Openness is More Than a State of Mind: Some Thoughts on New Ways of Creating Value

January, 2007

Elliot E. Maxwell

The Perils of Prediction

"I think there is a world market for maybe five computers."

-Thomas Watson, Chairman of IBM, 1943

"Computers in the future may weigh no more than 1.5 tons."

-Popular Mechanics Magazine, 1949

"There is no reason anyone would want a computer in their home."

-Ken Olson, Founder of DEC, 1977

"640K should be enough for anybody."

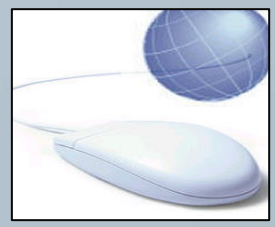
-Bill Gates, Founder of Microsoft, 1981

IT Trends

- Computing power continues to increase, with declining costs per cycle

- Memory is becoming cheaper, with faster access

- Transmission capacity (bandwidth) is increasing and communication costs are falling



Waves of IT Progress

- First wave—Mainframes
- Second wave—Mini-computers
- Third wave—Personal computers
- Fourth wave—Networked computers
- Fifth wave—Networked mobile devices

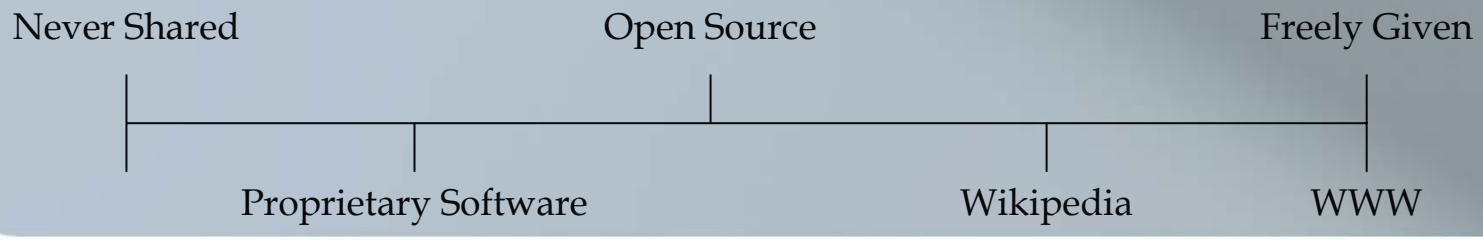
Today's "Digital Dilemma"

- Information is being digitized, making it easy to manipulate, copy, and distribute
- Digital information products are increasingly leased, not sold
- The Internet provides end-to-end communications capabilities for all types of information and all kinds of devices
  - ✓ One-to-one
  - ✓ One-to-many
  - ✓ Many-to-one
  - ✓ Many-to-many

The Digital Dilemma: While the Internet allows virtually free copying and distribution, digitization and leasing allows information to be "locked down", at least temporarily

What is Openness?

- Openness is a characteristic based on accessibility and responsiveness
- Most products, services, or processes are neither open nor closed, but can be placed on a continuum of openness
- Moving towards openness means increasing accessibility and responsiveness
- The degree of openness required depends on the purpose of the activity and the need to exercise judgment and control



Access to Information

- Old View: Internet allows access to the world's knowledge

- New View: Pervasive computing and communications allow access to the world's knowledge **and enables everyone to participate in its expansion**

Encyclopedia Britannica vs. Wikipedia

Walled Garden vs. Internet

Responsiveness

- Openness is measured not only by access, but by the ability to modify and add
- Should the first creator control any subsequent modification because he or she knows the creation best?
- Should we allow others who follow to make their own creative contributions by modifying it?
- Or both? What is the appropriate balance?

An Economist's View of Intellectual Property Rights

- Monopolies create "dead weight loss," which is why economists do not like them.
- Temporary monopolies, such as provided by copyrights and patents, create incentives for innovation by allowing creators to reap the benefits of their creations
- Society benefits most if the intellectual property is ultimately shared and made broadly available.

An Economist's View of Intellectual Property Rights II

- Every innovation has a first creator and follow-on innovators
- Creating or restricting rights of first creators or follow-on innovators through IP rights are just like taxing one or the other
  - Too high a tax on either group results in under-production of innovation
- Every first creator is "Standing on the shoulders of giants" (Newton)
  - There are far more follow-on innovators than first creators
- The key task is finding a balance that produces the greatest possible innovation

Openness and Intellectual Property

- Old View: IP rights holders obtain value and reap the benefits of the creation by controlling access to the work and charging for it

- New View: IP rights holders obtain value by controlling access to their works and charging for it, or by freely sharing it and encouraging others to contribute according to their abilities

Not either or. Both have their place.
Both rely on IP licensing systems.
Neither should be mandated.

Propriety software vs. Open source software

Open Source Software—a "cancer" on intellectual property destroying incentives

vs. "With enough eyes, all bugs are shallow"

Openness and Intellectual Property II

- Old View: Given the required investments in creation, production, and distribution of innovations, the IP rights holder must retain control of the work to obtain value. (Matches characteristics of the physical world.)

- New View: Intellectual property protection may be necessary as an incentive for innovation, but people create and contribute for many reasons. Sharing their rights is just as appropriate, particularly as producing and distributing intangible property is virtually free. (Matches characteristics of the digital world.)

Openness and Intellectual Property III

How to respond
to the challenge of piracy?

Extend IP rights
Strengthen and enforce technical protection measures such as DRM?

or

Find new means to facilitate contributions and to compensate creators?

Openness and Intellectual Property IV

- Old View: Make your technology the standard and obtain monopoly rents through licensing. Interoperability may be a by-product. Build patent war-chests.
- New View: Make your technology part of an open standard to speed up market development and validate the technology you know best. Contribute your patents and create a "commons" for innovation. Interoperability central to market growth

Microsoft Word vs. Open Document Standard

Grid computing

Openness and Where to Look for Innovation

- Old View: R&D is done in-house and tightly held. Firm's researchers are paid to produce valuable innovations
- New View: Anyone, anywhere—customer, supplier, shop floor worker—is a potential creator and collaborator

  - "Not invented here" versus "Proudly discovered elsewhere" (P&G)
  - **Distributed Innovation**—InnoCentive, Nine Sigma, Yet2com
  - Roomba vs. Sony vs. Apple
  - **Maxwell's Law**—Team with the most smart people wins

Openness and Where to Look for Innovation

- Rising cost of technology development and shorter product life reduces returns from R&D investment
- 75%-95% of patents lie dormant
- "Not sold here" keeps valuable patents locked up in the firm
- Keep patents so others can't use them or let others use them and profit from the value that others add?

Openness Is Not Just for Software

- Software—born digital with infinite number of potential paths
- Software controlled devices are increasingly important in the physical world
- Growth of cheap fabrication—Fab@Home
- History of physical world "tinkering"

A New Architecture for Participation Enabled by Openness

- Linux
- Wikipedia
- SETI—world's fastest supercomputer
- Napster
- Flickr
- Podcasting, blogs
- Second Life
- E-Bay listings, ratings
- Amazon reviews, recommendations
- YouTube

Openness Even Affects The Nature of the "Firm"

- Old View: Firms extend vertically because of the high costs of coordination and control of outside parties. Transaction costs determine organization

- New View: Firms extend horizontally with loosely coupled partners each contributing value. Internet causes costs of coordination and control to plummet

Vertical Integration vs. Creation networks

Open Source Illustrates New Leadership Forms

- Old View: Need market mechanism or legal authority to control workers
- New View: Open source project leader has no legal authority. Must inspire/persuade workers who can quit the project or "fork the code"

Openness in Spectrum Policy

- Old View: Spectrum scarcity and interference requires exclusive licensing arrangements. Additional users create congestion. Unlicensed spectrum is for non-critical services

- New View: Multiple users can share frequencies using "smart radios." Innovation enhanced with minimal technical rules. Each user in a mesh network adds communicative capacity. Unlicensed bands host disruptive technologies—Wi-Fi, Wi-Max, RFID

Licensed frequency as railroad track

vs.

Spectrum as ocean

Openness in Health Care—Some Opportunities I

- Human Genome Project
- Registering Clinical Trials
  - Journal of Failed Clinical Trials
  - Post-authorization monitoring
- Requiring Publication of Publicly-Funded Research
  - Public Library of Science
  - Peer review by anyone interested

Openness in Health Care—Some Opportunities II

- Electronic Patient Records-Physician Access to medical history, genomic data leads to "personalized" treatment
- Data base of clinical trials, family and individual histories, genomic, pharmacogenomic, and environmental data
- Patient Access to Internet-based Health Related Info
- Patient Access to Cost and Quality Data
- Open source medical devices

Openness is More Than a State of Mind

- Openness is not binary, but a continuum
- Many difficult issues
  - Evaluating contributions
  - Dealing with the flood of information
  - Security and authentication
  - Finding the appropriate level of openness depending on the task
- But, openness provides a lens to examine what we are doing and how we are doing it

Tapping the Collective Wisdom

- **Everybody knows more than anybody**

Contact Information

For further information, please contact

emaxwell@emaxwell.net

or visit

www.emaxwell.net

With special appreciation to Yochai Benkler, John Seely Brown, Henry Chesbrough, Tim O'Reilly, Eric Von Hipple, Steve Weber and the Center for Economic Development