

THE DATA ECONOMY AND THE NEXT GENERATION INTERNET

DIGITAL ASSEMBLY 2018



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Towards a common European data space:
Internet of Things, the data economy
and the Next Generation Internet

**HIGHLIGHTS FROM THE DIGITAL ASSEMBLY 2018
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DATA ECONOMY: BEYOND THE HYPE

The data-driven economy is increasing competitiveness, innovation and business opportunities at a world-wide scale. Recent estimates report that rising global data flows have boosted world GDP by more than 10% [1] and the [value of the EU data economy](#) was more than €300 billion in 2016, representing more than 1.99 % of the EU GDP [2], [3].

This revolves around the generation of value out of data that, under favourable policy regulations, legislative conditions and investments in ICT, might increase the value of the European data economy to €739 billion by 2020, representing 4 % of the overall EU GDP [4].

The potential that data holds becomes even larger when public sector information is combined with privately held data, which, when of public interest, constitutes another pillar in the EU data economy. When released and potentially combined with Open Data, it can become an important driver of economic, societal and environmental benefits, playing a crucial role in helping Europe ensure its competitiveness in the international landscape [5].

The creation of [a common European data space](#) with a clear and fit-for-purpose policy and legal framework regulating access and re-use of both public and private sector data is indeed a key priority of the European Commission’s Digital Single Market strategy and it requires coordinated efforts among all stakeholders [6].

This is of utmost importance to ensure that the ongoing digital transformation drives the development of our society to the benefit of all citizens.

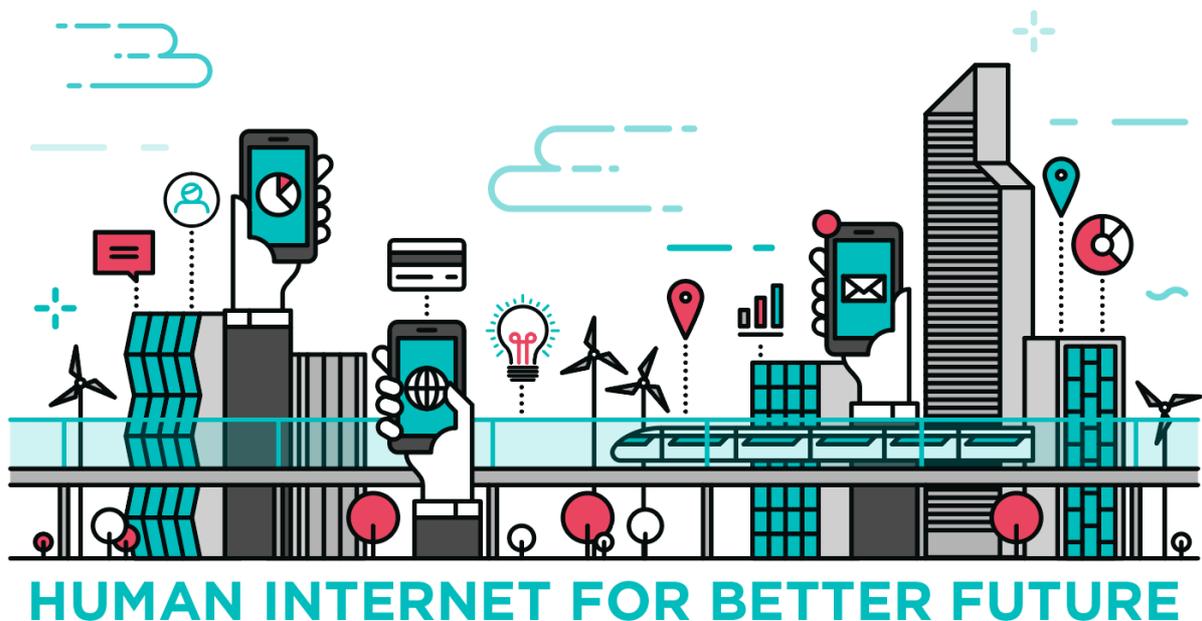


THE NEXT GENERATION INTERNET: THE WORLD IN DATA

The Internet raison d'être is very much about enabling the exchange of data in its multiple forms, whether it's about sending an email, watching videos, listening to music, chatting with colleagues or posting pictures. A big portion of our life happens on the internet where a huge amount of data is generated and elaborated. Obviously, this raises serious concerns, especially in an increasingly digital world where citizens' lack of control of their personal data can lead to inequalities, manipulation of information - with consequent restriction in the freedom of choices - and overall corrosion of our democracies.

The Next Generation Internet (NGI) initiative has been launched by the European Commission with the ambition to ensure the creation of an internet that respects human and societal values, privacy, participation and diversity, and offers new functionalities to support people's real needs, and addresses global sustainability challenges [7]. The overall vision is grounded on the idea that via increased connectivity and the progressive adoption of advanced concepts and technologies, spanning several domains such as artificial intelligence, IoT, blockchains, big data, etc., better value will be delivered to the people and to the society [8].

For this vision to be realised, several open questions and challenges need to be addressed at economic, political, legal and technological level. The NGI community is at work on this and many players in Europe, from researchers to innovators, including industry, policy makers, regulators and civil society players, are actively engaged in ensuring full transparency on the use of citizens' data. This will allow citizens to take back control of the internet and make it a powerful tool to improve their lives in areas as diverse as health, democracy, environment and mobility [9].



AT THE DIGITAL ASSEMBLY 2018: ANIMATING AN OPEN DEBATE TO GROW TOGETHER

To exploit the power of data, it will be crucial to master the underlying technologies, including AI, IoT, 5G, interactive technologies, blockchains and several others the Internet of the Future will rely on, but also to change the way the internet of today works. This, beyond technology, requires acting at several levels to break data monopolies, define and enforce new regulations, create better awareness and guarantee that our educational systems can adapt faster.

At the Digital Assembly 2018 [10], which brought together more than 1'000 stakeholders from all over Europe and beyond to talk about the Digital Single Market policies and recent technological progress that is transforming our society, the *"Towards a common European data space: Internet of Things, the data economy and the Next Generation Internet"* workshop gave the opportunity to explore and debate some of the core questions that must be addressed to create a better internet.

How can Europe embrace this technological revolution and shape the internet that we want? What is the role of the different stakeholders and how can we collaborate to make it happen? How to ensure data value creation to foster the development of a society that breaks data monopolies and through decentralised, trusted and secure mechanisms, brings back control to humans?

The debate was inspired by an introductory speech given by Sébastien Soriano, chairman of Arcep, the French national regulatory authority for telecoms and posts (Autorité de régulation des communications électroniques et des postes). This was followed by a panel debate, that besides Mr. Soriano, involved two other experts: Marleen Stikker, founder and director of Waag, a social enterprise in the Netherlands actively involved in the Open Design and Creative Commons movement, and Leopold Helmut, head of the Digital Safety and Security Center of the AIT Austrian Institute of Technology.

The audience also took an active role in the discussion by intervening with comments and questions both in place and remotely via sli.do, an online audience interaction platform made available for all.



INTERVENTIONS' SUMMARY BY THE EXPERTS



THE INTERNET – A COMMON GOOD

Sébastien Soriano inspirational speech
26 June 2018, Digital Assembly, Sofia

We live in a paradigm which is that of the free individual. The internet has made everything horizontal and decentralized. But the architecture of the internet is seriously threatened by feudal strategies in which big players try to lock us into their ecosystems. These splitting strategies call into question the very nature of the internet as a common good and at the same time our free will. Fortunately, Europe has anticipated some of these threats by adopting a regulation on net neutrality (dealing with networks) and another on the protection of personal data (dealing with control and consent). But we must prepare for the next battle: the one of the rising power of devices.

We are losing control as humans because we think we have the choice because we choose the gateway (the device); but we are engaged in a tunnel whose exits are predetermined. This is first due to a series of restrictions implemented by the operating systems, application stores and devices makers that impede a free and equal access to the internet. Soon, voice assistant will make life so comfortable that we will let them choose in our place. This is all a Faustian bargain. So, how to take back control while not impeding innovation?

As we will always need a device to connect to the internet, we at Arcep think we shall start with devices. A first proposal put forward in a report published in February [11] is to impose an equivalent of net neutrality for devices, i.e. the principles of a free and non-discriminatory internet access to operating systems and application stores of devices.

Then a series of measures could aim to bring more fluidity to the market (e.g. allow several search engines, enable users to uninstall preinstalled apps, provide full portability of all data, give non-discriminatory access to the phone's API, etc.). Another proposal is also to create a dispute settlement procedure that would provide effective solutions in a short time frame.

Finally, regulators should act as architects of choice. As a regulator, we must use the power of information to steer the market in the right direction. The purpose is to enable consumers to make informed choices as well as to help regulators develop their knowledge of the market. It is therefore important that regulators can collect the most relevant information to make it available to the public and develop, together with the ecosystem and crowdsourcing actors, applications that guide end-users in making an informed choice.



TOWARDS A DIGITAL EUROPEAN COMMONS

Marleen Stikker position statement
26 June 2018, Digital Assembly, Sofia

Our society rapidly becomes more dependent on technology that transcends the human capacity to understand, control, and influence. Now that refrigerators, toilets, thermostats and

even tampons are becoming digitally connected to the internet, it is important to ensure ourselves open, transparent and inclusive design processes, prioritized by all stakeholders.

The issues arising from the expanding, unequal relationship between large tech companies and users raise the need for an alternative model. We need an internet where the technology is open, accountable, distributed, encrypted and privacy by design, the business model is based on the commons. No data extraction and monetisation, no capital investments that force exponential growth. The design is excellent, user friendly and accessible for everyone and the governance structure is accountable with democratic control. You may want a system that lets you share your data with another party safely (that is, encrypted); that allows you to decide how long the other person can use that information and who they can share it with.

And that's precisely what DECODE is researching, designing and developing: a set of open source software that allows you to encrypt, control and share your personal information. DECODE is a European funded research project, to design an internet that respects the data sovereignty of all European citizens. This experimental project is at work to develop practical alternatives to how we use the internet today - four European pilots will show the wider social value that comes with individuals being given the power to take control of their personal data and given the means to share their data differently. Work is also ongoing to explore how to build a data-centric digital economy where data that is generated and gathered by citizens, the Internet of Things (IoT), and sensor networks is made available for broader communal use, with appropriate privacy protections.

As a result, innovators, startups, NGOs, cooperatives, and local communities can take advantage of that data to build apps and services that respond to their needs and those of the wider community.



SMART PRIVACY & SECURITY BY DESIGN AS A BASIS FOR EUROPE'S NEXT GENERATION INTERNET COMPETITIVENESS

Leopold Helmut position statement
26 June 2018, Digital Assembly, Sofia

We are experiencing a comprehensive digitization and simultaneous networking in all areas of our life. Thus, not only the infrastructure availability is an important driver for our societal development, also the various functions implemented in the Internet ecosystem must be critically re-evaluated.

The Internet, based on various functions, is changing societal structures and processes. Due to the possibility that every Internet user (people and machines) can produce content and communicate to all others, unprecedented opportunities for every single citizen on earth are created. However, there are also new responsibilities and duties for content producers, service operators, and end-users of the global Internet to be considered.

As an antithesis to the different developments in the USA and China - driven by different ideologies and culture of society - Europe has now the opportunity to realize its cultural understanding in the digital age. We need a discussion on the values and functions we want to build into our digital technical systems. This requires a clear understanding of our societal values and diverse cultures. Essential drivers for this are freedom of expression, independent decision-making options, and limited control and influence of the state on the individual citizen. Our fundamental human rights, which are clearly protected in constitutions, must not be undermined by new technological possibilities and potential oligopolies.

For the Next Generation Internet (NGI) we must rethink basic technical functions and embed them in a societal discourse. Important objectives of a European initiative should be:

- An NGI must inherently contain technical capabilities to support the data sovereignty of the end user. The end user should have the power to decide how his data is used and by whom the data is used. Security & privacy by design through new system engineering methods are just as important as new "smart encryption / attribute-based encryption" technologies. The massive market power of global monopolistic structures must be understood and appropriate framework conditions must be implemented.
- We need new methods and functions to support "trust" in our technical systems; it is important to distinguish between trust between people and "trust" between machines exchanging data - machine2machine (m2m) communication and IoT.
- New m2m applications, 5G and optical broadband require new approaches to change the basic technical concepts of the Internet.
- We need new approaches of European data production to gain the competence of technology control for new developments such as AI and Data Science. The usability and the final success of any AI-based solution heavily relies on the availability of training data where expert knowledge is included; i.e., for any AI algorithm the ground truth has to be determined by experts in specific processes.
- Existing data privacy protection systems should be harmonized with the new digital landscape; i.e., the use of technical privacy by design concepts enable new processes and business models, which are potentially jeopardized by traditional laws and regulation.
- We need a completely new awareness of the education of our youth to be able to manage our life independently in a flat digital world.
- Dedicated research projects which combine technology knowledge with policy making, media strategy and economy science, as well as societal aspects must be implemented on a European scale and put in a wide societal discussion.

WORKSHOP DISCUSSIONS: A DENSE CONVERSATION

The light goes up and it is my turn to help facilitate discussions and break the ice with first observations and questions – notice the whole session has been recorded and is available on-line¹. After a first quick tour of the audience aiming at identifying the diverse composition of the participants (some techies, many policy makers, some humanists and very few economists/business people in the hall), we start with **the first question**.



What is your view on achieving a unity of intent at governance level in the evolution of the Internet both at EU and international level.

Sébastien says there is no shared view on the internet at the international level, thinking for example of the Chinese model. There is too much individual interest from the various nations for them to be willing to align and converge. Maybe at European level this will happen, but the process will be slow. Some countries may pave the way. One of the core issues is whether in

¹ http://www.videliostreaming.com/Paris1/ec.europa.eu7/2018-06-26_13h/

Europe the choice between scale and diversity, which is distinctive of our society, and how to possibly combine these aspects.

Marleen follows saying that rather than “scaling”, we need to be at work for the “spreading” of new approaches deploying open technologies and creative commons models. This will create impact. What Europe is doing wrong is to try to stick to a Silicon Valley business model in which VC capital is injected into startups for data extraction and exploitation. The point, says Marleen, is to focus on what business models can ensure our society’s growth and promote EU social values by putting these values into models behind the technology, which is not neutral. If not, we will fall into a technology surveillance model. This though is changing in several cities in Europe, such as Barcelona or Amsterdam, where there is urgent need to rethink how to deal with public places and data collected from citizens. Cities are the perfect territory to experiment in real life with new approaches to data value creation.

Helmut adds that users give technology a value. There is a circular relation between technology, development and its usage. We need large experimentation to learn with the population. Laws and regulations can jeopardise innovation. We must be at work, Helmut says, to create and gain back trust as a core element.



We then take a question from sli.do that asks: how we can turn European values and sensibility into a competitive advantage?

Sébastien says that barriers to entry on the existing framework are very high, it is useless to try building alternatives to existing services. We should rather focus on new services and benefit from new waves of innovation enforcing our values by design. Voice assistants could be the killer app for next generation devices. Where is the European solution for voice assistants? We must act quickly on this.

Helmut affirms that the scenario includes a complete surveillance model – a state of control – such as there is in China, and clearly Europeans do not want that, and there is the opposite option where everything is “apparently” open and free, no regulation at all, such as in the US. Europe is very much positioned in the middle, we can say. The growing wave of societal commons can lead to the creation of trusted service providers, acting as third party / middle players. This of course triggers the question of how we ensure these players can and will deal in a trustful way on private data. It is a challenge.

Marleen steps in saying we should stop talking in terms of “consumers”. People should and increasingly want to rely on societal organisations and on themselves. If privacy is guaranteed by design and distribution is intrinsic, we can build a trusted layer not based on states or markets but based on identity related to attributes.



The next question is about whether commons can be a way to bring back data value creation in Europe.

Marleen confirms that indeed commons are being increasingly deployed in cities to guarantee that data produced in the cities stays in the cities as a common – data is not privatised and then eventually bought back from market. Public authorities act as guardians of commons.

Sébastien stresses the fact that we must work for freedom of choice of applications and services and empower end-users by means of information – architecture of choice. We often don’t know what we are buying when we buy technology. A public authority, a regulator must

be at work to empower end-users with information. Regulators must unbundle data, aggregate and understand it to finally re-publish it in an open format to allow comparative analysis between different solutions.



The next question from sli.do says: almost all the applications on the internet are technologies from the world wide web. Instead of building the next generation internet, why not building on the next generation web?

Helmut totally agrees on this. The most critical part of the internet is collecting, annotating, contextualising and using data. The question is where do we find the new means to collect and elaborate data? In the web, which needs therefore to evolve.

Unfortunately, time is running quickly, and we are coming to the end of the workshop. The final question to the experts is to summarise in one sentence how they see the evolution of the internet.

- Marleen says the process must be inclusive and we must mind the fact technology and algorithms are not neutral. We must adopt a more societal approach to the evolution of the internet involving humanities, societal players, arts for developing new technologies that will help moving away from the big tech solutions.
- Sébastien says the internet of the future will be exactly the internet that we want, if we break the glass of the fish tank in which we find ourselves locked up.
- Helmut says users determine the functions of the systems. We, experts, should focus on reshaping technologies for creating added value and put strong willingness on this.

In conclusion, thanks to the experts and all participants of our workshop. Please see “future events” below for information on the next NGI community meet-up.

HIGHLIGHT: MEETING ROBERTO VIOLA, THE NGI PIONEER

The light goes off, and shortly after I am sitting in another room of the National Palace of Culture in Sofia with Dr Roberto Viola, Director General of DG CONNECT (Directorate General of Communication, Networks, Content and Technology) at the European Commission. Roberto Viola is the pioneer of the NGI initiative, the one who has created the vision of an Internet of Humans. I could not have imagined a better way to conclude my Digital Assembly 2018 journey.

To have a chance to interview Roberto Viola on his understanding of the evolution of the internet and the strategic relevance of the NGI initiative in a forward-looking perspective [16], has been the best way to close the circle and have more food for thought in elaborating this report and some critical points as presented in this document.

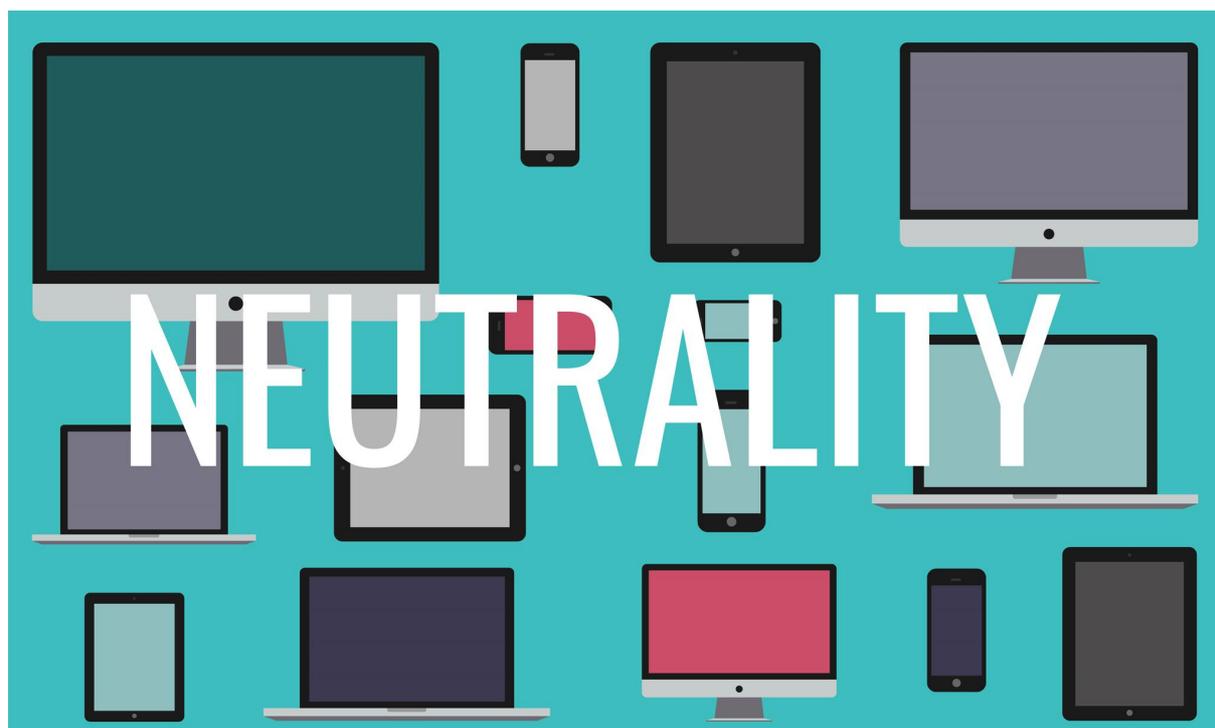
The interview has been published at:

<https://www.ngi.eu/news/2018/07/05/roberto-viola-focus-on-now-for-ngi/>



INSIGHTS AND TAKEAWAYS – MUMBLE, MUMBLE...

- **Technology is not always neutral** and “*ICT systems are now falling on people and affecting them*” as underlined also by Prof. Johanna J. Bryson in her talk at the Digital Assembly [14]. This requires more responsible and ethical choices to be enforced, also at software and hardware design and implementation levels.
- **From net to device neutrality.** As emerged from the discussions, net neutrality must be ensured not only at the network level [12], but pushed to devices, all the way to operating systems, app stores and device manufacturers. We must start from where citizens access the internet to reform and redesign it, that is at device level.
- **Break monopoly of data and bring back value creation in Europe.** Only 4% of the world’s data is stored in Europe, which indicates value creation happens elsewhere and possibly benefits only the GAFKA (in the US) and BATX (in China) tech giants. It is not an easy task, but via dedicated regulations, better information and education, technologies that are more responsible by design and promotion of new approaches such as the commons, we can counteract technology lock-in and surveillance.
- **Build intelligence and meaningful insights.** Despite a rather dominant view on this, data as such is not at all oil and is not a commodity [16]. The power of data is in the way data is collected, aggregated and elaborated. Its value emerges when intelligence (not only artificial) is plugged into the value creation life-cycle and leads to meaningful insights and valuable services.
- **When humans do it better.** Despite new regulations and more agile mechanisms to enforce them, our political, legislative and educational systems will never be able to keep pace with technology. There will always be a gap. Therefore, we need first to create awareness about this and go back to critical thinking and informed decision-making as core values to be taught to our children, but maybe also to those from older generations [18].



WE HAVE A DREAM THAT IS WORTH MORE THAN OUR SLEEP: LET'S DO IT!

There is an increasing awareness we need to more consciously and critically embrace technologies in a way that empowers humans, without depriving them of their rights to privacy, confidentiality and protection. Different communities, researchers, economists, politicians, including media initiatives are contributing to the debate on a human-centric evolution of the internet.

However, the large majority of citizens are only marginally aware of these debates: many people think that because they have easy access to devices and to the internet (still the digital divide is huge!) they are the masters of their relationship with digital technologies. This is wrong!

Many European stakeholders are fully engaged to ensure the fast progression of digitisation of our lives and society and there is a growing community at work on creating a solid foundation for the Next Generation of the Internet. With new regulations and technologies for protection of data [13], Europe has pioneered a new era, the era of data consciousness. We are just at the beginning of the journey, but by cultivating diversity, innovation and strong ethics principles enforced by design, we will be able to turn many of the big challenges we are facing today into opportunities for the growth of our society tomorrow.



WHERE TO MEET NEXT?

A quick reminder on how to stay plugged to the NGI community [15] and where to meet next!

The **NGI Forum** will take place on 13 September in Porto (Portugal) and will offer a mix of expert talks, open discussions and interactive working sessions, with an emphasis on stimulating discussion and the free exchange of ideas between members of the research community, SMEs & start-ups, industry, policy makers, and civil society players. An exhibition area will host local innovative start-up and SMEs and NGI projects. Registration is now open (and free) at: www.ngiforum.eu

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