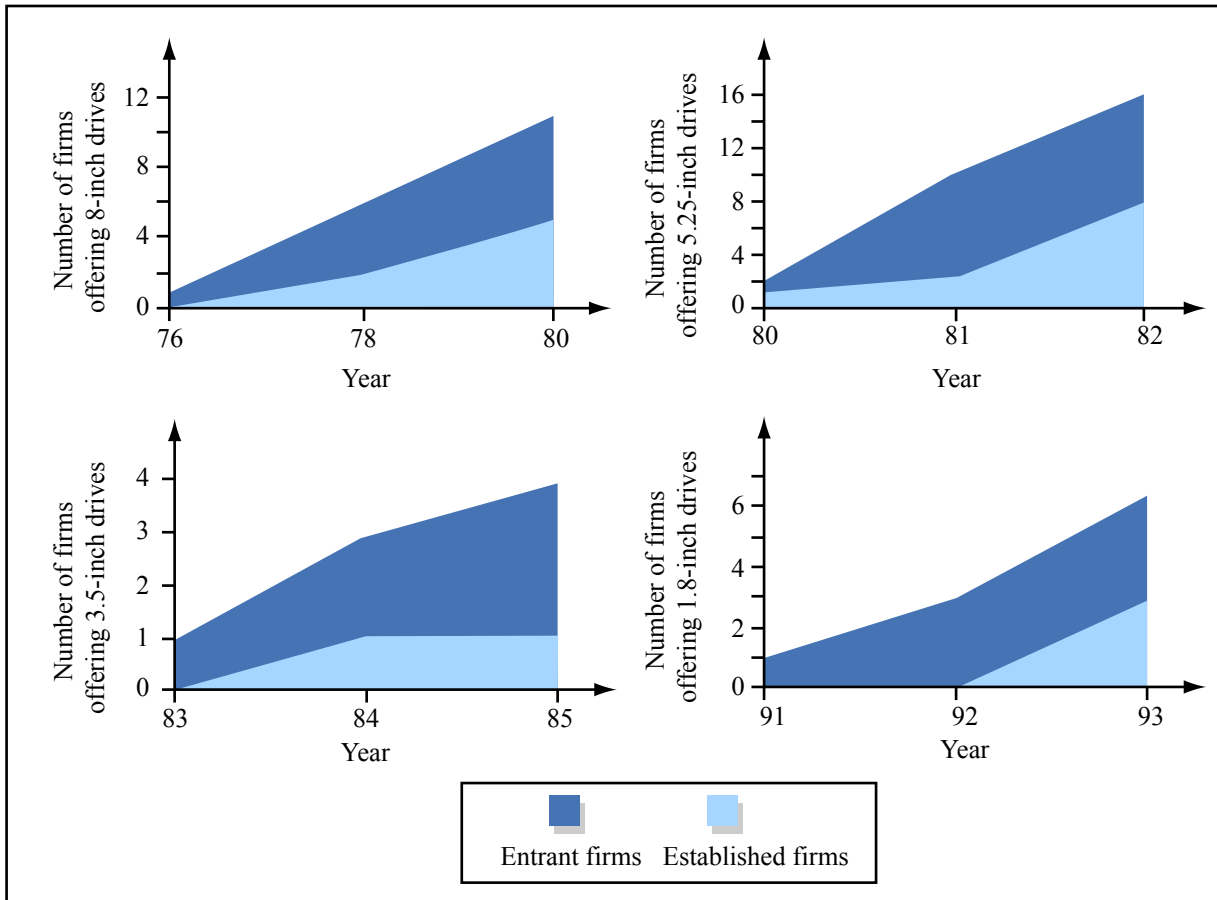
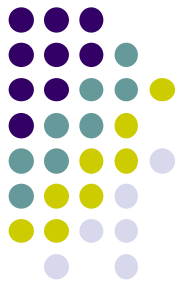
Implications for Competition



DO ALL NEW S-CURVES LEAD
TO DISRUPTION?



Classic Case of the Disk Drive

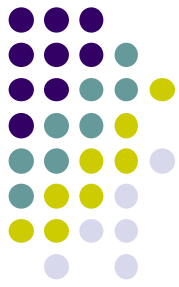


In the disk drive industry, changes in technological leadership goes hand-in-hand with changes in market leadership

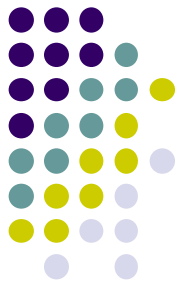
- Low-end technology S curve + low-end of market S curve
- => disruption
-

Figure by MIT OpenCourseWare.

Dilemma of Disruptive Innovation (Christensen)



- Traditional strategy emphasizes the central importance of staying “close to the customer”
 - Even in the best of circumstances, advantage relies on superior responsiveness to emerging customer needs
 - Traditional source of advantage erosion from taking long-time customers “for granted.”
- At their earliest stages, **low-end discontinuities** don’t even seem like attractive opportunities
 - Focus is on “over-served” customer segments (those who do not want to pay for the “extra” performance in the established technology)
- **Dilemma:** technology S-curve logic dictates that *some* (but not all) technologies originally focused on low-end market will ultimately provide performance that competes directly with main customer segment –
- **NICE OPPORTUNITY FOR ENTREPRENEURS**



The Televisionary

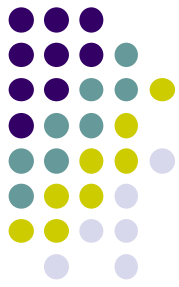
Farnsworth looked up from the tube. "*That's it, folks,*" he announced with a tremor in his voice. "*We've done it—there you have electronic television.*"

[Farnsworth] was a romantic, and in the romance of invention the creative process consists of two discrete, euphoric episodes, linked by long years of grit and hard work. First is the magic moment of conception: Farnsworth in the potato field. Second is the moment of execution: the day in the lab. If you had the first of those moments and not the second, you were a visionary. But if you had both you were in a wholly different category.

Gladwell, M. "The Televisionary". *The New Yorker*, May 27, 2002.

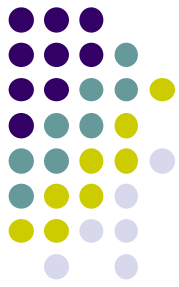
Seems like the classic discontinuity - a new technology S curve that will be highly "disruptive" to incumbent RCA...
WHY NOT??

Dilemma of Sustaining Innovation (Teece)



- Television was really a “high end” discontinuity – for customers wanting MORE than radio
 - Because incumbents have their “eye on the prize” of their lead customers, **MORE COMPLEX OPPORTUNITY FOR ENTREPRENEURS**
 - Makes it much more difficult to invade a market at the high end
 - Even when the technology is new & hard to copy, incumbent will likely invest more resources in their own technology S curve
- OR
- They may try and buy the competition!
-
- Dilemma here is for the entrepreneur – is it worth head-to-head competition?
 - **DEPENDS ON IP POSITION** e.g. biotech

Innovation & Competitive Advantage: A Synthesis & Entrepreneurial Opportunities



Undermines
Market Assets

Classic Disruptive Opportunities– may have only limited impact on technical expertise – more impact on market strategy – need to be fast!

Classic discontinuity– two new S curvesopens up **new markets & technology.**

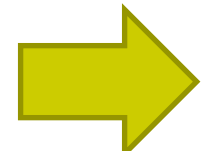
Incremental innovation/
Reinforces Technological expertise

Major Incumbent's Advantage! Incremental change along technology S curve or new component S curve that is easily integrated

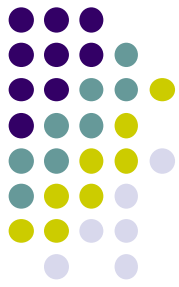
Reinforces
Market
Assets

Radical Innovation/
Destroys Technological expertise

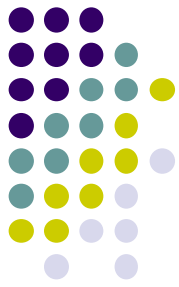
Often targeted at lead users - undermines competencies in managing the *Technology S-Curve* but firms will rapidly try and follow – need strong IP here



Appropriate strategy is a consequence of the commercialization environment

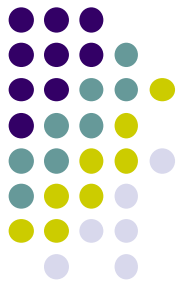


		Do incumbent's assets contribute to value proposition from new technology?	
		No	Yes
Can start-up IP preclude effective development by the incumbent?	No	The Attacker's Advantage e.g. disk drives	Reputation-based ideas trading e.g. Cisco
	Yes	Greenfield Competition e.g. video games	Ideas Factories e.g. biotech



Implications

- The transition across technology & market S-Curves is a complex challenge for any organization
- Discontinuity provides a window of opportunity to entrants, established firms often find transition a challenge
 - Core competencies associated with one architecture may become competency traps in moving between generations
 - Not only an organizational problem, but anti-cannibalization may limit incentives to move as quickly as potential entrants
- At a point in time, advantage in technology-intensive industries depends on...
 - Satisfying Key Customer Segments (Exploiting the Mkt. S-Curve)
 - Organizing Around the Technology (Exploiting the Tech. S-Curve)
=> *BUT advantage over time depends on transitioning between S-Curves*



Class 4 – BIG case study

- Case: Focuses on how BIG organizes and manages its creative process to allow for repeated innovation in toys.
- Key Decision: Focus your attention on the ways in which BIG manages the creative concept development process and the idea triage process. Does this seem like the optimal process? Is this a process you are familiar with?
- Additional Assignment: watch the IDEO video (if you have not done so recently!!) and compare to BIG:
<http://www.ideo.com/media/nightline.asp>