Google Case

• Much of Google’s value is from the data it has on its users
• Mobile telephone carriers also have a lot of data

1. What could mobile carriers do to “monetize” their data?
   - For advertising models, say how the advertising would be delivered to the end user, and how it would be sold
   - For selling data directly, who would buy the data and why?

2. What lessons from Google’s success, if any, apply here?

Scope of a standard

Included:
- interfaces (physical, electrical, information)
- architecture (reference model)
- formats and protocols (FAP)
- compliance tests (or process)

Excluded:
- implementation
- (possibly) extensions

Reference model

Decide decomposition of system
- where interfaces fall

Defines the boundaries of competition and ultimately industrial organization
- competition on the same side of an interface
- complementary suppliers on different sides
- hierarchical decomposition at the option of suppliers
- (possibly) optional extensions at option of suppliers
Some issues

Once a standard is set
- becomes possible source of industry lock-in;
  overcoming that standard requires a major (~10x?) advance
- may lock out some innovation

In recognition, some standards evolve
- IETF, MPEG
- backward compatibility

Types of standards

dejure
- Sanctioned and actively promoted by some organization
  with jurisdiction, or by government

de facto
- Dominant solution arising out of the market
  - Voluntary industry standards body

Industry consortium
- Common or best practice

Examples?

Examples

dejure
- GSM

de facto
- Microsoft Windows API (Application Programming Interface)
- Intel Pentium instruction set,
  - Voluntary industry standards body
  - IEEE (Institute of Electrical and Electronic Engineers)
  - IETF (Internet Engineering Task Force)

Industry consortium
- CD
  - Best practice
  - Windows GUI

The changing process

- As technology and industry move more quickly, the
global consensus standards activity has proven too
  - e.g. ISO

"New age" standards activities are more informal,
  - e.g. IETF, ATM Forum, WAP
  - Less consensus driven, a little less political, more
    strategic, smaller groups
  - e.g. XML, Java

Programmable/extensible approaches for flexibility
  - e.g. XML, Java

Reasons for change

- From government sanction/ownership to
  - Increasing fragmentation
  - Importance of time to market

Greater complexity
- Less physical/performance constraint for
  - either hardware or software

Lock-in

(Particularly open) standards reduce consumer lock-in
- Consumers can mix and match complementary products

Increase supplier lock-in
- Innovation limited by backward compatibility
  - e.g. IP/TCP, x86, Hayes command set
Why standards?

*de jure* are customer driven to reduce confusion and cost
*de facto* standards are sometimes the result of positive feedback in network effects

Customers and suppliers like them because they
- increase value
- reduce lock-in

Governments like them because they
- promote competition in some circumstances
- May believe they can be used to national advantage

Open vs. Proprietary Standards

- Open standard - a standard that is well documented, unencumbered by intellectual property rights and restrictions, and available to any vendor.

- What are the advantages?
- What are the disadvantages?

Why companies participate

- Pool expertise in collaborative design
  - e.g. MPEG
- Have influence on the standard
- Get technology into the standard
  - Proprietary, with expectation of royalties
  - Non-proprietary
- Reduced time to market

Cooperation and Compatibility

Carl Shapiro
Hal R. Varian

How Standards Change the Game

- Expanded network externalities
  - Make network larger, increase value
    - Share info with larger network
    - Attracts more users

- Reduced uncertainty
  - No need to wait
  - In war, neither side may win

Change Game, cont’d.

- Reduced consumer lock-in
  - Netscape’s “Open Standards Guarantee”
  - Offered source code for free in 1998

- Competition for the market v. competition in the market
  - Early battle for dominance to later battle for share
**Change Game, cont’d.**

**Competition on price vs features**
- Commoditized products?

**Competition to offer proprietary extensions**
- Extending a standard
- Ethernet 10 vs 100

**Component vs systems competition**
- With interconnection, can compete on components
- Xbox versus Playstation
- Philips versus Sony CD players

**Who Wins and Who Loses?**

**Consumers**
- Generally better off
- But variety may decrease

**Complementors**
- Generally better off
- May serve as brokering role –
  - content providers in DVD standards

**Who Wins, cont’d.**

**Incumbents**
- May be a threat
- Strategies
  - Deny backward compatibility
  - Atari did against Nintendo
  - Introduce its own standard
  - Ally itself with new technology

**Who Wins, cont’d.**

**Innovators**
- Technology innovators collectively welcome standards
- If the group benefits, there should be some way to make members benefit
- Negotiation costs, opportunistic behavior

**Formal Standard Setting**

*Essential patents must be licensed on “fair, reasonable and nondiscriminatory” terms*

**ITU**
- 1865, now UN agency
- Notoriously slow

**ANSI and ISO**
- 11,500 standards

**Tactics in Formal Standard Setting**

**What is your goal?**
- National or international?
- Protecting your interests?

**What are others goals?**
- Do they really want a standard?
List of Tactics

Don’t automatically participate
- If you do you have to license
- By not not participating, Motorola was able to charge higher royalties to makers of fax equipment using T.30 standard

Keep up momentum
- Continue R&D while negotiating

Look for logrolling
- Trading technologies and votes

List of Tactics, cont’d.

Be creative about deals
- licensing, hybrids, etc.

Beware of vague promises
- Definition of reasonable
- Make sure patent holders willing to license technology with “reasonable royalties”
- “Just price”

Search carefully for blocking patents
- Patents held by non-participants

Preemptively build installed base

Building Alliances

Assembling allies
- Pivotal customers should get special deals
- But don’t give your first customers too big an advantage
  - Offer temporary price break
  - Otherwise later customers can’t compete with your earlier customers

Building Alliances, cont’d.

Who bears risk of failure?
- Usually ends up with large firms
- But bankruptcy favors small firms

Interconnection Among Allies

History of interconnection
- Post office, telephone
- Internet?

Negotiating a truce
- Do the benefit cost calculation
- How to divide a larger pie?

The standards game

<table>
<thead>
<tr>
<th>Player A</th>
<th>Player B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>War</td>
</tr>
<tr>
<td>Willing to fight</td>
<td>Attempt to block</td>
</tr>
<tr>
<td>War</td>
<td>Voluntary standard</td>
</tr>
<tr>
<td>Want standard</td>
<td>Attempt to block</td>
</tr>
</tbody>
</table>
Maximizing Return

Your reward = Total value added x your share

Alliance Examples

Xerox and Ethernet
- Invented at Xerox
- DIX group
- IEEE Standard
- Beneficial for printer business

Adobe PostScript
- Anyone allowed to write postscript interpreter
- Became Standard

Managing Open Standards

Standard is in danger if it lacks a sponsor
Unix
- AT&T invention
- Gave away source code to EDU
- 1993 Coalition: Novell purchased rights for $320 million and gave name to X/Open

Lessons

Competition requires allies
How does your standard affect competition?
Standards benefit consumers and suppliers, at expense of incumbents and sellers
Formal standard setting adds credibility
Find natural allies

Lessons, continued

Before a battle, try to negotiate a truce
Try to retain control over technology, even when establishing an open standard

Standards Wars

Carl Shapiro
Hal R. Varian
Examples

RR gauges
Edison v. Westinghouse
NBC v. CBS in color TV
3Com v. Rockwell/Lucent

Classification of Wars

<table>
<thead>
<tr>
<th>Compatible</th>
<th>Incompatible</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rival</td>
<td>Evolution v. Revolution</td>
</tr>
<tr>
<td>Evolution</td>
<td>Revolution v. Evolution</td>
</tr>
</tbody>
</table>

Examples

Rival evolution
  - Video machines
Rival revolutions
  - DVD v. Divx, high density disks (JAZ, etc.)
Evolution v. Revolution
  - Windows 98 v. Mac OS X

Recent Standards Wars

AM stereo
  - Rival standards: Magnavox, Motorola, others
  - Delco picks Motorola standard
  - Auto industry invested, radio didn’t
Digital wireless phones
  - Europe: GSM
  - US: GSM, D-AMPS (TDMA), CDMA

Standards Wars

Late 90s:
  - Ericsson (TDMA) has AT&T, SBC, Bellsouth
  - Qualcomm (CDMA) has Bell Atlantic, US West, etc.
    - Performance play strategy
How big are the network externalities?
  - Geographic scope
  - Investment is sunk, systems interconnect

Standards Wars, cont’d.

56K modems
  - US Robotics
    - controlled 25% market for modems
  - Held key patents
  - Rockwell
    - Chipset maker
Standards Wars, cont’d.
- US Robotics moves preemptively before ITU standard set
  - Releases “x2” products in early 97
  - Signs up ISPs: Aol, Prodigy, MCI, CompuServe
- Meanwhile US Robotics bought by 3Com
- Rockwell and Lucent come to market with K56flex brand
  - Assembled alliance of modem manufacturers
  - OEMS
  - Ascend
  - Cisco

Key Assets
- Control over an installed base
- Intellectual property rights
- Ability to innovate
- First-mover advantages
- Manufacturing
- Strength in complements
- Reputation and brand name

Two Basic Tactics
- Preemption
  - Build installed base early
  - But watch out for rapid technological progress
- Expectations management
  - Manage expectations
  - But watch out for vaporware

Once You’ve Won
- Stay on guard
  - Minitel
- Offer a migration path
- Commoditize complementary products
  - Intel
- Competing against your own installed base
  - Intel again
  - Durable goods monopoly

Once You’ve Won, cont’d.
- Attract important complementors
- Leverage installed base
  - Expand network geographically
- Stay a leader
  - Develop proprietary extensions
What if You Fall Behind?

Adapters and interconnection
- Wordperfect
- Borland v. Lotus
- Translators, etc

Survival pricing
- Hard to pull off
- Different from penetration pricing

Legal approaches
- Sun v. Microsoft

Microsoft v. Netscape

Rival evolutions
- Low switching costs
- Small network externalities

Strategies
- Preemption
- Penetration pricing
- Expectations management
- Alliances

Lessons

Understand the type of war
- Rival evolution
- Rival revolution
- Revolution v Evolution

Strength depends on 7 critical assets
Preemption is a critical tactic
Expectations management is critical

Lessons, continued

When you’ve won the war, don’t rest easy
If you fall behind, avoid survival pricing

With Friends Like These

Handspring
- Hoped complementors would sell modules for $25-$50

Complementors sold them for $150-$250
Friends Like These

- Sometimes, think about reducing dependence on complementors
  - Kodak introduced film
  - Manufactured film cameras instead of depending on existing mfgs.

- If capacity to invest higher
  - → make more complements yourself

- If need for complements higher
  - → encourage third parties to make them

Friends Like These

“Hard Power”

Wintel

- MMX
  - Intel wanted to keep proprietary
  - MS wanted Intel to license to AMD
  - Avoid Platform Fragmentation
  - Reduce Intel Market Power

Soft Power

Intel Counter strategy
- Invest in Linux distributors

IBM and Linux
- OS/2 costly flop
- Champion open source Linux
- Develop applications for Linux
- Contribute to Linux Community
- Did not become a Linux Vendor

Soft Power

- Intel WiFi
  - Expensive marketing campaign
  - Assured complementors of
    - Commitment
    - Customer demand

- Apple iTunes
  - “Cajoled” music industry to open music libraries