

Open Source & Technology Adoption: An exploratory study of Linux market share

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Outline

- Free and Open Source Software - FOSS
- Linux in the Server specialized market
 - cooperative development
- Linux in the Desktop mass market
 - collective lock-in
- Conclusion
 - Lessons learned in FOSS & technology adoption

Free and Open Source Software

- Free and Open Source Software (FOSS):
 - increasingly important in the software industry
- FOSS as an open system:
 - Delivered with its source code
 - Freely understandable, modifiable and redistributable
 - Evolve progressively based on independent contributions
- Cooperative development process:
 - Numerous independent developers
 - most working voluntarily within a community
 - Regulated by special licenses that invert property rights:
 - share instead of exclude

Free and Open Source Software

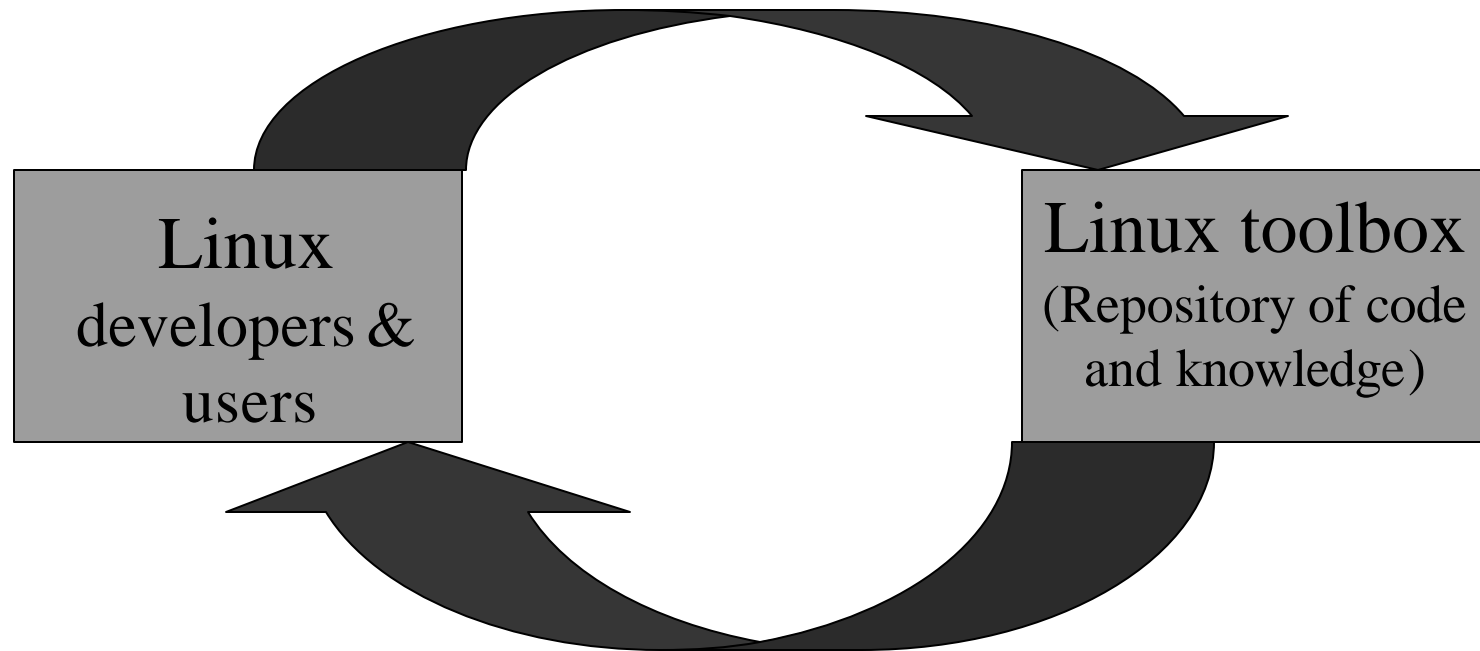
- FOSS projects develop several very good software systems:
 - Apache, emacs, Perl, BSD, MySQL, ...
 - Vocation : computer infrastructure
- The most important FOSS: Linux
 - Best known
 - Main platform for most FOSS
 - MS-Windows competitor
- But different results in terms of market share
 - Very competitive in the Server market: 25-30%
 - Marginalized in the Desktop : < 5%

The Server specialized market : Linux cooperative development

- Decisions taken by computer professionals
 - Main users: IS departments in organizations
 - They can understand, test, modify and adapt
 - they participate in its software development
- Linux as a toolbox in the specialized markets
 - Participants take software pieces, test-them, modify-them and return-them to the community box
 - Motivation to participate: find solutions to problems
- Toolbox grows as a cumulative and open system:
 - More code => more knowledge embedded => more attractive is the box to access, test and contribute => more code and knowledge

Cumulative development of the Linux toolbox

Market problems to solve, new pieces of code, test, financing



Code, information about software components and contributors

The Server specialized market : Linux cooperative development

- Toolbox is developed within the community
 - Interactions among participants:
 - allow in-depth knowledge about software & participants assets
 - They also develop criteria of evaluation
 - Decisions can be taken according to the relative merits of options
- Linux (FOSS) community as a specialized network
 - A network where computer specialists interact
 - A very meritocratic network, like scientific communities
 - It develops a good software
- Linux is a good OS appreciated by the specialists in the Server market => Linux is competitive

The Desktop mass market: Collective Lock-in

- Users have minimal computer knowledge
 - They cannot evaluate the options => they cannot choose based on technical or economic merits
 - They cannot participate in Linux construction
 - => Linux appears as a proprietary software package
- Market is locked-in on a unique standard = MS-Windows

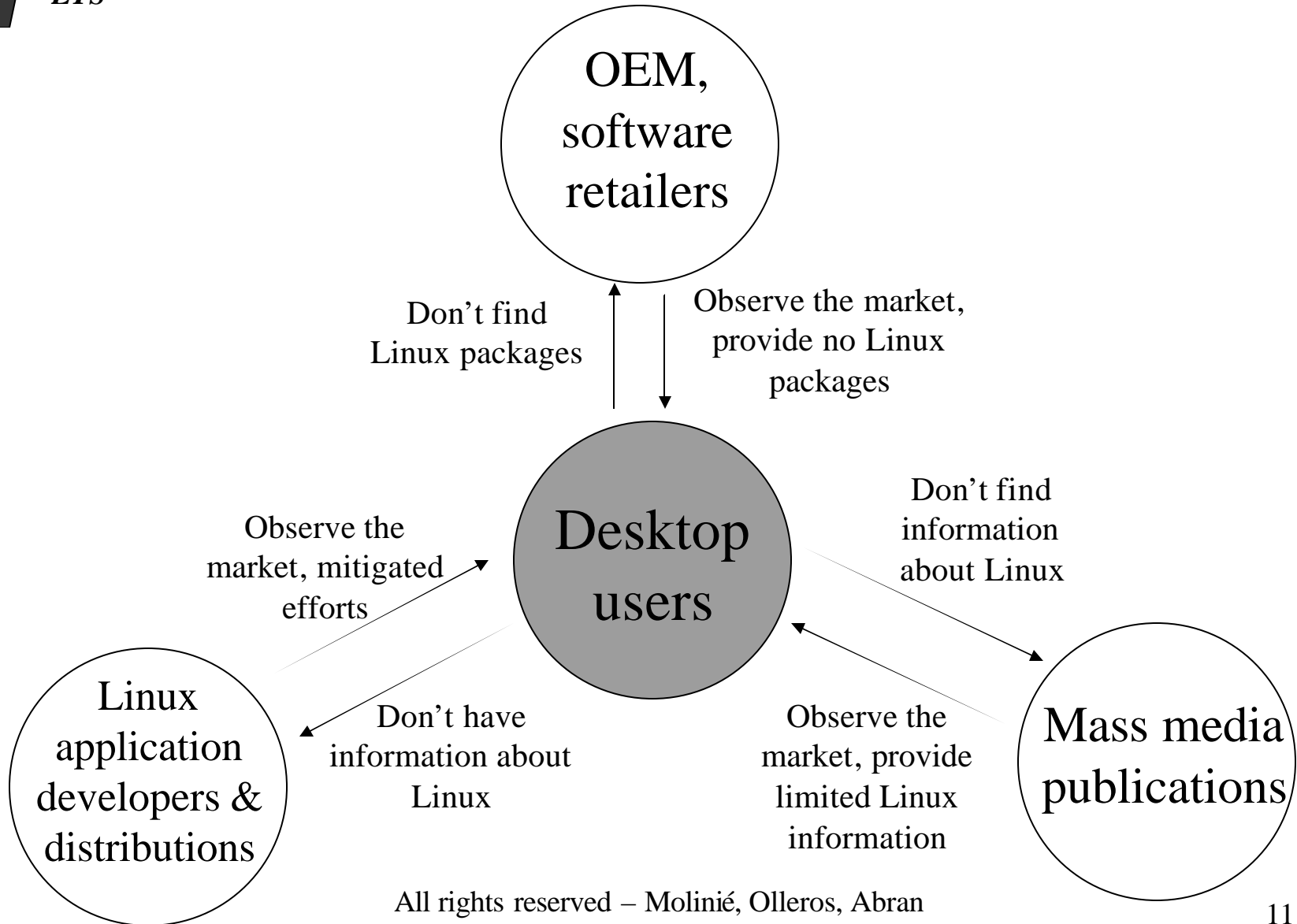
The Desktop mass market: Collective lock-in

- The problem is not technical:
 - Linux distributions (i.e. Red Hat, Mandrakesoft, SuSE) are competitive: user friendly, compatible, powerful, reliable, portable
 - Only small differences
- The problem is not economic:
 - Linux distribution is less expensive
- A Lock-in requires another explanation:
 - Actors interactions that amplify small differences in order to drive extreme results (Arthur, 1989)

The Desktop mass market: Collective lock-in

- Self-reinforcing network effects:
 - Users cannot evaluate alternatives:
 - They choose to maintain standard
 - OEM, software developers, software retailers and publishers look for users decision
 - They confirm support to standard
 - "Everybody chooses Windows because everybody chooses Windows "

The lock-in of the Linux desktop



The Desktop mass market: Collective lock-in

Why decisions in the Desktop market are governed by network effects instead of meritocratic criteria?

- Actors network is different compared to Servers:
 - Weak knowledge of the users determinates no participation (appropriation) in the technology development
 - Weak knowledge implies superficial interactions among actors:
 - no technical evaluation, only observation of other users' behavior
 - Network is much larger:
 - Millions of users acting according to behaviors are more exposed to uncontrollable cumulative feedbacks => market lock-in

Conclusion

- Explanation: different processes (development and diffusion) lead to different results
- What opposes Server and Desktop markets?
(Linux server is not Linux desktop)
 - Cooperative vs. private development
 - In-Depth technical knowledge vs. weak knowledge
 - Decision rules based on the merits of each option vs. on the observation of other users' behavior.
 - Local vs. global networks
 - Meritocratic vs. hyper-selective dynamics
 - Diversified and competitive market vs. standardized and locked-in market

Conclusion

- Candidate collective actions to overcome the lock-in:
 - To create a clear gap of superior performance (current and new applications in the new uses of computer)
 - Linux desktop adoption by very big users: enterprises and specially governments knowing Linux attributes as servers
- Both types of actions are self reinforcing and can send positive signals to other actors (suggesting to switch to Linux)
 - Collective dynamics of positive feed-backs can create a self-supporting critical mass to unlock the market

Conclusion

- Additional questions :
 - Could Linux replace Windows as a unique standard or could it only create diversity in the desktop market more accordingly with the FOS vocation and the competitive scenario of the specialized computer markets?
 - In which other activities is the cooperative and decentralized model of innovation and production that characterizes the FOS development process applicable?

Questions? Suggestions?

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