

Innovation and Energy Business Models

Lecture 14

Key questions

- What's the value proposition (what problem are we solving, for whom, how)?
- What's the best business model?
- Under what circumstances is it viable? Who/what has to change for it to work?
- What capabilities, scale, scope, and location(s) will be required at deployment?
- Depends.....

Innovation and business models

- Technology maturity
- Disruptive vs. incremental change
- Innovation games
- Innovation business models

Technology Maturity

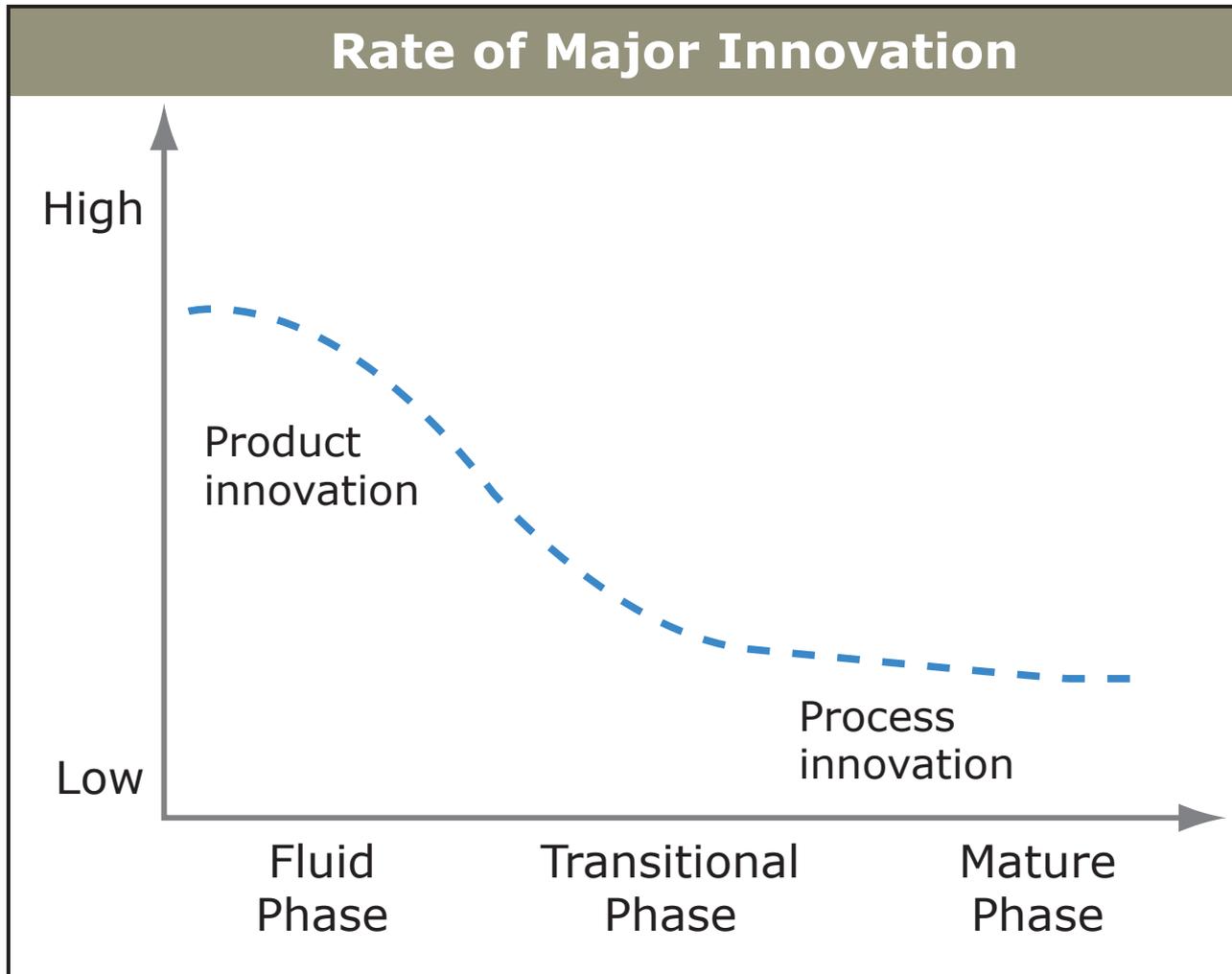


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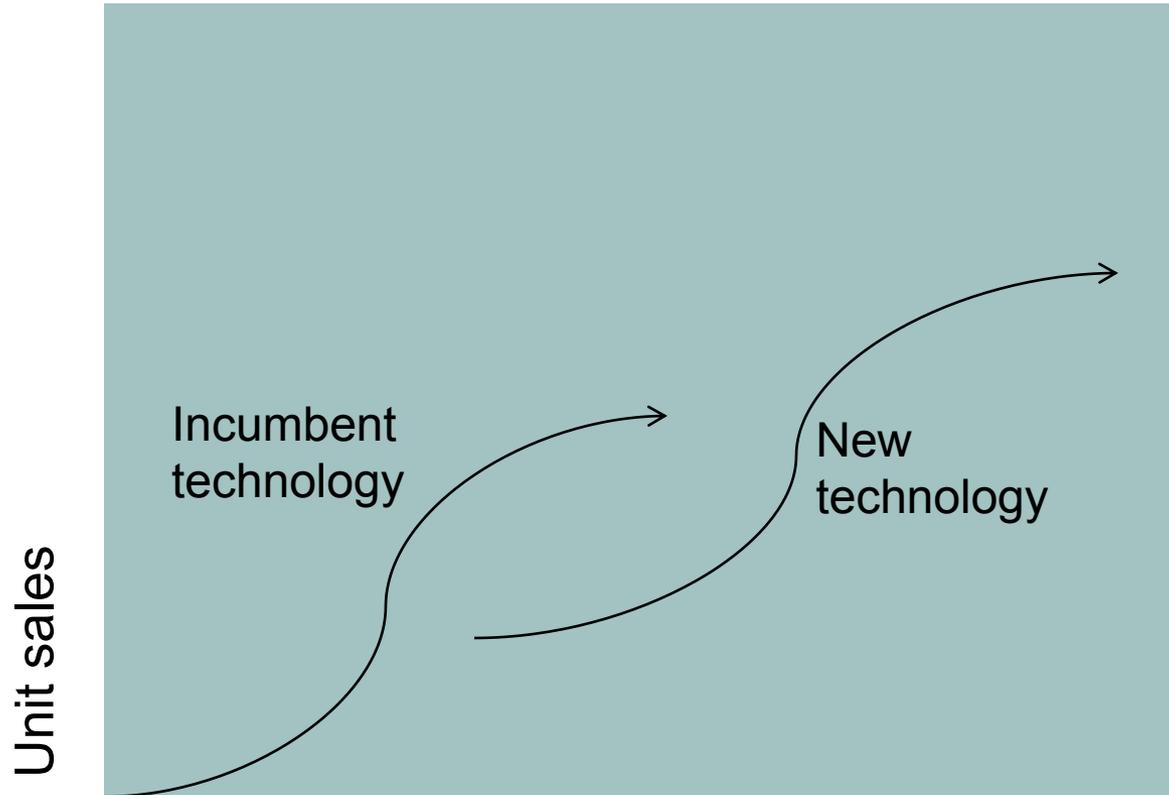
Characteristics of technology phases

	Fluid Phase	Transitional Phase	Mature Phase	Discontinuities Phase
Dynamics of the Phase	<ul style="list-style-type: none"> • Uncertainty in product and markets • High rate of product innovation and high degree of process flexibility • Fast-growing demand; low total volume • Greater importance of product functionality than brand names • Little direct competition 	<ul style="list-style-type: none"> • Appearance of dominant design • Increased clarity about customer needs • Increased process innovation • Importance of complementary assets • Competition based on quality and availability 	<ul style="list-style-type: none"> • Strong pressure on profit margin • More similarities than differences in final products • Convergence of product and process innovations 	<ul style="list-style-type: none"> • Invasion of new technologies • Increasing obsolescence of incumbents' assets • Lowered barriers to entry; new competition • Convergence of some markets as new technologies emerge
Priorities	<ul style="list-style-type: none"> • Development and preservation of technology (with a focus on product development and aggressive patenting) • Promotion of proprietary technology as industry standard 	<ul style="list-style-type: none"> • Realignment of technological capabilities with the dominant design • Continued exploration of technological opportunities • Pursuit of a growth strategy (through aggressive capacity building or by establishing a close relationship with suppliers and customers) 	<ul style="list-style-type: none"> • Cost control throughout the value chain • Strong customer focus • Lean and efficient organization 	<ul style="list-style-type: none"> • A need for incumbents to identify new technologies and realign core competencies • An option for incumbents to exit the market • Attackers' need to gain market recognition • Attackers' need to focus on product development

Discussion

- Identify at least one example of an energy technology currently at each stage of maturity

Discontinuities/disruptive change



Changes required in order for your opportunity to materialize?

- End user behavior
- Prices (energy, etc; general vs. specific)
- Policies (e.g. building codes, product standards, energy production standards, carbon taxes)
- What are the high leverage points to initiate/catalyze these changes (early adopters, influential customers/producers, bedfellows, social movements, regulators)
- What can you do to trigger change?

Disruptive to what?

- Customer
- Incumbent firm
- Platform/system
- Industry
- Regulation
- Social acceptance/mindset

Customer adoption

behaviors/competencies New system complements	New No	Yes
no	Incremental	Disruptive, requires awareness, education, behavioral change
yes	Disruptive, requires change on multiple fronts, who drives new “platform”?	Radical

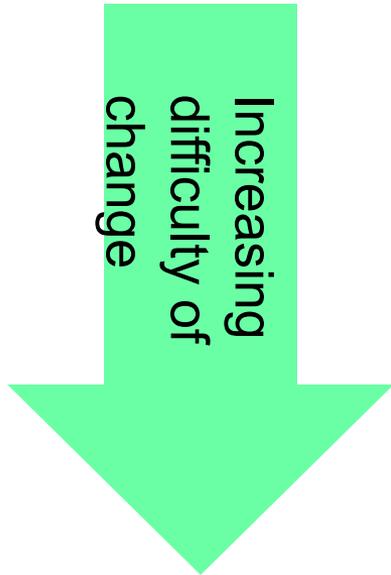
Incumbent firm's capacity to change

Fit with firm's values, time horizon / Fit with firms processes, capabilities	Good	Poor
Poor	Needs very strong team, support, new firm may do better	Won't make it "in house", new firm required
Good	Easy fit	Strong team required, unlikely to flourish, new firm may do better

System context of change

Nature of change Nature of product	Incremental	Disruptive
Free-standing	Usual strategy	Firm level change issue
Embedded in system	Alignment of change, clockspeed in various elements	Firm and system level change

Difficulty of change



	Customer	Firm
New usage, capabilities		
New complements, "use form"		
New mindset		

Discontinuity at level of Industry

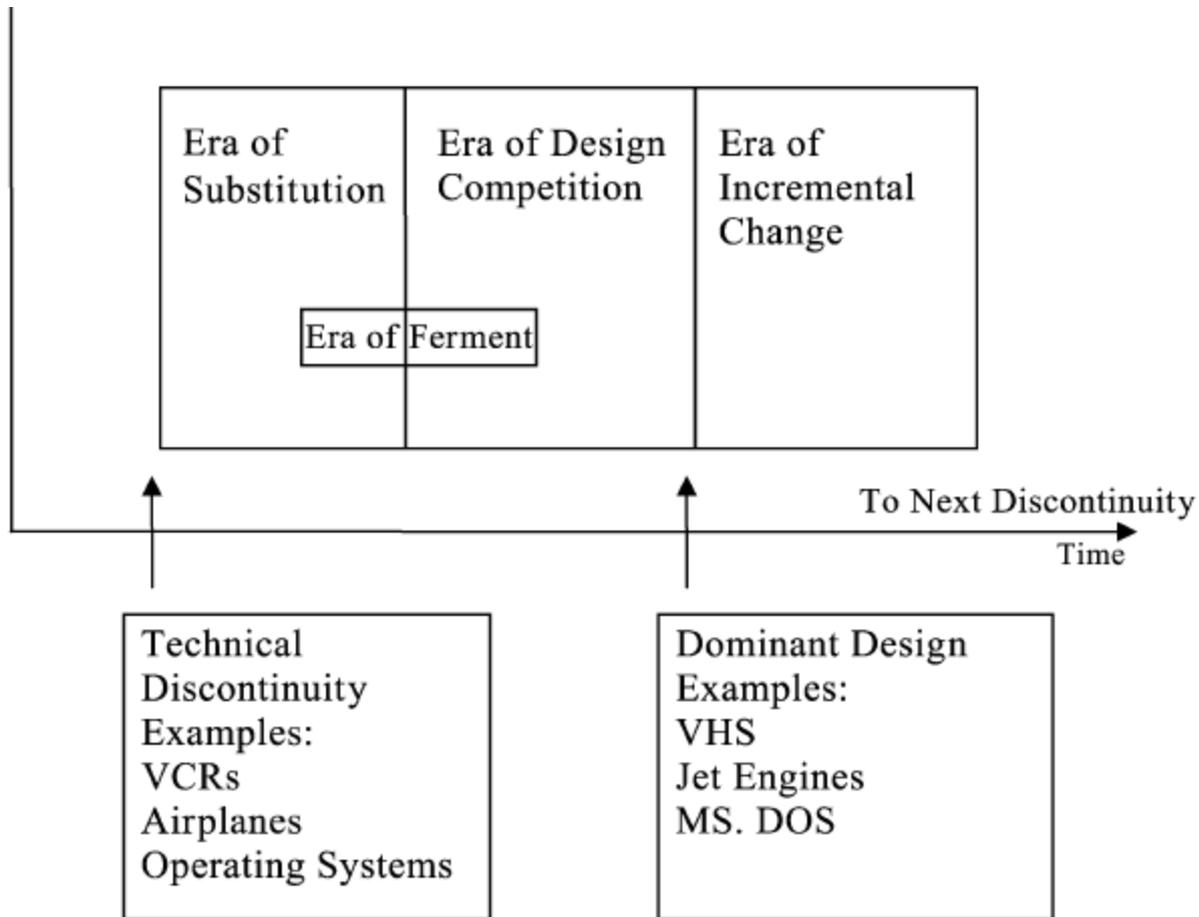


Fig. 1. Adapted from Anderson and Tushman (1997).

Industry dynamics

Table 1
Summary of key competitive dynamics that characterize periods of relative stability and rapid technological change

Key dynamics	Era of stability or incremental change	Era of rapid technological change or 'ferment'
What is the appropriate arena of competition?	Industry	Activity network
What defines competition?	Dominant design (silver–halide-based imaging technique)	Competing designs and trajectories (silver–halide, APS, Picture CD, digital) (within digital: designs of memory storage device, sensors, file format, etc.)
What is the basis of competition?	Similar competencies (chemical imaging)	Different competencies (firms competing on the basis of their competencies in chemical imaging, digital technology, software/hardware development, and so on)
What is the objective of competition?	Market share	Establishment of standards; consolidation of trajectories

Innovation games

Product architecture	Stand alone	Platform based	Closed system
Market Maturity			
Emergent markets	Eureka!	Platform wars	System breakthrough
Mature markets	“New and improved”	Mass customization/apps	Pushing the envelope

- Source: Miller and Cote, *Innovation Games* (University of Toronto Press, forthcoming)

Discussion

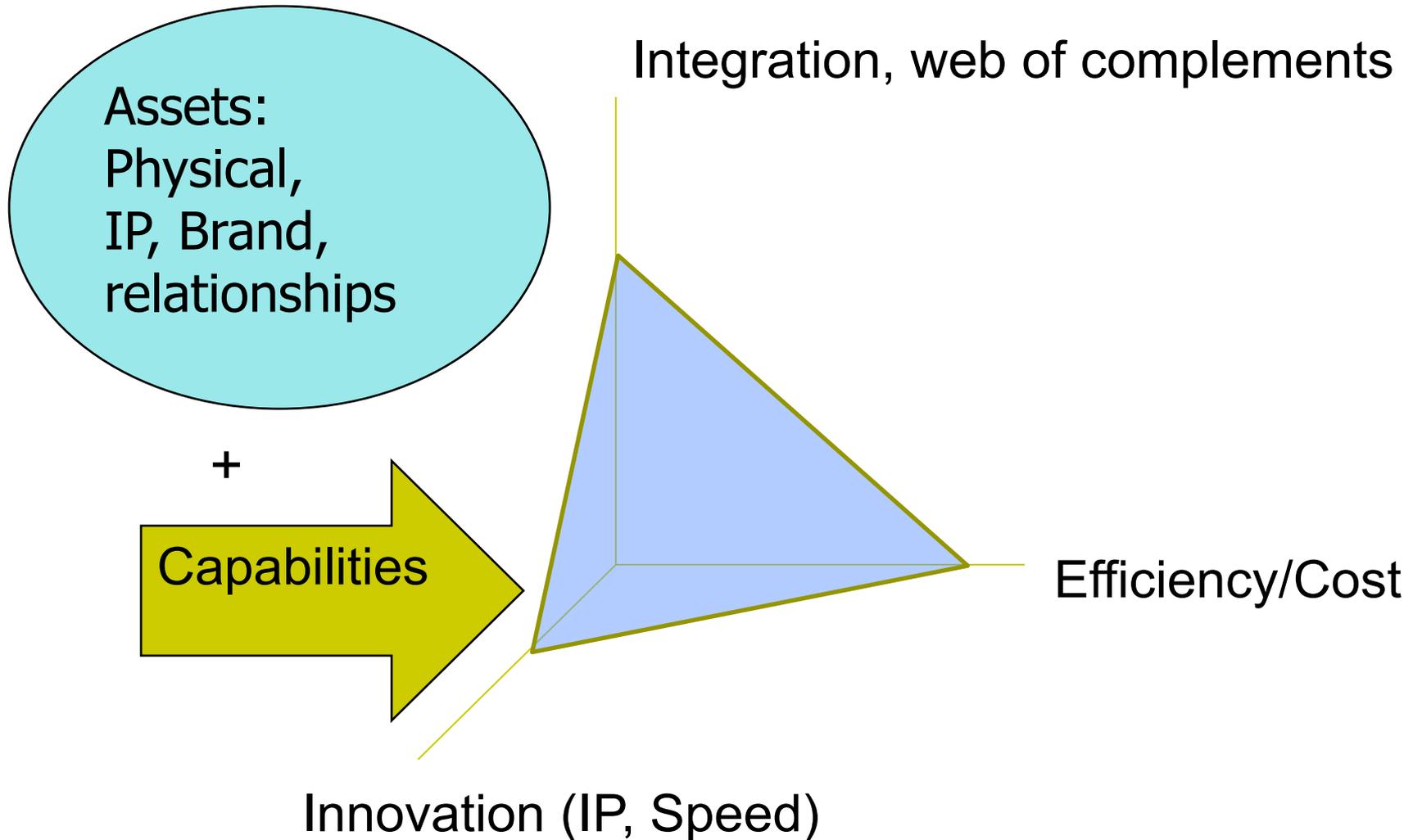
- Identify at least one energy innovation for each of the six games

Different business models for different innovation games

Product architecture	Stand alone	Platform based	Closed system
Market Maturity			
Emergent markets	Eureka! <i>Startup/skunk works</i>	Platform wars <i>Networked shaper</i>	System breakthrough <i>Public/private consortium</i>
Mature markets	“New and improved” <i>Established brand</i>	Mass customization/apps <i>Dominant platform</i>	Pushing the envelope <i>Large incumbent, private consortium</i>

● Source: Miller and Cote, *Innovation Games* (University of Toronto Press, forthcoming)

Value capture models



How to deal with uncertainty/complexity

- Make sure it works under “ideal” scenario
- Focus on segments/customers whose current attitudes, behaviors are similar to those expected with future prices/policies
- Identify players (you, complementors, competitors) that have comparative advantage in shaping, exploiting, withstanding key uncertainties

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