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Layout Design: François Louis Nicolet

Composition: Jorge Llácer-Gil de Ramales

Editorial correspondence: Llorenç Pagés-Casas <[pages@ati.es](mailto:pages@ati.es)>

Advertising correspondence: <[novatica@ati.es](mailto:novatica@ati.es)>

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### "20 years of CEPIS: Informatics in Europe today and tomorrow"

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### Monograph: Libre Software for Enterprises (published jointly with Novática\*)

Guest Editors: *Jesús-M. González-Barahona, Teófilo Romera-Otero, and Björn Lundell*

- 2 Presentation. Libre Software for Enterprises: Create your Product, Feed your Community, Eat your Cake! — *Jesús-M. González-Barahona, Teófilo Romera-Otero, and Björn Lundell*
- 5 Libre Software and the Corporate World — *Jesús-M. González-Barahona, Teófilo Romera-Otero, and Björn Lundell*
- 11 Best Practices for FLOSS Adoption — *Carlo Daffara*
- 17 Build and Sustain a Community of Practice: Method Applied to FLOSS Projects — *Stéphane Ribas and Michel Cezon*
- 22 Community Management in Open Source Projects — *Martin Michlmayr*
- 27 The Morfeo Project: an Open Source Approach towards Open Innovation — *Cristina Breña and Andrés-Leonardo Martínez*
- 32 Applying Open Source Software Principles in Product Lines — *Frank van der Linden*
- 41 Addressing Industry Needs in OSS — *Jan-Henrik Ziesing*
- 44 SpagoWorld, the Open Source Initiative by Engineering — *Gabriele Ruffatti*
- 51 An Opportunity for Libre Software Companies: Emerging Market in Developing Countries — *Susana Muñoz-Hernández and Jesús Martínez-Mateo*

### UPENET (UPGRADE European NETWORK)

- 54 From **Novática** (ATI, Spain)  
Mobile Technologies  
A Case Study of the Global System of Mobile Communication (GSM) in Nigeria — *Adeyinka Tella, 'Niran Adetoro, and Paul Adesola Adekunle*

### CEPIS NEWS

- 60 Promoting Skills Development in Challenging Times — *ECDL Foundation*
- 62 Selected CEPIS News — *Fiona Fanning*

\* This monograph will be also published in Spanish (full version printed; summary, abstracts, and some articles online) by **Novática**, journal of the Spanish CEPIS society ATI (*Asociación de Técnicos de Informática*) at <<http://www.ati.es/novatica/>>.

# An Opportunity for Libre Software Companies: Emerging Market in Developing Countries

Susana Muñoz-Hernández and Jesús Martínez-Mateo

*In recent years many aspects of the software business have changed. Software companies have gone from producing software applications and selling their proprietary code to providing open source applications and focusing their business on offering services related to the adaptation, installation, and maintenance of that software, together with related training. Libre software companies use a business model which provides new opportunities in markets where proprietary software is not viable. In this article we describe an interesting business opportunity which is emerging for libre software companies: the software needs of developing countries. These countries are becoming an emerging market for development software, a market which is particularly interesting because, bearing in mind their special needs and constraints, they are a perfect scenario for the libre software approach. Finally, we will also discuss the influence of a number of catalysts which are really having an effect on this target market.*

**Keywords:** Business Opportunities, Developing Countries, Emerging Markets, Libre Software.

## 1 Libre Software in Western Markets

### 1.1 Why Fight the Market?

It is a well known fact that free and open source software<sup>1</sup> will have a hard fight against proprietary software to make a space for itself in the western market. Some, perhaps all, of the problems facing it are specific to this market, one in which the traditional software business is well entrenched. However, there is a scenario in which this tribal culture can be avoided; in developing countries many of these problems simply do not exist. Generally speaking the development and roll-out of software in developing countries has a short tradition. This is a considerable advantage for the introduction and expansion of libre software into markets with more modern ideas regarding software [1].

### 1.2 The Ripeness of the Market

There have been a number of cases of new technologies that have found it easier to break into emerging markets than into well-established ones. For example, towards the end of the 19<sup>th</sup> Century it was easier to enter the electric locomotive market in places where the use of steam locomotives was not yet commonplace. A similar case today would be the use of mobile telecommunications in remote areas of developing countries without there having first been any previous landline infrastructure. In these countries, in the case of the industrial revolution, hardware, and communications among others, they have skipped a technological generation; so why not in the case of software too? Although

## Authors

**Susana Muñoz-Hernández** is a Doctor in Computer Science from the Polytechnic University of Madrid (Spain), with a Master in Information Technologies (IT) Management from the Ramón Llull University in Barcelona (Spain) and a degree in International Relations from the International Studies Society in Madrid. In 2003 she was awarded first prize in the national competition for young talent given by the La Salle University in Madrid. After several years of professional experience working in private companies, in 1998 she began to work as an assistant professor in the School of Informatics of the Polytechnic University of Madrid where she carried out her research activity within the BABEL research group. She is responsible for dissemination and communication for INES, the Spanish national platform for software and services. She set up the cooperation group Technology for Development and Cooperation (TEDECO) in 2006 and since then has acted as its director. Through TEDECO she leads the Morfeo-CODE initiative for the application of libre software to development cooperation in the Morfeo community. <susana@fi.upm.es>.

**Jesús Martínez-Mateo** is a doctoral student of Computer Science at the Polytechnic University of Madrid. He holds a Master in Computational Mathematics from the same university. He carries out his research activity in the computing laboratory of the Numerical Analysis department as part of the Quantum Information and Computation research group. He contributes to a number of projects, including the Cenit Segur@ project funded by the Spanish Ministry of Trade and Industry for the study and design of a Metropolitan Key Quantum Distribution Network. He divides his time between his research work and the development of libre software (e.g. Lan Core) and he also participates in the TEDECO group, in which he is an active member, and has taken part in two field missions in Burundi. <jmartinez@fi.upm.es>.

perhaps a better question would be: can libre software be the technology of the future in software development? The answer is probably yes, in which case history may repeat itself in the sense that proprietary software may be skipped in favour of libre software in developing countries. Under this scenario developing countries may become a serious

<sup>1</sup> In this article we decided to use the term *libre software* in accordance with the definition provided by the Free Software Foundation (FSF) rather than any of the other common, and certainly more popular, terms such as Free and Open Source Software (FOSS), or Open Source Software (OSS).

candidate for the adoption of a national strategy at a governmental level with regard to libre software, without having first passed through the proprietary software phase. On the basis of this premise, some libre software communities [2] are currently realizing that there are growth and business opportunities for them in these countries.

### 1.3 Tradition or PCI (Progress, Change and Innovation)?

The biggest problem regarding the use of libre software in major companies is that most of their applications have been developed using proprietary software. Tradition is a powerful disadvantage because software migrations may involve short-term investments, and companies are seldom convinced of the medium- and short-term advantages of migrating to libre software, or other products. However, in developing countries some institutions, organizations and companies are just starting to use software applications [3]. In these cases, and for obvious reasons given that we are talking about developing countries, the budget for the purchase of software is considerably smaller than in developed countries, and therefore the acquisition of libre software is not an option but rather a necessity. Buying libre software is much more economical than buying conventional proprietary applications, which turns the traditional disadvantages into opportunities in the software markets of developing countries.

### 1.4 Fair Trade

*Fair trade* is an organized social movement and market approach that aims to help producers in developing countries while promoting sustainability. Fair trade is not only prestigious from a moral standpoint but it is also profitable. In 2007, fair trade labelled goods recorded sales amounting to around 2.3 billion euros worldwide (USD 3.62 billion), a year-on-year increase of 47% .

There has been a debate in a specialized forum on the similarities between libre software and fair trade [4]. This debate was sparked by a presentation by Matthew Edmonson of the *Open IT Up* project which he gave in the United Kingdom at a conference for circuit riders. In fact there are quite a number of similarities, bearing in mind that both involve choice and a concern for people. James Davis says that as libre software users we expect to be granted the freedom of doing whatever we want with our software, provided that it does not prevent others doing whatever they want with our modified software.

While we are not entirely in agreement with this statement (since we see a number of substantial differences between libre software and fair trade [5]), being compared in a public debate with such a prestigious enterprise as fair trade is a very positive point in favour of libre software.

## 2 Libre Software Catalysts in Developing Countries

### 2.1 ICT in Developing Countries

Far from the old concept of cooperation, which was much more akin to charity, in the last five years cooperation projects have been oriented towards the development of receiving countries. As well as the traditional fields of

cooperation (public health, education, and the supply of food, among others) there are new areas in which cooperation is playing a decisive role and of these Information and Communication Technologies (ICT) related areas are probably the most important. In fact cooperation in ICT is directly applicable to all the other fields of traditional cooperation.

### 2.2 Libre Software for Institutional Strengthening

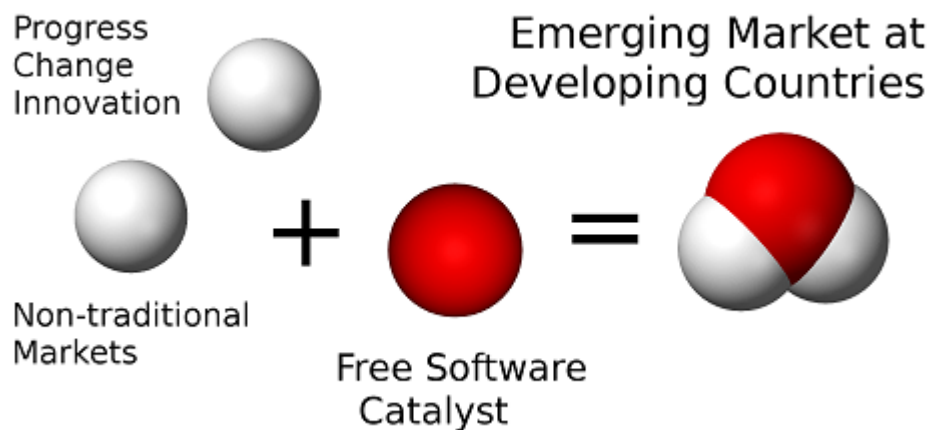
Most cooperation projects that include software development have taken the libre software route. This is very interesting if we bear in mind that this software is destined to form part of many key institutions (Administration or Education among others) of developing countries [6]. E-government is being especially promoted and many governments of developing countries are committing to libre software on the advice of independent external consultants and Non-Governmental Organizations (NGO) [7][8]. There can be no doubt as to the influence that this will have on software development in other sectors of these countries.

### 2.3 Next Generation of Top-Notch Programmers

In the absence of any other option, current trends in libre and proprietary software in developing countries come from abroad. However, in the near future the first generations of IT engineers are expected to be responsible for software development, and more especially its maintenance and use. This is another point in favour of libre software. Educational efforts are focused on the field of e-learning and the development of higher education. The influence of libre software on the education of future generations of programmers and professionals in developing countries is being backed up by the work of NGOs and the cooperation of western universities [9].

## 3 Developing Countries: Emerging Libre Software Markets

Libre software is a well-established option for the development of professional software which is highly recommended for developing countries. In recent years there have been studies and efforts from these countries which demonstrate a full commitment to open source software and libre software models [10]. Some fifteen African countries have already published recommendations for the adoption of libre software rather than proprietary software solutions (e.g. Angola, Benin, Kenya, Senegal, South Africa, Tanzania, Uganda, and Zambia). Libre software may be applied to many areas but it is important for three in particular: education, mainly focused on digital libraries [11], software developers, and ICT support for general education; Public Administrations, with a special interest in rolling out e-government; and health, not only providing software to health institutions but also for furthering the growth of e-health and its use in remote areas [12]. As well as these areas in which libre software has already started to be introduced, the private sector is keen to develop reliable and secure support software, and its decisions regarding the choice of software to be used greatly depends on the criteria of public administrations and the public sector in general.



**Figure 1:** Free/Libre Software Catalyst Process in Developing Countries.

Bearing in mind the special characteristics of developing countries, their lack of any reluctance to use libre software, the catalyst effect of cooperation, and the foreseeable growth of the software industry in these countries, we can conclude that the emerging software market in developing countries represents a clear business opportunity for libre software companies.

#### References

- [1] J. Lerner, J. Tirole. "The Simple Economics of Open Source". National Bureau of Economic Research, Inc., NBER Working Papers, No. 7600, 2000. <<http://ideas.repec.org/s/nbr/nberwo.html>>.
- [2] Morfeo-CODE. "Initiative for the use of libre software in development cooperation". <<http://tedeco.morfeo-project.org/>>.
- [3] G. Camara, F. Fonseca. "Information Policies and Open Source Software in Developing Countries". Journal of the American Society for Information Science and Technology, 2007.
- [4] D. Wilcox. "Is Open Source Software Fair Trade for Nonprofits? Designing for Civil Society". <[http://partnerships.typepad.com/civic/2007/02/is\\_open\\_source\\_.html](http://partnerships.typepad.com/civic/2007/02/is_open_source_.html)>.
- [5] J. Davis. "How Free Software is not Fair Trade for non-profits. Free Web hosting for UK charities and non-profit organizations". <<http://www.freecharity.org.uk/2007/02/08/how-free-software-is-not-fair-trade-for-non-profits/>>.
- [6] S. Weber. "Open Source Software in Developing Economies". Social Science Research Council, USA. <[http://www.ssrc.org/programs/itic/publications/ITST\\_materials/webernote2.pdf](http://www.ssrc.org/programs/itic/publications/ITST_materials/webernote2.pdf)>.
- [7] United Nations Economic y Social Commission for Asia and the Pacific (ESCAP). "ICT Policy database". <<http://www.unescap.org/icstd/policy/db/>>.
- [8] United Nations Development Programme (UNDP) and International Development Research Centre (IDRC) of Canada. "International Open Source Network (IOSN) – Software Freedom For All". <<http://www.iosn.net/>>.
- [9] TEDECO: Tecnología para el Desarrollo y la Cooperación. <<http://tedeco.fi.upm.es/en>>.
- [10] CIPESA. "Free/Open Source Software (FOSS) policy in Africa: A toolkit for policy-makers and practitioners". <<http://www.cipesa.org/files/FOSSPolicyToolkit.pdf>>.
- [11] I. Witten, M. Loots, M. Trujillo, D. Bainbridge. "The Promise of Digital Libraries in Developing Countries". Communications of the ACM, 44 (5), pp. 82-85, 2001.
- [12] Hispano-American Health Link (EHAS). <[http://www.ehas.org/index.php?page=fundacion-ehas&hl=en\\_US](http://www.ehas.org/index.php?page=fundacion-ehas&hl=en_US)>.