

# Economic Aspects of Libre Software

Master on Libre Software (URJC)

<http://master.libresoft.es>

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# Supporting innovation with free software



# Summary

*Free software has shown, in several areas, how it may be a powerful tool for supporting innovation processes, and the dissemination of its results. This presentation will show the relationship between free software and innovation, and some of the characteristics of innovation processes supported by free software.*

# What is innovation?

- Technological advance subdivided into two phases:
  - Invention (scientific breakthrough): research
  - Innovation (commercialization of the invention): development

Schumpeter (1934), attributed by Nelson and Winter (1982)

- Innovation: process by which research results (which may be new technologies) are applied to existing products or lead to new products.

# Free software and open innovation

*"Open innovation is a paradigm that assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as the firms look to advance their technology"*

"Open Innovation: The new imperative for creating and profiting from technology", Chesbrough, H.W. (2003)

Management challenges:

- Maximization of the use of internal innovation
- Incorporation of external innovation
- Motivation of a supply of external innovation.

# Patterns of open innovation in free software

Companies use free software in their open innovation strategy (based in [WestGallagher2006]):

- Pooled research  
Pool resources to innovate in a common platform, exploit results
- Spinouts  
Release some non-core innovation in a separate body, but stay involved
- Selling complements  
Income from complements, shared innovation in a common core
- Donated complements  
Income from a core innovation, seek donated labor for valuable complements

# Case study: Pooled research (Linux, Mozilla)

- Firms donate R&D
- Firms exploit pooled R&D of all contributors
- Mozilla: IBM, HP, Sun, etc.
- Linux: computers vendors, microprocessor manufacturers, Linux distributors, etc.
- Maximization: concentrate in their own needs
- Incorporation: shared technology in their products
- Motivation: pool of contributors assumed



# Case study: Spinouts (Eclipse, OpenSolaris)

- Transformation of internal development in external free software project
- “Donation” of research results, but maintaining involvement
- Project may generate demand for other products
- De-facto standards (no need to reimplement to conform with others)
- Maximization of impact of non-core technologies
- Incorporation of contributions by third parties
- Motivation: self-sustainable (or less resource-consuming) communities

<http://www.eclipse.org>

# Case study: Selling complements (Apache, Konqueror, Android)

- Some components commoditized, profit from others (rapidly evolving, difficult to imitate)
- IBM using Apache httpd for its WebSphere
- Apple using Konqueror for Safari
- Google using Linux for expanding to mobile adds and apps
- (in both cases, contributing back with innovation)
- Maximization by centering on core products
- Incorporation of “free” external innovation
- Motivation: self-sustainable (or less resource-consuming) communities

Related case: dual licensing, the complement is the proprietary version (e.g., MySQL)

<http://httpd.apache.org>  
<http://www.konqueror.org>  
<http://www.android.com>

# Case study: Donated complements (Early BSD Unix, Matlab Central)

- Free software components for a proprietary core
- Heavily based on the interest of a community, but can be promoted
- Maximization: more value for internal innovation (core product)
- Incorporation: complements are attracted innovation
- Motivation: developers involved in the core product, but willing more functionality

<http://www.mathworks.com/matlabcentral>

[http://en.wikipedia.org/wiki/Berkeley\\_Software\\_Distribution](http://en.wikipedia.org/wiki/Berkeley_Software_Distribution)

# Free software and community innovation

Moving to the perspective of the community (as opposed to the firms)

- Self-sustainable innovation communities
- Each actor, different motivations
- Win-win situations when research results flow freely
- Some rules may help to “enforce” free circulation (eg: GPL)
- Relatively small set of resources may unleash huge potentials

# Case study: GNU/Linux installation process

- As opposed to other OSs, GNU/Linux has usually to be installed
- Continuous improvement of the process
  - 1990s: difficult (bad hw support, little flexibility, too specific)
  - early 2000s: simple (most hw supported, hw-detection libraries, flexible, extensible tools, first live distros)
  - late 2000s: distro-on-stick, distro-on-file, quick-start, modular systems
- Collaborative effort by distribution vendors, volunteers, hw vendors, etc.
- Actors are competing while collaborating

# Case study: KDE, GNOME

- Many actors interested in having free software desktops
- Two main competing systems (GNOME, KDE), with points of contact (FreeDesktop).
- Volunteers collaborating with companies
- Companies benefit, and benefit of contributing back (Sun, IBM, Nokia, etc.)
- Each system composed by an ecosystem of programs, continuously varying
- Distribution vendors have key interest

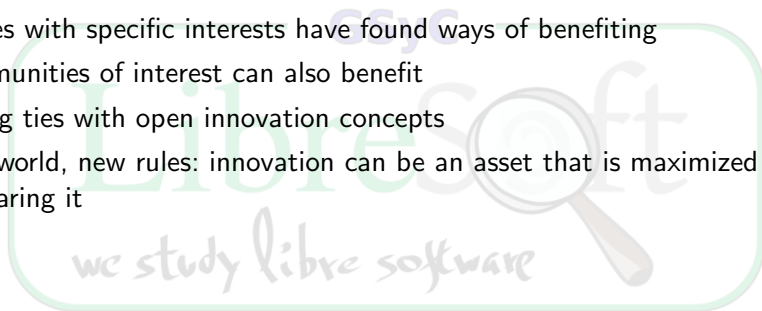
# Case study: gvSIG

- Created by a public administration (Comunidad de Valencia)
- Originally, satisfying needs of the creator
- Other parties joined, contributing small (but valuable) assets
- A community is created around the core gvSIG system
- Currently competing head-to-head with other systems in the area
- Needs of Comunidad de Valencia now provided by a market...
- ...as is the case of many other parties in the community

*we study libre software* <http://gvSIG.org>

# Some final notes

- Free software can boost innovation
- Parties with specific interests have found ways of benefiting
- Communities of interest can also benefit
- Strong ties with open innovation concepts
- New world, new rules: innovation can be an asset that is maximized by sharing it





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