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HUB4NGI

D1.2 PORTFOLIO AND NATIONAL PROGRAMMES

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Authors	Robert Szuman (PSNC), Bartosz Belter (PSNC), Roman Łapacz (PSNC), Stefania Aguzzi (IDC)
Reviewers	Peter Van Daele, Tim Wauters (IMEC) and Timo Lahnalampi (Martel Innovate)

Abstract	This deliverable provides a status and coverage report of the initiatives, research topics, technologies, actors and resources available to the NGI community.
Keywords	National Programmes, initiatives, research topics, technologies, actors and resources, NGI community

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Dissemination Level		
PU	Public, fully open, e.g. web	✓
CL	Classified, information as referred to in Commission Decision 2001/844/EC	
CO	Confidential to HUB4NGI project and Commission Services	

** R: Document, report (excluding the periodic and final reports)*

DEM: Demonstrator, pilot, prototype, plan designs

DEC: Websites, patents filing, press & media actions, videos, etc.

OTHER: Software, technical diagram, etc.

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EXECUTIVE SUMMARY

Launched by the European Commission in autumn 2016, the Next Generation Internet (NGI) initiative aims to shape the future internet as an interoperable platform ecosystem that embodies the values that Europe holds dear: openness, inclusivity, transparency, privacy, cooperation, and protection of data. The NGI should ensure that the increased connectivity and progressive adoption of advanced concepts and methodologies (spanning across several domains such as artificial intelligence, Internet of Things, interactive technologies, etc.) drive this technology revolution, while contributing to making the future internet more human-centric.

This ambitious vision relies upon the capability to embrace the best Internet research and innovation initiatives across Europe and beyond to address technological opportunities arising from cross-links and advances in various R&D fields ranging from network infrastructures to platforms, from application domains to social innovation.

This document reports on a status of the national initiatives, research topics, technologies, actors and resources available to the NGI community. The NGI-related portfolio and the national programmes for several EU countries are presented based on the main outcomes from NGI Contact Points Workshops performed in the year 2017 in the Member State countries and based on the received results of our NGI-related national activities survey. The survey included questions about public entities, national strategies or policies, national initiatives and regular events as well as the key academic institutions, business and “other type” entities.

Additionally, the major outcomes from the discussion groups during the two H2020 Future Internet Forum (FIF) meetings which happened in 2017 in Brussels are reported in this document to present the main subjects and thoughts in the NGI community.

The expected audience for this document could be the European Commission members as well as the EU countries’ representatives interested in the NGI subject and how this vision and activity are realised in different countries.

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ABBREVIATIONS

AC	Associated Countries
CSA	Coordination and Support Actions
EC	European Commission
FIF	Future Internet Forum
H2020	Horizon 2020 Programme
IoT	Internet of Things
IP	Internet Protocol
NCP	National Contact Point
NGI	Next Generation Internet
NGI CP	Next Generation Internet Contact Point
NGO	Non-Governmental Organization
MS	Member States
R&D	Research and Development
SME	Small or Medium Enterprise

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1 INTRODUCTION

Internet is becoming ever more important for the lives of any human on this planet. It creates new business opportunities and new social paradigms for interaction, from the local to the planetary scale.

Whereas many of the Internet developments have surpassed any expectations in terms of benefits for the citizens and the economy, there are some reasons for concern about further progress. In particular, the concentration of power in the hands of several companies, and the relative lack or abandon of control of citizens on their own personal data, together with restrictions on Internet access because of geographical, economic or cultural reasons raise concerns.

The Internet of the future should be more open, provide better services, more intelligence, greater involvement and participation. It needs to reflect the European social and ethical values: free, open and more interoperable.

The Next Generation Internet (NGI) should offer more to our society. It should provide better services and greater involvement and participation. It is essential that the next-generation Internet is designed for humans, so that it can meet its full potential for the society and economy. The scope of the European initiative should be broad, addressing technological opportunities arising from advances in various research fields, extending from new network architectures and software-defined infrastructures to new concepts for services and applications.[1]

The European Commission aims to shape the Internet of the future as a powerful, open, data-driven, user-centric, interoperable platform ecosystem and has therefore launched the Next Generation Internet initiative in autumn 2016.[2] The NGI initiative is promoted by the European Commission, Directorate-General for Communications Networks, Content and Technology, Directorate E: Future Networks, Unit E3: Next-Generation Internet.

FIGURE 1. NGI IMPACT AREAS

The European Commission funds the NGI initiative and support actions including the HUB4NGI project[3] which aims at transforming the current NGI initiative into an increasingly dynamic, collaborative and participatory Innovation Ecosystem. Such ecosystem should be capable of effectively supporting and coordinating activities across the whole NGI landscape and provide a collaborative platform,

[1] About Next Generation Internet https://ec.europa.eu/futurium/en/node/1460
[2] Next Generation Internet initiative https://ec.europa.eu/digital-single-market/en/policies/next-generation-internet
[3] The project, for which this deliverable was produced. More information can be found at: https://www.hub4ngi.eu

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including content, tools and processes, to turn all Internet Researchers and Innovators into NGI promoters.

As it was already stated in the previous D1.1 deliverable,[4] the HUB4NGI project plays a key role as a support and coordination action that started in January 2017 to provide help and contribute to the overall success of the NGI initiative in several ways. By creating an innovation "hub" for the NGI, the HUB4NGI aims to:

- Contribute to ground the NGI vision, defining research scope and priorities, building the community and engaging key players
- Facilitate contributions to the NGI from technological opportunities arising from cross-links and advances in various related RTD fields
- Contribute to the NGI roadmap definition to help shaping and defining its future, including recommendations for WP 2018-2020 and FP9.

This has already led to several concrete outcomes and ongoing activities, such as the creation of the NGI Online Map,[5] the HUB4NGI portal,[6] the organisation of and participation in several NGI events, as well as the work described within this and other deliverables.

The primary objective of this document is to describe in detail and analyse the NGI-related portfolio and national programmes available for citizens in different European countries as well as draw a comparison between them and then summarise conclusions across the whole EU's MS/AC offering. Also a very important objective of this deliverable is to present the main, most common and highest priority topics and outcomes of this NGI overview and analysis.

To achieve these goals, we have described the portfolio and national programmes based on the NGI Contact Points Workshops organised in different European countries and also based on the results of our survey concerning NGI-related national initiatives.

In detail, section 2 hereof describes the main goal and objectives of this document as well as the proposed and used methodology to achieve them. There is also a survey scheme included which consists of 7 questions and a proposed format for each answer.

Section 3 describes in detail the portfolio of presented topics on NGI Contact Points Workshops performed in different European countries in 2017 as well as the main outcomes and brainstorm ideas of the various discussion groups which took place at these workshops. Moreover, this section includes the results of the online survey which was completed for several countries giving a broad view into the NGI-related national initiatives in these countries and differences or common solutions between them.

Section 4 provides an overview of the Future Internet Forum (FIF) activity and presents the main outcomes of the discussion in 3 parallel brainstorming groups, which took place at the two FIF meetings organised in 2017 in Brussels (Belgium) and which were entirely dedicated to the NGI initiative and to the NGI-related activities.

[4] HUB4NGI Deliverable 1.1 https://hub4ngi.eu/wp-content/uploads/sites/11/2017/09/hub4ngi_d1.1_v1.0.pdf
[5] https://www.hub4ngi.eu/map/
[6] https://www.hub4ngi.eu

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Section 5 provides a summary analysis of the information included in sections 3 and 4 describing their main, most common and most important outcomes, and section 6 concludes the whole document.

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2 GOALS, OBJECTIVES AND METHODOLOGY

The main goal of this document is to provide a status and coverage report of the initiatives, research topics, technologies, actors and resources available to the NGI community. The proposed methodology to achieve this objective is to manage the collection of information from European countries through their local contact points working in the area of NGI using questionnaires and direct communication channels (e.g. emails, physical meetings or teleconferences). For this purpose, the HUB4NGI project designed and released an on-line[7] dedicated survey to collect information and data about NGI-related national initiatives from European countries. The survey was addressed to NGI Contact Points (NGI CPs) as well as the National Contact Points (NCPs) in Member States/Associated Countries (MS/AC) asking them to fill it in to provide important information about initiatives, research topics, technologies, actors and resources available and related to the NGI community in their countries. The collection of survey replies had finished in the end of November 2017 and all the results were analysed and described in the following chapters of this deliverable. This document summarizes the outcomes of the survey and stands as the first approach to identify and systemically collect information about NGI stakeholders, initiatives, technologies, etc. in different MS/AC. Although the process of collecting survey results has been finished, it may be possible to re-open the survey in 2018 to provide an updated version of the analysis, potentially with more countries involved.

The survey includes 7 questions and a proposed format for each answer. The survey scheme is presented below.

1. Indicate the **public entities** (national authorities, policy makers, associations, communities, etc.) which operate within defining, consulting, monitoring, assessing strategies, plans or policies embracing the NGI vision and goals.
Select max. ten (10) most important, influential and active.

All answers the above question should include: entity name, roles and responsibilities, contact details and website link.

2. Indicate the existing officially announced **national strategies or policies** which address the vision and goals of NGI.
Select max. three (3) most important, influential and active.

All answers the above question should include: name, short description, responsible institution and website link.

3. Indicate the **national initiatives** (project programmes, public-private partnerships, etc.) addressing the vision and goals of NGI.
Please, add the information about the founding size (total budget) in the description field if relevant.
Select max. ten (10) most important and influential initiatives.

[7] Link to the on-line version of the NGI survey: https://ehum.psnc.pl/survey/index.php/852992?lang=en

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All answers the above question should include: initiative name, short description, responsible institution and website link.

4. Indicate the **regular national events** (conferences, workshops, etc.) where representatives of public entities and business sectors can meet to discuss the existing challenges and the future of the internet.
Select max. three (3) most important and influential.

All answers the above question should include: event name, short description and website link.

5. Indicate the key **academic institutions** in your country which are involved in the initiatives related to the Internet of the future and have a considerable expertise, particularly in the three technological domains (NGI priorities): 1) Privacy and trust enhancing technologies, 2) Decentralized data governance, 3) Discovery and identification technologies.
Select max. five (5) most influential and active.

All answers the above question should include: institution name, area of expertise and contact details.

6. Indicate the key **business entities** in your country which are involved in the initiatives related to the Internet of the future and have a considerable expertise, particularly in the three technological domains (NGI priorities): 1) Privacy and trust enhancing technologies, 2) Decentralized data governance, 3) Discovery and identification technologies.
Select max. five (5) most influential and active.

All answers the above question should include: business entity name, area of expertise and contact details.

7. Indicate the key **"other type" entities** (Non-Governmental Organization (NGO), business angel, venture capital fund, influencer, etc.) in your country which are involved in the initiatives related to the Internet of the future and have a considerable expertise, particularly in the three technological domains (NGI priorities): 1) Privacy and trust enhancing technologies, 2) Decentralized data governance, 3) Discovery and identification technologies.
Select max. five (5) most influential and active.

All answers the above question should include: entity name, area of expertise and contact details.

The NGI Contact Points workshop structure was the same in all countries to make it easier to collect feedback in a harmonised way. Therefore, a generic set of preparation documents with a list of NGI pre-questions were produced and made available for the NGI Contact points. Each of the workshops had a core agenda as follows:

- Setting the scene:
    - The NGI Initiative: Context, plans and actions of the European Commission (Speaker from the EC)
- Presentations from the national actors:

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- A start-up's view on NGI: Needs and expectations (preferred speaker: start-up representative)
- A research perspective: Trends and topics that NGI should embrace (preferred speaker: young researcher, post-doc)
- A civil society needs and expectations: What does NGI do for the people (preferred speaker: civil society representative)

- World Café
  - Group work in three tables (start-up, research, civil society)
  - One host who presented results in the end of the workshop was appointed for each table.

The World Café results from those workshops whose report is available are collected and presented in detail in this deliverable.

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3 PORTFOLIO AND NATIONAL PROGRAMMES

This section describes results of the workshops organised by the NGI Contact Points in different Member States as well as the results of the online HUB4NGI survey.

3.1 AUSTRIA

The portfolio and national programmes description for Austria is based on the NGI Contact Points Workshop performed on 21st June 2017 in Vienna and on the HUB4NGI project online NGI Survey's results submitted by FFG.

The title of the NGI Workshop in Austria was "The Age of Post-Digitization" and the presentations included:

- "The Next Generation Internet: Internet of Humans" by Georgios Tselentis (EU)
- "State of the Next Generation Internet Project in Austria" by Helmut Leopold (AIT).

There was also a presentation on the Topic Team NGI - Next Generation Internet in Austria with its web-link www.iot-austria.at/ngi where the portfolio about e.g. Austrian Internet of Things Network can be found.

In Topic Teams, interested people meet to work together on a topic and talk about it. Topic teams are interdisciplinary, cross-organizational and self-organized groups. People work voluntarily, out of self-interest and self-drive into the Topic Team: as committed people who look outside the box and want each other: connect, share & collaborate.[8] There was also so called "World Café" discussion in sub-groups, whose results are described in detail in the workshop's report and the general outcomes of the 3 discussion groups were as follows.
The building blocks and keywords for a vision of a NGI and its functions should include:

- Invisibility of technology
- Consequence-oriented system - there should be awareness inbuilt into the system concerning the implications of its users wishes
- Privacy first
- De-centralised approach
- Power to the people.

Moreover, a digital prognosis for the year 2047 has to concentrate on the societal desired outcomes and take into account both the individual desires without deserting the collective well-being. It is also important that the NGI vision should give everyone access to the internet and provides inclusion to everyone within society, including minorities that have not had the best of chances so far. However, offline-time should also be guaranteed and digital literacy should be promoted. To truly deploy NGI in this fashion, it is needed to develop a new culture based on inclusion and collaboration within this new digital world.

According to the survey results, the public entities (national authorities, policy makers, associations, communities, etc.) which operate within defining, consulting, monitoring, assessing strategies, plans or policies embracing the NGI vision and goals in Austria are

[8] NGI Workshop in Austria – report: https://docs.google.com/document/d/1q6Arl31ZB6VbyPLSheb-mrhP_JTsu6yC1abw3wV7e9Y/edit#

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BMVIT[9] whose role and responsibility is a founder and FFG[10] with the role of an executive agency.

The national initiative (project programmes, public-private partnerships, etc.) addressing the vision and goals of NGI is "ICT of the future"[11] for which the responsible institution is FFG.

The key academic institutions in Austria which are involved in the initiatives related to the internet of the future and have a considerable expertise, particularly in the three technological domains (NGI priorities), are:

- AIT with its expertise area like safety & security, technical scouting & development
- JKU-LZM with area of expertise like privacy & trust, technical scouting & development and
- WUW which has expertise in privacy, trust & security.

The key business entities in Austria which are involved in the initiatives related to the Internet of the future and have a considerable expertise, particularly in the three technological domains (NGI priorities), are Eutema, SBA research, IBM Austria and Siemens Austria.

The key "other type" entities (Non-Governmental Organization (NGO), business angel, venture capital fund, influencer, etc.) in Austria which are involved in the initiatives related to the Internet of the future and have a considerable expertise, particularly in the three technological domains (NGI priorities) are IoT Austria which area of expertise is privacy & trust as well as data governance and Vienna Data Science Group which has expertise in privacy & trust and data governance.

3.2 BELGIUM

The portfolio and national programmes description for Belgium is based on the NGI Contact Points Workshop performed on 29th November 2017 in Charleroi and on the HUB4NGI project's online NGI Survey results submitted by impulse.brussels and Centre of Excellence in Information and Communication Technologies.

At the NGI Workshop in Belgium the presentations included:

- "General Introduction to NGI" by European Commission
- "Regional Numerical Strategy" by Andre Blavier (AdN)
- "Technical Vision" by Peter Van Roy (UCL), Nicolas Point (Multitel) and Thierry Dutoit (UMons)
- "Industry 4.0" by Nicolas Vanhille (Sonaca) and about legal issues by Jean-Marc Van Gyseghem (UNamur/CRIDS)
- About education by Guy Detroz (Technofutur-TIC)
- About SmartHealth by Monique Marrec-Fairley (BIOWIN).

There was also a so called "World Café" discussion in sub-groups, whose results will be described in the workshop report (not available yet).

According to the survey results the public entities which operate within defining, consulting, monitoring, assessing strategies, plans or policies embracing the NGI vision and goals in

[9] Website: https://www.bmvit.gv.at/en/innovation/international_eu/horizon_2020.html
[10] Website: https://iktderzukunft.at/de/kontakt/
[11] Website: https://iktderzukunft.at/

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Belgium are Softwareinbrussels[12] whose role and responsibility is strategy advice on digital strategy and CIRB[13] with the role in smart city strategy and Innoviris[14] with responsibilities in R&D strategy and also Brussels Digital Policy[15] and "Administration du Numérique"[16] responsible for defining digital strategy in the Walloon Region of Belgium.

The existing officially announced national strategies or policies which address the vision and goals of NGI are Nexttech Brussels[17] as the "Brussels Digital Strategy for Entrepreneurs" whose responsible institution is impulse.brussels, Brussels Smart City[18] which stands for "Regional Strategy for Smart City" with CIRB as the responsible institution and PRI[19] which is the "Regional Plan for Innovation" managed by Innoviris and "Plan du numérique"[20] which defines the digital strategy for the Walloon Region of Belgium and the responsible institution for this plan is "Agence du numérique".

The national initiative (project programmes, public-private partnerships, etc.) addressing the vision and goals of NGI is "Belgian Virtual Reality Community" which stands for "The Belgian VR Meetup Community"[21] and whose responsible institution is screen.brussels. Another national initiative in Belgium is DigitYser[22] which is a regional location to support the growing ecosystems and is managed by impulse.brussels.

The regular national events (conferences, workshops, etc.) where representatives of public entities and business sectors can meet to discuss the existing challenges and the future of the Internet are "Tech Start-up Day"[23] - the Belgian event on VR, Stereopsia[24] - the VR event in Belgium, "Digital First"[25] - the Belgian digital event and "Wall Invest Tour"[26] which focuses on investment in start-ups as well as "KIKK Festival 2017 et TEKK Tour Digital Wallonia"[27] - numeric and creative culture.

The key academic institutions in Belgium which are involved in the initiatives related to the Internet of the future and have a considerable expertise, particularly in the three technological domains (NGI priorities) are ULB,[28] VUB,[29] UCL Louvain,[30] KULeuven,[31] Ghent University,[32] University of Antwerp,[33] University of Hasselt,[34] Indutec,[35] and "Research Centre

[12] Website: https://nexttech.brussels/
[13] Website: https://smartcity.brussels/
[14] Website: http://www.innoviris.be/fr
[15] Website: http://be.brussels/a-propos-de-la-region/bruxelles-internationale/la-representation-de-bruxelles-a-letranger-la-presence-de-bruxelles-a-letranger-1/la-representation-permanente-1
[16] Website: https://www.digitalwallonia.be/
[17] Website: https://nexttech.brussels/
[18] Website: https://smartcity.brussels/
[19] Website: http://www.innoviris.be/fr/politique-rdi/plan-regional-dinnovation
[20] Website: https://www.slideshare.net/agencedunumerique/digital-wallonia-stratgie-numrique-de-la-wallonie
[21] Website: https://www.meetup.com/Virtual-Reality-in-Belgium/
[22] Website: http://www.digityser.org/
[23] Website: http://www.techstartupday.be/
[24] Website: http://www.stereopsia.com/
[25] Website: https://www.digitalfirst.be/index.php
[26] Website: https://www.digitalwallonia.be/wall-invest-tour/
[27] Website: https://www.digitalwallonia.be/kikk2017/
[28] Website: http://www.ulb.ac.be/
[29] Website: http://www.vub.ac.be/
[30] Website: https://uclouvain.be/fr/index.html
[31] Website: https://www.kuleuven.be/kuleuven/
[32] Website: https://www.ugent.be
[33] Website: https://www.uantwerpen.be
[34] Website: https://www.uhasselt.be
[35] Website: http://www.indutec.brussels/index.php/fr/

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in Information, Law and Society"[36] with experience in privacy and trust enhancing technologies.

There are many companies that are involved in NGI developments, both manufacturers and Internet service providers. Some of them are: Proximus,[37] Telenet,[38] Orange,[39] Nokia,[40] Barco,[41] etc.

A key "other type" entity (Non-Governmental Organization (NGO), business angel, venture capital fund, influencer, etc.) in Belgium which is involved in the initiatives related to the Internet of the future and have a considerable expertise, particularly in the three technological domains (NGI priorities) is DigitYser[42] with general innovation as the area of its expertise.

In terms of Strategic Research Centers, imec[43] is strongly involved in NGI technology development and Flanders Make[44] is an important user in its research and development of Industry 4.0 technology. Sirris[45] is a collective centre for and by the technological industry.
It is also worth mentioning the sector organizations such as Agoria[46] and Voka.[47]

3.3 CZECH REPUBLIC

The portfolio and national programmes description for the Czech Republic is based on the NGI Contact Points Workshop performed on 11th October 2017 in Prague and on HUB4NGI project online NGI Survey's results submitted by CESNET.

At the NGI Workshop in the Czech Republic the presentations included:

- "The NGI Initiative, context, plans and actions of the European Commission" by Nicole Muessigmann (EC)
- "A start-up's view on NGI: needs and expectations" by Petr Springl (Flowmon Networks)
- "The research perspective: Trends and topics that NGI should embrace" by Ondrej Filip (CZ.NIC)
- "Civil society needs and expectations: What does NGI do for the people" by Petr Pavlinec (Vysocina Region).

There was also a so called "World Café" discussion in sub-groups, whose results are described in the workshop's report[48] and the general outcomes of the 2 discussion groups was as follows.

[36] Website: http://www.crids.eu/
[37] Website: https://www.proximus.be
[38] Website: https://www2.telenet.be
[39] Website: https://www.orange.be
[40] Website: https://www.nokia.com/nl_int
[41] Website: http://www.barco.be/en/
[42] Website: http://www.digityser.org/
[43] Website: https://www.imec-int.com
[44] Website: http://www.flandersmake.be
[45] Website: http://www.sirris.be
[46] Website: https://www.agoria.be
[47] Website: https://www.voka.be

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The three main topics the NGI initiative needs to address include:

- Identity, Privacy & Security
  - Reliable & trusted identity
  - Availability, accessibility & accountability
  - Monitoring
- Social Aspects
  - User/human-centric
  - Regulation & legal aspect to new technologies
  - Global reach
  - Academia & Industry cooperation
- Simple & standard interfaces
  - Open standards
  - Keep lower layers in mind.

The expectations people have from the NGI initiative are:

- Building pan-European ecosystem
- Evolution, not revolution
- Breaking vendor silos (verticals)
- Addressing small pan-European teams
- Economic involvement of large infrastructures
- Creation of interoperability rules in certain areas (like eHealth).

The most visionary solutions envisaged at technology and policy levels:

- Artificial Intelligence & Deep Learning
- Other sophisticated mathematical tools for the technology of future
- Resources orchestration (like SDN/SDX)
- Open Hardware
- Augmented reality
- Pan-European technology legislation.

According to the survey results the public entities which operate within defining, consulting, monitoring, assessing strategies, plans or policies embracing the NGI vision and goals in the Czech Republic are the Ministry of Education Youth and Sports[49] whose role and responsibility is research coordination in academia; the Section of Deputy Prime Minister for the Science Research and Innovation[50] with the role of general research coordination; the Czech Science Foundation[51] which is a Grant Agency for basic research, and the Technology Agency of the Czech Republic[52] which acts as a Grant Agency for applied research.

The national initiatives (project programmes, public-private partnerships, etc.) addressing the vision and goals of NGI are CESNET[53] which is a large IT infrastructure; CERIT Scientific Cloud[54] which is a large infrastructure managed by Masaryk University Brno; IT4Innovations[55] - a national supercomputing centre whose responsible institution is the VSB-Technical University of Ostrava.

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[48] NGI Workshop in Czech Republic - report: https://drive.google.com/file/d/1bsGsSGj8qesY_cKzFHQPmePQ_FrUPZXb/view and https://drive.google.com/file/d/1IoiDxjqvCOBlSGwjTeTn2JDl8fiaTAq4/view
[49] Website: http://www.msmt.cz/?lang=2
[50] Website: http://www.vyzkum.cz/
[51] Website: https://gacr.cz/en/
[52] Website: https://www.tacr.cz/index.php/en/
[53] Website: https://www.cesnet.cz
[54] Website: https://www.cerit-sc.cz/
[55] Website: https://www.it4i.cz/?lang=en

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The regular national events (conferences, workshops, etc.) where representatives of public entities and business sectors can meet to discuss the existing challenges and the future of the Internet are CESNET – an annual conference of NREN (National Research Network) and the Day of National Research Infrastructures.[56]

The key academic institutions in the Czech Republic which are involved in the initiatives related to the Internet of the future and have a considerable expertise, particularly in the three technological domains (NGI priorities) are Masaryk University with its area of expertise in security, supercomputing, data processing; the Czech Technical University which has expertise in security, networking, IoT; Charles University which specialises in networking, privacy, data processing; the VSB-Technical University of Ostrava with area of expertise in supercomputing, data processing and CESNET with area of networking infrastructures.

The key business entities in the Czech Republic which are involved in the initiatives related to the Internet of the future and have a considerable expertise, particularly in the three technological domains (NGI priorities) are CZ.NIC, z.s.p.o. specialised in privacy & trust enhancing technologies as well as SPIR, z.s.p.o. working in the area of privacy and trust enhancing technologies.

3.4 FINLAND

The portfolio and national programmes description for Finland is based only on the NGI Contact Points Workshop performed on 5th October 2017 in Helsinki.

At the NGI Workshop in Finland the presentations included:

- “Setting the Scene” by Jean-Luc Dorel (European Commission, DG CONNECT)
- “Industry Needs and Expectations” by Varun Singh (Callstats.io)
- “Trends and Topics that NGI Should Embrace” by Heikki Hämmäinen (Aalto)
- “IHAN Easy Living” by Antti Larsio (Sitra).

There was also a discussion part in sub-groups whose results are described in detail in the workshop’s report[57] and the major items are summarized below.

What are the main concerns in the Internet nowadays?

- Data gathering, ownership and management issues are unclear
  - What is customer’s/citizen’s role as owner of data
  - It is not clear who is collecting what data
  - There is no guidance on how an entity could authoritatively say what it collects
  - Information sources are fragmented
  - Lack of transparency in using the data, e.g. algorithms, data aggregation, AI
- Internet security, trust and privacy is major concern:
  - “Smart is a new vulnerability”
- Network scalability and capacity:
  - Need for internet next level abstraction (e.g. IoP = Internet of People)
  - Complexity of network and network resource
  - Need to ensure scalability from Big Data to IoT/sensors
  - Service availability in every situation, e.g. speed in crowded place

[56] Website: https://www.vyzkumne-infrastruktury.cz/en/events/dnvi-2017/#prog
[57] NGI Workshop in Finland – report: https://drive.google.com/drive/folders/0B4r4DdwbHhruUVJXSi11TExfRGM

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- How to ensure network neutrality principles.

What are the three main topics the NGI initiative needs to address?

- Trust, Privacy, Security, reliability
  - Cyber security in the network level
  - Identifying and securing information
- Platforms and their management
  - Platform decentralization
  - Ensure consistency of the IP – platform (avoid fragmentation)
  - Internet as fast and reliable platform for control systems
  - Value creation in the
  - Support human oriented business (multiple consumer markets)
- European approach to AI in Internet
  - Need for regulation
  - Distribution: compute, data, AI
  - AI for network management
- Internet of People

What expectations do we have from the NGI initiative?

- Open research and piloting
  - New type of funding, better for innovation
  - Practice over theory/statements through pilots and experimentations
  - Able to study important research questions, but also providing solutions that enable new business (revenue) and better quality of life
  - Piloting concrete applications for digital single market
- Creation of ecosystems: users, service providers, vendors
  - Capabilities for tech transfer and impact
  - New application areas and applications
  - Leads to standardization (quality, privacy, my data management)
- Good funding possibilities
  - Flexible planning (targets, tasks, deliverables etc.) throughout the activities
  - Engaging start-ups with low bureaucracy application process and supporting “minimum viable product” thinking
  - Guide innovation initiatives across EU regulatory process
  - “Marketing” support across EU

What are the most visionary and high potential solutions/trends envisaged at technology and policy levels?

- User entity behavioural analysis will be the basis to design the high potential solutions
- Self-healing networks (auto scale, auto operate, auto manage)
- Blockchain based services (e.g. own Blockchain, light & rapid version)
- Digital twin for internet of people
- Decentralized solutions for data and AI (inverse cloud)
  - de-centralized computing, but centralized firewall

What will be the most effective funding tools to mobilize them?

- Different types of tools: 1. larger programs with flexibility in changing the detailed content and 2. agile tools
  - Large-scale programs: both national + EU are needed to engage industry; real pilots
  - Supporting risk taking in the programs with opportunity to fail fast
- Funding that is tied to results – needs to be an incentive to exceed
  - Return funding if no success
- Research Kickstarter – new way to select best themes from the business viewpoint

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- Own investments from people who buy the idea of research
- Large dissemination of ideas, the ideas bought by the customers will get funded

3.5 FRANCE

The portfolio and national programmes description for France is based only on the HUB4NGI project online NGI Survey's results submitted by Images&Réseaux/Cap Digital/Ministère de la Recherche.

According to these results the public entities which operate within defining, consulting, monitoring, assessing strategies, plans or policies embracing the NGI vision and goals in France are "Ministère de l'enseignement supérieur et de la Recherche",[58] "Ministère de l'Economie",[59] "French tech",[60] "BPI France",[61] and "Competiveness Clusters (Cap Digital, Images&Réseaux, Secured Communication, Systematic)".[62]

The existing officially announced national strategy or policy which addresses the vision and goals of NGI is "Nouvelle France Industrielle"[63] managed by "Ministère de l'économie" where 34 actions have been identified to develop the new face of the industry in France.

The national initiatives (project programmes, public-private partnerships, etc.) addressing the vision and goals of NGI are "GTN Working groups" - National Technical Group in charge of defining the French position on the European research program, managed by "Ministère de l'enseignement supérieur et de la recherché"; "Plan Investment for the Future (PIA)"[64] – a specific funding program for key activities in line with the Nouvelle France Industrielle plan managed by "Ministère de l'économie"; "Inter Ministry funding plan (FUI)"[65] - funding programs for innovation managed by "Ministère de l'économie" and "National research funding program (ANR)"[66] – a funding program for research managed by "Ministère de l'Enseignement Supérieur et de le Recherche".

The regular national events (conferences, workshops, etc.) where representatives of public entities and business sectors can meet to discuss the existing challenges and the future of the Internet are "NGI Information Day" (1st December 2017) - presentation of the next generation Internet and "Future En Seine"[67] (June) - as the largest free and open meeting on innovation in Europe, "Futur en Seine" is the only event that combines business meetings, pitches, demo show, prospective conferences, kids activities, mind-blowing experiences and parties.

The key academic institutions in France which are involved in the initiatives related to the Internet of the future and have a considerable expertise, particularly in the three technological domains (NGI priorities) are INRIA,[68] University Pierre&Marie Curie,[69] Institut

[58] Website: http://www.enseignementsup-recherche.gouv.fr/
[59] Website: https://www.entreprises.gouv.fr/
[60] Website: http://www.lafrenchtech.com/
[61] Website: http://www.bpifrance.fr/
[62] Website: http://competitivite.gouv.fr/
[63] Website: https://www.economie.gouv.fr/nouvelle-france-industrielle/accueil
[64] Website: http://www.gouvernement.fr/pia3-5236
[65] Website: http://competitivite.gouv.fr/les-financements-des-projets-des-poles/les-appels-a-projets-de-r-d-fui-375.html
[66] Website: http://www.agence-nationale-recherche.fr/en/
[67] Website: http://www.futur-en-seine.paris/en
[68] Website: https://www.inria.fr/en/

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Mines Telecom,[70] and CEA/TECH[71], all of which have expertise in media, IA, IoT, interactive technologies.

The key business entities in France which are involved in the initiatives related to the Internet of the future and have a considerable expertise, particularly in the three technological domains (NGI priorities) are Orange,[72] Nokia,[73] and Thales,[74] all of which have expertise in the areas like ICT, media, big data, IA, IoT and cyber security. Other business entities are also OVH[75] with specialisation in big data, IA, cloud and, last but not least, OT Morpho[76] experienced in cyber security.

3.6 GERMANY

The portfolio and national programmes description for Germany is based only on the NGI Contact Points Workshop performed on 11th May, 2017 in Berlin.

At the NGI Workshop in Germany the presentations included:

- "NGI Initiative - Context, Plans and Actions of the EC" by Nicole Muessigmann (EC)
- "Transformation of Internet Infrastructure - Developments, Requirements, Outlook" by Daniel Kopp (E-CIX Management GmbH)
- "SMEs and EU Programs - Opportunity for All or just for the Big Ones?" by Marc Willecke (Willecke IT Consulting and Development)
- "Permissionless Innovation - Hopes of a Start-up on the Future of the Internet" by Patrick Bunk (CEO ubermetrics).

There was also a so called "World Café" discussion in sub-groups, whose results are described in the workshop report[77] and the general outcomes of the 3 discussion groups were as follows.

The current challenges for the SME group:

- Reliability / Redundancy
- Relevance / signal-to-noise ratio
- Band width / data volume
- Availability in the area
- Data ownership (who owns data)
- Complexity / controllability
- Use of expertise
- Information transparency
- Implementation in productive results.

The main research and action fields for SMEs:

- Action on labour, society and economy
- Target group identification and contact

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[69] Website: http://www.upmc.fr/en/index.html
[70] Website: https://www.imt.fr/en/
[71] Website: http://www.cea-tech.fr/cea-tech/english/Pages/home-uk.aspx
[72] Website: https://www.orange.com/en/home
[73] Website: https://www.nokia.com/fr_int
[74] Website: https://www.thalesgroup.com/en
[75] Website: https://www.ovh.co.uk/
[76] Website: https://www.morpho.com/en
[77] NGI Workshop in Germany – report: http://smartdataforum.de/en/next-generation-internet/

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- Rights / questions regarding data and proxy technologies (bots, delegation)
- AI (opportunities, dangers and risks) for people, things and society
- Detection and avoidance of manipulation
- Data analysis and service
- European widely uniform standards

SMEs expectations of the NGI program:

- Import important actors (private individuals, associations, schools, business (SME, representative))
- Simple application procedures, less documentation, participation support, support advice
- Select partners more based on competence than on MA number or U. size
- Roll of the EU as an information source and multiplier
- Open Innovator (for example, in forums)
- Exchange across EU countries

The current challenges for start-ups:

- Data Lock In
- Infrastructure Lock In
- Vendor Lock In

Main start-ups' thematic focus:

- DevOps technologies: increased productivity of software developers
- Integration of services
- E-Governance through API and open data

The expectations for the program from start-ups group:

- Open source financing / no distortion of competition (no GPL)
- Little bureaucracy / requirements
- "Promotions through contracts" (EU awards contracts to the amount of the grant)

The current challenges for the science and research group:

- Social Challenges (Human-Centric)
  - Current relevance of online media and online communication, not only socially, but also politically and economically (fake news, etc.)
  - Overcoming language barriers (e.g., multilingual digital single market)
- Economic challenges
  - Integration of SMEs
  - New business models and services enable flexibility and comfort
- Technical challenges
  - Future Internet Architecture - how would one conceive the basics technologies of the Internet in 2017?
  - Bandwidth, latency, processing power
  - Transparent encryption through "EU certificate"
  - Flexible infrastructure - EU / EC guidelines for fast Internet access from 20xx

Science and research group's thematic focus:

- Human-machine interaction: gestures, language, interaction, etc.
- Internet of Things
- Security, data locality, data control (key-based)
- Interoperability between systems, services and data
- Scalability of technologies
- Artificial Intelligence and Machine Learning (Deep Learning)
- Digital Humanities, Computer Linguistics, Multilingualism

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- Autonomous driving

Expectations of the program from the scientists and researchers:

- Do not make the mistake of FI-PPP (too strong concentration on large and very large companies)
- Promoting disruptive ideas for SMEs
- More precise terminology (Internet ≠ WWW - what layer in the OSI layer model actually works in NGI?)
- Clear positioning: transfer research? Basic research? Development of basic technologies?
- Focus: standardization and technology development
- National clusters for national issues (?)
- Coaching for SMEs to minimize attendance

3.7 ITALY

The portfolio and national programmes description for Italy is based only on the NGI Contact Points Workshop performed on 11th July 2017 in Pisa.

At the NGI Workshop in Italy the presentations included:

- "The NGI Initiative, Context, Plans and Actions of the European Commission" by Valentina Scialpi (European Commission)
- "The Research Perspective: Trends and Topics that NGI Should Embrace" by Vincenzo Gervasi (University of Pisa)
- "NGI, a Start-up View" by Daniele Mazzei (Zerynth)
- "Next Generation Internet for the Civil Society" by Marco Conti (IIT-CNR)
- "The Next Generation Internet for the PA" by Sauro del Turco (Region of Tuscany).

There was also a so called "World Café" discussion in sub-groups, whose results are described in the workshop's report[78] and the general outcomes of the 3 discussion groups were as follows.

Concerns and problems related to the use of the next generation Internet in the start-ups and SMEs area:

- Standardization is mainly dictated by the big players (i.e. Google, Amazon) and it is hard to compete with them because they dominate the sector
- Scarce level of awareness about the importance of data, particularly their real value. EU citizens are mostly unaware of their rights concerning data protection and ownership and that data can leave EU towards big international corporations located elsewhere
- New regulations that favour fair treatment to everybody (both SMEs and large enterprises) are required because now the market is unfair (dominant position of big players).

Possible remedies:

- Special incentives are needed, i.e. a platform that will bring together SMEs to foster the exchange of ideas, create new products and services, and increase the critical mass of SMEs and help them scale up in a market that is monopolized by big players

[78] NGI Workshop in Italy – report: http://www.next-in.eu/wp-content/uploads/2017/07/NGI_WS_11072017_Report.pdf

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- Public authorities should give incentives like launch of open calls, in order to help European SMEs to scale up their business to compete at the same level of the big international players
- Public authorities should also adopt regulations in order to protect SMEs and citizens
- Specific trainings and awareness campaigns should be envisaged from the very early age so as to give every citizen the tools to face the challenges of the new digital society (i.e. open data, data protection, ownership and exchange).

Stakeholders to be involved into the NGI initiatives:

- SMEs and micro-enterprises that face the above-mentioned problems. In particular, Fintech companies, ICT companies with a strong expertise in semantic web, web 3.0, big data (with an open data approach), blockchain technology.
- Universities and research centres can do research on consequences of the new digital technologies on the socio-economic environment and they can support policy-makers by designing new policies (i.e. standards that should not be decided by big players)

Outcomes of the discussion in the research and university group follow.
The three priorities that the NGI initiative should focus on:

- Trainings in the area of innovation and development of the Internet
- New models of economic support for SMEs and for university and research institutions
- Support for national and European federal experimental platforms (as in the USA or Japan).

What are the expectations with respect to the NGI?

- Access to funding, research and development initiatives that will enable fruitful collaboration with enterprises, in particular innovative SMEs in the territory
- New tools to support young people's careers in the public research domain
- Allow new models of collaboration between companies and research entities that include high-level training and continuing training also in the business environment as one of the key aspects

Among the NGI examples that discussion participants could think of (companies, individuals, initiatives, projects) the Pisan territory was mentioned. This territory has been one of the most active in the development of Internet network also because the University of Pisa is equipped with a completely private fibre optic network that corresponds to 7000 km of single-mode fibre. New data centres are being developed, in addition to those already in operation, in order to maintain the current network services in the various institutions. The tradition of participation in the EU-funded projects in the specific direction of network development spans from aspects related to "social innovation", smart-cities, highly advanced technological aspects both on the subject of photonics and development of the next generation cellular mobile radio network or of other enabling technologies.
The researchers also stated that there was a need for strong involvement of trade associations and control rooms that would not only share best practices, but also ways of participation by a wider audience of researchers and SMEs. In this sense, university associations are particularly important because they could be a key element in the development of new cascade funding methods at the national level.
The role of the European Union should be supporting experimentation that can really give rise to economic growth of the territory and actions of education, research and technology transfer of universities and research institutions up to and in synergy with what is happening globally in this strategic sector.

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The general remarks from the civil society discussion group follow:

- Internet is not yet focussed on people. There is a need of an IoP – Internet of People.
- The future of Internet is not yet designed, for some categories Internet is something not accessible, it is not a reality.
- Internet services are not usable to all, they do not correspond to the users types
- There is a strong need of education and retraining to allow all people being able to use the Internet inclusively
- People have to be aware of their rights: first of all, the right to be disconnected
- There is a need for a general EU policy concerning taxation in relation to the Internet, technology modernisation, etc.
- Training for conscious Internet users is necessary
- Technology is neutral in theory, until it is kept apart from economic interests. Interests should be kept together with citizens
- Internet users must be aware of the tool: there should be an appropriate training everywhere – at home, at school, etc.

This group also had the following remarks about their concerns connected with the future Internet:

- There are worries and dangers in the future evolution, e.g. for what concerns the use of blockchain in different sectors, such as the e-Health. With the blockchain technology there is the risk to lose the “right to be forgotten”. Security of data vs erasability
- The big players will have full control over data and they are pushing and will push the ways technology is changing)
- Concerning technologies, users are told only about the potential and the positive aspects, while there is no attention to inform on those aspects that can impact negatively
- Connectivity is not pervasive. It is brought only in those areas where there is a market. Areas with a low number of inhabitants are yet “isolated”
- Concerning the NGI stakeholders, the risk is that only those with an economic interest will raise their voice in the process, while the weakest in society will not participate in the debate
- Internet is being designed for users and not for human beings
- People should master the technology and not be mastered by it
- There is a big risk of an excessive polarization
- Ungoverned things go in the hands of those with much more power

The Public Authorities in the NGI process should take care not only of the technological aspects but also of the social one and all local authorities should make an important joint effort to intervene on infrastructures, improve the digital culture at all levels, simplify bureaucracy, and define a bureaucracy in line with the easiness of technologies. Policies should control territories so that enterprises behave ethically and should be fair more than equal in order to allow everybody to be to able to use technologies. The Internet is related to society management, therefore it must be a priority in policies.

3.8 POLAND

The portfolio and national programmes description for Poland is based on the NGI Contact Points Workshop performed on 8th June 2017 in Poznan and on the HUB4NGI project online NGI Survey’s results submitted by PSNC and FundingBox.

The title of the NGI Workshop in Poland was ‘Widen the European Space of Life and Work” and the presentations included:

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- "The NGI Initiative, Context, Plans and Actions of the European Commission" by Georgios Tselentis and Nicole Muessigmann (EC)
- "A Start-up's View on NGI: Needs and Expectations" by Michal Majewski, (PublishSoSimply)
- "The Research Perspective: Trends and Topics that NGI Should Embrace" by Krzysztof Walas (Poznan University of Technology)
- "Civil Society Needs and Expectations: What Does NGI Do for the People" by Marcin Borkowski (City Development Department, Poznań City)
- "HUB4NGI" by Bartosz Belter (PSNC).

There was also a so called "World Café" discussion in sub-groups, whose results are described in the workshop's report.[79] Additionally, this workshop is described in detail in Deliverable 3.1 of the HUB4NGI project.

According to the survey results the public entity which operates within defining, consulting, monitoring, assessing strategies, plans or policies embracing the NGI vision and goals in Poland is the National Centre for Research and Development.[80] It is the implementing agency of the Minister of Science and Higher Education. It was appointed in summer 2007 as an entity in charge of tasks to be performed within the area of national science, science and technology and innovation policies. When it was founded, it was the first entity of this type, created as the platform of an effective dialogue between the scientific and business communities. Currently, it is operating under the Act on National Centre for Research and Development dated 30th April 2010 (Journal of Laws from 2010, No. 96 item 616). The science reform adopted in autumn 2010 gave the Centre more freedom to manage its financial assets within the scope of a strategic research programme; in addition, the National Centre for Research and Development extended its activity with new initiatives and possibilities on 1st September 2011. Assigned by the Ministry of Science and Higher Education the function of the Mediation Institution in three operational programmes: Human Capital, Innovative Economy and Infrastructure and Environment, the Centre became one of the greatest innovation centres in Poland. The activity of the Centre is funded by the national treasury and the European Union.
Another public entity is the National Information Processing Institute[81] - (Ośrodek Przetwarzania Informacji – OPI) an interdisciplinary research institute. Its principal aim is to provide access to complex and up-to-date information concerning Polish science. In addition, it conducts our own R&D projects, mainly of an applicable character, which serve as a stimulus for development of science, technology transfer and improvement of the Polish higher education system. OPI pursues research on Polish scientific developments and assess activities of other R&D entities, universities and centres of technology transfer. It focuses on expediency and efficiency of scientific undertakings and ways of their financing. It creates complex IT systems on science and higher education: from technology architecture, through data collection and verification (organisation of processes, Internet search, semantic analysis) to data aggregation and visualisation. OPI recognises the importance of interdisciplinarity in contemporary science. Hence, its projects combine IT studies (artificial intelligence, cognitive science, human-computer interaction), sociology and economy of science (sociology, psychology, statistics), and user-experience design (user-centred design, economics). The core recipient of its work is the Ministry of Science and Higher Education in

[79] NGI Workshop in Poland – report: https://hub4ngi.eu/wp-content/uploads/sites/11/2017/07/report-ngi-workshop-poznan.pdf
[80] Contact details: 47a Nowogrodzka Str. 00-695, Warsaw, Poland office: +48 22 30 07 401 fax: +48 22 20 13 408 Website: http://www.ncbr.gov.pl/en/
[81] Contact details: al. Niepodległości 188 b 00-608 Warsaw Poland phone: +48 22 570 14 00 fax: +48 22 825 33 19 website: https://www.opi.org.pl/en/

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Poland, for which the results of research serve as an instrument for better decision-making. Accordingly, the Information Processing Institute provides analysis for the two other central R&D financing agencies: the National Science Centre and the National Centre for Research and Development, as well as for the Ministry of Regional Development, other governmental bodies, public sector experts and entrepreneurs. OPI creates linkages between public and private entities. As an entity supervised by the Ministry of Science and Higher Education, it is keen on cooperation with entrepreneurs, local government officials and NGO's representatives. Approaching research problems from many perspectives allows OPI to come up with unprecedented solutions, spot complexity and interconnections of processes and occurrences.
Another public entity in Poland is the Ministry of Digital Affairs[82] whose role is to develop infrastructure related to broadband in order to support the creation of web content in Poland and electronic services. It also promotes digital awareness among Polish citizens. The Ministry is responsible for thirteen departments which help achieve the goals of the ministry.

The existing officially announced national strategy or policy which addresses the vision and goals of NGI is "Action plan for responsible development of Poland"[83] managed by the Ministry of Economic Development. It supports development of enterprises, their productivity and foreign expansion, and even development of the entire country experienced by all Poles. The main assumptions of the plan adopted by the government on 16th February 2016 include more investment and higher innovation expenditure, significantly better cooperation between science and business, high-quality GDP growth, changes facilitating the functioning of enterprises and promotion of savings. Out of several institutions whose tasks partially overlapped, a coherent Polish Development Fund will be created.

The regular national event (conferences, workshops, etc.) where representatives of public entities and business sectors can meet to discuss the existing challenges and the future of the internet is "Mobile Trends Conference 2017"[84] - the biggest conference about mobile techniques, technology and marketing in Poland with approximately 1000 attendees every year. The general topic of the conference is very broad and combines extremely important scopes of creating and promoting mobile solutions. It is no secret that the world of marketing, technology and IoT have been going hand in hand in the last years. That is why one can find on the speakers' list many marketing practitioners with a rich experience in creating products strictly connected with tech industry. The topics discussed at the conference range from mobile consumer behaviours and UI/UX aspects to mobile marketing and case studies related to the mobile market in Poland. The "Mobile Trends Conference" lasts 3 days and ends with annual "Mobile Trends Awards" that select the best companies of the mobile industry in the previous year.
Another Polish event is InfoShare 2017.[85], attracting over 5000 participants and thousands of developers, executives, entrepreneurs, start-ups and innovation leaders among them. As a result, the biggest tech conference in Central-Eastern Europe (CEE) is received. InfoShare is a three-day conference that traditionally begins with a Before Party one day before the conference and ends with a Closing Party on the last evening. The organizers seem to take a very good care of the networking side of the conference. The last year agenda was divided into lectures and workshops running simultaneously. Creation of dedicated stages (Inspire, Tech, Start-up) make it easier for participants to choose the appropriate lectures. Moreover, start-up owners can count on the support of mentors and inventors in the Start-up Zone.

[82] Contact details: ul. Królewska 27 00-060 Warszawa website: https://www.gov.pl/
[83] Website: https://www.mr.gov.pl/media/14873/Responsible_Development_Plan.pdf
[84] Website: https://2017.mobiletrends.pl/en
[85] Website: https://infoshare.pl/

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Also the Impact CEE[86] - impact'17 4.0 Economy is the most forward-looking event in CEE, unlocking the future of economy and digitalization.

The key academic institutions in Poland which are involved in the initiatives related to the Internet of the future and have a considerable expertise, particularly in the three technological domains (NGI priorities) are Warsaw University of Technology[87] with expertise in incubation services, distributed ledgers, network technologies, technology transfer; Poznan Supercomputing and Networking Center[88] which boasts the main area of expertise in e-health, network technologies, IoT, artificial intelligence, 5G and Gdansk University of Technology[89] specialised in wireless networking, 5G, 3D visualization, and technology transfer.

The key business entity in Poland, which is involved in the initiatives related to the Internet of the future and has a considerable expertise, particularly in the three technological domains (NGI priorities), is FundingBox[90] with expertise in discovery and identification technologies.

The key "other type" entity (Non-Governmental Organization (NGO), business angel, venture capital fund, influencer, etc.) in Poland which is involved in the initiatives related to the Internet of the future and has a considerable expertise, particularly in the three technological domains (NGI priorities), is the Foundation Digital Poland[91] - an initiative which seeks to provide foundations for the development of Poland as a European hub of digital innovations, fulfil the potential of the national economy, and foster social prosperity. The foundation is run with active support from our members who are high-calibre business executives with high standards and great ambitions.

3.9 SLOVENIA

The portfolio and national programmes description for Slovenia is based only on the HUB4NGI project online NGI Survey's results submitted by the Ministry of Education, Science and Sport.

According to these results, the public entity which operates within defining, consulting, monitoring, assessing strategies, plans or policies embracing the NGI vision and goals in Slovenia is ARNES – the Academic and Research Network of Slovenia.[92] ARNES is a public institute that provides (Internet) network services to research, educational and cultural organizations. It maintains and manages infrastructure linking universities, institutes, research laboratories, museums, schools, databases and digital libraries. It offers users the same services as national academic networks in other countries. ARNES cooperates with these networks in European Commission projects to test, develop and introduce new Internet protocols and services. It also provides services that are not offered by commercial organizations but are essential to the operation of the Internet in Slovenia.

[86] Website: http://impactcee.com/
[87] Website: https://www.pw.edu.pl/
[88] Website: www.psnc.pl
[89] Website: https://pg.edu.pl/
[90] Website: https://fundingbox.com/
[91] Website: http://www.digitalpoland.org/en/
[92] Contact details: ARNES, PO Box 7, 1001 Ljubljana, Slovenia, Tel.: + 386 1 479 88 77 website: http://www.arnes.si

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The existing officially announced national strategy or policy which addresses the vision and goals of NGI is the Development Strategy for the Information Society until 2020.[93] It is an umbrella strategy determining the key strategic development orientations and uniting the mentioned strategies in a uniform strategic development framework. The responsible institution for this strategy is the Ministry of Public Administration.[94]

The national initiative (project programmes, public-private partnerships, etc.) addressing the vision and goals of NGI is Internet research (2015–2018), which stands for integration of the Internet into modern societies, is an extremely important issue in contemporary social science research that is opening new prospects of innovative research methods. The research programme covers both aspects: the Internet as a research object and the Internet as a tool for social science research. The responsible institution for this initiative is the Faculty of Social Sciences, University of Ljubljana.[95]
Another national initiative in Slovenia is "Future Internet Technologies: Concepts, Architectures, Services and Socio-Economic Issues (2015–2018)". The research is focused on the concepts, models, applications and services for the dynamic wireless environments connecting resource-constraint devices and moving objects (e.g. vehicles). These environments are by nature more vulnerable to a number of different security threats that affect not only the performance of the components inside the system, but also the confidentiality, privacy, authenticity, and integrity of the data being processed and transmitted. The responsible institution for this initiative is the Laboratory of Open Systems and Networks, Jozef Stefan Institute.[96]
The next national initiative of such kind is "Communication Network and Services (2015–2018)". The research programme covers communication networks and services, more precisely with wireless communications that in the last decade have penetrated all areas of life and society. The main goal of the programme is to jointly investigate management of radio, network, computation and energy resources, aiming at significant improvement of the spectral and energy efficiency based on more flexible, configurable and dynamic network architecture. The responsible institution for this programme is the Department of Communication Systems, Jozef Stefan Institute.[97]
"The Advanced Methods of Interaction in Telecommunication (2014–2017)" is another initiative in Slovenia. The research work is carried out within two research fields: multimodal interfaces and ensuring the system correctness. In the field of multimodal interfaces research addresses the key issues, which will allow successful implementation of speech technologies for the Slovenian language in modern communication environments. The work in the framework of system correctness assurance will include theoretical, development, and applicative research in the area of system design with the help of formal methods. The Faculty of Electrical Engineering and Computer Science, University of Maribor[98] is responsible for it.
Last, but not least, national initiative is "Knowledge Technologies (2015–2020)". The research follows five main directions: (a) complex data analytics, including scientific and heterogeneous networked data, (b) big data analytics from text, multimedia and other multi-modal data, (c) computational creativity, as a new area of our research, especially in connection with scientific discovery, (d) decision support, including relational modelling and integration with data mining, and (e) language technologies and digital humanities, including

[93] Website: http://www.mju.gov.si/fileadmin/mju.gov.si/pageuploads/DID/Informacijska_druzba/pdf/DSI_2020_3-2016_pic1.pdf
[94] Contact details: Trzaska cesta 21, 1000 Ljubljana, Slovenia, T: + 386 1 478 8330
[95] Website: https://www.fdv.uni-lj.si/en/research/research-centres/department-of-sociology/centre-for-social-informatics
[96] Website: http://www.e5.ijs.si/
[97] Website: http://e6.ijs.si/
[98] Website: https://ietk.feri.um.si/en/#

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machine learning of language structure and development of language resources for Slovenia. The Artificial Intelligence Laboratory, Josef Stefan Institute[99] is managing this initiative.

The regular national events (conferences, workshops, etc.) where representatives of public entities and business sectors can meet to discuss the existing challenges and the future of the internet are "Slovenian IPv6 Summit"[100] - the main Slovenian and regional event intended to provide updates on the progress, achievements and exchange of good practice in the transition to IPv6, and the adoption of the protocol in business environments and organisations and SINOG[101] - "Slovenian Network Operation Group" which is a Slovenian forum of network experts, created in order to actively promote the exchange of ideas, knowledge and good practice among network experts in Slovenia as well as wider.

The key academic institutions in Slovenia which are involved in the initiatives related to the Internet of the future and have a considerable expertise, particularly in the three technological domains (NGI priorities) are the Centre for Social Informatics, Faculty of Social Sciences, University of Ljubljana, whose activities refer to the area of social informatics, a discipline dealing with the role of information and communication technology (ICT) in contemporary society; the Laboratory for Telecommunications together with the Laboratory for multimedia at the Faculty of Electrical Engineering, University of Ljubljana, whose activities refer to telecommunication systems (broadband, IPv6, NGI), future internet (IoT, e-health), and development of multimedia applications on convergent terminals (e-learning, e-inclusion); Laboratory of Open Systems and Networks, Jozef Stefan Institute, whose activities address research and development of next generation networks, telecommunication technologies, components and integrated systems, and information society services and applications also from the point of privacy and trust; the Department of Communication systems, Jozef Stefan Institute, whose core activities comprise research, development and design of next-generation telecommunication networks, technologies and services, wireless communication, embedded and sensor systems and new procedures and algorithms for the parallel and distributed computing and the Artificial Intelligence Laboratory, Josef Stefan Institute, whose area of expertise is research and development in information technologies with emphasis on artificial intelligence and the main research areas are: (a) data analysis with emphasis on text, web and cross-modal data, (b) scalable real-time data analysis, (c) visualization of complex data, (d) semantic technologies, (e) language technologies.

The key business entities in Slovenia which are involved in the initiatives related to the Internet of the future and have a considerable expertise, particularly in the three technological domains (NGI priorities) are NIL[102] with expertise in advanced networking, data centre & cloud, IT security, services, workspace; Advant[103] with the area of expertise like data centres, computer networks, automation of buildings; Agenda[104] which has a considerable expertise in CRM solutions, e-mail/ collaboration, Linux software, services ecosystem, consultancy, business IT consultancy, consultancy on the use of OSS, implementation of the OSS, IT solution management, maintenance and management, cloud infrastructure rental, application hosting, software development, and trainings.

[99] Website: http://kt.ijs.si/
[100] Website: http://go6.si
[101] Website: https://www.sinog.si/
[102] Contact details: NIL Ltd., Tivolska cesta 48, SI - 1000 Ljubljana, T: +386 1 4746 500, F: +386 1 4746 501
[103] Contact details: ADVANT d.o.o., Cesta na Brdo 119A, 1000 Ljubljana, +386 1 470 00 00
[104] Contact details: Agenda d.o.o., Ul. Pohorskega bataljona 49, SI-2000 Maribor, Tel: +386 (0)2 421 61 31

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The key "other type" entities (Non-Governmental Organization (NGO), business angel, venture capital fund, influencer, etc.) in Slovenia which are involved in the initiatives related to the Internet of the future and have a considerable expertise, particularly in the three technological domains (NGI priorities) are "go6 Institute"[105] which is a non-profit organization and public initiative for IPv6 deployment with the core activities like awareness raising, education, consulting and assistance in the implementation of the IPv6 Internet Protocol in Slovenia and beyond, and is also administrative and organizational home for SINOG ("Slovenian Network Operators Group") organizing and hosting SINOG meetings and workshops and SloIGF – "Slovenian Internet Governance Forum" which is an inclusive and long-term multi-stakeholder platform where stakeholders from the private sector, civil society, government, academia and the technical community cooperate on a common initiative for the national Internet governance dialogue and it is part of worldwide initiatives for an open dialogue on Internet Governance (IG), under the umbrella of the United Nations Internet Governance Forum (IGF).

3.10 SWEDEN

The portfolio and national programmes description for Sweden is based only on HUB4NGI project online NGI Survey's results submitted by RISE.

According to these results, the public entities which operate within defining, consulting, monitoring, assessing strategies, plans or policies embracing the NGI vision and goals in Sweden are the Ministry of Enterprise, Energy and Communications[106] which develops policies related to housing and transport, IT and mail policies, regional growth, infrastructure and rural policy; the Swedish Post and Telecom Authority (PTS)[107] which monitors the electronic communications and postal sectors in Sweden; Digitaliseringsrådet (the Digitalisation Council)[108] which contributes to the Swedish ICT policy regarding utilising and promoting the opportunities offered by digitalisation and includes regulation of IT and electronic communications, network and information security, frequency policy and issues concerning broadband access and IT infrastructure, including eGovernment issues; Vetenskapsrådet / Swedish Research Council (VR)[109] - a public agency under the authority of the Ministry of Education and Research which funds strategic research areas, incl. ICT related research; KK-stiftelsen / Knowledge Foundation (KKS)[110] which funds research and competence development at Sweden's new universities and university colleges with the purpose of strengthening Sweden's competitiveness, incl. ICT oriented research and Vinnova[111] - Sweden's government agency for innovation with a mission to contribute to sustainable growth by improving the conditions for innovation by funding innovation projects and research needed to develop new solutions and also make long-term investments in strong research and innovation environments.

[105] Website: http://go6.si, https://www.sinog.si/
[106] Contact details: Registrator, Näringsdepartementet Telefon (växel) 08-405 10 00 Fax 08-411 36 16 e-post till Registrator, Näringsdepartementet; website: http://www.regeringen.se/regeringens-politik/digitaliseringspolitik/
[107] Contact details: Telephone: +46 8 678 55 00 Telefax: +46 8 678 55 05 Postal address: PTS, Box 5398, SE-102 49 Stockholm, Sweden; website: https://www.pts.se/
[108] Contact details: The Digitalisation Council, Telephone: +46 86 78 55 00, Postal Address: The Digitalisation Council, Box 5398, S-102 49 Stockholm, Sweden; website: http://www.digitaliseringsradet.se
[109] Contact details: Vetenskapsrådet; Box 1035; SE-101 38 Stockholm; Reception: +46 (0)8-546 44 000; Fax: +46 (0)8-546 44 180; website: https://vr.se
[110] Contact details: Stiftelsen för kunskaps- och kompetensutveckling (KK-stiftelsen); Birger Jarlsgatan 16; 114 34 Stockholm; website: http://www.kks.se
[111] Contact details: Mäster Samuelsgatan 56; 101 58 Stockholm; 08-473 30 00; website: https://www.vinnova.se

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The existing officially announced national strategy or policy which addresses the vision and goals of NGI is “För ett hållbart digitaliserat Sverige - en digitaliseringsstrategi; Diarienummer: N2017/03643/D”.[112] The government presents a strategy for how digitization will contribute to competitiveness, full employment and economic, social and environmentally sustainable development. The strategy sets the focus on government's digitization policy. The strategy is centred around five sub-goals on digital skills, digital security, digital innovation, digital management and digital infrastructure, explaining how digitization can contribute to positive digital development based on social development. The responsible institution for this strategy is Näringsdepartementet; Ministry of Enterprise, Energy and Communications.

The national initiative (project programmes, public-private partnerships, etc.) addressing the vision and goals of NGI is “Digital infrastruktur och digital säkerhet / Digital infrastructure and digital security”[113] which is funding for projects covering digital infrastructure and digital security across several strategical project programmes, smart cities, life science, next generation traveling and transportation, bio-based economy and connected industries. The scope of ongoing applications regards feasibility studies (up to 500 KSEK per approved project). Vinnova is responsible for this initiative.
Another national initiative is “Smarta system / Smart systems”.[114] It is a national call launched in 2015 for problem- or application-driven research projects that meet the highest international scientific standards. The call aims at the "ICT’s abilities to improve the designs and functionalities of existing kinds of technological systems or to create entirely novel types. A system exhibiting smartness should be expected to analyse and communicate with its environments, respond to changes autonomously, and learn from its experience. It might blend into a human environment with its inner complexity largely hidden from users". The total funding announced was 300 MSEK - 10 projects are receiving funding between 2016–2021. The responsible institution is “Stiftelsen för Strategisk Forskning (SSF) / Swedish Foundation for Strategic Research”.
Smart Mobility and Accessibility[115] is yet another initiative in Sweden and it is managed by MISTRA. It is a programme for projects running 2016–2020 with an expected budget of 50 MSEK over 4 years. The programme concerns mobility services, attitudes, behaviour and the transition from today’s inefficient transport system to a more sustainable system centred on accessibility, in which efficient mobility is part of the solution, and includes research on the role of the Internet and the digital society in development towards greater accessibility and mobility, how disruptive innovations, technologies and services can be directed towards sustainable mobility and accessibility and how new business models and policy instruments can promote more sustainable mobility and accessibility. The programme focuses on mobility services, intermodality, and behaviour and attitudes.
Last, but not least, initiative of this kind is “Digital delaktighet / Digital participation”[116] for which the Internet Fund (Internetfonden) institution is responsible. Internetfonden (the Internet Fund) is managed by Internetstiftelsen which through financing external projects that promote the Internet’s development, supports both business and personal life in Sweden, but not commercial projects. Focus areas encompass digital inclusion/participation, innovation catalysts and open educational resources.

[112] Website: http://www.regeringen.se/informationsmaterial/2017/05/for-ett-hallbart-digitaliserat-sverige---en-digitaliseringsstrategi/
[113] Website: https://www.vinnova.se/e/digital-infrastruktur-och-digital-sakerhet/genomforandestudier-inom-digital-sakerhet-och-tillforlitlighet/
[114] Website: https://strategiska.se/en/about-ssf/
[115] Website: http://www.mistra.org/en/mistra/application-calls/completed-application-calls/smart-mobility-and-accessibility.html
[116] Website: https://www.internetfonden.se

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The regular national events (conferences, workshops, etc.) where representatives of public entities and business sectors can meet to discuss the existing challenges and the future of the Internet are Internetdagarna (Internet Days)[117] - an annual event organized by the Internet Foundation in Sweden, IIS, an independent organization that is responsible for .se, the Internet's Swedish top-level domain, and promotes the positive development of the Internet in Sweden; Webbdagarna (Web Days)[118] – an annual event organised by IDG targeting business developers, innovators, entrepreneurs, marketing, e-businnesses, etc. using digital channels and also Nordic IT Security[119] - summit and exhibition on IT, cyber and information security.

The key academic institutions in Sweden which are involved in the initiatives related to the Internet of the future and have a considerable expertise, particularly in the three technological domains (NGI priorities) are "Kungliga Tekniska Högskolan (KTH) / Royal Institute of Technology"[120] which is a multidisciplinary ICT focus area / strategic research platform; Karlstad University (KAU),[121] whose area of expertise is Computer Science research including networking as well as privacy and security oriented research; the Faculty of Engineering LTH Lund University,[122] which has expertise in research involving communications engineering, networking, security, etc. and Luleå University of Technology (LTU)[123], which acts for enabling ICT - area of excellence within research and innovation as well as the Chalmers University of Technology[124] specialised in ICT area of advance.

The key business entities in Sweden which are involved in the initiatives related to the Internet of the future and have a considerable expertise, particularly in the three technological domains (NGI priorities) are Ericsson AB,[125] which is a Swedish telecom vendor and service provider, R&D encompasses cloud systems, radio, network architectures, machine intelligence, security, etc.; Telia Company AB[126] - a Swedish telecom operator; R&D encompass cloud and IoT solutions; IP-only[127] - a provider of infrastructure, including fibre, Internet, datacentre, server capacity, telephony, etc., and "Finansiell ID-Teknik BID AB",[128] which focuses on Swedish citizen identification and authentication solutions.

The key "other type" of entities (Non-Governmental Organization (NGO), business angel, venture capital fund, influencer, etc.) in Sweden which are involved in the initiatives related to the Internet of the future and have a considerable expertise, particularly in the three technological domains (NGI priorities) are RISE AB (Research Institutes of Sweden)[129] – a

[117] Website: https://internetdagarna.se/english/
[118] Website: https://webbdagarna.se/om-webbdagarna/
[119] Website: https://www.nordicitsecurity.com/about/
[120] Contact details: https://www.kth.se Postal Address: Kungliga Tekniska Högskolan, SE-100 44 STOCKHOLM; Phone: +46 8 790 60 00 Fax: +46 8 790 65 00
[121] Contact details: https://www.kau.se Phone: +46 (0)54-700 10 00; Fax: +46 (0)54-700 14 60; VISITING ADDRESS: Karlstads universitet Universitetsgatan 2; POSTAL ADDRESS: Karlstads universitet; Faculties/departments; 651 88 Karlstad
[122] Contact details: http://www.lth.se Postal address: Department of Electrical and Information Technology, Lund University, Box 118, SE-221 00 Lund, SWEDEN; Phone: +46 46 222 00 00 (operator)
[123] Contact details: https://www.ltu.se Phone: +46 (0) 920-491000; Luleå tekniska universitet, 97187 Luleå
[124] Contact details: http://www.chalmers.se/sv/Sidor/default.aspx Phone (switchboard) +46 31 772 1000; Chalmers University of Technology; SE-412 96 Gothenburg; Sweden
[125] Contact details: https://www.ericsson.com/se/en Torshamnsgatan 21, Stockholm, Sweden, +46 10 719 00 00
[126] Contact details: http://www.teliacompany.com/sv Telia Company AB; 169 94 Solna, Sweden; Stjärntorget 1, Solna, Sweden; Tel: +46 8 504 550 00
[127] Contact details: http://www.ip-only.se IP-Only AB; Postadress: 753 81 UPPSALA; Besöksadress: Bäverns gränd 17, Uppsala; Tel: +46 (0)18-843 10 00; Fax: 018-843 13 99
[128] Contact details: https://www.bankid.com/en/om-oss Finansiell ID-Teknik BID AB; Södra Kungstornet, Kungsgatan 33, 111 56 Stockholm; Tel. 08 411 81 50
[129] Contact details: https://www.ri.se ; RISE Research Institutes of Sweden AB; Besöksadress: Lindholmspiren 7 A, 417 56 Göteborg; Postadress: Box 857, 501 15 Borås; Telefon: 010-516 50 00;

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multidisciplinary ICT division covering relevant topics such as: the Internet and telecom, IoT, security, AI and big data; EIT Digital[130] - an ICT knowledge and innovation community with focus on digital innovation and education; invests in strategic areas to accelerate the market uptake of research-based digital technologies focusing on Europe's strategic, societal challenges; Swedsoft[131] - an independent, non-profit association that works to increase Swedish software's competitiveness, focusing on innovation and software-intensive systems as part of digitization development.

Another such type of entity is "Wallenberg Autonomous Systems and Software Program (WASP)"[132] - Sweden's largest ever individual research program which provides a platform for academic research and education, fostering interaction with Sweden's leading technology companies. This program addresses research on autonomous systems acting in collaboration with humans, adapting to their environment through sensors, information and knowledge, and forming intelligent systems-of-systems. Software is the main enabler in autonomous systems, and is an integrated research theme of the program. WASP's key value is research excellence in autonomous systems and software for the benefit of Swedish industry.

Also "Internetstiftelsen / The Internet Foundation"[133] in Sweden (IIS) is an independent public-service organization that acts to ensure positive development of the Internet.

[130] Contact details: https://www.eitdigital.eu/about-us/locations/stockholm-node/ ; EIT Digital Stockholm Node; Isafjordsgatan 26, Elevator C, level 3; Kista (Stockholm); Phone: +46 8790 4231
[131] Contact details: http://swedsoft.se Postadress: Swedsoft, Box 5510, 114 85 Stockholm, Sweden
[132] Contact details: http://wasp-sweden.org ; 581 83 LINKÖPING; Tele: 013-28 10 00; Fax: 013-14 94 03; Info at WASP-Sweden.se
[133] Contact details: https://www.iis.se ; Tel: 08 452 35 00; Fax: 08 452 35 02

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4 FUTURE INTERNET FORUM ACTIVITY

"The H2020 Future Internet Forum (FIF) is a registered group which aims to exchange views on H2020 topics relating to "Future Networks" (5G, Cloud, Next-Generation Internet and IoT). The members of this group have been appointed by the respective National Authorities of the Member States and Associated Countries. […]
It consists of officials from the competent ministries and/or experts from public or private institutions mandated specifically to represent national Future Internet (FI) initiatives. The forum meets twice a year (in the context of the Net Futures Conference or other events like the ICT Conference) and is the place where Member States and Associated Countries can:

- share knowledge, experience and best practices
- identify key national actors, activities and institutions
- devise common approaches and complementarities between the various frameworks.

The group is expected, by way of considered opinions, recommendations or reports, to provide information on relevant objectives and scientific, technological and innovation programmes, activities and priorities, and to share good practices and roadmaps."[134]

4.1 3RD MEETING OF THE H2020 FUTURE INTERNET FORUM OF MEMBER STATES AND ASSOCIATED COUNTRIES

This FIF meeting took place on 27th April 2017, in Brussels (Belgium) and was entirely dedicated to the Next Generation Internet (NGI) initiative and the related activities. After four sessions with various presentations, including the HUB4NGI presentation about the FIF/NGI Contact Points support and the NGI Map, there were discussions in three parallel brainstorming groups and their main results are shortly presented below. A detailed description of the meeting can be found in the meeting minutes.[135]

The key outcomes of Group 1 (NGI Contact Points in member states):

- Profile: seniority in terms of experience/management skills (meetings and discussions) interest, energy, time, knowledgeable in the field, being NGI an important part of his agenda, acknowledged within the country and with access to academy, industry, public authorities and all stakeholders
- Not just one person (maybe deputies), support from an existing organization (resources/facilities). Options: Research centres, associations, academia, agencies, technology platform, etc.
- Could be on a voluntary basis, free time. What would be the interest/motivation/added-value? Informal link to H2020 FIF as an expert. But also enlargement of contacts, CV
- Formal nomination? Not required. A document from the Commission/ToR explaining objectives of this NCP would help. Deadline. ASAP. Document in 1 week+ 3 weeks to reply (End of May). Flexible approach
- A midterm commitment would be wishful, e.g. 2 years

The key outcomes of Group 2 (Mapping of stakeholders):

- What will be the interest of the NGI community regarding the mapping exercise?

[134] About FIF: https://ec.europa.eu/digital-single-market/en/future-internet-forum
[135] 3RD FIF meeting minutes: https://drive.google.com/drive/folders/0B1Rgl0KU7ZFVcVktd1ItbWN0Mzg

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    - Promoting themselves and/or
    - Networking
- The interactive map is a good tool for displaying information, but the functionality allowing promotion and networking seems similar to a social network
- Promotion and networking: will the NGI member (individual, entity...) include information about the expertise regarding NGI topics, contact details, projects (in execution or already concluded) and interest in tackling new projects (topics and calls to be addressed). Information about projects can be potentially taken from open databases using data extraction tools already available. France FIF member mentioned such a tool called Scan-R. Would a ranking/reputational model also be shown whereas other NGI community members are allowed to recommend a particular member (note: only positive feedback should be allowed)
- The national funding agencies should be considered a special category of NGI community members. Since they will provide information about funding opportunities related to NGI. Both private and public funding agencies should be included. FIF members are expected to contribute to these profiles.

The key outcomes of Group 3 (NGI workshops):

- Communities already exist and are organized – imposing an external structure may not be good; instead, help existing organisations in working together
- Obstacles on start-ups to join these initiatives – they like to keep their ideas to themselves for competitive advantage. Focussing on standardisation challenges could be a means to bring them together
- How can this engagement be sustainable? – still need to find a solution
- National workshops – MS/AC are different (size, structure, communities) – regional events may be a possibility
- Based on the experience of some MS/AC, which have already initiatives and workshops on NGI themes, the NGI theme broken over a number of relevant topics is generally good for inspiring fruitful free-style discussions and building of national agendas over time
- Good to have the EC point of view and from different countries in these national and regional workshops.

4.2 4TH MEETING OF THE H2020 FUTURE INTERNET FORUM OF MEMBER STATES AND ASSOCIATED COUNTRIES

This FIF meeting took place on 28th June 2017, in Brussels (Belgium) and was entirely dedicated to the Next Generation Internet (NGI) initiative and the related activities. After a few presentations, including the HUB4NGI presentation about the FIF/NGI Contact Points support and the NGI Map, there were discussions in 3 parallel brainstorming groups and their main results are shortly presented below. A detailed description of the meeting can be found in the meeting minutes.[136]

The key outcomes of the Group 1 (NGI Contact Points):

- Timo Lanhalampi (Martel, HUB4NGI) is the contact point and the support for all NGI contact points
- Who is/will be nominated as a NGI contact point – person/organisation etc. -> a need to share the list of the current NGI contact points

[136] 4th FIF meeting minutes: https://drive.google.com/drive/folders/0B4r4DdwbHhrucE9WUEF1S25yOTQ

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- Provide 3 slides – ToR for the NGI contact points (including their tasks, the resources, clarify the reimbursement and add a slide with the NGI vision)
- Deliver a roadmap – project plan for NGI contact points (merge events – try to minimize the resources – e.g. 13th September 2017)
- Deliver one presentation with standard slides the NGI contact points can use
- Implement a platform to exchange documents/outcomes/experiences (HUB4NGI platform)
- Implement a Q&A tool – live chat
- Elaborate how the study and especially the three projects of ICT-41 will collaborate with the NGI contact points
- Inform/Involve the NCP and the NGI contact points in further national NGI workshops.

The key outcomes of the Group 2 (NGI interactive map):

- Provide an overview on main features and functionalities and on how organizations can be classified in the map
- The map has to be recommended to the relevant NGI stakeholders who then have to fill in the information. The data inserted must be validated by HUB4NGI
- The map should be shown and publicised as the main communication tool of the NGI initiative. The NCP and the NGI contact points have to spread the existence and the benefits with their community. This should be also a key message in the workshops organised in the MS
- An extra effort has to be made by the NCP and the NGI contact points to ensure reaching the relevant stakeholder to be registered in the map
- Once a stakeholder enters the map he gain visibility and become part of the NGI initiative
- The map should constitute a long term landscape for the initiative, where actors can interact and communicate (see also group 1)
- A particular relation should be established between the map and one of the three projects of ICT-41 acting as the press-office of the initiative.

The key outcomes of the Group 3 (Stakeholder engagement/ organising workshops/ etc.):

- To reach far it is crucial to involve all innovation stakeholders, including researchers, civil society players, chambers of commerce, municipalities, accelerators, associations, etc.
- Press and media can help in raising awareness
- The approach has to combine top-down (presence of the EC) and bottom-up presence (to engage and gather consensus from the participants and local players)
- The presence of prominent speakers can help raising interest and attention
- A holistic view is necessary: Combine technological research with social/ societal issues
- There is a need to have a standard format of the workshops with topics outlined, while keeping certain flexibility
- For start-up and SMEs it is important to know that funding are available; however, at this first stage the definition of topics is more relevant
- It is important to relate to R&D&I agendas and priorities at MS/AC level.

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5 SUMMARY ANALYSIS

This chapter provides a comprehensive analysis of the evidence of the data collection on the existing NGI initiatives, research topics, actors and resources across Europe presented in Chapter 3 of the current deliverable.

In particular, this section is devoted to the examination of the results of the online survey as well as of the outcomes of the NGI Contact Points Workshops, with the aim of identifying potential commonalities in the research topics, expected outcomes, and research and policy priorities.

5.1 ANALYSIS OF THE SURVEY RESULTS

As anticipated in Chapter 2, the online survey that was active from September 2017 to November 2017 and sent to 33 countries, gathered 7 responses from 7 EU Member States: Austria, Belgium, Czech Republic, France, Poland, Slovenia and Sweden. The questionnaire covered 7 different areas to investigate about:

- The main actors involved in the NGI-related policies and initiatives
- The existence of official national strategies or policies boosting the implementation of the NGI goals
- The presence of NGI-related initiatives like funding programmes and PPPs
- The regular organization of NGI-related events
- The key academic organizations doing research in the NGI-related domains
- The key business organizations on the market
- Any other organizations who play a relevant role in the NGI and future internet domains.

This section is dedicated to the presentation and commentary of the aggregated results.

The first part of the analysis looks at the identification of the **main national players** who are responsible for launching and guiding policy actions around the Next Generation Internet initiative in the seven Member States taken into account. As shown in the Figure below, except for Slovenia, the implementation and guidance of NGI-related policies is a collaborative effort of different actors, like ministries and national government agencies. Also, apart from Belgium where the key plans and strategies are implemented mainly at the regional level (for example, in the Brussels region), the data collected shows that these policies are mainly coordinated at the national level.

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FIGURE 2. THE RELEVANT PUBLIC ENTITIES IN THE SURVEY RESULTS

Then, we investigated whether these countries have an **official national strategy** in place that aim at promoting the development and uptake of NGI technologies and ecosystem. Out of the 7 Member States surveyed, 3 of them have a specific official plan launched by the national responsible authorities, while Belgium has set up multiple strategies mainly at the local level.

FIGURE 3. THE OFFICIAL STRATEGIES OR POLICIES IN THE SURVEY RESULTS

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The third part of the survey delved into the **existing initiatives** set up by the individual countries, like research programs. In all Member States, with the exception of Poland, one or more initiatives are ongoing.

FIGURE 4. THE OFFICIAL NATIONAL INITIATIVES IN THE SURVEY RESULTS

The survey also explored the most **relevant NGI-related events** organized in the different countries. Interestingly, France has a specific event dedicated to the Next Generation Internet area.

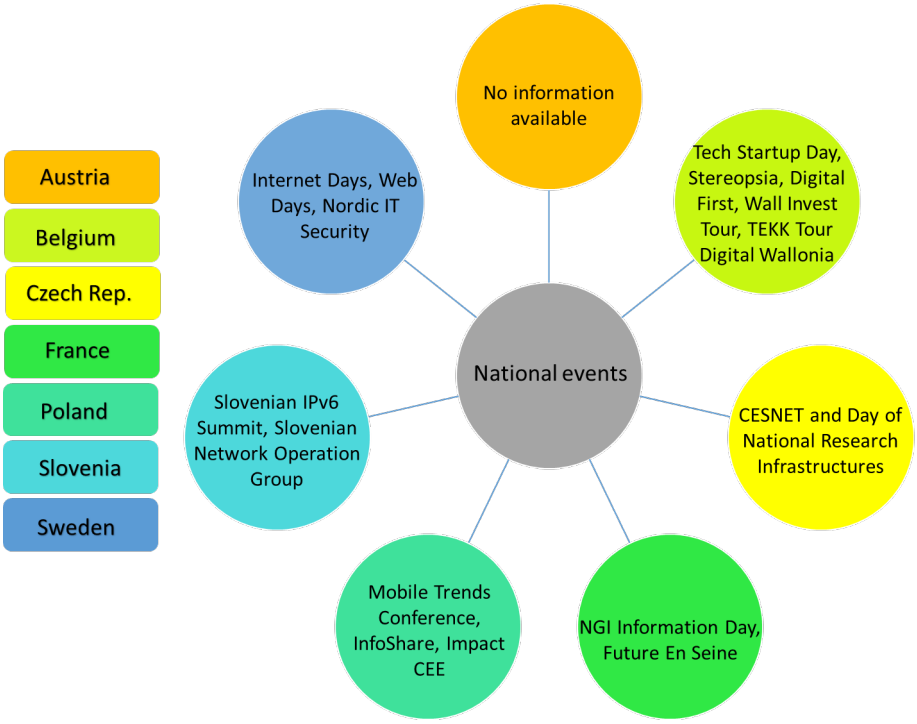

FIGURE 5. THE NATIONAL EVENTS IN THE SURVEY RESULTS

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Additionally, the survey examined which are the key **national research entities and academic institutions** with relevant capabilities and expertise in the NGI top domains. The information collected shows that all research topics relevant to the NGI area are covered by the identified organizations: privacy and trust, security and data management, IoT and Artificial Intelligence.

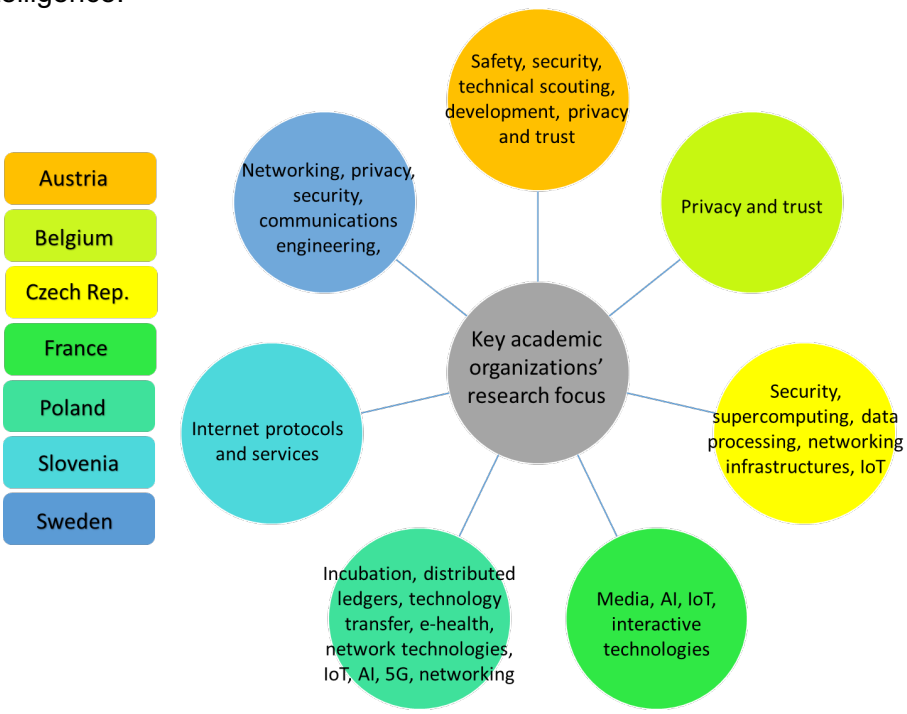

FIGURE 6. THE KEY ACADEMIC ORGANISATIONS' RESEARCH FOCUS

Finally, the survey gathered data about the main **companies** operating in these countries, in the NGI-related domains. The data collected helps identifying the frequent typologies of these players: telecom providers, large manufacturers, ICT vendors and specialized technology providers.

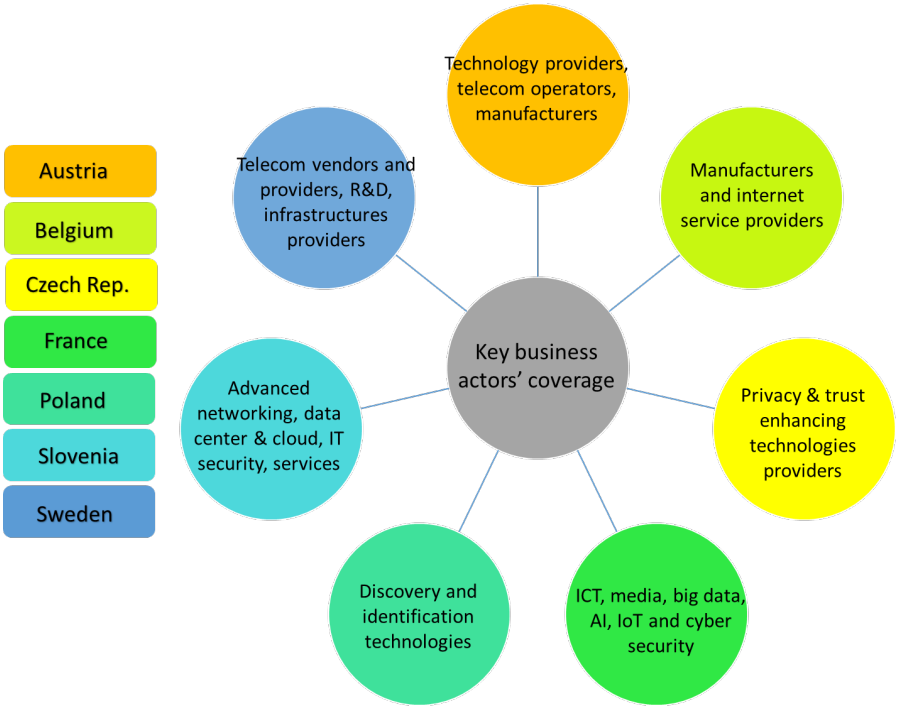

FIGURE 7. THE KEY BUSINESS ACTORS' COVERAGE

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5.2 ANALYSIS OF THE NGI WORKSHOP RESULTS

This section provides an overview of the results of the 5 NGI Contact Points Workshops held in 5 Member States: Austria, Czech Republic, Finland, Germany and Italy, with the aim to underline the common outcomes in terms of NGI-related priorities to be addressed by policy makers and key stakeholders.[137]

As shown in Figure 8 below, the topics discussed more frequently can be grouped under 6 umbrella categories:

- **Data** is one of the main concerns and opportunities of the Internet nowadays: data gathering, data ownership, lack of transparency about data management processes, lack of awareness about the value of data and fragmentation of data sources and information asymmetries. Also, the debates stressed that the role of citizens and customers as owner of data is not clear. These topics also represent the research and action fields identified as priority
- **Privacy and trust**: in terms of the main topics to be addressed under this domain, the stakeholders identified the need for reliable and trusted identity, the accountability, and the need to improve monitoring processes. The proliferation of smart devices and data sources has been identified as the new vulnerability
- **Internet of People**: the common priorities include the need for a user/human-centric approach and the urgency for people/society to master the technology
- **Societal needs**: the NGI community call for concrete actions to concentrate on the collective well-being and societal implications, as well as a more user-oriented regulation of new technologies. As a possible solution to these challenges, training initiatives and awareness-raising campaigns could be designed to provide the citizens with the tools to face the new digital society
- **Standards**: in this respect, the NGI community pointed out that the current and future initiatives in this domain should take into account how to improve the use of open standards, widely uniformed across Europe not only designed by the dominant ICT players – as it is perceived currently
- **SMEs and start-ups**: especially the German and Italian groups focused on the current challenges and possible solutions to increase the participation of smaller players (SMEs, start-ups and young entrepreneurs) in the research and development activities in the NGI domain, and to help scaling their business. To achieve this goal, some potential solutions were identified: the simplification of application procedure and requirements as well as the reduction of bureaucratic burdens; the introduction of special incentives and new supporting regulation and policies.

[137] There were 12 workshops organised. Reports are not yet available from the seven other recently organised workshops.

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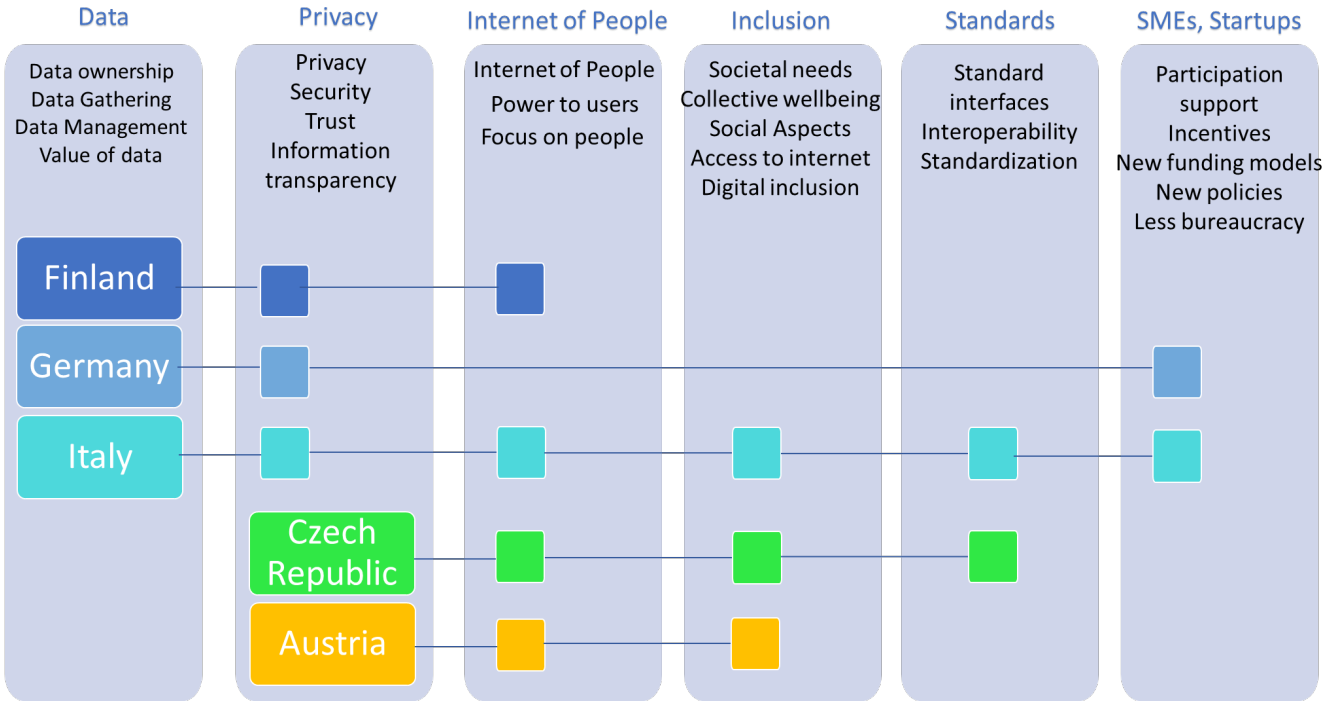

FIGURE 8. THE MOST FREQUENTLY DISCUSSED TOPICS GROUPED UNDER 6 UMBRELLA CATEGORIES

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6 CONCLUSIONS

The main goal of this document is to provide a status and coverage report of the initiatives, research topics, technologies, actors and resources available to the NGI community. To do this, the HUB4NGI project has designed a data collection methodology aiming at gathering information from European countries through their local contact points working in the area of NGI, using two main tools:

- An online questionnaire to collect information and data about NGI-related national initiatives from European countries, addressing the NGI Contact Points (NGI CPs) as well as to the National Contact Points (NCPs) in Member States/Associated Countries (MS/AC). The survey gathered information from 7 countries (Austria, Belgium, Czech Republic, France, Poland, Slovenia, and Sweden) on 7 main topics (including key policy/research/business actors, official policies, regular events)
- Direct communication channels (e.g. emails, physical meetings or teleconferences), including the organization of NGI Workshops.

Overall, this document provides information on 10 European countries. The detailed data collection methodology is presented in Chapter 2, while Chapter 3 reports the list of information collected by country, presenting an overview of the current portfolio of NGI national programs.

Chapter 4 is dedicated to the presentation of the key outcomes of two Future Internet Forum meetings held in April and June 2017 in Brussels, where the appointed working group met to provide information on relevant objectives and scientific, technological and innovation programmes, activities and priorities, and to share good practices and roadmaps.

Finally, Chapter 5 provides a comprehensive analysis of the data collection results with the ultimate attempt to identify potential common topics, their relevance and the key NGI-related research and development priorities across Europe.

Although the process of collecting survey results has been finished, it may be possible to continue to collect data in 2018 to provide an updated view of the analysis, e.g. in a white paper, potentially with more countries involved.

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