

# Why developing countries need to use and create Free Software (and how it promotes Gross National Happiness)

**Department of Information Technology**

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# The FLOSS survey

- **Origin of term “FLOSS” uniting Free Software, Libre Software and Open Source, different names for the same thing; term now in wide use**
- **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)

# 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?

# FLOSS and Happiness

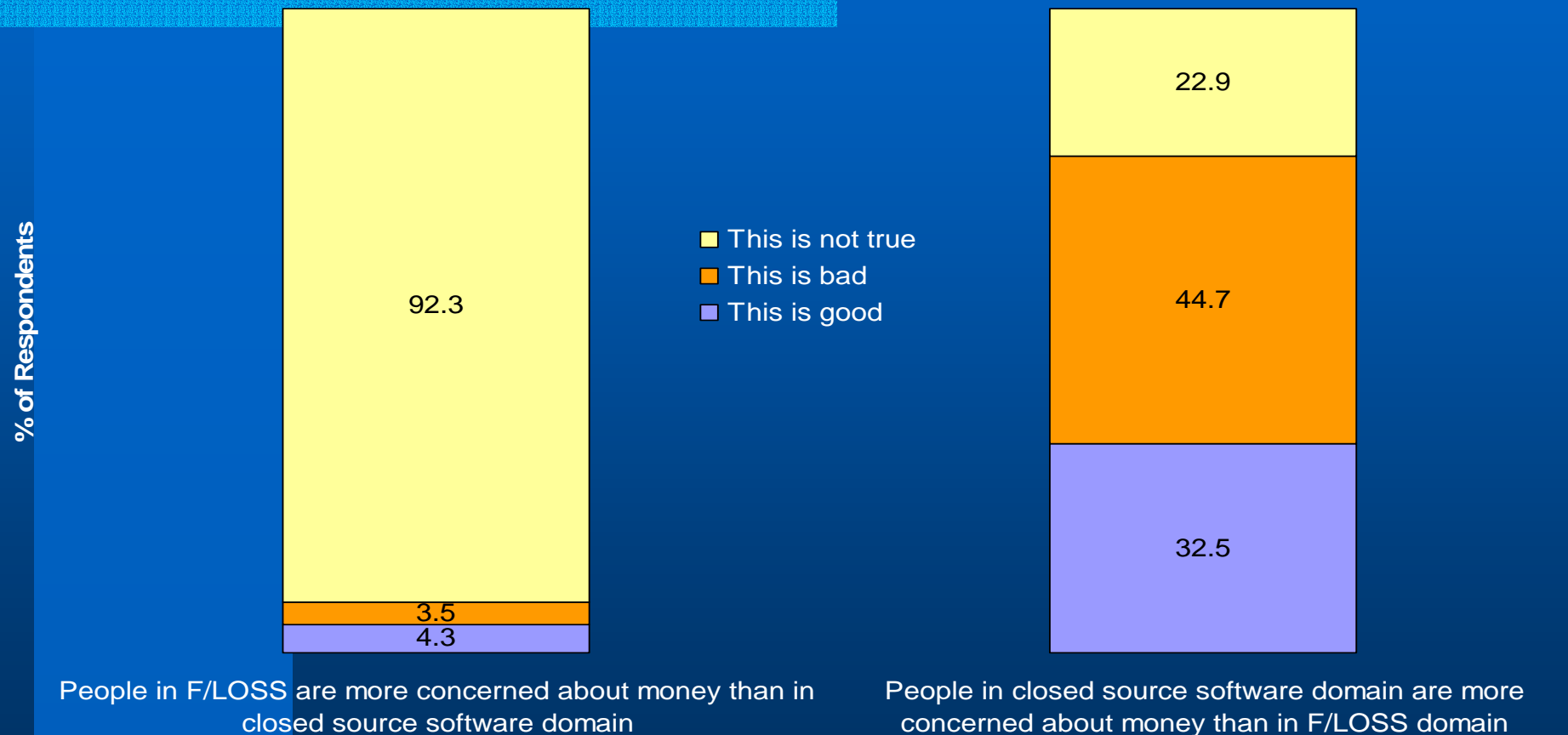
**Not just practical reasons, also ideological:**

- **Freedom and independence – from large software companies or other suppliers**
- **Control of creativity – your own ability to create, with free software, is controlled only by you**
- **Happiness – proprietary software created purely for profit vs. FLOSS created for enjoyment, artistic pride and to learn**

# FLOSS and Happiness

- **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%

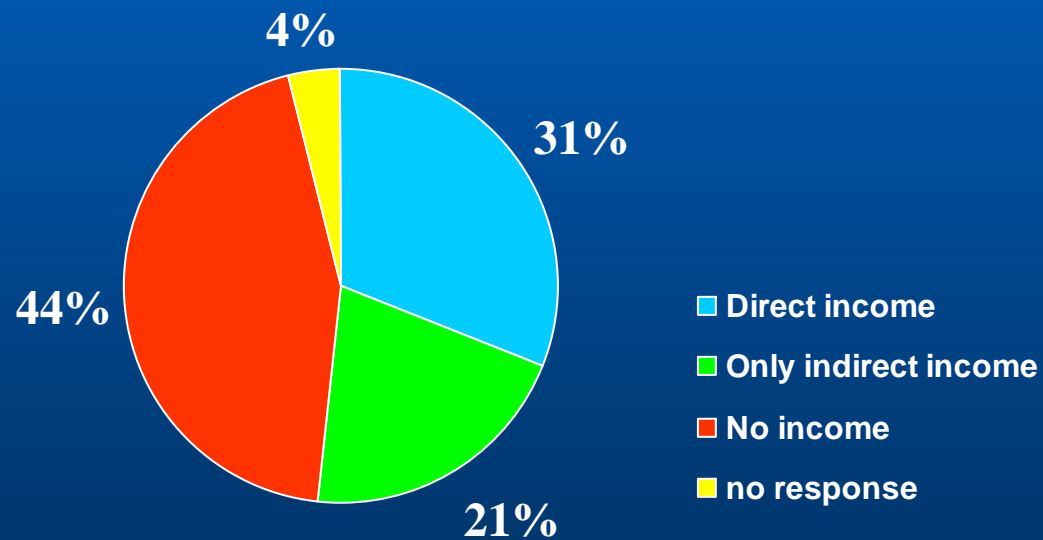
# Money should not be the priority...



# ...but happiness *can* lead to profit!

## Money is not the priority but is not ignored:

Participants' income from FLOSS activity



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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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15-40%

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# The TCO bogeyman?

## Software Total Cost of Ownership:

- |                     |               |  |
|---------------------|---------------|--|
| <b>Labour costs</b> | <b>60-85%</b> | <ul style="list-style-type: none"><li>● Licence fees: 5-10% (proprietary)</li><li>● Associated hardware costs</li><li>● Associated software costs</li><li>● <b>Maintenance</b></li><li>● <b>Integration</b></li><li>● <b>Support</b></li><li>● <b>Training</b></li></ul> |
|                     | <b>15-40%</b> |  |

# The TCO bogeyman!

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- 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 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**

# Licence costs seem low...\*

Licensing Cost of Windows XP + Office (USA):  
**\$560\*\***

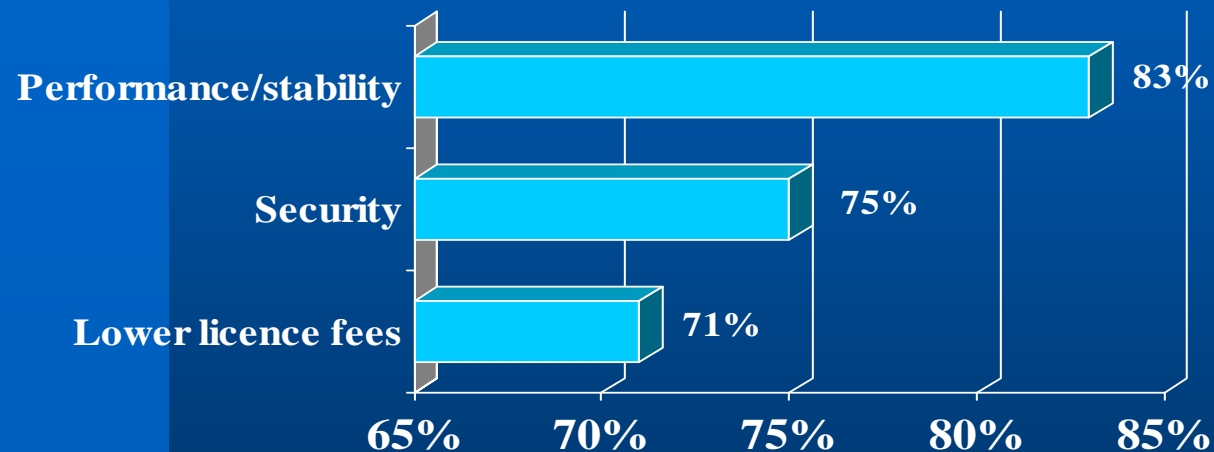
*\*\*Standard Edition, price from Amazon.com,*

*\*The view from the rich world!*

# ...and not the #1 reason for FLOSS

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

## Benefits from using F/OSS



Source: FLOSS survey of user organisations, FLOSS final report, [www.flossproject.org/report/](http://www.flossproject.org/report/)



# But in Bhutan...

Licensing Cost of Windows XP + Office\* in the US:  
**\$560**

**In BHUTAN:**

**GDP/capita (average annual income) \$644**

**Effective cost of Windows XP + Office (per capita)**

**10.4 months' GDP**

(I.e. the cost of a single copy is 10.4 months of average income)

\*Standard Edition

# ...Cost really DOES matter

Licensing Cost of Windows XP + Office in the US

\$560

BHUTAN: GDP/capita \$644

Effective cost of Windows XP + Office (per capita)

10.4 months' GDP

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

**Effective cost in \$ equivalent for a *single copy* of**

**Windows XP + Office in India: \$30 668**

# ...Cost really DOES matter

Country	GDP/cap	PCs ('000s)	Piracy	WinXP Cost:**	
				Effective \$	GDP months
Bhutan	644	5	n.a.	30668	10.4
China	911	24222	92%	21678	7.4
India	462	6031	70%	42725	14.5
Japan	32601	44311	37%	606	0.2
Korea, Rep.	8917	12142	48%	2215	0.8
Malaysia	3699	3000	70%	5341	1.8
Philippines	912	1702	63%	21658	7.4
Saudi Arabia	8711	1343	52%	2268	0.8
Tajikistan	169	n.a.	n.a.	116879	39.8
Thailand	1874	1698	77%	10540	3.6
<b>Asia*</b>	<b>2128</b>	<b>102229</b>	<b>n.a.</b>	<b>9282</b>	<b>3.2</b>
United States	35277	178326	25%	560	0.2

GDP/capita in US\$, WinXP cost in \$ equivalent; \* Asia (continental, including Japan, Korea) average

\*\*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)?

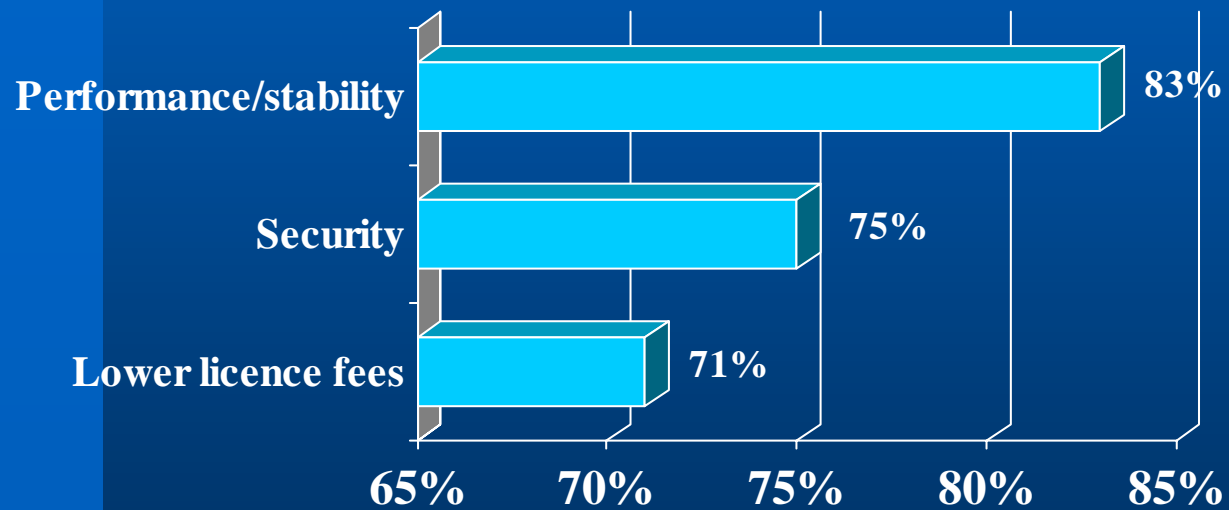
- **Cost – *Total Cost of Ownership!***  
The broad, socio-economic change long promised by ICTs would be limited to a tiny elite without FLOSS. Although other barriers exist (hardware, bandwidth) software licence fees are yet another additional barrier, but can be avoided.
- **Performance, flexibility, localisation**  
Many FLOSS applications provide superior performance & security; adaptation is permitted, e.g. for local languages
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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



# 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](http://translate.org.za), [LinEx](http://LinEx), adapting software to local needs, culture

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# FLOSS develops local skills

**“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

# **FLOSS develops local skills**

**FLOSS is a training environment that enables this ability to create.**

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

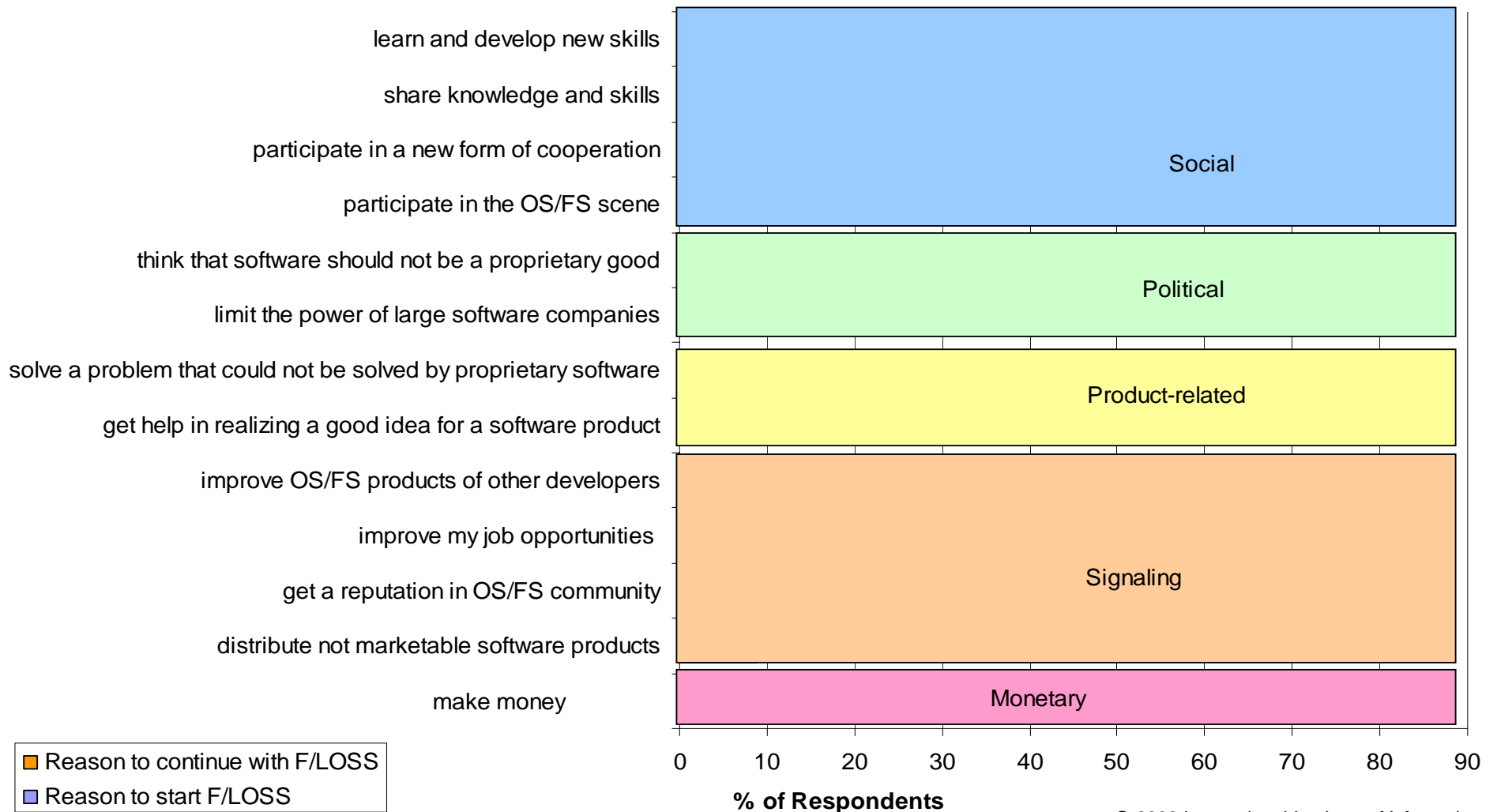
# FLOSS develops local skills

- **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

# 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*

# What motivates FLOSS developers?



# 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)**

# “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)

# **“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**

# “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**

# 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

# 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.

# 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.

# Building ICT competencies

- Be passive users of “black-box” software or active participants in global ICT?
- Being active requires being able to create – and choose with the least barriers the level of creativity
- Developing countries need to avoid being locked out of skills and competencies
- Skills development requires access to the ability to create – you don’t have to be a programmer, but you *should* have the choice.



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# FLOSS is the best way for developing countries to:

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

# FLOSS is appropriate for *Bhutan*

- The FLOSS development process is based not on money but on the happiness of individual developers
- This results from various motives: aesthetics of programming, learning skills
- This results in software that is often better practically as well as ideologically
- FLOSS is best designed to create a *local* ICT skills base in line with the principles of furthering Gross National Happiness

# More information...

The FLOSS project pages & final report

<http://flossproject.org>

Licence fees & GDP/capita paper:

[http://firstmonday.org/issues/issue8\\_12/ghosh/](http://firstmonday.org/issues/issue8_12/ghosh/)

Paper on FLOSS as Official Development Aid,

By Jordi Carrasco Munoz

[http://www.i-today.com.vn/itoday/open\\_source/baocao/](http://www.i-today.com.vn/itoday/open_source/baocao/)

[jordi\\_europeancommunity.ppt](#)