Market Evolution

Professor Jason Davis
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The first of 3 key questions

How will we **Create** value?

How will we **Deliver** value?

How will we **Capture** value?
Market Evolution over the Life Cycle

• Drivers of diffusion
  – When does the S curve imply a diffusion curve?

• Managing the market
  – Market segmentation
  – Crossing the chasm
  – New markets, new needs:
    • Invasive Technologies
    • Disruptive Technologies (The Innovator’s Dilemma)
The Industry Life Cycle as an S curve
Do all good things come to an end?  
Technological exhaustion

Performance is ultimately constrained by physical limits

E.g.:
- Sailing ships & the power of the wind
- Copper wire & transmission capability
- Semiconductors & the speed of the electron
Predicting S curves

• Limited by physics?
  – “up against the limits”

• Limited by the dominant design?
  – “squeezing the lemon”

• Limited by the production technology?
  – “the productivity dilemma”

• Limited by the problem solving approach?
  – “problem solving trajectory”

• Limited by “technological bottlenecks”? 
  – “Inducement mechanisms and focusing devices”
What is the relationship between the S curve and the diffusion curve?

Performance

Cumulative sales

Time

Time

=> ?
If technology never changed, would there be diffusion?
The diffusion of many products and services follow a similar pattern:
What drove the diffusion of the CD?

Cumulative Unit Sales

- Singles
- Albums (LPs/EPs)
- Compact Discs
- Cassettes
- 8-track cartridges

Millions of units
# Thinking through diffusion

**Technology is:**

<table>
<thead>
<tr>
<th>Static</th>
<th>Evolving</th>
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**Customers are**

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Thinking through diffusion

Technology is:

- Static
- Evolving

Customers are

- Homogeneous
- Heterogeneous

- Information
- Externalities
- Supply constr.
- Price dynamics
Thinking through diffusion

Technology is:
- Static
- Evolving

Customers are
- Homogeneous
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“Technology push”
new capabilities
gate demand
Thinking through diffusion

Technology is:
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Market pull: Diffusion evolves across segments
Thinking through diffusion

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"Technology push" new capabilities gate demand
Managing the Market:
Who buys a technology as it evolves?
Understanding market dynamics: Basic segmentation (Rogers)

Adopters differ by, for example, social, economic status -- particularly resources, affinity for risk, knowledge, complementary assets, interest in the product
Rodger’s characterization of adopters:

- Innovators: Venturesome
- Early adopters: Respectable
- Early majority: Deliberate
- Late majority: Skeptical
- Laggards: Traditional
Understanding market dynamics: Crossing the chasm: (Moore)

Making the transition from “early adopters” to “early majority” users often requires the development of quite different competencies: e.g. service, support capabilities, much more extensive training.
Comparing Moore and Rodgers:

- Innovators: Venturesome
  - “Technology for its own sake”
- Early adopters: Respectable
  - “Relies on intuition and vision: adopts for CA/build career.”
- Early majority: Deliberate
  - “Keeps the wheels oiled”
  - “Pragmatic”
- Late majority: Skeptical
  - “Skeptical”
- Laggards: Traditional
Managing customers at moments of disruption

Who buys a technology when it is first introduced?

New technologies sell to:
- New customers
- With new needs
- Often at lower margins
Buzz Groups: Develop a Marketing Strategy for Crossing the Chasm with Kindle
“Invasive” technologies often meet new needs: The case of the power bar
Initially, S&R aligners sold to customers with different needs:

For example: *Semiconductor Photolithography*

- **Scanning Projection Aligners**
- **Step & Repeat Aligners**
But then they improved sufficiently to take the whole market

For example: *Semiconductor Photolithography*
Changing Tradeoffs in Photolithography

Scanning
Projection
Aligners

S&R 1
S&R 2
Some new technologies sell to niche markets with less demanding requirements

Clay Christensen: *The Innovator’s Dilemma*
Buzz Groups: Other Disruptive Technologies?

What should entrants (new firms) do?

What should the established firm do?
Managing the change in customer groups may be the hardest task!

Leading edge customer focused research may be a critical capability
What can be done?

• Launch and hope?

• Lead user research

• Virtual products

• Small scale experiments

• Organizations capture relevant experience in structures like rules, roles, hierarchies

{ Significant resources required!}
Previewing Next Time: Using Effective Organizational Structures to Bring New Technologies to New Markets

How will we Create value?

How will we Deliver value?

How will we Capture value?
Strategic Challenge: Changing Environments are Unpredictable and Ambiguous!

**SOURCES**

- Future S-curves and market evolution are hard to predict!
- Blurred timing and paths
- Shifting competitive basis, from products to business models
- Lack of control over key technology resources

**IMPLICATIONS**

- Planning is limited
- Reacting is insufficient
- Traditional strategies of “defend a position” and “leverage core competence” are incomplete
- Shift from “closed” internal innovation to “open” innovation with partners
Potential Solution: Organizational Structures that respond to change

Organizational Structures enable coordinated responses to environmental change by shaping action in real-time
Amount of Organizational Structure can vary greatly!
Inverted U-shaped Relationship between the Amount of Structure and Performance

- Fundamental Relationship illustrates the tension between efficiency and flexibility
- Observed in multiple industries and for multiple types of structure:
  - Hierarchy
  - Roles
  - Rules
  - Networks
New Modeling and Evidence suggests Asymmetry and Dependency on Market Dynamism

- **Asymmetry**: more forgiving with too much structure
- Optimum is **less structured** and **more severe** in less predictable environments
  - e.g., during discontinuities, better to use simple rules
# Examples: Simple Rules in Dynamic Markets

<table>
<thead>
<tr>
<th>Company</th>
<th>Simple rules</th>
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<tbody>
<tr>
<td><strong>Intel®</strong></td>
<td>• Priority Rules helped Intel shift from DRAMs to Intel® Microprocessors</td>
</tr>
<tr>
<td></td>
<td>• Simple Rules about minimum project size</td>
</tr>
<tr>
<td></td>
<td>• Copy Exactly</td>
</tr>
<tr>
<td><strong>Pfizer®</strong></td>
<td>• Clear ranking molecules types as research priorities</td>
</tr>
<tr>
<td></td>
<td>• Maximum number of molecule types pursued at any one time</td>
</tr>
<tr>
<td></td>
<td>• Projects “killed” according to step charts</td>
</tr>
<tr>
<td><strong>Miramax Films®</strong></td>
<td>• Movies must</td>
</tr>
<tr>
<td></td>
<td>– Center on a basic human condition and flawed, but sympathetic character</td>
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<tr>
<td></td>
<td>– Have a clear beginning, middle, and end</td>
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<tr>
<td></td>
<td>• Disciplined financing (50% more efficient than industry standard)</td>
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The Crying Game
Pulp Fiction
The English Patient
Life is Beautiful
Shakespeare in Love
For Next Session:

• Novartis:
  – New industry (for us! 😊 pharma) with new technologies (genomics) and new customers (new therapeutic areas)
  – Focus on effective organization to bring new technologies to new markets
  – How should Novartis reorganize now?

• Two-page paper #2 due Session 6