

Session 4b

Technology as a Source of Value

In this session you will learn:

1. How to use technology as a competitive advantage in creating superior value
2. How to use an understanding of the theories of technology progress as the basis for assessing the competitive environment
3. How to use technological innovation to create competitive advantage
4. How to define your firm's technology strategy

Technology Strategy Must Match Competitive Strategy

Low Cost

Product R&D Reduce product cost
(Materials, Mfg., Logistics)

Process R&D Learning Curve and
scale economies

Cost Focus

Product R&D Segment acceptable
performance

Process R&D Tune value chain to
improve structural cost
advantage

Differentiation

Enhance performance
(Quality, Features, Applications)

Improve Quality and responsiveness

Differentiation focus

Superior performance matching
segment needs

Focus value chain on highly
valued attributes

Leaders and Followers Have Different Strategies

Low Cost

Differentiation

Lead

Pioneer low cost product design

Pioneer unique products that deliver unique value

Be first down learning curve

Innovate complementary activities that add value to user

Invent and innovate

Follow

Lower cost using leader's experience

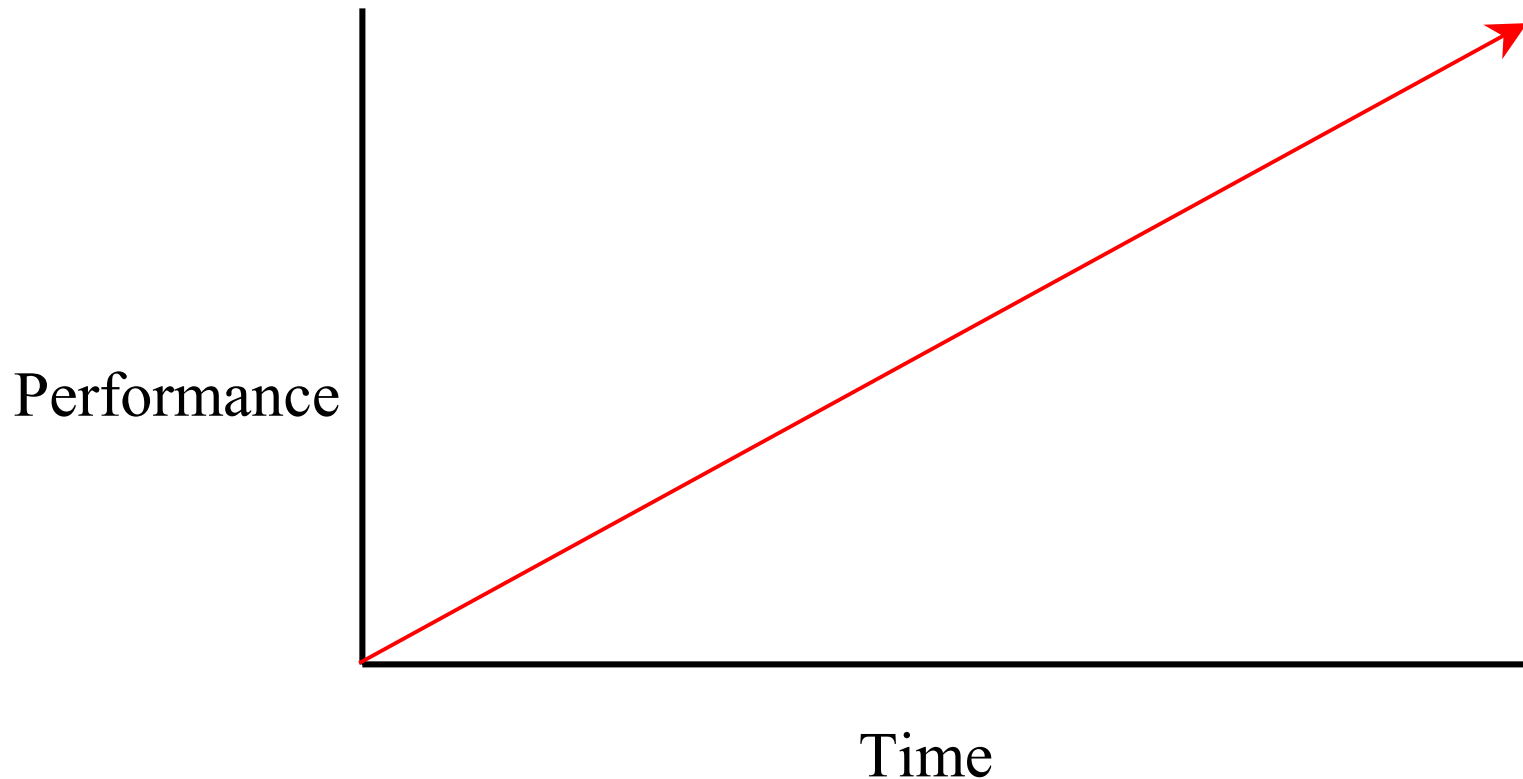
Creative imitation to adapt product or system to buyer needs

Imitate rather than invent

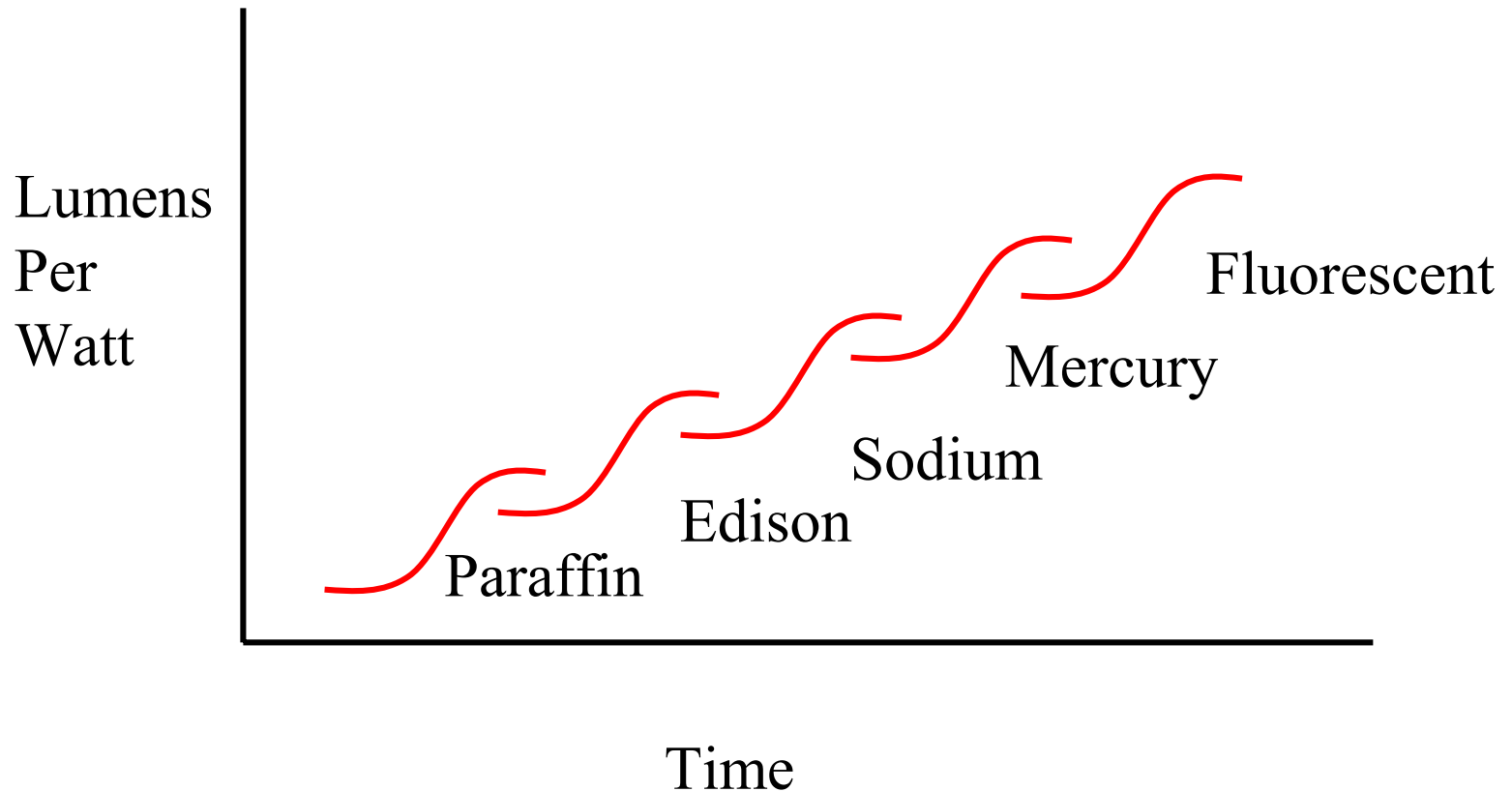
Good Technology Yields Strategic Advantages

- Lowers cost or provides unique benefits desired by customers that cannot be duplicated by competitors
- Changes cost drivers or product differentiation factors in the direction in which the firm is advantaged
- Provides first mover advantages
- Improves industry structure

1) The Law of Progress: A Technology's Performance Improves With Time

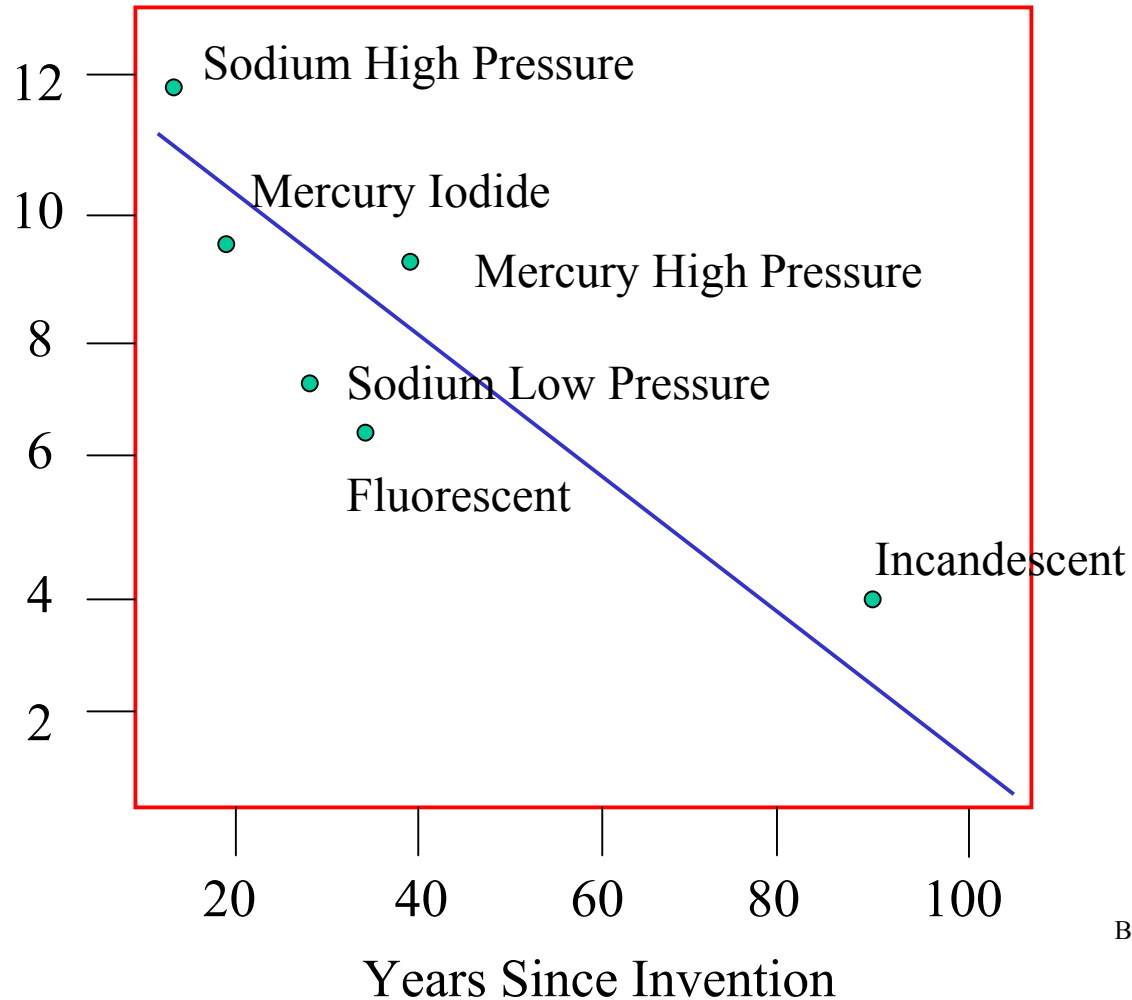


2) The Law of Limits: But The Technology That Delivers That Performance Changes

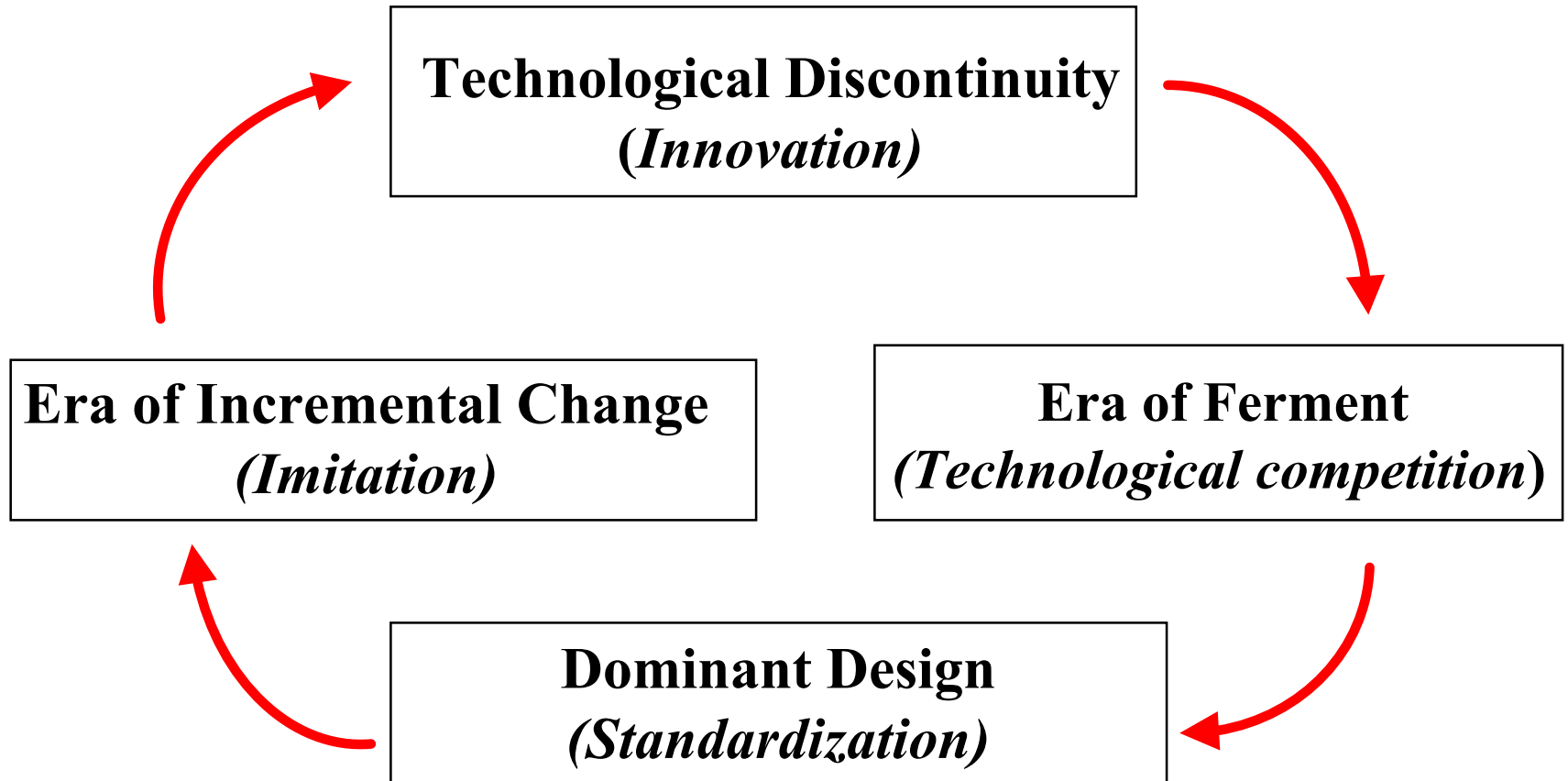


Changes in Performance of Lighting Technology Illustrates the Laws of Progress and Limits

Average Annual Change of Lumens/Watt x Lifetime (Hours) (1970-1979)

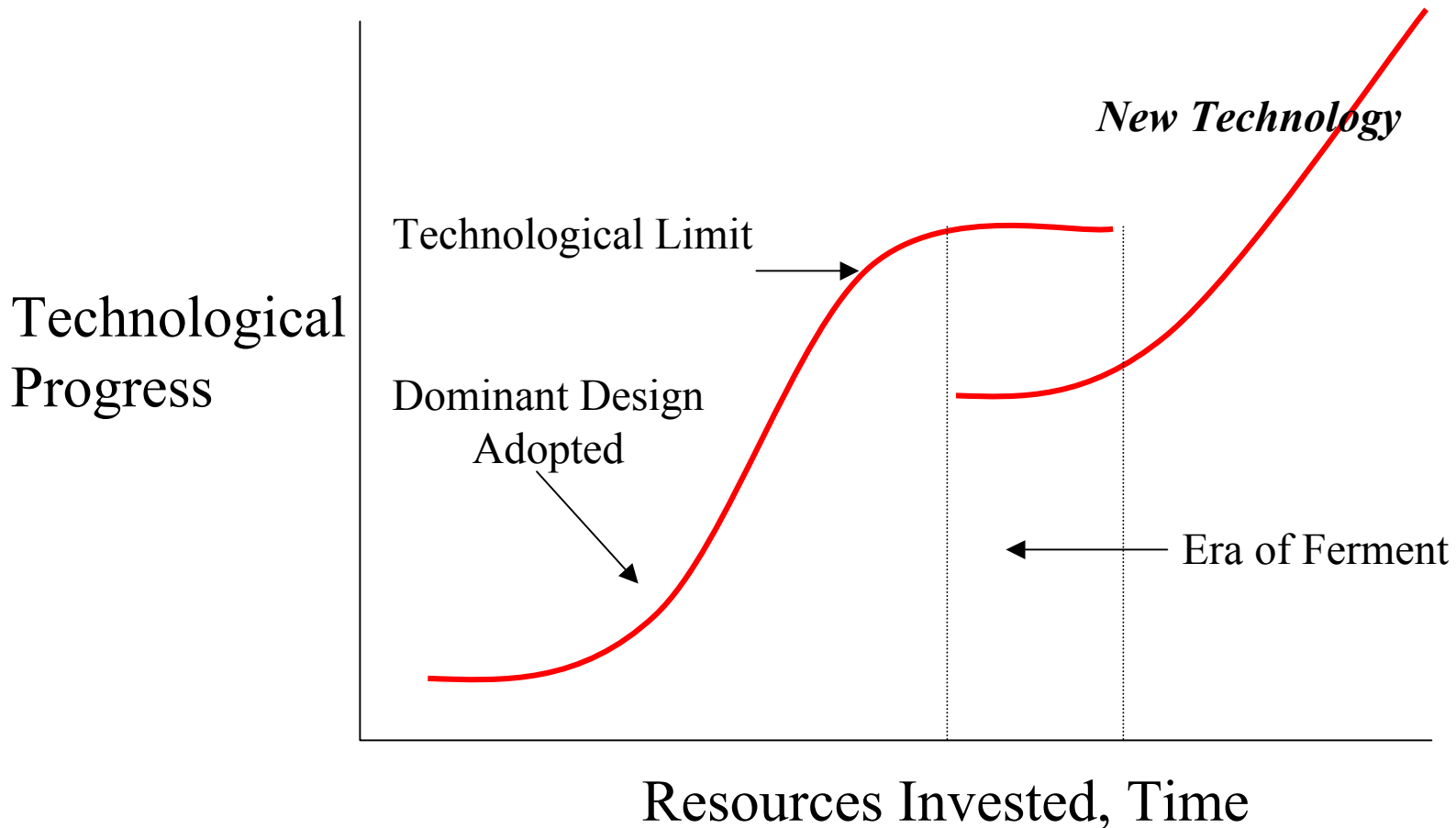


3) Technology Evolution Follows This Pattern



Source: Michael J. Tushman and Lori Rosenkopf, "Organizational Determinants of Technological Change: Toward a Sociology of Technological Evolution," in *Research in Organizational Behavior*, Vol. 14, Greenwich, CT: Jai Press, 1992, pp. 311-347.

The Law of Limits Underlies The Technology Cycle



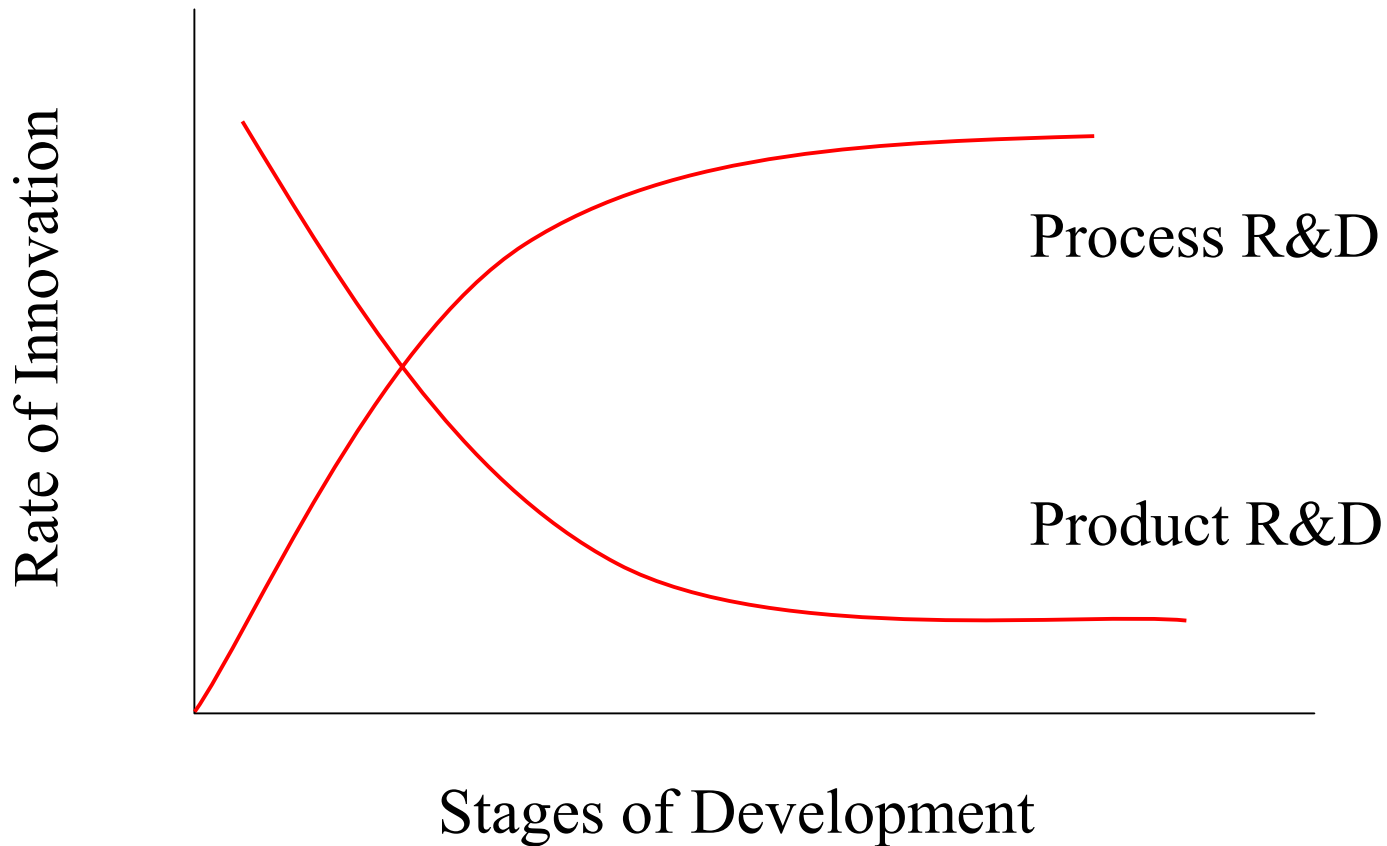
Era of Ferment is Characterized by Two Types of Competition

- Old Vs. New Technology
 - Audio Cassettes Vs. CDs
 - Plastic Grocery Sacks Vs. Paper Bags
- Multiple Forms of New Technology
 - Beta Vs. VHS in VCR
 - Alternate Technologies for Digital TV,
Cellular Phones

4) New Technologies Interact With Their Environments

- Availability of complements speeds adoption
- Learning by users expands usage and speeds adoption
- High switching cost of current technology delays adoption
- Expectations of high rates of technological progress and/or improvements in cost can delay adoption

5) The Rate and Type of Innovations Changes with Market Development



To Stop Either Type is to Fail

Forecasting Speed of Technology Adoption is Difficult

Do Not Estimate
the Number of People
Who Will Use a Bridge
By Counting
How Many Swim Across the River

Mao Tse Tung