

Agenda

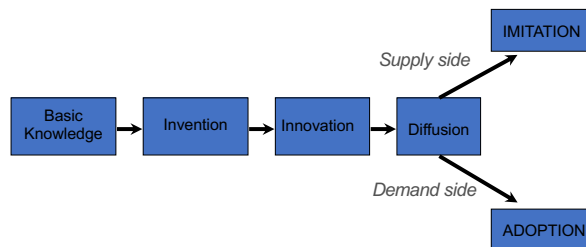
- How do small companies compete with bigger companies?
- How can firms compete based on innovation?
- Competition in Technology Intensive Industries
 - To lead or to follow?
 - Who benefits from innovation?

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Competitive Advantage in Technology Based Industries

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The Development of Technology: from Knowledge Generation to Diffusion

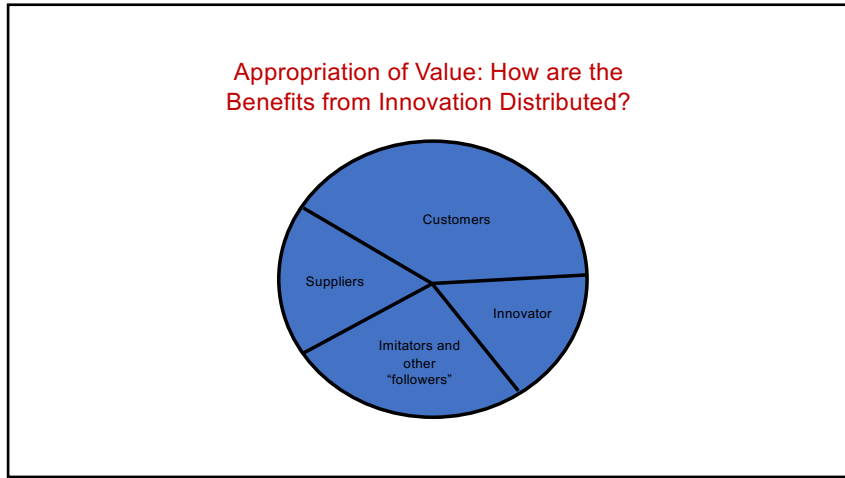


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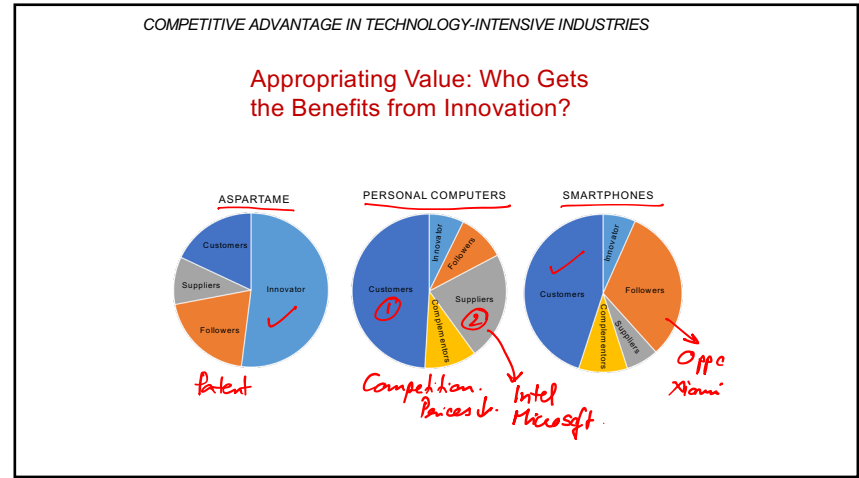
Compressing the Technology Cycle: Less Lag between Invention and Commercialization

	BASIC KNOWLEDGE	FIRST PATENTS	PRODUCT LAUNCH	IMITATION
→ Jet Engines	17 th century Newtonian physics	1930	1957	1959
Xerography	Late 19 th , early 20 th centuries	1940	1958	1974
Fuzzy logic controllers	1960's	1981	1987	1988
Automobile satellite navigation	Late 1950s	Early 1960s	1998	2002
→ MP3 players	Early 1990s	1994	1997	1999
Instant messaging	Late 1980s	2002	2008	2009

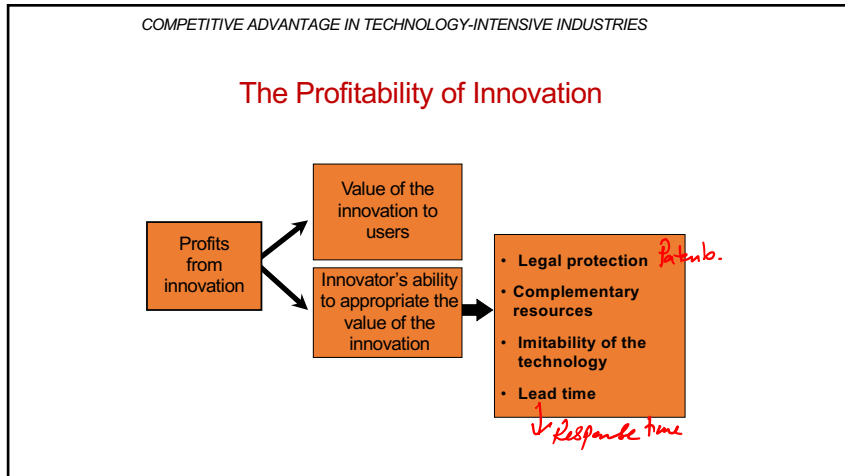
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- ### Legal Protection of Intellectual Property
- **Patents** — exclusive rights to a new product, process, substance or design.
 - **Copyrights** — exclusive rights to artistic, dramatic, and musical works.
 - **Trademarks** — exclusive rights to words, symbols or other marks to distinguish goods and services; trademarks are registered with the Patent Office.
 - **Trade Secrets** — protection of chemical formulae, recipes, and industrial processes. *|| Employees tacit.*
- Also: employment contracts may restrict employees' freedom to transfer technology and know how.*

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Alternative Strategies for Exploiting Innovation

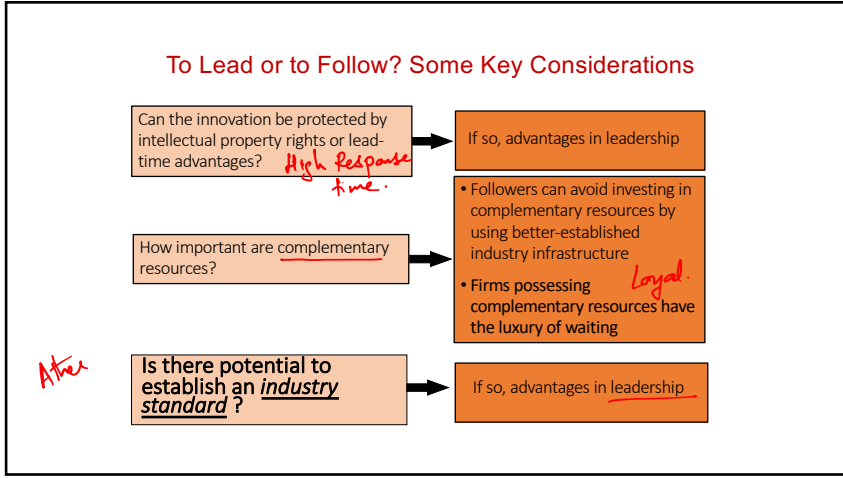
	Licensing	Outsourcing certain functions	Strategic Alliance	Joint Venture	Internal Commercialization
Risk & Return	Low risk, but limited returns (unless patent position very strong)	Reduces investment, but means dependence on suppliers & partners	Benefits of flexibility and speed, but coordination risks	Reduces investment and risk, but partner disagreement likely	Biggest risks and benefits. Allows complete control
Competing Resources	Few	Allows outside resources & capabilities to be accessed	Permits pooling of the resources/capabilities of more than one firm		Substantial resource requirements
Examples	ARM licenses its micro-processor designs to several semi-conductor	Apple outsources manufacture to Foxconn	Apple and Nike collaborate to develop intelligent footwear	Tesla and Panasonic jointly build gigafactory for lithium ion batteries	Page and Brin establish Google Inc. to commercialize their search algorithm

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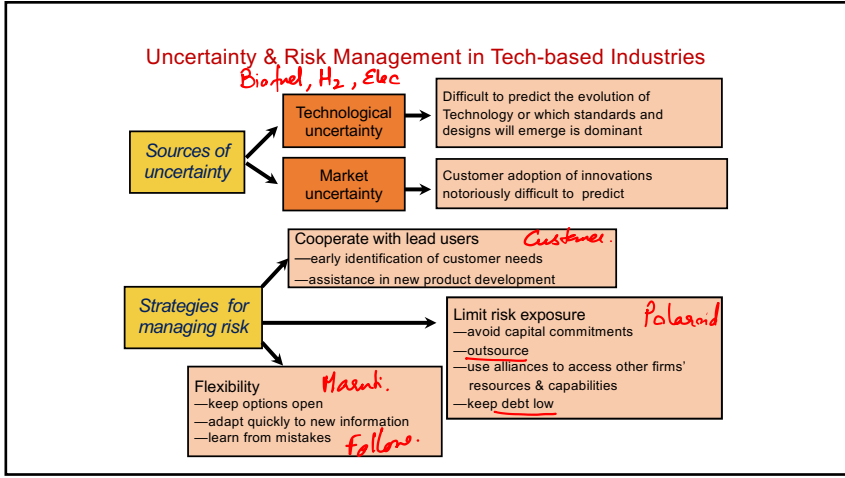
The Timing of Innovation: To Leader or to Follow?

Product	Innovator	Follower	The winner
Jet airliner	De Havilland (Comet)	Boeing (707)	Follower
Float glass	Pilkington	Corning	Leader
X-ray scanner	EMI	General Electric	Follower
Office PC	Xerox	IBM	Follower
VCRs	Ampe/Sony	Matsushita	Follower
Instant camera	Polaroid	Kodak	Leader
Microwave oven	Raytheon	Samsung	Follower
Video games player	Atari	Nintendo/Sony	Followers
Disposable diaper	Procter & Gamble	Kimberly-Clark	Leader
Compact disk (CD)	Sony/Philips	Matsushita, Pioneer	Leader
Web browser	Netscape	Microsoft	Follower
Web search engine	Lycos	Google	Follower
MP3 music players	Diamond Multimedia	Apple (iPod)	Follower
Operating systems for mobile devices	Symbian, Palm OS	Apple, Google	Followers
Cryptocurrencies	Bitcoin	Etherium, Ripple	Leader
Flash memory	Toshiba	Samsung, Intel	Followers
E-book reader	Sony (Digital Reader)	Amazon (Kindle)	Follower
Social networking	SixDegrees.com	Facebook	Follower

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Disruptive Innovation

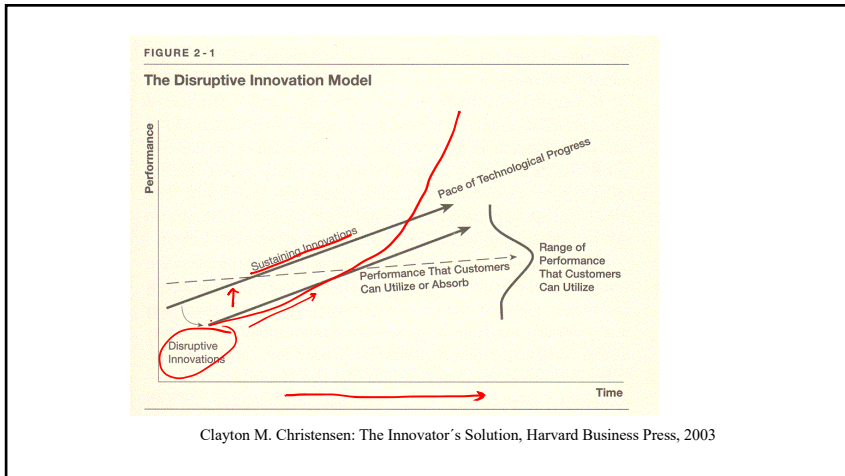
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Impact of Innovation

better & cheaper.

- **Sustaining** – better products that can be sold with higher margin to demanding customers; incumbents win
 - focused on demanding customers; both incremental and radical. Incumbents have resources and motivation.
- **Disruptive** – commercialization of simpler, more user-friendly products, which are cheaper and targeted to new or less demanding customers; new entrants win
 - introduce products and services not as advanced as existing ones, but offering other advantages (simpler, cheaper, more user friendly, ...) and focus on new or less demanding customers.

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Conditions of success

- Good managers are expected to continuously improve products to target upper market tiers and attain higher margins
 - Each company therefore prepares its own disruption.
 - This is the innovator's dilemma, but also the start of innovator's solution.
- The advice to new, growing firms: focus on products and markets ignored or neglected by incumbents.

existing customer product } *disruptive tech.* *instant camera.* *small team*

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Two types of disruption

- **New markets:** compete with non-consumption: simpler, more user friendly, can be used by less sophisticated customers (PC, transistor radio, desk copiers).
- **Low-end:** focus on lower tiers of main markets (minimills, discount stores, Korean auto-makers); motivate incumbents to leave the market

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Dethroning the leader

- Creative destruction
 - Inevitable destruction of the leader's position due to the creative new actions of challengers
 - Discovery of a new profit opportunity through differences in knowledge / views
 - Behavior of customers removes information asymmetry
 - Higher the creativity higher will be the imitation lag

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Summary

- Competition as a tennis match
- Disruptive innovation
- Creative destruction
- Competitive Advantage in Technology based Industries

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