

The logo for 'Next Generation Internet' is a teal square with a white border. Inside the square, the words 'NEXT', 'GENERATION', and 'INTERNET' are stacked vertically in white, uppercase, sans-serif font. The bottom right corner of the square is cut off, creating a speech bubble effect.

# NEXT GENERATION INTERNET

## The Next Generation Internet

Fields marked with \* are mandatory.

### Consultation for a Next Generation Internet Initiative

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#### **Setting the scene**

The Internet is ever more critical for most aspects of our daily life, for work, education and leisure. The next generation Internet will be even more pervasive, working with and through many different devices and sensors, and will present completely new functions and characteristics. It can become a more human Internet, and contribute to a stronger presence and competitiveness of the EU worldwide. Given the importance of the Internet, both private and public interests in the domain are huge, and may dramatically change the way Internet will work in the future.

When we talk about the Internet we mean that in a broader sense, i.e. the networks and technologies powering the network and computing, the services and applications delivering user value, all the socio-economic innovation it enables and also the policies governing its use and evolution.

#### **The Next Generation Internet initiative**

There are many activities ongoing; they may be focussed on technical aspects, on new services and application, or on delivering social innovation. Everybody invests into the Internet, companies and startups, and all levels of public sector – from regions to Europe. The Internet has many diverse stakeholders from the research, technical and business communities, but the views of citizens and the civil society deserve more attention.

We believe it is the right time to take a fresh look, with a broad and inclusive perspective. Therefore the European Commission launches the 'Next Generation Internet' initiative.

A first step is to open a broad conversation and consult with those actors who are the drivers of this next generation Internet, notably young researchers, the emerging generation of Internet start-uppers and civil society.

To kick-start this conversation and reach out to actors new to us, we put together a series of questions (see below). By no means do they cover all possible aspects of a next generation Internet, but they give us a start to a conversation which should help us defining research and innovation priorities for Horizon 2020. The first set of questions is higher level and citizens oriented, the latter part dives into specific technologies we believe relevant in developing the next generation Internet.

In this consultation we seek to be as open as possible. Some technology areas that could have a strong influence in the development of Internet in the years to come are presented, but there are no preconceived ideas and any new ideas for other or different priorities are welcome.

### **Why is this important**

Being home to [615 million Internet users](#), Europe is a major actor on the Internet. The European Union is the world's single largest online market. Europe is home to many more great Internet companies than what is commonly known and many more are scaling up fast. Europe is strong in social innovation and is at the forefront of digitising its public sector. European values should influence the next generation Internet.

In order to back up this consultation and provide additional information, we have created a dedicated space for the Next Generation Internet initiative on [Futurium](#). This will be our open space for conversations, for [additional information, background documents and other material](#). This is also where we will launch additional discussions on those topics that raise most interest in the consultation, giving you the opportunity to provide more detailed contributions at a later stage. Please note that a preparatory consultation was carried out in March 2016.

The deadline for giving input to this consultation is **9 January 2017**. A report with the outcomes of this consultation will be published in January 2017 on [Futurium](#).

Please keep your answers brief and to the point in the "free text" boxes in order to facilitate the processing of the responses.

## Identification of Respondent

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**\* You are replying to this consultation as** *(up to two answers are possible)*

- researcher/ research institution
- small and medium enterprise (SME)/ start-up
- enterprise (not SME)
- industry (ICT sector)
- industry (other sectors)
- public employee/ public administration
- civil society (including NGOs, freelancers, citizens)
- other

Any category that is not mentioned above

*100 character(s) maximum*

**\* Gender**

- female
- male

**\* Age**

- 18-24
- 25-34
- 35-50
- 51-65
- over 65

**\*In what country do you live at the moment?**

- Austria
- Belgium
- Bulgaria
- Croatia
- Cyprus
- Czech Republic
- Denmark
- Estonia
- Finland
- France
- Germany
- Greece
- Hungary
- Ireland
- Italy
- Latvia
- Lithuania
- Luxembourg
- Malta
- Netherlands
- Poland
- Portugal
- Romania
- Slovak Republic
- Slovenia
- Spain
- Sweden
- United Kingdom

Any country that is not mentioned above

*100 character(s) maximum*

**\* Have you ever applied for or participated in a Horizon 2020 research and innovation project?**

- Yes
- No

## Questions

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The Internet as we define it here is broad. Tell us more about what values are a priority for you: how would you rate the relative importance of the following statements?

|  | 5 (high)              | 4                     | 3                     | 2                     | 1 (low)               |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Internet should be more human - social, easy, immersive, emotional.  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Internet should avoid the concentration of data in a few proprietary platforms.  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Internet should ensure diversity, pluralism and a right to choose.   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Internet should ensure citizens' sovereignty over their own data and protect privacy.                                    | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Internet should be more inclusive, participatory and transparent.  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Internet should be a level playing field for new entrants and new economic models.                                       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Internet should be more resilient, secure and safe, especially for children, elderly and people with low digital skills. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Internet should be a real agent of change towards sustainability.  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

**Other Statements? Please, share with us!**

*200 character(s) maximum*

## Questions focused on technology areas

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In the next sections you will be able to provide your opinion on the relevance of the technology areas identified and provide additional information in "free text" fields.

Please tell us in addition which technology areas you consider key drivers in future Internet developments.

Please note that you do **NOT** have to respond to each of the technology areas below.

At the end of the consultation there are two more questions regarding types of research and key research actors - we would like to know your view on this!

## Technology area 1: **Discovery and identification tools**

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*One of the premises of the Internet of Things is that devices around us will be partly physical and partly digital, with a vast majority of those devices being "headless", lacking buttons, screens and other means by which the user interacts with the device. This premise forces us to figure out ways to discover, identify, and interact with the objects, devices and services in our lives in a seamless way, as well as ways to be made aware of the connected devices that surround us at any given moment.*

**How important do you consider this area to drive the transformation of the Internet?**

- very important
- important
- not that relevant

**Research and Innovation challenges that will be critical to address in this area:**

*1000 character(s) maximum*

**Indicate up to three relevant national or European initiatives in the area:**

*500 character(s) maximum*

**What is your expertise in this technology area?**

- I work in this area
- I have a good understanding of the area
- I have just general knowledge

## Technology area 2: **New forms of interactions and immersive environments**

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*Increased computing, transmission power and next generation of devices (enabled by micro-nano-bio technology) allows conceptualizing new forms of interactions with machines and immersive environments that will have an impact in our professional and private life. New challenges are raising related to augmented and virtual reality, behaviour, human-computer interactions, haptics, human-human interactions through computers, machine-to-machine, spatial recognition and geographic information systems.*

**How important do you consider this area to drive the transformation of the Internet?**

- very important
- important
- not that relevant

**Research and Innovation challenges that will be critical to address in this area:**

*1000 character(s) maximum*

**Indicate up to three relevant national or European initiatives in the area:**

*500 character(s) maximum*

**What is your expertise in this technology area?**

- I work in this area
- I have a good understanding of the area
- I have just general knowledge

## Technology area 3: **Personal data spaces**

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*Personal data privacy is one of the biggest concerns of today's internet. Personal data is everything that identifies an individual, from a person's name to telephone number, IP address, date of birth and photographs. The next generation Internet aims to develop technologies to help us achieve greater control of our personal data, knowing what is being shared and with whom.*

**How important do you consider this area to drive the transformation of the Internet?**

- very important
- important
- not that relevant

**Research and Innovation challenges that will be critical to address in this area:**

*1000 character(s) maximum*

**Indicate up to three relevant national or European initiatives in the area:**

*500 character(s) maximum*

**What is your expertise in this technology area?**

- I work in this area
- I have a good understanding of the area
- I have just general knowledge

## Technology area 4: **Distributed architectures and decentralised data governance**

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*Distributed open hardware and software ecosystems are capable of supporting decentralised data management (so that each piece of user-generated information remains under the full control of the entity who generated it, and is subject to on-demand aggregation by third parties), leveraging on decentralised algorithms based on blockchains, distributed ledger technology (DLT) or peer-to-peer (P2P) technologies.*

**How important do you consider this area to drive the transformation of the Internet?**

- very important
- important
- not that relevant



**Research and Innovation challenges that will be critical to address in this area:**

*1000 character(s) maximum*

**Indicate up to three relevant national or European initiatives in the area:**

*500 character(s) maximum*

**What is your expertise in this technology area?**

- I work in this area
- I have a good understanding of the area
- I have just general knowledge

## Technology area 5: **Software defined technologies**

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*There is an evolution towards software-defined technologies. These may provide more functionalities and control for the allocation of resources, configuration and deployment, and may open new opportunities to develop the Internet.*

**How important do you consider this area to drive the transformation of the Internet?**

- very important
- important
- not that relevant

**Research and Innovation challenges that will be critical to address in this area:**

*1000 character(s) maximum*

**Indicate up to three relevant national or European initiatives in the area:**

*500 character(s) maximum*

**What is your expertise in this technology area?**

- I work in this area
- I have a good understanding of the area
- I have just general knowledge

**Technology area 6: Networking solutions beyond IP**

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*The current internet has certain limitations derived from its protocols that were developed in the 70's, like the [transmission control protocol/internet protocol](#) (TCP/IP) and its limitations on mobility, IP address management and task limitation. [Quality of Service](#) (QoS) is another problem derived from TCP/IP, which is a problem generated by the inherent nature of networking technologies and the focus on pumping data from point A to point B as fast as possible without focusing on how the data is sent. The internet of the future should be able to overcome these limitations.*

**How important do you consider this area to drive the transformation of the Internet?**

- very important
- important
- not that relevant

**Research and Innovation challenges that will be critical to address in this area:**

*1000 character(s) maximum*

**Indicate up to three relevant national or European initiatives in the area:**

*500 character(s) maximum*

**What is your expertise in this technology area?**

- I work in this area
- I have a good understanding of the area
- I have just general knowledge

**Technology area 7: Artificial Intelligence**

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*Artificial intelligence will also change the Internet. Inspired by how the human brain works, mathematical models can learn discrete tasks by analysing enormous amounts of data. So far, machines have learnt to recognize faces in photos, understand spoken commands, and translate text from one language to another. But this is only the beginning. Artificial Intelligence will greatly sharpening the behaviour of any online services and be core technical enabler of the future Internet.*

**How important do you consider this area to drive the transformation of the Internet?**

- very important
- important
- not that relevant

**Research and Innovation challenges that will be critical to address in this area:**

*1000 character(s) maximum*

**Indicate up to three relevant national or European initiatives in the area:**

*500 character(s) maximum*

**What is your expertise in this technology area?**

- I work in this area
- I have a good understanding of the area
- I have just general knowledge

**Other important technology areas not mentioned above**

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*Please add **up to two** other important technology areas not mentioned above.*

**Additional important technology area 1 (not mentioned above)**

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**Title of another important technology area:**

*100 character(s) maximum*

**Description of the area and research and innovation challenges that will be critical to address in this area:**

*2000 character(s) maximum*

**Indicate up to two relevant national or European initiatives in the area:**

*500 character(s) maximum*

**How important do you consider this area to drive the transformation of the Internet?**

- very important
- important
- not that relevant

**What is your expertise in this technology area?**

- I work in this area
- I have a good understanding of the area
- I have just general knowledge

**Additional important technology area 2 *(not mentioned above)***

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**Title of another important technology area:**

*100 character(s) maximum*

**Description of the area and research and innovation challenges that will be critical to address in this area:**

*2000 character(s) maximum*

Indicate up to two relevant national or European initiatives in the area:

*500 character(s) maximum*

How important do you consider this area to drive the transformation of the Internet?

- very important
- important
- not that relevant

What is your expertise in this technology area?

- I work in this area
- I have a good understanding of the area
- I have just general knowledge

## Type of research and key research actors

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### \* Type of research

Which type of interdisciplinary research is necessary to bring out the Internet of tomorrow?

- long-term research only
- applied research only
- a combination of long-term and applied research
- other

Any category that is not mentioned above

*100 character(s) maximum*

## \* Key research actors

Who do you believe should be target key actors to carry out the research work?

- academic researchers
- high-tech start-ups
- industry
- a mix of the above
- other

Any key research actor that is not mentioned above

*100 character(s) maximum*

## Key research initiatives

Please tell us about relevant Internet research and innovation initiatives in your organisation or your country which we should be aware of or which may have a bearing on the Next Generation Internet initiative we prepare.

## Contact information

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Please feel free to leave us your email address for further information on the Next Generation Internet initiative.

*Privacy Statement:* The information you provide will be used strictly in accordance with the provisions of Regulation (EC) No 45/2001 on the protection of individuals with regard to the processing of personal data by the Community institutions and bodies and on the free movement of such data.

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