



### Inside

- 1 The big picture
- 2 What are we talking about?
- 3 Why are we talking about this?
- 4 Conclusion: What can I do?
- 5 Additional Reading

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### Summary

*An ICT ecosystem is the entire technology environment. It is not just hardware and software. It encompasses the policies, processes, procurement, data, laws, applications, partnerships, standards and stakeholders that together make up a technology environment for a country, a government or an organization. People - those who create, buy, sell, regulate, manage and use technology - are the most important part of any ICT ecosystem.*

*An open ICT ecosystem brings increased choices, collaboration, innovation and economic opportunities. It impacts access to public information, government procurement, industrial development (especially for small- and medium-sized enterprises), privacy, security, investment policy, intellectual property and economic growth.*

*Five **principles** define open ICT ecosystems and guide their evolution. Open ICT ecosystems are: interoperable, user-centric, collaborative, sustainable and flexible. To activate these principles, there are three **building blocks** of an open ICT ecosystem: open standards, open source and service-orientation.*

*This APDIP e-Note explains the value of open ICT ecosystems and elaborates on their principles and building blocks in simple terms.*

### The big picture

When people hear the word "technology" they may think: Everyone talks about it, but does technology really have anything to do with social development and economic growth? Answer: it has everything to do with development and our daily lives. One year ago, the world saw just how true that was.

26 December 2004. 7:56 AM. A wall of water – a tsunami – slams into the famed resort islands off Thailand's coast. In one tragic moment, thousands of lives are lost, and thousands more are missing. Homes are destroyed; businesses ruined.

As agencies and non-governmental organizations desperately mobilize in a race against time, emergency relief slows. Aid groups are unable to share information vital to the rescue effort – who was found, who was hospitalized, what supplies were delivered. Each uses different data and document formats to record this critical information. The need for common, open standards for disaster management was never more compelling or painful.

The Royal Thai Government responded by creating a common website for registering missing persons and making open file formats, in particular, an immediate national priority.

It is time for people - especially policy makers and civil society leaders - to stop seeing technology as something only for techies. Technology is not about bits and bytes, or computers and code. It is about innovation, knowledge, economic opportunities and public services. It is about transforming our governments, our economy and our communities. In rare moments, it is about saving lives.

This needs to be understood, especially now, as globalization, cheap technology and the Internet spread.

Living in a globalized world is challenging, and sometimes overwhelming. Everything moves faster. It is hard to manage the amount of information before us. People everywhere expect and need real-time information and faster, cheaper, better services. Governments and companies (indeed, all of us!) must adapt, and quickly.

There is some good news. The fusion of globalization and technology offers new ways to meet the demands of our high-speed, 24/7 world. A potent combination of connectivity, access, collaboration and transparency - or openness - is emerging as a catalyst for transformation. And we can all use it.

This is the big picture.

To understand the big picture, we need to discuss “open technologies” and why they matter.

Much of what follows is drawn from the ***Roadmap for Open ICT Ecosystems***, a project of Harvard’s Berkman Center for Internet & Society, developed jointly by members of the Open ePolicy Group. The Group included leaders from 15 countries - including tech heavyweights like Brazil, China, India and the U.S. along with industry and institutions such as the European Commission, and development organizations such as the United Nations Development Programme.

## What are we talking about?

The first thing to understand is that we are all stakeholders in our technology environment, or the “ICT ecosystem” as it is called in the *Roadmap*.

And what is an ICT ecosystem? In simple terms, it is the entire technology environment. An ICT ecosystem is not just hardware and software. It encompasses the policies, processes, procurement, data, laws, applications, partnerships, standards and stakeholders that together make up a technology environment for a country, a government or an organization. People - those who create, buy, sell, regulate, manage and use technology - are the most important part of any ICT ecosystem.

A word about open. The word causes much confusion and outright conflict, in part because everyone wants to be open. “Closed” sounds bad. The problem is that the meaning of “open” depends on the specific context. Open for standards differs from open for software. Open standards and open source are different - standards are like technical design blueprints, while open source is a development approach (and licensing model) for software.

So, what are **open** ICT ecosystems? First of all, the types of systems or software installed do not define them. As described in the *Roadmap*, five principles define open ICT ecosystems and guide their evolution. Open ICT ecosystems are: interoperable, user-centric, collaborative, sustainable and flexible.

An open ICT ecosystem is more capable of incorporating and sustaining interoperability,

collaborative development and transparency (on policy, process and technology levels). Increasing these capacities - call it “openizing” an ICT ecosystem - is the key.

An open ICT ecosystem does not mean, “all open, all the time.” In terms of technology, open ICT ecosystems are heterogeneous – combining open and closed, proprietary and non-proprietary technologies. This will not be a transitional phase, but a permanent situation.

To activate these principles, the *Roadmap* focuses on three building blocks of an open ICT ecosystem: open standards, open source and service-orientation.

If hardware and software are ICT ecosystem’s bricks, open standards are its mortar, holding together diverse systems and services. They enable interoperability, assure future access to information and lower costs. Open standards ensure that the next purchase is not dictated by the last purchase. They help break lock-in. *The Roadmap* recommends that all governments treat open standards as the norm, and make them policy priorities.

Opening an ICT ecosystem is impossible without addressing software, the second pillar of an open ICT ecosystem. Open source does not define an open ICT ecosystem, but it can have a transformative impact. In recent years, open source has been the most powerful change agent of ICT ecosystems, forcing the re-examination of policies, purchasing practices and business models.

While software developers stress the access to code that open source offers, the most vital aspect of the open source model is its collaborative nature. Demonstrating the power (and networking effect) of collaboration may be open source’s most enduring contribution to society. It has the potential to change not only how technology is created and used, but also more broadly how a knowledge society connects and competes.

The third foundation of an open ICT ecosystem - and the most technical - is its service orientation. In simple terms, this is about focusing less on the technology and more on the business processes that drive delivery of services. A service orientation focuses on people’s needs and how to meet them. Open standards are the backbone of a service-based approach, adding the flexibility needed by managers, suppliers and users to respond to new business requirements without always having to replace systems and applications.

## Why are we talking about this?

The *Roadmap*’s perspective is straightforward. Open ICT ecosystems bring increased choices, collaboration, innovation and economic opportunities.

These issues cannot simply be left to the Chief Information Officer or the IT Department. Decision makers in governments, industry and civil society need to pay attention. Opening an ICT ecosystem raises serious issues that touch not only technology. It impacts

access to public information, government procurement, industrial development (especially for small- and medium-sized enterprises), privacy, security, investment policy, intellectual property and economic growth.

High-level debate and consideration are essential. The public needs to know what is going on so back-door deals are eliminated and public money is spent wisely.

Openness in an ICT ecosystem enables choice, access and control, delivering tangible benefits to both users and providers of technology.

Policies that mandate choice strengthen a buyer's bargaining position and the ability to balance cost, needs and performance. More choices mean lower costs and a longer life for the technology you purchase.

Access to information, specifications and code drives collaborative innovation, lowers market barriers and allows new players to shape technology development. New types of collaboration between government, communities and companies become possible. Openness creates new avenues of innovation.

Finally, open ICT ecosystems shift control over ICT decisions from vendors to buyers (whether it is consumers, government or other organizations). Buyers decide what functionality they want and when upgrades are needed. No longer is future access to data controlled by a company. Users (all of us) no longer need to rely on technology owned by a company in order to access, use and share the data and documents that we create.

Another word for all this is empowerment. Open technologies empower people by giving them greater access to technology, information, decision-making and the collaborative efforts that drive innovation.

These are not merely theoretical benefits. They can propel more effective delivery of public services, expand public access to policy-making and create opportunities for entrepreneurs to build new businesses.

## Conclusion: What can I do?

The short answer is: push for change - change in how government buys and uses technology and change in how ICT policies are made. We do not have to wait for another disaster to see the importance of open technologies.

Opening an ICT ecosystem means changing people's behaviour and procurement drives behaviour. A few procurement rules will help drive real change:

- Mandate interoperability in procurement decisions, with a preference for open standards where they are applicable, mature and widely used.
- Require technology and brand neutrality in procurement specifications to prevent lock-in to a single vendor, data format or technology.

- Link final payments to an auditor's confirmation that a system or solution comply with policies on open standards and related procurement terms. This will ensure that suppliers deliver the openness promised.

Secondly, see technology in a different way. See the big picture. Make sure government leaders understand the stakes involved and the benefits of more open ICT ecosystems.

The *Roadmap* focuses on introducing openness system-wide to ICT ecosystems. The potential impact of its principles and policies, however, extends across a government, an organization or an economy, touching countless sectors from transportation and energy to healthcare and disaster management.

In every country, agencies must become more efficient; economies and industry must be more innovative and competitive. Evolving more open ICT ecosystems is a decisive, even necessary, step. It is vital to building and sustaining an innovative, knowledge society.

~ Jeffrey A. Kaplan, Founder and Director, Open ePolicy Group

## Additional Reading

*Roadmap for Open ICT Ecosystem*, 2005, Berkman Center for Internet & Society at Harvard Law School.  
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Louis-Dominique Ouédraogo, 2005, *Policies of United Nations System Organizations Towards the Use of Open Source Software (OSS) for Development*, Geneva: Joint Inspection Unit, United Nations  
[http://www.unsystem.org/JIU/data/reports/2005/en2005\\_3.pdf](http://www.unsystem.org/JIU/data/reports/2005/en2005_3.pdf)

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International Open Source Network  
<http://www.iosn.net>

Open Regional Dialogue on Internet Governance  
<http://igov.apdip.net>

Open Document Format Alliance  
<http://www.odfalliance.org/>

Malaysia Public Sector's Open Source Competency Centre  
<http://opensource.mampu.gov.my/>

Campaign for Open Standards in Thailand  
<http://open.giti.nectec.or.th>

OECD – Policy Brief on “Open Government”  
[http://www.oecd.org/LongAbstract/0,2546,en\\_2649\\_34489\\_34455307\\_119696\\_1\\_1\\_1,00.htm](http://www.oecd.org/LongAbstract/0,2546,en_2649_34489_34455307_119696_1_1_1,00.htm)