Session 8

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

### Differentiation
- **Product R&D**
  - Enhance performance
  - (Quality, Features, Applications)

- **Process R&D**
  - Improve Quality and responsiveness

### Cost Focus
- **Product R&D**
  - Segment acceptable performance

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

### Differentiation focus
- **Product R&D**
  - Superior performance matching segment needs

- **Process R&D**
  - Focus value chain on highly valued attributes

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## Leaders and Followers Have Different Strategies

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<th><strong>Low Cost</strong></th>
<th><strong>Differentiation</strong></th>
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<tr>
<td><strong>Lead</strong></td>
<td>Pioneer low cost product design</td>
<td>Pioneer unique products that deliver unique value</td>
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<td>Be first down learning curve</td>
<td>Innovate complementary activities that add value to user</td>
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<td>Invent and innovate</td>
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<td><strong>Follow</strong></td>
<td>Lower cost using leader’s experience</td>
<td>Creative imitation to adapt product or system to buyer needs</td>
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<td>Imitate rather than invent</td>
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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)

Years Since Invention

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3) Technology Evolution
Follows This Pattern

Technological Discontinuity
*(Innovation)*

Era of Incremental Change
*(Imitation)*

Era of Ferment
*(Technological competition)*

Dominant Design
*(Standardization)*

The Law of Limits Underlies The Technology Cycle

Technological Progress

- Technological Limit
- Dominant Design Adopted
- New Technology
- Era of Ferment

Resources Invested, Time
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

Stages of 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