15. 351 Managing Innovation & Entrepreneurship

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Market Dynamics & Competitive Implications
AGENDA

- Motivation for today’s material: Why it is important to assess market-driven dynamics & why it is hard.
- Market S-Curves
  - Defining market dynamics
  - Mapping market dynamics
  - Managing market dynamics
- Competition – interaction of market & technology dynamics
Typical analyses fail to examine the **dynamics** of technology & market factors

A more robust opportunity assessment is clear about the **dynamics** of the proposed technology & that of competitors & the proposed market & that of competitors

**THIS IS HARD – WHY?**
Can we forecast the dynamics of market change?

- Hard because:
  - Predicting the future
  - Hard to get data
  - Requires expert knowledge (across domains)
  - Blind spots when considering others’ response

But….

- Wealth of historical data
- Customers to talk to
- Robust heuristics – market S curve

*Harder or easier than technical change?*
Consider the case of hybrid corn...

The states that tended to adopt earlier were those with the highest economic return (in terms of yields). Within each state, adoption followed an S-shaped pattern...
The same basic shape and pattern is observed across a variety of technologies, such as electric motors...

Image by MIT OpenCourseWare.

Hall, 2004
And Television, Washing Machines, VCRs, and the Internet!
Understanding market dynamics: The Market S-Curve

Nerd Sidebar: The Diffusion S-curve is the single most commonly accepted finding in the social sciences.
Disentangling the evolution of the technology & the market

What is the relationship between these two curves? Under what circumstances do the S-Curve and the market diffusion curve look the same? How does diffusion depend upon differences in the technology vs. differences in customers?
Null hypothesis.
Vaccine development for example:
technology changes ➔ immediate adoption
Disentangling the evolution of the technology & the market (cont.)

Typical situation.
Bass diffusion curve => contagion

What factors can explain this kind of diffusion pattern?

Nerd Sidebar:
The Diffusion S-curve is the single most commonly accepted finding in the social sciences
Contagion in Action: 1927 Orteig Prize & the Spirit of St. Louis

• 1919 Raymond Orteig puts up a $25,000 challenge to fly New York Paris
• 9 Teams register to compete and spent $400,000 to win the prize
• The underdog, 25 year old Charles Lindberg wins the prize!
• Within 18 months of his flight:
  • Passenger traffic increased 30x
  • # of aircraft increased 4x
  • Aviation stocks soar
Disentangling the evolution of the technology & the market (cont.)

Typical situation.
Different types of customers – Rogers on segmentation

What factors can explain this kind of diffusion pattern?

Nerd Sidebar:
The Diffusion S-curve is the single most commonly accepted finding in the social sciences.
Factors that influence diffusion:

- Progressive development of complimentary assets and complimentary products
- Classic externalities
- Word of mouth
- Process improvements
- Vintage effects (e.g. machine tools)
- Supply constraints
- Development of new uses for the same product
- General shift in the needs of the population (lifestyle effects)
- Progressive development of skills
- Pricing strategies ➔ Market diffusion curve can be the discriminatory pricing curve
Different categories of adopters differ by, for example, social, economic status -- particularly resources, affinity for risk, knowledge, interest in the product.
But what if the technology is changing as well?
This scenario maps most closely to Moore although he never explicitly says so....
The S-Shaped Diffusion Curve Results from the existence of distinct adopter categories, who tend to purchase at a different point in the overall technology life cycle. Achieving diffusion over the life cycle depends on offering distinct value propositions to each customer grouping. The “demand curve” is changing over time!
# Diffusion Patterns are the result of a Distribution of Adopter Types

<table>
<thead>
<tr>
<th>Adopter Group</th>
<th>Characteristics of buyers</th>
<th>Characteristics of tech</th>
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<tbody>
<tr>
<td>Innovators</td>
<td>Techies - Technology for technology’s sake; tolerant of bugs; low ability/willingness to pay; lead users</td>
<td>Slow performance, bugs, no docs, gaps in functionality</td>
</tr>
<tr>
<td>Early Adopters</td>
<td>Visionaries - Seeking advantage through new technology; demands customization and close contact; willing to pay!</td>
<td>Accept tech risk, bugs &amp; fixes, pilot project, milestones, risky; customization, PoC vs. vision</td>
</tr>
<tr>
<td>Early Majority</td>
<td>Pragmatists - Evolution rather than revolution; requires documentation and effective references; more cost-sensitive</td>
<td>Measurable &amp; reliable technology; standardized; quality, infrastructure, support</td>
</tr>
<tr>
<td>Late Majority</td>
<td>Conservatives - seeking demonstrated ROI; looks for similar references; evolution; cost sensitive</td>
<td>Simple, plug &amp; play; preassembled</td>
</tr>
<tr>
<td>Laggards</td>
<td>Luddites - low “WTP”; commodity technology</td>
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# Putting technology dynamics & market dynamics together

<table>
<thead>
<tr>
<th>Technology</th>
<th>Static</th>
<th>Changes</th>
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<tbody>
<tr>
<td><strong>CONTAIGON</strong></td>
<td>• Information effect</td>
<td>• CHANGING SHAPE OF CONTAIGON</td>
</tr>
<tr>
<td><strong>WOM</strong></td>
<td>• Externalities</td>
<td>• Diffusion depends on the rate of technology change &amp; its impact on customer needs</td>
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<tr>
<td>• These factors influence diffusion in all four quadrants</td>
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| **ROGERS** | • Price sensitivity | • MOORE |
| • Reference information | • Diffusion depends both on the number of customer segments and on the rate of technology change – differentiation is key here | |
| • Skills | • Diffusion depends on the number of customer segments | |

**Customers**

- **Same**
- **Different**
Lecture wrap up

- Value is created when new technology is matched to customer need.
- But customer needs change: as the technology evolves existing customers develop new needs, and in addition the technology may appeal to new kinds of customers, with new kinds of needs.
- Understanding the structure of customer needs may be particularly important as it provides insight into the source of new opportunities.
Implications

- The transition across technology & market S-Curves is a complex challenge for any organization.

- At a point in time, advantage in technology-intensive industries depends on:
  - Satisfying Key Customer Segments (Exploiting the Mkt. S-Curve)
  - Organizing Around the Technology (Exploiting the Tech. S-Curve)

=> BUT advantage over time depends on transitioning between S-Curves.
Class 3 – BIG case study

- **Case**: Focuses on how BIG organizes and manages its creative process to allow for repeated innovation in toys.

- **Key Decision**: Focus your attention on the ways in which BIG manages the creative concept development process and the idea triage process. Does this seem like the optimal process? Is this a process you are familiar with?

- **Additional Assignment**: watch the IDEO video (if you have not done so recently!!) and compare to BIG: [http://www.ideo.com/media/nightline.asp](http://www.ideo.com/media/nightline.asp)