



# **Commentary on “Tools and technologies for equitable access”**

by Alberto Escudero-Pascual

Steve Song, June 2008<sup>1</sup>

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<sup>1</sup> This is a commentary on the issue paper *Tools and technologies for equitable access*, by Alberto Escudero-Pascual. It is part of a series on equitable access to ICT infrastructure commissioned by APC for an event on equitable access which took place in Rio de Janeiro in November 2007. The papers and commentaries can be found at: [www.apc.org/en/pubs/research](http://www.apc.org/en/pubs/research)

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Alberto Escudero-Pascal has written an excellent paper on tools and technologies for equitable access. He touches on all of what I consider to be the key issues. I take the liberty in this commentary to expand or add nuance to some of the issues that he has raised. In particular, I will briefly discuss the benefits and challenges of WiFi and WiMax, what I call the "OLPC effect", and the potential of unlicensed spectrum.

## WiFi

Escudero-Pascal correctly attributes the success of WiFi to:

- *Low cost due to mass production*
- *Easy integration with personal computers and operating systems*
- *Certified interoperability standards*
- *Existence of ISM2 or unlicensed wavelengths that allow the end-user to innovate solutions.*

However, related to mass production and low costs, I think that a nuance could be added to the above, and that is the fact that WiFi is embedded in everything, from laptops to personal digital assistants (PDAs) to phones. It is this ubiquity that makes WiFi a serious contender. Using another standard such as WiMax means adding that technology to whatever device you happen to be using. Because WiFi is everywhere, it dramatically lowers the barrier to use.

Another factor related to WiFi's success has been the development of an open source community around WiFi access points. Beginning with the Linksys WRT54G router, open source developers have been replacing the operating systems of WiFi access points with open source software, which offers tremendous opportunity for customising the delivery of WiFi services, allowing alternative business models to emerge. This customisation has led to the deployment of wireless-captive portals with customised access linked to revenue models, as well as the introduction of mesh protocols, allowing WiFi access points to be connected in a seamless web of connectivity. The combination of effectively open hardware and unlicensed bandwidth in which to experiment has unleashed a wave of creativity in the development and deployment of WiFi access networks and solutions.

## WiMax

While it is technically feasible to use WiMax in the unlicensed spectrum, it has been designed for use in licensed spectrum. Combined with the fact that WiMax equipment is still comparatively expensive, this means that rolling out WiMax infrastructure is probably limited to large telecom infrastructure providers.

To understand WiMax, however, it is important to recognise that it is generally proposed in one of three roles: as backhaul, as municipal broadband, and as mobile infrastructure.

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2 Industrial, scientific and medical band.

**Backhaul:** There is little question that WiMax is a useful and efficient backhaul technology. Whether it turns out to be much less inexpensive than competing options is another question.

**Municipal broadband:** It may well turn out to be a successful municipal infrastructure technology but there are no examples of successful, large-scale, municipal WiMax networks that one can look to as an example.

**Mobile infrastructure:** The approval of mobile WiMax as an International Telecommunication Union (ITU) standard raised the hopes that it might be a serious contender among the many competing technologies for third generation (3G) and fourth generation (4G) networks. However, the very fact that there are so many competing options makes this a very uncertain place to make predictions.

## **Unintended consequences**

It is important to recognise in the implementation of communication technologies that the most useful function of the network may not be what you predict. From the unexpected growth of short message service (SMS) and its adaptation into a political tool in countries like the Philippines, to the innovative uses of telecommunications such as “beeping”, credit transfers, and, increasingly, m-banking (mobile banking): none of these innovations were predicted by the original network implementers. Therefore it is important not to over-design solutions. It is more important to make communication technology as inexpensive and simple to use as possible, then allow users to innovate their own solutions.

## **The OLPC effect**

One Laptop per Child (OLPC) is mentioned in the paper as an initiative which has attracted a quantity of criticism for being, among other things, “centralised and top-down”. I think it is worth pointing out that even if the OLPC is a completely wrong-headed initiative, it has had the very important effect of attracting computer manufacturers into the low-cost laptop market. Since the announcement of the OLPC, there have been at least a dozen new low-cost laptops announced in the market, and some such as the Asus Eee PC seem to be selling in quantities which indicate that the low-cost laptop has come to stay. This is good news for developing countries.

Equally, the Eastern Africa Submarine Cable System (EASSy) cable project, which has sparked so much controversy around ownership and access models, seems to have unleashed a flurry of undersea cable initiatives. And while the EASSy project has ended up with as complicated an ownership framework as it is possible to imagine, arguably it has been a spur for other cable initiatives, such as SEACOM, to choose a transparent, open access ownership model.

The lesson: sometimes doing the wrong thing with technology is better than doing nothing. Sometimes.

## **In defence of the affordable proprietary solution**

While I agree broadly with Escudero-Pascal’s sentiments in his section on open standards, hardware and

software, I am tempted to rephrase the discussion about the need for openness to one about ensuring affordability. There is no question that open standards are important. Open standards ensure interoperability and prevent vendors from forcing you to purchase equipment that is only compatible with their equipment. At the bottom of that, though, is really the question of affordability. Open standards eliminate single-vendor lock-in or the need for parallel systems, both of which are recipes for paying more than you should for technology. In large part, open standards are about keeping technology affordable.

The argument is often made that open source also makes technology, and in particular software, more affordable; and indeed it can be a mechanism for controlling costs by ensuring that software vendors cannot extract value from their software over and over again. However, open source may not always be the most affordable choice. Skype, for example, is proprietary but is free to use for PC-to-PC calls. This technology has proven incredibly useful to millions of users. Skype does not lock the user into a particular framework. It runs on all popular platforms. This is pretty hard to argue against.

Having said that, there are some very compelling reasons to choose open source software and hardware that do relate to affordability, but not in a straightforward way. One of the biggest reasons is to be able to leverage the collective efforts of others. If you have a large or potentially large group of stakeholders, there is a significant potential for leveraging their interest/expertise/resources to develop collectively that which would be too expensive to produce individually. Flexibility to adapt and innovate is another reason. Many applications and technologies are not designed for developing countries. The opportunity to adapt and innovate solutions appropriate to developing countries is far more possible with open source solutions.

So, in general, open source offers tremendous benefits for developing countries: But if someone comes up with a USD 5 voice over internet protocol (VoIP) phone that is completely closed yet open standards compliant, I would not hesitate to place an order in quantity.

For governments and civil society organisations, the way I would translate this into policy is to *insist* on open standards, but to let hardware and software be chosen on its own merits. I think legislating the use of open source in government is a bad thing. It is a bit like forcing a child to eat spinach. They will always find a way of avoiding it. However, helping children understand how spinach will help them grow up to be like their favourite sports hero might have them eating of their own free will. Similarly, helping government departments understand the benefits of open source in terms of cost, adaptability, future-proofing, and vendor lock-in is likely to create more positive results.

## **On spectrum**

I completely agree with Escudero-Pascal's comments about freeing up spectrum to support universal service efforts. I think that unlicensed spectrum offers tremendous potential, as it allows organisations of all sizes to innovate their own solutions. In this context it is worth taking a look at the lobby in the United States to gain access to airwaves freed up by the upcoming conversion from analogue to digital

television. The so-called White Spaces Coalition and the Wireless Innovation Alliance have brought together some of the largest companies in the software world to lobby for access to this spectrum in order to improve access in underserved areas. It is important for this sort of debate to find its way to developing countries.

## **Conclusion**

We live in a time when technology is increasing in power by orders of magnitude every few years, while, amazingly, costs continue to come down. This means that technology, once the purview of large corporations or the state, can be put in the hands of small organisations or even individuals. Given the opportunity, this has the potential to be a profound lever for social and economic growth.