

CITIZEN ENGAGEMENT AND MEDIA CAMPAIGN ON THE NEXT GENERATION INTERNET

Analysis and results of the launch of REIsearch 2.0



IN COOPERATION WITH:



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Atomium – European Institute for Science, Media and Democracy (EISMD) – brings together some of the most authoritative universities, newspapers and businesses in Europe in the first intersectoral platform to promote knowledge sharing and “out of the box” thinking on issues regarding the development of a European knowledge society.

Atomium – EISMD was launched publicly by the former President of France Valéry Giscard d’Estaing and by Michelangelo Baracchi Bonvicini, together the leaders of the institutions engaged, at the European Parliament in Brussels during the first conference on the 27th of November 2009.

Atomium - EISMD seeks to balance the interests and needs of six different societal actors: researchers, universities, businesses, media, policy makers and, most importantly, citizens. Focussing on the role of science in the 21st century, seeks to align the five key areas:

- 1) Science-Based Policy Making
- 2) Science Communication
- 3) Education
- 4) Equality and Equal Access
- 5) Innovation through Collaboration

Aligning these categories with each other will enable European citizens to successfully account for all the varied faces of society in an ultimately positive way.

In 2016, Atomium-EISMD launched the REsearch Platform, with the support of the European Parliament and European Commission, as a bridge to linking citizens, researchers and policy makers on topics linked to the scientific research and to societal challenges that Europe will face in the years to come.

After the first citizen engagement and media campaign on Chronic Diseases (April 2016), REsearch has launched the campaign on the Next Generation Internet (April 2017) and is showing how a technology tool, coupled with a broad network of leading media, research institutions, researchers, civil society organizations, and citizens, can help policy makers to make better use of all knowledge and experience - wherever they may come from - to make better decisions based on evidence and experience, for the benefit of society as a whole.

Atomium - EISMD is organised under the Law of Belgium as an International Non-Profit Organization (Association International Sans But Lucratif).

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REsearch is funded by the European Commission’s Directorate-General for Communications Networks, Content and Technology. The views expressed do not necessarily reflect the views of the European Commission. (contract nr 30-CE-0682336/00-34).

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EXECUTIVE SUMMARY

Many Europeans are highly interested in the Next Generation Internet (NGI) and expect a better alignment of the digital world with values including human rights, dignity, freedom, democracy, equality, and the rule of law. The discussion on this complex area is, however, fragmented, with few young people and women involved, not to mention people living in rural areas and ethnic minorities. We need more debate between stakeholders - whose interests are not always aligned - and with citizens, in order to develop shared actions to build the internet of the future in a way which reflects European fundamental values. As highlighted by Commissioner Timmermans during the NGI Summit, "technology has no innate morality. Nuclear power can cure, and it can kill. Innovation above all is a moral and political challenge. For innovation and technology to serve us, we – humanity – must endow innovation with true meaning. For this reason, the Next Generation Internet must be more than the Internet of things. It must be the Internet of values" and these values are first and foremost those reflected in the European Social Model, according to which nobody must be left behind. Indeed, as pinpointed by Commissioner Moedas, the internet is as good as our purpose in using it, and "we will create purpose if we connect people to solve climate change. If we get all the data together and cure cancer. If we reduce inequality".

While it is difficult to understand what policies and regulatory interventions are needed to strike the right balance between fostering innovation and managing disruption, given the breadth, pace and interconnectedness of technological innovation, there is general agreement that European policy-makers have a pivotal role to play in designing the Next Generation Internet in a way which reflects and supports the above-mentioned values. In the words of MEP Alain Lamassoure, "we need to give science all its place, but nothing more than a right place, as it is not for scientists to decide on collective use of their research, it is indeed for policy-makers, democratically elected. And while Silicon Valley researchers and entrepreneurs pretend that their science is able and allowed to prescribe the future of mankind, and it is a current debate now between transhumanism and post humanism, we should never forget that Europe is the birth place of humanism, and it must remain so. Science alone will never be able to give the answer to the fundamental question of human anguish – the meaning of life."

However, such moral and political imperatives demand a new mindset as well as new tools. While policy-makers and the public sector need to proactively drive the innovation process via policy and regulatory action, they cannot act alone and in isolation as new governance systems are required to balance top-down and bottom-up approaches, including standards and self-regulation from companies. Indeed, as remarked by DG CNCT Director-General Roberto Viola during the NGI Summit, when DG CNCT started to explore the idea of designing a set of policies and supporting programmes to drive the development of the internet in the next 30 years in line with EU values of openness, inclusion and safety, the project was called "Agora, because we really wanted an open space for everyone to be in". As highlighted by Kathryn Brown from the Internet Society, "we actually have to move from managing disruption to the things as they are, to inventing new frameworks for anticipating and managing the way things will be. And to do that, the internet way requires that the discussions, the decision-making enforcement be inclusive and multi-stakeholder", or, in Commissioner Moedas words, "now Parliament's legislative processes take up to five years. But technology is moving much faster than that. Legislation can't keep up. After five years we are legislating for products that don't exist. Or for things that are completely different by then. This will have to change. And that means our governance will have to change.

Stakeholders will have to play a bigger role. Governments will need to legislate with everyone around the table. So that



the result is truly user-driven and user-centric". In a nutshell, this means engaging with people and their organisations to understand the objectives of policy actions and driving the necessary change, while also allowing enough flexibility to adjust to a fast-changing world. This is what MEP Mariete Schaaake defines a "principles-based" approach to regulation.

Parallel themes emerge among the indications from RElsearch's second citizen engagement and media campaign focusing on the topic of the Next Generation Internet.

RElsearch is a platform connecting citizens, researchers, and policymakers on topics linked to scientific research, with the overarching aim of helping to address societal challenges that Europe will face in the years to come.

The main objectives of RElsearch's NGI campaign were to:

- Inform citizens about the threats and opportunities related to internet technologies' developments in different areas, particularly in terms of their socio-economic impact potential;
- Better understand what EU citizens think, feel, fear, and express about future internet technologies and their potential impact on the way we will live, work, and play over the next decade.

To achieve the first objective, preparatory work was carried out to analyse and pinpoint the most pressing issues related to NGI technologies and their impact on the economy, society and individuals. This was done in close consultation with the initiative's Scientific Committee, knowledge and business partners, and representatives of the European Institutions.

Based on this preparatory work, the media campaign was launched on the 18th of April, with dedicated articles published through paper and online editions of Atomium's media partners: Der Standard, El País, Elsevier, Frankfurter Allgemeine Zeitung, La Libre Belgique, Gazeta Wyborcza, Luxemburger Wort, Público and Sole24ore. The initiative was also featured in The Guardian, Politico and other specialised media outlets.

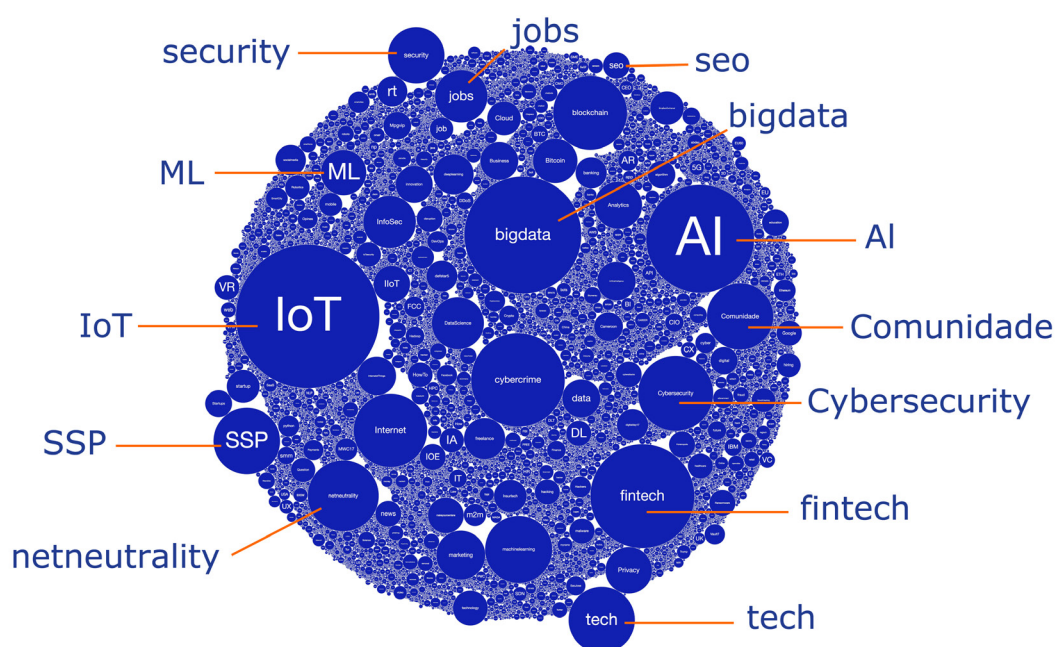
The media campaign, which ran for three weeks, was built around three main topics: (i) The economy, including businesses, employment, and skills; (ii) The public sphere, with a focus on how the rise of social media and Artificial Intelligence (AI) is disrupting how we access and use information; and (iii) Blurring the boundaries between offline and online/virtual worlds and the impact of internet technologies on our daily lives.

As a result of the media campaign, a total of 53 articles were published. While we were unable to track the total number of people who read the articles, we know that articles published by the media partners received around 300 comments, and that approximately 23,000 people visited the RElsearch platform during the media campaign, with another 11,000 joining after its end in May 2017. Over 8,600 people participated in online consultations in the form of responding to questionnaires, of which 3,514 completed the questionnaires in full. The online articles published during the media campaign contained a link to an online consultation, presented in the form of a questionnaire that centred on the topic of the week. Each questionnaire was prepared with the support of the initiative's Scientific Committee and relevant stakeholders and was accessible online for the entire week.

To partly compensate for these limitations, this report actively tries to combine and compare multiple insights from our online consultation and network/sentiment analysis with literature findings and data from the recent Eurobarometer 460 'Attitudes towards the impact of digitisation and automation on daily life' and the Standard Eurobarometer 86 'Media use in the EU'.

tech

Fig 1. Most discussed topics on social networks (Source: EISMD – HER 2017 network analysis).



1. The artistic recording of the NGI Summit can be found in Annex to this publication.

Finally, in response to the scarce representation of women and young people among both the participants to the event, the respondents to the online consultation and the sample analysed with the network and sentiment analysis, a member of the Scientific Committee, Professor Andrzej Nowak from Warsaw University, with the support of the CEO of Polish Company Ogólnopolski Panel Badawczy Ariadna, Mr Tomasz Baran, decided to run the survey focused on the 'information, democracy and social media' subtopic to a statistically representative sample of people in Poland. Interestingly enough, with the exception of a couple of questions, results are not too different from those obtained via REsearch's online consultation, as better detailed in the chapter dedicated to the results of week 2 and in the Annex to this report.

Overall, this analysis allowed us to identify 12 unsolved challenges spanning across four areas for future research and action, which we believe will need to be addressed by policy-makers and stakeholders to build a more inclusive, open and human-centred next generation internet. These key challenges are outlined below:

ENGAGEMENT AND INCLUSION

1. In terms of **participation and interest**, it is clear that the discourse around technology, and particularly around the Next Generation Internet, is limited to a relatively small group of highly educated and invested people. It is also remarkably male-dominated, and young people are hugely underrepresented. This suggests that targeted communication and awareness raising actions are needed at EU as well as at national and local levels if we want to extend the debate on the Next Generation Internet to EU citizens and, most importantly, if we want them to fully benefit from the positive socio-economic potential of internet technologies. This means considering the different vocabularies, linguistic styles, and behavioural patterns of different population groups, as well as preferred media, channels, and places for communication. For example, design, arts, or gamification processes might appeal to younger audiences, while the workplace seems the best place where women are at ease expressing their opinions on technology topics. From a research perspective, more work and a combination of methodological approaches are needed to better understand what people think, fear and expect from Next Generation Internet technologies. This, in turn, would allow to better inform policy-making and to develop the right regulatory and policy frameworks, as well as funding programmes, at different levels of government. Equally, it would allow to better understand how different stakeholders from both the public, private and third sector could better collaborate to build the Next Generation Internet in a way which, further to fostering economic growth, would reflect the European values of openness, collaboration, inclusion and respect of citizens' rights.

2. In our sample, most people expressing their opinions on NGI technologies and their impacts are aware of **both risks and opportunities** implied by the ongoing digital revolution. They are genuinely interested in several issues, and looking for further information and dialogue, beyond both technocratic optimism and pessimism. This is particularly evident from our network and sentiment analysis, where many conversations are about preserving net neutrality and equal access to the internet or making sure that user privacy, security, and data ownership are respected, and that data based profiling does not result in manipulation of people or the democratic process. This is further confirmed by the online consultation, as well as by comments posted on the media-partners' websites and on social media, where respondents are cautious about the positive impact of potential of NGI technologies, and agree on the need for public institutions to better understand and tackle disruptions caused by the innovation process: on the job market; on citizens' behaviours and psychology; and on our democracies. More efforts are needed at European, national, and local levels to create spaces and places where citizens, stakeholders, and policy-makers could exchange ideas on the future of NGI related issues, such as safer society, better work-personal life balance, more control on personal data, better connectivity and so on. The aim is to find shared positions and build a roadmap for action, similarly to what happened for example in the 1960s to 1980s in terms of environmental movements. While it is crystal clear that policy-makers and the public sector, in general, should lead the regulatory and policy process leading to the development of the NGI, new means are required to open up this process to involve multiple stakeholders as well as individuals, building on their collective intelligence. In this sense, as highlighted by OpenGov Simon Willis, the Open Government agenda needs renewed commitment and better execution, and a more experimental approach to regulating should be taken. In the words of Robert Madelin, Chair of the NGI Summit, we need a "principles-based, agile, helical and open regulation. Regulation using technologies rather than simply sorting of manual intervention of regalian regulators."

BUSINESS, JOBS AND SKILLS

3. Both our online consultation and network/sentiment analysis show that **it will be key to invest and catalyse investment in promising areas**. This includes stepping-up efforts to develop the European Data Economy according to the Digital Single Market Strategy, and building on European excellence such as the increasingly well-established Fin-tech sector. It also includes capitalizing on the need – and space – to develop cutting-edge solutions and businesses in the privacy protection and cyber-security areas. Indeed security (e.g. Cybersecurity, Cyberattacks and Malware), privacy and surveillance are at the centre of Europeans' concerns. At the same time, these areas are considered key areas for the development of new businesses, where cutting-edge research and innovation can serve people's security and rights, particularly via Cloud solutions and distributed networks, also building on existing initiatives such as the European Cloud Flagship.

The potential of AI, Virtual Reality (VR) and Augmented Reality (AR), particularly in the customer management and marketing fields, should also be leveraged. Emerging technologies such as blockchain and distributed ledgers – which are still not familiar to most people - should be supported, and funding should be devoted to the creation of European platforms based on open source and democratic principles which could provide a decentralized alternative to the dominant American platforms that aggregate data at a worldwide level (this idea was endorsed by 70% of respondents to our online consultation). Indeed, European citizens are concerned with the increasing power of dominant platforms (with nearly 80% of respondents to the online consultation stating that it is important to limit the increasing power of dominant platforms aggregating data and nearly 70% agreeing that sharing economy platforms should be regulated more organically) and about the way their personal data is used. Collective intelligence platforms, where blockchain technology could be used to efficiently distribute benefits among people involved in any transaction, could be a viable and fairer alternative to centralised sharing economy platforms. Supporting the creation of connected European poles of excellence in the abovementioned areas could also contribute to raise citizens' confidence in our economy. Currently, concerning the role of ICT in growing the influence of Europe in the world, only a minority of respondents to our online consultation think this might be a possibility. This seems in line with the Eurobarometer 460, according to which "opinions are mixed as to whether the EU is ahead of other world regions when it comes to the digital transformation of industry", with 41% agreeing and around 33% disagreeing. Similarly, from the network and sentiment analysis, the tendency to look at the States to spot emerging trends – particularly in terms of educational and business opportunities – emerges with clarity. Designing actions to support the development of business excellencies answering priorities which are typically European, could greatly contribute to bringing Europe to the centre of the Next Generation Internet. At the same time, investing in infrastructure is also of the essence if we want Europe to take full advantage of the ongoing technological revolution, as pinpointed by Vice-President Timmermans "we have to prepare for this data deluge: storage, infrastructure, security, transferability - to name just a few issues to tackle. In the next 30 years, if not sooner, the Internet of Things should be a widespread reality. Analytic and processing capabilities will have progressed and offer intelligent machine learning. Robotics and artificial intelligence will be more system-embedded and mainstream. We could imagine depending less on specific connected devices, and more on the most appropriate one that is immediately to hand", this implies a dramatic improvement of the current infrastructure, starting with our broadband network. As remarked by Mr Houkun Hu, Deputy Chairman of the Board and Rotating CEO of Huawei, "according to the EU report on digital progress the 30 Mbps broadband network coverage is around 76% in Europe. However, the percentage goes down to 40% in rural areas, and while Europe needs a total investment of 500 billion euros to meet its objectives in terms of connectivity by 2025, we are still short of 155 billion euros. These are big gaps and a problem for further digital transformation, calling for policy action and collaboration between public and private stakeholders".

4. In line with the Reflection Paper on the Future of Social Europe, Member States and local governments should be supported in the effort to **adjust their social protection systems to the ongoing technological revolution**. More research and experimentation are needed to pilot and scale new institutional arrangements and governance models to compensate employment or revenue losses caused by ongoing automatization processes, as well as the lack of social protection for workers of the so-called gig economy. People are particularly concerned when it comes to the impact of internet technologies on employment rates and salaries, with only one in five respondents to RElsearch's online consultation believing that "the digitisation and 'internetisation' of business will deliver meaningful work for all, and generate salaries that equal or exceed current levels".

While answers may be a reaction to the very optimistic tone of the question, they are largely confirmed by the results of the Eurobarometer 460: "Although more than six in ten respondents have a positive view of robots and artificial intelligence, an even higher proportion (72%) agree robots and artificial intelligence steal people's jobs" and "almost three quarters of respondents (74%) agree that due to the use of robots and artificial intelligence, more jobs will disappear than new jobs will be created". This is at least partly contradicted by the findings of the network and sentiment analysis, where concerns about "uberization" of the job market and rising unemployment are in good measure balanced by the excitement around new areas of business development such as cybersecurity, fintech and social media. This, however, might be due to the fact that users talking about the future of the internet on social media tend to be quite knowledgeable, and often already working in the sector, and therefore less preoccupied about negative consequences of technological advances on their employment situation. Even at the academic level, as remarked several times during the NGI Summit, projections around the impact of the digital revolution on the job market such as Frey and Osborne's *The Future of Employment* study, are far from being recognised as methodologically sound, while according to Deloitte's *Human Capital Trends Study* "there is no fatality for the workforce in the next generation internet era: we are far from the situations where organisation will have the binary option replacing jobs or not. 77% of companies told us they either busy retraining people to use technology or will redesign jobs to take better advantage of human skills".

5. Policy interventions and investments should aim to increase SMEs' and civil society organisations' ability to profit from NGI technologies. Indeed, SMEs and civil society organisations are not currently perceived as well placed to take full advantage of NGI technologies, in stark contrast to established tech companies and start-ups. To avoid SMEs and social enterprises being 'left behind', the EU and member states should further support their readiness to use NGI technologies for growth and scaling. This seems particularly important in the NGI growth sectors such as services, cultural/creative industries, finance, and manufacturing. Indeed, as remarked during the NGI Summit by Mr Michele Angelo Verna, and based on Assolombarda's 'European firms Performance Landmark Analysis', which analyses the performance of over 700 SMEs from the five most industrialised regions in Europe since 2009, those companies that innovate both in terms of products and processes, that are internationalized, which go through efficient digital transformations and invest in management skills, are over 200% more performing than enterprises of the same size, operating in the same sector for the same time and with the same levels of capitalisation. However, there is no clarity around what policies, particularly at the EU level, could support the transformation of SMEs' ways of working, raising managerial skills to make them able to take advantage of the digital revolution to innovate, grow and internationalise. This is indeed a problem also for large companies, and particularly when it comes to managing collective intelligence: as remarked during the NGI Summit, according to Deloitte's *Human Capital Trends 2017* study, only 17% of global executives report they are ready to manage a workforce with robots, people and AI working together. This is the lowest level of readiness recorded for a trend in the last 5 years of surveying trends. In this sense, more research and policy experimentation are needed.

6. It is important to raise people's awareness of the significance of **acquiring ICT skills throughout their lives**, reducing the gap between 'technicians' and 'non-technicians', encouraging collaboration among public and private institutions to develop and disseminate innovative teaching methods, and supporting skills exchanges and ICT-enabled learning. Technical skills should be provided together with more transversal skills, such as complex problem solving and critical thinking. All along the education continuum, transdisciplinarity should be encouraged. While further research would be needed to validate this hypothesis, it seems that European citizens tend to underestimate the importance of their ICT skills, both as part of education curricula, and as the objective of life-long learning activities. This is true at all levels, but as remarked during the NGI Summit, particularly within the public sector, where, on the one hand, decades of Silicon Valley rhetoric have convinced policy-makers that regulating means killing innovation and, on the other hand, technical skills are often considered by high-ranking public officers and politicians as "a kind of a necessary evil that you get other people to do, people that didn't go to Oxford or Cambridge. That is a kind of deep, binding cultural problem" (Simon Willis, NGI Summit).

SOCIAL MEDIA, DEMOCRACY AND THE PUBLIC SPHERE

7. According to both our online consultation and network analysis, the **relationship between internet technologies and democracy is highly conflicted and uncertain**, with users wondering if and to what extent recent elections (particularly the US Presidential elections and the Brexit referendum) were influenced by big-data based profiling and targeting of voters, often based on fake-news. Fears about collusion between government and tech companies to spy on citizens and implement social control policies are also recurrent, and from this point of view, Europe - with its advanced General Data Protection Regulation (GDPR) and the forthcoming update of the ePrivacy Directive - appears particularly well placed to re-establish trust in the internet for connecting with public debate and democratic processes. Europeans highly value their right to access reliable, well documented and diverse content, and are hugely concerned by the possibility of being profiled and manipulated via targeted messages. Indeed, nearly 80% of our online survey participants agreed that action is needed to tackle phenomena such as echo-chambers, filter-bubbles, fake news and hate-speech. This means first and foremost investing in educating and empowering citizens, but also in promoting fact-checking solutions based on research and science and supporting experimentation around technological solutions such as AI and distributed networks. Importantly, as remarked by international human rights organisation Access Now, the European Commission and member states should start a comprehensive reform of current surveillance practices affecting individual rights, to prevent the retention of data or attempts to limit the use of encryption.

8. Making sure that there is a **fair balance between the right to access information and freedom of speech** is also a key point. Further research is needed to validate this hypothesis, but from our network/sentiment analysis and online consultation it seems that while a majority of people support a "hard-regulation" approach to issues such as data/privacy protection, most people are against the idea of regulating tech-companies on fake-news and hate speech, since this would imply a high-risk of censorship and social control. While, as highlighted by Access Now, voluntary codes of conduct present clear risks in terms of arbitrariness and unaccountability, strictly regulatory approaches present clear risks in terms of surveillance, and as highlighted by many MEPs during the NGI Summit, protecting freedom of speech is key if we want to foster democratic participation. What is needed is a mix of open-government and smart-regulation approaches – promoting bottom-up participation and total transparency, new forms of technology-enabled distributed governance systems, as well as clear explanations on how information is sourced and by whom and more investment into educating people to navigate increasingly large amount of information.

9. Particularly from our online consultation, there seems to be relatively little awareness about the **potential of NGI technologies to address and overcome a broad set of socio-economic challenges**. The potential to foster financial inclusion, increase SMEs and social enterprises' competitiveness, or encourage civic engagement and social solidarity are all underestimated across Europe. This would call for specific awareness raising and communication actions, as well as for exchange of knowledge and best practices in this area.



RESEARCH - A necessary bridge between citizens, researchers, and policy makers

"REsearch wants to successfully overcome the challenge of connecting the experience of EU citizens and the expertise of EU researchers to support policy makers in taking decisions that will affect society as a whole."

Valéry Giscard d'Estaing and Michelangelo Baracchi Bonvicini, Atomium – EISMD

"I strongly believe that the next generations of tech innovators represent Europe's digital future. It is really worth investing financially and politically in startups and high-tech research. Our Digital Single Market strategy has a strong focus on data in all its aspects. This is vital, given how much we already depend on data– and will increasingly depend in the future. It also recognises the importance of cybersecurity and online privacy, common technical standards and interoperability, especially in areas like the Internet of Things. And it addresses emerging growth technologies that will define our digital future – like high-performance and quantum computing, big data, artificial intelligence and cloud services. We are shaping now our digital future – and how the next generation internet will look like: I welcome the debate launched by REsearch on this very important issue."

Andrus Ansip, European Commissioner for Digital Single Market and Vice President of the European Commission



"Internet and digital technologies have turned upside down the way we think, work and innovate. We do not only have to adapt to this change, but also to take advantage of it. That's why the Commission's working hard to create a fully functional Digital Single Market, and why I fully reflect this change in the three priorities that I set for EU Research and Innovation policy: Open Innovation, Open Science and Open to the World."

Carlos Moedas, EU Commissioner for Research, Science and Innovation

"The Next Generation Internet should offer more to people and to our society, providing better services and greater involvement and participation. It should be designed for humans, so that it can meet its full potential for society and economy and reflect the social and ethical values that we enjoy in our societies. The REsearch initiative is therefore an important input for our policies, as it brings together European citizens and researchers in an open and citizen-centred debate."

Roberto Viola, Director General of DG CONNECT

ACKNOWLEDGEMENTS

This report which provides citizens and organisations across Europe who took part in REsearch's citizen engagement and media campaign with further information for each subtopic, and policy-makers with what we hope will be useful indications to help shape the EU Next Generation Internet Agenda, is the result of a collaborative effort. REsearch would like to express its deepest gratitude to all contributors from this network, but particularly to the members of the initiative.

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Prof. Peter-Paul Verbeek, Professor of philosophy of technology, University of Twente

We would also like to extend our gratitude to the Members of REsearch's Advisory Board, who provided us with precious input:

Dr. Stephane Berghmans, VP Academic Relations EU at Elsevier, Chairman of the Advisory Board

Ms. Cissi Askwall, Secretary General of Vetenskap och Allmanhet (Science and Society)

Dr. Morten Busch, Science Writer, Editor-in-chief, Sciencenews.dk, Novo Nordisk Fonden Impact Assessment Team at Novo Nordisk Foundation and Former Head of Science and Media learning Centre Experimentarium

Ms. Anna Maria Fleetwood, Senior Adviser External Relations at Swedish Research Council, Head of External Relations of the Communication Department of the Swedish Research Council

Dr. François Heinderyckx, Professor at Université Libre de Bruxelles, former President of the European Communication Research and Education Association (ECREA)

Mr. Martin Hynes, President of the European Science Foundation



Dr. Alexander Gerber, Founder & Scientific Director of INSCICO, Professor at Rhine-Waal University

Ms. Natalia Manola, Project Manager at OpenAIRE

Dr. Joan Marsh, Deputy Editor, The Lancet, President of the European Association of Science Editors

Mr. Wilfried Ruetten, Former Director of the European Journalism Centre

Dr. Markus Weisskopf, Director of Wissenschaft im Dialog (Science in Dialogue)

REsearch's business and knowledge partners also generously contributed to this publication, and we are particularly grateful to:

Mr. Filippo Addarii, Co-founder and CEO, PlusValue

Mr. Luc Chalsège, Senior Director, Public Sector Policy line leader, Deloitte Consulting

Dr. Monique Callisti, Executive Director & Partner, Martel Innovate

Mr. Mansoor Hanif, Director of Converged Networks Research Lab, BT Research and Innovation

Ms. Cornelia Kutterer, Senior Director, EU Government Affairs, Privacy and Digital Policies, Microsoft

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Ms. Taina Tukiainen, Member of Cabinet, National Seconded Expert, CoR

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Speakers and participants to the NGI Summit were also instrumental in enriching this report. They include:

Ms. Fanny Hidvégi, European Policy Manager and Legal Counsel, Access Now

Ms. Estelle Massé, Senior Policy Analyst, Access Now

Ms. Lucie Krahulcova, EU Policy Associate, Access Now

Ms. Vivian Linssen, Founding Director & CEO, International Multidisciplinary Neuroscience Research Center

Mr. Martin Schmalzried, Senior Policy and Advocacy Officer, COFACE – FAMILIES EUROPE

Mr. Angelos Charlaftis, EPAPHOS Advisors

Special thanks go to **Mr Tomasz Baran**, CEO of Polish Company Ogólnopolski Panel Badawczy Ariadna, which ran the survey revolving around the "information, democracy and social media" subtopic to a statistically representative sample of people in Poland.



Finally, our sincere gratitude for their invaluable contribution goes to colleagues from DG CONNECT, who supported us all along the way with their expertise and enthusiasm:

Mr. Giuseppe Abbamonte, (DG CNCT – Director, Media and Data)

Mr. Paolo Cesarini, (DG CNCT – Head of Unit, Media Convergence and Social Media)

Dr. Jean-Luc Dorel, (DG CNCT – NGI Unit)

Dr. Ralph Dum, (DG CNCT – Media convergence and social media unit, STARTS program)

Mr. Peter Fatelnig, (DG CNCT – Deputy Head for Next Generation Internet)

Dr. Peter Friess, (DG CNCT – Media convergence and social media unit)

Mr. Jorge Gasos, (DG CNCT – Next Generation Internet Unit)

Ms. Anni Hellman, (DG CNCT – Deputy Head of Unit Media Convergence and Social Media)

Ms. Stephanie Matt, (DG CNCT – Communication Digital Excellence & Science Infrastructure)

Ms. Nicole Muessigmann, (DG CNCT – Next Generation Internet Unit)

Mr. Pearse O'Donohue, (DG CNCT – Acting Director for Future Networks and Head of Unit for Cloud & Software)

Mr. Viorel Peca, (DG CNCT – Head of Unit, Future and emerging technologies)

Mr. Khalil Rouhana, (DG CNCT – Director for Digital Industry)

Ms. Johanna Schepers, (DG CNCT – Next Generation Internet Unit)

Mr. Fabrizio Sestini, (DG CNCT – Senior Expert for Digital Social Innovation)

Mr. Georgios Tselentis, (DG CNCT – Scientific Project Officer)

Ms. Camelia Vajeu, (DG CNCT – Information and Communication Officer)

Mr. Jesus Villasante, Head of the Net Innovation Unit of the Communications Networks, Content and Technology (DG CNCT)

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The views and opinions expressed in this report are those of the authors and do not necessarily reflect the opinions of the experts listed above.

1. CITIZEN ENGAGEMENT AND MEDIA CAMPAIGN ON THE NEXT GENERATION INTERNET

ABOUT

In April 2017, Atomium – European Institute for Science Media and Democracy (EISMD) launched a *citizen engagement and media campaign on the Next Generation Internet* for the release of the second beta version of REsearch. The aim was to stimulate a public debate between policymakers, scientists and citizens to create a real public discourse on the topic and better understand the evidence, the constraints and the opinions of citizens across Europe. The campaign was developed together with representatives of European institutions, leading research organisations, key stakeholders and some of the most authoritative newspapers in Europe.

On the 18th of April, the campaign was launched, with dedicated articles published both on the paper and online editions² of Atomium media partners, including Der Standard, El País, Frankfurter Allgemeine Zeitung, La Libre Belgique, Gazeta Wyborcza, Luxemburger Wort, Público and Sole24ore. Elsevier and the European Commission's DG Connect facilitated the engagement of researchers. The initiative was also featured on The Guardian, Politico and other specialised outlets. Based on readership, the potential public reached by the campaign was equal to over 5,7 million Europeans.

The campaign ran for 3 weeks and 53 articles were published around three main topics:

- (i) The economy (including businesses, employment, and skills);
- (ii) The public sphere, with a focus on how the rise of social media and Artificial Intelligence (AI) is disrupting how we access and use information, while new technologies are emerging which could help reverse this trend; and
- (iii) Blurring the boundaries between offline and online/virtual worlds and impact of internet technologies on our daily lives.

The online articles contained a link to a questionnaire centred on the topic of the week, which was accessible for the entire week.

A social media campaign was also run in parallel with the article publications. The social media campaign reached more than 706.000 people on Facebook, with 12.222 click-throughs to survey-related links, over 160.000 people on Twitter, and about 23.000 on Instagram.

As a result, over 34.000 unique users reached the REsearch platform and over 8.500 took part in the online consultation in the form of a questionnaire, out of which 3.514 completed in full.

The launch of the public campaign followed a network and sentiment analysis of public conversations on the Next Generation Internet emerging on the major social networks (Facebook, Twitter, Instagram). This large-scale research aimed at gaining a better understanding of stakeholders' expectations, desires, fears, worries, visions and aspirations when they think and express about the future development of Internet-related technologies. Over 650.000 messages around the next generation internet, generated by 355.451 users, in 54 languages, were recorded and analysed between November 2016 and April 2017.

Finally, the results of the campaign and network and sentiment analysis were presented and enriched during the Next Generation Summit, held in Brussels on the 6th and 7th of June 2017, which saw the participation of over 350 people consisting of speakers and participants.

2. <https://research.eu/info/research-in-the-media>

The aims of the campaign were to:

- 1) Create a responsible and informed multi-stakeholder debate on the issues facing Europe, involving thousands of European citizens, researchers, policymakers and stakeholders;
- 2) Create and promote access to reliable information on the issue;
- 3) Increase inter-disciplinary and inter-sectoral debate;
- 4) Collect and analyse results to deliver to citizens, media, researchers and policymakers;
- 5) Bridge the gap between science, society and policy in an innovative way.

The topic selected for the second REsearch initiative is the Next Generation Internet (NGI), a theme of crucial importance in the European policy agenda given both its impact on EU citizens' well-being and its potential for stimulating economic growth across the Union.

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Indeed, it is clear that from commerce to entertainment, from co-production to data analysis, from remote working (or co-working) to e-government, e-payments and e-health, to smart homes and supply-chains, the opportunities to improve EU citizens' lives seem endless. However, many challenges remain, for instance in terms of the concentration of power (and data) in the hands of a few players, access to adequate infrastructure, the distortion of information and distribution (fake news and confirmation bias), as well as in terms of interoperability, digital inclusion and skills, privacy and security. The aim of this second campaign was, therefore, to stimulate a reliable and authoritative debate on digital technologies (from networks to autonomous cars and blockchains and much more), bringing together researchers, media, policy-makers and citizens from across Europe. This should contribute to support the European Commission in shaping its Next Generation Internet strategy to drive an inclusive development of the internet in the next ten years via regulation, policy action and funding.

FORMAT

The citizen engagement and media campaign ran for little more than three weeks from mid April to the beginning of May 2017. Each week, a different subtopic was introduced by an editorial on both the paper and the on-line editions of our media partners, according to the following schedule:

- 18th - 24th of April 2017 – New technologies for disrupting the economy: business, employment and skills
- 25th of April - 1st of May 2017 – New technologies disrupting the public sphere: information, democracy and social media
- 2nd - 8th of May 2017 – New technologies blurring online and offline worlds and disrupting the personal sphere

The online articles contained a link to a questionnaire centred on the topic of the week, which was accessible for the entire week.

For each week, we had two sub-questionnaires containing 4 questions each. Users were randomly assigned to the sub-questionnaires to ensure we had about the same number of answers for each sub-questionnaire.

Preparatory work for the citizen engagement and media campaign was done in close consultation with the initiative's Scientific Committee, knowledge partners and representatives of the European Institutions, to analyse and pinpoint the most pressing issues from a policy-timeliness perspective.

The social media campaign started on the 1st of March 2017 and lasted until the end of June.

The network analysis on Facebook, Twitter and Instagram ran from the 10th of November 2016 to the 30th of April 2017, collecting 669.734 messages generated from 355.451 users, in 54 languages. Data was gathered and analysed with the support of HER (Human Ecosystems Relazioni).

Preparatory work for the network analysis was conducted by RElsearch's and HER's teams using the background document developed in collaboration with RElsearch's scientific committee and advisors.

Over 23.000 researchers, citizens, policy-makers and journalists accessed RElsearch to respond to questions, participate in the debate and access additional information about the topic.

Participation provided both quantitative and qualitative data –mainly in response to social media activities and in the form of comments to the articles, as well as on the occasion of the NGI Summit, where a preliminary version of this report was extensively discussed with experts and participants from different backgrounds.

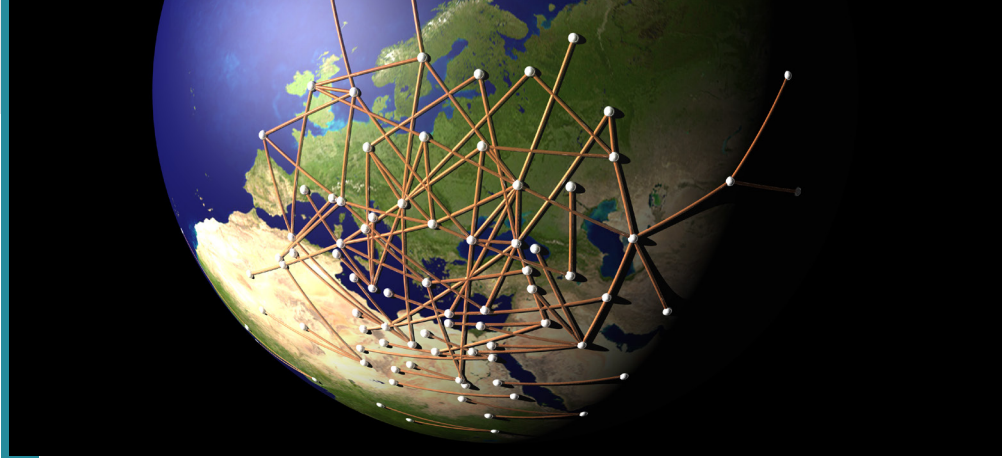
Chapter 3 (Outcomes) outline some of the results of the initiative.



This report should be read together with the studies, materials and datasets available on the REsearch platform, and particularly:

- The background paper on the Next Generation Internet;
- All the articles published by REsearch's media partners and other outlets;
- The studies and support materials made available by REsearch's business and knowledge partners;
- The data gathered via the citizen engagement and media campaign;
- The data gathered via the network analysis (in open-data with a CC share alike licence)
- The detailed network and sentiment analysis report.

We are grateful to all users and researchers who will want to dive into the data and propose further interpretations for this research.



BACKGROUND ON THE CHALLENGES POSED BY NEXT GENERATION INTERNET TECHNOLOGIES

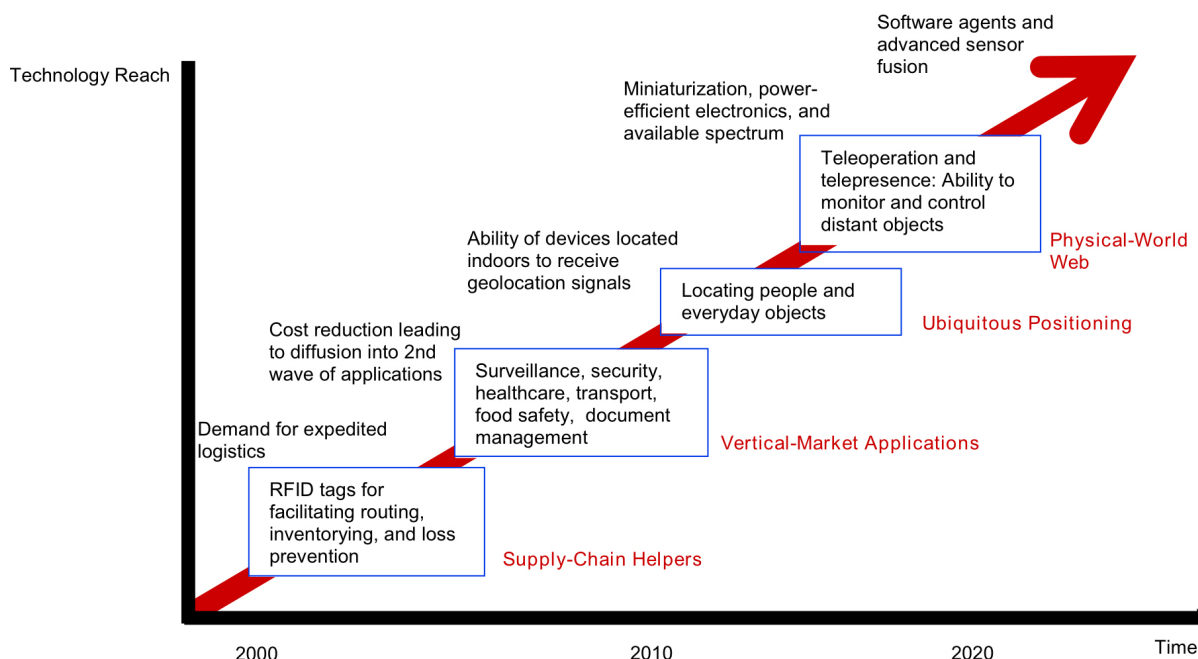
"The goal of the Web is to serve humanity. We build it now so that those who come to it later will be able to create things that we cannot ourselves imagine."

Sir Tim Berners Lee

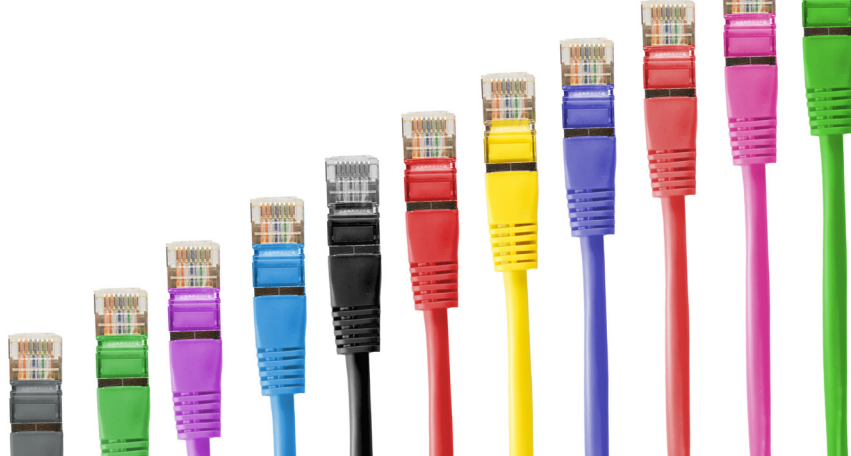
What do Europeans expect from digital technologies over the next decade? To correctly answer this question, we should frame it within the values defining Europe through the Treaty of Lisbon. The 2009 agreement recognizes that the EU's fundamental values are respect for human dignity and human rights, freedom, democracy, equality and the rule of law. These values unite all the member states and no country not recognising them can belong to the Union. In this framework, EU member states are pluralistic, nobody may be discriminated against and people and government representatives must respect others and be tolerant. Everybody must be treated fairly. Minority rights must be respected. Equality between men and women is promoted. Responsibility must be shared. Additionally, the Charter of Fundamental Rights defines rights to data security, bioethics, good administration and the right to access information, negotiate and go on strike for workers.

Today these values are both being put to a test and offering new opportunities for expansion as internet technologies have fundamentally changed our world over the last 40 years, and the next generation internet is set to impact the global economy and society even further. This process has already begun, illustrated for example by the current rise in social media, the sharing economy, e-governance, e-commerce, digital marketing, e-learning, e-residency, self-driving cars, smart devices, wearable technologies, mobile apps, and so on.

TECHNOLOGY ROADMAP: THE INTERNET OF THINGS



Source: SRI Consulting Business Intelligence



Social media, online retail, and new forms of production are all driven by the internet, big data, and machine learning. Internet technologies are not only changing our perception of the business world and the labour market but also our relationship to the democratic process itself, with a recent emphasis on the post-factual society (e.g. fake news) that has placed social media and its societal role in the spotlight.

As pointed out by Professor Anna Carbone during the NGI Summit, both the pervasiveness of internet technologies and related attitudinal changes, emerge with strength if we follow the Oxford Dictionaries Word of the Year context. In 2013, the word of the year was "selfie", in 2015 it was "emoji" - the so-called tears for joy -, in 2016 it was "post-truth", e.g. an adjective defined as "relating to or denoting circumstances in which objective facts are less influential in shaping public opinion than appeals to emotion and personal belief". As noted in the European Commission White Paper on the Future of Europe³: "restoring trust, building consensus and creating a sense of belonging is harder in an era where information has never been so plentiful, so accessible, yet so difficult to grasp. The 24/7 nature of the news cycle is quicker and harder to keep up with and respond to than it ever has been before. More tweets are now sent every day than in a whole year ten years ago. And by 2018, around a third of the world's population will use social media networks".

Internet-based technologies have the potential to disrupt our global economies, societies, and environments - for better or worse - in ways we couldn't previously imagine. In Commissioner Timmermans' words "disruption is to break up or throw into disorder. I think that's your goal if you're an innovator: to wake up in the morning and disrupt the world. To discover a new concept that changes everything. On social media – you get millions of shares. On Euronext – shares worth millions. And as the inventions conquer the world, we stand in awe. Innovators are modern wizards. They enchant us with their magic. The pace of change is bewildering. Because of our connectivity once secluded realms of technology now team up and share concepts, principles and methods across disciplines, helping everyone progress even faster together. I'm not telling you anything new by saying we're in the middle of a fourth industrial revolution. And it will upset the current economic order: the way we make things, the way we trade, the way we work, and also the way we live".

Indeed, the most disruptive of next generation Internet technologies are already emerging: 5G high-speed wireless connection; the Internet of Things (IoT) and smart devices; 3D printing; drones and unmanned aerial vehicles; blockchain. As a result of these technologies, we are approaching the Internet of Everything, where devices, people, processes, data and people's ideas are connected in one web of activities and influence.

This scenario is well described by Klaus Schwab in his *The fourth Industrial Revolution*⁴ as raising many issues. In a disrupted period, everyone can gain but also lose established positions of strength and he calls for leaders and citizens to "together shape a future that works for all by putting people first, empowering them and constantly reminding ourselves that all of these new technologies are first and foremost tools made by people for people."

3. https://ec.europa.eu/commission/white-paper-future-europe-reflections-and-scenarios-eu27_en

4. <https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/>

The European Commission has answered this call by launching in Autumn 2016 its *Next Generation Internet Initiative*⁵, not only to support – via policy, regulation and funding programmes - the development of radically new functionalities in the next decade, but, most importantly, to set the right conditions for the internet of the future to be a human-centred, collaborative space, reflecting the fundamental values of the European Union.

As highlighted by Commissioner Ansip during the NGI Summit, Europe has now a choice between “remaining a mere consumer of internet technology, services and applications – and perhaps be progressively dominated by other countries, or companies” or “developing internet tech that will better serve its people and put them more in control of the digital society where they live”. The EU Digital Single Market Strategy already achieved some milestones in pursuing the second option, including in terms of funding start-ups and SMEs and promoting emerging technologies such as high-performance and quantum computing, big data and cloud services. But more efforts are needed to meet Europeans’ concerns and expectations around “digitisation’s effect on society and jobs, about cybersecurity and privacy, about online power being concentrated in the hands of a few big companies and platforms and about the impact of artificial intelligence”.

Within this context, Atomium – European Institute for Science, Media and Democracy, with the help of its media partners, aimed at mobilising its network to better understand what different stakeholders see as the main opportunities and challenges stemming from the ongoing technological developments in the ICT domain, and, most importantly, to engage EU citizens in this debate.

Three issues related to NGI technologies’ societal impact seemed particularly urgent to be debated, also because of their implications at policy level:

A Human-centred Internet: There is a need to find a trade-off between the need of ensuring that people keep mastering machines and that machines contribute to ensuring sustainability and inclusion - and the need to allow for experimentation and innovation. How can we achieve this balance? How can we foster levels of trust in technology, as well as critical thinking? What does a “human-centred Internet” mean concretely?

The proliferation of mobile devices and the expanding ubiquitous networking lead to an obvious convergence between the physical and the cyber world. We are at the same time producers and consumers in a complex socio-technical system. As technological developments become new products and services (not to say an extension of ourselves), the guiding principle for all stakeholders involved in their development and adoption should relate to the need of keeping people at the core of every concern and action (building an internet for the people, by the people, with the people). However, there is a difficult balance to keep technology serving and not enslaving us. Also, there is a need that behind technological choices fundamental human values shared in Europe and the developed world are considered as guiding principles. As remarked during the NGI Summit and extensively discussed in the parallel sessions, technology itself could offer us valuable support in handling technologies, this could for instance be the case with the blockchain, as remarked by Prof. Primavera de Filippi: “if we want to restore this global decentralised network which is capable of promoting individual freedom and privacy, which constitutes an actual digital commons, then we have two choices: either we have to change the usages which are made of the network - and this means regulating all the network operators - or we can act and influence the actual architecture of this network, changing the technical design. Blockchain technology could allow us to do just that. On the one hand, it would make possible to move data away from those centralised data centres, which constitute a single point of failure and control, towards more decentralised and p2p networks which rely on the blockchain as an authentication layer. To ensure that data comes from a particular source, and at the same time to ensure that it has not been manipulated by any third party. On the other hand, and this is more related to the privacy question, a blockchain can also be used to deploy more granular access, control and credential management system”. Further to this, blockchain technology could enable cooperative models of sharing-economy platforms, “decentralized community driven organizations which are operated by the community and for the community and where every community member is at the same time a contributor and a shareholder. Opposite to the traditional centralized model of crowdsourcing, where people are contributing value to a centralized platform but cannot really benefit from the success of these platforms - with blockchain technology, since there is no need for a centralised intermediary platform, the value created within the network can be shared and redistributed much more equally between all the people that have actually contributed to its creation”.

5. <https://ec.europa.eu/digital-single-market/en/next-generation-internet-initiative>



Similarly, if we think of big-data and the internet of things, AI could offer us a formidable support in handling the ever-increasing amount of information produced by both men and, to a larger extent, by machines, but this means making sure to be at the top of technological development. Indeed, as remarked by Prof. Luciano Floridi “complexity, in the technical sense, in the computational sense of complexity, is just going to increase. And we do have a trick to deal with increasingly complex things - we develop more complexity to deal with complexity. We have technologies that work with themselves about themselves increasingly in an autonomous way. We can be the Khyberneter, mastering the whole system. Or we can just step out and think: ‘well, fingers crossed, hopefully everything will go fine’. This is all the difference between the rise of artificial intelligence and the rise of collective intelligence, the rise of the internet of things or the rise of the internet of values.

2) Trust (privacy, security, transparency): as internet technologies become more pervasive, establishing trust in the data and algorithms used to support access to information and decision-making at all levels becomes a key issue, strictly interrelated to the need of ensuring user privacy and security and to foster transparency on how (and by whom) data is used. Several options on how to address this issue – from technological solutions to peer-regulation, self-regulation and policy intervention to new organisational models, awareness raising and education actions – are on the table. How can we frame this debate? How can we engage stakeholders (both organisations and individuals)? Who should/could lead this process? **As in the previous case, technology could offer us valuable support, so for instance, blockchain powered e-identity systems – which have already been adopted in Estonia - could ensure high levels of user control over their personal data, as well as high levels of transparency and security. At the same time, blockchain technology also entails several risks: besides purely technological backdrops and the possibility to overpower the network, there are risks in terms of de-regulation, liability attribution, and transactionalisation of any relationships just to name a few. Similarly, as highlighted by Katherine Brown, encryption can be both a force for good and for worse. “Given the focus on user privacy in the EU, it is perhaps not a coincidence that, according to Cisco, Western Europe followed by Central and Eastern Europe, lead all other regions in the number of secure internet servers that conduct encrypted transactions over the internet. As with many things, technology designed for legitimate or even laudatory reasons can be exploited by those with nefarious intent. Thus, we hear what sounds like a logical call to do a wave with these safe places for terrorists. But it’s quite evident that encrypted technologies protect the civil freedoms of many”.**

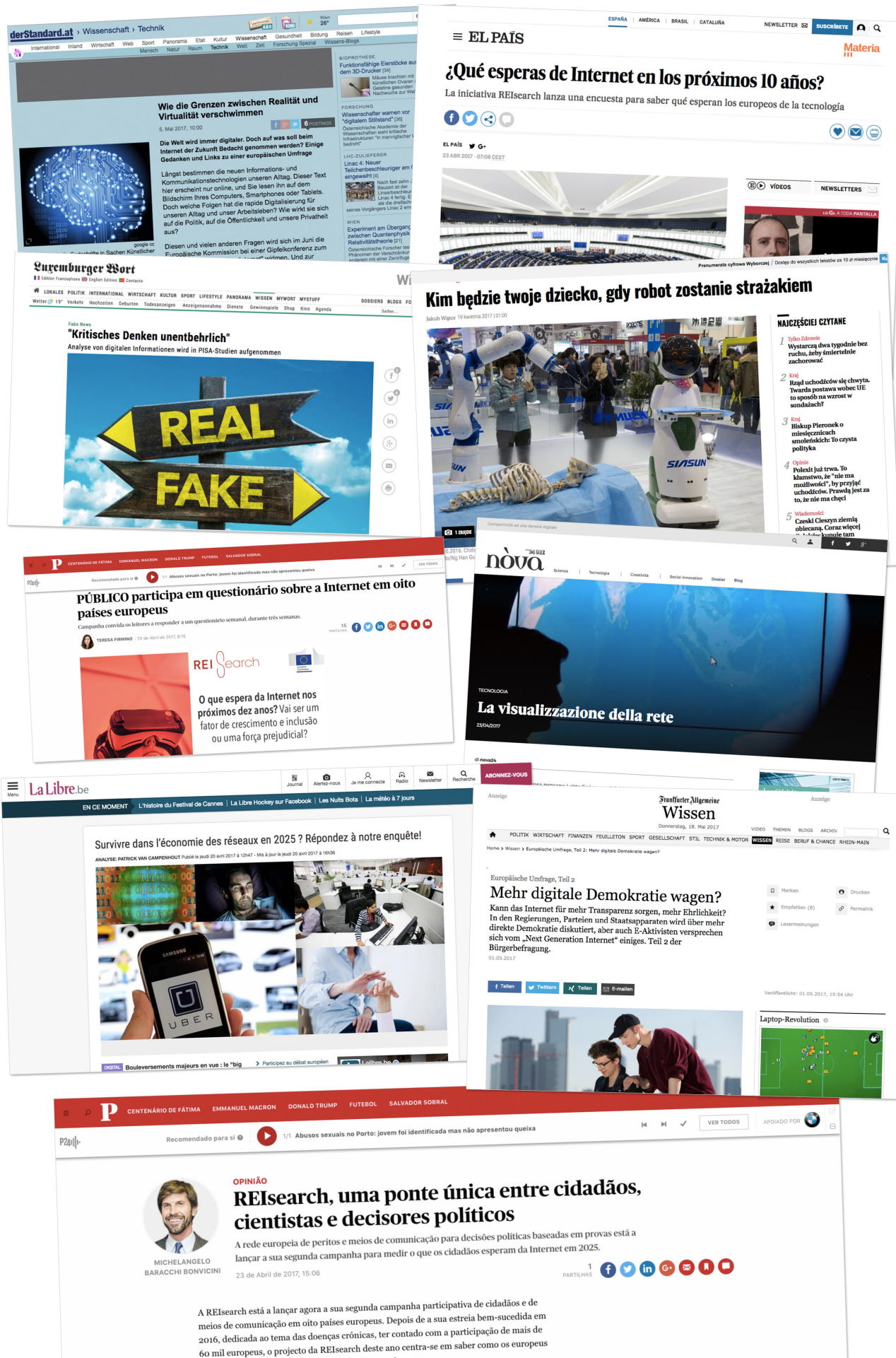
While, as remarked by Dr Luukas Kristjan Ilves during the NGI Summit, despite the increasing power of a handful of tech platforms “as long as we have the open internet nothing stops you from building your own feed aggregator and pulling together your own picture, so while we bemoan the difficulties we also need to be creating some practical bottoms-up solutions”, technology and markets are just one of the reasons why trust in democratic institutions is shrinking. Indeed, as highlighted by Commissioner Timmermans “in Europe, we are perhaps too used to living in a free, peaceful and open society. But nothing is irreversible, nothing unbreakable, nothing inevitable. Our values are under threat. Not only from the outside but alas, also from within. And the 4th industrial revolution also carries the risk of ‘Our democracies being hacked’. Hacked by inequality, by the ever-greater power and money in the hands of a few mighty Internet giants. Hacked, in very literal terms, by hackers and trolls disrupting politics at home and abroad or waging a hybrid war. Hacked by the Internet echo chambers, that stop us from listening to each other and seeing each other. By the misinformation revolution. By the new illiteracy: the inability to tell fact from fiction, the loss of critical thinking.” To revert this course, research and innovation need to be coupled with politics and policies aiming at empowering people and reduce inequality: “to stop the social fabric from ripping to shreds, we must redraw the social contract, and re-affirm our promise that no one in Europe gets left behind”.



3) Governance and multi-stakeholder approach: whilst it seems clear that to increase the positive societal impact of internet technologies a multi-stakeholder approach is necessary, ensuring net-neutrality and open access for everybody, as well as monitoring and tackling of potential negative consequences of on-going disruptions; it is not clear how this approach could be implemented concretely. Who are the main players in this process? To what extent and on which ground should they collaborate? Are we talking about organisations or individuals? Who should lead this process? Does it have to be global?

As remarked by Catherine Brown, besides governments and technicians, civil society, experts from different backgrounds, private businesses and NGOs advocating for the adherence to the rule of law should have a place at the table, and internet technology could help us find experimental, agile ways of governing. Cities and regions, which have pioneered smart specialization strategies at the systems level, should also have a say, as highlighted by President Markkula. Indeed, governments and the public sector in general have still a key role to play in safeguarding the interests of the many, and particularly when it comes to infrastructure. This is trickier than it might seem, as pointed out by Mansoor Hanif during the NGI Summit, since "we are not actually in control of our current infrastructure. 90% of the IT organisations around the world have no idea how the people who programmed their systems did it. It is crumbling, so we need to put control in place rather than lose control. I don't think we are in control of our systems and I think that the new generation of networking and IT will give that transparency and visibility which are today lacking. We need to make sure that ultimately those solutions will be implemented in a way that allows the right institutions and organisations - whether as corporate or as regulators - to be in control."

These were the main questions which orientated the preparatory work for this second REsearch initiative, the results of which are the object of this report. We believe that people can shape their own future and that while the change underway is huge, the real question is not about the technology, but about ourselves and what we do as a society, how we create the conditions to embrace change, fully exploiting its positive social, economic and environmental potential while managing disruption by building resilient institutions and investing in people.



These are the headlines of some of the articles published during the week on "New Technologies and Innovation" of the Citizen Engagement and Media Campaign on the Next Generation Internet



3. OUTCOMES

OVERVIEW

REsearch's initiative on the Next Generation Internet had a twofold objective. Firstly, we wanted to inform citizens about the threats and opportunities related to internet technologies' developments in different areas, particularly in terms of their socio-economic impact potential. This was achieved via:

- The media campaign, which saw the publication of 53 articles in 10 EU countries;
- The social media campaign, which saw the publication of 114 posts on Facebook, 73 posts on Instagram and 608 tweets;
- The dissemination of the initiative's background report, which offered further information on the topics presented during the media campaign, and was prepared in close collaboration with the initiative's Scientific Committee.

Unfortunately, we are not able to track the total number of people who read the articles, however, we know that about 34.000 people visited the REsearch platform between the 18th April and June 2017 and over a thousand registered on the website to access further information. Articles published in the newspapers received around 300 comments, while the social media campaign reached over 850.000 people.

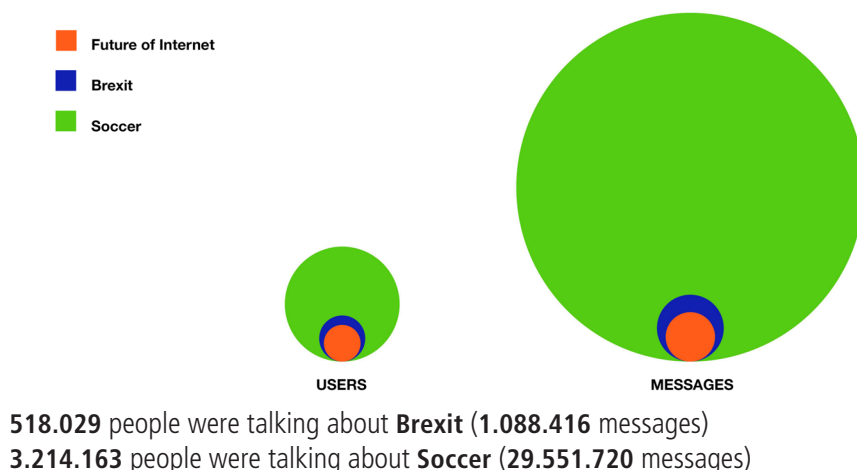
The second objective of the initiative was to better understand what EU citizens think, feel, fear, and express about future internet technologies and their potential impact on the way we will live, work, and play over the next decade, to better inform EU policies in this area. This was achieved first via the online consultation linked to the media campaign. Banners linking to the surveys disseminated among the scientific community (by media partner Elsevier) received over 4 million impressions and nearly 3.000 click-throughs. Nearly 8.600 took part in the survey, out of which 3.514 people completed it in full. The questions surveyed in the second week of the campaign, and centred around the impact of internet technology on our democratic institutions and processes, were also run to a statistically representative sample of citizens in Poland, as detailed later on.

To further achieve the second objective, a network and sentiment analysis was performed by investigating - via machine learning and natural language processing techniques - over 650.000 messages around the next generation internet, generated by 355.451 users, in 54 languages, on Twitter, Facebook and Instagram, between November and April 2017⁶. The rationale behind the choice of this methodological approach was that we wanted to discover what Europeans were thinking and discussing - without the bias of questionnaires, surveys and communication campaigns - in their daily lives, without us asking. We wanted to know whether the 'future of Internet' was something on people's mind, why and just how much.

6. The data gathering exercise was split in 2 phases. In the first phase we searched for content in major social networks (Facebook, Twitter, Instagram) compiling a list of what we assumed were relevant terms, in 54 languages, and we used combinations of words and terms to identify those expressions (posts and tweets, for example) which referred to them in terms of future expectations, desires, needs, visions. For example, posts like: "my online banking account needs to be more secure than it is now", or "I would expect my wearable device to protect my data". As we collected data according to this first strategy, we prepared the second phase: we used several different techniques (mostly Natural Language Processing and Machine Learning) to gather advanced information about the ways in which subjects discussed about these topics and issues, what languages and forms they used, which channels, groups, words, situations, contexts were used in different cases, for different types of subjects, to talk about the next generation internet. This knowledge was used for the second phase, where we further fine-tuned the first type of observation, to be able to learn from what we were observing and to start collecting data using the words, languages, forms and patterns that people used (rather than the ones we imagined people were using), and, secondly, to produce networks. The full report presenting the results of the network analysis, including the methodological, technological and ethical approach to social networks analysis, data extraction and visualizations, as well as the related open dataset, are available on the REsearch platform.

To understand to what extent the topic was at the centre of Europeans' conversations, we monitored over the same period, using the same techniques and on the same media (Twitter, Instagram and the same set of Facebook Pages and Groups) how many people were speaking about Brexit and Soccer. Not surprisingly, conversations about soccer were incomparably more frequent than conversations about the future of the internet, however, the situation changes if we use Brexit as a comparison, denoting a broad interest in the theme:

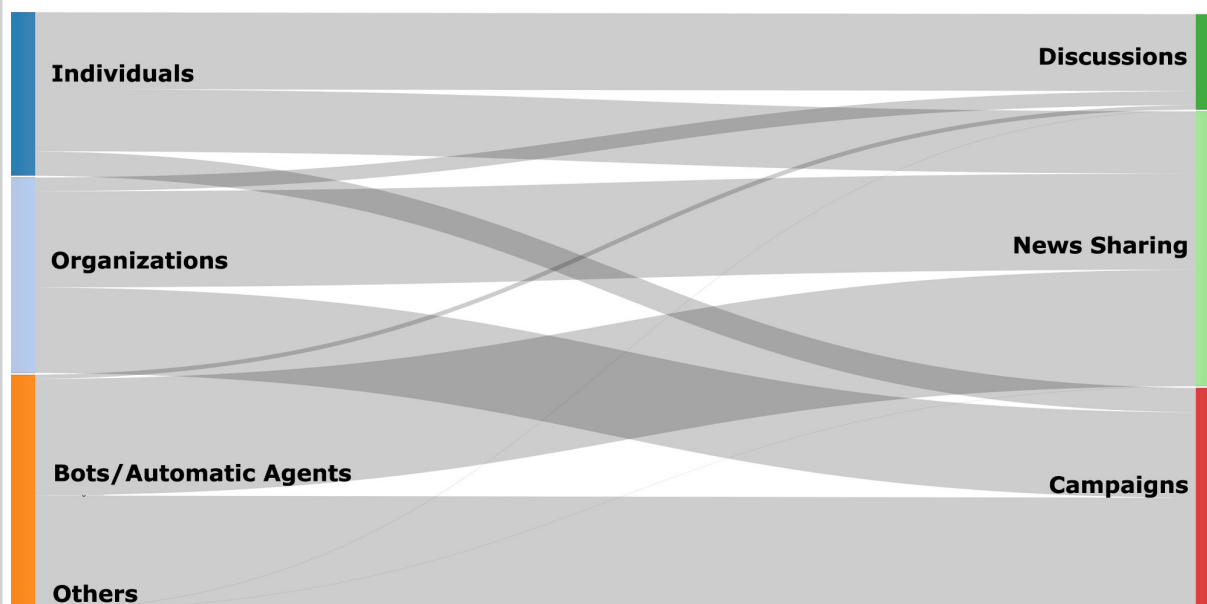
Graph 1.1 – The volume of online conversations on NGI (355.451 people with 650.000 messages), Brexit (518.029 people, 1.088.416 messages) and soccer (3.214.163 people, 29.551.720 messages) (Source: EISMD – HER 2017 network analysis).



But who was interested in next generation Internet technologies? As a first thing, we tried to understand if users were really humans, and we found that while bots and automatic agents represented only about 2% of users, they produced nearly 40% of the messages. Secondly, we tried to distinguish between individual and organisational accounts and found that organisations accounted for about the 34% of total users and 33% of messages produced, leaving a 63% of individual users responsible for the 27,5% of the messages retrieved.

What is more interesting though, is to see how different the messages are based on the nature of their originators:

Graph 1.2 – The flow of online conversations on NGI (Source: EISMD – HER 2017 network analysis)

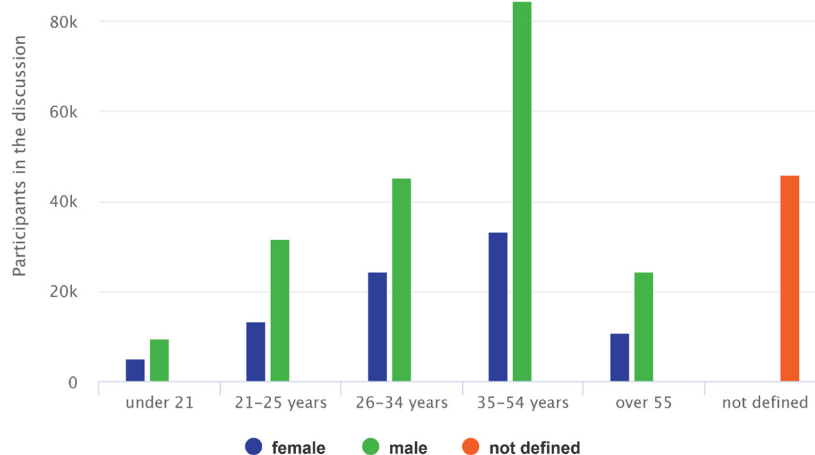




Indeed, automated systems only engage in campaigns or in news sharing, only very rarely in discussions, which are the prerogative of individuals and, to a lesser extent, of organisations. Of course, this might change as AI goes mainstream.

Once refined our “human” sample, we searched for its main demographic characteristics, and found another striking result – at the crossroad between the two REsearch’s initiative main goals of engaging people on the topic of NGI and understanding what they think – i.e. we found that the debate around NGI and their socio-economic impact, at least on “traditional” social media, is strongly male dominated, while young people are far less represented in the conversation.

Graph 1.3 – The ages and genders detected in the subjects expressing about the NGI
(Source: EISMD – HER 2017 network analysis).



This is also confirmed by the results of our online consultation, where women make up around 25% of respondents - a share just slightly larger than that of researchers, equal to around 20% of the total - and young people below the age of 16 represent less than 1% of the group. This in spite of the fact that young people were an explicit target of the social media advertising campaign, which reached 49.239 16-17 year olds and 115.487 18-24 year olds.

It is worthwhile to explore the relative absence of younger generations from the analysis. This phenomenon can be attributed to a diverse set of reasons. Among the main ones is the progressive shift of younger generations towards different platforms for their public and private expressions and interactions. Among these are other social interaction and media platforms such as WhatsApp, Snapchat, Telegram, and other minor ones, which have hybrid characteristics falling between instant messaging platforms and social media.

This progressive migration is also very variable in its extension, and, as new platforms appear on the market, younger generations move fluidly among them according to a nomadic, unstable, profile. Of course, platforms such as WhatsApp, for example, have established a strong presence and userbase, but the overall scenario is far from static and very fragmented and dynamic. One characteristic of these platforms is their “closure-ness” and strong particularization. Services like WhatsApp and Snapchat, for example, are constituted through the aggregation of myriads of social microcosms. This raises several worrying issues, for instance, the likely emergence of social, knowledge and information bubbles, and the quasi-impossibility for large, shared, public discussions to emerge.

This fact alone could account for the limited contribution of younger generations to the conversations analysed by the network and sentiment analysis. But there's more. Indeed, large numbers of young people still actively use the social media services which have been screened in this analysis: according to the Standard Eurobarometer 84 (Autumn 2015), 77% of Europeans aged 15-24 use social media every day, and another 13% use it at least once a week. We therefore need further hypotheses to account for their absence from our sample. Looking at their online behaviours the following characteristics emerge:

- different linguistic styles used for expressions;
- different topics, scopes and objectives of social media communication; and
- different approaches to usage of technological systems.

In summary, it seems that younger generations use different vocabularies, and have different linguistic styles and behavioural patterns to express thoughts on next generation internet technologies compared to our adult sample. Which ones? The answers are found by analysing their scopes and objectives for social media communication, which are more playful and fluid, if compared to the ones of older generations. On top of that, younger generations tend to have a more utilitarian vision of the platforms they use: they are more vocal about the malfunction of certain functionalities than about the technological, social, economic, or political implications of the technologies they use. If not stimulated, they appear to be more "users" than critical discussants. This, if united with the changing style and behaviour of social media expression, which is becoming generally shorter in form and simpler in content architecture, provides useful insights about the need to elaborate specific communication strategies – for instance by using design, arts, or gamification processes and, in any case, giving serious consideration to the visual, linguistic and iconic styles to be used - if a wider participation of younger generations is desired.

Concerning low rates of women participation, a broad body of literature exists on this phenomenon, and the Commission has undertaken several initiatives to foster women's participation in tech, including the recently launched call for pledges on Women in ICT under the Digital Skills and Jobs Coalition. In spite of increased attention by European and national policy makers, the gender gap in terms of ICT access, skills as well as in terms of (self-)confidence and interest into the subject is not narrowing, as showed by the Special Eurobarometer 46011 according to which men are more likely to agree for all aspects asked about than women (they are more positive about ICT impacts on their lives, society and the economy, they are more informed and more optimistic about the current and future role of social media, AI and robots, they feel more skilled in using ICT in current and future working and social contexts, etc.) with one single exception: indeed, "there is no difference between men and women when it comes to feeling sufficiently skilled in the use of digital technologies to do their job".

Results are confirmed Jose Manuel Alonso of the World Wide Web Foundation

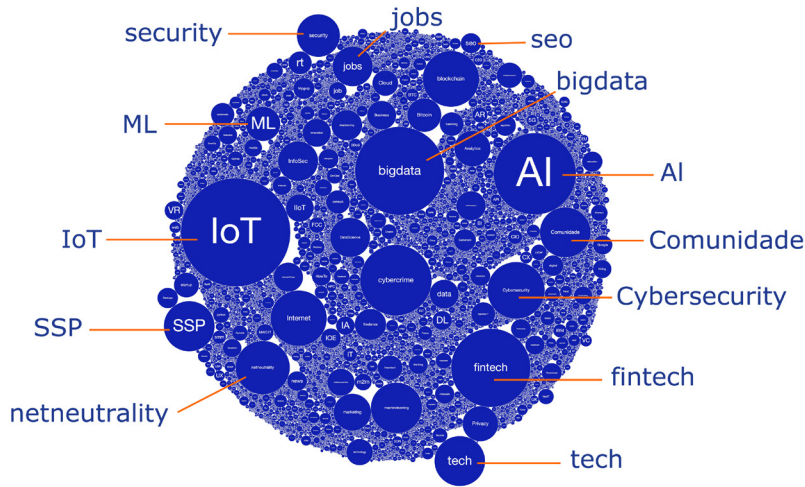
For example, we have an initiative across the whole of the foundation that is called the Women's Rights Online. Where we study 10 emerging cities all over the world where we found out that women were up to fifty percent less likely to be online than men. Less likely to speak out online. Less likely to use the web to look for a job. If you look at this conference for example, and it's very, very usual at conferences unfortunately, barely a third of the speakers where women. Gender equality was only mentioned - that I could find, and apologies if I'm mistaken - in one sentence in the 45-page background report.

There is no dedicated mention and I would really suggest that this is taken into consideration on others, to erase the gender gap in STEM education and skills. On the number of women in the STEM careers, that's very important in my opinion.

Looking at some of these trends is sobering but some sections in the same country, maybe you see self-driving cars while their compatriots are not even online yet. As jobs are automated, and we had some discussions about that, the new digital industries become the leading sources of employment, women around the world may fall further behind instead of charging ahead - if we don't address this disparity now. So how do we change this? Because it's notable about the problem I can also offer some solutions. In my opinion, to build the world we want, we must build the web we want.

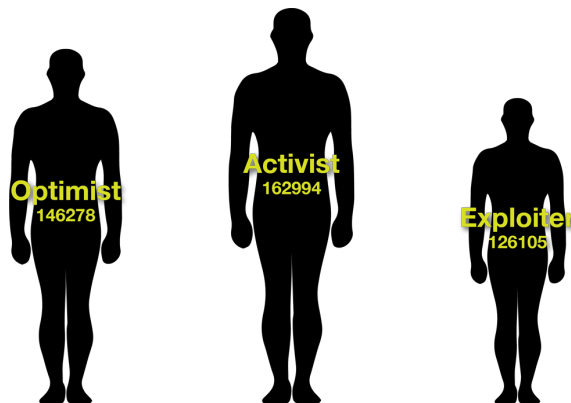
Going back to our network and sentiment analysis, it is very interesting to see that a limited set of topics is at the centre of most conversations. The future of internet focuses on IoT, AI, BigData, Fintech, Cybercrime, Cybersecurity, Privacy, Machine Learning, Blockchain and their impact on Net Neutrality, the job market and our democratic societies.

Graph 1.4 – The subtopics of conversations on NGI (Source: EISMD – HER 2017 network analysis).



If we group the emotions expressed for these topics, and we average them, we find that – according to the Circumplex Model of Affect⁷ - most of them fall into the “Concerned” emotional expression, which we re-named “apprehensive”. This “apprehensive” sentiment corresponds to discussions which are not identifiable as fights or arguments but are built around problematic issues. People engaging in these discussions are not just providing information, but posing problematic questions and discussing them with others, highlighting potential negative externalities stemming from innovation processes and igniting debate on how to tackle them – we called them “**activists**”. At the same time, “**optimists**” ready to share their enthusiasm about new technologies and calling for action to fully exploit their socio-economic potential make up nearly a third of our sample, while younger people around the age of 30 (“**exploiters**”) tend to talk about future technologies mostly in terms of how to exploit them to improve their business or careers⁸.

Graph 1.5 – Users talking about NGI segmented in Activists, Optimists and Exploiters (Source: EISMD – HER 2017 network analysis).

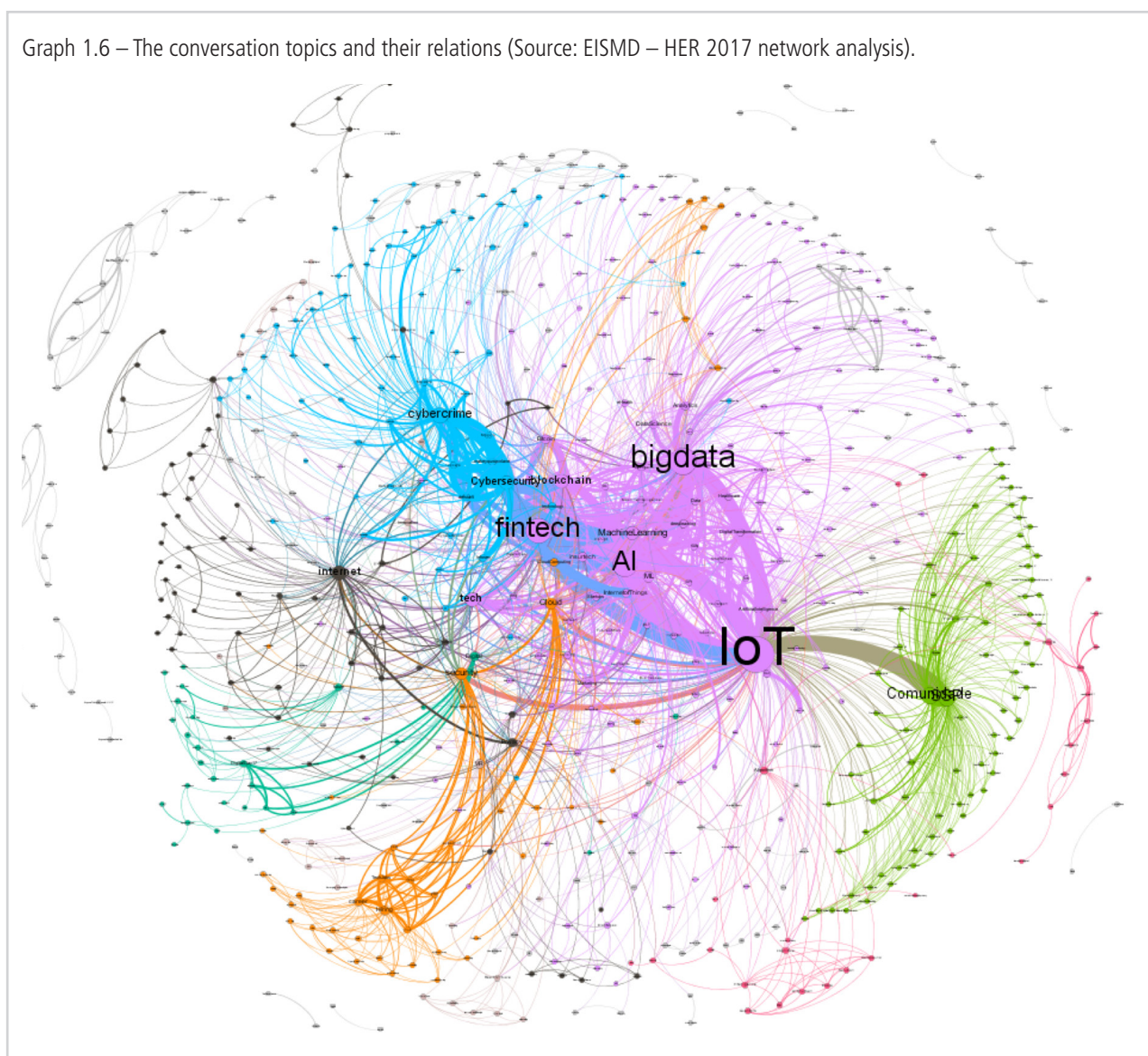


7. The Circumplex Model of Affect: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2367156/>

8. The three profiles are based on particular patterns in expressions which were systematic. We took a selection of the most important topics (IoT, BigData, AI, Fintech, CyberCrime, BlockChain, CyberSecurity, NetNeutrality, MachineLearning, Privacy, Analytics, Marketing, DataScience, Business, Jobs, Security, Education) and we used neural network based Machine Learning techniques to see if there were significant recurring patterns: we used a classifier to see if there were systematic correspondences in the ways in which people expressed about these important topics, to possibly describe some profiles. The result was that we discovered the 3 profiles featured in Graph 1.5: 1. The Optimist has a strong, positive opinion on the hot topics of the innovations related to next generation internet technologies. The optimist follows the themes of Data, IoT, Security, Business and Education in very active ways, expressing enthusiastic opinions which leave very little space for critique, and calling for action to turn opportunities into concrete ventures. It wants something to happen. 2. The Activist is practically the opposite of the Optimist. (S)he systematically creates frictions in ongoing discussions on the Future of Internet, highlighting the dangers and potential negative effects and impacts of most technological innovations. (S)he is very useful in any discussions, creating frictions and polarizations, causing people to take sides and elaborate on their opinions. The activist expresses critique which is smart and informed, but leaves little space to opportunity. 3. The Exploiter focuses on the business uses of the technological innovations. This profile does not critique, and is only vaguely interested in the more critical topics, such as NetNeutrality or Security. On the other hand, the profile is very interested and active in understanding how things can be applied to generate novel businesses. It is also a profile which is very actively engaged in the evolution of education, skills and competences needed to succeed in the future. Each profile is not exclusive, meaning that a subject (a social network account) does not belong to one OR the other, but, rather, it belongs to all three according to a degree: for example, account X may be 92% profile 1, 24% profile 2 and 38% profile 3.

Finally, if we look at the relationships between the principal topics discussed during our monitoring period, we can draw some further important insights (for how to read this graph please see note⁹).

Graph 1.6 – The conversation topics and their relations (Source: EISMD – HER 2017 network analysis).



9. The graphs show the relations among topics, that is the ways in which, in the messages captured from social networks, the topics are mentioned together. In the graphs, each dot with a label represents a topic. A topic is not a single keyword, but, rather, the sum of the keywords, phrase sections, or expressions which have been recognized by the semantic engines as referring to the same concept. This can happen, for example, because a certain phrase is used systematically in the same way as a certain keyword, or similar cases. The larger the dot, the more the topic was contained in user messages. For example, the AI topic is more than three times the size of the CyberCrime one, meaning that it appeared more than three times as much in the messages. The dots (and, thus, the topics) are connected by arches of a certain thickness. If an arc appears between two topics, it means that they were mentioned together in a message. For example, an arc would appear in the graph between AI and BigData if there was at least a message in which the two topics were mentioned together (for example as in all those messages in which AI is described as a meaningful opportunity to deal with BigData to extract meaning from them). The thickness of the arches indicates how "strong" is the connection, and is proportional to the number of messages in which the two topics appear together: if an arc is two times as thicker as another one means that the co-occurrences of the related topics were as well one two times the other. Topics and relations are also coloured. If two items have the same colour it means that they belong to the same "Cluster" of expression. "Cluster" are defined statistically. When a certain set of topics are mentioned systematically together (for example topic A is mentioned many times with topic B, and topic B with topic C, and these numbers of mentions are much higher than the ones relative to other topics), they form a Cluster. A Cluster shows a "family" of topics, meaning that they form a welldefined, recognizable, area of interest and expression. They are topics which "go together".

- **Fintech** is the topic which is most interconnected with all the other major topics; showing how users are systematically discussing the financial implications of Internet technologies and the new networked technologies which may open up novel and disruptive financial scenarios, including digital currencies, blockchains and other distributed technologies. Addressing Fintech means, today, creating impact on most of the other topics in discussion. And the opposite is also true: addressing any major topic bears impact which orbit in or around Fintech. This is a very promising situation, which should be valued and exploited, by designing and supporting European approaches to excellence in this field.
- **Security** (Cybersecurity, Cyberattacks, Malware...), **Privacy** and **Surveillance** are at the centre of Europeans' concerns. At the same time, these areas are seen as key areas for the development of new businesses, where cutting-edge research and innovation can serve people's security and rights. If matched with the fact that Europe, today, has maybe the most advanced set of Privacy and Cyber security laws and regulations in the world, this might lead us to reflect on the possibility of creating a serious competitive advantage in software and hardware production, in data hosting and management services, etc.
- Connected to this is the discussion about the **Cloud**. Cloud solutions are seen as a great opportunity for both education (for which competencies and skills on cloud systems are highlighted as important all over the conversations) and business. But they are also seen as a potential major threat to privacy, security and surveillance. By uniting these two considerations, interventions could be designed to support new business and social domains which could explicitly offer the best of Cloud and security/privacy, also referring to encryption and distributed solutions (which are systematically mentioned as meaningful and potentially effective solutions).
- **Algorithms** are another protagonist, both in positive (for example for all that concerns their applications in health and smart systems) and negative ones (for example due to possible negative implications in terms of privacy, control, surveillance).
- Concerning **NetNeutrality**, it is possible to observe two separate phenomena. On the one hand, the number and dimensions of explicit discussion about NetNeutrality are minimal. On the other hand, people are mentioning multiple types of NetNeutrality related issues, but without referring directly to the NetNeutrality theme and mostly creating dispersed communications which often only refer to the private entities which are the objects of these discussions, under the form of complaints to subjects such as Netflix, YouTube and the like. A dedicated intervention in this area would allow bringing these discussions together, in public, shared ways, so that a larger narrative could be achieved as well as a clearer, more transparent and inclusive opportunity to design shared solutions.
- The relationship between internet technologies and democracy is highly conflictual, with users wondering if and to what extent recent elections (particularly the US Presidential elections and the Brexit referendum) were influenced by big data based profiling and targeting of voters, often based on fake-news. Fears about collusion between government and tech companies to spy on citizens and implement social-control policies are also recurrent, and, from this point of view, the European Union appears particularly well placed to re-establish trust in the internet in its connections with public debate and democratic processes.

Many of the insights provided by the network analysis are confirmed by the results of the online consultation linked to the media campaign, as well as by the expert discussion held in Brussels during the NGI Summit.

Of course, it is important to notice that this wasn't a scientific survey and that the sample is not statistically representative: only 8 newspapers from 8 EU countries were involved in the initiative, and we had no means to influence how many respondents would have participated for each country or to ensure a balance in terms of, for instance, geographical distribution, age, sex or socio-economic background. However, results obtained by polling the questionnaire on the public sphere, social media and democracy to a statistically representative sample of people living in Poland, were largely aligned to those presented below. Moreover, to at least partly compensate for this shortcoming, the following chapters will compare the results of the online consultation, where possible, with insights obtained via the network and sentiment analysis, literature findings and results from the recent Eurobarometer 460 'Attitudes towards the impact of digitisation and automation on daily life' and the Standard Eurobarometer 86 'Media use in the EU'. Feedback provided by experts and participants during the NGI Summit or in response to the circulation of the preliminary version of this report are also considered in the analysis.

As already mentioned, the citizen engagement and media campaign ran for three weeks and saw the access to the REsearch platform of over 34.000 unique users, out of which 8.592 took part in the survey, and 3.514 completed it in full. Participation varied extensively across topics and countries, with the first week topic "New technologies for disrupting the economy: business, employment and skills" registering the highest response rate. This was mostly due to the coverage provided to the initiative and related weekly survey by The Guardian and Politico, which led to a surge in English and French answers.

The second week topic "New technologies disrupting the public sphere: social media and democracy" received the least responses (1.107 in total, out of which 480 complete) overall, but performed better than any other topic in Portugal. This outcome might be due to the fact that the theme has been covered very extensively by European and international media since the British referendum, and readers might have felt fatigued by the topic.

The third week topic "New technologies blurring online and offline worlds and disrupting the personal sphere" performed very well in Spain and Germany, but registered the highest number of incomplete questionnaires, possibly due to the fact that questions were slightly more technical compared to the previous weeks (2.653 answers were received, but only 696 were complete).

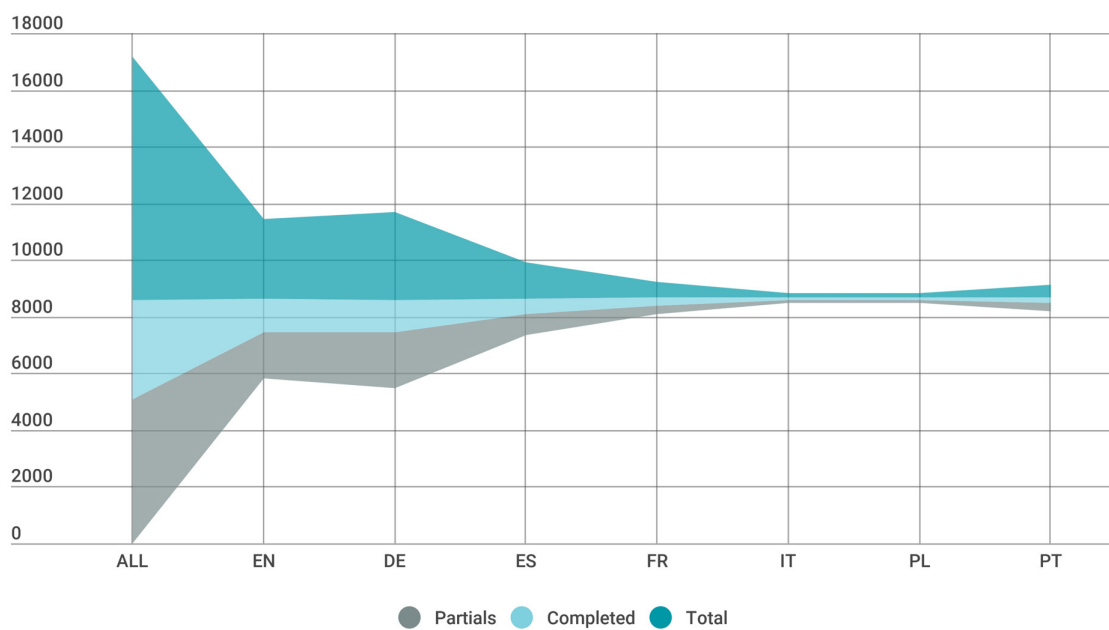
English, Spanish and German speakers were the most represented, while very few responses were collected from Italian and Polish-speaking readers.

As already mentioned, male participation was higher than female across all the topics with a most accentuated gap for week 1 (77% of male respondents compared to 22% female) and a slightly less accentuated gap for week 3 (67% male compared to 31% female).

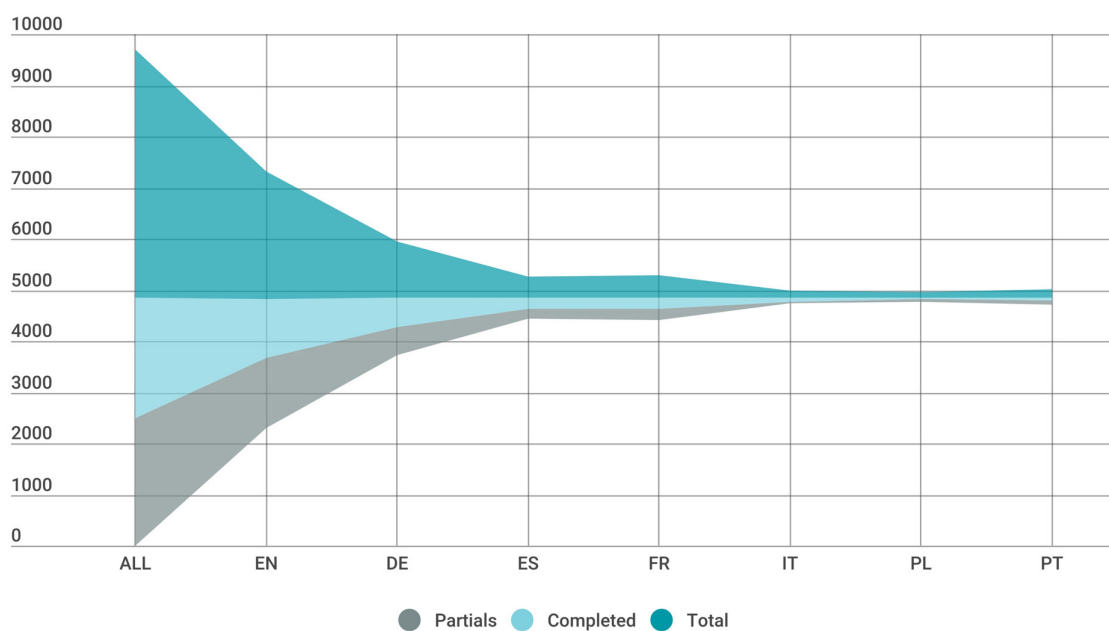
The age distribution remained quite constant throughout the campaign, with a majority of participants being in the 16-65 range.

The education level of participants remained high above the EU average, with 35% of participants having a master's degree and another 12% having a PhD. Most strikingly, 19% of respondents were researchers. This was most probably due to the dissemination work carried out by media partner Elsevier, as well as by Atomium-EISMD knowledge partners. This also indicates that – in line with the network and sentiment analysis finding – people discussing the future of the internet tend to either work or research in the field.

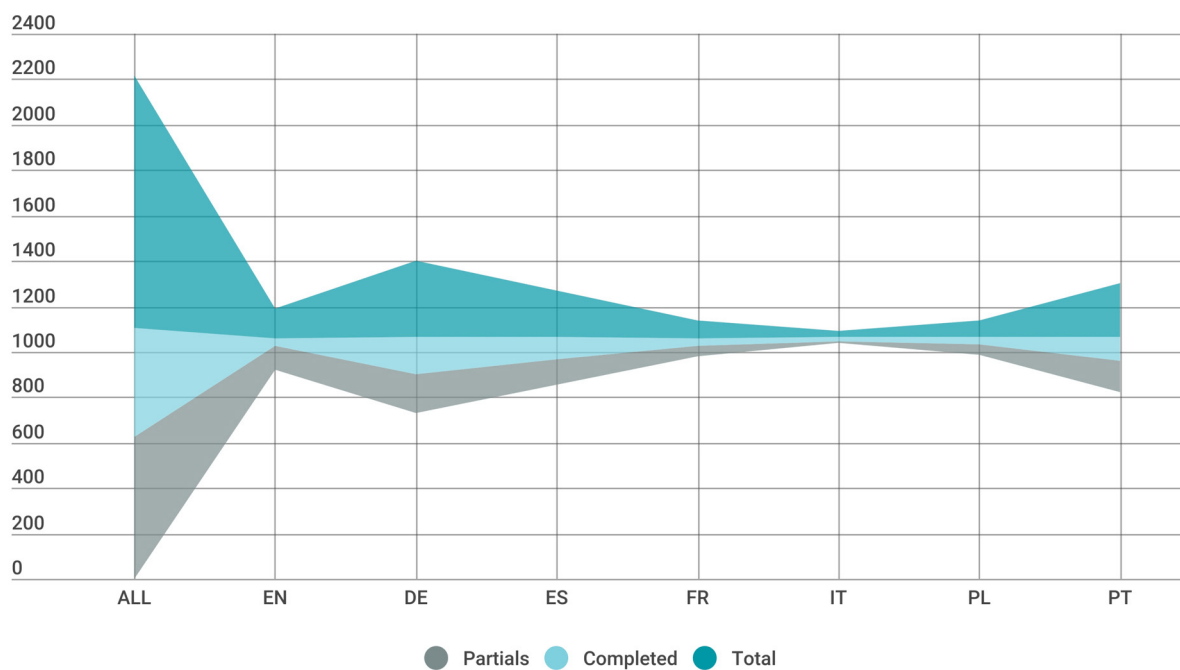
Graph 1.7 – Answers per language group during the three week campaign.



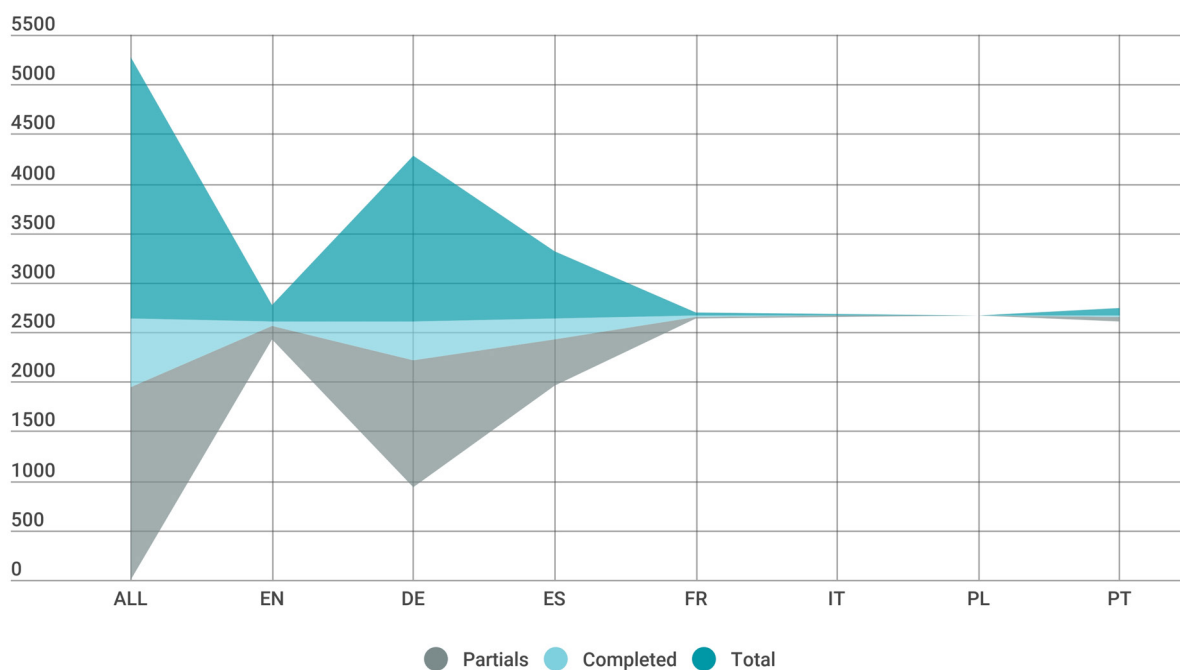
Graph 1.8 – Answers per language group during the first week.



Graph 1.9 – Answers per language group during the second week.

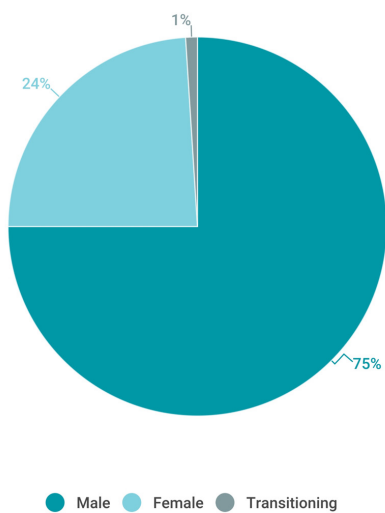


Graph 1.10 – Answers per language group during the third week.

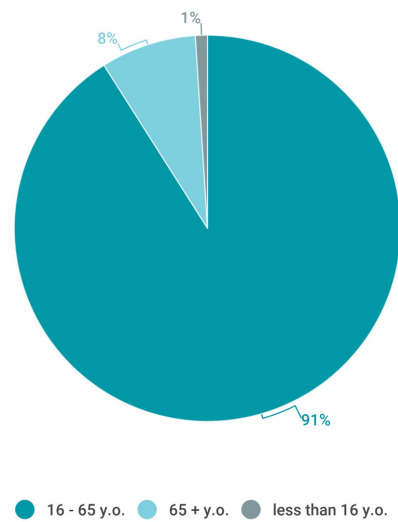




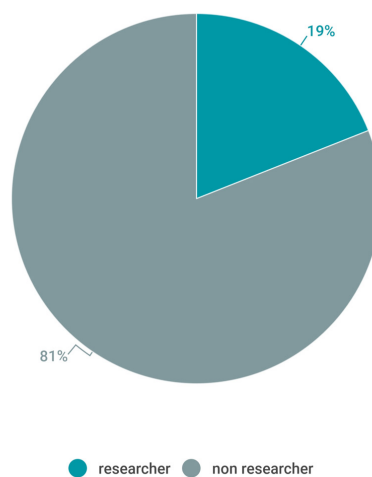
Graph 1.11 – Gender of overall respondents.



Graph 1.12 – Age of overall respondents.



Graph 1.13 – Share of researchers on overall respondents.





Even though the consultation is not statistically representative, indications are interesting:

- In line with the network analysis' results, the broad majority of readers agree that IoT, BigData and machine learning are the most promising internet technologies in terms of their impact on both the labour market and people's personal lives. However, neither the blockchain nor fin-tech are recognised as key development sectors, while collaborative technologies are expected to bring about radical change to the job market but not in people's personal lives. On the contrary, immersive technologies and human-machine interfaces are expected to impact more on personal habits than on the job market. Interestingly, people tend to have well-defined opinions on the impact that technologies are going to have on their personal lives, way less so on the impact on business models and the job market.
- In line with the findings of the Eurobarometer 460, automation of jobs is a source of great concern, and people expect public institutions to manage the disruption caused by rapid technological advance. While the contribution of internet-technologies to overcoming societal challenges such as terrorism and security, as well as healthcare, is widely recognised, opinions are extremely polarised concerning other potentially positive contributions of internet technologies to tackling existing socio-economic issues such as migration, climate change, shrinking public budgets or slow economic growth.
- Citizens value very much their right to privacy and data ownership and expect the public sector to limit the power of tech-giants. Security and access to fast broadband at affordable prices are also major concerns. "Hard regulation" of tech companies is broadly supported, even if at the expenses of the possibility/easiness of trading on the internet.
- Europeans value very highly their right to access reliable, well documented and diverse contents, and are hugely concerned by the possibility of being profiled and manipulated via targeted messages. The GDPR is a good start in this sense, while more efforts are needed to speed-up the revision of the e-privacy directive and to undertake a reform of surveillance practices.
- It is important to ensure that there is a fair balance between the right to access information and freedom of speech. Further research is needed to validate this hypothesis, but both from our network analysis and online consultation it seems that while a majority of people support a "hard-regulation" approach to issues such as data/privacy protection, most people are against the idea of regulating tech-companies on fake-news, since this would imply a risk of censorship and social control. Internet technologies are seen as a cause of rising populism, but also as an opportunity to restore public trust, well-informed debate and multi-sectoral collaboration. Over 70% of respondents strongly agree that action is needed to tackle filter-bubbles, echo-chambers and fake news, and educating/empowering people is seen by far as the best way to go about it. Fact-checking solutions through scientific research would also be warmly welcome, supporting experimentation around technological solutions such as AI and distributed networks are also important.

The following sections provide a more detailed analysis of the 3 main topics covered week-by-week in the media campaign and online consultation, and further discussed during the NGI Summit.



WEEK 1 – NEW TECHNOLOGIES FOR DISRUPTING THE ECONOMY: BUSINESS, EMPLOYMENT AND SKILLS

“The challenges of increased use of technology and automation will affect all jobs and industries. Making the most of the new opportunities whilst mitigating any negative impact will require a massive investment in skills and a major rethink of education and lifelong learning systems. It will also call for the roll-out of new social rights to accompany the changing world of work”

European Commission, White Paper on the Future of Europe, 2017

BACKGROUND

The advent of the internet has radically changed the job market as well as industrial processes. E-commerce has become a key sales channel for large and small companies worldwide, the sharing economy is already allowing citizens to monetise their expertise as well as their assets and manage their data as digital assets, whilst physical systems that integrate digital technology like internet-connected manufacturing or cars, 3D printing, the Internet of things and cloud computing are radically changing production models for traditional industries as diverse as manufacturing, healthcare, energy management, transportation or agriculture. As highlighted by John Frank during the NGI Summit, there has never been a better moment to innovate “because the power of cloud computing and digital insight is available to everyone with the curiosity and courage to apply data science to all problems and new opportunities”. At the same time, the capacity to take advantage of the ongoing technological revolution is key to surviving and thriving in the market: based on Assolombarda’s “European firms Performance Landmark Analysis”, which analyses the performance of over 700 SMEs from the 5 most industrialised regions in Europe since 2009, those companies that innovate both in terms of products and processes, that are internationalized, which go through efficient digital transformations and invest in management skills, are over 200% more performing than enterprises of the same size, operating in the same sector for the same time and with the same levels of capitalisation. However, there lacks clarity around what policies, particularly at the EU level, could support the transformation of SMEs’ way of working, raising managerial skills to make them able to take advantage of the digital revolution to innovate, grow and internationalise. This is indeed a problem also for large companies, and particularly when it comes to managing collective intelligence: as remarked during the NGI Summit, according to Deloitte’s Human Capital Trends 2017 study, only 17% of global executives report they are ready to manage a workforce with robots, people and AI working together. This is the lowest level of readiness recorded for a trend in the last 5 years of surveying trends. In this sense, more research and policy experimentation is needed.

Indeed, internet-technologies are changing the way in which businesses interact among themselves, with their customers and employees as well as with the environment in which they operate. As pointed out by Paul Sallomi "The digitization of the enterprise is opening up whole new markets, creating ecosystems that often extend across multiple sectors. Connected and autonomous vehicles, e-medicine, fin tech, e-tail, and smart cities are all enabled by connectivity, growth in storage and bandwidth, advances in cognitive technologies, and increasingly sophisticated data analytics. They are spawning a myriad of new products and services that will continue to excite and astonish us" (Sallomi, 2017).

As pinpointed by Vincent Fosty, the consequences of the ongoing digital revolution to the way businesses and people employed by these businesses are organised is hard to underestimate. This is the core of "The future of work", "a combination of workforce augmentation through robots and AI on the one hand, and crowds and contingent workers on the other. In this context, companies and organizations will need to reinvent what work really means, how the workforce is designed, how the workforce is trained ... or retrained". Indeed, according to Deloitte's Human Capital Trends 2017, "41% of companies reported they have fully implemented or have made significant progress in adopting cognitive computer robotics and AI technologies within their workforce, and another 34% are in the midst of pilot programmes". This automation process doesn't necessarily mean that jobs will be lost, and we know from the same Deloitte report that 77% of companies surveyed are either retraining people to use technology or will redesign jobs to take better advantage of human skills: "there is no fatality for the workforce in the next generation internet era ... We are far from the situations where organisation will have the binary option replacing jobs or not. With all technology developments comes a world of opportunities. And beyond productivity we see an opportunity to rethink work around something we call "essential human skills". Whilst tasks are being automated, the essential human parts of work are becoming more important: empathy, personal service, creativity, communication, problem solving, persuasion, ethical skills ... Technologies will boost productivity and allow workers to focus on the human aspects of work". Of course, while the web has great potential to foster entrepreneurship and self-employment, and to radically improve efficiency, sustainability and competitiveness, several barriers need to be addressed, for instance in terms of interoperability, standardisation and security, at technological, legal and fiscal levels. Similarly, more research is needed to understand the consequences of automation and the data economy on employment and welfare systems, as well as the impact of new forms of e-entrepreneurship on social security. As remarked by Professor Cristiano Codagnone during the NGI Summit, the correlation between automation and loss of jobs, and particularly of routine cognitive and manual tasks, is far from proven, while a similar assumption, i.e. the correlation between the difference in wages and the difference in skills, has been empirically disproved. This, however, doesn't mean that the fears expressed by so many Europeans towards the negative impact of internet technologies on jobs and wages should be dismissed. As remarked by Vice-president Timmermans

"We say to people: learning becomes a life-long duty. You must adapt. You must be flexible. Which is true. But at the same time our mortgages, our rents, are not flexible. Nor is our insurance, our groceries, or the schooling of our kids. This poses a challenge. Schumpeter's 'creative destruction' is a great concept, leading to great progress. But if you lose your job in the meantime you will wonder angrily: "Progress?" What progress?".

In conclusion, again following Professor Codagnone, the real change-maker is not technology, but policy and politics. Technological progress is just one out of many trends which have characterised western economies in the last 20 years, which include de-industrialization; stagnant wages and divergence between productivity growth and wage growth; declining labour share and related massive surge in corporate profits; declining labour force participation; declining business dynamism and net job creation; soaring inequality and; polarization and growing number of part-time jobs. What has really changed in the **last decades is the relation of force between capital and labour. The correlation between this and the seven trends mentioned above is much stronger statistically than the correlation with technologization**: "we have to ask ourselves, not about the technology - enough with the technology - we have to ask ourselves, **what policies, what institutions, what alternative mechanisms we want to have, in order to do as we have done in the past**. Because we always solved the problem of finding new ways of using labour, even though there was technological innovation".

FOCUS: Beyond the knowledge economy - The skills of the future

According to the WEF report *The Future of Jobs*¹⁰, we are facing a new and accelerated scenario requiring educational institutions to step up the pace of innovation. In fact, during previous industrial revolutions, it often took decades to build the training systems and labour market institutions needed to develop major new skill sets on a large scale. However, given the upcoming pace and scale of disruption brought about by the Fourth Industrial Revolution, this is simply not an option.

As the WEF report notes:

"Without targeted action today to manage the near-term transition and build a workforce with futureproof skills, governments will have to cope with ever-growing unemployment and inequality, and businesses with a shrinking consumer base. Moreover, these efforts are necessary not just to mitigate the risks of the profound shifts underway but also to capitalize on the opportunities presented by the Fourth Industrial Revolution. Freelancing is a growing trend, but for a talent revolution to take place, governments and businesses will need to profoundly change their approach to education, skills and employment, and their approach to working with each other".

The manifestation of talent revolution is much wider than many think. Businesses will need to put talent development and future workforce strategy front and centre to their growth. Firms – as highlighted several times during the NGI Summit - can no longer be passive consumers of ready-made human capital. They require a new mindset to meet their talent needs and to optimize social outcomes. In the words of Microsoft's John Frank "it is important that we think carefully about the kind of future we want to create and to ensure that it is inclusive. That the benefits of digital transformation are shared widely in society and that we rethink how we educate people not just once at the beginning of adulthood and then you just keep going, but in fact realizing that we will need to skill people and re-skill people and in fact each of us will be responsible for to continued re-skilling our people."

Like many people here in Brussels, people are on their second, third or even fourth careers. We re-skill. That will be the keystone of a part of the future is ensuring people that we will be there for them when it's time to re-skill". Governments will need to re-consider fundamentally the education models of today. As the issue becomes more urgent, governments will need to show bolder leadership in putting through the curricula and labour market regulation changes that are already decades overdue in some economies. And intrapreneurship will be fundamental within the public sphere, just as much as it is within the private sector. Indeed, according to Cathy Davidson, professor at Duke University, 65% of students attending primary school today are likely to work in jobs that don't yet exist by 2020¹¹, while as highlighted in the WEF report, up to 7.1 million jobs could be lost in the meantime because of technological advancements, two thirds of which are concentrated in routine white-collar office functions. But high-profile jobs aren't secure either: recently, Hong Kong-based venture capital fund Deep Knowledge Venture has nominated as a member of its executive board Vital, an algorithm which can calculate which investments are likely to be most successful.

Clearly, if the right skills for the future are to be obtained, then we require a holistic and concerted effort that includes all members and sectors of society, at all ages, and in all institutions (from schools to businesses to government offices). Indeed, as pointed out by Professor Anna Carbone during the NGI Summit, while there is a lot of discussion around "Industry 4.0" we should look more in depth at what a "Society 4.0" would look like. This means coming up with a credible "Education 4.0" Agenda as "What is the society 4.0? It is an ecosystem of disciplines that we call here finance 4.0, economy 4.0, governance 4.0 - a plethora of disciplines and skills & expertise that are necessary to make our industry 4.0 at work, successful. Otherwise, we will never succeed. Probably, we have already the technologies, we have just to put in place these technologies - collective platforms to collect, share and integrate ideas, cultures and the latest technologies - the IoT, blockchain and all these things - these collective platforms are needed to allow the education 4.0 strategy to succeed in building a prosperous and inclusive Society 4.0".

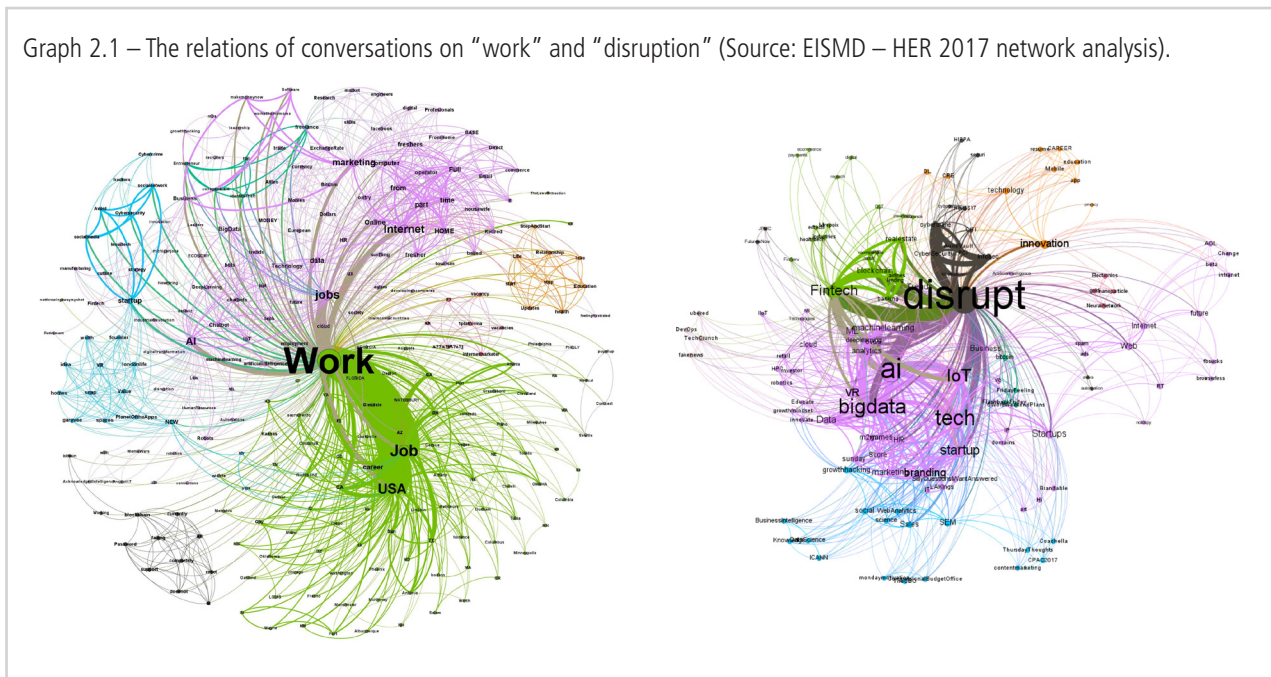
This is no easy task, and fundamental questions will need to be addressed along the way if we are to get even close to this ambitious goal. But if we can develop and use the right skills at the right time, then the next generation of internet-based development is almost limitless.

10. <https://www.weforum.org/reports/the-future-of-jobs>

11. (Davidson, 2011)

RESULTS

Graph 2.1 – The relations of conversations on “work” and “disruption” (Source: EISMD – HER 2017 network analysis).



What will be the jobs of the future? Based on our network analysis, it seems that to reply to this question, people look first to the US job market, which is supposed to outline the trends of the next generation internet.

Clearly, AI, BigData, IoT and Fintech are seen as the most disruptive technologies when it comes to markets and jobs. The development of Bot and Chatbot tools, especially via the integration with the rapidly evolving AI technology, is considered a very impactful phenomenon on certain specific jobs, e.g. on customer care functions. There are two aspects to this. On the one hand, there is a heated discussion about the ways in which it is feared that Smart non-human Agents will replace human workers, causing unemployment. On the other hand, AI, Bots and other forms of Smart Agents are seen as a great opportunity and as means to create new businesses and jobs. This is evident in the education area for example, as well as in the service sector, where Bot and AI design and development are becoming increasingly valuable skills.

Marketing is another predominant topic, creating peculiar interconnections with other topics. Strong links to Home, Online, Part-time, Housewife and Freelance, for instance, suggest a significant boost towards Agile and Flexible work modalities, which seems particularly interesting from the point of view of boosting women employment.

This seems confirmed also by the Start-up node of the work graph, assuming that a start-up is a company where innovative organizational paradigms are predominant. Start-ups are mentioned according to two main modalities. On the one hand, as paradigmatic of the Next Generation Internet work modality: for a large part of the subjects whose expressions were observed, the most relevant employment and professional opportunities will revolve around Start-ups. On the other hand, Start-ups are associated with the most promising market areas such as Fintech, Cloud services, Cyber Security and Social Media, which are deemed to be the right areas where to start a business.

The importance of nurturing the European start-ups ecosystem was highlighted several times also during the NGI Summit, particularly by Commissioner Ansip: “Our Digital Single Market project already does a lot to promote start-ups and encourage innovation. But there is a lot more we could do, such as reinforcing this commitment with more funding for tech research, for example. We are looking into this, to anchor technology as a firm priority in the EU’s next seven-year funding period.

The next generations of tech innovators represent Europe’s digital future. I strongly believe in investing in start-ups and hi-tech research, both politically and financially: to build a new class of internet innovators, to help them grow and compete globally”. Similarly, the link between start-ups and flexible work arrangements, and the need to build ecosystems in which start-ups, freelancers and established companies, as well as the public and third sectors, can operate in a synergic way were also highlighted during the Summit, with a particular reference to the role of cities and regions in promoting this systemic innovation approach.

The increase in big data mining and artificial intelligence is viewed as the most impactful factor when it comes at changing the way we will learn, work and do commerce over the next ten years, according to the participants in REsearch's consultation. Quite surprisingly, the contributions to change of sharing economy platforms such as Uber, TaskRabbit and AirB&B are viewed as much less important although probably one of the most visible and present effects of digital networks are already sparking protests and discussions in many member states. Interestingly, this seems in line with recent literature findings. Indeed, paraphrasing Albert Hirschman's Rhetoric of Reaction, there still seems to be little robust evidence about the actual disruptiveness of the sharing economy¹².

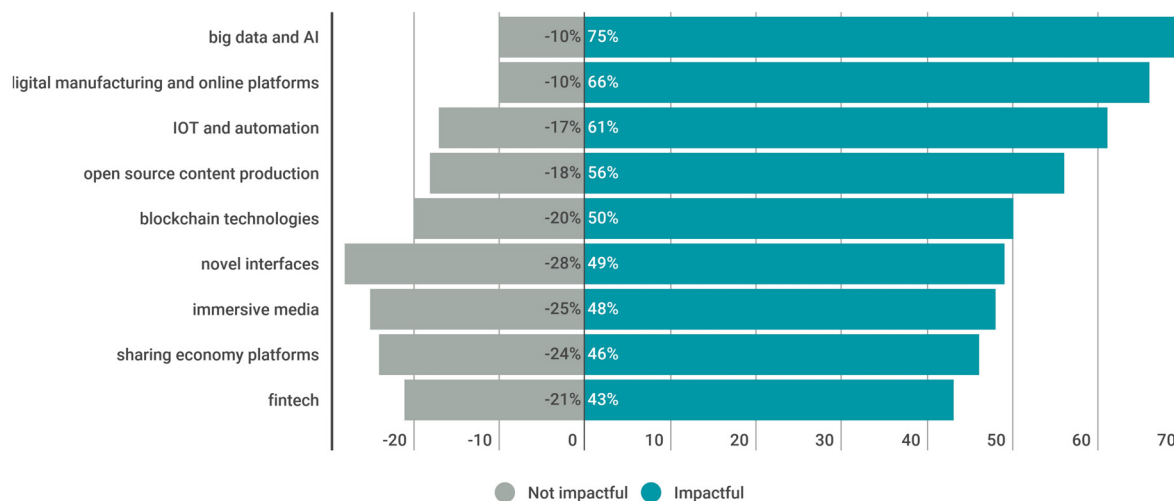
Several experts have observed that it is still unclear if digital platforms are really producing disruptive innovation in the true meaning, or are just thriving on regulatory arbitrage for they operate in a grey area not fully regulated and to some extent standing outside the law¹³.

Technologies such as fintech and blockchain – which were at the centre of every business conversation according to REsearch's network analysis, are probably the least familiar to the layman as at least one-third of respondents do not perceive they will be significant drivers of change. This should not be surprising if we consider the results of the Eurobarometer 460, according to which less than half of the EU population has heard, read or seen something about AI – a more established technology compared to blockchain – in the last 12 months.

The role of immersive media is also slightly underestimated, as remarked by BT's Mansoor Hanif: "Augmented reality is fundamentally a mobile platform from a network perspective. We feel we can augment every sphere of the society. From work to entertainment. I was interested in the survey results, noticing that people didn't recognise how much we are disrupting the entertainment world".

On the other hand, the potential of collaborative, open-source platforms is widely acknowledged, most likely in relation to education and learning opportunities.

Graph 2.2 – Which technologies will bring the most profound change in change in how we learn, work and do commerce in the next 10 years?



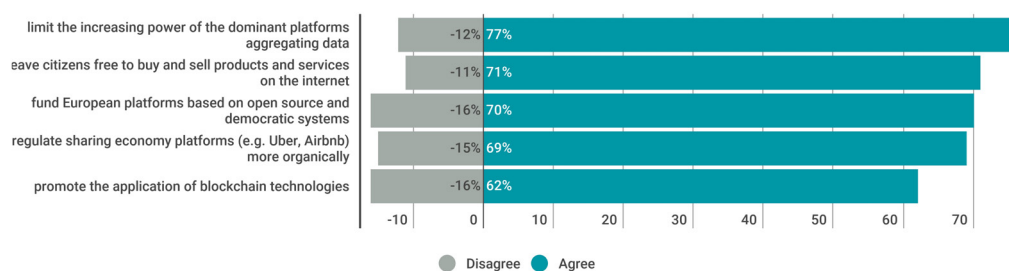
12. Hirschman, A. O. (1991). *The Rhetoric of Reaction: Perversity, Futility, Jeopardy*. Harvard University Press. See also Codagnone, C., Abadie, F., & Biagi, F. (2016). *The Future of Work in the "Sharing Economy" Market Efficiency and Equitable Opportunities or Unfair Precarisation? And Codagnone, C., Biagi, F., & Abadie, F. (2016). The Passions and the Interests: Unpacking the "Sharing Economy."*

13. See for instance Codagnone, C., Abadie, F., & Biagi, F. (2016). *The Future of Work in the "Sharing Economy" Market Efficiency and Equitable Opportunities or Unfair Precarisation?*



In terms of unlocking the socio-economic potential of internet technologies, respondents seem more preoccupied with the need of protecting consumers than incentivising e-commerce and build a more conducive business ecosystem. Clearly, and in line with the results of the network analysis, people are concerned with the increasing power of dominant platforms (with nearly 80% of respondents stating that it is important to limit the increasing power of dominant platforms aggregating data and nearly 70% agreeing that sharing economy platforms should be regulated more organically) and concerned about the way their personal data is used. Interestingly, there is considerable support for the idea of funding alternative, European-based platforms complying with open-source and democratic principles, however, blockchain is not understood as a key technology to power this effort. This seems to confirm that distributed networks are still the object of specialist conversations and their potential is not yet recognised by the broader public.

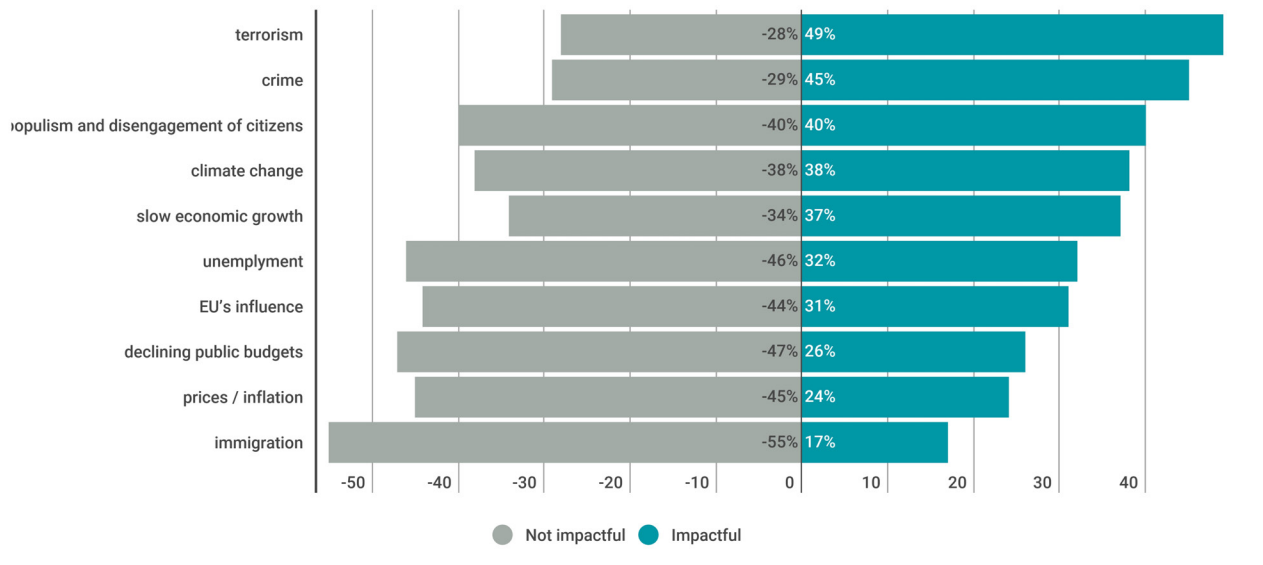
Graph 2.3 – The internet has significantly simplified matching supply and demand for products and services and reduced transaction costs. What are the most important actions to be taken in the coming years to take full advantage of this?



Concerning the potential of NGI technologies' positive societal impact, terrorism, crime and the spread of populism are perceived as the main societal issues on which NGI technologies are likely to contribute to a solution (or, in the case of rising populism, to accentuate the problem). Quite strikingly, some of the longer term pressing issues such as immigration, inflation and slow economic growth are not considered a ground where digital technologies could make a difference. It is important to note that the most technical subjects such as inflation and growth, are also the ones with the highest percentage of respondents declining to take sides (respectively 31% and 29%). All in all, respondents do not seem to be particularly optimistic about the role of NGI technologies in tackling current socio-economic challenges in the near future, which is slightly in contradiction with the results of the Eurobarometer 460, according to which 64% of EU citizens believe that the most recent digital technologies already have a positive impact on society and 75% think they have a positive impact on the economy. However, this might at least partly be due to a general pessimism towards the future, which is also confirmed by the fact that, in the same Eurobarometer, respondents are more optimistic about the role of AI and robots in the current labour market than in the future labour market.

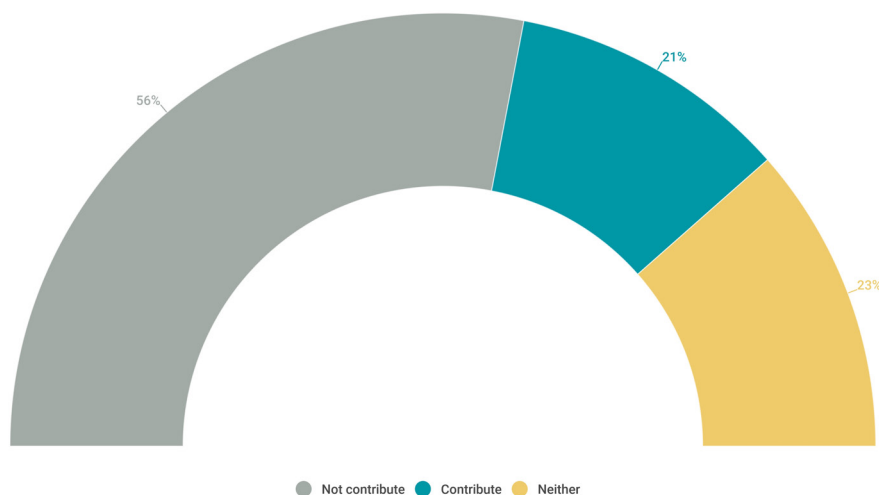
Concerning the role of ICT in growing the influence of Europe in the world, only a minority of our respondents think this might be a possibility. This seems in line with the Eurobarometer 460, according to which "opinions are mixed as to whether the EU is ahead of other world regions when it comes to the digital transformation of industry", with 41% agreeing and around 33% disagreeing. Indeed, the slightly more optimistic view of the Eurobarometer sample might be explained by the fact that "other regions" include developing countries.

Graph 2.4 – Which key issues in society will be overcome with the contribution of future and emerging internet technologies?



People are particularly concerned when it comes to the impact of internet technologies on employment rates and salaries, with only one in five respondents believing that “the digitisation and ‘internetisation’ of business will deliver meaningful work for all, and generate salaries that equal or exceed current levels”. While answers might be a reaction to the very optimistic tone of the question, they are largely confirmed by the results of the Eurobarometer 460, according to which: “Although more than six in ten respondents have a positive view of robots and artificial intelligence, an even higher proportion (72%) agree robots and artificial intelligence steal people’s jobs. In fact, more than one third (35%) say they ‘totally agree’ with this statement”. In addition, “almost three quarters of respondents (74%) agree that due to the use of robots and artificial intelligence, more jobs will disappear than new jobs will be created, with 37% saying they ‘totally agree’, although only a minority think their job could be done by a robot or artificial intelligence”. This is at least partly contradicted by the findings of the network and sentiment analysis, where concerns about “uberization” of the job market and rising unemployment are in good measure balanced by the excitement around new areas of business development such as cybersecurity, fintech and social media. This, however, might be due to the fact that users talking about the next generation internet on social media tend to be quite knowledgeable, and often already working in the sector, and therefore less preoccupied about negative consequences of technological advances on their employment situation. As highlighted during the NGI Summit, evidence on the impact of digitisation on employment levels is far from clear, and the predictions put forward by Frey and Osborne in their “The Future of Employment” report, according to which nearly half of existing jobs in the US might be automated in the next 20 years, are not supported by a sufficiently sound methodology, while also not taking into account the possibility of regulatory intervention. As remarked by Professor Floridi: “that analysis has been produced by assuming that legislation would make no difference to the job market. Which is like weather forecast assuming that the winds are not to be taken into account. Obviously, a pointless exercise”. However, this also means that both the regulator and private companies have a key role to play in maintaining and creating new jobs, including by allowing workers to acquire new skills all along their lives, starting with soft-skills such as critical thinking, empathy and creativity.

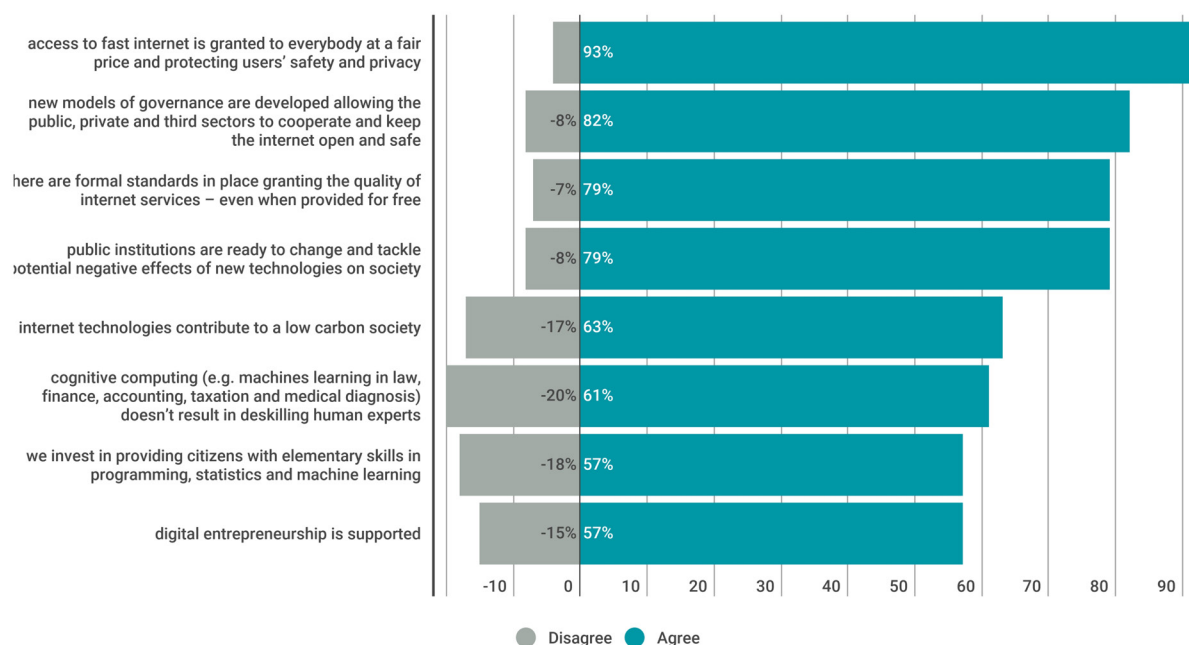
Graph 2.5 – Will the digitisation and “internetisation” of business deliver meaningful work for all, and generate salaries that equal or exceed current levels?



The concern towards negative externalities brought about by the ongoing internet revolution is further highlighted by the fact that, when it comes to regulating standards and services of the digital world, respondent's priorities clearly lean towards a protection of citizens' and consumers' rights. Access to broadband and an open and safe internet are, in fact, overwhelmingly seen as a prerequisite for the improvement of the job market. This is fully in line with findings of the Eurobarometer 460, according to which "almost seven in ten respondents say a faster and more reliable Internet connection would encourage them to make more use of recent digital technologies (69%), with 39% saying this would 'definitely' encourage them". The importance of investing in digital infrastructure – particularly in rural areas - strongly emerged during the NGI Summit, with Mr Houkun Hu, Deputy Chairman of the Board and Rotating CEO of Huawei, highlighting how "according to the EU report on digital progress, the 30 Mbps broadband network coverage is around 76% in Europe. However, the percentage goes down to 40% in rural areas, and while Europe needs a total investment of 500 billion euros to meet its objectives in terms of connectivity by 2025, we are still short of 155 billion euros" and Mr Jose Manuel Alonso from the World Wide Web Foundation highlighting that the divide between countries is also worrying, with "Sweden and Denmark enjoying internet penetration rates of 95% or higher and countries such as Bulgaria or Romania, where one third of the population or even a little bit more is still offline, not to mention developing countries". Importantly, investment should be directed to cutting-edge digital infrastructure. In BT's Mansoor Hanif words: "we need to start building the next stage of 5G now, but it cannot just be a 4G +++. It cannot just be faster, it cannot be just lower latency. What it really needs is transformational and that means programmable networks. It needs to be completely based in the cloud and it needs to be agile and we need to move into industries, vertical industries where we are not present enough today because we simply cannot build the right networks from those industries, otherwise we won't survive".

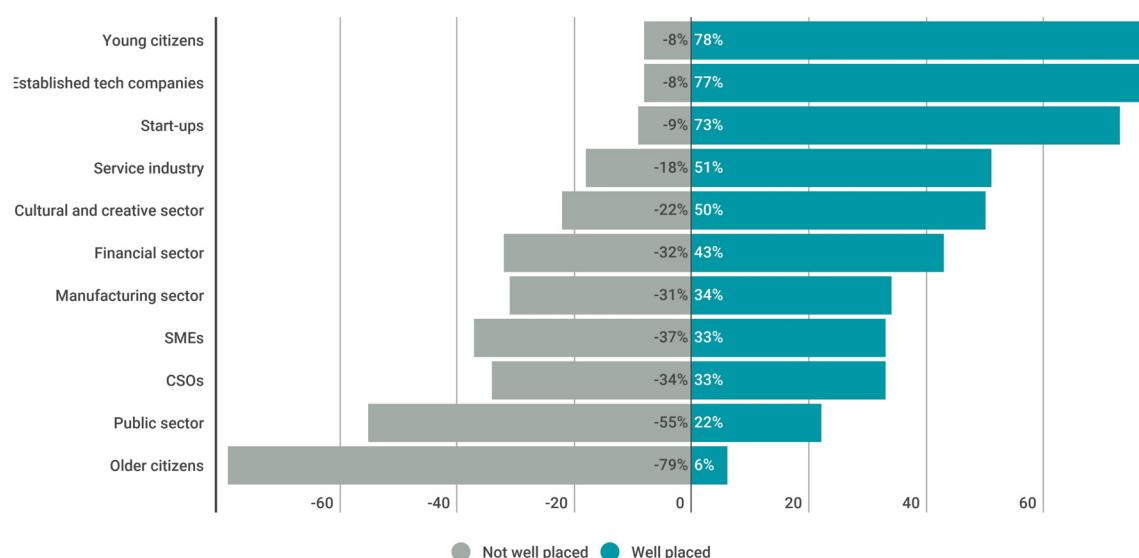
Interestingly, respondents to the REsearch survey consider very important to think further about the governance of the internet, and see the public sector not only as a catalyser of action from the private and third sector, but also as a manager of the negative externalities brought about by technological advances. Indeed, as remarked by MEP Mariete Schaake "I saw an interesting observation about the distributed Ledger Technologies and I think that there's often a lot of hope when it comes to new technologies such as the blockchain, that reminds me of how the expectations were with the open internet in and of itself a couple of decades ago. And although I am generally an optimist and I think there are opportunities everywhere, especially in technological developments, I think we risk underestimating the importance of governance. Linking back to the whole question about which stakeholder has which task, the question of safeguarding the public interest, the question of how to bake values into the systems that Engineers are making, I think there could be merit in Bridging the worlds of Technological design and development and of governance". Curiously, and in contrast with the outcomes of the network analysis, respondents don't seem to think that providing citizens with basic digital skills and supporting digital entrepreneurship are policy priorities. Relative lack of support for start-ups might indicate that a large majority of people consider start-ups already well positioned to take full advantage of future internet technologies.

Graph 2.6 – How important is each of the following actions for ensuring future and emerging internet technologies contribute to better working and living conditions for the majority of citizens?



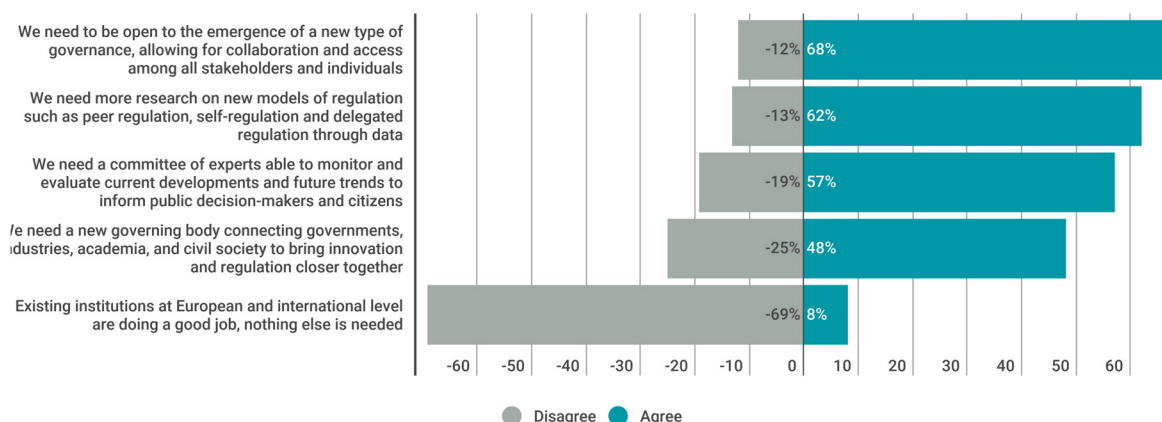
Indeed, a minority of actors seem to be perceived as well placed to take advantage of the digital world in the next decade: millennials, established tech companies and start-ups, while the older generation of European citizens clearly seems exposed to the risk of being sidelined. It is important to note that, despite Industry 4.0 being a European-conceived and -led sector, only a third of respondents thinks internet technologies may have a positive impact on the manufacturing sector – which is even more surprising considering that digital manufacturing and online collaborative platforms are considered among the most important development areas for NGI technologies. A similar result emerges for small and medium enterprises (SMEs), the backbone of the Union's economy, which are not perceived as ready to profit from next generation internet scenarios. Interestingly, while - as we will see in the next chapter – respondents strongly agree that internet technologies will contribute to improving quantity, quality, cost-efficiency and access to public services, they clearly do not see the public sector in a particularly good position to take advantage of NGI technologies. As pinpointed by Simon Willis during the NGI Summit, this is certainly explained by the fact that governments have often a poor understanding and poor consideration of technology, and that attempts at Open Government so far have mainly been disappointing, but this might also have to do with the “myth of the unencumbered innovator” which lays behind much Silicon Valley rhetoric and according to which “government just needs to get out of the way and allow entrepreneurs to get on with their innovative work”.

Graph 2.7 – Who is best placed to take advantage of the next generation of internet technologies?



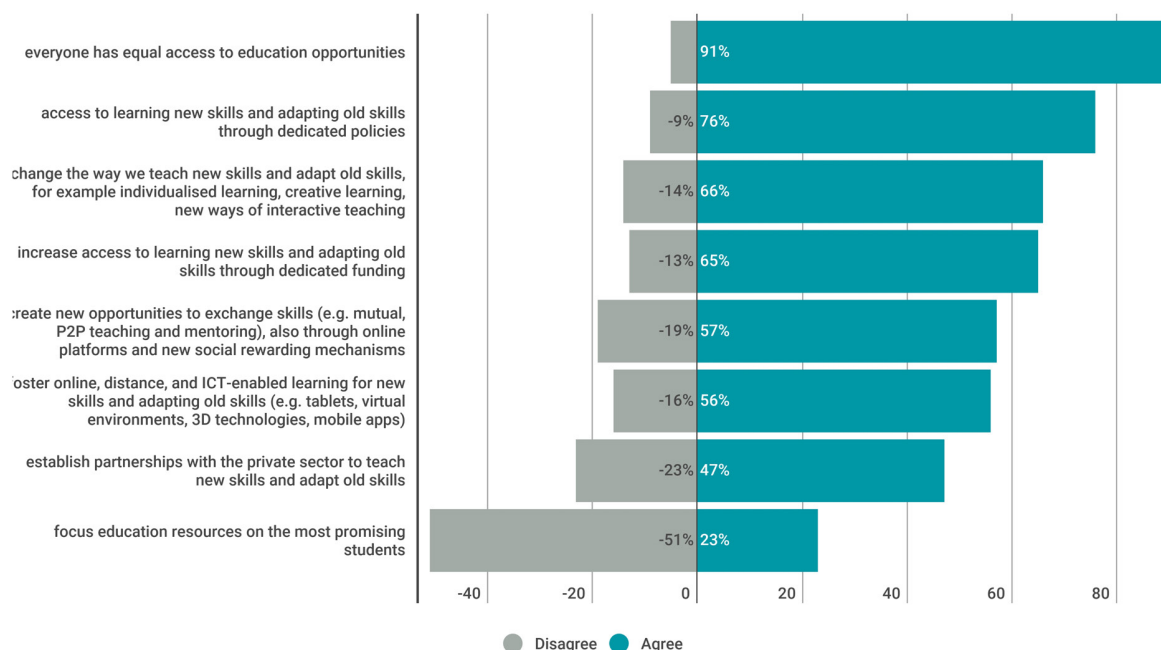
Roles and relationships between sectors and with citizens at large to develop a more inclusive and more competitive internet are indeed a key issue. While it is clear that respondents are not at all satisfied with the way the internet is currently governed, there does not seem to be much agreement on the way forward. The idea of setting up a dedicated multi-stakeholder body is endorsed by less than half the respondents, while expert committees are considered a possible solution by about the 60% of our sample. If the need for further research into new models of regulation is broadly acknowledged, most respondents believe that taking action might be premature and that it is important to wait for radically new types of governance which might allow individuals to be part of the process. This is much in line with the Open Government agenda and experimental approach to regulation put forward by several speakers during the NGI Summit, including members of both the European Commission and Parliament.

Graph 2.8 – How should the next generation internet be governed to fairly and efficiently harmonise regulations across EU member states, promote businesses, manage disruptive applications, and protect and empower citizens?



Finally, concerning digital skills, the need for ensuring equal access to education and training, allowing citizens and workers to fully profit from the opportunities opened by new internet technologies, is strongly felt among respondents. Educational opportunities and policies for the improvement of teaching skills are among the most stressed priorities, while more meritocratic and selective measures aimed at the most promising students appeal only to a minority of respondents. Interestingly, policies are deemed largely more important than funding programmes to promote digital skills among citizens, while investing in teachers and teaching methodologies is felt as more important than investing in e-learning tools.

Graph 2.9 – What are the most important actions to ensure that citizens are provided with the right skills to succeed throughout their lives and take full advantage of new internet technologies?



AREAS FOR FUTURE RESEARCH AND ACTION

Based on the needs as highlighted by policymakers, the facts as put forward by researchers, and the suggestions and opinions of citizens and their organisations, the findings of the initiative indicate several unresolved challenges which need to be addressed by policy-makers and stakeholders to build a more human-centred next generation internet.

Europeans are aware of the fact that internet technologies are going to have a tremendous impact on the business world, as well as on the job market. They acknowledge the positive potential of the ongoing 4th technological revolution, and particularly in terms of new business opportunities and better working conditions related both to more flexible work arrangements and increased support stemming from technology (particularly AI and robots). However, they are afraid that more jobs will be lost than created, and they expect public institutions to take action and tackle the negative externalities brought about by the innovation process. In this regard, it is important to:

- Invest, and catalyse investment, into the most promising areas – stepping-up efforts to develop the European Data Economy according to the Digital Single Market Strategy, but also building on European excellences such as the increasingly well-established Fin-tech sector, and capitalizing on the need – and space – to develop cutting-edge solutions and businesses in the privacy protection and cyber-security areas, also building on the European Cloud flagship initiative. The potential of AI, VR and AR in the customer management and marketing fields should also be leveraged. Emerging technologies such as the blockchain and distributed ledgers should also be supported, and funding should be devoted to the creation of European platforms based on open source and democratic principles which could provide a decentralized alternative to the dominant American platforms that aggregate data at a worldwide level.
- In line with the Reflection Paper on the Future of Social Europe, support Member States in the effort to adjust their social protection systems to the ongoing technological revolution, researching and piloting new solutions to compensate job and revenue losses due to automatization processes.
- Policy interventions and investments should aim to increase SMEs' and social enterprises ability to profit from NGI technologies. While they are one of the backbones of the EU's economy, they are not currently perceived as well placed to take full advantage of NGI technologies, in stark contrast to established tech companies and start-ups who are best placed to profit. To avoid SMEs and social enterprises being "left behind", the EU and member states should further support their readiness to use NGI technologies for growth and scaling. This seems particularly important in the NGI growth sectors such as services, cultural/creative industries, finance, and manufacturing.

The EC has a potentially central role to play in governing the NGI to fairly and efficiently harmonise regulations across EU member states; promote business; manage disruptive applications and negative externalities; and protect and empower citizens. To safeguard the Net-neutrality principle and citizens' right to privacy, while making sure Europe remains competitive on the market, the Commission, Parliament and Member States should:

- Create adequate digital infrastructure across the single market by i) rapidly adopting and implementing relevant legislation (as the proposals for an Electronic Communications Code and the Regulation on the Body of European Regulators for Electronic Communications (BEREC) as well as the Directive 2014/61/EU on measures to reduce the cost of deploying high-speed electronic communications networks) ii) ensure that more funds are allocated to digital infrastructures via the Europe Connecting Facility, EFSI and structural funds and iii) implementing the 5G Action Plan. While it is understood that private investors and companies need to be part of these efforts, preserving the right of EU citizens to access fast and reliable connection at fair prices is vital to ensure Europe future prosperity.

- Remain open to the emergence of new types of governance of the internet, allowing for collaboration among different stakeholders and with citizens.
- Promote further research and experimentation with new models of regulation such as peer, self, and delegated regulation.

In line with the EU agenda for skills and job and the Coalition for digital skills, policy interventions and investments should aim to ensure that citizens are provided with the right skills to succeed throughout their lives and take full advantage of NGI technologies. While, according to the Eurobarometer 460, EU citizens are quite confident in their digital skills, results from the latest PISA surveys are not encouraging: “around a quarter of the adult population struggles with reading and writing or poor numeracy and almost twice that number lacks adequate digital skills”¹⁴. Equal access to education and training scores high both within our online survey and our network analysis samples, however, the potential of internet technologies to facilitate learning, and the importance of acquiring digital skills and soft-skills all along people lives, doesn’t seem fully appreciated by EU citizens. At the same time, as broadly discussed during the NGI Summit, more efforts are needed to promote interdisciplinary learning and to promote transversal skills such as critical thinking, creativity, entrepreneurship, negotiation skills and so forth. In this sense, it might be important to:

- Works with member states, companies and civil society organisations to raise people awareness of the importance of acquiring ICT skills all along their lives;
- Encourage collaboration among public and private institutions to develop and disseminate innovative teaching methods and skills exchanges, as well as ICT-enabled learning.

14. Commission’s Reflection paper on the social dimension of Europe:
https://ec.europa.eu/commission/publications/reflection-paper-social-dimension-europe_en



WEEK 2 – NEW TECHNOLOGIES DISRUPTING THE PUBLIC SPHERE: INFORMATION, DEMOCRACY, AND SOCIAL MEDIA

*"The Internet remains a formidable power at the service and in favor of the citizens,
the isolated and the consumers.*

*Thanks to it, an artist finds an audience directly, my daughter reassures me
from Cambodia and a political dissident gives me his opinion".*

*Yves Baudechon, president Ogilvy & Social Lab.
(La Libre Belgique, April 26, 2017¹⁵)*

BACKGROUND

As highlighted by Yochai Benkler¹⁶, the internet was originally designed as an open network, where decentralised institutional, technical, and market power maximized freedom to operate and innovate at the expense of control. However, it is becoming apparent that today a small number of "internet giants" are strongly influencing consumers' and businesses' choices and habits, often limiting their possibility to operate and/or access information, products and services and therefore threatening the net neutrality principle. The concentration of users' data in the hands of a few large companies or public organisations is also raising concerns in terms of privacy and security, as well as of social control and unfair surveillance practices. In the words of Professor Primavera de Filippi: "the internet, which was created as a tool to increase individual freedom, is now increasingly becoming a tool for government and corporate surveillance, for censorship and for profiling individuals in a way that often decrease their privacy and their autonomy. The freedom of expression is actually being pushed to such an extreme that it has led to the well-known problem of fake news, hate speech and echo chambers. The problem of today is that we have too much information on the internet and we need to rely on the new information gatekeepers which are actually acting as the curators of the information that we see or not see on the internet. The important question here is: how will the next generation internet look like? If we want to restore this global decentralised network which is capable of promoting individual freedoms and privacy, which constitute an actual digital commons, then we have two choices: either we have to change the usages, which are made of the network - and this means regulating all the network operators - or we can act and influence the actual architecture of this network, changing the technical design. Today we have new technologies that could, to some extent, help us to do just that, starting with blockchain technology".

These new technologies could have a tremendous impact in terms of "democratisation" of the internet as well as social, economic and financial inclusion, while opening new spaces where public and private actors can cooperate and co-produce with citizens for the common good. However, technology per se is not sufficient, as largely demonstrated by the evolution of the internet itself, what we need is instead values-oriented policies and principles based regulations which can help restore trust in democratic institutions as well as the genuine debate around complex issues. As pinpointed by MEP Marju Lauristin and by Dr Olivier Dumont, restoring trust is fundamental if we want the next generation internet to be a means for democratic participation in a complex world where the simple, black-and-white messages around which mass-movements developed are, fortunately, no longer an option. As highlighted by Professor Andrzej Nowak, we need a better understanding of the narratives which could help us build bridges across polarised opinions and spotting incoherent or falsely coherent messages – which is often what fake news is. In this respect, art could make an invaluable contribution.

15. <http://www.lalibre.be/debats/ripostes/le-reve-d-un-web-universel-ouvert-et-libre-a-t-il-disparu-aujourd-hui-590024f3cd70812a65a867ac>

16. https://www.schneier.com/blog/archives/2016/03/power_on_the_in.html

FOCUS: Rethinking the right of access to information and free speech in the digital era

The rise of social media, blogging and news websites has radically changed the way news is accessed and shared. Whilst traditional newspapers are still regarded as more authoritative sources by many readers (including young people), it is becoming increasingly hard to justify the costs of well documented articles in a world where everything is communicated instantly via Twitter and the average reader's attention span is strongly reduced. As pointed out by the European Newspaper Publishers' Association, "newspapers' content is increasingly used by third parties, whether commercial companies, news aggregators or public authorities, without previous authorisation and without remuneration"¹⁶. Enforcement of copyrights to defend high-quality content created by traditional media organisations, which has often required a heavy initial investment in developing an IT infrastructure, a viable business model and the skills necessary to deal with media content, seems ineffective. In addition, as the reach of traditional media organisations shrinks, and people tend either to trust their friends and peers as sources of information or to rely on news aggregators which are either sponsored or adjusted to the user profile, a fundamental problem around the quality, objectivity and reliability of information emerges. As highlighted by Katharine Viner¹⁷, the "filter bubble" has grown incredibly strong in the last few years, posing a serious threat to our ability to access information on the internet. Another issue related to the rise of internet news outlets and social media is the increasing amount of fast-spreading fake news, which in some cases, can heavily influence the democratic process. Indeed, according to Katharine Viner, this was the case for the Brexit Campaign, with "Leave" campaigners bluntly admitting, in the aftermath of the vote, that most of the claims made during the campaign (for instance that leaving the EU would have meant to get £350 million a week to spend on NHS) were just false. "It was hardly the first time that politicians had failed to deliver what they promised, but it might have been the first time they admitted on the morning after victory that the promises had been false all along. This was the first major vote in the era of post-truth politics: the listless Remain campaign attempted to fight fantasy with facts, but quickly found that the currency of fact had been badly debased". Indeed, the rise of "fake news" intended to generate a maximum of traffic over the internet is certainly compromising the public debate space, and deeply affecting citizens' perception of the importance of stating the truth¹⁸. The fact that the outcomes of the elections – including presidential elections – might have been influenced by tailored campaigns supported by third countries have further complicated things. Countermeasures though are also worrying, as proved by the recent debate in Italy, where the President of the National Antitrust Authority, Giovanni Petruzzella, advanced the idea of establishing a central authority tasked with removing fake news from the internet. As highlighted by Edoardo Segantini and Pierluigi Battista¹⁹, this is hardly feasible, but also fundamentally dangerous since establishing an "official truth" can easily become an anti-democratic act per se, very similar to what Orwell described in 1984 as one of the main tasks of the "Ministry of Truth".

16. *Promoting Value of Content In the Digital Era:*

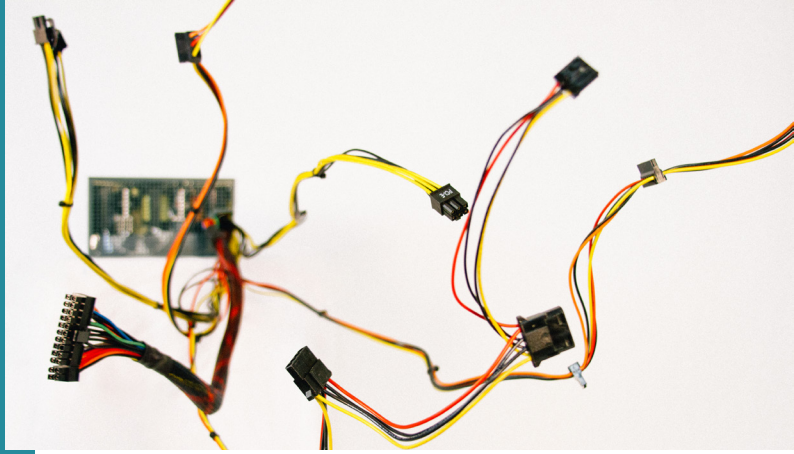
<https://euiipo.europa.eu/ohimportal/documents/11370/45502/Promoting+value+of+content+in+the+digital+era>

17. Viner, K. (2016). *How technology disrupted the truth.*

Retrieved from https://www.theguardian.com/media/2016/jul/12/how-technology-disrupted-the-truth?CMP=soc_568

18. See for instance ("Art of the lie," 2016)

19. (Battista, 2017)

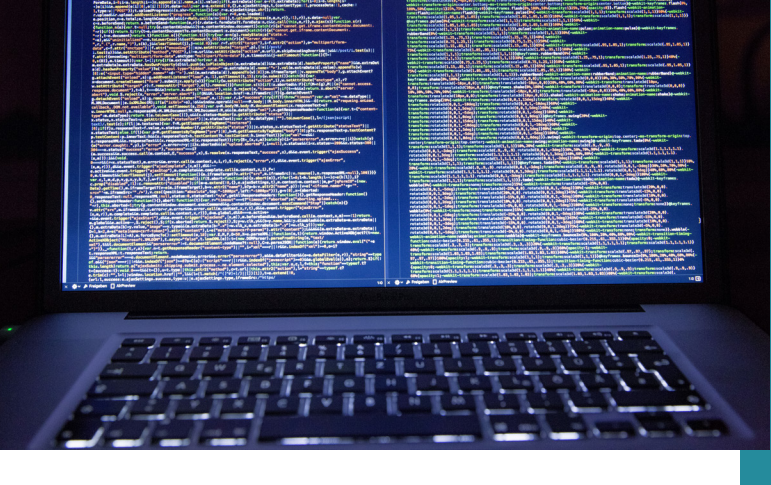


Solutions to these issues come in many forms. As highlighted by Giuseppe Abbamonte, Director for Media and Data and the European Commission, there are three main issues/lines of action in this area: 1) Fighting misinformation (particularly in certain political domains such as health policies), 2) Fighting violence (including terrorism) and hate-speech and 3) Restricting access to harmful/illegal content for children and kids. The main problem at the root of these three issues is that online platforms are regulated as tech companies by the e-commerce directive, which is a 20-year-old piece of legislation stating that platforms are not responsible for the contents they publish, even though they are obliged to pull down illegal content as soon as they become aware of its existence. This regulation was conceived – and worked - when platforms weren't data companies acting as gatekeepers of online information. The Commission is responding with several initiatives announced in the May 2016 Communication on platforms:

- Under the regulation on audio-visual (May 2016) proposal, platforms are required to promptly react to protect children and against terrorism or instigation to violence. This is being implemented by various measures, such as parental control, contents rating systems and by acting upon users' request.
- The reform of copyright requires platforms to cooperate with rights-holders to help them monetize their online contents, mainly by providing information on what happens online (for instance how many times a piece is read, played or downloaded). At the same time, platforms are obliged to take down content which is circulated disrespectfully of copyrights. This should help high-quality content providers to monetise their efforts.
- On the 31st of March 2016, four of the most important tech-companies (Facebook, Twitter, YouTube, Microsoft) signed a Code of conduct on hate speech, committing to review the majority of notifications for hate speech in less than 24 hours upon receipt and to remove harmful content. Furthermore, they committed to strengthening civil society organisations active against hate speech and to help users become more critical about the contents they access. The Commission is now evaluating the outcomes of the initiative so far.
- Several soft initiatives on media literacy are being supported to help citizens evaluate contents critically, including awareness-raising campaigns and exchanges of best practices. Two pilot projects have recently been launched on media literacy for all, and a pan-European network has been established for this purpose. In addition, dialogues on media literacy with digital intermediaries are also ongoing.

However, three main questions are still open:

1. How do we implement an effective response which does not threaten freedom of expression and flows of information, while protecting the plurality of media?
2. How do we avoid platforms to just eliminate any kind of content for fear of being legally pursued/fined? What are the risks of regulatory action?
3. Where is the responsibility of individuals online? How do we make sure that platforms do not become scapegoats for collective irresponsibility?



Much of the discussion held during the NGI Summit's parallel sessions dedicated to this topic revolved around these questions. Indeed, as remarked by Dr Erik Huizer, the fact that, in the online world, you are either totally anonymous or totally known, without the possibility to speak under "Chatham House Rules" (i.e. by sharing and using information, but without specifying the name and affiliation of the source, who is still a reliable source) makes it extremely difficult for people to speak freely. This is for a variety of reasons: "fear of extreme behaviour along with cyber criminality, fear of tech, fear of government mass surveillance – they all contribute to self-censorship". In this sense an EU e-identity, which while ensuring that you exist also gives you the opportunity to express in anonymous or pseudonymous form might be a viable solution. However, as remarked by Dr Innar Liiv, technology might make the anonymity/identity conundrum obsolete as ubiquitous facial recognition systems enter the market. Indeed, "ubiquitous face recognition will have a shocking impact on everyday life. Pointing your phone at someone will mean to access a variety of information about that person, ultimately blending together digital conversations with face-to-face interaction. Currently we rely on anonymity online, so what happens if that no longer applies?" On the other hand, as highlighted by Giuseppe Abbamonte, hate-speech is not necessarily related to anonymity, as shown for example by the fact that people keep on trolling the Italian Chair of Parliament despite being perfectly visible and easily identified. The problem here is that "people tend to believe that social media provides impunity, and do not feel responsible for what they say online". For this reason, as highlighted by MEP Michal Boni, it is important to work on education and counteract echo-chambers and opinion polarisation. At the European Parliament, defence of free speech against the risk of censorship and surveillance are at the centre of the debate on fake-news. A European Science and Media Hub is currently being set-up to counteract the phenomenon. In MEP Eva Kaili's words: "We do believe that we should not touch contents, because it is more important to protect freedom of speech, even the freedom of a lie, than banning content. But to provide options at the same way we do for politicians, to provide options for citizens - providing them with our data, the scientific data based on which we make decisions so that they can then choose in what to believe, this we think could make a difference".

In Germany, independent journalists have agreed to check on fake news and Chancellor Merkel has asked social media and e-commerce companies to make the decision-making of their algorithms 'transparent'. Social-media users' peer-review systems, implemented in close collaboration with tech-platforms are also being experimented with encouraging results, whilst, as highlighted by Fabrizio Sestini technological solutions (AI and/or blockchain based) might also lead to viable solutions. Education, training and awareness-raising campaigns should also play a vital role to find the right balance between the right to access information and freedom of speech in the digital era.



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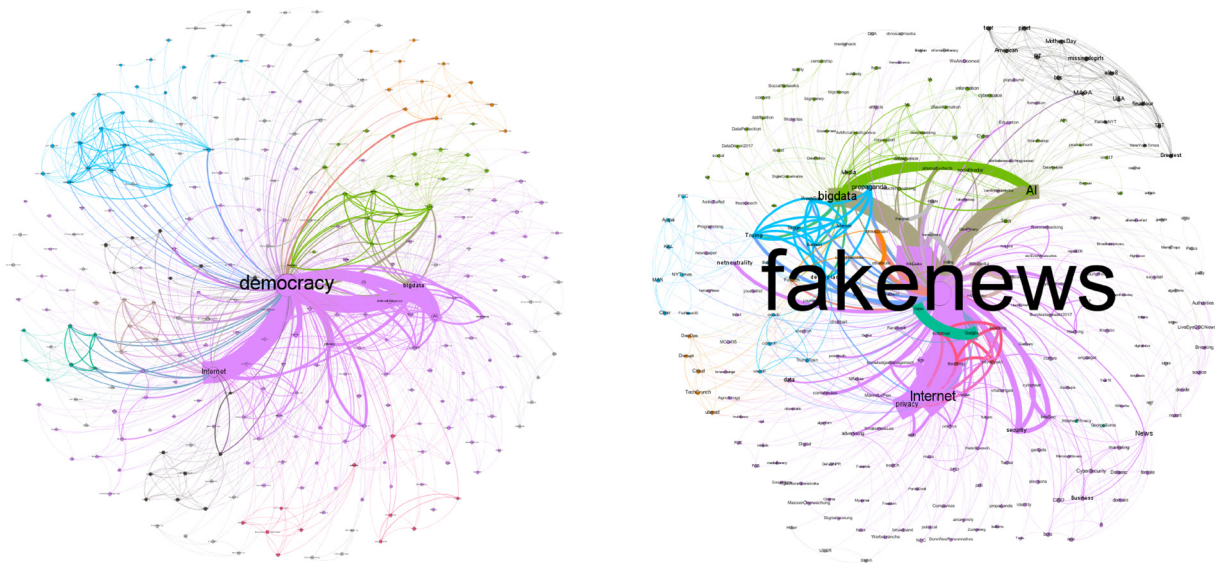
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many :ratings, foreign_key: :vendor_id
s_many :messages_sent, class_name: 'Messa
s_many :messages_received, class_name: 'Me
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RESULTS

Graph. 3.1 – The network of conversation around “democracy” and “fake news” (Source: EISMD – HER 2017 network analysis).



What is the relationship between internet technologies and democracy? And what is the role of social media and fake news?

According to our network and sentiment analysis, discussions about Democracy are the favourite playground of the Activist profiles – meaning that conversations tend to be smart and well informed, but mostly critical and pessimistic about the role that emerging technologies will play in the future. Several concepts are closely connected to Democracy, and present negative connotations in most cases. They include Censorship, Control, Surveillance, Data, Artificial Intelligence, Algorithms and even Science, all interpreted as potential threats to Human Rights, Freedom and Liberty. The discussion is strongly influenced by the Big Data topic (purple cluster), with users wondering if and to what extent recent elections (and particularly the US Presidential elections and the Brexit referendum) were influenced by big-data based profiling and targeting of voters. This is confirmed by the connections between the topics: Internet, Big Data, Privacy, Social Media and Election, Marketing, Campaigns, Sociology, Consumerism.

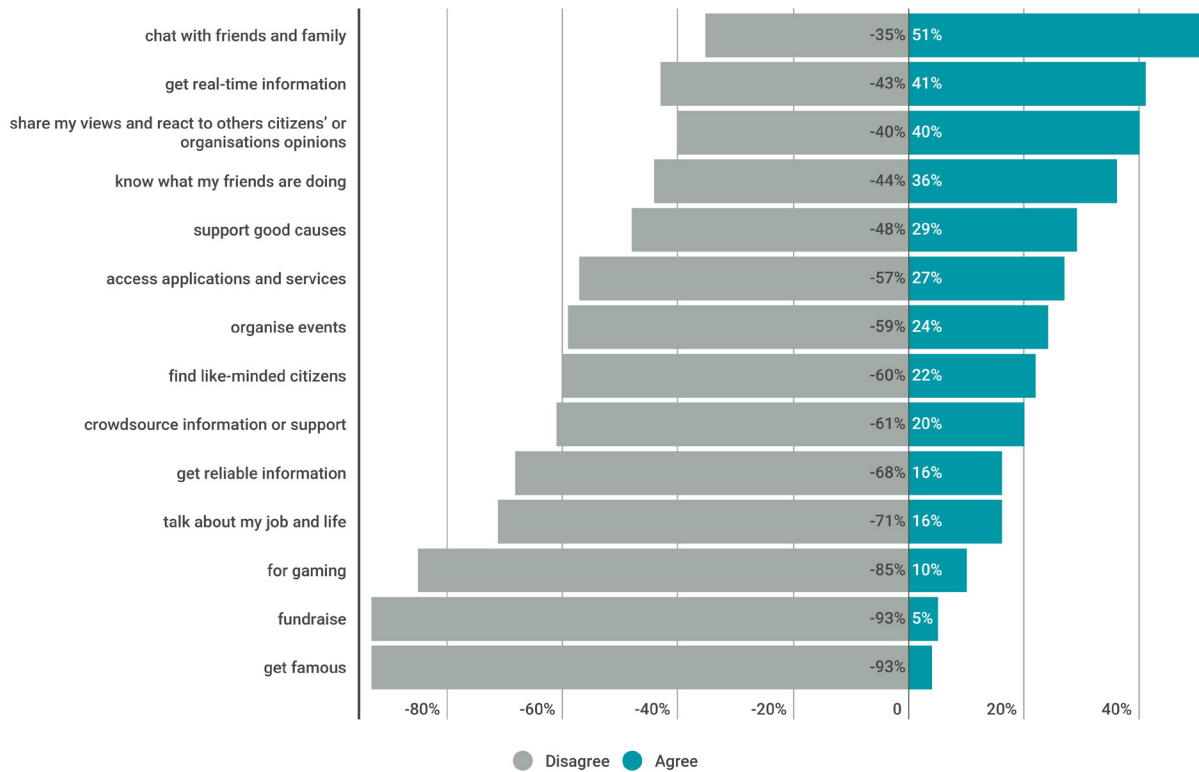
Fear about collusion between government and tech companies to spy on citizens and implement social-control policies are recurrent and linked to key-words such as Big Brother, Transparency and Wikileaks. The Washington Post's catch-phrase "Democracy Dies in Darkness" is quite frequent in the graph (in red), and seems to have come to symbolize the "dark side" of the Internet.

It is also increasingly used as a motto by anti-Trump activists, with particular reference to the recent congressional vote which, by allowing internet service providers to sell users' personal data has basically wiped away the FCC's landmark Internet privacy protections. Finally, directly connected to this topic is the Fake News one, in turn well related to two political actors: Trump and Farage. This suggests that many people are linking this controversial topic to specific people or electoral events. Indeed, if we look more in detail at the Fake News graph, we notice that, although complex and rich, it is not on par with other major topics discussed in the same period. Conversations which are not strictly related to a political event are quite technical, revolving around the relationship between Fake News and cybersecurity issues, Internet architecture topics, data and algorithms, content filtering, NetNeutrality, crime and online systems (including Wikipedia). In terms of addressing the issue (green cluster), the strongest connections are with Education, Press Ban and the use of Artificial Intelligence and Big Data technologies, boosted in particular by the announcements made recently by Google and Facebook (see Forbes²⁰). Finally, we can note the significant presence of new business initiatives around Fake News removal/prevention activities: see for example the orange cluster, pivoting on a new app for Fake News detection via an algorithm, created and launched during a Hackathon and promoted by the TechCrunch website.

Looking at the Citizen engagement and media campaign, results were slightly below expectations, with only 1.100 people taking part in the survey, for a total of 482 complete answers. This can be at least partly explained by the drop in the number of English and French responses, due to the fact that The Guardian and Politico covered the initiative only in the beginning. The bank holiday and heated debate around the French elections might also have contributed to the decrease in answers; however, and in line with the results of our network analysis, it might also be that the topic had already received lot of attention in the last months, mainly in relation with specific political events, causing a certain fatigue among readers. Results are nonetheless interesting, also considering that they are largely aligned with those obtained by administrating the survey to a statistically representative sample of citizens in Poland. In terms of use, most of our respondents are on social media to chat with friends and family. Interestingly, this is the only use on which most respondents agree, whilst even for the secondranked "getting real-time information", there are more users disagreeing than agreeing (43% vs 41%). While "sharing and discussing opinions" rank relatively well, "finding like-minded people" score poorly (with 60% respondents disagreeing), meaning that respondents are either not aware of the existence of echo-chambers and filter-bubbles or not actively looking for reinforcement of their opinions. Among the "practical" uses of social media, only supporting good causes seems somewhat popular (with 29% of our sample agreeing and 48% disagreeing), whilst crowdsourcing, fundraising, organising events or accessing services are largely dismissed. This is somewhat surprising, considering that social media are widely used by both private and, even more so, by third sector organisations for these purposes. Finally, if we focus on trust, we'll see that only 16% of our sample use social media to find reliable information, with an impressive 68% disagreeing. This is in line with findings from the Standard Eurobarometer 84 (Autumn 2015), according to which only 2 in 10 Europeans trust online social networks and the recent Eurobarometer 460, according to which only 7% of Europeans generally consider stories published on social media trustworthy.

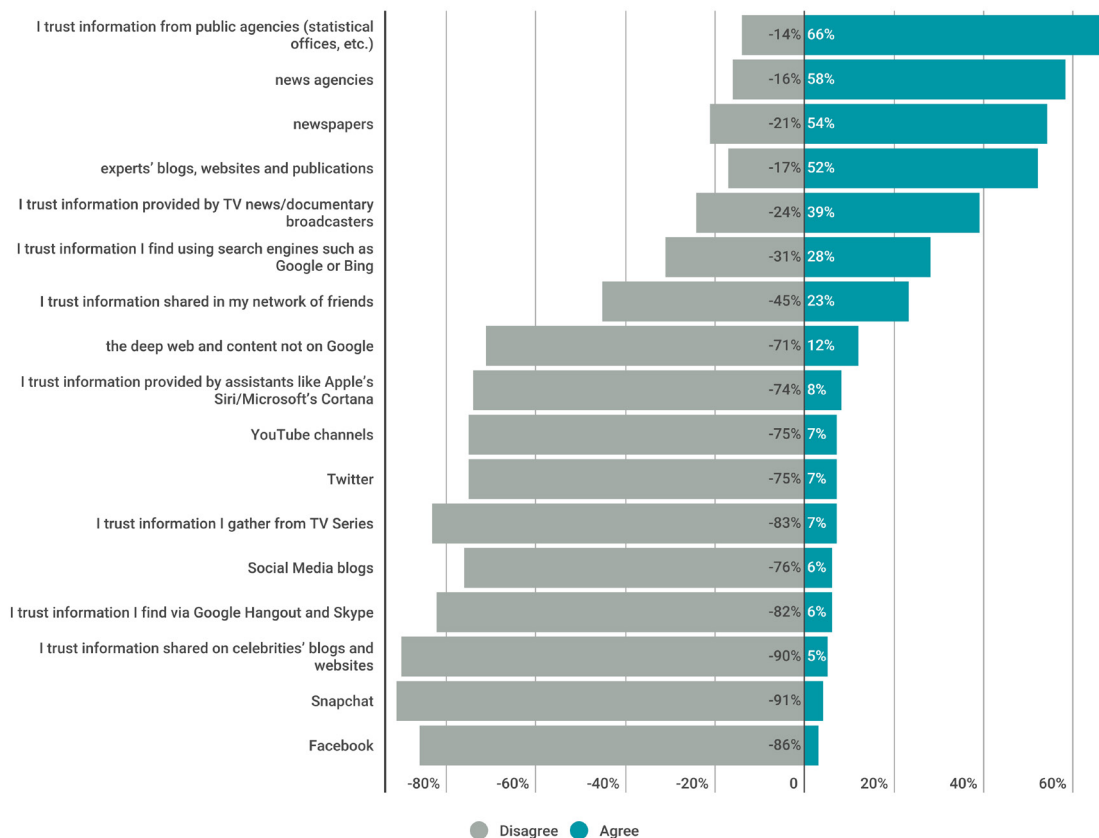
20.

Graph 3.2 – What do you use social media for?



Indeed, there is strong distrust of the accuracy of information from social and popular media sources such as Snapchat, celebrity blogs, TV series, Twitter and, most notably, Facebook. On the other hand, over 65% of respondents trust public agencies such as statistical offices, while news outlets, newspapers and experts are all scoring relatively well - although the level is still not high (10-25% strongly agreed). Interestingly people rely more on their own capacity to find information via search-engines than on the accuracy of information shared by their network of friends.

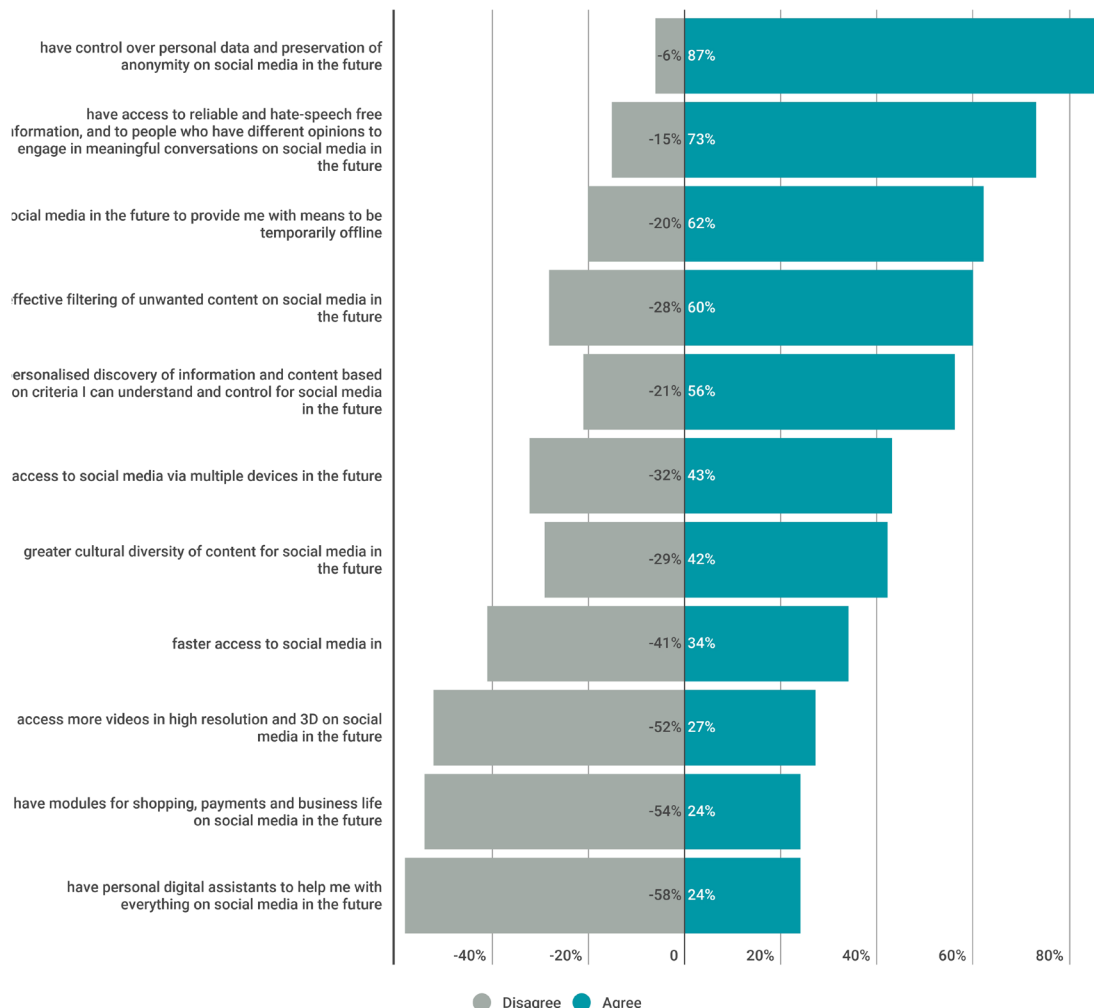
Graph 3.3 – Which channels do you trust to give you accurate information?





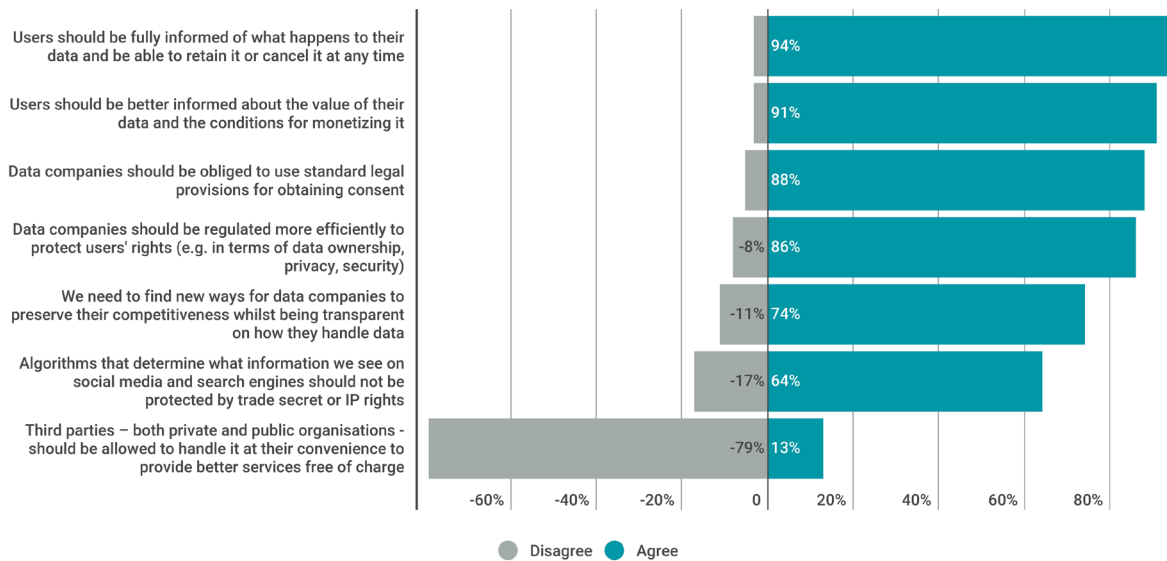
Concerning social networks' potential in the future, and in line with previous answers, it seems that respondents are more interested in protecting their privacy and improving the quality and reliability of contents than in experimenting with new uses and functions. Indeed, people's strongest desire for Social Media in the future is to have control over their personal data and preserve their anonymity (75% strongly agreed), overcoming phenomena such as echo-chambers, filter-bubbles, fake news and hate speech follows closely. This is in line with the finding of the network and sentiment analysis, which highlight the close relationship between social media, big data and privacy protection. Tech-companies – and social media companies in particular - are perceived as massive personal data collectors, with great impact on users' privacy.

Graph 3.4 – What is your wish list for Social Media



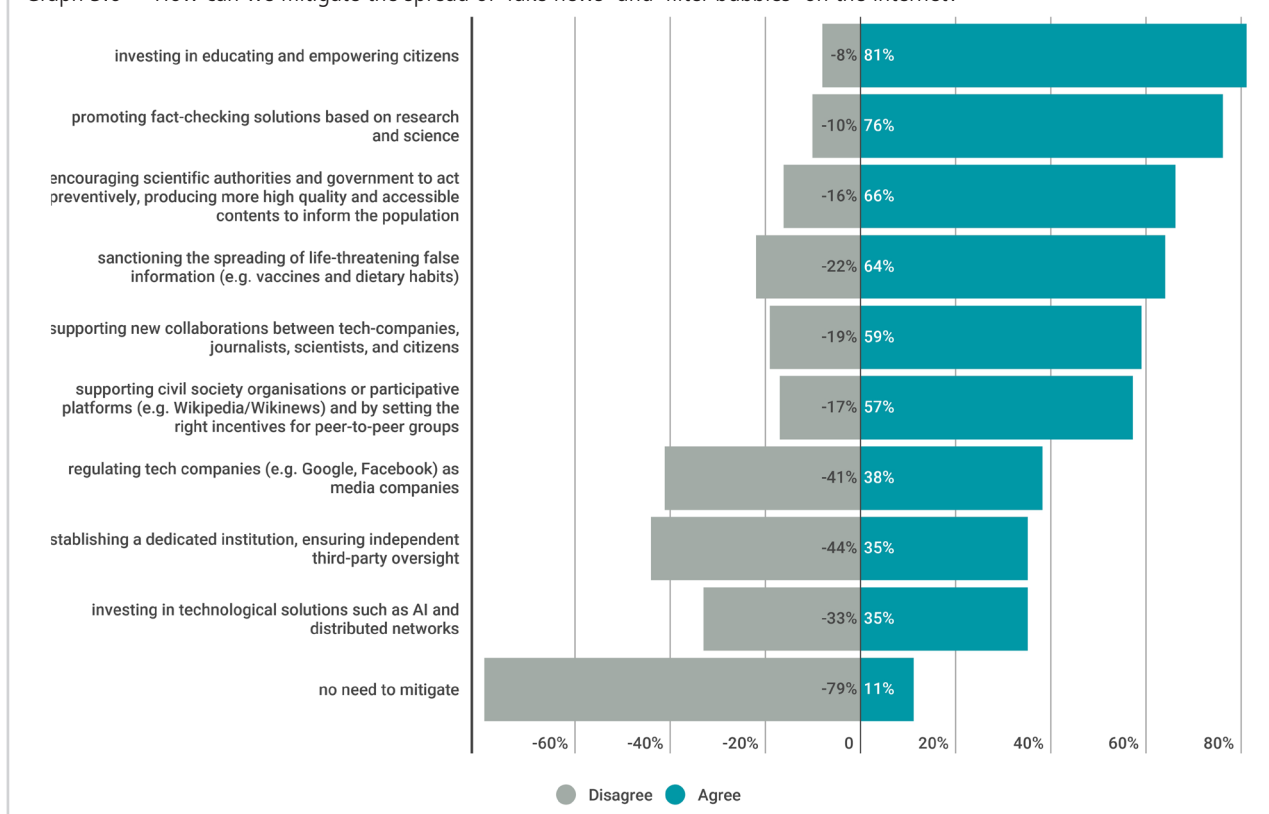
The importance of protecting user privacy strongly emerges also by the answers provided to a question focussing specifically on ways of handling users' data online. Indeed, participants most strongly disagreed that public/private 3rd party organisations should be able to handle users' information at their convenience (58% strongly disagreed), even if this means having access to better services free of charge. Instead, participants most strongly agreed that users should be fully informed of how their data is used, valued, sold, and that data companies should be regulated and monitored more stringently to protect users.

Graph 3.5 – How should users' data be handled online?



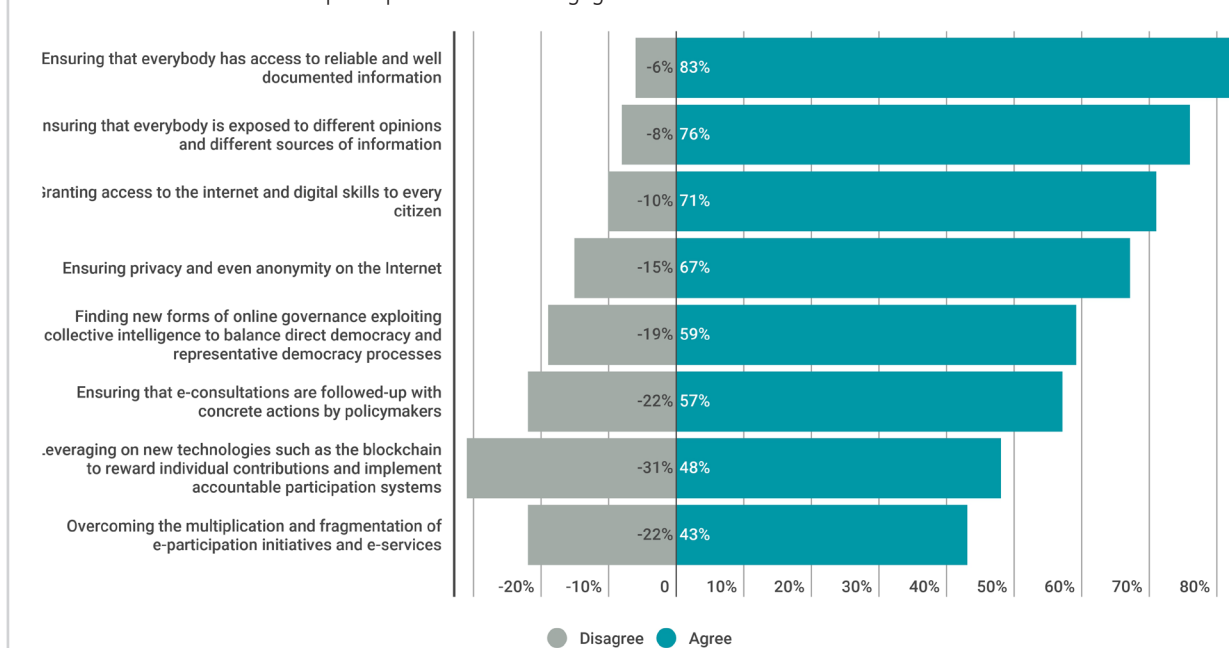
Concerning possible measures to mitigate the spread of fake news and filter bubbles, and again in line with the results of the network and sentiment analysis, there is a strong desire to intervene and change the current situation. The most popular idea is to invest in educating and empowering citizens, but survey participants agreed or strongly agreed with a wide range of possible mitigation strategies, and particularly with the idea of promoting fact-checking solutions based on research and science. The rising importance of fact-checking websites is confirmed by the Eurobarometer 460, according to which over 36% of European citizens have already used a fact-checking website to check the reliability of social-media contents. Interestingly, whilst a majority of respondents support the idea of regulating tech-companies to preserve privacy and data ownership, the idea of regulating companies in terms of the contents they provide doesn't encounter the sympathy of the majority of respondents. Finally, it is worth noting that expectations in technological solutions such as AI and distributed networks – one of the most discussed and supported solution by users monitored for our network and sentiment analysis as well as by experts attending the NGI Summit – score low among our survey respondents. This is probably due to lack of knowledge since respondents are evenly distributed among the agree – disagree – neither agree or disagree options.

Graph 3.6 – How can we mitigate the spread of ‘fake news’ and ‘filter bubbles’ on the internet?



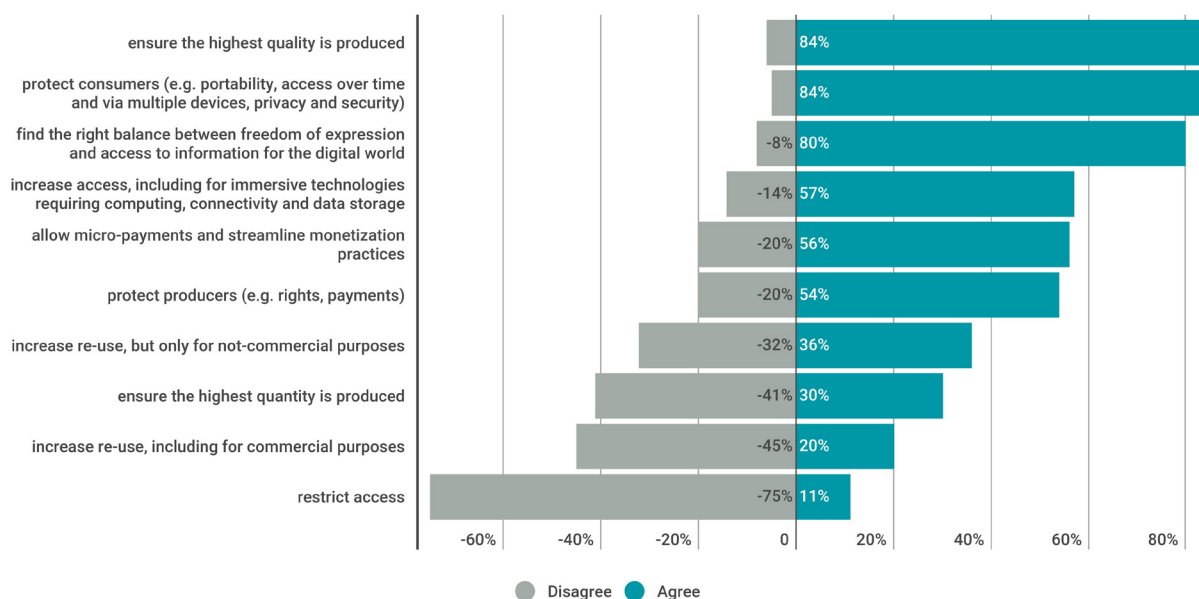
Concerning the relationship between social media, internet technologies and democratic participation/civic engagement, results appear well aligned with previous answers, with participants strongly agreeing with a wide range of actions, starting with ensuring that everybody has access to reliable and well-documented information (67% strongly agreed). Interestingly, the availability of reliable, well documented and diverse contents is deemed even more important to the democratic process than promoting digital skills and access to the internet itself.

Graph 3.7 – What are the most important actions to be taken in the next decade if we want the internet and social media to foster democratic participation and civic engagement in the future?



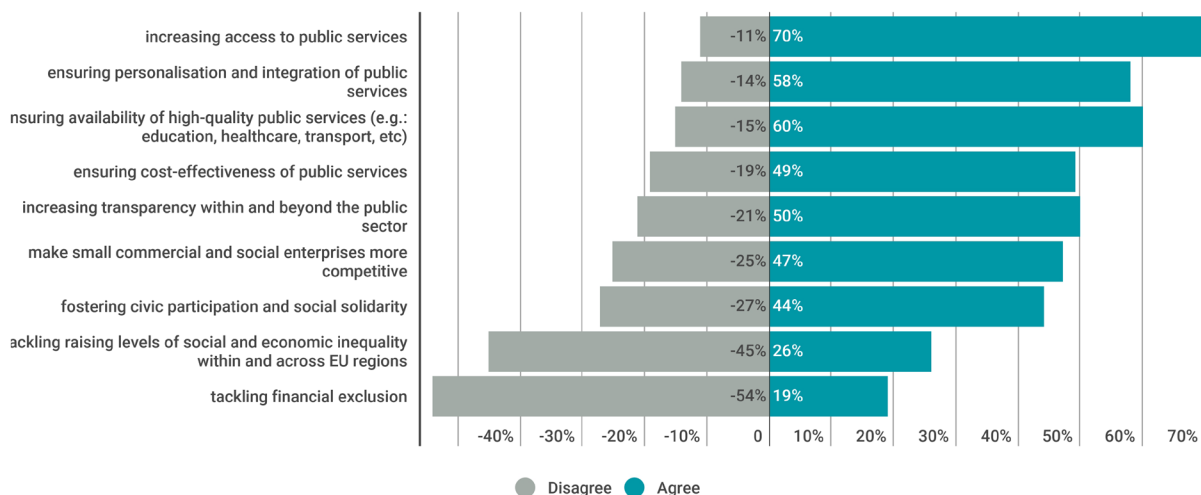
This is confirmed by the following question, focussed on the most important actions to be taken concerning digital contents. Indeed, a striking 84% of participants agree that the most important action is ensuring that contents produced are of the highest quality. Protecting consumers and finding the right balance between freedom of expression and access to information follow closely at 84% and 80% respectively, with the following priority – increasing access – falling well behind at 57%.

Graph 3.8 – What are the most important actions to be taken concerning digital content (e.g. text, image, audio, video, music, art, etc.) in the next generation Internet?



Finally, concerning the societal impact of future and emerging internet technologies, respondents strongly agreed that this is likely to be significant when it comes to increasing access, availability, and personalisation of public services (24-38% strongly agreed). Counter-intuitively, opinions are far less optimistic when it comes to improving the cost-effectiveness of public services. In line with answers provided in the week 1 survey, participants were sceptical that Internet technologies could help tackling financial, social, or economic inequality (12-25% strongly disagreed). It is worth noting that the most evident misalignment between the network and sentiment analysis and the media campaign concerns attitudes towards fintech. Whilst according to the network analysis Fintech is by far the most crowded – and probably the most promising – work-field in the NGI area, with wide-spread optimism about the potential of internet-technologies – and particularly of blockchain technologies and AI/Big Data – to overcome financial exclusion, respondents to the online consultation tend to underestimate the disruption potential of internet technology in the financial sector.

Graph 3.9 – To what extent can future and emerging internet technologies contribute to improve our societies?



FOCUS ON POLAND: Surveying a statistically representative sample of citizens²¹

As discussed at length, the data observed in this report cannot be considered representative of the entire European population. It is not representative in terms of sex, age, socio-economic background or geographical distribution. By way of comparison, and to attempt to gain some understanding of the way in which this may have affected our results and conclusions, this section considers data from an alternative dataset of 1007 respondents specifically selected to be statistically representative of the Polish population. Clearly it is a stretch to assume the Polish population is somehow representative of the wider European population, however, it clearly represents a step forward in many respects, and at the very least a useful comparison tool.

A full body of graphs displaying the two datasets alongside each other can be viewed in the appendix. When we aggregate positive and negative responses and compare them between the two datasets we see that while the average absolute difference in response percentage is 16% (which may appear high without terms of reference) it appears that in truth our two datasets reveal at least directionally similar responses. Of the 97 questions asked in week 2, only 7 returned results where both the positive and negative sentiments differed by more than 15% between the two surveyed populations. That is to say that even when the populations differed drastically in their responses the vast majority of this difference in most cases can be explained by a large number of neutral responses, as opposed to polar different opinions between the groups. For example, 79% of our European sample responded negatively to the assertion 'Third parties – both private and public organisations - should be allowed to handle users' information at their convenience to provide better services free of charge' versus only 32% of our Polish sample. Although this difference is undoubtedly large, it is almost entirely explained by a difference in neutral responses (Polish 42% vs European 8%). It is promising to observe that there are few fields in which our populations hold polar opposite views.

As mentioned above there are seven fields in which both positive and negative responses differ significantly. Shining a light on these seven may help us to understand any underlying differences between the populations. For example, if we observe that much of the differences in results can be attributed to female respondents in the Polish population then this may be a cause for concern, given that we are aware of the comparatively few women in the European dataset.

This hypothesis can be held to be true for the question 'For what purpose do you use social media? - using social media to find out what my friends' wherein the Polish dataset 28% of female respondents replied, 'strongly agree' as opposed to only 11% of male respondents. Similarly, over 35s in the Polish population were considerably more likely to respond positively to the premise that 'Emerging Internet technologies contribute to the fight against increasing levels of social inequality and the economy' than 16-35s (an interesting finding given the standard wisdom that younger generations in Europe are both more tech savvy, and more concerned about inequality than older generations).

That being said, none of the other 5 questions flagged as having significant differences can have their differences explained by looking at a specific section of the population, which offers comfort that the data used in the study while not scientifically representative, does appear to have drawn out at the very least directionally correct conclusions.

²¹ Our deepest gratitude goes to Mr Tomasz Baran, CEO of Ogolnopolski Panel Badawczy Ariadna, who ran the survey free of charge.

AREAS FOR FUTURE RESEARCH AND ACTION

Based on the needs highlighted by policy-makers, the facts as put forward by researchers, and the suggestions and opinions of citizens, the findings of the initiative indicate several unresolved challenges which need to be addressed by policy-makers and stakeholders to build a more human-centred next generation internet.

The relationship between internet technologies and democracy is highly conflictual, with users wondering if and to what extent recent elections (and particularly the US Presidential elections and the Brexit referendum) were influenced by big-data based profiling and targeting of voters, often based on fake-news. Fears about collusion between government and tech companies to spy on citizens and implement social-control policies are also recurrent, and, from this point of view, the European Union appears particularly well placed to re-establish trust in the internet in its connections with public debate and democratic processes. Europeans value very highly their right to access reliable, well documented and diverse contents, and are hugely concerned by the possibility of being profiled and manipulated via targeted messages. For these reasons, it would be important to:

- Make sure that users have control over their personal data and can preserve their anonymity on the internet if so desired;
- Invest in tackling phenomena such as profiling, echo-chambers, filter-bubbles, fake news and hate-speech, which are seriously undermining the democratic decision-making process. This means first and foremost investing in educating and empowering citizens, but also promoting fact-checking solutions based on research and science and supporting experimentation around technological solutions such as AI and distributed networks;
- Make sure that there is a fair balance between the right to access information and freedom of speech. Further research is needed to validate this hypothesis, but both from our network analysis and online consultation it seems that while a majority of people support a “hard-regulation” approach to issues such as data/privacy protection, most people are against the idea of regulating tech-companies on fake-news, since this would imply a risk of censorship and social control.

Concerning the positive societal potential of future internet technologies, EU citizens expect that the NGI will increase availability and access to public services that are high-quality, personalized, integrated and transparent. However, the potential of internet technologies in addressing other socio-economic challenges such as fostering financial inclusion, increase SMEs and social enterprises’ competitiveness, or encouraging civic engagement and social solidarity seem very underestimated across Europe. In this sense, it would be important to:

- Raise awareness and facilitate the exchange and dissemination of best practices about the potential of NGI technologies to address and overcome a broad set of socio-economic challenges.



WEEK 3 – NEW TECHNOLOGIES BLURRING ONLINE AND OFFLINE WORLDS AND DISRUPTING THE PERSONAL SPHERE

"In fact, together with the current burgeoning of devices, sensors, robots, and applications, and these emerging technologies, we have entered a new phase of the information age, a phase where the hybridisation between bits and other forms of reality is so deep that it radically changes the human condition in profound ways."

The Onlife Initiative background paper

Some say God created man, and then man rejected God. Today we create sophisticated algorithms... Can they one day reject us? As technology surges forward, we need to take a step back and look in the mirror. Are our ethics, our norms, our laws adapted to these new developments? Can we still be sure that we – we humans – will still control technology?

Vice-president Timmermans, NGI Summit

BACKGROUND

In 1991, Mark Weiser suggested that "ubiquitous computing" was on the horizon, a technology so pervasive that it would be entirely invisible and embedded in our lives. As more recently highlighted by the Commission's OnLife Initiative, we are already living in the ubiquitous computing era, which is changing our way of understanding reality in four ways, e.g. "1. by blurring the distinction between reality and virtuality; 2. by blurring the distinctions between human, machine and nature; 3. by reversing from scarcity to abundance, when it comes to information; and 4. by shifting from the primacy of entities over interactions to the primacy of interactions over entities".

As highlighted by Professor Peter Paul Verbeek during the NGI Summit, "the ways in which the technologies are there, somehow between humans and the world, is changing. We always thought about technologies as technologies that we use, but suddenly these technologies become linked to us in different ways than we are using them. Technologies are reading the activities of our minds and therefore we can interact with the technologies in a completely different way. We merge with them, or they merge with our environment". In Dr Olivier Dumon's words "we already went from the search era on the internet to the network era, now, what will increasingly define us is the convergence between the digital world and the physical world". Using an analogy put forward by Prof. Luciano Floridi "we live in a mangrove society. Mangroves grow where sweet water meets the salty water, where the river meets the sea. Asking: where do the mangroves grow? Is the water salty? Is it sweet? Do we live in a digital world? Do we live in an analogue world? Asking that means, not knowing, not having understood where we are, which is an intrinsically mixed environment where the analogue and the digital live in a cycle of mutual interactions.

Most of us, live in this special sort of world, a world where navigation is difficult and where, to use another metaphor, we need good cybernetes – sea captains - who know how to navigate difficult waters with undercurrents and unpredictable winds. This cybernetic ability to have a direction with full sight - because you need to know where you would like to end up - and control, those are the virtues of the cybernetic Politics (capital P) that we would like to see implemented. Especially because the waters are perilous, especially because the winds are fast”.

From a technological and commercial perspective, the Internet of Everything (IoE) goes further than the Internet of Things to refer to the ever-growing networked connections between not just ‘things’ but everything - devices, people, processes and data - that are occurring in our world.

As experiments develop and become fully-fledged products and services, and human beings and smart devices become increasingly interconnected, new challenges emerge at the regulatory, ethical, and business levels. How will people and machines interact in a future populated by mobile, hyperconnected objects? How can we ensure privacy and security in this context, avoiding breaches which might potentially damage vital infrastructure? What new forms of production will be enabled by 3D printing? What should safety standards look like for self-driving cars or 3D printed food? How will ‘citizenships’ look or be defined in a world where it is no longer linked to physical residency? And how can technology help sharpen our senses rather than causing information overload?

These and other questions were at the core of the third and final leg of RElsearch’s campaign running from May 2 to May 13. This period saw 2650 people taking part in the survey, with a total of 696 complete questionnaires received.

From artificial to collective intelligence

Close to 50% of the world’s population was on the internet in 2016, and over 5 billion people are predicted to be online by 2030. All the tech giants are working to increase access²² to fast internet: Facebook (Internet.org), SpaceX, Google (Project Loon), Qualcomm and Virgin (OneWeb) are planning to provide global Internet connectivity to every human on Earth, at speeds exceeding 1 Megabit per second. In India, businessman and philanthropist Mukesh Ambani allocated \$20 billion to build a mobile network – Jio - that will bring 4G Internet to hundreds of millions of people by 2018. At the same time, by 2022, the IoE could exceed 50 billion connected devices, each with a dozen or more sensors collecting data, leading to a trillion-sensor economy, and driving a data revolution beyond our current imagination. In Commissioner Ansip’s words: “the age of the zettabyte – or one trillion gigabytes – has already arrived. Some forecasts put the global data sphere rising 10 times from current levels by 2025, to 163 zettabytes. But by 2050, who knows? After the zettabyte comes the yottabyte. We have to prepare for this data deluge: storage, infrastructure, security, transferability - to name just a few issues to tackle”.

As remarked by Luca De Biase, over 2 billion people are already connected to each other and to very smart data-analysis programmes on the internet, which has brought about the emergence of a “collective intelligence”, bringing extraordinary new insights into human behaviours, often used merely for marketing reasons or to take financial decisions. However, this collective intelligence could also be used, as pinpointed by Thomas Malone, to make sure that collectively people and computers act in smarter and fairer ways than has ever been conceivable. There is a broad body of research showing that groups are smarter than their smartest member and that the most diverse are the smartest. The internet and social media offer an extraordinary opportunity in this sense, provided that we can preserve diversity in virtual groups.

22. <http://www.itu.int/en/ITU-D/Statistics/Pages/facts/default.aspx>

Collective intelligence should be understood as the sum of human and artificial intelligence. In this perspective, AI refers to “a constellation of technologies including machine learning, perception, reasoning, and natural language processing” (Crawford & Whittaker, 2016). While the field has been developing for over 65 years, the potential impact of AI within the Next Generation Internet is wide-ranging and could create entirely new opportunities or challenges for our social, economic, and interpersonal lives. While extreme futurist scenarios such as “singularity”, “total disruption”, and “machines that fully understand humans” make for flashy headlines and popular science fiction, they are far from the current reality, and we do not know what the future holds for AI. What is clear is that AI technologies are progressing, particularly in the field of machine learning. The majority of practical machine learning uses supervised learning, whereby an algorithm is given a “teaching set” of data that supervises the learning process:

1. We know the correct answer;
2. The algorithm iteratively makes predictions on the teaching data and is corrected by the teacher;
3. Learning stops when the algorithm achieves an accepted level of performance at completing its computational task.

On the other hand, unsupervised machine learning aims to model the underlying structure of the data to learn more about those data: there is no correct answer and no teacher, instead “algorithms are left to their own devices to discover and present the interesting structure in the data” (Brownlee, 2016). For problem-solving in the real world, supervised and unsupervised processes are often combined into semi-supervised machine learning.

The types of AI and machine learning depend on the required trade-offs that are inherent in their problem-solving tasks, including for example: speed of testing and output; accuracy, completeness, and relevance of training and testing data; and the type and appropriateness of the hypothesis space that determines how algorithms are trained. In order to achieve “fairness, accountability, and transparency in machine learning” (FAT/ML), we need to ask the right questions and seek well-informed answers. Overall, leading research on the social impacts of AI, for example by AI Now, Nesta, and FAT/ML, highlights multiple and overlapping themes that need to be addressed for a more equitable future with AI. Key questions remain, including but not limited to:

Rights and Liberties:

What is AI’s impact on basic rights and liberties as it is increasingly employed in criminal justice, law enforcement, housing, hiring, lending, and other domains? How do we ensure privacy, due process, or presumption of innocence?

Labour and Automation:

What is AI’s impact on the nature of employment, types of jobs, and working conditions? Who benefits and who pays the price of these changes?

Bias and Inclusion:

AI is only able to “see” the data it is given, yet data reflects the socio-political context in which it is collected. What is the nature of this bias, how is it defined, by whom, and with what impact? How do we ensure non-discrimination and understandability in decision-making?

Safety and Critical Infrastructure:

How is AI introduced into core infrastructures such as hospitals and energy grids, and what does safe and responsible integration and use look like? Who is responsible when something goes wrong? What happens if humans can no longer check whether machines are getting it right?



EL PAÍS

CIENCIA



VER MAS RECIENTES PRIMERO



15. 07/05/2017, A LAS 11:03
Eduardo Suárez

Existe una gran diferencia entre poner la tecnología a nuestro servicio y ponernos al servicio de la tecnología.

RESPONDER COMPARTIR 0 0 ***

14. 05/05/2017, A LAS 15:07
Rafael Cortés

El fuego, la agricultura, la ganadería, la alfarería, las armas de piedra también son tecnologías y también modificaron la esfera individual y la esfera social. La imprenta de Gutenberg también es una tecnología informática que también creó gran impacto en lo personal y lo social. En el libro de Cervantes (El quijote) se describe a alguien que "vive conectado" a los libros de caballería y que es tan fuerte esa enajenación que confunde la "realidad" con la realidad virtual descrita en sus gadgets tecnológicos llamados libros de caballería.

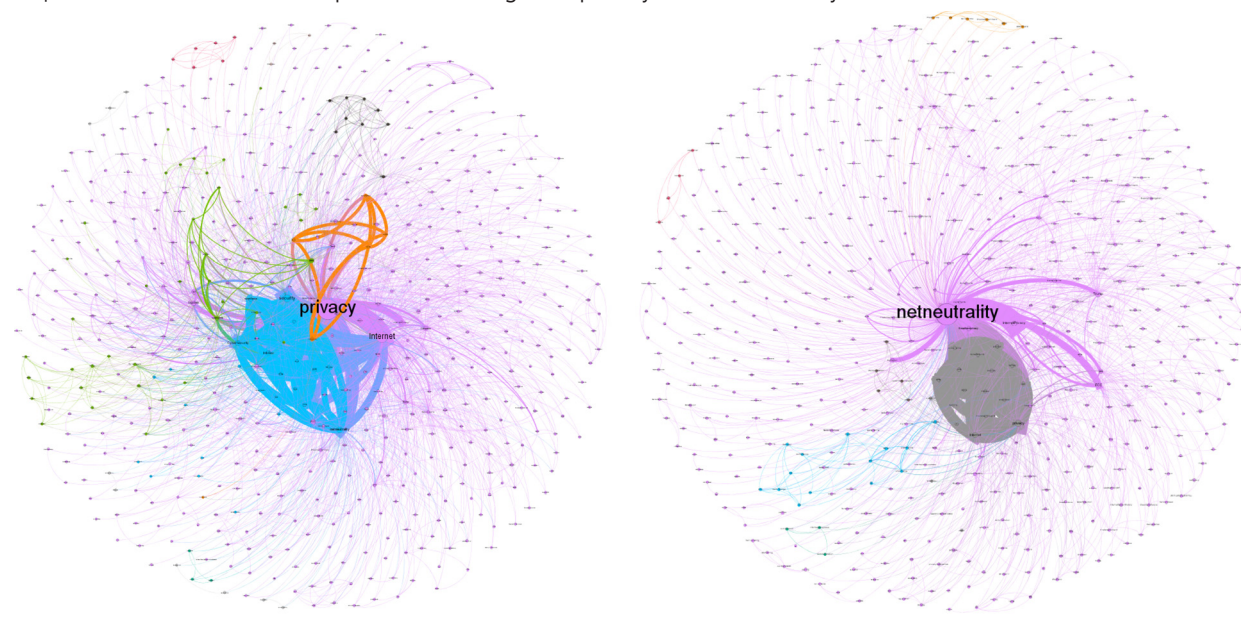
"In my life I've never seen something as powerful as mobile computing"

*Regina Dugan Facebook leader of Building 8 at Facebook and former Darpa.
El Pais²⁸, May 4, 2017*

28. http://elpais.com/elpais/2017/05/04/ciencia/1493890150_694485.html

RESULTS

Graph 4.1 – The networks of expressions dealing with privacy and netneutrality



What are the main threats and opportunities people associate with a world where humans and machines are increasingly interconnected? What are the most promising technologies and priority areas where policy action is required?

From both our network and sentiment analysis and our online survey, we found that privacy, security, and access emerge as people's key – and hyperconnected – concerns.

According to our network analysis, privacy is tightly connected to all the major topics which animate the discussions around the next generation internet and its impact on society and the economy. Multiple domains are beginning to be systematically associated with privacy concerns, including health, traffic, domotics, IoT, Apps and the Cloud. Echoes of recent elections and referendums are also often associated with discussions about privacy, with targeted advertising campaigns on the spot as examples of blatant violations of privacy rules when not of human rights.

Emotional expressions vary from confident (either because subjects are confident that current negative scenarios will not change, or because they are confident/sure that major interventions and regulations are necessary) to open fear and nervousness. Positive/optimistic expressions are few and far apart, and, usually, they relate to perceptions of business opportunities linking to the development of tools ensuring the protection of privacy.

Public institutions are at the centre of the debate. On the one hand, we have the recent GDPR, which will enter into force in 2018 and which emerges as a beacon of hope in an otherwise gloomy scenario. On the other hand, a heated debate seems ongoing on the role of the American Congress and the FCC: indeed, the Congress might determine a substantial change in the role of FCC as a grantor of the Net Neutrality principle. In addition, the potential cancellation of the Obama regulation on Privacy also raises many concerns. Users of brands like Google and Facebook seem particularly concerned about this latest issue and the increased possibility for private companies to use their Personal Data for business purposes.

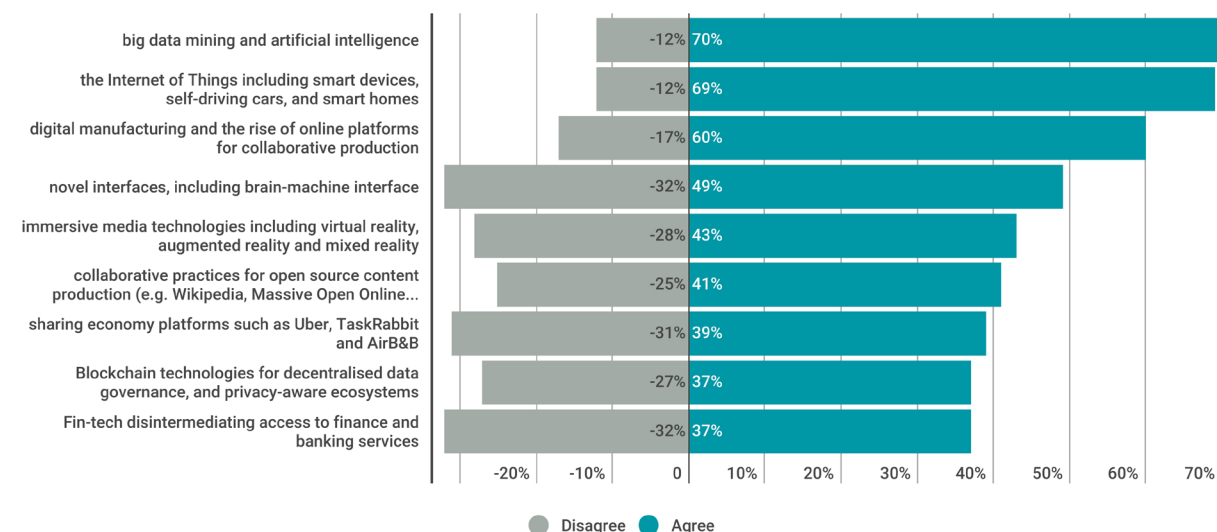
Indeed, to talk about Privacy means unavoidably to talk about Net Neutrality: this is evident from the strong connection between the two topics in the graph. In turn, the topics of Net Neutrality is strongly connected to the topics of Data Security, Cybersecurity and other personal Data Protection topics such as Encryption, Ransomware, Malware. The analysis along all the topic connections suggests that a prejudice to users' online privacy is actually perceived as a direct attack to the first principle of the Internet, i.e. Net Neutrality.

If we focus on the Net Neutrality graph, we will notice that while being a heated topic of discussion, only a limited number of subjects talk about it, unless it relates to precise entities which, in the subject's opinion, are threatening it. Besides governments, policy-makers and regulators, we have operators like YouTube or Netflix, as well as Telcos, which by acquiring/building private infrastructures seem to make Net Neutrality de facto impossible.

What is sure in the captured expressions is that NetNeutrality matters, is a right, should be protected and promoted by subjects like the EU and the UN and that it should be the object of "resistance" and of "No Compromise".

If we look at our media online consultation, we'll see that concerns about privacy, security and equal access to the internet are only reinforced. This might have to do with the fact that respondents strongly agree that big data, AI and the IoT – for which data protection is key - are the technologies which are likely to impact the most on their daily lives.

Graph 4.2 – Which internet technologies do you think will most profoundly change our daily lives over the next 10 years?



The guarantee that there is the right infrastructure in place, that it is well protected, and that citizens are not discriminated on economic grounds in accessing the internet, are priorities for 85% of respondents. This seems indeed very well aligned with the priorities put forward by the European Commission on the occasion of the Digital Single Market Strategy mid-term review.

Graph 4.3 – What are the most important actions to be taken if we want internet technologies to improve our daily lives in the next decade?



The extent to which, for readers interested in the impact of next generation internet technologies, the European Union is associated with privacy protection is evident by the fact that, when asked what values commonly shared among European countries should be better reflected in the next generation internet, 88% of respondents agreed (and 72% strongly agreed) that "protection of privacy is the most important value". The second and third most selected values, i.e. "decentralisation of information, infrastructure and decisions to avoid monopolies" and "Transparency and auditability of transactions" are also closely related to the need of ensuring data-ownerships and protection for the benefit of users. Comments to articles published by newspapers and featuring the initiatives were also quite adamant in this sense.



DonkeyLogic 18 Apr 2017 23:22

5 ↑

European Union ... whatever your politics... has done, and will be doing, some sterling work on the internet, but more importantly, manipulation and ownership of data.

Some of the stuff they are considering on the "right to be forgotten" is, quite rightly, making the schemers in San Francisco, get a little animated. There's no use waiting for the USA to find a conscience, or a philosophy, on some of the monsters lurking behind nerdy T Shirts.

We have to consider and react to what has been happening - and that is, our data and our kid's data, is dropping into the hands of some of the nastiest and exploitative corporates we've witnessed for decades.

It is not a trivial matter to handover the very keys to how things are collected and collated - and we have given a free hand to multi-billion American corps (and their voracious Rat Bankers who are very keen to bankroll them)

Who owns YOUR data is a pivotal question. What THEY do with your data, equally so.

So far, the EU has spearheaded some tough questions on this, and they have the right idea.

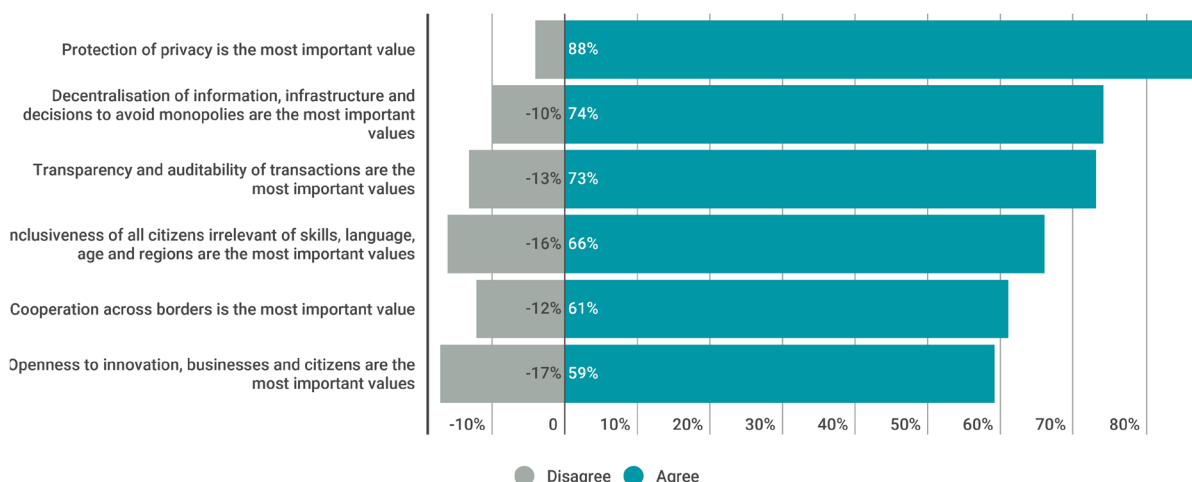
Of course, looking at the supine UK's attitude on the matter , just accentuates the need.

Share

Report

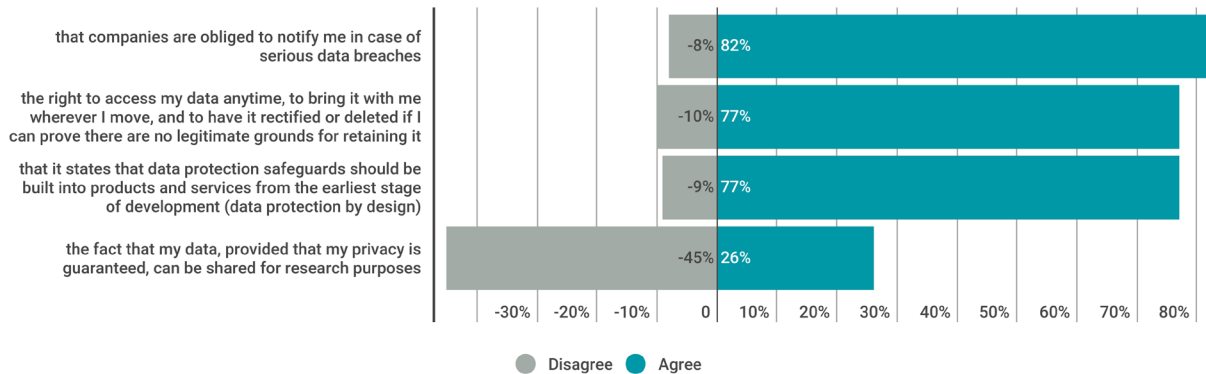
Quite surprisingly, more "traditional" values such as inclusion, international cooperation and openness are considered less important when it comes to imagining how the future internet should look like. This is at least partly confirmed also by our network analysis, where the word "open" and its derivatives appeared only in a dozen of messages.

Graph 4.4 – Which of the following values commonly shared among European countries should be better reflected in the next generation internet?



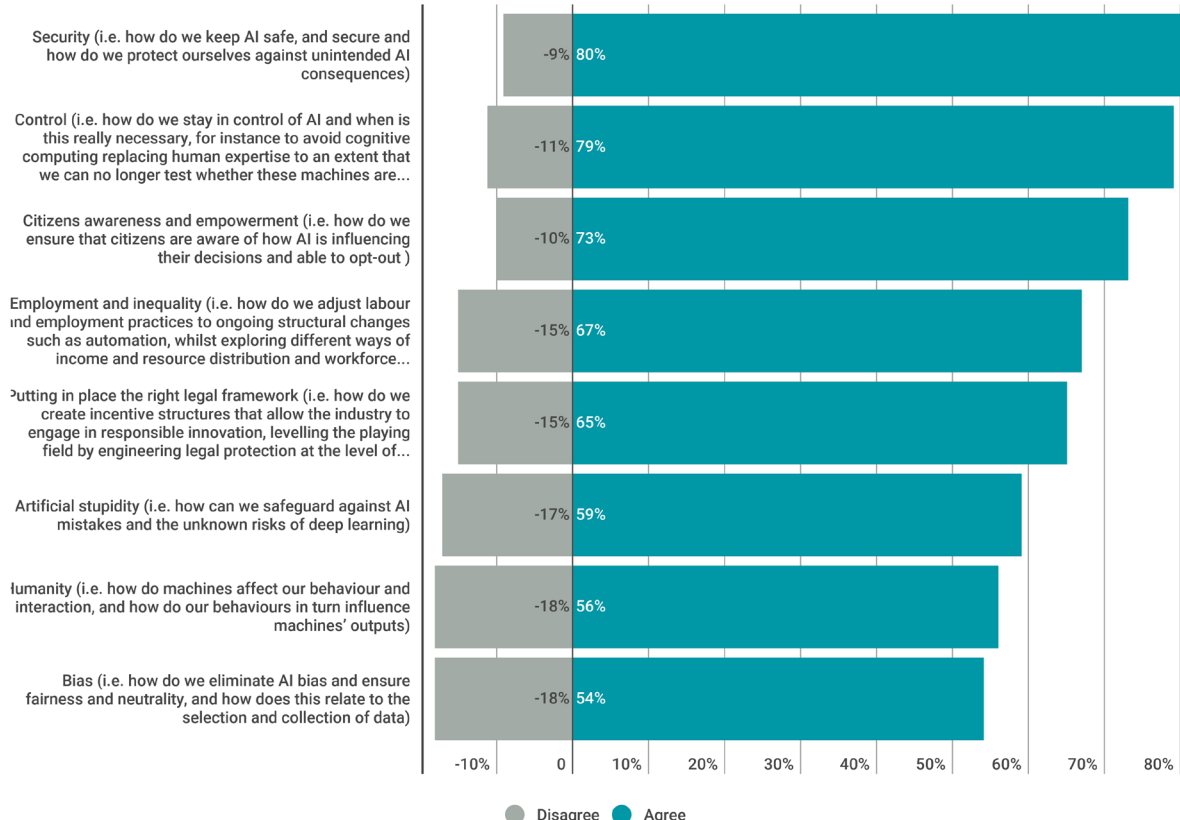
When asked to rate the importance of certain distinctive elements of the EU GDPR data protection regulation, respondents expressed once again the desire to limit the power of tech-companies and ensure ownership and protection of data. This is further confirmed by the fact that 23% of respondents strongly disagreed and 22% disagreed that it is important that data can be automatically shared for research purposes, even if privacy is guaranteed. Interestingly, citizens seem more optimistic about the possibility of ensuring “data protection by design” than they were about the possibility of technology-enabled solutions to tackle fake news and eco-chambers.

Graph 4.5 – What are the most important aspects of the new EU data protection regulation, entering into force in all EU member states in 2018?

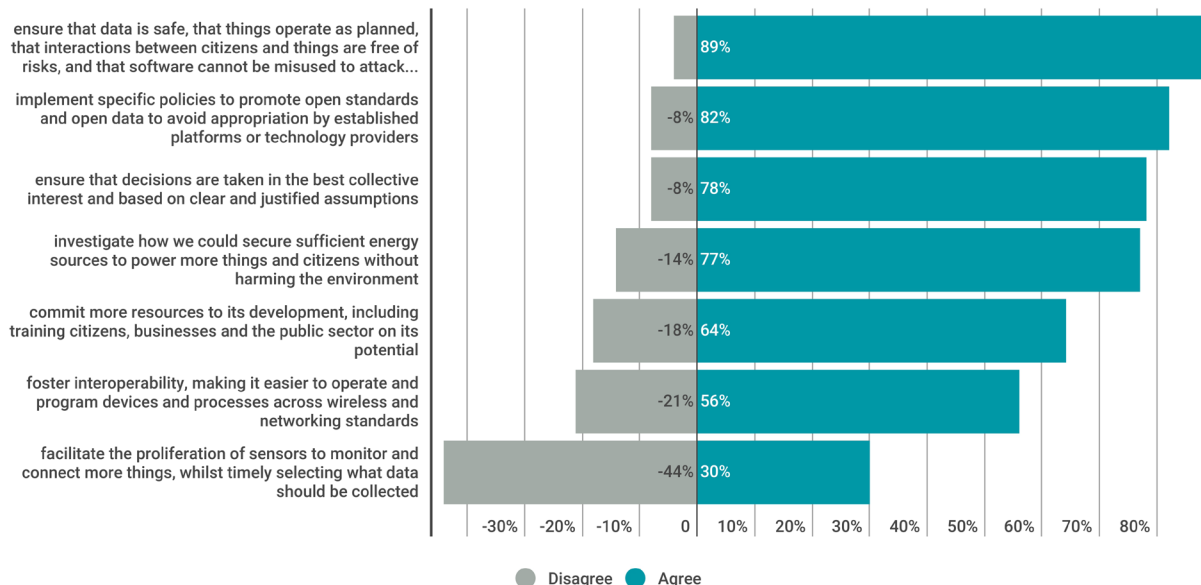


If we look at specific technologies, such as AI and at the rise of the IoE, the situation does not change: security and privacy – and the need to ensure users are protected against the power of big tech companies - are still firmly at the top of respondents' concerns. In the case of AI, control is also considered a priority, with respondents largely more concerned by the fact that humans might find themselves in the position of not being able to understand why machines took a certain decision than by the risk of being replaced by machines in the workplace. This is in line with the results of the Eurobarometer 460, according to which 88% of Europeans agree robots and artificial intelligence technologies require careful management. Interestingly, according to the Eurobarometer, more than two thirds of respondents (68%) agree that robots and artificial intelligence are a good thing for society because they help people do their jobs or carry out daily tasks at home, but an even higher proportion (72%) agree that robots and artificial intelligence steal people's jobs. While 74% agree that due to the use of robots and artificial intelligence, more jobs will disappear than new jobs will be created, only a minority think their job could be done by a robot or artificial intelligence.

Graph 4.6 – What are the most important issues posed by Artificial Intelligence systems in the next decade?

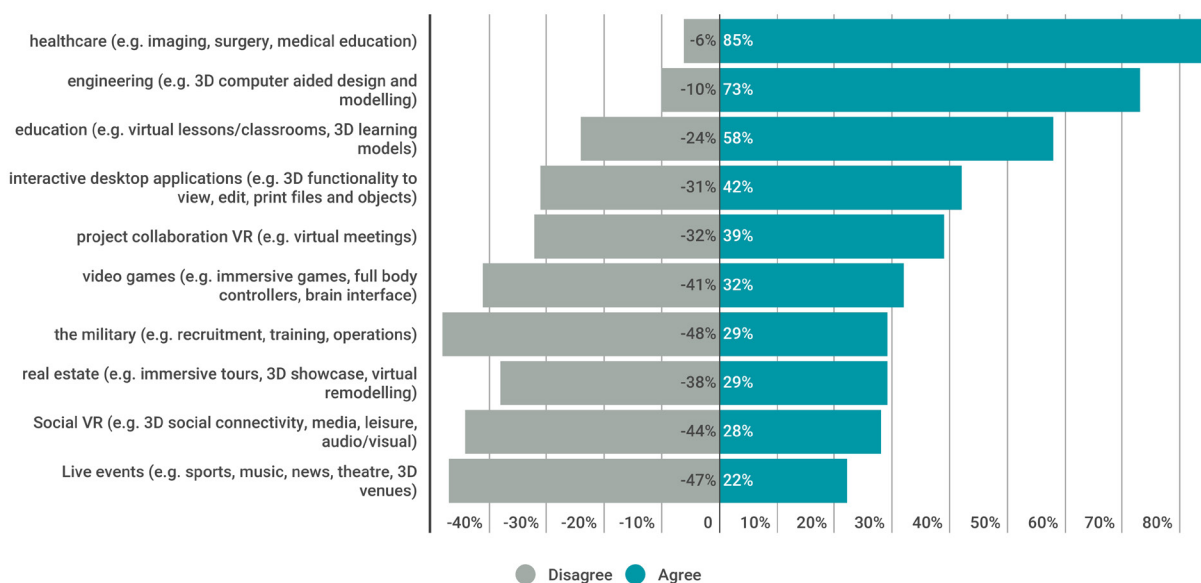


Graph 4.7 – What are the most important actions to be taken to ensure that the Internet of Everything (IoE) (i.e. bringing together devices, citizens, processes and data) can grow and generate positive socio-economic impact for most citizens in the next decade?



Finally, looking at the relationship between online and offline realities, we looked at two very specific topics such as future areas of application of VR and issues raised by e-residency.

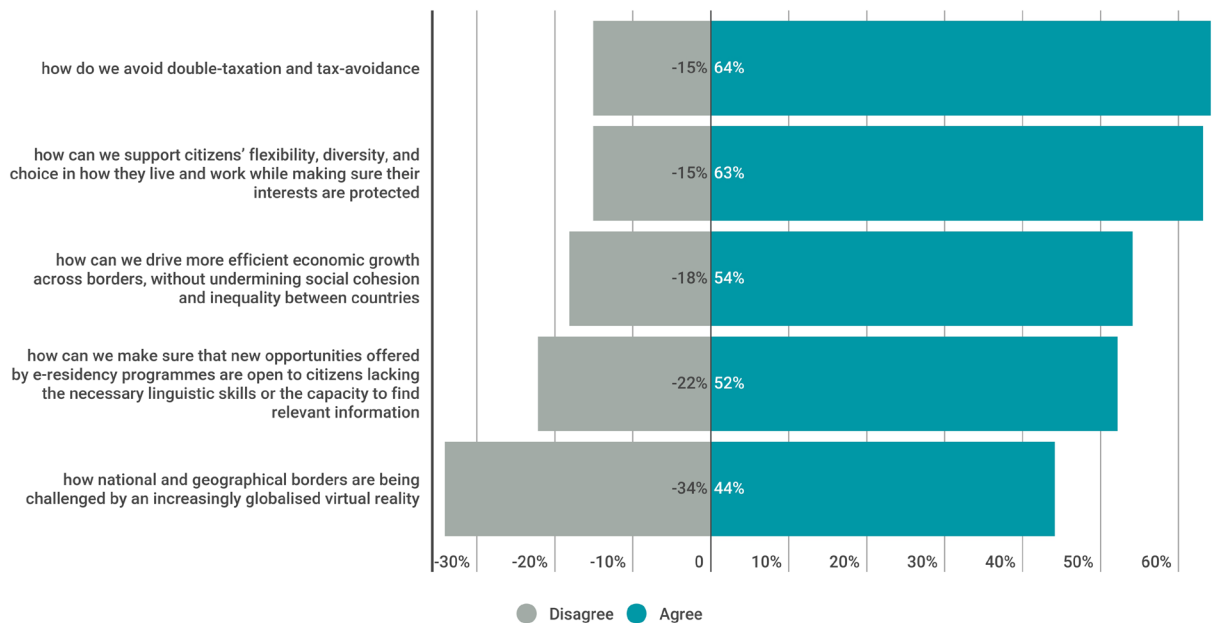
Graph 4.8 – What will be the most valuable uses of Virtual Reality in the years to come?



Concerning VR, most respondents believe that the areas potentially more impacted by its future developments are going to be healthcare, engineering and, to a lesser extent, education. Based on our network and sentiment analysis, VR will play a major role in the near and far future, being connected with the technologies more closely associated to disruption: AI, IoT, BigData, AR, Fintech and Robots. The connection with the healthcare and education sectors is confirmed, but other business development areas seem equally important, starting with the gaming industry and culminating with Fintech, Customer Care and Marketing: VR is deemed to allow for radical transformations in the interaction paradigm, with VR ChatBots likely to replace customer care assistants.

Concerning e-residency, the main issue identified by survey participants revolved around how to avoid double taxation and tax avoidance (36% strongly agreed); interestingly, opinions resulted highly polarised around the fact that e-residency might challenge national and geographical borders.

Graph 4.9 – What are the main issues related to e-residency, i.e. the possibility to establish companies and access services such as banking, fiscal and business services entirely on-line in another country?



AREAS FOR FUTURE RESEARCH AND ACTION

Based on the needs as highlighted by policymakers, the facts as put forward by researchers, and the suggestions and opinions of citizens, the findings of the initiative indicate several unresolved challenges which need to be addressed by policy-makers and stakeholders to build a more human-centred next generation internet.

- Interventions and investments should focus on **privacy**. Our network analysis shows that privacy is tightly connected to all the major topics of discussion around NGI technologies and their socio-economic impacts, including health, traffic, home automation, IoT, Apps, cloud computing, and the use of personal data for commercial or political purposes. People's overarching sentiment is one of open fear and nervousness regarding the protection and promotion of privacy and net neutrality. Our online consultation confirmed that, to the point that when asked what values commonly shared among European countries should be better reflected in the next generation internet, 88% of respondents agreed (and 72% strongly agreed) that "protection of privacy is the most important value", as well as decentralization to avoid monopolies (74% agreed), and transparency and auditability of transactions (73% agreed). The EU has a central role to play in privacy policy, with one of the most important aspects of the GDPR identified as data protection by design built into products and services (77% agreed). The use of people's personal data cannot be taken for granted, even if it is for research purposes, with 45% disagreeing with the idea of personal data sharing for research purposes. This is particularly the case with the Internet of Everything, with 82% agreeing that there is a need to implement specific policies to promote open standards and open data to avoid appropriation by established platforms or technology providers.
- Policy interventions and investments should also focus on security. The network analysis shows that security is most often discussed in relation to the topics of data security, cybersecurity, and data protection topics including encryption, ransomware, and malware. The online consultation confirmed that as citizens and machines become increasingly interconnected and applications "running" the IoE proliferate, we will need new approaches to avoid potential system breakdowns that could threaten critical infrastructure. This is particularly the case for AI systems, where security (i.e. how we keep AI safe, secure, and protect ourselves against unintended AI consequences) and control (how we stay in control of AI) were identified as the two most important issues to address. The GDPR has a key role to play, with the most important aspect identified as companies' obligation to notify users in case of serious data breaches (82% agreed). Research and innovation initiatives under the EU framework programme, including the Cloud Flagship Initiative, have also a key role to play in supporting the creation of EU poles of excellence in business products and services in the cybersecurity field.
- Thirdly, policy interventions and investments should focus on access. As access to fast broadband becomes necessary for both our personal and working life, it will be key to ensure that the right infrastructure is in place and that citizens and organisations are not discriminated against based on their economic background. Indeed, granting that the right infrastructure is in place, that it is well protected, and that citizens are not discriminated against on economic grounds to accessing the internet, are priorities for 85% of our online consultation's respondents. This seems very well aligned with the priorities put forward by the European Commission on the occasion of the Digital Single Market Strategy mid-term review.



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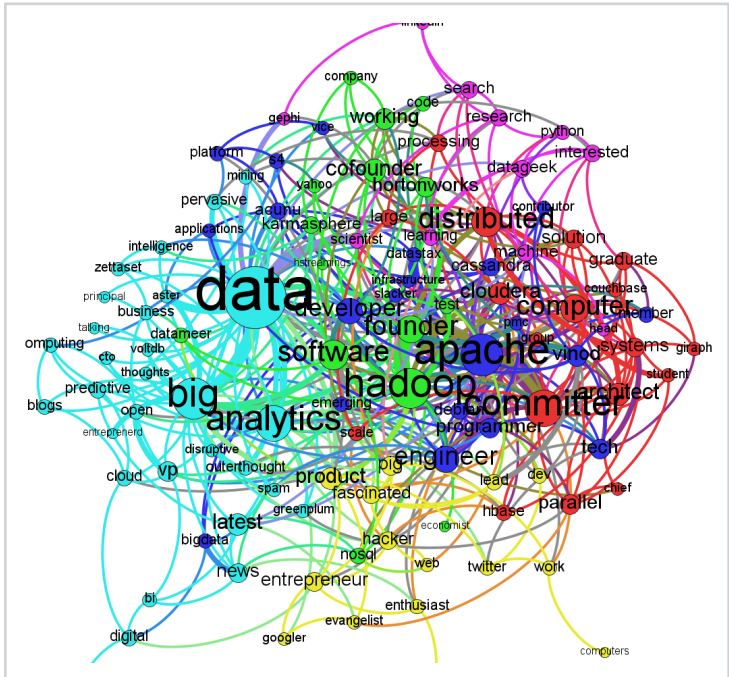
ANNEX 1 - REISEARCH

REISEARCH - A necessary bridge between citizens, researchers, and policy makers

REsearch was proposed by the European Parliament as a Pilot Project to become a bridge connecting citizens, researchers and policy makers on topics linked to the scientific research and to societal challenges that Europe will face in the years to come.

REsearch is a non-profit European initiative co-funded by the European Commission to demonstrate how a technological tool, coupled to a broad network of leading media, research institutions, researchers, civil society organisations, businesses and citizens, can help policy makers to make better use of all knowledge and experience - wherever it may come from - to make better decisions, based on evidence and experience, for the benefit of society as a whole. It aims to provide a secure and reliable platform which encourages information-sharing and dialogue, while ensuring the privacy of user data.

REsearch is promoted by Atomium – European Institute for Science, Media and Democracy, launched eight years ago at the European Parliament by the former President of France Valéry Giscard d’Estaing and by Michelangelo Baracchi Bonvicini.



WHAT

REsearch is an online tool that brings together different and existing communities around specific challenges with the aim to bring together their experience and expertise to the benefit of society as a whole.

REsearch communities are built by bringing together individuals and organisations around specific challenges, starting from the societal challenges as outlined by Horizon 2020, the EU's Research and Innovation programme, and reflecting the policy priorities of the Europe 2020 strategy:

- Health, demographic change and wellbeing;
- Food security, sustainable agriculture and forestry, marine and maritime and inland water research, and the Bioeconomy;
- Secure, clean and efficient energy;
- Smart, green and integrated transport;
- Climate action, environment, resource efficiency and raw materials;
- Europe in a changing world - inclusive, innovative and reflective societies;
- Secure societies - protecting freedom and security of Europe and its citizens.

For the beta test of REsearch, the platform opened on the challenge of **health, demographic change and wellbeing**, and more in particular of **chronic diseases**.

In February and March 2016, REsearch coordinated nine European media organisations – Der Standard, El País, Euroscientist, Frankfurter Allgemeine Zeitung, Gazeta Wyborcza, La libre Belgique, Luxemburger Wort, Público, Sole24ore – to run a citizen engagement campaign through their online editions as well as through the REsearch's platform. Elsevier, Mendeley, OpenAIRE, and the European Commission's Joint Research Centre facilitated the engagement of researchers. Some of the most important European organisations operating in the Chronic Disease sector (ALL European Academies, European Respiratory Society, EuroScience, League of European Research Universities, Science and Technology Options Assessment Panel – European Parliament), together with relevant Directorates-General of the European Commission, cooperated to write questions that were addressed to both researchers and the public at large.

The campaign – which run for five weeks in seven languages - reached over 60.000 people, out of which around 16.000 provided input via an online survey.

The results of this campaign were collected in a report¹ and presented to leading representatives of the European Parliament and European Commission in April 2016². The outcomes presented will allow policy makers across Europe to obtain useful and significant insight, expertise, and data on key issues related to citizen's expectations and concerns in the chronic diseases area.

1. Available on <https://reiresearch.eu>

2. <http://www.eisri-summit.eu>

TECHNICAL FEATURES AND IMPROVEMENTS

User Interface

The entire User Interface ("UI") of the RElsearch platform was redesigned to provide users with a "look&feel" graphic, making navigation easier and quicker and improving user experience.

1. Registration process

The registration process is now more visible and allows for an easier and more accurate initial profiling of new users. Once they register, users are provided with a short tutorial via e-mail, and periodically reached with tips on the platform's functionalities and on-going e-engagement activities based on their profile and behavior on the platform. The possibility to securely register using LinkedIn credentials was added to the already available options (i.e. registering via e-mail, Twitter, Facebook and Mendeley).

2. Surveys

The survey page was re-designed both in the desktop and mobile version to improve usability by introducing a single-step page per question.

3. Articles

Improvements were made on the process allowing to gather articles from existing repositories (Mendeley, OpenAIRE, ScienceDirect) in order to obtain faster results and provide users with a better reading experience.

4. Additional contents

New info pages were created where all the articles published by the media partners, as well as relevant materials provided by business and knowledge partners, can be showcased.

A "visualizations" page was also created to present highlights from the network and sentiment analysis in a easily understandable and interactive way.

5. Twitter feed

Twitter feeds on the main topics being discussed during the initiative were embedded.

6. Additional repositories

It is now possible to access data and relevant publications from the EuroLex database.

7. Discussion area

The forum interface was redesigned with clearer menus and buttons to allow users to easily understand the relationship between topics, subtopics and threads, to propose new topics and threads and to easily browse between them.

8. Search and indexing system

A new indexing system was adopted in order to perform better searches on all types of contents: members, articles, forum messages, news.

9. Social network

The searchability of other registered members based on their role and academic/professional background was improved to encourage and facilitate the establishment of connections and online collaboration and interaction between users.

10. Statistics

Detailed charts on on-going polls and statistics were provided to registered users so that they can visualize the campaigns' results in a more structured way.

11. Analytics

It is possible to geolocalize participants to the polls to obtain detailed statistics on their area of origin, and more detailed access data using Google Analytics.

12. Contact module

Registered users are now able to provide feedback and interact with the technical and editorial teams also by using a new contact module.

WEEKLY TOPIC

NEW TECHNOLOGIES BLURRING ONLINE AND OFFLINE WORLDS AND DISRUPTING THE PERSONAL SPHERE

SEARCH THROUGH OVER 120 MILLION DOCUMENTS FROM 4 DIFFERENT DATABASES

Search...

Articles Discussions News

SEARCH

NEWEST DISCUSSIONS

Could you live without Facebook?

MESSAGES 1

How much does your life depend on the internet?

MESSAGES 3

Man machines

MESSAGES 2

Incompetence/inefficiency/Ineficacy

MESSAGES 1

VIEW ALL

REISEARCH NEWS



Digital Single Market Mid-Term Review

17/05/2017

YouTube Playlist

MORE



From chatbots to self-driving cars: what worries people about machine learning?

17/05/2017

Utopian and dystopian visions of an AI-dominated future are everywhere, from films to tech company press releases. But what are people really concerned

VIEW ALL

TWITTER FEED



13 May

Come along to our Next Generation Internet Summit: from the #internetofthings to the #internetofhumans [buff.ly/2qFX1X](#)

EURLEX NEWS

Opinion of the European Economic and Social Committee on the 'Responsible use of social networks and the prevention of related problems' (own-initiative opinion)

Eur-Lex

Q

COMMISSION STAFF WORKING DOCUMENT Advancing the Internet of Things in Europe Accompanying the document COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS Digitising European Industry Reaping the full benefits of a Digital Single Market

Eur-Lex

Q

Opinion of the Committee of the Regions on the Internet of Things and reuse of Public Sector Information

Eur-Lex

Q

VIEW ALL

ARTICLES

Big Data for Social Innovation

DESOUZA, K. C., & SMITH, K. L.

Stanford Social Innovation Review, vol. 12, issue 3 (2014) pp. 38-43 . 2015 [mendley](#)

READ

Legal Impediments in the EU to New Technologies in the Example of E-Residency

Tanel Kerikmäe; Sandra Särav

Baltic Journal of Law & Politics . 2015 [openaire](#)

READ

E-citizens unite

Hal Hodson

New Scientist. Volume 224, Issue 2991, 18, Pages 24 . October 2014 [sciencedirect](#)

READ

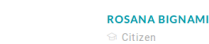
VIEW ALL

NEWEST MEMBERS



IBEN

Citizen



ROSANA BIGNAMI

Citizen



ANTONIO DAVID AGUILAR CHORDA

Citizen

SEARCH



DER STANDARD

EL PAIS

Frankfurter Allgemeine

THE IRISH TIMES

THE IRISH TIMES

La Libre.be

Süddeutsche Zeitung

wyborcza.pl





GOVERNANCE

REsearch brings together four different key stakeholder groups: science, policy, media and society. This set-up is reflected in the set-up of the Steering Committee and Advisory Board of REsearch.

STEERING COMMITTEE

The Steering Committee serves as the main decision making body for REsearch and is co-chaired by Valéry Giscard d'Estaing and Michelangelo Baracchi Bonvicini.

Members of the Steering Committee are:

- **Valéry Giscard d'Estaing**, *former President of France, former President of the European Convention*
- **Michelangelo Baracchi Bonvicini**, *President of Atomium – European Institute for Science, Media and Democracy*
- **Ron Mobed**, *Chief Executive Officer of Elsevier*
- **Hossein Moiin**, *Executive Vice President and Chief Technology Officer (CTO) of Nokia Networks*
- **Vladimír Šucha**, *Director General of the Joint Research Centre*
- **Nils Torvalds**, *Member of the European Parliament, journalist and writer*



ADVISORY BOARD

The Advisory Board serves as the main advisory group for the development of RElsearch.

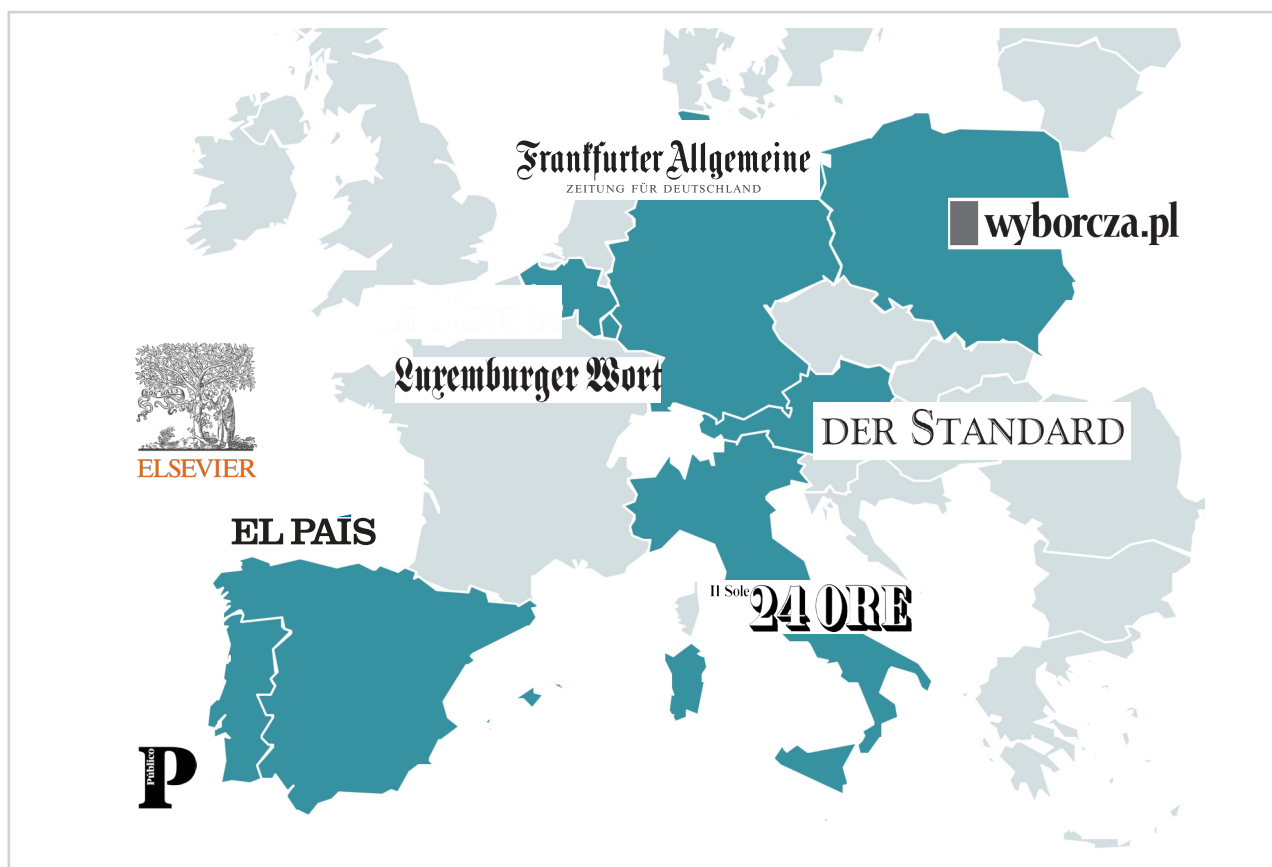
Bringing together leading representatives of the key European institutions and organisations engaged in the dissemination of science and innovation results to society at large. The outcomes of the deliberations of the Advisory Board serve as a guide for the Steering Committee when making its decisions.

Members of the Advisory Board are:

- **Dr. Stephane Berghmans, VP Academic Relations EU at Elsevier, Chairman of the Advisory Board;**
- **Ms. Cissi Askwall, Secretary General of Vetenskap och Allmanhet (Science and Society);**
- **Dr. Morten Busch, Science Writer, Editor-in-chief, Sciencenews.dk, Novo Nordisk Fonden Impact Assessment Team at Novo Nordisk Foundation and Former Head of Science and Media learning Centre Experimentarium;**
- **Ms. Anna Maria Fleetwood, Senior Adviser External Relations at Swedish Research Council Head of External Relations of the Communication Department of the Swedish Research Council;**
- **Dr. Alexander Gerber, Founder & Scientific Director of INSCICO, Professor at Rhine-Waal University;**
- **Dr. François Heinderyckx, Professor at Université Libre de Bruxelles, former President of the European Communication Research and Education Association (ECREA);**
- **Mr. Martin Hynes, President of the European Science Foundation;**
- **Ms. Natalia Manola, Project Manager at OpenAIRE;**
- **Dr. Joan Marsch, Deputy Editor, The Lancet, President of the European Association of Science Editors;**
- **Mr. Wilfried Ruetten, Former Director of the European Journalism Centre;**
- **Dr. Mr. Markus Weisskopf, Director of Wissenschaft im Dialog (Science in Dialogue).**

ANNEX 2 - MEDIA PARTNERS

The Citizen Engagement and Media Campaign ran in **seven** different languages and with the support of nine leading media partners including national newspapers as well as European publisher Elsevier.



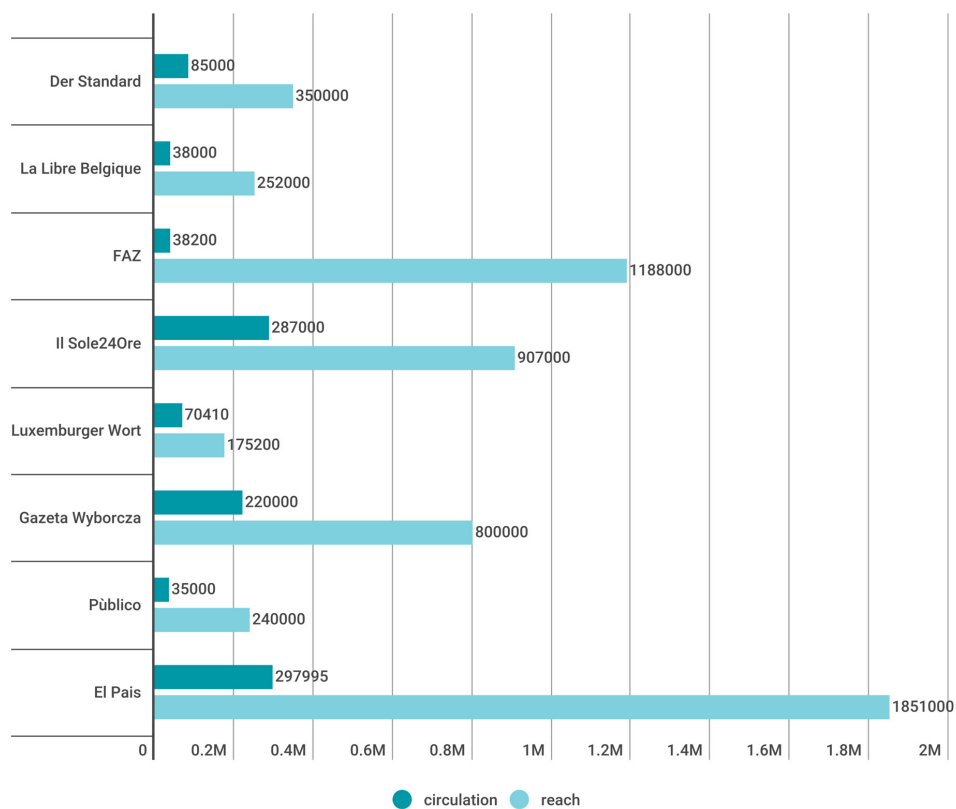
In the next page you can see the reach of the individual media partners in terms of percentage of national population and of the European population.

Together the media partners of the campaign have a circulation of over one million and reach over 5,7 million people. The fact that the campaign was also featured by other newspapers - including the Guardian - and specialized media outlets, ensured further reach to our campaign.

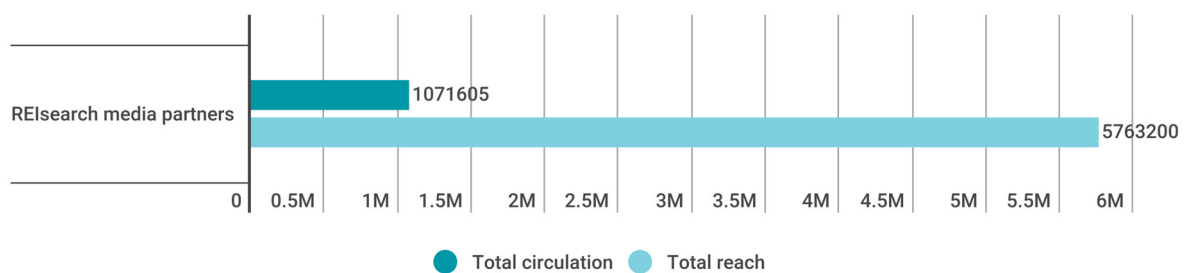
Reach among the global scientific community was granted via the participation of Elsevier, which promoted the campaign through its channels, leading to over 2 million impressions and nearly 2.000 clicks through.



Overall circulation of media partners.



Overall estimated online reach of media partners.



Please find below a detailed list of the media partners:

AUSTRIA – DER STANDARD

Der Standard is an Austrian national daily newspaper that is published in Vienna.

Der Standard is one of Austria's best-selling quality newspapers and is readily quoted by foreign media when an opinion from the Austrian press is required.

Der Standard is published in accordance with the honour code of the Austrian press (which sets rules on matters such as a transparent division between news and comment and the right to privacy). The paper's general editorial stance could be described as socially liberal and most of its regular columnists also tend to this position, although guest writers come from a wide variety of political positions.

BELGIUM – LA LIBRE BELGIQUE

La Libre Belgique (literally, "The Free Belgium"), now sold under the name *La Libre*, is a Belgian newspaper in French. The paper was started as *Le Patriot* in 1884 and had a pro-Catholic stance. It was renamed *La Libre Belgique* and was published as part of the underground press in February 1915 during the occupation of Belgium by German Empire.

La Libre is published six times per week (from Monday to Saturday) by the IPM publishing group and has its headquarters in Brussels. The online edition of the paper was started in 2001. The paper has been published in tabloid format since 2002.

In Belgium, it is seen as roughly equivalent to the Flemish *De Standaard*. It is the only Francophone newspaper that is also distributed in Flanders. Along with another high circulation French-speaking newspaper it dominates the market in Wallonia and Brussels.

GERMANY – FRANKFURTER ALLGEMEINE ZEITUNG

Frankfurter Allgemeine Zeitung (FAZ) is a German daily published in Frankfurt. Founded in 1949, this major conservative-liberal daily is a reference tool in business circles and among intellectuals, who appreciate its literary supplement, *Feuilleton*.

The *FAZ* is the German daily with the widest circulation abroad and one of the world's largest networks of correspondents, which makes it by and large independent from the press agencies.

The *FAZ* promotes an image of making its readers think. The truth is stated to be sacred to the *FAZ*, so care is taken to clearly label news reports and comments as such. Its political orientation is classical liberal with an occasional support for conservative views by providing a forum to commentators with different opinions. In particular, the *Feuilleton* and some sections of the Sunday edition cannot be said to be specifically conservative or liberal at all.

GLOBAL – ELSEVIER

Elsevier, the modern publishing business, was founded in 1880 and takes its name from the original House of Elsevir, a Dutch family publishing house founded in 1580.

It has evolved from a small Dutch publishing house devoted to classical scholarship into an international multimedia publishing business with over 20,000 products for educational and professional science and healthcare communities worldwide. Elsevier has been at the forefront of the open science movement and has massively contributed to digitizing scientific contents. Over 3,800 journals were made available via ScienceDirect, of which 1,800 have the option to publish open access articles, meaning that a growing amount of contents is available to any reader without the need to make a subscription. More than 35,000 books were also digitized and indexed on ScienceDirect - with digital archives reaching as far back as 1823, for a total of over 14 million peer-reviewed publications.

ITALY – IL SOLE 24 ORE

Il Sole 24 Ore is an Italian daily published in Milan. Italy's reference business daily was founded in 1965 after the merging of *Il Sole* (founded in 1865) and *24 Ore* (1946).

It is the third national daily, with circulation boosted by an increase in publication of non-economy related articles. Its Sunday culture supplement *Domenica* pulls in an intellectual readership that normally shows little interest for economics.

Il Sole 24 Ore's website is more like a portal: in addition to a selection of articles published in the print edition, it features a wide range of services related to the stock exchange and the economy, most of which are subscriber-only.

POLAND – GAZETA WYBORCZA

Gazeta Wyborcza was one of the first independent newspapers, established in 1989, the year when communism collapsed. It was founded as the mouthpiece of the Polish freedom movement *Solidarność*.

Many of the people who subscribed to *Gazeta Wyborcza* in those times still subscribe to it today. Consequently it is Poland's leading quality newspaper in terms of circulation. It is published by Agora, one of the largest Polish media groups.

LUXEMBOURG – LUXEMBURGER WORT

Luxemburger Wort was founded in 1848 by Bishop Johannes Theodor Laurent, the paper was originally owned by the Catholic church. The paper was founded just three days after press censorship was abolished.

Luxemburger Wort is the Grand Duchy's leading daily and is read by 40 percent of the population. The paper is published by Saint-Paul Luxembourg SA group which is majority owned by the archdiocese of Luxembourg. For 42 years the paper was shaped by its director and editor-in-chief Léon Zeches, who resigned in 2010. Articles are printed in German, French and Luxembourgish.

PORTUGAL – PÚBLICO

Público was first published on 5 March 1990. Founded as a joint project by a group of journalists and the investor group Sonae, this liberal paper quickly became a newspaper of reference, particularly among the political class, entrepreneurs and intellectuals. *Público* is published in tabloid format and has its headquarters in Lisbon.

Público is one of the first Portuguese mainstream newspapers to have an online edition which was started in 1995. The online edition of *Público* was named as Europe's online-medium of the year in 2013. The paper was awarded the European Newspaper of the Year in the category of nationwide newspapers by European Newspapers Congress in 2014.

SPAIN – EL PAÍS

El País is the world's leading daily newspaper in Spanish and a byword for quality in the field of journalism in the Hispano-American world. It was first published on May 4, 1976, and its founders envisaged it as an independent quality, European-oriented newspaper, and an advocate of multiparty democracy.

Today, the newspaper remains true to its founding principles, while it continues to adapt to the changing times. *El País* can be read today in its print version, on the Internet, in any electronic format and through social networks.



ANNEX 3 - THE COMMITTEES

As for the 2016 campaign on chronic diseases, the *Citizen Engagement and Media Campaign on the Next Generation Internet* required two characteristics to be fulfilled in order to be seen as trustworthy and reliable and therefore a success:

- Firstly, the relevance and reliability of the information presented and the questions asked had to be ensured. The campaign had to present the most relevant information from an interdisciplinary and intersectoral perspective whilst ensuring that there was no bias built into the content.
- Secondly, the editorial content had to be independent, relevant and represent the interest of the citizens. In order to ensure the two above conditions to be met, two committees were set-up to support the editorial team when developing the content and drafting the questions: an Editorial Committee and a Scientific Committee.

The **Editorial Committee** was aimed at supporting REsearch's editorial team by highlighting the priorities and key questions of interest to their diverse readership. They also ensured the independence and authoritativeness of the information presented and the questions developed for the campaign.

The members of the Editorial Committee represented the media partners of the initiative that come from different countries, backgrounds and political orientations.

The **REsearch's Scientific Committee on the Next Generation Internet** represented the different areas of expertise of the scientific community around the Next Generation Internet. It comprised experts across the selected area that served to guide and to provide insight to the development of the content and questions of the campaign.



THE EDITORIAL COMMITTEE



Patricia Fernandez de Lis

Editor in Chief of Science and Technology of El País

Patricia Fernandez de Lis has been working for over 15 years as a journalist, covering the economy, science, and technology. She is the Editor in Chief of Science and Technology of El País and a Lecturer on the Master's degree in Communication of Science, Technology and the Environment at the University Carlos III Madrid.



Luca De Biase

Editor in Chief of Nòva24 – Il Sole24ore

Luca De Biase is the founder and editor of Nòva24, the weekly technology and new media insert of Il Sole 24 Ore and is co-founder of Italia Startup. He is author of numerous books and essays on science and digital culture and runs one of the most popular Italian blogs dealing with the knowledge economy, news and social media.



Dorian de Meeûs

Science Editor of La Libre Belgique

Dorian de Meeûs is the online Editor in Chief at Belgian daily newspaper La Libre Belgique (LaLibre.be). He is a visiting professor at IHECS and a graduated from the Université Libre de Bruxelles.



Iris Kisjes

External Partner Relations Manager, Elsevier

Iris currently works for Elsevier as External Partner Relations Manager. She has been actively involved in public relations, corporate- & marketing communications, media- and stakeholder relations with two industry awards: in PR and marketing communications. Working in high-tech environments where technology is the driving innovation is the focal point throughout her career having worked for various Fortune 500 companies including: Dentsu, BT and Elsevier.



Teresa Firmino

Science Editor of Público

Teresa Firmino is Science Editor in Chief at Portuguese daily newspaper Público. She holds a Degree in Social Communication from Lisbon New University and was a Knight Science Journalism fellow at Massachusetts Institute of Technology (MIT).



Christophe Langenbrink
Science Editor of Luxemburger Wort

Christopher Lagenbrink is Editor in Chief of the Luxemburger Wort, with responsibility for the daily management of the newspaper, including coordinating its main themes and supplements. He has an MBA and a master in Political Science from Universität des Saarlandes.



Joachim Mueller Jung
Science Editor of Frankfurter Allgemeine Zeitung

Joachim Mueller-Jung is Chief Science Editor of Frankfurter Allgemeine Zeitung, a national German daily newspaper. He joined in 1995 and took responsibility for the science department "Natur und Wissenschaft" in 2003. He had a journalism training at the "Kölnische Rundschau" in Cologne after graduating in Biology in Heidelberg, Cologne.



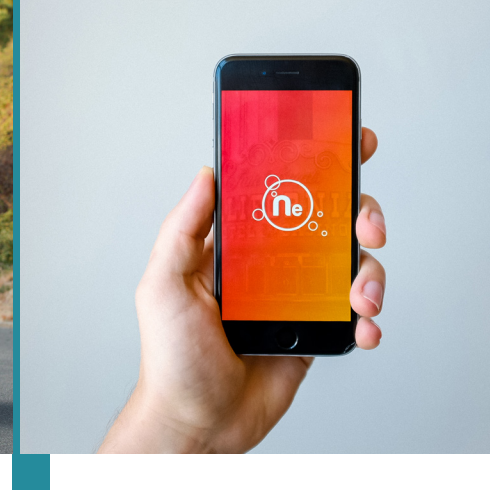
Iwona Pawluk
Science Editor of Gazeta Wyborcza

Iwona Pawluk is Editor and Coordinator of Social Campaigns at Gazeta Wyborcza, the biggest opinion-making daily newspaper in Poland. Graduated from Warsaw University, she holds a Master in Iberian Studies. She has been responsible for many campaigns, among them: Magic Roads, two Polish editions of Editors Lab Hackdays and City Labs.



Klaus Taschwer
Science Editor of Der Standard

Klaus Taschwer is science editor of the Austrian daily newspaper Der Standard. He was trained in sociology, political science and social studies of science. Klaus co-founded a course-programme on communicating science and authored books on the history of Austrian science in the 20th century.



RESEARCH'S SCIENTIFIC COMMITTEE ON THE NEXT GENERATION INTERNET



Dr. Robert Madelin

Visiting Research Fellow, University of Oxford, Chair of the Scientific Committee

Robert Madelin is a Visiting Research Fellow at the University of Oxford, Chairman of Fipra International Ltd, and a policy thinker with four decades of public policy experience in the UK administration and the EU. He authored in summer 2016: "Opportunity Now: Europe's mission to innovate".



Prof. Cristiano Codagnone

Professor, University of Milan and Barcelona – former JRC expert on sharing economy

Cristiano Codagnone holds a double academic affiliation, as aggregate professor at Milan State University (Department of Social and Political Sciences) and at the Universitat Oberta de Catalunya (UOC, Department of Communication Studies); he is the CEO of the UOC spin-off research company Open Evidence and is the director of the Research Group 'Open Evidence Research' funding and conducting basic research in Applied Social Sciences and Behavioural Economics (ASSBE).



Elizabeth Crossick

Head of the Brussels office of RELX Group

Elizabeth Crossick is Head of Gov Relations at Reed Elsevier working in Brussels and London with considerable expertise in advocacy, lobbying, fully integrated public affairs, communications & media and CSR.



Prof. Primavera De Filippi

National Center of Scientific Research, Berkman Center for Internet & Society at Harvard Law School

Primavera De Filippi is a permanent researcher at the CNRS in Paris and faculty associate at the Berkman-Klein Center for Internet & Society at Harvard, where she is investigating the concept of governance-by-design as it relates to blockchain technologies such as Bitcoin, Ethereum and others.



Prof. Luciano Floridi

Research Chair in Philosophy of Information and the UNESCO Chair in Information and Computer Ethics, University of Hertfordshire

Luciano Floridi is the OII Professor of Philosophy and Ethics of Information at the University of Oxford and Faculty Fellow of the Alan Turing Institute (ATI). He is Chair of the ATI's Data Ethics research Group, and Chairman of the Ethics Advisory Board of the European Medical Information Framework and of the ATI's Working Group on Data Ethics.



Prof. Mireille Hildebrandt

Chair of Smart Environments, Data Protection and the Rule of Law, Vrije Universiteit Brussel

Mireille Hildebrandt is a tenured Research Professor 'Interfacing Law and Technology' at the Faculty of Law and Criminology of Vrije Universiteit Brussel (VUB), appointed by the VUB Research Council. She also holds the parttime Chair of 'Smart Environments, Data Protection and the Rule of Law' at the Science Faculty of Radboud University in Nijmegen. Her research interests concern the implications of automated decisions, machine learning and mindless artificial agency for law and the rule of law in constitutional democracies.



Dr. Erik Huizer

Director of IETF Area Director, IRTF chair, CTO Surfned

Erik Huizer is CTO at SURFnet, the Dutch national academic and research network. He is also a member of the board for GÉANT, Europe's leading collaboration on e-infrastructure and services for research and education. Furthermore he is on the boards of various international non-profit Internet organizations.



Prof. Innar Liiv

Associate Professor, Tallin University of Technology

Innar Liiv is an Associate Professor of Data Science at Tallinn University of Technology and a Cyber Studies Visiting Research Fellow at the University of Oxford. His research interests include e-government and data science, social network analysis, organisational network science, computational social science, information visualization, and big data technology transfer to industrial and governmental applications.



Dr. Irene Lopez de Vallejo

Director of collaborative research at Digital Catapult

Irene Lopez de Vallejo has devoted the last 20 years to multidisciplinary applied technology research, in robotics, high-value manufacturing and the Internet of Things. With a background in sociology and architecture, her long-standing passion is to understand the complex relationships underlying society, technology and continuously evolving physical and digital environments. She is presently driving the Digital Catapult's regional and international R&D strategy.



Prof. Andrzej Nowak

Professor of Psychology, Warsaw University

Andrzej Nowak is a professor of psychology at the Department of Psychology, University of Warsaw, where he directs the Center for Complex Systems at the Institute for Social Studies, and in University for Social Sciences and Humanities in Warsaw. He is also professor of Psychology at Florida Atlantic University. His primary focus is on social and psychological dynamics and new technology. His current research includes social influence, new media, culture, social transitions, conflict, and radicalization.



Ms. Zoe Romano
co-founder WeMake

Zoe Romano co-founded in 2014 WeMake, a Milan based Makerspace and Fablab focused on fashion and design, training on digital fabrication with a special attention for projects with social impact. After spending several years working in digital communication, since 2011 she's been exploring the world of makers with a series of initiatives for the dissemination of open design and digital fabrication. She's been involved into media activism working on precharity and spent 4 years at Arduino as digital strategist, from 2013 to 2017.



Dr. Paul Timmers
Director Digital Society, Trust & Cybersecurity. DG CNCT (former)

Paul Timmers is involved in academic research and entrepreneurship related to digital business models in health, smart energy & mobility and cybersecurity. He also advises on digital technology, policy, and economy / society. He was a European Commission Director for Digital Society, Trust & Cybersecurity in the Directorate General Connect.



Prof. Peter-Paul Verbeek
Professor of philosophy of technology, University of Twente

Peter-Paul Verbeek (1970) is professor of philosophy of technology at the Department of Philosophy, vice dean of the School of Behavioral, Management, and Social Sciences, and co-director of the DesignLab at the University of Twente, The Netherlands. His research focuses on the philosophy of human-technology relations, and aims to contribute to philosophical theory, ethical reflection, and practices of design and innovation.

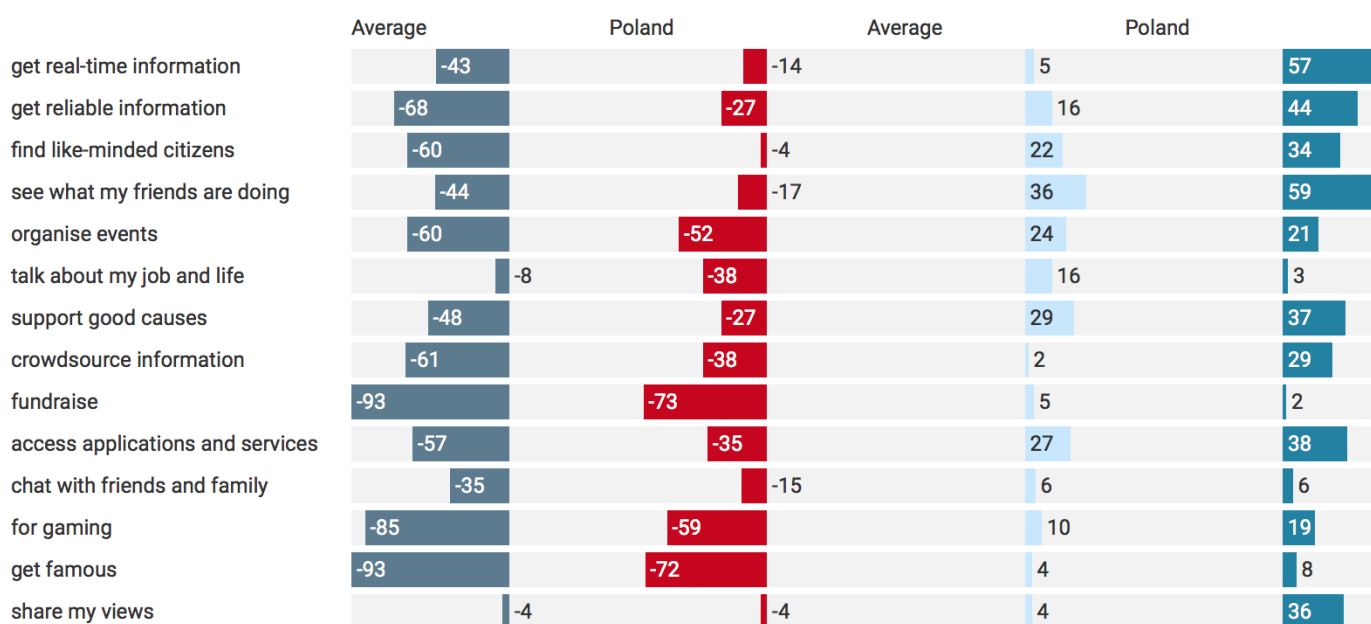
ANNEX 4 - AN IN DEPTH ANALYSIS OF WEEK 2 IN POLAND

On top of the data collected through questionnaires and illustrated in this report a more accurate analysis for questions of week two (information and social media) was conducted on a statically representative sample of the Polish population with the support of prof. Andrzej Nowak from the Jagiellonian University and Business College and the National Louis University in Nowy Sącz. In the following pages polish responses are compared to the average of the other European countries (Spain, UK, Ireland, Germany, Austria, Portugal, Italy, Belgium, Luxembourg).

The first two columns on the left of the graphs show the percentage of respondents disagreeing with the suggestions, while to the right (with positive values) are those agreeing.

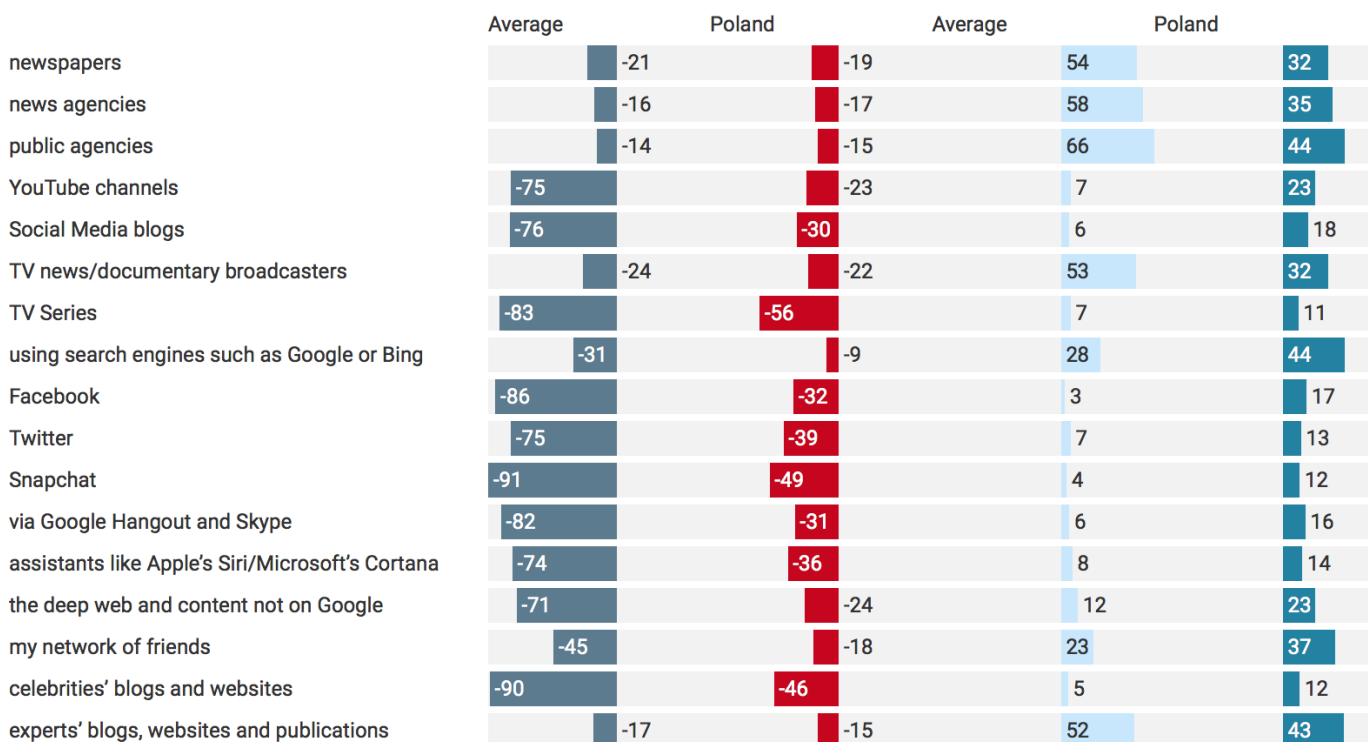
Respondent's view indicate an intensive attention of Poles to digital media and a strong appreciation for free services and a reduced interest for top-down approaches to regulate the online information sphere.

1. What do you use social media for?



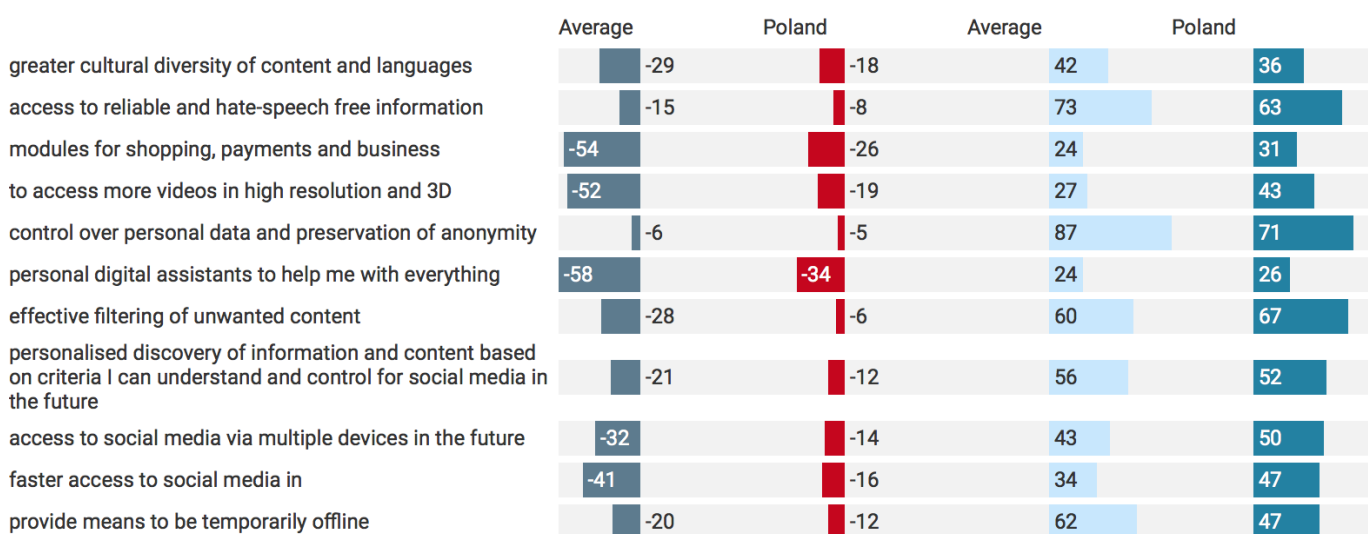
Polish respondents show a significantly above average prooensity to use rely on social media to keep informed and also seem to trust these media more than other Europeans. Social networks are also very used for keeping in touch with friends while there seems to be little interest in sharing more intimate information regarding job and life.

2. Which channels do you trust to give you accurate information?



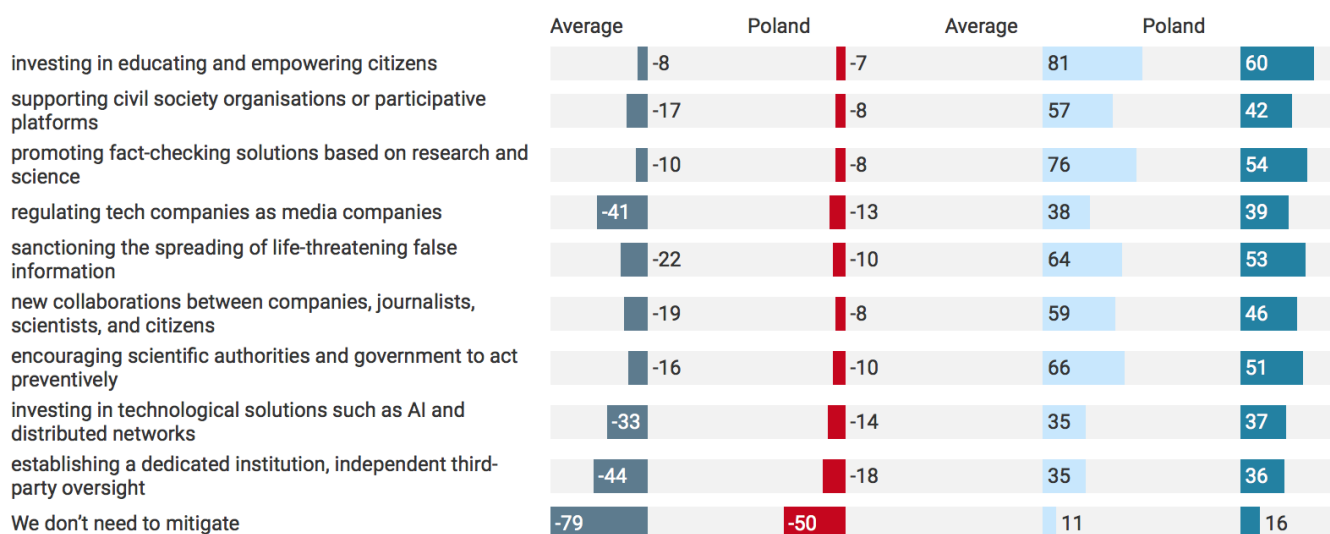
Compared to their fellow Europeans, Polish respondents appear quite traditional in their media consumption and ranking of source as they view newspapers, media agencies and the State as the most reliable sources of information. They are nevertheless attracted to celebrity blogs and channels.

3. What is your wish list for Social Media in the future?



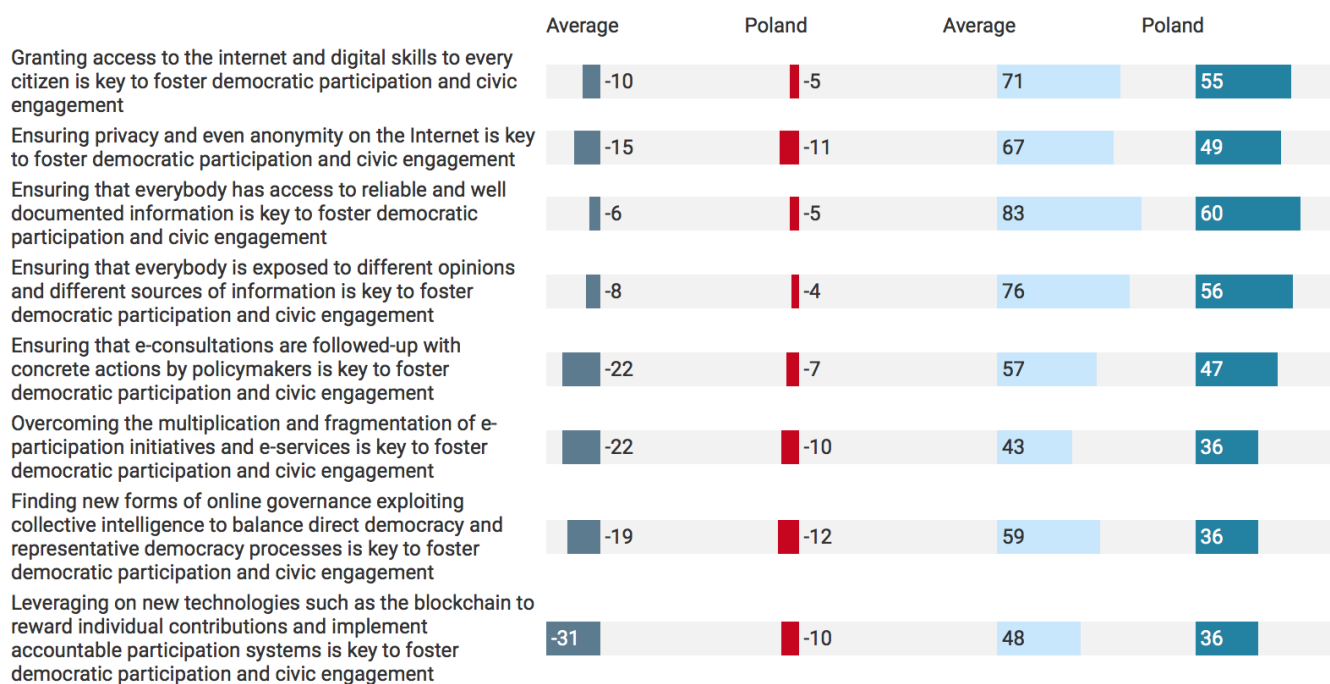
When it comes to possible future improvements of social medias, Polish respondents seem very aligned with other Europeans but express and above average interest for new functions filtering unwanted messages and contents.

4. How can we mitigate the spread of 'fake news' and 'filter bubbles' on the internet?



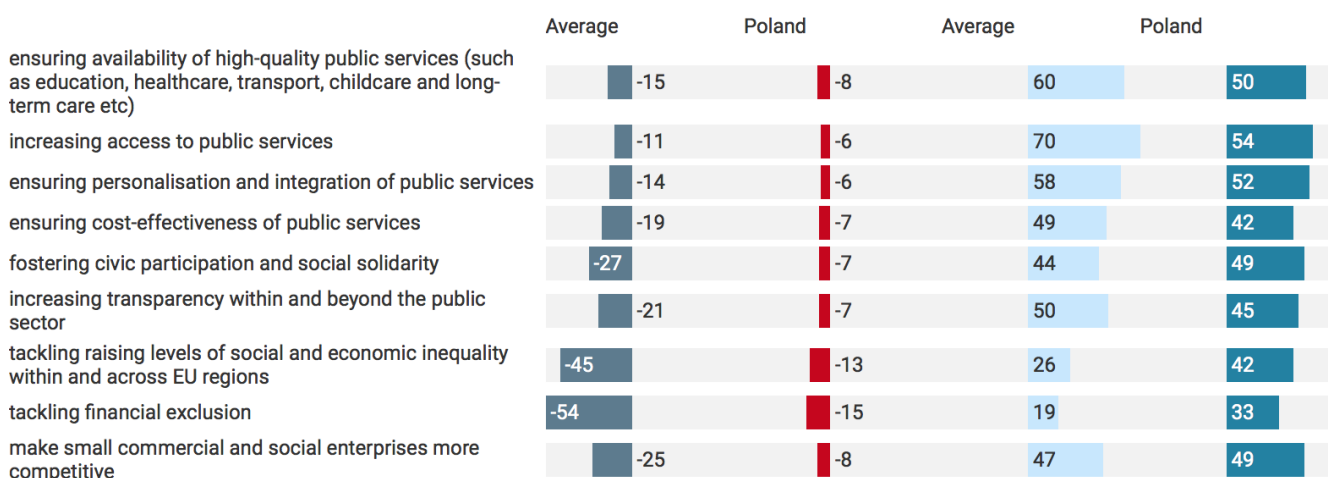
As for countering the spread of fake news and disinformation, Poles seem keener than the average European on the adoption of a top-down approach favouring technological solutions over education investments as well as an oversight body.

5. What are the most important actions to be taken if we want the internet and social media to foster democratic participation and civic engagement in the future?



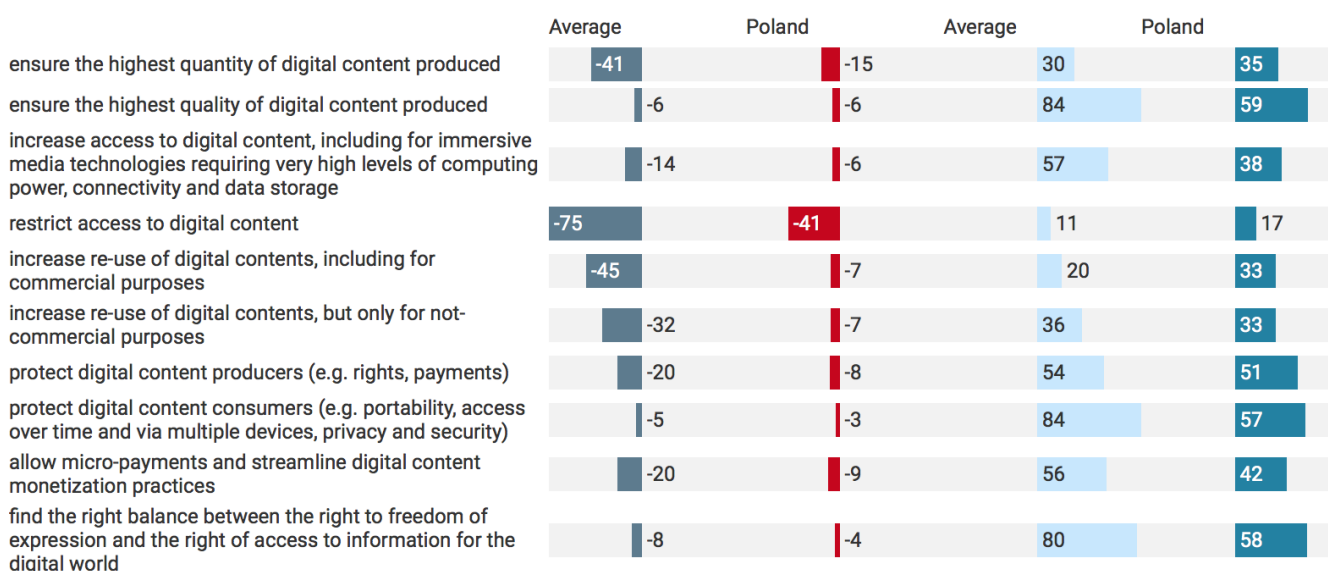
Poles' views significantly differ from other Europeans when confronted with possible measures for improving social media's positive impact for democracy. The most remarkable difference is on measures for ensuring access to reliable information and the development of a governance system. On these points Poles appear up to 23% less interested than other citizens of the Union.

6. To what extent can future and emerging internet technologies contribute to improve our societies?



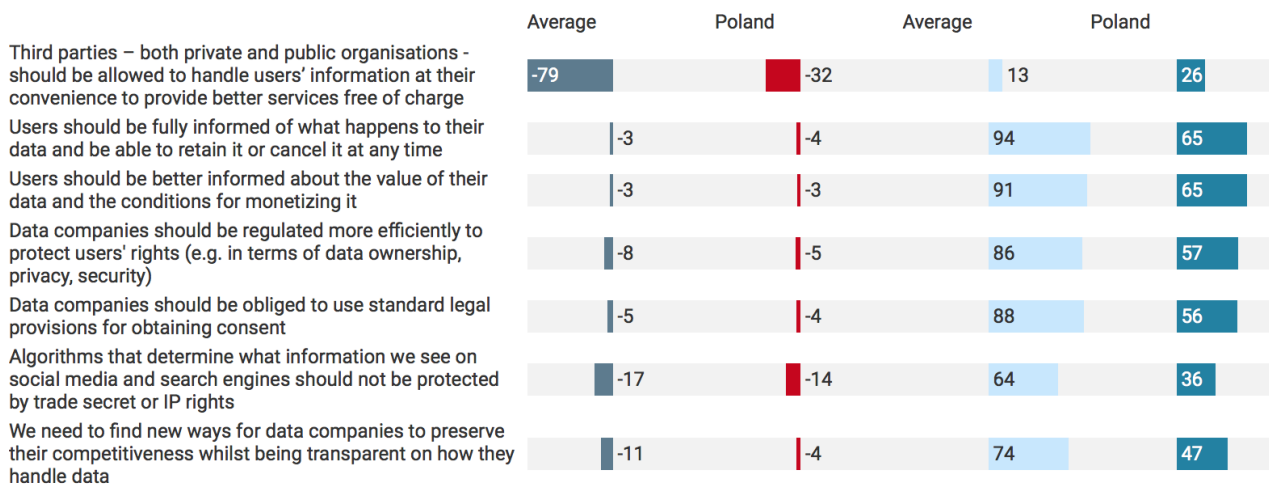
In Poland, digital media seem to be regarded as mostly a tool for personal information and expression, while their importance for providing services and fostering inclusion seems much less underscored.

7. What are the most important actions to be taken concerning digital content?



Respondent's views on future actions on digital content are by and large aligned with those of other Europeans although less polarised and keener to restrict access to certain types of digital content.

8. How should users' data be handled online?



Poles views deviate from other Europeans when it comes to giving access to personal data in exchange for free services.

ANNEX 5 - AN ARTIST'S POINT OF VIEW ON THE NGI SUMMIT SESSIONS

A printed text is a proven media for disseminating knowledge but has many shortcomings when we rely exclusively on it to return the richness and nuances of a live discussion as the 2017 NGI Summit.

Luckily, art has come to the rescue in the person of New Zealand contemporary artist Simon Denny¹, whose work on technology and society has showcased at MoMA and at the Venice Biennale.

As Denny has explained in a recent video², digital networks have radically changed how we exchange information and influence each other and generated viral forms of transmission we have yet to understand how to control. In this challenge the effort we need to make is cultural more than technological as, as Denny notes, we need to become literate in numerics and understand the format and structure of this new information ecosystem.

Below are the graphic tables produced by Denny's team at the European Parliament to summarize the sessions of the 2017 NGI Summit.

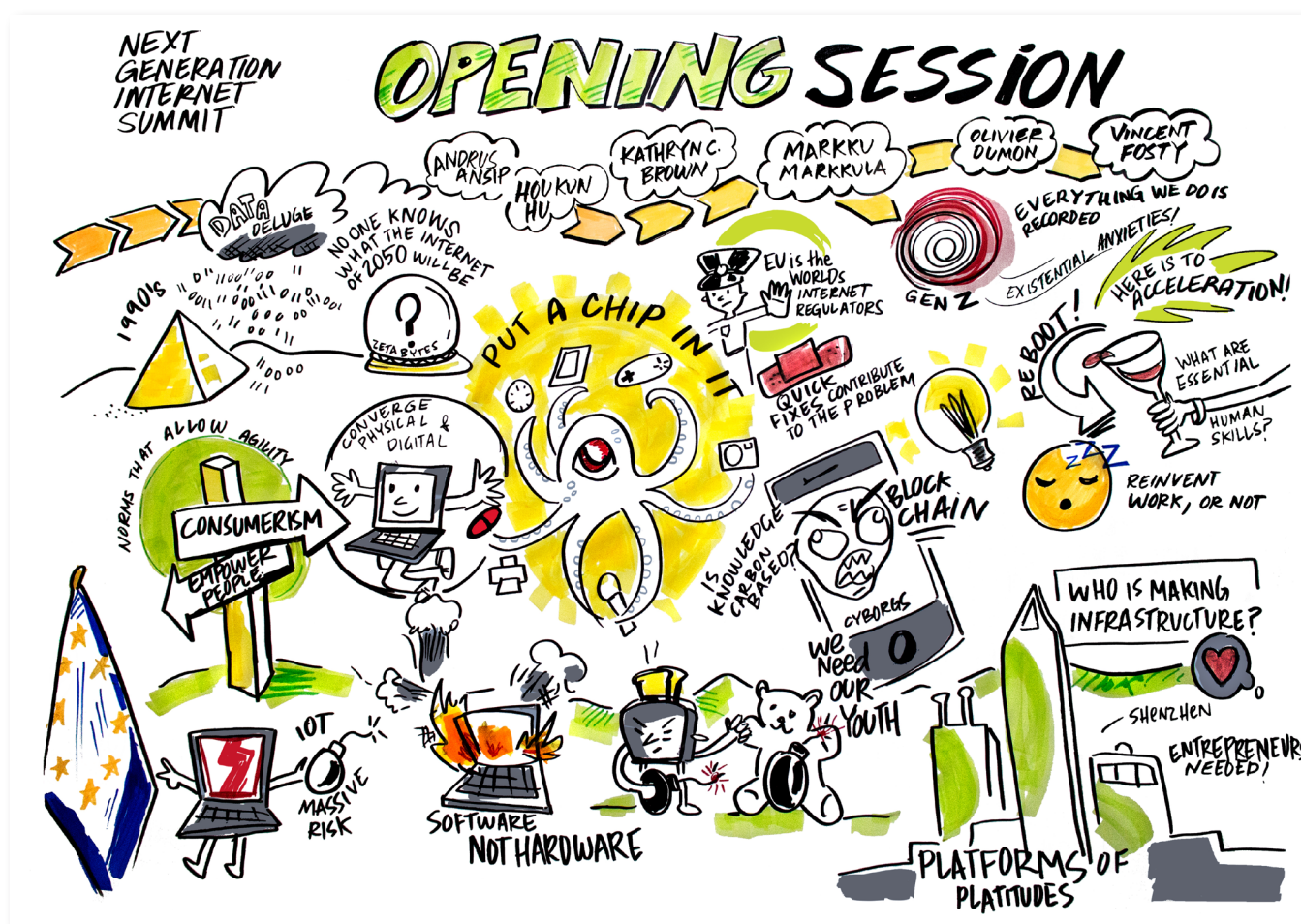


Table 1. The Opening session on the ever diverse components of the Next generation internet.

1. simondenny.net

2. <http://research.eu/videos/danny-move>

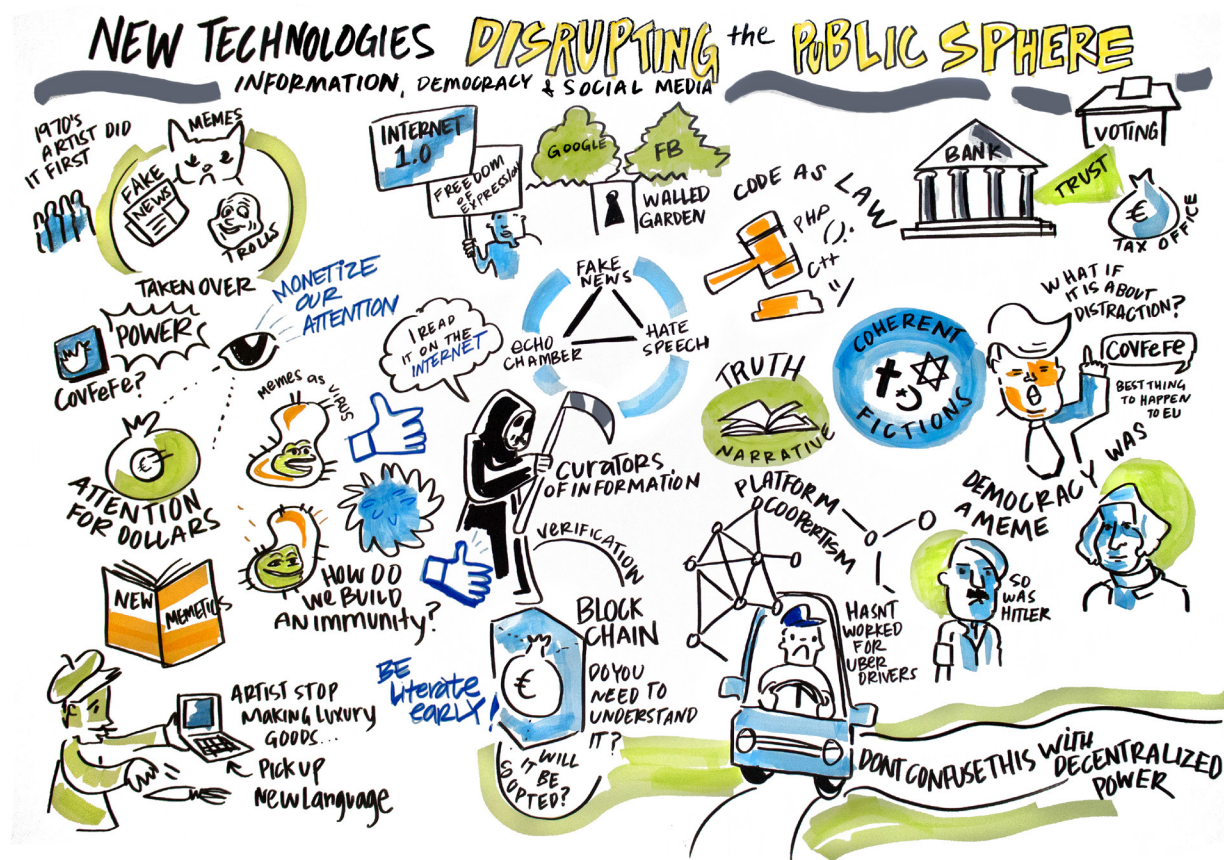
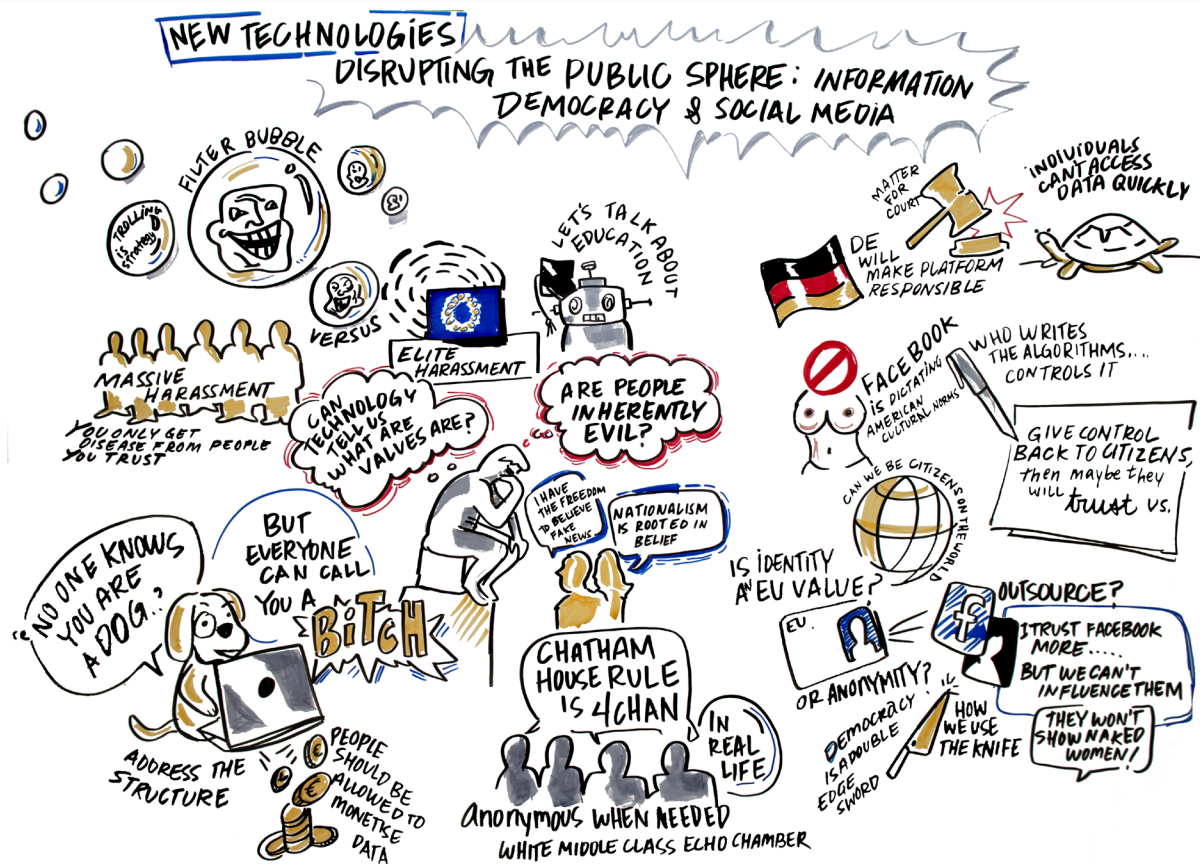


Table 4 and 5. Two sessions of the parallel workshops covered how new technologies are disrupting the public sphere.

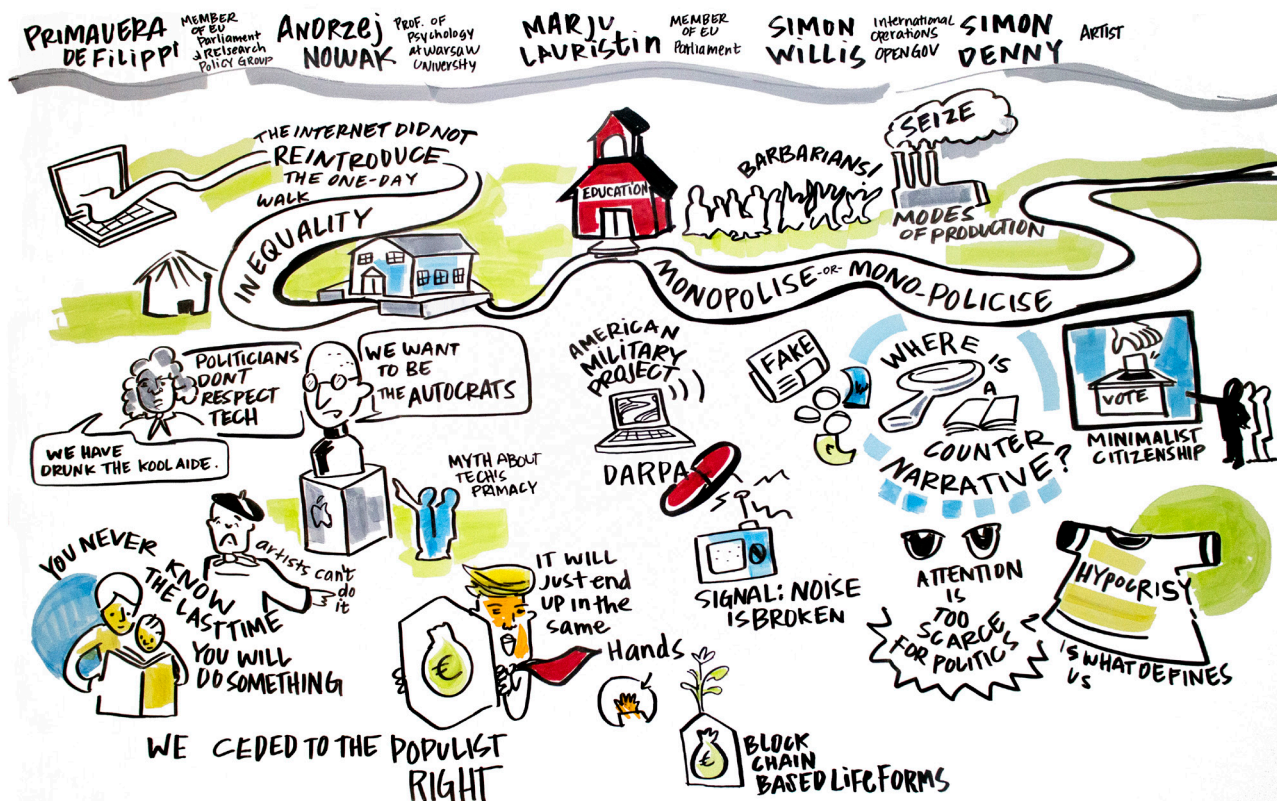
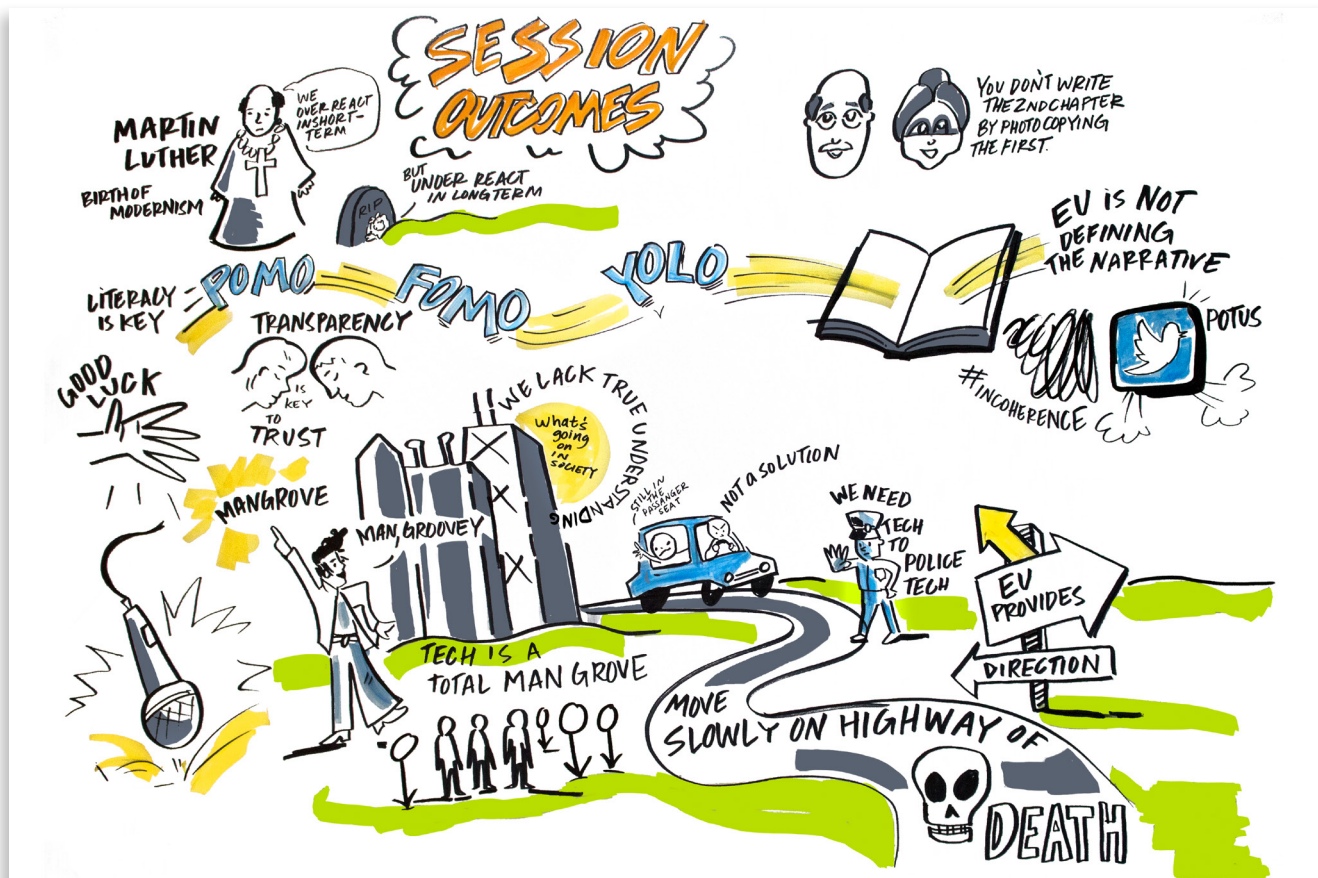


Table 6 and 7. The outcomes of all parallel sessions where summed-up before the closing of the conference.

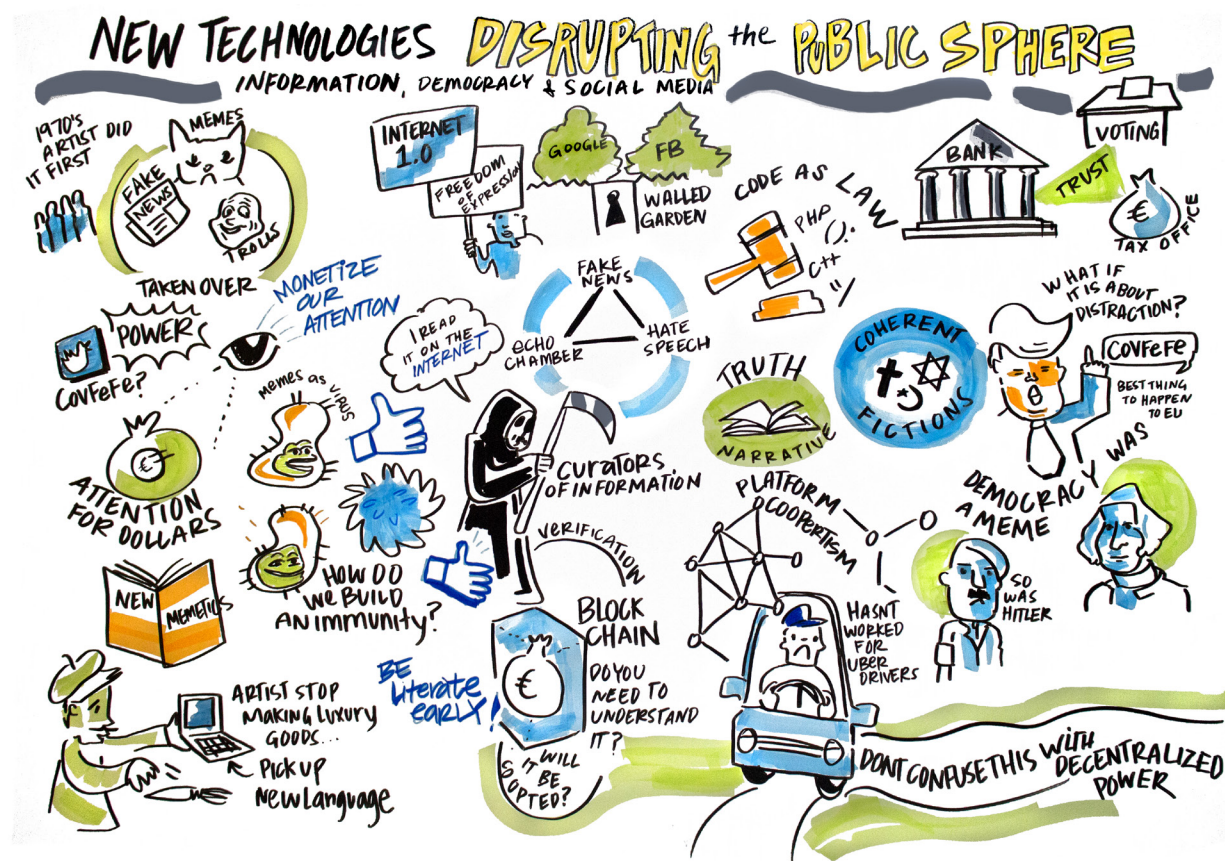


Table 8. The Final Remarks stressed the importance of developing a European digital space coherent with the founding rights and values of the Union.

