



Collaboration & Development in Free Software Communities

Freedom, Sharing and Sustainability in the Global Network Society

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Where is the Digital Divide?

“Access [to ICTs] is not enough, it is the ability to create, to add value, that is important”

Felipe Gonzalez
former Spanish Prime Minister,
Speaking at Open Source conference in Málaga, Spain, 18/2/04



What is “free software”?

Defined in 1984 as software with the:

- Freedom to run for any purpose.
- Freedom to study and modify.
- Freedom to redistribute.
- Freedom to redistribute improvements.

All freedoms are commercial and non-commercial: you can sell “free software”



“Open source” and “free software”

- English confuses free as in freedom with free as in no price
- “Open source” was coined in 1997 as a business-friendly term for “free software”
- Both terms have official definitions, and refer to the same software
- A political movement around free software, though, emphasises freedom



“Libre” and FLOSS

- French, Spanish etc avoid the English confusion: libre software
- Free/Libre/Open Source Software – created as acronym for FLOSS project*
- Since the success of the project, FLOSS has become a widely used “compromise” term in Europe, Latin America and Asia

*FLOSS was funded by the EU FP5, and led by Infonomics/MERIT at the University of Maastricht



Selling free software

- IBM, HP, SAP, Oracle, Novell are companies with large FLOSS-related revenues in billions of \$ annually
- Red Hat, MySQL, Mandrake are companies that work mainly with FLOSS
- They charge for software CDs, support, administration, customisation, hardware; using FLOSS as a platform



Examples of FLOSS

- GNU/Linux: operating system based on the Linux kernel + other free software including the GNU system (from gcc and libraries to bash and emacs...), Apache, Mozilla, Sendmail, etc
- Distributions include Red Hat, Debian, Novell/SuSE... various Indian-language distributions



How is FLOSS developed?

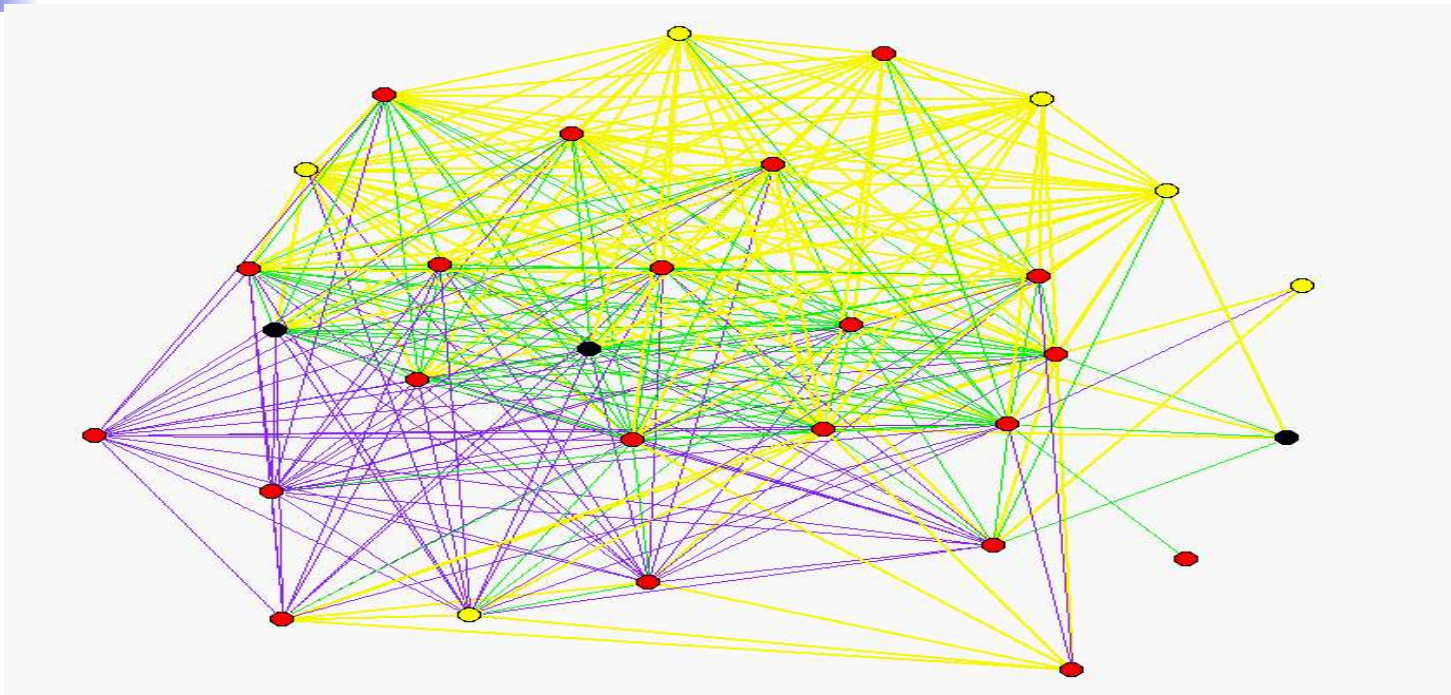
- Bottom-up collaboration
- Collaboration in small, distributed pieces
- Joined together through:
 - Law (licences) reduce entry barriers
 - Technology (Net, modularity) to integrate
- Most individual contributions are small
- Motives are diverse, this doesn't matter



Development: example Linux

- The Linux kernel was first written by Linus Torvalds, a student in Finland in 1990, and released over the Internet under the General Public Licence (GPL)
- GPL says: this provides the 4 freedoms, but if you modify it, your modified version must be free software too
- GPL + Internet allowed many authors...

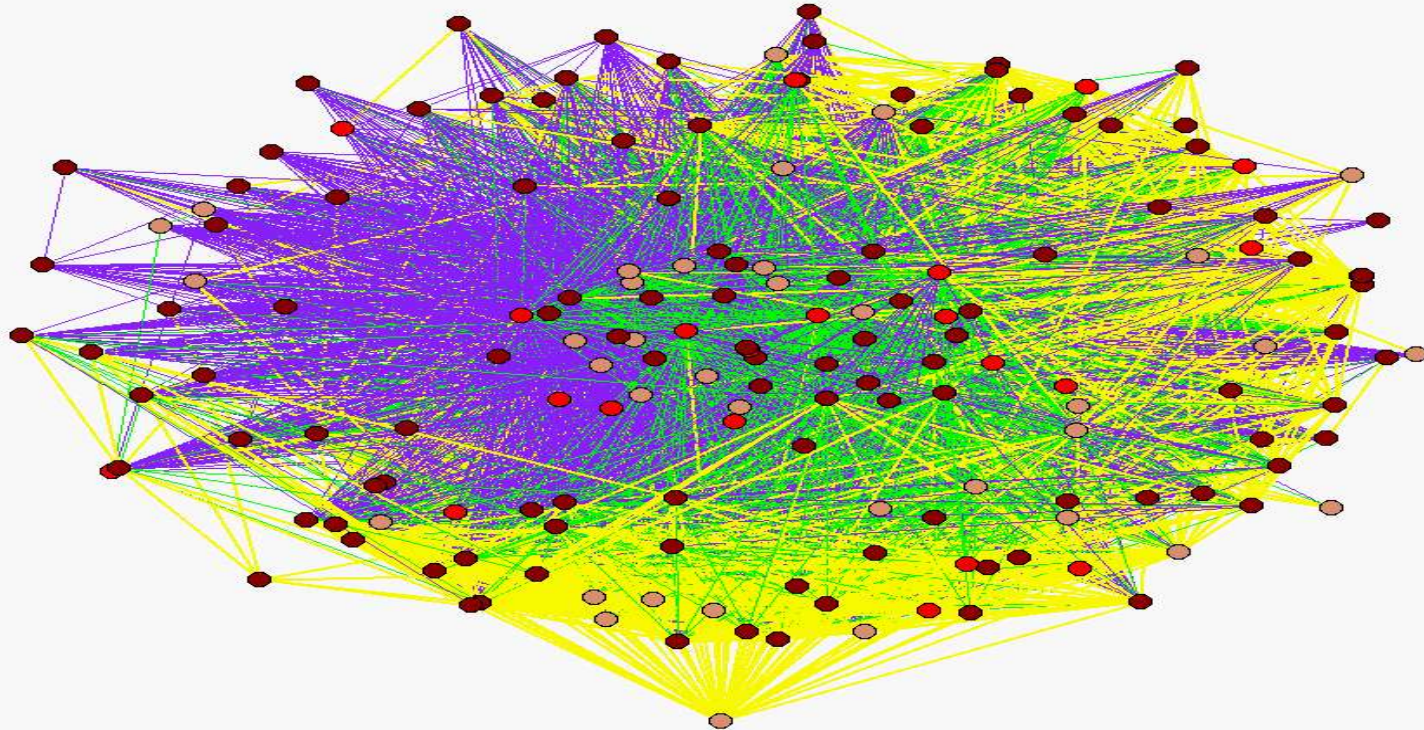
Linux kernel v1.0: 158 authors



1994. Nodes are 30 modules. Arcs represent **common authors**, **code dependencies**, or **both**

(Source: "Nature and composition... ", Ghosh & David)

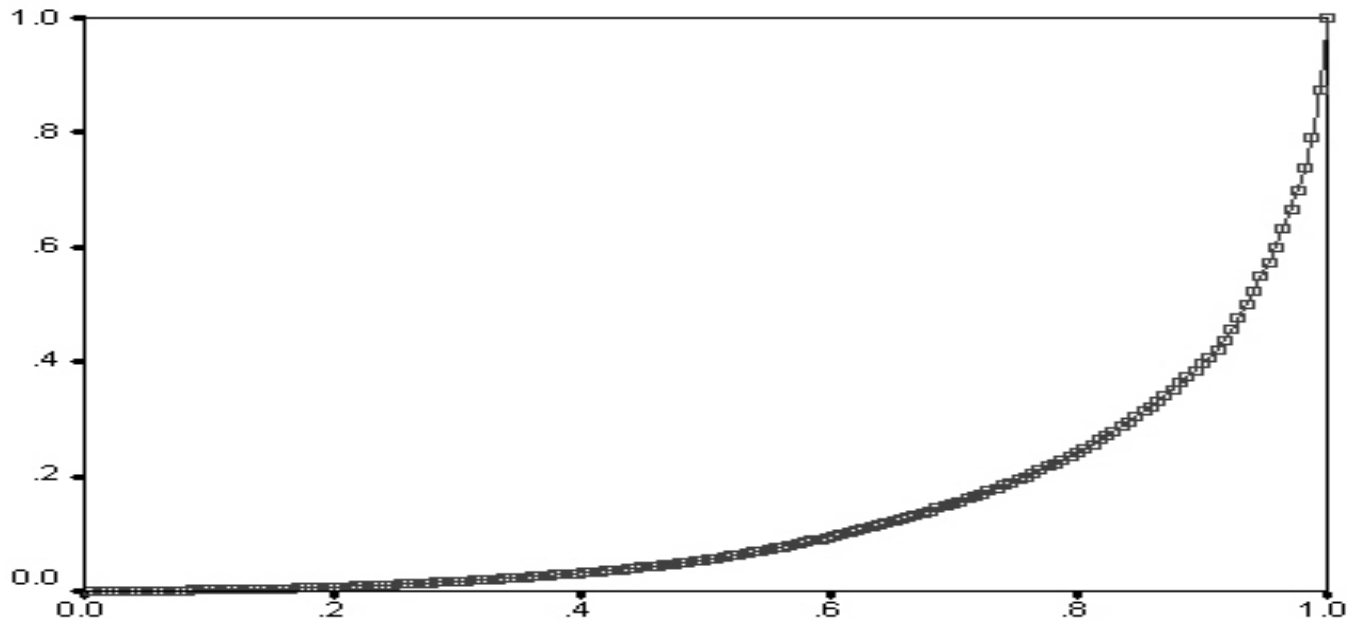
Linux kernel v2.5.25: 2263 authors



2002. Nodes are 169 modules. Arcs represent **common authors**, **code dependencies**, or **both**

(Source: "Nature and composition... ", Ghosh & David)

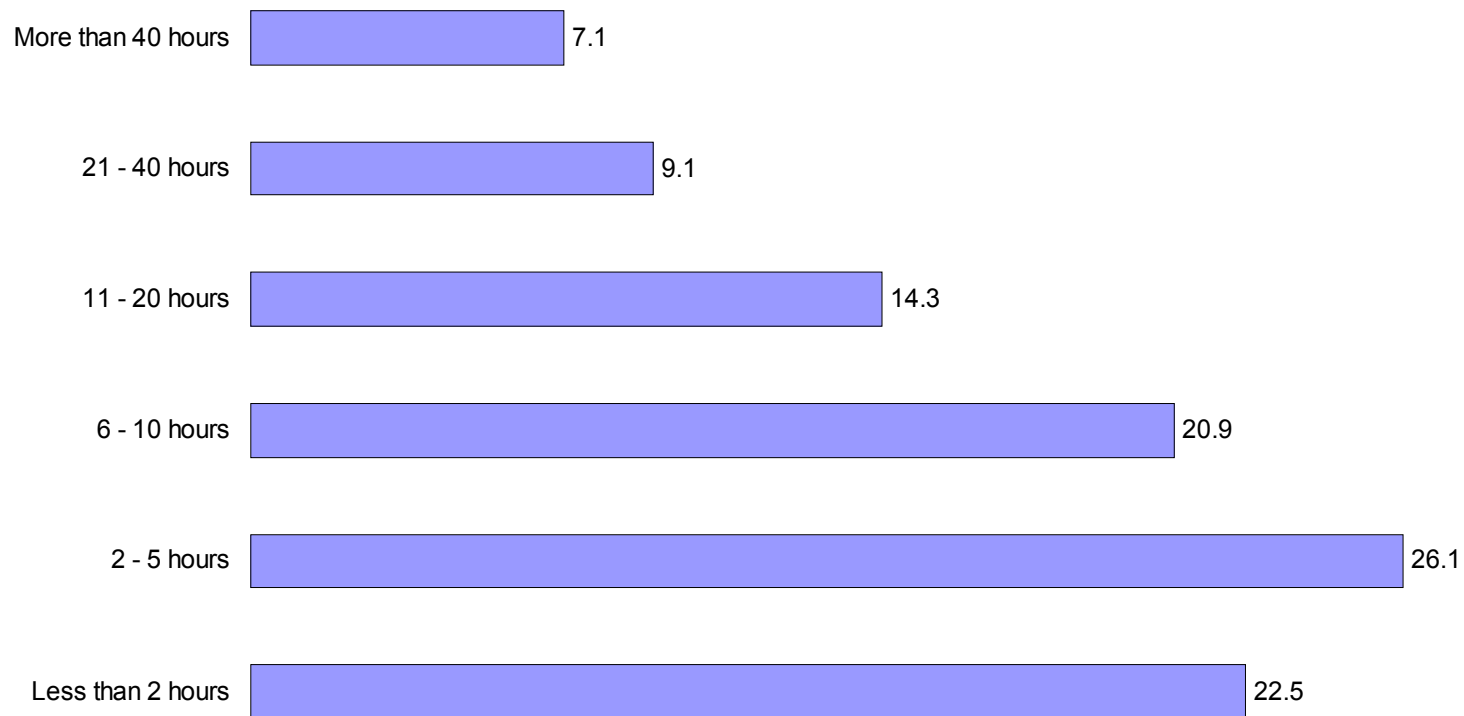
Linux kernel v2.5.25: 2263 authors



Share of authors (X) vs share of code contributed (Y).
Bottom 80% contributes under 30% of code.

(Source: "Nature and composition...", Ghosh & David)

Weekly hours per developer, %



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(Across a range of FLOSS projects, 2002. Source: "FLOSS Final Report, Developer Survey", Ghosh et al)



Valuing FLOSS

- Example: Debian 2.2 GNU/Linux (2001)
 - Source lines of code: 55,201,526 (of which the Linux kernel forms under 6%)
- If Debian was written in a software company:
 - Estimated effort: 14,005 person years
 - Estimated schedule: 6.04 years (team of 2,318!)
 - Development cost: US\$ 1,891,990,000

(Source: "Counting potatoes" by Gonzalez-Barahona et al)

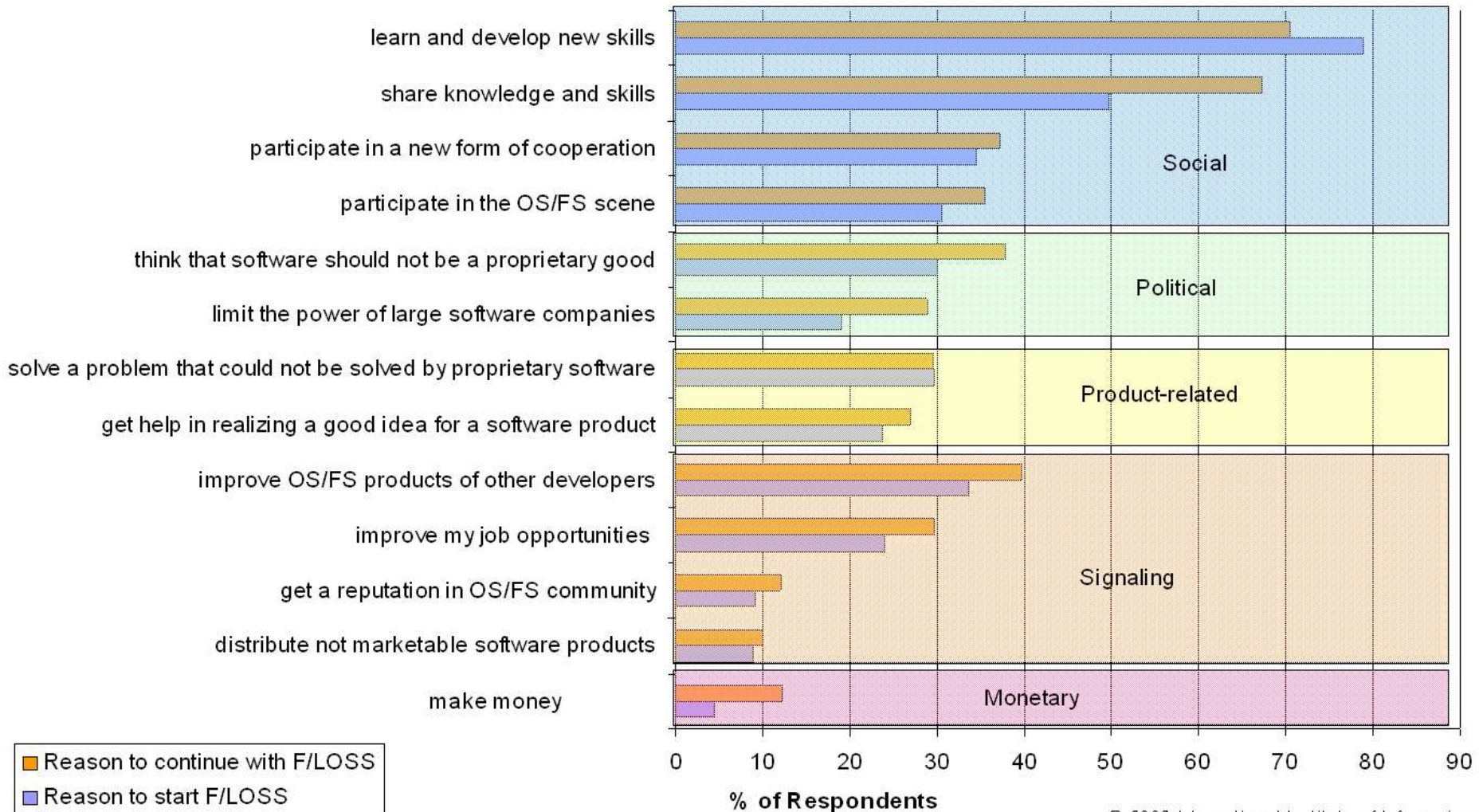


Who develops FLOSS?

- Young (av. age 26) and largely male community
 - High educational level
 - 44% IT sector, 15% IT students, 5% other students, 4% other engineers
 - Most (59%) are married or have partners
 - Most employed (65%) or self-employed (14%)
 - PhD 9%, University degree 61%, high-school 25%
 - 49% do not contribute more than 5 hours/week
- Start young: 14! or old: 73! Average starting age 22

(Source: "FLOSS Final report", Ghosh et al)

Why develop FLOSS?





FLOSS develops local skills

- FLOSS encourages not only passive “use” but active participation in the creative process
- FLOSS provides a very low barrier to entry for creativity – you don’t have to be creative but if you want to, you easily can



Skills and economic growth

- **Skills development: “the ability to create”**
FLOSS is a training environment that increases the earning capacity of community participants without any explicit investment in training: a novel form of technology transfer
- **Economic growth: “ability to add value”**
FLOSS allows local entrepreneurs to provide a greater share of total value added, thus retaining a greater share of profits within the local economy



In conclusion

- FLOSS use is rapidly growing worldwide
- This is driven by demand from government and from industry: FLOSS is viable business
- FLOSS appears to have positive implications for skills and employment generation
- FLOSS provides a model for collaborative production in other sectors e.g. biotech
- FLOSS helps truly bridge the digital divide, offering developing countries participation and the ability to create, not just passive access



More information

FLOSSPOLS: <http://flosspols.org>

References:

- FLOSS report: <http://flossproject.org/report/>
- “Nature and composition...” (Ghosh & David):
<http://dxm.org/papers/licks1/>
- “Counting Potatoes” (Gonzalez-Barahona et al):
<http://libresoft.dat.escet.urjc.es>