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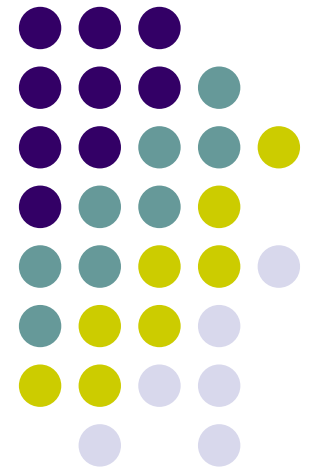
15.351 Managing Innovation and Entrepreneurship
Spring 2008

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15. 351 Managing Innovation & Entrepreneurship

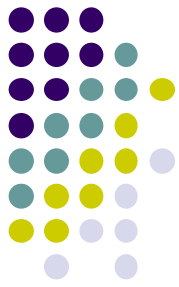
Fiona Murray
MIT Sloan School of Management
Spring 2008

Class Seventeen – Commercialization Strategy



Module Three:

Exploiting innovations



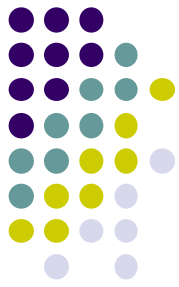
Four Classes - insights into the most effective exploitation strategies & processes

Exploiting Innovations

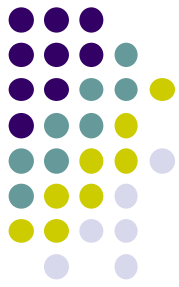
**Key strategies
& processes**

- IP & Complementary Assets framework – commercialization strategies
- Le Petit Chef – portfolios & portfolio management processes
- Leveraging platforms – Electronic Arts & video gaming – Cyrus Beagly from McKinsey
- Leveraging portfolios – A123 – Ric Fulop, founder & VP Biz Dev

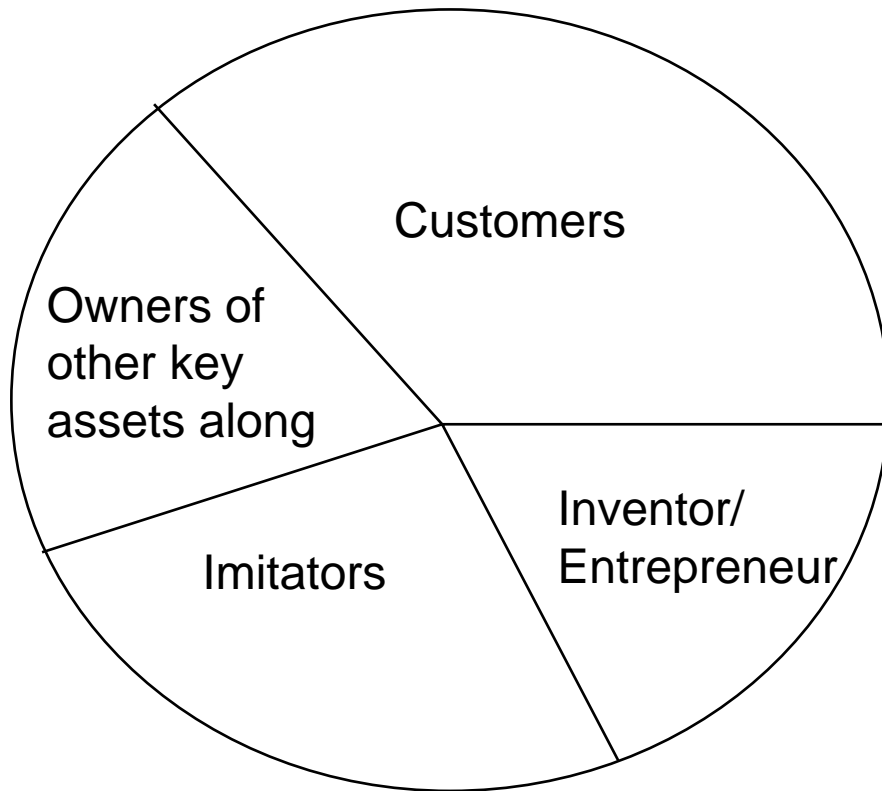
Exploiting Innovations



- Two key questions
 - Who will earn \$ from a technological innovation?
 - What is the most effective commercialization strategy to exploit innovation?



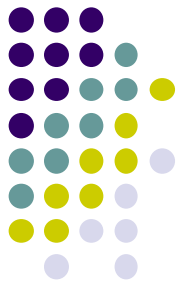
Who might capture the profits from a technological innovation?



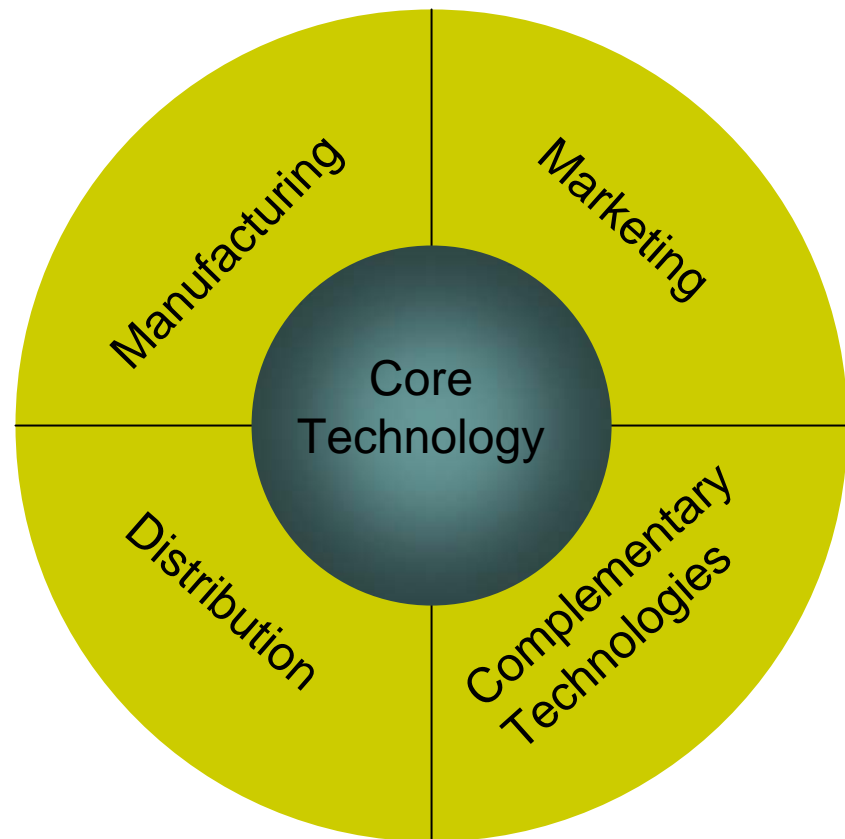
Examples:

- Novel drill bit
- Small Camera
- Visicalc
- Artificial Sweetener
- Television
- New cookie
- New dress design
- Firefox

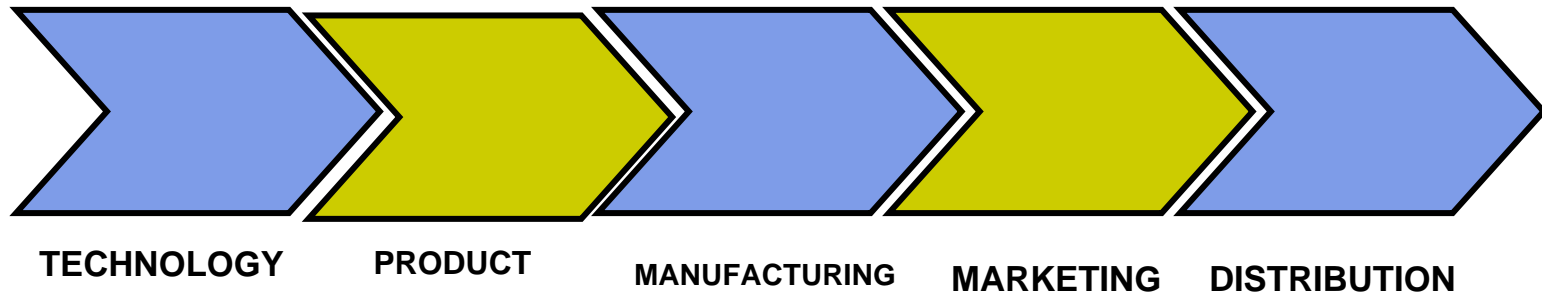
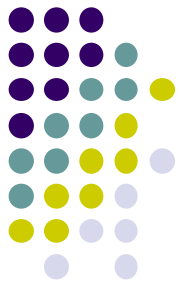
What Are Key Assets required for commercialization?



Assets necessary to translate an innovation into commercial returns

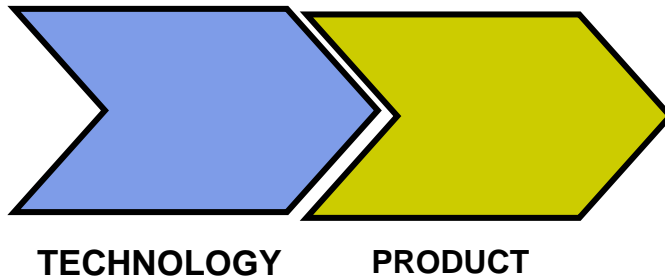
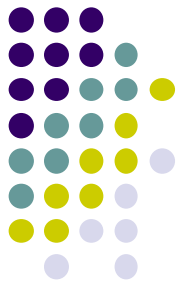


Map assets along the entire value chain (vertical) or several...

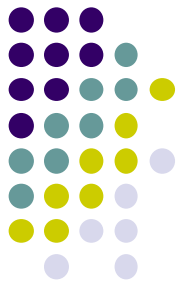


- Analysis of all the steps necessary to deliver a product to the customer
- Key to understanding which complementary assets you need to own (or contract) and where you might cooperate for access...

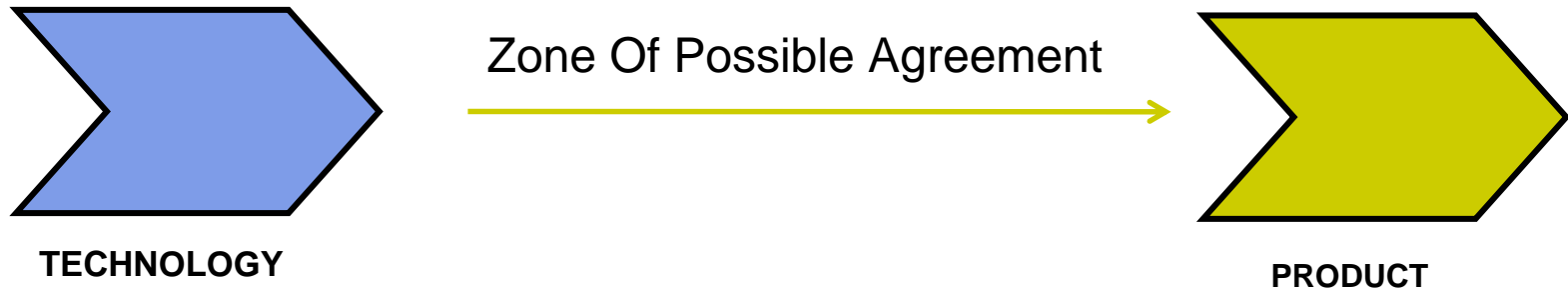
Imagine you have developed a new technology that might become a critical component in a large system....



If you want to negotiate with the (large?) product firm, what determines the outcome of the negotiation?



Classic negotiation framework...



BATNA

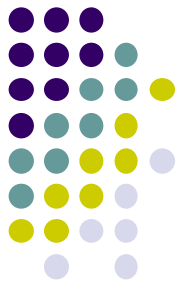
- What is your alternative if the deal fails?
- Are there other “product” firms?
- Could you build the product yourself?
- Is there an alternative vertical?

BATNA

- Are there alternative technologies that can do the job?
- Can you copy the technology? If they have IP will they sue me?
- Can you invent around? How long would it take?

To put it another way:

How is the value shared depends on ability to control idea and ability to control assets



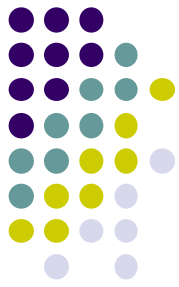
- Control ideas - Appropriability Regime
 - An innovation can be controlled if no one else can use it or copy it. This gives enormous bargaining power in the value chain.
- Control Assets (i.e. control over key parts of the value chain)
 - One vertical or multiple verticals

Controlling your ideas



	Cost	Time	Cost to enforce	Limits	In a bargaining situation?
Intellectual property	\$\$\$\$	20 yrs (patent)	US\$1M/pat/yr in litigation – is this a credible threat?	<ul style="list-style-type: none"> -Disclosure -Time ltd -No= freedom to operate 	<ul style="list-style-type: none"> -Sign of real technology - Signal threat of possible litigation - Strength varies by sector
Secrecy/ Complexity	\$	Indefinite (Coke)	Difficult once a secret is “out”	<ul style="list-style-type: none"> -Can you build the firm -Do NDAs work? 	<ul style="list-style-type: none"> -Hard to bargain if your stuff is secret (unless you can show its results) - Hard to sell – how do you sell the firm?
Speed	\$\$	Short!	na	<ul style="list-style-type: none"> - Need to repeatedly innovate 	<ul style="list-style-type: none"> - Hard to bargain when speed is of the essence

Easy to over estimate your control of an idea: The Televisionary



Low end of new technology S curve BUT targeting the high end of the market S curve and the important customers for RCA – so STRONG response

Many others were involved:

May & Smith: photoconductivity

LeBlanc: transmit image line by line due to time for vision

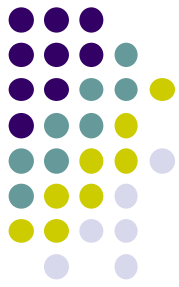
Swinton: 1908 British E Engineer, scanned images using a cathode ray

Farnsworth: dissect image with a vacuum tube with lens at one end, photoelectric plate at the other to convert from light to electricity then anode finger to scan

Zworykin & Rosing: (mentor in physics from St. Petersburg): iconoscope

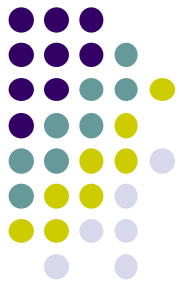
Dieckman & Hell: (Germany) 1920s, similar ideas patented

Baird: 1925 Scottish inventor



The Televisionary, cont.

- Worldwide landscape of complex IP
- RCA licenses Farnsworth ideas but used their own image dissector – their TV was the best of both worlds
- RCA – S curve incorporating the ideas of many others....Zworkyn promised a TV in 2 years and 100k – instead it took 10 years and 50M
- Sarnoff took control of the fruits of invention in return for freedom to invent
- Farnsworth refused to settle with RCA until 1939 when there was a million dollar settlement
- Forced out of business after the war when he could not compete with RCA



Easy to over-estimate your ability to rapidly build the value chain: EMI & the CAT Scanner

Image of CAT Scanner removed due to copyright restrictions.

- Computerized axial tomography invented by EMI engineer in late '60s
 - “greatest advance in radiology since the discovery of x-rays in 1895”

Ups & Downs of EMI



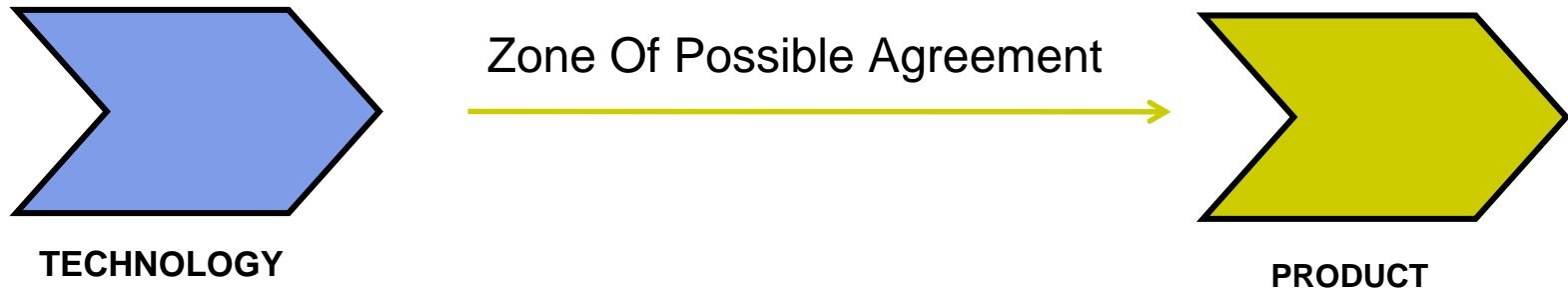
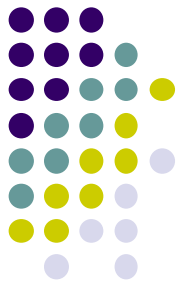
Image of CAT Scanner removed due to copyright restrictions.

CAT Scanner: market leadership lost within 6 years of introduction to U.S.

Hounshell gets Nobel Prize!

Within six years, EMI has lost the market to General Electric who have been able to invent around the patent and leverage their extensive & highly effective presence in US hospitals.
EMI execute poorly!

Why big companies/start-ups might negotiate even when they could do it alone...



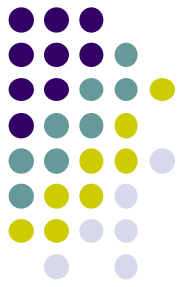
WHY TRY AND DO A DEAL?

- It might be quicker to leverage an existing value chain element than to build from scratch
- May only be useful for one vertical not others, so maybe risky
- Costly and cost of capital is high

WHY TRY AND DO A DEAL?

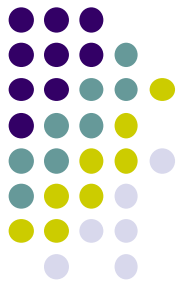
- Gathering the technical capabilities in house may be costly, impossible
- Risky – rather sign a deal which focuses on long term upside not costs today
- Faster this way
- Reputation for being good to deal with – more deals come my way

Interaction between Appropriability & Complementary Assets critical when determining who makes \$ exploiting innovation



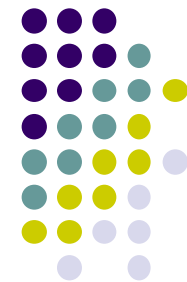
		Controlling the Assets	
		Tightly held by others	Free or don't yet exist
Controlling the Ideas	Strong	Innovators & Asset holders share profits	Innovators in strongest position to profit
	Weak	Hard for innovators to profit	Innovators can profit

This tells you about the pie...



- But how should you develop a commercialization strategy to ensure that you get your share of the pie...?
- Need the most effective commercialization strategy....

Interaction between Appropriability & Complementary Assets critical when determining who makes \$ exploiting innovation



		Controlling the Assets	
		No, free or don't yet exist	Yes by powerful incumbents
Controlling the Ideas	Weak	Innovators can profit	Hard position for innovators to profit – need to move!
	Strong	Innovators in strong position to profit	Innovators & Asset holders share profits

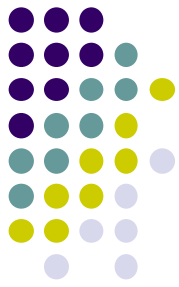
Effective Commercialization Strategy Depends on Assessing Two Key Questions



Do incumbents control assets that you need to create value from your innovation?

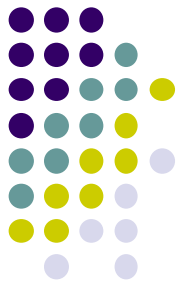
		No, free or don't yet exist	Yes by powerful incumbents
How well do you control the ideas behind your innovation?	Weak	Innovators can profit	Hard position for innovators to profit – need to move!
	Strong	Innovators in strong position to profit	Innovators & Asset holders share profits

Effective Commercialization Strategy Depends on Assessing Two Key Questions

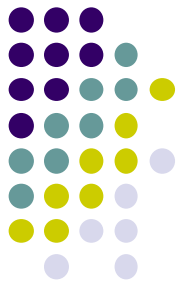


		Do incumbents control assets that contribute to value proposition from your innovation?	
		No	Yes
Do you control your innovation – can you prevent imitation?	No		
	Yes		

Industry Dynamics Are A Consequence of the Commercialization Environment



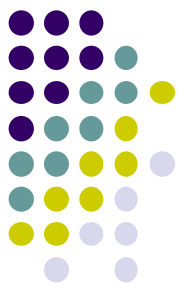
		Do incumbent's complementary assets contribute to value proposition from new technology?	
		No	Yes
Can invention by the start-up preclude effective development by the incumbent?	No	The Attacker's Advantage	Reputation-based ideas trading
	Yes	Greenfield Competition	Ideas Factories



Differences in Commercialization Strategy Across Industry Result from Differences in the Commercialization Environment

		Do incumbent's complementary assets contribute to value proposition from new technology?	
		No	Yes
Can invention by the start-up preclude effective development by the incumbent?	No	Disk Drives Fashion	Cisco, Intel Autos, Toys? TVs, Med devices
	Yes	Xerox Video Games	Biotechnology TV Shows Chemicals

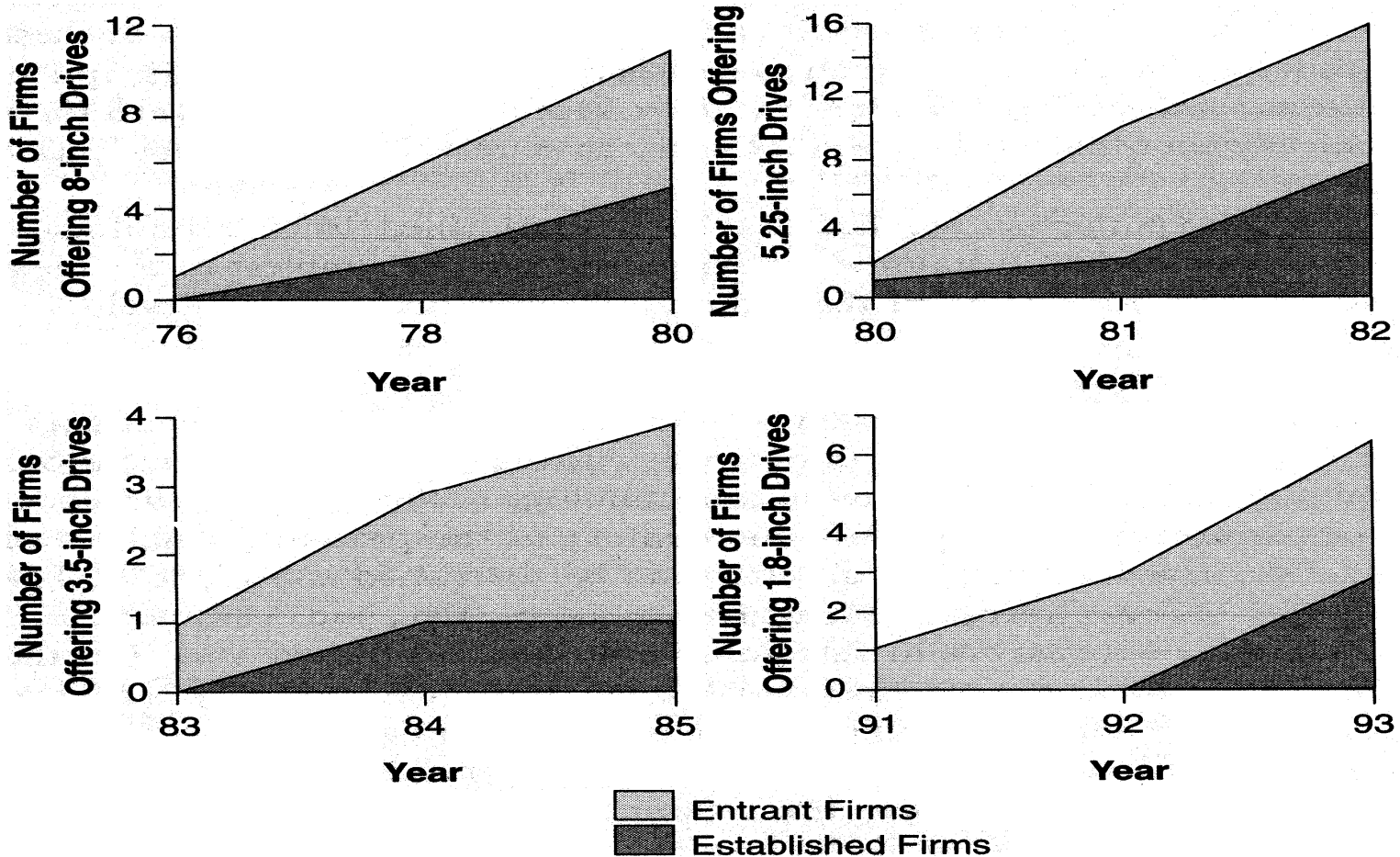
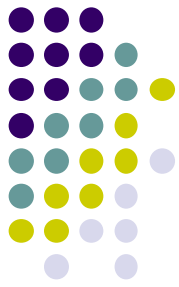
Some Evidence: The MIT Commercialization Strategies Survey

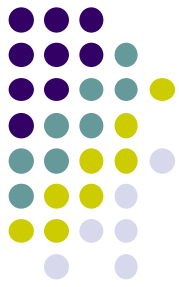


Figures represent the rate of cooperation within each “cell”		Do incumbent’s complementary assets contribute to value proposition from new technology?	
		No	Yes
Can invention by the start-up preclude effective development by the incumbent?	No	14%	30%
	Yes	34%	56%

DIFFERENT ALTERNATIVES

In disk drives innovators developed the entire value chain & sold in the product market





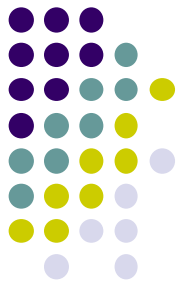
Images of video game screens removed due to copyright restrictions.

DIFFERENT ALTERNATIVES

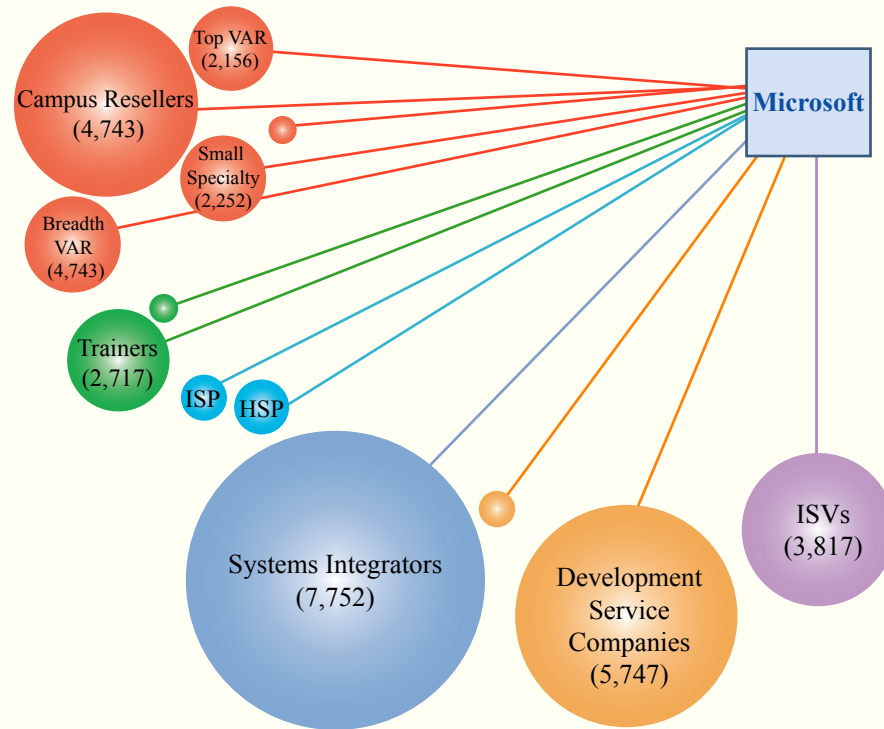
In (early history of) video games innovators generally developed entire value chain – but through widespread licensing (could also vertically integrate)

DIFFERENT ALTERNATIVES

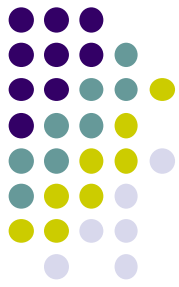
In software & hardware innovators have typically relied on market for ideas partnering (with caution) with Microsoft (Intel)



MICROSOFT PARTNERS	38338
<i>PARTNERS SEGMENT</i>	<i>FIRMS</i>
Systems Integrator	7752
Development Srve Co	5747
Campus Resellers	4743
ISV	3817
Trainer	2717
Breadth VAR	2580
Small/Specialty	2252
Top VAR	2156
Hosting Srve Prov	1379
Internet Srve Prov	1253
Business Consultants	938
Support	675
Hardware Outbound	653
Consumer Electronics	467
Unsegmented Reseller	290
Media Store	238
Mass Merchant	220
Software Outbound	160
DMR	105
Computer Superstore	51
ASP Aggregator	50
eTailers	46
Office Superstore	13
General/Aggregator	7
Warehouse/Club Store	7
Niche/Specialty	6
Subdistributor	6
Apps Integrator	5
MS Direct (Rslr)	2
MS Direct (Msft)	1
Network Wquip Prov	1
Network Srve Prov	1

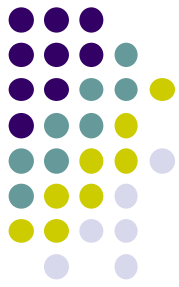


Note: Only segments with 500 or more firms are pictured.



Oswald the Lucky Rabbit

- In 1927, Walt Disney contracted with Mintz-Winkler for the distribution and marketing (i.e., commercialization) of his “new” animated character, Oswald the Lucky Rabbit.
 - Starting with the *Alice Comedies*, Disney was building a fledgling studio, and had begun to build a team of exceptionally talented animators, and emphasize a distinctive style that focused less on “hi-jinx” (such as Felix the Cat) and more on storytelling / emotional resonance
 - Oswald the Lucky Rabbit is an extraordinarily popular animation, receiving strong critical and audience reviews
 - Despite this success (and perhaps because of it), contentious disputes over Oswald
 - The Disney Brothers believed they were being cheated out of the profits (Mintz would not let them “see the books” about the total revenues earned), and also believed that Mintz was foregoing lucrative deals on new Oswald comedies in order to “milk” the old material
 - Mintz, on the other hand, believed that Walt Disney was simply a “manager” of a very talented team, and that the Disney Brothers provided little “value added”
- In April, 1928, Disney meets with Mintz in NY, demanding a higher per-reel contract and a higher share. Mintz, in turn, announces that he has already lured away several key Disney employees, and also owns the “rights” to Oswald the Lucky Rabbit

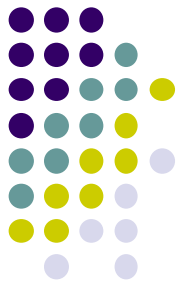


Mortimer Mouse?

- On the train back to California, Disney focuses on how to recover from the Oswald expropriationtrims down the ears and creates Mortimer Mouse....

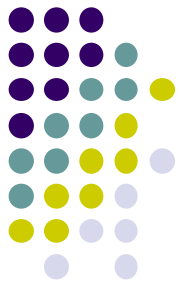
Image of Micky Mouse
removed due to
copyright restrictions.

Mickey Mouse



- On the train back to California, Disney focuses on how to recover from the Oswald expropriationtrims down the ears and creates Mickey Mouse...
- Both the defectors and Disney teams work together on Oswald cartoons under contract, but work in secret at night on the follow-on project
- Disney focuses on independently commercializing Mickey Mouse, and chooses a “radical” approach, developing the first popularly released *sound* cartoon, Steamboat Willie, in November, 1928, including a range of synchronization and story techniques years ahead of competitors

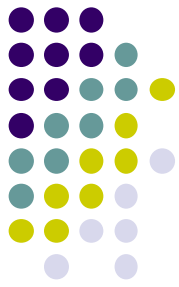
Mickey Mouse and Long-Term Advantage in the Animation Industry



- Independent strategy was at the cornerstone of the differentiating aspects of the Disney animation studio in the 1930s (and beyond)
 - An intense push for high-quality animation; rather than pay animators “by the reel,” Disney chose straight wage contracts with a high subjective bonus
 - An intense focus on storytelling rather than pure physical humor
 - Tight control over Mickey (Disney himself was the voice until 1946)
- The *long-term* structure of advantage in animation industry reflects the failure of the *market for ideas* in this segment
- Oswald studio ultimately evolves into *Looney Tunes* franchise of Lantz (Woody Woodpecker), incl. Bugs Bunny
- Disney itself now established as leading incumbent, recently purchased “entrant” Pixar after long period of cooperative commercialization

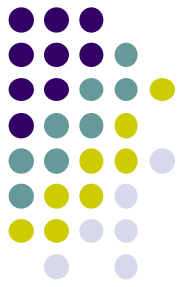
APPENDIX

Non-Excludable Technology / Overturns Incumbent Asset Value



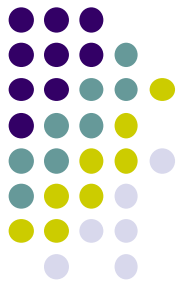
- Start-up Strategies
 - Few opportunities for effective contracting
 - Opportunity to exploit technological leadership to capture market leadership
 - Performance depends on “stealth” product market entry
 - Incumbent Issues Strategies
 - Competitive Advantage in products not competencies
 - Sustained market position requires continual reinvention and preemption
 - Constant monitoring and tight integration of value chain
-
- Expected Competitive Dynamics
 - Market leadership determined by technological leadership
 - Established firms face competition from entrants in “niche” markets
 - Start-ups will make new investments in complementary assets as a part of establishing a novel value proposition

Excludable Technology / Reinforces Incumbent Complementary Assets



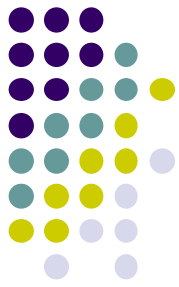
- Start-up Issues & Strategies
 - Contracting with Established Firms
 - Product market entry is very costly and perhaps impossible
 - Performance depends on securing bargaining power
 - Product market strategy both costly and less profitable than partnering
- Incumbent Issues & Strategies
 - Competitive Advantage in both competencies and products
 - Sustained positioning requires securing start-up partners
 - Find balance between internal development and use of external start-up innovation
- Expected Competitive Dynamics
 - Frequent changes in technological but not market leadership
 - Start-ups compete with one another for priority in negotiations
 - Start-up innovation reinforces existing platforms

Non-Excludable Technology / Reinforces Incumbent Complementary Assets



- Start-up Issues & Strategies
 - May be few opportunities for contracting
 - Product market entry due to high costs and imitation risk
 - Performance depends on existence of incumbent commitment to ideas trading
 - Incumbent Issues & Strategies
 - Competitive advantage in both competencies and products
 - Opportunity for sustainable positioning by developing reputation for ideas trading
 - Often results in internal R&D focus
-
- Expected Competitive Dynamics
 - Relative market and technological stability
 - Established firms face few credible competitive threats from start-up innovators
 - Start-ups play greater role if incumbent chooses reputation strategy

Excludable Technology / Overturns Incumbent Complementary Assets



- Start-up Strategies
 - Ideal opportunity to choose between contracting and product market entry
 - Opportunity to use temporary monopoly power to build future positioning
 - Performance depends on strength of technological competition
 - Incumbent Strategies
 - Competitive advantage is based on products not competencies
 - Sustained market position requires continual innovation and ceding profits to upstream providers
 - Develop reputation from strong innovative performance
-
- Expected Competitive Dynamics
 - Technological leadership drives rent distribution along the value chain
 - Start-ups and incumbents compete for technological priority
 - Substantial investments in new platforms and complementary assets