

Digital Dystopia

Jari Arkko's speaking points on the "Digital Dystopia" panel at the Aalto Media Lab 20 year anniversary seminar, September 25, 2014, Helsinki

Panelists: *Ville Oksanen, Jari Arkko, Rasmus Vuori, Kari-Hans Kommonen*

Panel background from Kari-Hans Kommonen: *Digital technology has made our lives easier, our work more efficient, and connects everyone on the planet to each other. But recently we have also learned much more about the dark side of the digital world – it is misused in many ways against us and mocking basic freedoms and protections that we used to consider important for a free society. What went wrong? Are we heading towards a dystopia, how far are we on that track, and is it still possible to change the course?*

What is your angle on this topic?

My background is in networking. My day job is with Ericsson Research. I am also the current chair of the Internet Engineering Task Force (IETF). Our organization is tasked to make basic Internet technology work better.

I am approaching this topic as an engineer. What can we do? I also care a lot about the benefits of the Internet for people, privacy, and ability of people to communicate freely.

Should we be worried? Are we headed to a digital dystopia?

Yes in the sense that our lives are increasingly online, and it is difficult to keep information safe. When I was a kid I could talk to my friends and we said many silly things. Fortunately no one heard us and no one no longer has a record of it. My kids today are communicating with their friends over the Internet, and at least some of it is leaving permanent records. It is difficult guarantee that information isn't later misused, accidentally or intentionally.

As you know, what we do online is often used commercially. And the devices that you own may not be entirely in your control. Do you know what your tablet does, internally? The Internet of things that will put even more of our lives in the network: your heartbeat, GPS track, and habits. And the status of your lightbulbs, or what your toaster is doing. We are also putting everything in the cloud, and no longer storing information in our own systems. The global Internet operates on the winner takes it all market dynamics that create large, attractive targets for mining information.

And we've seen examples of local and foreign information collection, or even global co-operation in retrieving information. Everyone knew that some of these activities were going on, but the scale and breadth took us by surprise. And it seems that the Snowden revelations have created what I call the NSA-Envy effect. Those who were

not collecting information are now trying to do it as well. Just witness the discussions we have had in Finland.

Laws and politics are lagging behind technology. The Internet is new, and we keep applying laws from the telephone network era to it.

And I am not saying these things to get everyone depressed. It is just that we have to take privacy seriously. There are things we can do, technically, through consumer choice, and legally or politically. In the words of John Connor from Terminator, the future is not set. There is no fate but what we make for ourselves.

What can we do?

There are means to mitigate some of the effects.

Lets talk about technology. For instance, many service providers in the last couple of years have been turning on secure web browsing (https) for their content. For various reasons, and the surveillance revelations have accelerated this trend. And many e-mail server operators have been turning on server-to-server security behind the scenes.

At the IETF we are helping by revising our TLS and HTTP specifications that will be more secure and easier to employ for more and more traffic. We are also looking at ways of providing confidentiality for domain name queries.

All these things help reduce the number of parties with access to your information.

Are the limits to what technology can do?

Improving the security of the Internet is not easy, however. One of the challenges is that you'll have to deal with so many different situations. For instance, we've had a long debate about the role of ISPs caching content in the era of more and more encrypted connections.

And technology has also fundamental limits. Even if we'd have perfect communications security, you still have to trust the entity at the other end of the communication. It is important to talk about non-technical issues too, like who you can trust your data with, legal frameworks for how data can be accessed by authorities, competition that ensures consumers have choice, personal responsibility on what is stored where, and so on.

There have been proposals to create national or EU-wide "safe" Internets. Would that help?

The first thing that I would like to observe is that a lot of the value in Internet is in its global nature. (a) Whether you think about your personal or professional lives, you are going to have friends and partners in different places. When that happens, localization isn't that useful. (b) Metcalfe's law says that the value of the network goes up when it has more participants. (c) You benefit from global innovation

So from the outset, localization does not look such a great idea.

Network localization can be good for some things, though: IXPs, cables, cloud location, shorter RTT, resiliency, and competition.

But localization is not necessarily a solution to all problems. You need a global network. And networking technology does not follow borders, it usually follows organisational boundaries, like companies that have offices in different countries. But perhaps most importantly, how do you guarantee that data does not flow anyway? Many intelligence operations are run on foreign land. It only takes one corrupt employee or one company with an extra-territorial demand from a country.

Advocate thinking in terms of awareness of where your information is, trusting a limited number of parties to have your information, trusting a limited number of platforms for your devices, and using encryption technology for communication.

Should we replace the Internet with some better design?

I'd point out that the Internet as a piece of technology is certainly neither good nor bad. It can be used for either and doesn't put any particularly high technological barriers up against either, which is probably a good thing. It is probably true that the laws as well as law enforcement still have not quite caught up with what the Internet enables, but I'd consider that a temporary problem. Hopefully.

There are plenty of challenges, but that many go deeper than mere technology. For instance, global markets are quite concentrated for the "winner" services (be their social media or search or whatever), and changing that isn't a technology issue. Or that some amount of spam is probably fundamental in our ability to receive messages from previously unknown people, and in the different legal and value systems in different jurisdictions.

But can we do better? Of course. Are there silver bullets that solve all our problems? No. As it comes to the improvement of the Internet, I'm more in the evolutionary camp than in the replacement camp. Not because I try to minimize the problems, but because I believe evolution is how we can best achieve results. And no one has the crystal ball to see what we need in the future, anyway.

A key feature of the Internet is that it allows what I call permissionless innovation. It is very difficult to foresee the use cases for technology. It is true that a particular technology is designed by humans and therefore humans can alter it in some ways. But once you have a technology, it changes the world. So *inherently*, it is designed as an evolving and changing system: as its parts change, it must change too. That is a good thing, and I shouldn't think we'd want to prevent such changes.

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(but speaking as an individual – affiliations given for identification purposes only)

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