The Economics of Free Software
and why it matters for developing countries

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The FLOSS survey

- **FLOSS project: Free/Libre/Open Source Software Study, supported by the European Commission**

- **Largest, most comprehensive survey of developers worldwide (2002-2004)**
  - **~2800 responses to original EU–funded survey**
  - **~1500 responses to FLOSS-US survey (Stanford/SIEPR)**
  - **~650 responses to FLOSS-JP/FLOSS-Asia (Mitsubishi Research)**

Software as society

- **What FLOSS developers expect of each other:**
  - **"share their knowledge": 78%**
  - **"respect my contribution": 32%**
  - **"write beautiful and aesthetic programs": 24%**
- **Why they participate in the FLOSS community:**
  - **"learn new skills": 70%**
  - **"share their knowledge and skills with others": 67%**
  - **"improve the products of others": 40%**
  - **"improve job opportunities": 30%**
  - **"make money": 12%**

What motivates FLOSS developers?

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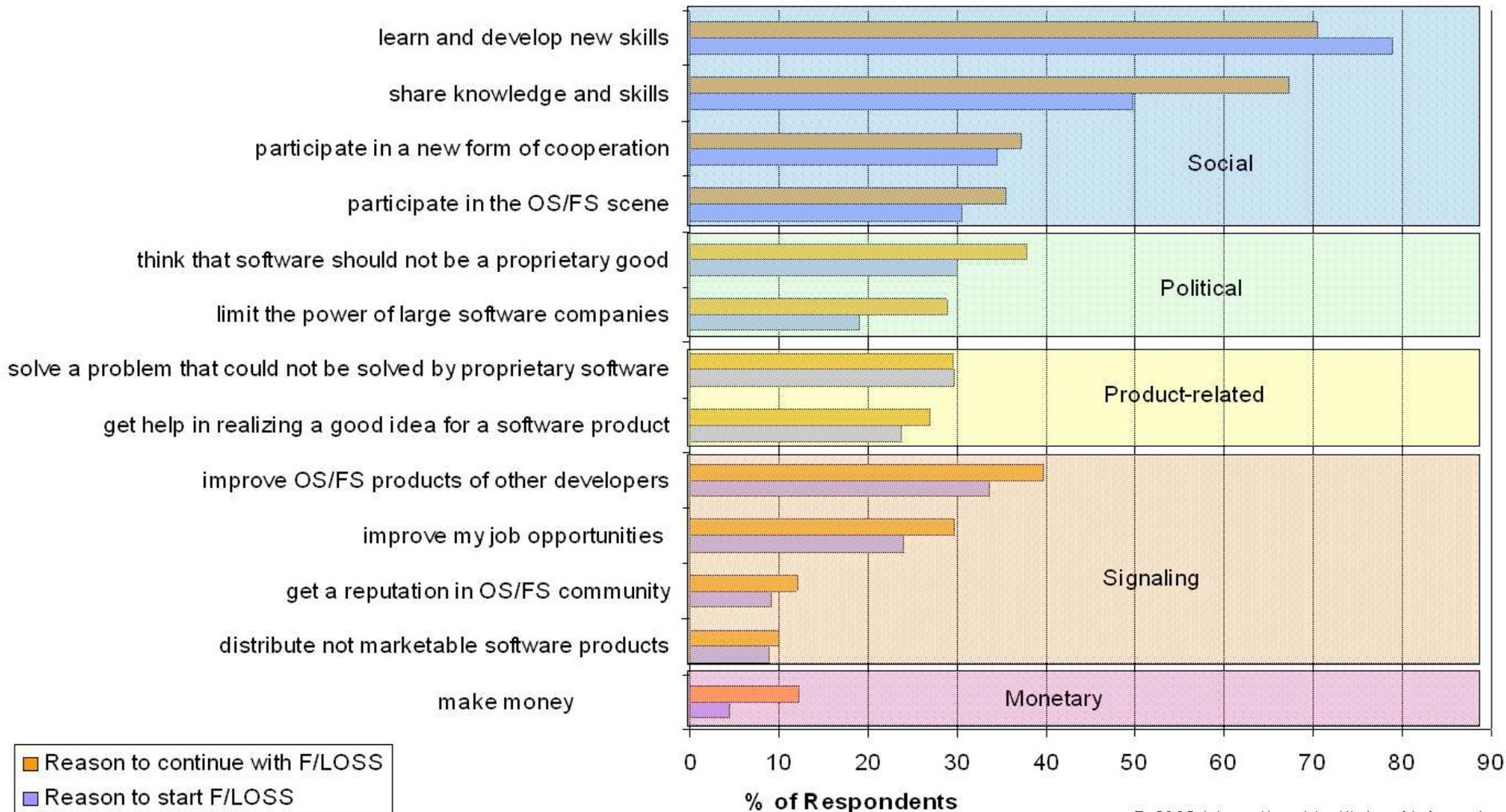
Software in society

"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

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Why Free/Libre/Open (FLOSS)?

- ## Cost – *Total Cost of Ownership!*
  The broad, socio-economic change long promised by ICTs would be limited to a tiny elite without FLOSS

- ## Performance, flexibility, localisation
  Many FLOSS applications provide superior performance & security; adaptation is permitted, e.g. for local languages

- ## Skills development
  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?

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The TCO bogeyman?

Software Total Cost of Ownership:

- **Licence fees**
- **Associated hardware costs**
- **Associated software costs**
- **Maintenance**
- **Integration**
- **Support**
- **Training**

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The TCO bogeyman?

Software Total Cost of Ownership:

15-40%

- Licence fees
- Associated hardware costs
- Associated software costs

60-85%

- Maintenance
- Integration
- Support
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The TCO bogeyman?

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Labour costs 60-85%
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The TCO bogeyman!

Software Total Cost of Ownership:

- **The share of licence fees in TCO is small…**
  …when the share of labour costs is high (as in the countries or social domains where TCO studies are normally conducted)

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The TCO bogeyman!

Software Total Cost of Ownership:

- **The share of licence fees in TCO is small… …when the share of labour costs is high (as in the countries or social domains where TCO studies are normally conducted)**

- **If labour costs (average incomes) are low, their share in TCO is lower, with the result that the share of licence fees is considerably higher**

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Licence costs seem low...*

Licensing Cost of Windows XP + Office (USA):

$560**

**Standard Edition, price from Amazon.com,*

The view from the rich world!

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...and not the #1 reason for FLOSS

(even in rich countries: UK, Germany, Sweden)

Benefits from using F/OSS

Performance/stability	83%
Security	75%
Lower licence fees	71%

65%   70%   75%   80%   85%
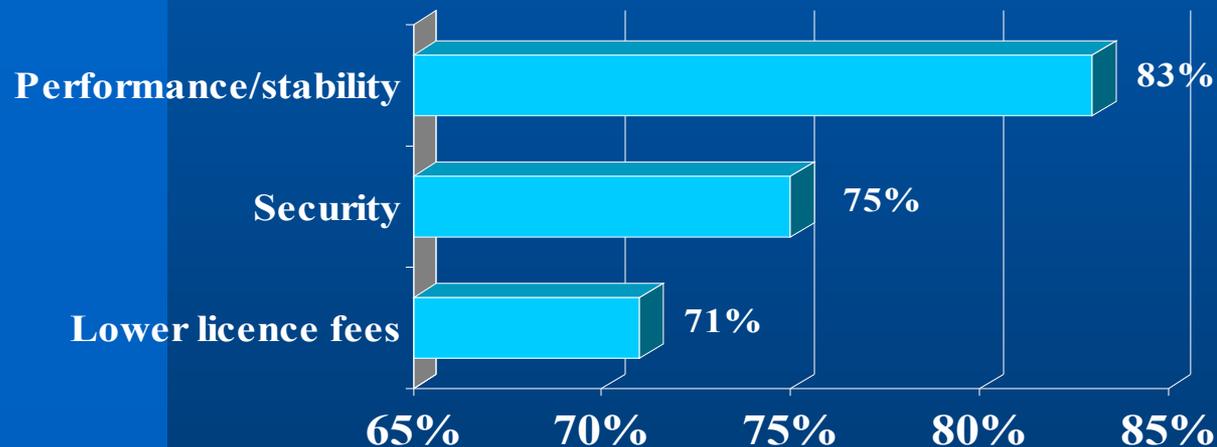
Source: FLOSS survey of user organisations, FLOSS final report, www.flossproject.org/report/

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But in Argentina...

Licensing Cost of Windows XP + Office* in the US:

    $560

In Argentina:

GDP/capita (average annual income) $7716

Effective cost of Windows XP + Office (per capita)

    0.9 months' GDP

    (I.e. the cost of a single copy is 0.9 months of average income)

  *Standard Edition

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...Cost really DOES matter

Licensing Cost of Windows XP + Office in the US

    $560

ARGENTINA: GDP/capita $7716

Effective cost of Windows XP + Office (per capita)

    0.9 months' GDP

Comparing with US GDP/capita: $35 277 p.a…

    Effective cost in $ equivalent for a *single copy* of Windows XP + Office in Argentina: $2 757

...Cost really DOES matter

Country	GDP/cap	PCs ('000s)	Piracy	WinXP Cost:**	
				Effective $	GDP months
Argentina	7166	3415	62%	2757	0.9
Brazil	2915	10835	56%	6777	2.3
Chile	4314	1640	51%	4579	1.6
Ecuador	1396	300	62%	14149	4.8
Mexico	6214	6835	55%	3179	1.1
Peru	2051	1262	60%	9630	3.3
Asia*	2128	102229	n.a.	9282	3.2
Latin America*	4335	18703	n.a.	4557	1.6
Africa	652	7636	n.a.	30297	10.3
United States	35277	178326	25%	560	0.2
EU	20863	116997	n.a.	947	0.3
Canada	22343	14294	0.38	884	0.3

*GDP/capita in US$, WinXP cost in $ equivalent; * Asia (incl Japan, Korea); LatAm incl Mexico, Caribbean*
***Windows + Office XP effective $ cost calculation = $560 * (GDP per capita / US GDP per capita)*
Source: World Bank World Development Indicators Database, (2001 data); Business Software Alliance
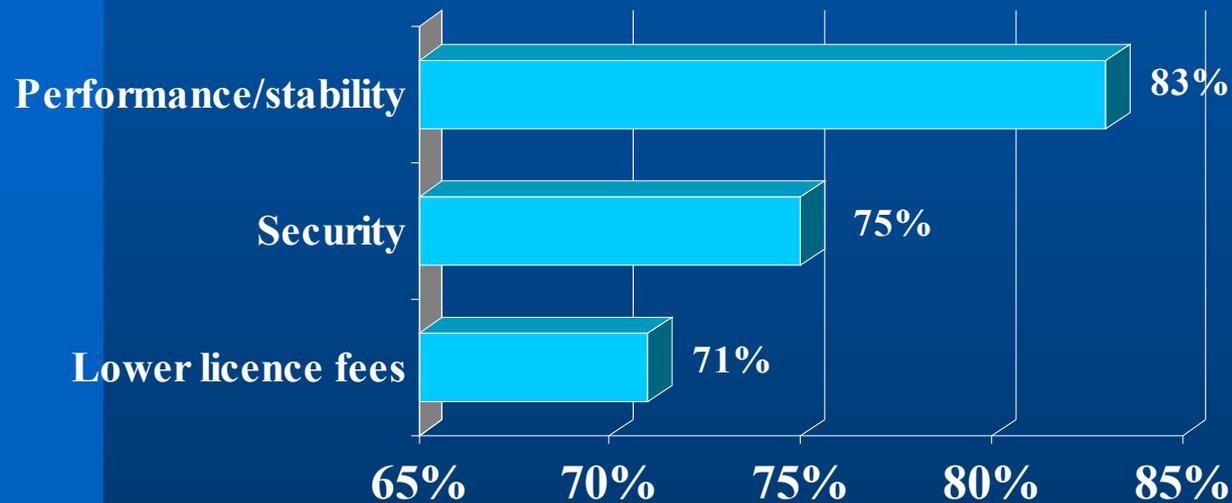
Why Free/Libre/Open (FLOSS)?

- **Cost – *Total Cost of Ownership!***
  The broad, socio-economic change long promised by ICTs would be limited to a tiny elite without FLOSS. Although other barriers exist (hardware, bandwidth) software licence fees are yet another additional barrier, but can be avoided.

- **Performance, flexibility, localisation**
  Many FLOSS applications provide superior performance & security; adaptation is permitted, e.g. for local languages

- **Skills development**
  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?

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FLOSS can mean better security...

Benefits from using F/OSS

Performance/stability — 83%
Security — 75%
Lower licence fees — 71%

(x-axis: 65%, 70%, 75%, 80%, 85%)

Source: FLOSS survey of EU user organisations

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FLOSS helps localisation

- **Proprietary vendors are motivated by global profit-maximisation strategies**
- **They often don't care about local issues and user needs – unless they matter in "a global context"!**
- **Many FLOSS developers may have absolutely no interest in software usability for Xhosa speakers**
- **But FLOSS developers allow and encourage those *with* locally relevant motives to adapt their software**
- **This allows projects such as translate.org.za, LinEx, adapting software to local needs, culture**

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FLOSS develops local skills

FLOSS is a training environment that enables the ability to create and actively participate rather than passively use ICT.

FLOSS increases the earning capacity of community participants without any explicit investment in training: a novel form of technology transfer.

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FLOSS develops local skills

- **Not skills *to use* FLOSS applications, but skills *learned from* participating in the FLOSS community**
- **Skills learnt through participating in the FLOSS community:**
  - programming
  - copyright law and licenses
  - teamwork and team management

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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***

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Learning skills – then sharing!

- **78% of developers *join* the FLOSS community "to learn and develop new skills" (70% *continue* for this reason)**
- **67% of developers *continue* their participation in the FLOSS community "to share … knowledge and skills"**

Source: Free/Libre/Open Source Software (FLOSS) Study of Developers

These skills have economic value

- **30%** of developers participate in the FLOSS community **"to improve … job opportunities"**
- **Over 30%** of developers **derive income directly** through their FLOSS work
- **A further 20% derive indirect income** as a result of their FLOSS work
- **18% got job because of FLOSS experience**

  Source: Free/Libre/Open Source Software (FLOSS) Study of Developers

Employers appreciate this…

- **36% of organisations "totally" or "somewhat" agree that employees can work on FLOSS projects on employer time**

- **These are not software companies! 16% of low IT-intensity companies (retail, automobiles, tourism, construction) "totally agree" with this**

    Source: Free/Libre/Open Source Software (FLOSS) Study of Users

…but don't pay for it.

- **FLOSS communities are like informal apprenticeships – but apprentice/students and master/teachers contribute their own time for free**

- **Nothing in life is free; but this is a social cost borne voluntarily by the participants themselves and not paid for directly by those who benefit (employers, society at large)**

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"To each according to need…"

- **Everyone can benefit equally from this training, though not everyone invests equally in it – many "teachers" may have been formally trained at university or at work (which is explicitly paid for)**

- **In the larger perspective, this training system represents a subsidy – or technology transfer – from those who pay for formal training to those who don't (or can't)**

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"To each according to need…"

- **Within countries, this represents a technology transfer from big companies to SMEs, who can less afford formal training**

- **Globally, this represents a technology transfer from economies who can afford formal training, to those who cannot**

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"To each according to need…"

- **Sectoral benefits: poor countries may have formal computer training during computer science degree courses, but perhaps not in other subjects (biology)**

- **FLOSS usage provides students of other subjects to *informally* learn computer skills, programming skills and enhance their competence in their formal training**

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But do we all want to program?

- **How will we know, unless we can try?**

- **HTML is a programming language – the web only took off because it was open, so people could learn to write their own sites just by copying and changing other sites**

- **"Programming" covers a very broad range of skills from HTML to C; FLOSS allows entry at any degree with little investment in time or effort**

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But do we all want to program?

- **In a proprietary environment, you have to decide to be a programmer, then buy development software, then spend lots of time and effort – all of which is a risk and entry barrier**

- **With FLOSS, you can *tinker.* You don't need to buy tools. You can use them to the extent you choose.**

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But do we all want to program?

- **Learning skills in FLOSS, you risk losing only your time and effort**

- **However, since the barrier to entry is low (HTML!) you can control the degree of your investment – paddle at the shallow end or dive in deeper.**

- **In proprietary environments, the dividing line between user and developer is much sharper – the pool has only a deep end, you have to dive in or stay out altogether.**

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Building *local* ICT competencies

- Be passive users of "black-box" software or active participants in global ICT?
- Being active requires being able to create, locally – and choose with the least barriers the level of creativity
- Skills development requires access to the ability to create – you don't have to be a programmer, but you *should* have the choice.
- Relative local value addition is much higher with free software, as compared to proprietary (where the vendor controls and provides the most value)

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Extremadura: Free software society

- **Poorest region in Spain, one of the poorest in Europe**

- **Agricultural and remote with limited transport infrastructure**

- **1999: EU telecoms liberalisation threatened a digital divide**

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Extremadura: Free software society

- **Decided to "leapfrog" into the information society**
- **Strong political support at the highest level of government**
- **Principle of universal access and universal active participation**

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Extremadura: Free software society

"We could use proprietary software to provide access to all government officials, even all doctors and lawyers, but to provide access to all *citizens* – to *everyone* – we had to use free software"

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40

Extremadura: Free software society

- **Public Internet access points in every village, 2mb connectivity**
- **Public libraries in every village**
- **A computer for every 2 students in every school**
- **Free "digital literacy" training for pensioners, unemployed, housewives**

"Economically possible only with FLOSS"

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Extremadura: Free software society

- **Government-supported gnuLinEx project: Linux distribution adapted to local language *and* culture**
- **Universally adopted by entire public sector**
- **Over 70 000 desktops (running now)**
- **Promoted for private sector too**

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Extremadura: Free software society

- **78000 people trained in "digital literacy" programme – Linux is obviously not hard to learn!**
- **Training is participatory – creation of multimedia "local knowledge" archives, regional Internet radio…**
- **School students using gnuLinEx**
- **Teachers trained to use gnuLinEx**

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Extremadura: Free software society

- **Business incubator provides business plan assistance**

- **Encourages new local startups to provide services and support**

- **Locally developed (private-sector) applications include FacturLinEx, free software invoice/billing system**

Extremadura: Free software society

- **From a backward, poor region to a leader in many key indicators of ICT access – in FOUR YEARS**

- **Won the European Regional Innovation Award (April 2004)**

- **Agreements to share model with Andalucia, Brazil, El Salvador…**

Free software's social potential

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

Free software can make practical:

- **Access** – *for everyone*
- **Participation** – *active, by everyone*

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FLOSS lets developing countries:

- *Rapidly* deploy information technology
- *Affordably* deploy information technology
- *Universally* deploy information technology
- Develop a *local* ICT software and services skills base and foster a *local* ICT software and services economy
- Develop an ICT infrastructure while respecting IPR, limiting "software piracy"

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More information…

The FLOSS project pages & final report

http://flossproject.org

Licence fees & GDP/capita paper:

http://firstmonday.org/issues/issue8_12/ghosh/

European Union Open Source Observatory

http://europa.eu.int/ISPO/ida/oso/

Paper on FLOSS as Official Development Aid,
By Jordi Carrasco Munoz

http://www.i-today.com.vn/itoday/open_source/baocao/

jordi_europeancommunity.ppt

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