



Deliverable 4.8

“Final summary of activities about the EU-US ICT community enhancement including evaluation of results and lessons learnt”

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Abstract:

One of PICASSO's goals is to set up and support communities on the three technological areas (IoT/CPS, 5G Networks, Big Data) between actors of different background (i.e. industry, policy making) coming both from the EU and from the US. The current report provides a summary of all major activities which took place during the second period of the project (Task 4.4), towards the interaction of all EGs with external stakeholders.

It is also critical to mention that the activity of community enhancement is completely interlinked with a number of other project activities, such the opportunity report, the webinars, dissemination activities etc., as all of them can be considered as the means for engaging external organisations and thus formulating an unofficial network and community of actors around the three technological pillars.

Keywords:

Community Engagement, Networking, International Collaboration

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The PICASSO Project

The aim of the 30-months PICASSO project is (1) to reinforce EU-US collaboration in ICT research and innovation focusing on the pre-competitive research in key enabling technologies related to societal challenges - 5G Networks, Big Data, Internet of Things and Cyber Physical Systems, and (2) to support the EU-US ICT policy dialogue by contributions related to e.g. privacy, security, internet governance, interoperability, ethics.

PICASSO is oriented to industrial needs, provides a forum for ICT communities and involves 24 EU and US prominent specialists in the three technology-oriented ICT Expert Groups and an ICT Policy Expert Group, working closely together to identify policy gaps in the technology domains and to take measures to stimulate the policy dialogue in these areas. The synergy between experts in ICT policies and in ICT technologies is a unique feature of PICASSO.

A number of analyses are being accomplished, as well as related publications, that for a major part are made public and contribute to the project's outreach. Dedicated communication and dissemination material are prepared that support the operational work and widespread dissemination through different channels (website, social media, publications ...). The outreach campaign includes 30+ events, success stories, factsheets, info sessions and webinars.

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1. Introduction and Overview

1.1. Purpose of the document

The purpose of this current document is to provide a summary report on the activities implemented from M20 to the end of the project, for all three PICASSO ICT Expert Groups and the Policy Expert Group (as a supportive Group). Moreover, it includes additional information on the lessons learnt from all Expert Groups throughout the implementation of activities over the total lifespan of Task 4.4 which ran from M10 until M30 of the project. The current documents can be used in conjunction with the Communication and Dissemination Strategy and other activities of the project.

Adding to the above, Task 4.4 and therefore all activities implemented under this task, specifically focused, but not limited, on the following actions:

1. Interaction and engagement with external (to the PICASSO EG Groups) experts
2. Interaction with the European Commission and US Agencies
3. Interaction with the public
 - a. Implementation of dedicated webinars
 - b. Engagement with the public audience during dissemination events
4. Interactions with other EU and US initiatives
5. Implementation of dedicated thematic workshops

Moreover, the current document includes information about next steps and possible sustainability paths that each Expert Group will consider and implement in order to ensure that all Expert Groups will remain active after the end of the project. Last but not least, the outcome of this task, as originally described in the DoA, is the involvement/contribution of the specialised target audiences to expert group activities and contribution to the enhancement of ICT communities related to the topics of the Expert Groups.

2. Expert Group Activities and Next Steps (from M20 to M29)

2.1.1. Big Data Expert Group

2.1.1.1. Big Data Expert Group Activities so far and engagement of external stakeholders

The Big Data Expert Group has implemented a number of activities to which external stakeholders have been engaged, either through direct or indirect participation as Expert Group members and by providing feedback and input to requested deliverables, such as the opportunity report.

A) Establish a “EU-US Big Data Open Community of Experts”

The PICASSO Big Data Expert Group, with the support of BDVA and the US Big Data Hubs, has managed to set up and operate a “EU-US Big Data Open Community of Experts”. This community includes over **50 individuals** representing a number of EU, US and International organisations and associations. The community met for the first time during the **Trans-Atlantic Workshop on Public Private Partnerships for Big Data**, which took place in Versailles, France, on November 20th, 2017 in conjunction with the European Big Data Value Forum 2017. The community was mobilised in and took part in a number of activities organised and coordinated by the PICASSO Big Data Expert Group, such as the validation of the opportunity report and the elaboration of strategic initiatives proposals. The current community can be considered as the wider and larger Big Data community, between EU and US experts, initiated as an independent initiative. More information regarding the workshop can be found in subsection B, below. The names of network members can be shared with the EC upon request.

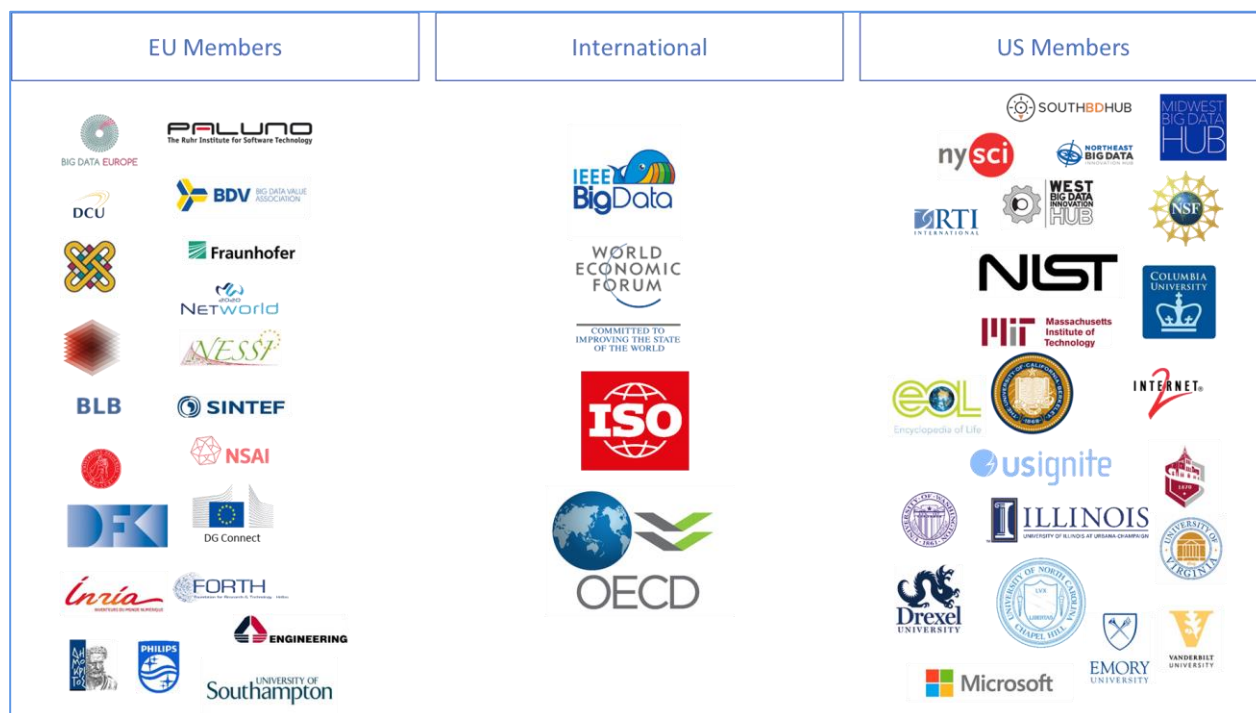


Figure 1: EU-US Big Data Open Community of Experts

B) Trans-Atlantic Workshop on Public Private Partnerships for Big Data

The NSF Big Data Innovation Hubs, in collaboration with the PICASSO Big Data Expert Group, BDVA and INRIA, held an invitation-only workshop on November 20th, 2017 in conjunction with the European Big Data Value Forum 2017. The workshop brought together academic and industry actors from the US and the EU to share ongoing Big Data research

and innovation efforts, who discussed effective models for bridging data science workforce needs with the academic discipline of data science, and determined how to best support academia-industry collaborative research programs.



Figure 2: Participants at the Trans-Atlantic Workshop on Public Private Partnerships for Big Data

More specific, the goals of the workshop were to **bring together academic and industry actors** from the **United States (US)** and the **European Union (EU)** to:

- **Discuss effective models and practices for supporting academia-industry collaborative research programs in Big Data/data science** research and innovation, with particular focus on public-private partnerships (PPP) in the application domains of smart cities, transportation, health, environment, and food-energy-water;
- **Provide presentations to exchange ongoing Big Data research and innovation efforts in the US and EU**, encourage peer-to-peer discussions between NSF and EU funded project leads, and identify opportunities for direct bilateral research and innovation collaborations; and
- **Discuss effective models and practices for bridging data science workforce** needs with the developing academic discipline of data science.

The workshop, was **co-funded by NSF (50k)** after a joint application of all NSF US Big Data Hubs, decided during our 2nd PICASSO EG Meeting in Minneapolis, while **40 participants in total** (23 from the US and 17 from the EU) attended. PICASSO and BDVA supported the activity by providing input to the proposal, provide speakers, shaping the agenda and providing dissemination channels to NSF and US Big Data Hubs.



Figure 3: Infographic developed during the Participants at the Trans-Atlantic Workshop on Public Private Partnerships for Big Data

C) Validation of the Big Data Opportunity Report and Strategic Initiatives Proposal

The second draft version of the Opportunity report (WP2) regarding Big Data has been shared with Expert Group members and other external experts (over 11 individuals in total, representing 16 different organizations - from EU or US) in order to collect feedback and validate the content of this report. These individuals were representing the following organisations: Big Data Value Association (BDVA), Big Data Europe, NESSI ETP, IEEE Big Data Initiative, South Big Data Regional Innovation Hub, Midwest Big Data Innovation Hub, West Big Data Innovation Hub, NSF, NIST, and MIT. The opportunity report has been updated with content derived from the Trans-Atlantic Workshop on Public Private Partnerships for Big Data regarding the areas and topics of collaboration.

Furthermore, the “EU-US Big Data Open Community of Experts” has provided significant input to the PICASSO Big Data Expert Group for the identification and development of the two strategic initiatives to be included in **D3.2 Strategic initiatives proposals and recommendations**. Both initiatives were the major outcomes of the Trans-Atlantic Workshop on Public Private Partnerships for Big Data were collaboration initiatives and ways to move forward have been identified by all participants, during dedicated breakout sessions. It is important to say that **NSF representatives** participated in the workshop and provided significant input to the findings of the workshop which were infused directly in D3.2.

D) Interaction with the Commission

As already reported in other deliverables, the PICASSO Big Data Expert Group has managed to secure and arrange a physical meeting between PICASSO, BDVA, US Big Data Hubs, NSF and representatives of the Big Data Unit (DG Connect), at 22/11/2017 in Versailles, France. The main them of discussion was to identify potential opportunities for collaboration between EC and NSF funded initiatives and organizations on Big Data related issues.

E) Interaction through dedicated webinars

The South Big Data Hub with active assistance and participation of the PICASSO Big Data Expert Group, have organised and performed **two webinars on “Security, Networks and Social Computing”**, by establishing an external to the PICASSO working group under the name “Security, Networks and Social Computing Working Group”. The scope of this working group is to create a EU-US collaborative platform bringing data scientists, social scientists, cognitive scientists, psychologists, security experts, among others to share, exchange, learn, and develop new concepts, ideas, and principles on manipulation of perceptions through modern communication platforms. Outcomes of the working group will include a repository of resources, policy briefs laying out the research agenda, and viable paths to advance our security apparatus to spark innovation among researchers.

Moreover, the PICASSO Big Data Expert Group has organized a webinar on “**EU-US Collaboration on Big Data Funding Opportunities in Horizon 2020**”, on the **11th of May 2018 (02.30 p.m. UTC/04.30 p.m. CEST/10.30 a.m. EST)**. The interactive webinar aimed at exploring how EU-US collaboration on Big Data funding opportunities could be expressed in the Horizon 2020 work programme 2018-2020, as well as for paving the way for a possible collaboration in the upcoming FP9, taking into account the EU-US innovation ecosystems and the target technical objectives defined by the European Public Private Partnership “Big Data Value” (BDVA). Various material from the webinar can be found at: <http://www.picasso-project.eu/projectevents/webinars/eu-us-collaboration-on-big-data-funding-opportunities-in-horizon-2020/>

F) Engagement with the public audience during the “2nd Annual Trans-Atlantic Symposium on ICT Technology and Policy” symposium

As already described in other deliverables, PICASSO consortium has organised the “2nd Annual Transatlantic Symposium on ICT and Policy”, June 18-19, 2018, in Washington, DC as a follow up to the “Trans-Atlantic Symposium on ICT Technology and Policy” symposium in Minneapolis, to which the Big Data Expert Group contributed with two sessions, during which an active engagement with the public audience took place. Guest speakers and presenters, who are all members of the Big Data Expert Group (permanent or external), had fruitful discussions with the general public through their presentation sessions which were dedicated on dissemination of the Expert Group’s views. The Expert Group had the opportunity not only to present and expose its views and suggestions to a wide audience but also to collect valuable feedback to be taken into account during future activities.

2.1.1.2. Next Steps & Sustainability of Activities

Following the second phase of engagement of external stakeholders, we foresee to expand and engage additional individuals and organisations into our activities and finally setup a formal and official association/network of EU and US Big Data stakeholders.

- 1. EU-US Big Data Open Community of Experts:** this community, originally initiated by the PICASSO project, will remain active after the project ends. The role of the community operator has been taken over by the South Big Data Hub, which orchestrates frequent exchanges with all community members and collaborates closely with senior members of BDVA in order to define a sustainable collaboration formula for this network.
- 2. 2nd Trans-Atlantic Workshop on Public Private Partnerships for Big Data:** a follow-up workshop is foreseen to take place in parallel with the European Big Data Value Forum 2018, to be held in Vienna, Austria, from Monday, 12 November 2018 to Wednesday, 14 November 2018.
- 3. Webinars:** a number of webinars have been foreseen to take place around the topics agreed and discussed in the Trans-Atlantic Workshop on Public Private Partnerships for Big Data, which will target research managers, experienced researchers in universities, government and ICT industry, both from the EU and US in order to disseminate opportunities about possible joint projects supported either by the EU or the US side.

2.1.2. IoT/CPS Expert Group

2.1.2.1. IoT/CPS Expert Group Activities and Engagement of External Stakeholders

Throughout the project, the IoT/CPS Expert Group has conducted major dissemination and community enhancement actions, reaching a large audience from both sides of the Atlantic that consists of senior industrial experts from a variety of domains, R&I intermediaries such as AIOTI, ARTEMIS-IA, the industrial Internet Consortium (IIC), FIWARE, and others, international collaboration, research, and innovation initiatives and projects, relevant public-private partnerships, policy stakeholders, and leading EU and US researchers in CPS and the IoT. These actions include:

- Two IoT/CPS Expert Group meetings were organized (in addition to numerous remote interactions). The first EG meeting was organized and held in Washington D.C. on May 20, 2016, in conjunction with meetings of the other

EGs and a public workshop (see deliverable D2.1). In addition to EG members, the meeting was attended by seven external experts, mostly from NIST. The second EG meeting was organized and held on June 20, 2017, in Minneapolis, alongside the public PICASSO Trans-Atlantic Symposium on ICT Technology and Policy (see deliverable D2.4).

The third Expert Group meeting was held in May 2018 in the form of an interactive webinar “Challenges and Opportunities in Autonomous Cyber-physical Systems” due to funding limitations that made another face-to-face meeting infeasible (see deliverable D2.5). This webinar complements the first IoT/CPS interactive webinar on the opportunity report that was held in early 2017 and was focused on the topic of autonomy that was identified as the major EU-US challenge in the second half of PICASSO.

All meetings led to fruitful discussions of numerous important aspects that helped both sides to understand in more detail the initiatives, the players, and the focus of the other side. The results were used as the basis for follow-up activities, in particular for the development and revision of the IoT/CPS opportunity report and the definition of deliverable D3.2.

- Throughout the project, the EG disseminated the results (in particular the IoT/CPS opportunity report) to a wide range of relevant stakeholders (EC, government agencies, industry representatives, non-governmental industry associations, research institutions, and others) via direct mailing, distribution to expert networks, and social media (LinkedIn, Twitter, more than 800 recipients) and collected feedback that was used to refine all of the project reports and results. In addition, the IoT/CPS Expert Group used its wide reach in social media to generate visibility for other project results and announcements.
- The EG has presented PICASSO concepts and results at numerous public events that target many relevant stakeholders, such as ARTEMIS and the CPSoS, Platforms4CPS, Road2CPS, and TAMS4CPS initiatives, academic and industry representatives attending conferences such as CPSWeek and EMERGE-Americas, and policy stakeholders. Most of these events were attended by policy stakeholders.
- The EG has engaged with the EC as well as US funding organizations on several occasions. The EG has validated the findings in the opportunity report with the IoT and CPS units of the EC as well as with NSF, NIST, and NITRD representatives in personal interviews, and the EG has (unsuccessfully) investigated the feasibility of a coordinated call between the EU and the NSF unit with the EC CPS unit on the topics of human-machine interactions in CPS and overcoming the modelling bottleneck. The results of an EG investigation into standardization for interoperability in IoT-enabled CPS were discussed in a face-to-face meeting with EC representatives, and in the later project stages, the IoT/CPS-relevant project reports were advertised to additional EC representatives.
- The EG has contributed to the organization of both public transatlantic symposia that were organized by the PICASSO project.
- Throughout the project, the EG contributed to all other PICASSO outreach and dissemination activities, such as project communications, promotion of H2020 and US ICT opportunities, newsletters, the website, and the CROSSROADS tool kit (database of currently funded R&I projects, lists of relevant main conferences, workshops, and other events in the EU and the US, and online teaching materials).
- The EG has contributed to the EU-US ICT policy dialogue in PICASSO and to the PICASSO policy briefs and all policy webinars on aspects relating to IoT/CPS throughout the project.

External stakeholders engaged included representatives from several EC units and US government bodies (NSF, NIST, NITRD), international organizations and projects such as AIOTI, CPS Summit, BILAT USA 4.0, TAMS4CPS, CPSoS, Road2CPS, oCPS, CPSE Labs, ARTEMIS-IA, Industrial Internet Consortium (IIC), SafeTRANS. NSF, NIST, the IoT and CPS units of the European Commission, the ERA-NET instrument, the Smart Manufacturing Leadership Coalition (SMLC), the Intelligent Manufacturing Systems (IMS) global research and business innovation program, the National Council of

University Research Administrators (NCURA Global), and senior industrial and academic experts from a variety of domains (e.g. CPS, IoT, control, production, energy, transport).

2.1.2.2. Next Steps & Sustainability of Activities

The work of the IoT/CPS Expert Group has “kept the channels open” between EU and US IoT/CPS experts despite the challenging political climate and has led to a comprehensive collection of analyses and comparisons of EU and US RDI priorities, application sectors, funding environments, and potential barriers. Our analyses clearly indicate that there is a need and potential for EU-US collaboration, and our activities have created a common understanding on both sides. Our results have already generated significant interest in all targeted audiences.

Concrete guidelines for the establishment and support of EU-US collaboration actions have been created that can be built upon by all relevant stakeholders. The relevance of our results is guaranteed by the contributions from high-level experts from EU and US funding agencies, industry (networks), and academia, and several actors have already expressed interest in participating in such actions. This material will be valuable for many external stakeholders even after the end of PICASSO, e.g. in follow-up initiatives that are established in response to our recommendations. In addition, the lessons learnt in this work, as well as the new EU and US contacts, partnerships, and working relationships that were established in PICASSO, will be beneficial for all participants in the future, e.g. to establish follow-up activities and projects. Several of the actors that were part of the IoT/CPS Expert Group are involved in other initiatives in the area of international collaboration and will continue to pursue the PICASSO objectives and to promote the PICASSO results.

2.1.3. 5G Expert Group

2.1.3.1. 5G Expert Group Activities so far and engagement of external stakeholders

- **PICASSO 5G External Stakeholder Network**

During the project period, the PICASSO 5G expert group has been very actively building network with external stakeholders via versatile activities, e.g., expert group meetings, distributing opportunity report and public events. So far, PICASSO 5G expert group has directly reached and communicated with many high impact external shareholders in the 5G network domain, as shown in Figure 1, i.e. major EU or US based international equipment vendors (Nokia, Ericsson and National instruments), major network operators (AT&T, Vodafone), major universities (TU Dresden, UC Berkeley, UGM, NYU, Lehigh U), major research institutes/centres (CWC, 5G Lab Germany), major telecom management/consulting companies (Eurescom, Wireless 20/20), major funding organisations/policy makers (NSF, European Commission, FCC, NIST, NITRD, NCURA), major 5G related strategic initiatives (5GPPP, 5G-IA, WIFIUS, IEEE 5G, PAWR), and major 5G projects (METIS II and Fast). This forms the basic distribution network for the 5G expert group to disseminate project output, e.g., the opportunity report and conference information, interview and receive feedbacks on the PICASSO 5G topics.



Figure 4: The chart of engaged external stakeholders via activities of the PICASSO 5G expert group

- **Distribution the Recommendations on 5G R&I the Opportunity Report over the External Shareholder Network**

As one of the most important technical outputs of the PICASSO project, the opportunity report has been distributed over the 5G external stakeholder network. Meanwhile the major R&I collaboration themes are constantly discussed and revisited by members of the 5G expert group during the project period. Based on the information that EC was going to open a new call on EU-US collaboration, i.e. H2020 ICT-21-2018, chair of the 5G expert group arranged a telco with “Future Connectivity Systems” unit in EC and informed them the major findings and recommendations from the 5G expert group and the corresponding opportunity report.

- **Public dissemination feedback through Webinar**

A second webinar on “EU-US collaboration on 5G funding opportunities in Horizon 2020” was held by Jacques Magen from InterInnov/5GPPP and 5G EG manager Yaning Zou, on May 7th 2018. In addition, the 5G EG also participated in two policy webinars held by policy EG and discussed the 5G related aspects on “Standardization and its impact on EU-US ICT collaboration”, September 29th, 2017 and webinar on “Spectrum issues affecting EU/US ICT development collaboration” March 28th 2018.

- **Public dissemination and feedback through Public Event**

The 5G expert group is co-organising the “Second Trans-Atlantic Symposium on ICT Technology and Policy” from the 5G network point of view. The targeted groups are stakeholders from telecom industry, policy makers, universities and research institutes. It is planned that 5G EG will discuss the PICASSO project results with the targeted audience groups, engaging direct dialog between EU and US peers and paving the way to the future. In addition, the 5G chair also promoted the PICASSO project and disseminated outputs in major well-known international events in the 5G domain, e.g., 5G Dresden Summit 2017 through a final panel.

2.1.3.2. Next Steps & Sustainability of Activities

In 2018, a joint call of EU-US collaboration on advanced wireless platform has been published at the EU side, i.e., H2020 ICT-21-2018, and at the US side, i.e., NSF US-EU Internet Core & Edge Technologies (ICE-T). It is expected that this program will start from the beginning of 2019 at the both EU and US sides. The program, especially at the EU side, will focus on building an EU-US community and a common roadmap, organising workshops, and twinning testbeds. The PICASSO 5G EG believes the results from the PICASSO project will provide a solid foundation and knowledge base for such activities in this coming project. In this context, the chair of 5G EG will look into the possibility to arrange a F2F or online meeting with the consortium that will be selected under H2020 ICT-21-2018 call and deliver related PICASSO results to the upcoming project, ensuring the continuation of PICASSO knowledge and success of the EU-US collaboration on 5G network or advanced wireless area.

2.1.4. Policy Expert Group

2.1.4.1. Policy Expert Group Activities so far and engagement of external stakeholders

Other than the ICT expert groups, the Policy expert group has three groups of stakeholders it serves. First and foremost: it provides the opportunity for PICASSO partners to more deeply and holistically address the policy context of their activities, notably the ICT Expert Groups. Supporting this is the prime interest of the Policy Expert Group, hence in all events and deliverables the Policy EG works with the experts from the other three PICASSO expert groups. Policy expert group members themselves come from industry, research, and internet/telecoms technical communities with deep experience on policy matters, and involved in policy preparation on both sides of the Atlantic. The PICASSO work informs their interaction in the global and national fora as well as relevant workshops they participate in, sometimes explicit (e.g. referring to the PICASSO work during IGF, EuroDIG, USA IGF), sometimes implicit. With involvement over the stretch

of the year from Robert Pepper (Aspen Institute – stepped down when he joined Facebook Inc); Dan Caprio (The Providence Group, IGF USA co-organiser); Avri Doria (Technicalities; IETF working group chair; ICANN Board Director) and Dave Farber (Carnegie Mellon University, Stevens Institute of Technology, University of Delaware, Keio University Cyber Civilization Director, former RAND, Internet Hall of Fame, we are very well linked in to US and global institutions on ICT policy, standards bodies, and research institutions. On the European side, Jonathan Cave (Warwick University, UK Regulatory Committee, Alan Turing Institute, former RAND, participant to several European related projects), Ilkka Lakaniemi (former FI-PPP Chair, Aalto School of Business, Finland Chamber of Commerce VP Digital Economy and growth), and Maarten Botterman (GNKS Consult BV, former RAND, ICANN Board Director, IGF DC IoT Chair) we have been able to bring in a lot of issues raised and researched in the associated networks, and bring insights from PICASSO facilitated discussions back into those networks – implicit and explicit.

In order to be able to serve them well, the Policy EG is reaching out to two groups of networks: the global Internet Governance community, as all activities relate to internet governance in how data are reached, how objects are communicating, and how 5G establishes connectivity (over IP). This means that global Internet Governance issues provide challenges and opportunities for the three PICASSO technology domains. The PICASSO Policy Papers have been used to inform discussions during the global Internet Governance Forum, European and US Internet Governance meetings such as EuroDIG and IGF USA, and have been shared with ISOC, IETF, W3C, IEEE, ICANN researchers and policy makers. The second network is the European Future Internet community.

The Policy EG also actively reached out to policy makers in government positions that are actively interested in the specific topics at hand at both sides of the Atlantic as to inform them, and to invite them to participate to discussions, where and when appropriate: in PICASSO context or in other networks. A meeting was organised in Brussels with representatives of the relevant policy units in the European Commission around the table. In addition, EuroDIG, IGF USA, IGF have been regular meeting grounds for us. Participation to other events such as the ESRC workshop on issues in SDO decision-making for the Internet complemented that.

Next to engagement with external parties during international events, the Policy EG also organised 5 webinars for which people from these communities and from the other three PICASSO expert communities are invited to discuss the key policy subjects selected by the PICASSO project team (at the suggestion of the PICASSO Policy Expert Group). More than 200 people signed up and were informed, almost 100 participated over the last years. In addition, the Policy EG has organised workshops and sessions during all of PICASSO's public events.

2.1.4.2. Next Steps

The Policy Expert Group members will continue to share their insights in their networks, recently further expanded to Japan with the appointment of Policy Expert Group Vice-Chair Dave Farber as Director of the Keio University Cyber Civilization Center. These issues are truly global in nature, even if there are specific factors relevant for the US and EU policy contexts. During the remainder of the project we foresee active reach out during the PICASSO event in Washington DC on 18 and 19 June, and at EuroDIG in Tbilisi, Georgia on 5 and 6 June. After that, we will continue to reach out to other researchers and policy makers during global internet governance and future internet events.

3. Summary and Lessons Learnt

3.1.1. Summary

During the second and last phase of the project, all expert groups have focused on enhancing the interactions with key stakeholders both from the EU and from the US and operate a “loose” network of actors and experts, to be engaged in PICASSO activities. External organisations and individuals/experts who have contributed to the PICASSO activities, cover a wide spectrum of expertise as they represent different clusters of stakeholders, with different agendas, such as the industry or policy making. Activities implemented during this period specifically aimed on supporting interaction and engagement with external (to the PICASSO EG Groups) experts, interaction with the European Commission and US Agencies, engagement with the public and other EU and US initiatives. Moreover, all Expert Groups have examined possible sustainability mechanisms in order to stay alive after project ends and ensure the continuation of their dedicated actions and activities.

3.2. Lessons Learnt

3.2.1. Lessons learnt from the PICASSO Big Data Expert Group

Community engagement activities have been always a challenge for community builders and animators. Throughout community engagement activities of the PICASSO Big Data Expert Group, we have defined a number of lessons learnt which could benefit future initiatives to achieve even greater results than the ones achieved by PICASSO.

- **Engaging the right people:** engaging the right people in this communities is vital and critical. People to be engaged have to have the motive and the willingness to participate and contribute without being offered incentives but commit to contribute because of their own interest. Especially for key influences, this is considered to be critical as they are the people who normally drive the whole community forward. Normally, high profile experts do not have the time or resources to devote on animating a whole community but may contribute to dedicated workshops and position papers. Therefore, less prestigious experts (i.e. in their early steps of their career) may find both the time and resources to engage in such initiatives.
- **Physical engagement is critical:** even though online meetings can be considered as an important mean of frequent communication, physical engagement is mandatory. The practices showed that great results derive from workshops that physically engage a large number of network members, specifically designed for knowledge exchange and community building.
- **Financial support is vital:** financial incentives for attending workshops and meetings can be considered as vital. Requesting people to participate in these initiatives without securing that their travel expenses are covered, is a very difficult task that requires cautious handling. Therefore, exploiting all possible funding sources for ensuring that network members will be able to physical engage is crucial.

3.2.2. Lessons learnt from the PICASSO 5G Expert Group

During the PICASSO project period, different community building and enhancement measures have been taken, online or offline. Still, we consider face-to-face meetings as the most effective way to engage a community. In practice, this is rather challenging to achieve due to the large geography distance between EU and US peers and limited funding for travelling in the project. Social media platforms, e.g., LinkedIn or twitter, are only effective if there are happenings or important events. In this case, a day-to-day communication platform might be required to build a tighter EU-US research community together in the future. The content of the platform should also link to the users day-to-day work life as well, e.g., specific research topics and specific policy problems, essentially providing certain incentives for active participations. Last but not least, the composition of the EG should also include policy makers from both regions (i.e. EC officials, NSF officials, etc.). It is rather critical to include members from the whole spectrum (i.e. policy makers,

industry, research, etc.) in order to exchange information and share views and thoughts between all different stakeholders.

3.2.3. Lessons learnt from the PICASSO IoT/CPS Expert Group

The IoT/CPS Expert Group focuses on socio-technical systems that process real-time data that is transmitted via IoT connectivity to achieve improved monitoring and management (and hence new levels of energy and resource efficiency, and quality of products and services), and safe and reliable operation (IoT-enabled CPS). The dissemination work of the IoT/CPS Expert Group has addressed a significant audience of EU and US technology experts and decision makers and has helped them to understand the challenges and opportunities that exist in EU-US collaboration in the IoT and CPS sectors.

However, the currently strained political climate has made it very challenging to establish concrete opportunities for EU-US collaboration. While there are currently some initiatives in the IoT space in this direction (and there are future calls that are specifically focused on EU-US collaboration on the next-generation internet in the H2020 work programme 2018-2020), we have found that collaboration in the CPS space (which is the focus of the EG) is currently only feasible for scientific collaboration but not for the type of projects that the EU sponsors in the LEIT domain. Despite this, our dissemination and community enhancement actions have provided a valuable service. Our analyses clearly indicate that there is a need and potential for EU-US collaboration, and our activities have created a common understanding on both sides and have provided channels between EU and US experts and governmental bodies. Thus, our efforts are a good basis for the establishment of concrete collaborations in the future (e.g. in FP9).

3.2.4. Lessons learnt from the PICASSO Policy Expert Group

It is crucially important to observe the mandate given to the project, which means that it has been important to focus on ICT R&I policy aspects relevant for EU/US collaboration in the specific fields of 5G networks, Big Data and IoT/CPS. Over time, we have been able to further emphasise that in our documents, webinars and events.

A second issue is that when engaging in a 2.5-year long project on ICT, policy issues are bound to change, and within the contract it would be important to build in a review half-way, with the explicit opportunity to adjust the focus.