Network Effects and Standards-Based Competition

Professor Jason Davis
MIT Sloan School of Management
What is a standard?

• A standard is a specification that allows for interoperability

• Eg:
  – Cups and lids
  – Pistons and engines
  – Telephones and sockets
  – Speakers and amplifiers
  – Hardware and software
Outline

• The power of common standards – when (and why) do industries “tip”?
• Coming soon to an industry near you: the push for public, open standards
• Making money in an open world
• Standards matter because they create “network effects,” “tipping,” and “lock-in”
It’s not just about high technology

- Bicycles
- Financial services
- Health care
- Automobiles
The push for **common** standards
The pros and cons of common standards

• Pros
• Cons

• Pros
• Cons
Tipping

• Markets “tip” when one standard becomes the preferred choice of nearly every consumer
  – VHS
  – Windows on the PC
• Not all markets tip: in some markets multiple standards co-exist
  – UNIX vs. Windows on servers
  – Sony vs. Microsoft in video games
  – Palm vs. Windows CE in PDAs
  – Multiple standards in cellular phones
“Great products” vs. “Platforms”

**Great Products**
- Consumers base their purchase decision on the intrinsic value of the product **to them**
- *What would this be worth to me if I were the only buyer in the world?*
- Competition on the basis of features, price etc

**Platforms**
- Consumers base purchase decisions on the size of the (actual or projected) installed base and/or the (actual or projected) availability of network externalities
- *How many other people are likely to buy this product?*
- Competition on the basis of the size of network effects: installed base, availability of complementary products etc
There are two sources of network effects

• Direct network effects
  – Network size
  – *Value increases with the number of other individuals who own the same product*
    • E.g.: Telephones, fax machines

• Indirect network effects
  – Complementary products/services
  – *Value increases with the number of complementary products that are available*
    • E.g.: CDs, software, VHS/Beta
  – Learning by using
  – *Standards mean customers invest only once in learning to use the technology:*
    • E.g.: Qwerty keyboard, Autocad
With Strong Network Effects Market Share Itself Creates Value

Value of standards Driven product

Value to consumer

Conventional product

Actual (or anticipated) size of the installed base
If network effects are important, markets may “tip”

Probability the next consumer chooses to buy A

A’s share of installed base
Annual Production: VHS vs Betamax

- **VHS**
- **Betamax**

### Chart Details:
- **X-axis:** Year (1974 - 1990)
- **Y-axis:** Annual Production, Thousands of units
- **Legend:**
  - VHS
  - Betamax

### Key Observations:
- Betamax production was highest in 1982 and saw a sharp decline after 1984.
- By 1990, VHS production was significantly higher than Betamax.
Strong network effects and high switching costs may create “lock-in”

- All consumers might prefer to adopt a different standard
- But, if it is expensive to switch between standards (high switching costs) and network effects are important and costly to create, then markets may become “locked in” to particular standards
- “Lock-in” has dramatic competitive implications
Tipping dynamics differ with the strength of network effects

- Products with extensive N. effects
- Products with "threshold" network effects
- Conventional product

Value to consumer

Actual (or anticipated) size of the installed base
Will this market tip?

Value to consumer

Products with “threshold” network effects

Actual (or anticipated) size of the installed base
Will this market tip?
What about Blu-Ray and HD DVD formats? Did they tip?

- Did either standard hit a market share threshold?
  - Or did the market just give up on HD?
- Was this ultimately good for consumers?
- Why couldn’t they make a deal?
Establishing a standard: Sun

- Sun was founded in 1982 to focus on the workstation market
- It offered an “open” standard:
  - Standard components,
  - UNIX operating system
Sun (2)

• 1980: Apollo founded
• 1983: Apollo has $18m in sales, dominates the workstation market -- uses a proprietary operating system
• 1983: Sun has $1m in sales, mostly to universities
• Lead customer, Computervision “likes the technology but doesn’t find the company credible” -- “we love your technology but there is no way you can supply it. Apollo is the standard in the industry, well financed and well managed.”
• What should Sun do?
What should Sun do?
The push for public, open standards
Establishing a standard

- Introduce a great “product”
- Come to market ahead of competition
- Build expectations
- Develop, or encourage the development of, complementary products and services
- Give it away: put the standard in the public sector

- Sounds great, but this is expensive!
- ...and – these days – your competitor is trying to do the same thing!
Thinking about the dynamics of the strategic space

<table>
<thead>
<tr>
<th>Public</th>
<th>Closed</th>
<th>Open</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Standards are owned and controlled by the public sector but are not freely available</td>
<td>Details of standards are available to all: no single firm has control over how they evolve: no charge for their use</td>
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<tr>
<td></td>
<td>E.g. Cryptography</td>
<td>E.g. TCP/IP, HTML</td>
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<table>
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<tr>
<th>Private</th>
<th>Closed</th>
<th>Open</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Technology may be standard, but details are not made available beyond the firm</td>
<td>Details of standard are made available to all: but owner has control over how the standard evolves and may charge for use</td>
</tr>
<tr>
<td></td>
<td>E.g. Landmark Graphics, IBM 360</td>
<td>E.g. Nintendo, Palm OS</td>
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In practice these boundaries are fuzzy:

Access is:

- More Closed
- More Open

Control is:

- More Public
- More Private

- IBM 360
- Symbian
- Linux
- Windows
- CDMA
Conventional logic (1):
What do customers prefer?

**Access** is:

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**Control** is:
Conventional logic (2):
What do producers prefer?

**Access is:**

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How do industries evolve over time?

Access is:
- More Closed
- More Open

Control is:
- More Public
- More Private
Making money in an open world
Business models in the different quadrants

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<tr>
<td>Compete on a level field Move to “soft” standards?</td>
<td>Deliver a best in class system</td>
</tr>
<tr>
<td>Encourage the “ecosystem” Embrace/extend</td>
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The technology is:
Where’s the money?
Competition in a closed, private world
Where’s the money?  
Competition in an open private world
Where’s the money?
The challenge of an open public world
Making money in an open public world

• Competing on a level playing field:
  – Do it better, faster, cheaper, in a more integrated way...
  – Leverage “complementary assets”

• Be part of the evolution of the playing field:
  – Exploring “soft” standards
Exploring soft standards

• A “soft” standard is a specification that is completely compatible with current public standards but offers enhanced functionality and performance
• It offers customers the security of knowing that they have avoided being “locked in” and an upgrade path to the public standard
• Plus the functionality and performance of a more finely “tuned” technology
• May permit significant premium pricing and the generation of customer loyalty
Soft standards in action:

Perf.  

“Soft” standard

Public standard

Time
Managing soft standards

• Maintaining customer trust is critical:
  – The instant they come to believe you’re trying to lock them in, there will be trouble

• The technology task is complex. The “soft” standard must be:
  – Better than the public standard
  – Compatible with the current version
  – Compatible with future versions

• Ensuring that the “soft” technology is embodied in future generations of the technology may be a central strategic goal
Standards: Conclusions

- Not all markets “tip”, or move to a common standard: but as network effects (connectivity, complementary services, tools, products) become more important, more and more will.
- Getting a private standard established in these kinds of worlds is likely to be increasingly difficult.
- Fortunately, there are ways to make money in an open world - but managing a “soft” standard requires sustained attention.
Looking forward

• Next time, Linux and Open Source:
  – How should Red Hat make money?