NEXT GENERATION INTERNET

NGI FORUM 2019
- REPORT -

Wanha Satama Conference Centre

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Welcome

Olivier Bringer, *Head of Unit, DG CONNECT, European Commission*

Olivier Bringer

NGI is a priority for the incoming European Commission, the funding of next generation Internet innovators is high on the agenda and policies on data governance focus on people as users.

The future European Commission's policies will focus on how to use artificial intelligence (AI) and blockchain and how to develop the public's trust in technologies powering the next generation internet. It is important to create the NGI network so it becomes a community, at events such as this NGI Forum.

The perspective of Finland

Mikko Koskinen, *State Secretary, Finland*

The *Finnish Presidency of the EU*'s approach Internet governance considers the transformational force of the digital economy, since it offers the promise of greater connectivity, but also carries the risk of social disruption. In Finland, access to data is granted by default, for public as well as private sector use, based on a new multi-stakeholder approach. The EU's economy must evolve from fixed value chains towards a new ecosystem for value creation, entailing using data in a structured machine-readable format that is available in real time. The first steps towards building a common European data-space have been taken. Creating a new and responsible approach to the data economy will be the best way of restoring trust in both the Internet environment and the economy.

Mikko Koskinen

The Perspective of a digital city

Pia Pakarinen, *Deputy Mayor of the City of Helsinki*

Pia Pakarinen

The Finnish capital of Helsinki uses the Internet and digital innovation to improve public services and increase citizens' engagement in local affairs. Digital solutions which use public data can improve the quality of life for local residents via better targeted services such as health screenings or school options for children. These more proactive types of public service must be built on an ethical use of data and AI. Since the volume of data is on the rise, we must be able to build up trust in the way AI uses that data. The City of Helsinki is working to make sure that everyone has the skills to make use of digital applications.

Inspirational speech

Martin Wezowski, *Futurist and Chief Innovation Officer at SAP*

Imagination is a prerequisite to conceptualise the Internet of the future, but there are limits to our thinking, since we are not sure of where we are heading. Innovation is about trying to hit a target that you cannot yet see. The volume of data is ever increasing and with the help of AI, we can achieve a lot more. We also need to think about the future of work; SAP's solutions are currently involved in three-quarters of business transactions worldwide, which is a huge chunk of global GDP.

Martin Wezowski

In the future, machine intelligence and human ingenuity will work together for processing high-value tasks. By combining humans with robots, we can enhance ourselves. Data analysis can be improved by removing the limits on human knowledge; instead, we can keep track of the processes. This is an environment that is complex and diverse and that requires further work. Synchronisation will be particularly important in the future.

Shaping a new Internet

[L to R] Teemu Ropponen, Meeri Haataja, Iren Lopez de Vallejo, Adrian Perrig

Meeri Haataja[1], *CEO of Saidot, Chair of Ethics Working Group in Finland's AI Programme*, said she was very encouraged by the sector's drive to find new ways of developing AI, advancing from defining principles to putting them in practice. The new European Commission will publish a proposal on Internet governance in a few months' time. There is a great deal of debate on the principles of governance, but a lack of means to operationalise those principles, so new standards are required. Registering common standards for metadata could be one way of providing oversight of the system. In order to allay concerns on governance and the regulation of AI we need to increase trust in technology. Without this, there is the risk of blanket bans on the use of photos from cameras in public places or facial recognition technologies, for instance. The sector cannot simply wait for the regulators to do their job, but must find practical ways of addressing these concerns.

Teemu Ropponen[2], *General Manager at MyData,* commented on the perceived lack of trust in buying online and stressed that transparency in the use of personal data is essential. The core idea of the MyData initiative is that individuals should be in control of their own data. Personal data must be protected by advancing from theoretical to actionable rights that everyone can use to protect their personal information; and measures must consider the issue of data portability.

[1] *Check the slides here:* http://bit.ly/ngif19-meeri-haataja
[2] *Check the slides here:* http://bit.ly/ngif19-teemu-ropponen

Monique Calisti

Monique Calisti, *NGI Outreach Office Director, CEO at Martel Innovate*, remarked that shaping the new Internet is not only a question of technology, but also the use of data and its properties. Regulation should be used to deliver real accountability. This is a complex matter which needs to balance the need for openness in the data environment with protection for data privacy to create trust. Only trusted entities can act. The fact that the Internet transcends the frontiers of Europe presents a further challenge.

Adrian Perrig[3], *Professor at the Swiss Federal Institute of Technology, Zurich,* said we must explore how secure the global Internet is in order to design a future Internet that can inspire trust. That may involve some high-risk projects. If we use a single-path Internet optimised for low cost, there are limits to what can be done, since using the Internet in this way would not support diverse applications or requirements. The Internet must remain public but must provide multi-path communication. This might involve domains of autonomous systems that agree to follow trusted routes. Every Internet protocol has routing and control plans, from path segments to path, so how do we know if a device can be trusted? The Internet is a public infrastructure and transparency is important; there must be choice and flexibility in terms of which entities we trust more and which we trust less. Therefore, regulation can be enforced in order to react to fake certificates. Education must be adapted to facilitate making the Internet more human-centric. People in Europe are very concerned about the security of the Internet and companies are aware of this issue.

Irene Lopez de Vallejo, *Director Partnerships & Business Development at DEX*, remarked that what is at stake here is the open public infrastructure that will enable an open and fair Internet. There are 'data silos' which need breaking down in order to give AI access to data. There is also a need for more equality in the data economy and the NGI community is but one initiative in a complex and changing landscape. We need to go beyond digital skills and realise that we need AI skills; people also need to be encouraged to have more critical thinking.

[3] *Check the slides here:* http://bit.ly/ngif19-adrian-perrig

Who's the NGI? – A community of researchers and innovators at work

Michiel Leenaars and Ruth Puente

Michiel Leenaars[4], *Director of Strategy at NLnet Foundation, NGI Zero,* reminded the audience the Internet has been around for 30 years now, so we must make sure every project lives up to the expectations of society by delivering on transparency. Working in a consistent manner calls for a structured approach, and this is still in testing mode. The aim is for a more secure Internet, but the question is how to achieve this while ensuring access for all and permitting mechanisms for verification.

Nadim Kobeissi[5], *Director of Symbolic Software, NGI Zero*, said that in terms of cryptographic protocols, there are certain ways of making systems secure. A secure line of communication requires authentication. Formal verification technologies consist of different protocols and these technologies are used to check that a signal is secure. Most tools rely on users for formal identification; VERIFPAL, an NGI Zero-funded project, is a new verifier that eliminates user error and yet is easy to use and gives good results. It integrates easily with the developers' workflow. In this regard, the end goal is to achieve a high quality and robust protocol. This protocol was successfully put to the test in a classroom setting at an American college. Putting new protocols to use in educational contexts is highly relevant as it is essential to guarantee access to the latest research and foster a better understanding among the public of how security protocols function in cryptographic systems. Software should be made more accessible so that ordinary people can understand what level of security it offers.

[4] *Check the slides here:* http://bit.ly/ngif19-michiel-leenaars
[5] *Check the slides here:* http://bit.ly/ngif19-nadim-kobeissi

Ruth Puente[6], *Executive Programme Manager at Kantara Initiative, NGI Trust*, said the aim of the research community is to improve the public's trust in emerging technologies, as well as designing ways of protecting people's privacy. The NGI Trust's first call for applications received more than 100 project proposals. Some are now in their initial phase while others are more advanced. The projects are working on a range of issues including better privacy online, safer Internet browsing and stronger user control of their privacy. Specific priorities are better management of individual consent to the use of data and enhanced control of their data by end users. But in spite of these efforts to better protect privacy, many problems remain to be solved. For this reason, the next round of applications will be on the topic of security certificates for the next generation Internet.

Andrés Sánchez Sandaz[7], *Director at FundingBox Communities, LEDGER*. LEDGER promotes alternative models where data is a common good owned by citizens and wealth is created by data-driven platforms is equally distributed. The goal is to empower people to solve problems using decentralized technologies such as blockchain, peer to peer or distributed ledger technologies. LEDGER is funding 32 projects building Most Viable Products where privacy by design, open software and data sovereignty are at the core of the proposition. The programme gives up to EUR 200,000 equity-free, a venture programme of 12 months, a researcher in residence and business mentors as well as access to market and support to raise further investment. LEDGER has six verticals: health, economy, mobility, public services, energy & sustainability and disruptive innovation.

A human-centric approach to data governance

Francesca Bria, *DECODE Project Coordinator,* said that in big cities, data is something very concrete that directly affects the lives of citizens. Data is the backbone of the infrastructure of cities. It is difficult to develop the Internet in a way that preserves privacy because people's personal information is being monetised. The processes for the use of data must be established in a democratic and transparent way. Problems related to infrastructure and logistics can be solved by scaling up the use of data. There is a lot of European expertise on cryptographic applications, encouraged by EU's regulation. Protecting privacy must take a decentralised approach which recognises that citizens have agency and the right to decide

[6] *Check the slides here:* http://bit.ly/ngif19-ruth-puente
[7] *Check the slides here:* http://bit.ly/ngif19-andres-sanchez

what they want their data used for. This is what a people-centred digital society stands for.

Francesca Bria (l) and Cathy Mulligan (r)

Jaana Sinipuro[8], *Project Director at SITRA*, stressed that the work on a more people-centred Internet must be made more visible to the public. Right now, the big tech companies are setting the narrative of what the Internet is about, but we need to establish a new narrative based on a transparent and fair use of data. There should be something like a fair trade label for Internet applications, this would act as a way of distinguishing those companies who are willing to comply with protocols that ensure users' privacy in a transparent way. A framework aimed at enhancing trust could work in Europe, but all technical solutions, such as healthcare applications, should be examined in terms of their implications for people's privacy.

Jaana Sinipuro

Cathy Mulligan, *CTO of GovTech Labs and DataNet at UCL*, rejected the idea that the Internet was something that had developed purely by chance, adding that looking further into the origins of the Internet could give people ideas for how it could develop in future. The Internet is reconfiguring capitalism, since it is a system that has evolved this way over time. Nowadays the focus is on guaranteeing integrity and

[8] *Check the slides here:* http://bit.ly/ngif19-jaana-sinipuro

proving where the data comes from. The role of corporations has become that of an intermediary in ecosystems where the individual has greater control over the supply chain. The Blockchain Initiative is still at an early stage of development and will evolve further.

Olivier Bringer, *Head of Unit at DG CONNECT, European Commission,* spoke of people's *right to consent* to the use of their data and how data portability is a prerequisite for a 'fluid' data economy. The question now is how to put this right to give or withhold consent into practice as it has to be actionable through models developed by initiatives such as MyData or other decentralised models. The European Commission will continue helping innovators to develop appropriate tools. There might be scope for government intervention to put in place a framework that can support new standards. A good example is the Blockchain Initiative which is becoming a building block for the future Internet. Even so, issues of scalability and efficiency will need resolving before these technologies can be used more widely. The next step will be applying AI that depends on large-scale use of both quantitative and qualitative data. The European Commission will remain very active in the digital field as it will be a priority for the new European Commission. Digital technologies can be used for many purposes, but the way they work has to change — they must become more energy-efficient in future to avoid causing excessive pollution.

The next generation Internet – an Internet of humans

Roberto Viola, *Director General DG Connect at European Commission*

Future AI must address the needs of citizens. We must consider whether technology can provide solutions, rather than always adopting a legislative approach. AI can be harnessed to improve the Internet, by developing cognitive search algorithms that use natural language for searches. Europe has a lot to offer in terms of cognitive and language technologies. Data searching is a field that needs to be 'greened' as the huge data centres it requires consume a lot of energy. Using AI could make data searches more efficient. Virtual reality is an important dimension of the next generation Internet — in future, the way we live will combine the physical environment with the digital sphere. These are still very sensitive areas.

Roberto Viola addressing the conference via video link

The use of data should obviously be linked to us as human beings. The EU's data protection regulation provides us with a great standard for protecting personal data. Privacy should be provided by the ecosystem and by both Internet provider and Internet browser. Can we have a universal identity and can it be used for any service? An alternative is to have independent authentication services that would be different from the Internet service providers with identity registration that respects people's privacy. Blockchain can be used to verify user identity, the challenge is to establish a system that works well for a broader audience so that the future Internet does not become an Internet of the few.

The EU tends to think of itself in terms of having 'soft' power, but is the battle for the future of the Internet a battle that we Europeans can win? At the very least our approach in Europe can be unique. The next generation Internet is always on the agenda in the EU's relations with its global partners, so we have to pay attention to developments in other countries. In Europe, we can do digital business because it is important to have more European digital solutions to offer. The NGI community should be more proactive in developing these new initiatives.

NGI priorities and future directions - parallel workshops

NGI Workshop session

Workshop 1 | Where next for online identities[9]

The workshop on the future of online identities concluded that this could represent a huge market and that developing a digital wallet would be a positive development, but it is not yet clear who should govern that. There are different strands of thought on credit-scoring and profiling in terms of digital identities. The biggest problem seems to be how to arrive at a logical definition of the concept of identity. It is clear that there must be data transparency to establish who people are and the politics to establish the digital identity is a matter that concerns everyone.

Workshop 2 | Mind meets machine: harnessing collective intelligence[10]

The workshop examined the need for a new policy to encourage innovation to harness collective intelligence. There is scope for new ways of defining how it applies to new fields such as healthcare. Sectors must work together to ensure opportunities are not missed. In the end it is all about defining the right sort of AI for the right purpose and that calls for enforcing hierarchies and deciding how to create networks.

[9] *Check the slides here:* https://www.ngiforum.eu/workshop-1/
[10] *Check the slides here:* https://www.ngiforum.eu/workshop-2/

Workshop 3 | Policy to nourish innovation, NGI Trust Marks[11]

The workshop addressed how to develop digital trust marks to signal fairness and trust in services and products. These were explored in several areas relating to data reliability and security. This is an area which could have a huge impact in future. The European Commission's policy paper on the future of the Internet should address these questions by examining what is known as fair trade trust marks and how robust they are.

Workshop 4 | Blockchain in action[12]

The workshop discussed blockchain and other distributed ledgers and what they can be used for. Blockchain has laid the foundations, but the question remains whether in the future it will be taken forward by private or public structures. The participants pointed out that Europe must be aware that certain schemes could risk undermining government control. Regarding the discussion on digital identity, a central question seems to be whether we are prepared for users to control their identity.

Wrap-up from workshop and open discussion

[11] *Check the slides here:* https://www.ngiforum.eu/workshop-3/
[12] *Check the slides here:* https://www.ngiforum.eu/workshop-4/

NGI funding opportunities – Upcoming H2020 calls

Ragnar Bergström[13], *Head of Sector, European Commission , DG CONNECT*

Ragnar Bergström

Funding opportunities are still available for the Next Generation Internet initiative. The research and innovation budget is largely implemented through sub-granting. Some calls for applications will be launched soon for innovators and some still remain open. Some require consortia for sub-granting to applicants. Nevertheless some funding opportunities are still open for applications and the aim is to award the funds over the next few months. The next generation Internet is a topic where there is still plenty to explore.

Looking at the future of NGI

Olivier Bringer, *Head of Unit, DG CONNECT, European Commission*

Bringing the conference to an end, Olivier Bringer reminded participants that we need to provide a stronger narrative for the next generation Internet, so researchers should actively discuss their vision. The cross-cutting theme is data governance and its transformative effect when data is used to improve services for citizens. Cities and the local arena seem to be where the digital transformation - which puts users at the centre - can take off. There also remain issues of sustainability. People need to be able to trust that data will be used correctly, in order for data-sharing across sectors to happen. In that regard, a multi-stakeholder approach is important to develop trust. We have to think about where data is heading and how to increase transparency and accountability in the use of data packages. Trust marks are labels that certify that technology respects privacy. Building a better Internet is a collective effort that means new ideas should be presented to the public as an

[13] *Check the slides here:* http://bit.ly/ngif19-ragnar-bergstrom

attractive technological development. There is a strong current of change towards a new kind of Internet.

NGI Forum 2019 photos, go to **2019.ngiforum.eu/photos**

NGI Forum 2019 presentations, go to **2019.ngiforum.eu/agenda**

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