NGI Consultation Platform Summary Report

#1 Roadmap View

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This consolidated report provides four different synthesis views of the content available on the NGI online consultation platform (consultation.ngi.eu). As each of these "views" represent different ways of looking at the content, some discussions will be available from multiple views.

2018 - 2021 (WP 2018 Topics)

Discussions related to topics targeted in WP-2018 calls for proposals

Privacy and Trust Enhancing Technologies

This discussion area helps to identify the challenges arising within the privacy and trust enhancing scenario, as well as potential solutions to address these challenges, and to identify gaps that need to be filled by research and innovation projects within this topic area. H2020 WP 2018-2020 includes three calls for proposals related to this discussion channel: ICT-24-2018-2019: Next Generation Internet - An Open Internet Initiative SU-ICT-03-2020: Advanced cyber security and digital privacy technologies EUJ-01-2018: Advanced technologies (Security/Cloud/IoT/Big Data) for a hyper-connected society in the context of Smart City

Follow the discussion:

PRIVACY AND TRUST ENHANCING TECHNOLOGIES / GDPR AND NGI

https://consultation.ngi.eu/channels/privacy-and-trust-enhancing-technologies/gdpr-and-ngi

Responsible AI

AI is already being used to augment human potential in many ways including cancer diagnostics. With AI becoming more ubiquitous, there is a need for means of redress where decisions made by machines are difficult to understand, or unethical or even illegal. “Responsible AI” concerns applications of AI whose actions need to be explainable and governed from both a legal and ethical standpoint because they are either safety critical or impact the lives of citizens in significant ways. There is still an open question that “will AI empower us as human beings or kill us?” H2020 WP 2018-2020 includes two calls for proposals related to this discussion channel: CT-09-2019-2020: Robotics in Application Areas ICT-26-2018-2020: Artificial Intelligence

Follow the discussion:

ARTIFICIAL INTELLIGENCE

https://consultation.ngi.eu/channels/artificial-intelligence

RESPONSIBLE-AI

https://consultation.ngi.eu/channels/responsible-ai

Discovery and Identification Technologies

According to the call text related to R&I Actions for H2020, there is a need to search and access the technologies for large heterogeneous data sources, services, objects and sensors, devices, multi-media content, etc. and which may include aspects of numbering; providing contextual querying, personalised information retrieval and increased quality of experience. H2020 WP 2018-2020 includes one call for proposals related to this discussion channel: ICT-24-2018-2019: Next Generation Internet - An Open Internet Initiative

Read more about this discussion channel here...

Follow the discussion:

DISCOVERY AND IDENTIFICATION TECHNOLOGIES *https://consultation.ngi.eu/channels/discovery-and-identification-technologies*

Blockchain as an enabler for NGI

This discussion is related to the view of how blockchain can enable the Next Generation Internet. How can this technology be applied to empower European citizens in being part of the Next Generation Internet? What are the challenges, technically, socially and legally?

While the TCP/IP made communication easy since it allowed devices to talk to each other, the blockchain technology could help advance it further by making data interoperable in such a way that having to hard code APIs for accessing databases would be a thing of the past.

As someone who deals with data extraction, verification and analysis, it is believed that blockchain can help restore trust in the Internet by allowing storing and dealing with data more interoperable, reliable, convenient and efficient. Doing so helps journalists and the public less prone to falling into fake news traps. H2020 WP 2018-2020 includes one call for proposals related to this discussion channel: ICT-28-2018: Future Hyper-connected Sociality

Follow the discussion:

BLOCKCHAIN ENABLER NGI

https://consultation.ngi.eu/channels/blockchain-enabler-ngi

Experimentation Support for Start-ups

Experimentation platforms are important to test and validate new products and services for compliance with real-world conditions, which can be really expensive to simulate particularly for start-ups. Therefore experimentation resources such as hardware, cloud and software should be provided to them as a service. Additionally, for SMEs and start-ups requiring experimentation funding, there should be support for flexible funding (responsive mode and fast turnaround) in addition to existing open calls. H2020 WP 2018-2020 includes one call for proposals related to this discussion channel: ICT-35-2018: Fintech: Support to experimentation frameworks and regulatory compliance

Read more about this discussion channel here...

Follow the discussion:

INNOVATION NETWORKS / EXPERIMENTATION-PLATFORMS

https://consultation.ngi.eu/channels/innovation-networks/experimentation-platforms

Algorithmic Accountability

In the Hub4NGI D2.1, a significant issue regarding the responsible AI has been raised which is about whether and how can an AI algorithm be accountable for its actions.

The issue of Algorithmic Accountability was also raised in Net Futures debate "Legal, ethical and social issues in a software defined world" and the participants agreed that there is a responsibility gap for the AI systems.

Transparency is considered to be a key aspect of algorithmic accountability as depicted in the Net Future 2017 debate session. And it is widely agreed that the algorithms need to be able to explain their decisions.

H2020 WP 2018-2020 includes two calls for proposals related to this discussion channel: SU-ICT-02-2020: Building blocks for resilience in evolving ICT systems ICT-35-2018: Fintech: Support to experimentation frameworks and regulatory compliance

Follow the discussion:

RESPONSIBLE AI / ALGORITHMIC ACCOUNTABILITY

https://consultation.ngi.eu/channels/responsible-ai/algorithmic-accountability

Ethical Frameworks for Autonomous Machines

» It is important to have an ethical framework in place for artificially intelligent and autonomous machines. It is however still a question to be answered that how ethics can be designed into AI technology and where these ethical and legal questions lie. Multi-disciplinary research and discussion are undertaken to provide answers to legal and ethical questions surrounding AI and its applications. Read more about this discussion channel here...

» The European Group on Ethics in Science and New Technologies (EGE) released a statement calling for the launch of a process that would pave the way towards a common, internationally recognised ethical and legal framework for the design, production, use and governance of artificial intelligence, robotics, and 'autonomous' systems.

H2020 WP 2018-2020 includes two calls for proposals related to this discussion here: CT-09-2019-2020: Robotics in Application Areas ICT-26-2018-2020: Artificial Intelligence

Follow the discussion:

RESPONSIBLE AI / TOWARDS SHARED ETHICAL FRAMEWORK ARTIFICIAL-INTELLIGENCE

https://consultation.ngi.eu/channels/responsible-ai/towards-shared-ethical-framework-artificial-intelligence

Decentralised Data Governance

» Dominant data platforms have extremely centralised architectures, especially at the level of data governance. The key question is whether technological solutions enabling intrinsically decentralised data governance break the "rules of the game" that have made current data incumbents successful. Read further here

This discussion in addressing ICT-24 call proposes creations of personal data spaces that the users have complete control over, and thereafter provides access to the desired applications to use this data.

Arguing that data is of common good, new economic models will be beneficial that incentivize the sharing of information hoarded by applications and companies such as Google.

H2020 WP 2018-2020 includes two calls for proposals related to this discussion channel: ICT-28-2018: Future Hyper-connected Sociality CT-24-2018-2019: Next Generation Internet - An Open Internet Initiative

Follow the discussion:

DECENTRALISED DATA GOVERNANCE / FIXING A SYMMETRY DATA GOVERNANCE AND ADAM SMITHS INVISIBLE

https://consultation.ngi.eu/channels/decentralised-data-governance/fixing-asymmetry-data-governance-and-adam-smiths-invisible

Decentralisation of Control

One of the topics raised in the Hub4NGI D2.1 deliverable that needs to be addressed by NGI research topics is that of "Decentralisation of Control". The report provides evidence from multiple sources including the 2017 DIN Forum Report which acknowledges that the GAFA (Google, Apple, Facebook, Amazon) incumbents are in such a dominant position that it is difficult for European start-ups to compete. The NGI should enable alternative business models and infrastructure to support alternative solutions to the current centralised service offerings. H2020 WP 2018-2020 includes two calls for proposals related to this discussion channel: ICT-28-2018: Future Hyper-connected Sociality CT-24-2018-2019: Next Generation Internet - An Open Internet Initiative

Follow the discussion:

DATA

https://consultation.ngi.eu/channels/data

DECENTRALISED DATA GOVERNANCE / DENCENTRALISATION CONTROL

https://consultation.ngi.eu/channels/decentralised-data-governance/dencentralisation-control

The Pressing Need for IoT Security

The Internet Society 2017 report- Paths to our Digital Future quoted "IoT compounds every security problem ever seen and multiplies every problem of the Internet. Your toaster could be sending out spam". This highlights the magnitude of risks posed to critical Internet infrastructure and applications if security frameworks are not included early into the IoT innovation process. The case of Mirai attack of 2016 is often taken up to prove the extent of damage mere plug-and-play remotely-managed IoT devices can have on the broader Internet. H2020 WP 2018-2020 includes two calls for proposals related to this discussion channel: ICT-27-2018-2020: Internet of Things EUJ-01-2018: Advanced technologies (Security/Cloud/IoT/Big Data) for a hyper-connected society in the context of Smart City

Follow the discussion:

SOCIO ECONOMIC LEGAL CONSIDERATIONS NGI / PRESSING NEED IOT SECURITY

https://consultation.ngi.eu/channels/socio-economic-legal-considerations-ngi/pressing-need-iot-security

IoT, Interoperability and the Future of Internet

Interoperability is fundamental to the success of IoT. As Jari Arkko, former chairman of IETF quoted - "I cannot think of a better example where interoperability is more important than the Internet of Things. Without interoperability, lights won't work with the switches, sensors can't be read by your smartphone, and devices cannot use the networks around them". Without giving significance to interoperability, we face the risk of fragmentation of Future Internet as in a race to progress ahead of their competitors; businesses will deploy and develop proprietary solutions. H2020 WP 2018-2020 includes two calls for proposals related to this discussion channel: ICT-27-2018-2020: Internet of Things ICT-29-2018: A multilingual Next Generation Internet

Follow the discussion:

OPEN INTERNET INITIATIVE / IOT INTEROPERABILITY AND FUTURE INTERNET

https://consultation.ngi.eu/channels/open-internet-initiative/iot-interoperability-and-future-internet

2019 - 2022 (Potential WP-2019 Topics)

Discussions related to topics to be addressed in the WP-2019 calls for proposals.

Work Programme 2019, An Open Internet Initiative

There is need for a more human-centric Internet supporting values of openness, co-operation across borders, decentralisation, inclusiveness and protection of privacy; giving users control to increase trust in the Internet. Providing more transparent services, more intelligence, greater involvement and participation, leading towards an Internet that is more open, robust, dependable, more interoperable and more supportive of social innovation.

Read more...

Follow the discussion:

OPEN INTERNET INITIATIVE

https://consultation.ngi.eu/channels/ open-internet-initiative

Compliance with GDPR

GDPR offers a great chance to improve the protection of the user's privacy, but on the other hand it is a big burden for companies with all the new regulations, and especially with the fear to get huge fines. There might be little support for SMEs and high personal risks for SME owners due to the potential high fines.

Follow the discussion:

GDPR

https://consultation.ngi.eu/channels/ gdpr

Limitations to Democracy and Liberty

Another widespread concern, raised in Hub4NGI D2.1, is the abuse of Internet technologies causing threats or limitations to democracy and liberty.

In an online article titled "Will we still have a single global internet in 2025?", the Ditchley Foundation also mentioned that the authoritarian governments wish to use the capabilities of the Internet to exert controls over citizens and keep their data at home in order to ensure access.

Follow the discussion:

HYPER CONNECTED SOCIALITY / LIMITATIONS DEMOCRACY AND LIBERTY *https://consultation.ngi.eu/channels/hyper-connected-sociality/limitations-democracy-and-liberty*

Technology Evolution vs Legislation

A very important point raised in Hub4NGI is that legislative speed cannot keep up with technical development, resulting in ineffective and out of date legislation. Legislation and the legislative process are recurring themes in the sources.

It is usual that citizens and businesses are ahead of governments in understanding the implications of Internet, and overall conclusion is that the legislative process must reform to adapt to the speed that technology evolves at. Changes are rapid, so legislation must adapt.

Follow the discussion:

HYPER CONNECTED SOCIALITY / TECHNOLOGY EVOLUTION VS LEGISLATION

https://consultation.ngi.eu/channels/hyper-connected-sociality/technology-evolution-vs-legislation

Governance and Ethics in a World of AI

» Technologists themselves say the technology needs to align with human values, and that ethical dimensions must be prioritised at every stage of the design, development and deployment of AI systems. The ISOC report on "Paths to Our Digital Future" released in 2017 brought attention to the fact that there could be extensive ethical concerns due to AI and automation. The speed at which AI and related technologies are being developed and deployed will require significant investment and effort in the short term to avoid unintended consequences for society and humanity. "We will need focused research and effective governance structures to make sure AI technologies create opportunities and not harm".

» The European Group on Ethics in Science and New Technologies (EGE) released a statement calling for the launch of a process that would pave the way towards a common, internationally recognised ethical and legal framework for the design, production, use and governance of artificial intelligence, robotics, and 'autonomous' systems.

Follow the discussion:

RESPONSIBLE AI / TOWARDS SHARED ETHICAL FRAMEWORK ARTIFICIAL INTELLIGENCE

https://consultation.ngi.eu/channels/responsible-ai/towards-shared-ethical-framework-artificial-intelligence

RESPONSIBLE AI / GOVERNANCE AND ETHICS WORLD AI

https://consultation.ngi.eu/channels/responsible-ai/governance-and-ethics-world-ai

Next Generation Internet and Skills

This discussion is more focused to find out the answers to the following questions:

» What skills will workers and citizens need to fully contribute to and participate in the next generation global infrastructure?

» What should we be teaching our children? (and what not?)
» How may new Internet technologies enhance education?
» Can we go beyond MOOCs (Massive Open Online Courses)?
» Will AI supplant tutors?
» Can blockchain be used to disintermediate higher education?

Avoiding Echo-Chambers and Fake News

There is a risk that the Internet becomes an "echo chamber", where profiling of citizens, "fake news" and citizens' own preferences and social groups distort the information citizens can see to biased opinions or sympathetic views that reinforce entrenched views.

Follow the discussion:

ECHO CHAMBERS

https://consultation.ngi.eu/channels/echo-chambers

Integrated Collaboration Spaces

Collaborations spaces such as incubators and internet forums are essential platforms bringing together stakeholders to innovate on NGI related issues. 2017 DIN Forum report suggested integrating them with other innovation networks like social networks, experimentation platforms and evidence platforms so that people from different disciplines can apply technologies to solve real-world problems.

Follow the discussion:

INNOVATION NETWORKS / COLLABORATION SPACES

https://consultation.ngi.eu/channels/innovation-networks/collaboration-spaces

Innovation Agencies for Commercializing Innovation

There is an identified gap between applied research output that addressed and solved some real-world problems and their transition into a marketable product or service majorly due to the traditional way of funding of these two activities, applied research by EC or national grants, and product development through private money like venture capital. To address this, it has been recommended that such innovation support be provided by national innovation agencies to create sustainable businesses, expert base, and strengthen economy.

Follow the discussion:

INNOVATION NETWORKS / INNOVATION SUPPORT

https://consultation.ngi.eu/channels/innovation-networks/innovation-support

Safeguarding Confidentiality

Privacy and confidentiality are essential human values which should be ensured in the single largest ubiquitous fabric of modern communication that is Internet. On a contrary, shocking revelations from whistle-blowers like Edward Snowden have made it very clear that this shared trust in the internet has been naive and undeserved, and that weak parts of the design of the internet have being systematically abused at a scale beyond comprehension. NGI initiative seeks to craft an internet that is resilient, trustworthy and sustainable, and varied aspects that would inject confidentiality into the core Internet have been suggested

.

Follow the discussion:

PRIVACY AND TRUST ENHANCING TECHNOLOGIES / CONFIDENTIALITY

https://consultation.ngi.eu/channels/privacy-and-trust-enhancing-technologies/confidentiality

Internet Threat Catalogue critical to NGI

The internet needs to be extremely resilient and should be able to cope with many parts of the modern threat landscape. Different threat categories are identified which could be prioritized for mitigation in the NGI initiative. Grouped together as 'Force majeure' (Natural disaster, Man-made disasters, Adversary AI), 'Technological' (Cascade of system failure, Spillover from inadequate isolation/segmentation), and 'Human intent' (Cyber warfare and cyber conflicts).

Follow the discussion:

WORK PROGRAMME 2019 OPEN INTERNET INITIATIVE/INTERNET RESILIENCE

https://consultation.ngi.eu/channels/work-programme-2019-open-internet-initiative/internet-resilience

Improving Maintainability and Deployability

Flexibility and responsiveness is essential for Internet as a system. Without proper procedures for maintenance and without auditability, a system cannot be expected to be secure and reliable. It is also important for NGI initiative to make sure that R&D efforts should be deployable and maintainable in the context of actual Internet environment. A successful approach for NGI would be to create a universal and reliable path to automatable deployment even during (continuous) development.

Follow the discussion:

WORK PROGRAMME 2019 OPEN INTERNET INITIATIVE / IMPROVING MAINTAINABILITY AND DEPLOYABILITY

https://consultation.ngi.eu/channels/work-programme-2019-open-internet-initiative/improving-maintainability-and-deployability

2020 and beyond (post H2020)

This section represents discussions of topics that need to be addressed beyond H2020 in the NGI flagship era.

NGI Beyond 2020
https://consultation.ngi.eu/ngi-beyond-2020

This is the discussion about the vision for NGI beyond H2020 focusing on the longer term priorities for NGI.

Emerging NGI Technologies
https://consultation.ngi.eu/emerging-ngi-technologies

This discussion is focused on the application of NGI technologies like AI, IoT and Interactive Technologies including Virtual Reality (VR), and Augmented Reality (AR)

Hyperconnected Sociality
https://consultation.ngi.eu/hyperconnected-sociality

This discussion channel is focused on:

» Mobilising a positive vision as to the role that social media will increasingly play in communication, exchange, business, creation, learning and knowledge acquisition.

» Overcoming the critical issue of trust and governance through democratic reputation mechanisms and user experience.

» Creating a Global Social Sphere.

Inclusive NGI
https://consultation.ngi.eu/inclusive-ngi

The aim is to enable every citizen, from all walks of life, to fully take part in the digital single market. The next generation internet will have to empower users, including the most vulnerable or challenged, to have access to the same digital learning opportunities, in forms that are accessible, perceivable and understandable by everybody.

Multilingual NGI
https://consultation.ngi.eu/multilingual-ngi

The objectives of this discussion channel include:

» Supporting technology-enabled multilingualism for an inclusive digital single market.

Ensuring every European has access to content and can engage in written and spoken communication activities without language being a barrier.

Overcoming linguistic fragmentation to enable all citizens and businesses to engage in online activities and benefit from online content and services.

Wealth Distribution in Digital Economy and New Business Models https://consultation.ngi.eu/channels/socio-economic-considerations-ngi/wealth-distribution-and-new-business-models

Wealth distribution and economies are being increasingly influenced by the digitization and Internet. The proliferation of AI and automation is becoming a major threat to human employment. As the machines will take over certain tasks in the economy, there is a need to find new ways of distributing wealth.

Compared to other business types, SMEs are seen to be at a disadvantage and need help to take advantage of NGI. Investment policies and legislations should aim to increase the abilities of SMEs to profit from NGI technologies. Furthermore, new business models are needed to challenge the current dominance of the large incumbents. New collaboration based business models which integrate people and resources from various disciplines might help significantly.

Need for a new Internet Architecture https://consultation.ngi.eu/channels/ngi-beyond-h2020/need-new-internet-architecture

It is argued by many researchers and technologists that the five decades old Internet architecture is not proved to be able to provide best foundation for the next generation services and applications. The simple 4 layer TCP/IP model has now become a very complex structure. To solve the emerging problems, more and more building blocks were added and a very complex solution is the current result. Today's Internet is it has bad performances, bad security, hard to build and maintain, and configuration and operational costs are through the roof.

Evolving Edge and Safeguarding Open Internet https://consultation.ngi.eu/channels/open-internet-initiative/evolution-edge-and-issue-fragmentation

Increasingly many new services (IoT, smart grid, health) are being delivered from Internet edge (home or enterprise access networks, their ISPs). However, these emerging services require specialized infrastructure, which may create private islands of connectivity that

don't use public Internet posing a risk for interoperability and to the future of global open Internet [Read more]. Another driver for specialized edge networks is the need to provide ubiquitous connectivity for emerging latency/bandwidth intensive applications such as IoT, HD video, the proliferation of which will make the user edge more complex and lead to the deployment of proprietary and specialised solutions [Read more].

Safeguarding Standardization and Innovation https://consultation.ngi.eu/channels/open-internet-initiative/safeguarding-standardization-and-innovation

Open and voluntary standards have long been the core of the Internet's success. However, standardization process will be challenged in the future by the speed of Internet innovation, the complexity of the emerging infrastructure and services, and possible inclination towards proprietary systems. Standards development processes thus have to evolve to mitigate manipulation from big corporations, in making the process less cumbersome and incentivizing as well as engaging more and more innovators into the standardization process.

Cooperative Security Needed in the Future Internet https://consultation.ngi.eu/channels/privacy-and-trust-enhancing-technologies/cooperative-security-needed-future-internet

Too often companies and other entities are reluctant (for good reasons) to share security related information. Prevailing principle is: what is inside my walls is my business, the rest of the Internet including my customers, does not concern me. Plus everyone handles security patching themselves, or leaves it until later. No surprise that most security breaches take place using known vulnerabilities for which patches exist. The hackers can keep on using the same resources against many potential victims. The solution is cooperative firewall (customer edge switching).