

COOPERATION INDICATORS ANALYSIS ON EMERGING TOPICS



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EXECUTIVE SUMMARY

This report was prepared to complement and feed the future activities planned within the framework of BILAT USA 4.0 project. More specifically, it aims to contribute to the several activities of BILAT USA 4.0 to create a knowledge base and analytical support for evidence-based decision making for researchers and innovators to build partnerships, to discuss common (horizontal) issues and specific measures to improve framework conditions. In addition, this report provides an overview of the existing cooperation patterns in three thematic areas, in order to set the ground to further discuss and analyse the common interest of researchers and policy makers during the pilot workshops that will take place in WT 3.2. The objectives of the workshops are to further specify the results of WT 3.1 and to examine these areas in view of their potential to be added to the "established" thematic areas of EU-US cooperation.

To achieve this, a consultation process with funders and policy makers on both sides of the ocean took place and a list of research topics emerged as it is described in D .3.1 "Analysing Report on consultation process with funders and policy makers". The list of topics was further discussed with the EC, in order to decide which areas will be further discussed during the workshops.

Three new thematic areas were chosen as suitable by BILAT partners to be further discussed during the pilot workshops of BILAT 4.0. The three broad thematic areas of common interest that have emerged are:

- **Smart Cities**
- **Digital Social Innovation**
- **Open Innovation & Open Science**

In these three thematic areas, ICT has been portrayed as a cross-cutting issue valuable for supporting research and development.

This report analyses the EU-US research collaboration patterns in these areas in terms of participation in projects funded by the EU via the Framework Programme on Research and Technological Development (FP) and Horizon 2020 (H2020) and in terms of publications co-authored by researchers in the US and researchers in the EU.

Since these thematic areas are fairly new, it is no surprise that the share of projects with US collaboration is low, when compared to the results of Del 2.1 'Report on Status quo and EU-US STI Cooperation patterns'. Del 2.1 has analysed the EU-US research collaboration patterns, in the established areas by the predecessor of this project, BILAT 2.0. Those areas are: Health research, Marine and Arctic research, Nanotechnologies, Materials and Production technologies and Transport research. In general, the numbers regarding cooperation patterns are much higher, indicative, in the area of health research the EU-US collaboration in terms of EU Framework Programme 7 (FP7) projects with US participation, 127 projects have been funded.

Regarding the area of Smart Cities, only two projects have been implemented with the collaboration of the US, out of 102 that have been funded by the EC. For Digital Social Innovation, there was no US collaboration identified among the 36 projects that were funded under FP7 and H2020. When it comes to open innovation and open science, only 3 projects have been identified with US partners out of the total of 41 projects.

Thus, for the identified thematic areas, only five projects have US partners. The overall funding for these priority areas amount to roughly 23.7 million Euro- with about 7.7 million going to Smart Cities and 16 million to Open Innovation and Open Science.

The majority of the US partners in these five projects come from the Education sector, since five of them are



universities and only one is categorised as “other” (Public Library of Science).

The most active countries in creating synergies in these areas are Belgium and Germany. These are involved in four out of the five projects mentioned in this report, whereas Ireland comes next by participating in three projects.

To gain further insights, an analysis of EU-US co-publications in each of those topics is conducted. By consulting SCOPUS, a major citation database, the extent of the EU-US collaboration over the past 12 years was examined, i.e. from 2005 to 2016. Research on *Open Science and Open Innovation* shows output during the entirety of this timespan (gaining momentum from 2009 on) –while the other two topics show an increase in research output only during the past two to four years. Although both sides of the Atlantic show research output separately, the number of joint publications is low.

Joint research on Digital Social Innovation is so low that the overall EU co-publications on this subject (with or without US involvement) was regarded to gain an understanding of recent developments. The term *Digital Social Innovation* has emerged recently, which is why during the search related concepts such as *Internet science* related to social issues were used. It appears that, although the EU is picking up on the subject, the number of co-publications on the US side is basically non-existent.

The situation regarding Smart Cities with a focus on *transport* is similar. Research on the topic may be lower, compared to research on Smart Cities without the focus on *transport*, but its EU-US co-publications seem to be gaining momentum, especially since 2014.

Of all three topics, *Open Science and Open Innovation* shows the strongest research output. Both sides show strong output separately, i.e. close to 2,200 by the US and close to 5,200 by EU member states (compared to approximately 9,600 worldwide). However, the jointly published works amount to only 480 co-publications. Even though the topic has been prominent on the agenda of policy-makers on both sides of the Atlantic, it did not translate into solid collaborations.

ICT is a strong component and can even be considered as *the* enabling technology for all three topics, which is why it is no surprise that *Computer Science* is the most visible research field in the respective co-publications. Also, frequently involved disciplines are Engineering, Social Sciences, Mathematics, and Business, Management, and Accounting.

The EU countries most involved in EU-US co-publications with regard to the three focus topics are the United Kingdom, Germany, Italy, Spain, France, and the Netherlands.



INTRODUCTION

During the implementation of BILAT USA and BILAT 2.0, the predecessors of this project, a series of tasks took place to enhance and develop science, technology, and innovation (STI) partnerships between the U.S. and Europe. Health research, Marine and Arctic research, Nanotechnologies, Materials and Production technologies and Transport research were the first thematic areas identified, from BILAT 2.0. BILAT USA 4.0, continues the activities started by the predecessor projects, thus WP3 “Identifying emerging STI fields to initialise partnerships” aims to explore research areas to foster a common ground of cooperation.

To achieve this, a consultation process with funders and policy makers on both sides of the ocean took place and a list of research topics emerged as it is described in D3.1 “Analysing Report on consultation process with funders and policy makers”. The list of topics was further discussed with the EC, in order to shorten that list.

This deliverable provides an overview of the cooperation patterns in the thematic topics that emerged from the consultation process with policy makers and the EC, in order to set a discussion ground and to contribute into setting new strategic priorities for the EU and US collaboration. More specifically, the following sections are analysing the collaboration patterns in research projects and co-publications. In addition, the existing funding opportunities are also presented as a leverage to foster STI cooperation between the EU and US.

Objectives of this report

The report at hand provides an overview of some of the key cooperation patterns between the EU and the USA. More specifically, the cooperation patterns analysed are the common research projects funded by the EU with US partners, and the common research publications implemented by EU & US partners. The analysis is focused on three new thematic areas, as they emerged from the consultation process described in D3.1 “Analysing Report on consultation process with funders and policy makers”. The findings of the analysis in the current report highlight the importance for further collaboration between the EU and the USA. In addition, the available funding opportunities related to the examined thematic areas were collected, to be used to promote H2020 in the fourth coming workshops.

The three broad thematic areas that have emerged are:

- **Smart Cities**
- **Digital Social Innovation**
- **Open Innovation & Open Science**

The thematic area of Smart Cities has been identified as an area of common interest for both sides of the ocean. Smart Cities are a broad area since it is composed from different factors, such as smart infrastructure, smart transportation, smart energy, smart health care, and smart technology. In addition, ICT is a key enabler to transform traditional cities into smart cities, especially now that the Internet of Things (IoT) and Big Data (BD), are technologies that contribute into making smart cities efficient and responsive.

Another area of common interest was social sciences and social innovation and as a more specialised case, Digital Social Innovation. DSI has been identified among the emerged topics since more and more social challenges are addressed with the use of ICT tools. More specifically, according to (Bria et al., 2015, p. 9), DSI is ‘a type of social and collaborative innovation in which innovators, users and communities collaborate using digital technologies to co-



create knowledge and solutions for a wide range of social needs and at a scale and speed that was unimaginable before the rise of the Internet¹. Moreover, DSI is related to Open Hardware, Open Networks, Open Data and Open Knowledge, and how innovators utilise this to address social challenges and needs.

Open Innovation and Open Science have been identified as an area of common interest for the EU and US. Global challenges are important drivers for research and innovation, and open innovation and Open Science are tools are considered key enablers. The evolution of the Internet and the ICT have opened the way to bring people and data together to meet these challenges.

In these three thematic areas, ICT has been portrayed as a cross-cutting issue valuable for supporting research and development.

This report documents the existing cooperation patterns in the research fields in order to provide the necessary input for the implementation of the future tasks of BILAT USA 4.0. More specifically, this report will set the ground for the discussions during the foresight workshops within WP3. During those workshops, discussions will take place on the potentials of these new emerged topics for joint future cooperation endeavours. The workshops will also examine the areas in view of their potential to add them to the "established" thematic areas of EU-US cooperation.

METHODOLOGY

The analysis of the collaboration patterns related to the implementation of research projects was based on the open CORDIS database. Two separate data sets were collected from CORDIS. One was related to the participation date in research projects during the implementation of the FP7 programme and the other was participation data in H2020. The data related to FP7, were fairly complete since most projects have ended. The last update from CORDIS about FP7 projects was on November 11th 2015, while for H2020 we could only access the data that were updated on the 22nd of December 2016² since the programme is still in process. The data were extended/improved by information obtained from online research, as there was originally no data available in the database. Other than that, no external information was added to the database. For both data sets, a keyword search was conducted based on the three topics. For each thematic topic, a set of keywords was created in order to optimise the search results of the database. After collecting the search results, the outcomes were scanned to confirm that the projects were related to the three thematic areas. Then, the short lists of the research projects were further analysed, to identify if there were any US partners. The analysis of this data was conducted by conventional suite of Office 2016.

In the context of the co-publication analysis, a co-publication is considered a cross-border publication, i.e. where at least one author affiliated with at least one organisation in a country jointly publishes a scholarly work with at least one other author affiliated with at least one organisation in a different country. E.g. a publication involving an author affiliated with the MIT and another one affiliated with the Pennsylvania State University is not considered by this study as a co-publication, because only one country is involved; the interest of this study is to capture international collaboration, hence the cross-border nature of the co-publication definition.

The co-publication analysis relies on the correctness of the data provided by Scopus. It is safe to assume that the data are incomplete, contain errors, and are skewed in terms of the coverage of scientific disciplines. It is recommended to

¹ Growing a digital social innovation ecosystem for Europe, <http://www.nesta.org.uk/publications/growing-digital-social-innovation-ecosystem-europe>

² The data from CORDIS were last accessed In March 2017 (url: <https://data.europa.eu/euodp/en/data/dataset/cordisref-data>)



view the offered results as merely indicative, and as data that should be complemented with qualitative expertise.

The three emerging priority research areas that are of interest in the context of this study are Smart Cities research with a focus on transport, research on Digital Social Innovation, and research on Open Innovation and Open Science. Since none of these themes are well classified by Scopus, i.e. there are no predefined subject areas that could be directly used in our database search, a nuanced search using keyword sets were necessary.

The funding opportunities were collected after screening the available calls on H2020. For some of the topics there were no specific calls, for example, DSI is promoted through the calls of CAPS. In order to optimise the search results of the calls, the table on the chapter of funding opportunities, depicts all the available funding opportunities that either target the specific topic or have an impact on one of these topics.

PROCESS AND ACTIVITIES

The task builds on an analysis of the previous activities (e.g. BILAT USA 4.0 WP3 deliverables) and provides basic data from bibliometrics and project databases to illustrate EU-US STI cooperation patterns, outcomes of this cooperation and needs for improvements of framework conditions for transatlantic EU-US STI cooperation.

In parallel to this analysis, plans for the pilot thematic workshops are prepared that will profit from more detailed and tailored analysis during the project. The workshops will be combined with other scientific events, in order to bring together policy makers and researchers. For the successful implementation of the workshops, detailed presentations will be prepared, in order to increase the participants' awareness of EU-US collaboration and to stimulate discussions.

Please note that the coverage of research and innovation areas in FP7 and H2020 do not completely align in terms of their scope, which is why they were treated separately. The presentation of analysis results – especially concerning involved US partners – may seem skewed in favour of FP7. This is due to the availability of participation data – while FP7 as a programme has already ended and the data are complete, H2020 is fairly new and does not yet have the same amount of data to show.

Projects and Collaborative Links in Priority Areas in FP7 and H2020

The data collected from CORDIS show that in total 503 projects with US partners have been funded from the FP7 and H2020 programme through all calls and thematic areas. The total cost of all these projects is 3.323.951.933,19€ while the total contribution of the EC for these projects is 2.454.335.717,75€.

According to Horizon 2020 – Work Programme 2016-2017, Cross - cutting activities³, Smart Cities and Communities is considered to be one of the cross-cutting focus areas of the programme and the specific area focuses on demonstrating sustainable, cost-effective and replicable district-scale solutions at the intersection of energy and transport enabled by ICT.

Regarding the area of Smart Cities, only two projects have been implemented with the collaboration of the US, out of 85 that have been funded from the EC. Looking to the data it is easy to conclude that there has been an increased interest in the area of Smart Cities, since under FP7 there were only 40 projects funded, while in H2020 it has increased to 45. Unfortunately, that is still not reflected in the collaboration of the EU and US according to the

³ Horizon 2020–Work Programme 2016-2017, Cross-cutting activities, URL: http://ec.europa.eu/research/participants/data/ref/h2020/wp/2016_2017/main/h2020-wp1617-focus_en.pdf



available data, since there was only one project in FP7 and one in H2020. The results show that this area could be enhanced so as to increase the cooperation rate between the EU- US. (Figure 1).

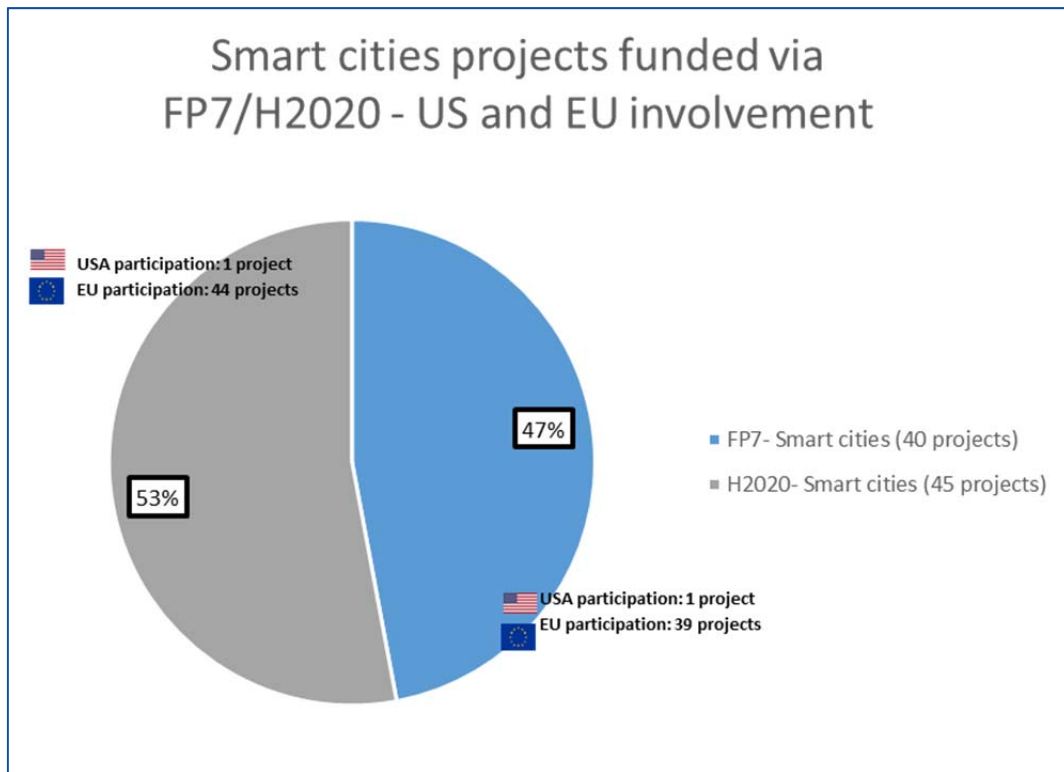


Figure 1: Smart Cities projects funded via FP7/H2020 - US and EU involvement

In addition, the following chart depicts the total amount of the EC contribution within H2020 and FP 7, compared to the two projects that were implemented with the contribution of US partners (Figure 2).

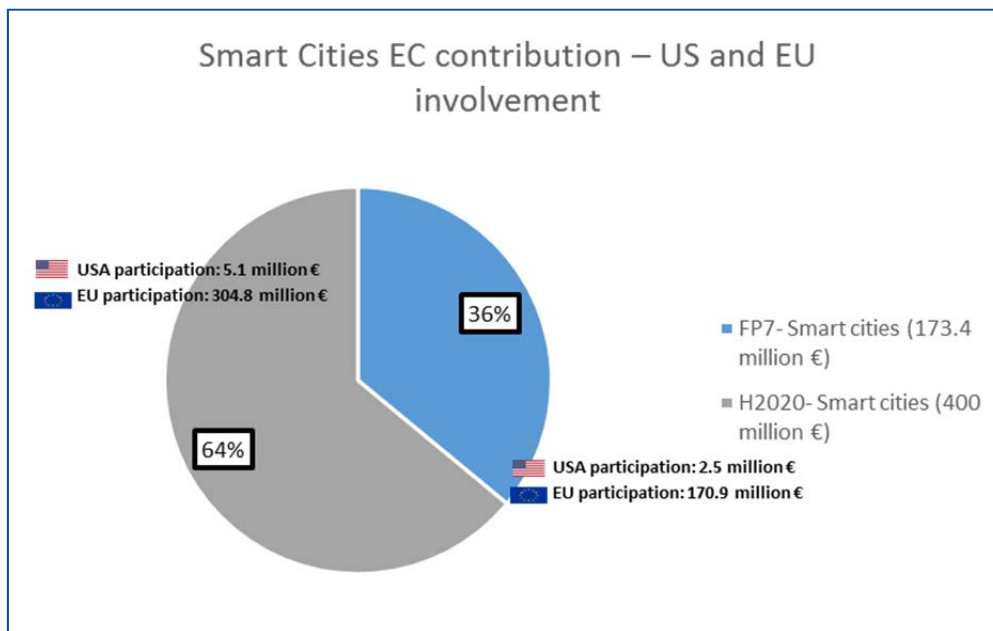


Figure 2: Smart Cities EC contribution – US and EU involvement

Another cross-cutting topic that is related to social sciences and social innovation, is Digital Social Innovation. The data of CORDIS were analysed using keywords that are used to describe the 'Digital Social Innovation'. According to the data collected and analysed, 36 projects in total were funded with the aim to promote Digital Social Innovation as a research topic or by implementing activities with a Digital Social Innovation an impact. In these 36 projects, there was no US collaboration identified. (Figure 3).

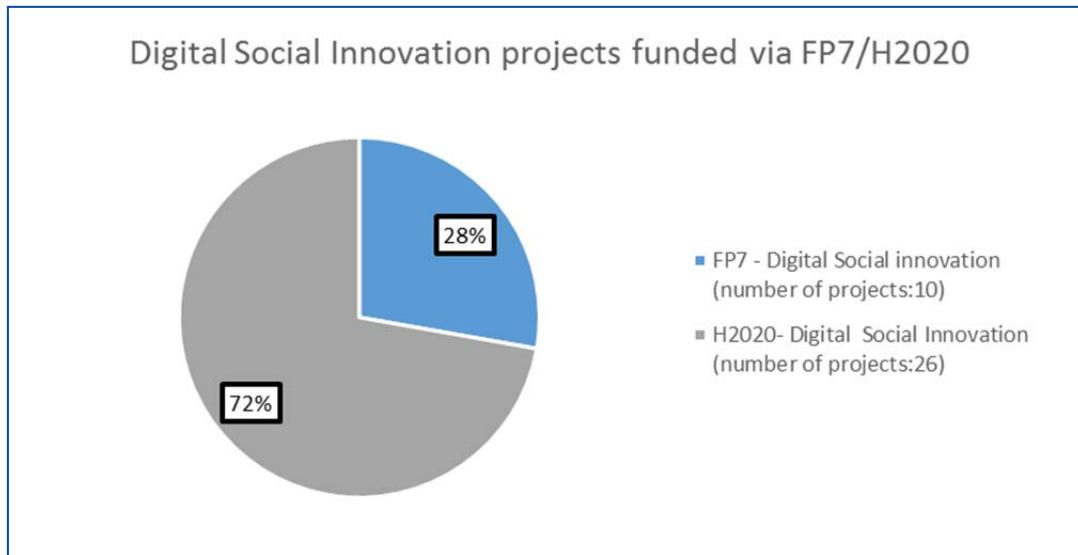


Figure 3: Digital Social Innovation projects funded via FP7/H2020

It is worth highlighting that the number of projects aiming to this topic within H2020 were doubled, compared to the projects implemented within FP7, but based on the available data in the time this report was written there is no US collaboration identified among these projects.

The following chart depicts the total amount of the EC contribution within H2020 and FP 7 spent on Digital Social Innovation. (Figure 4)

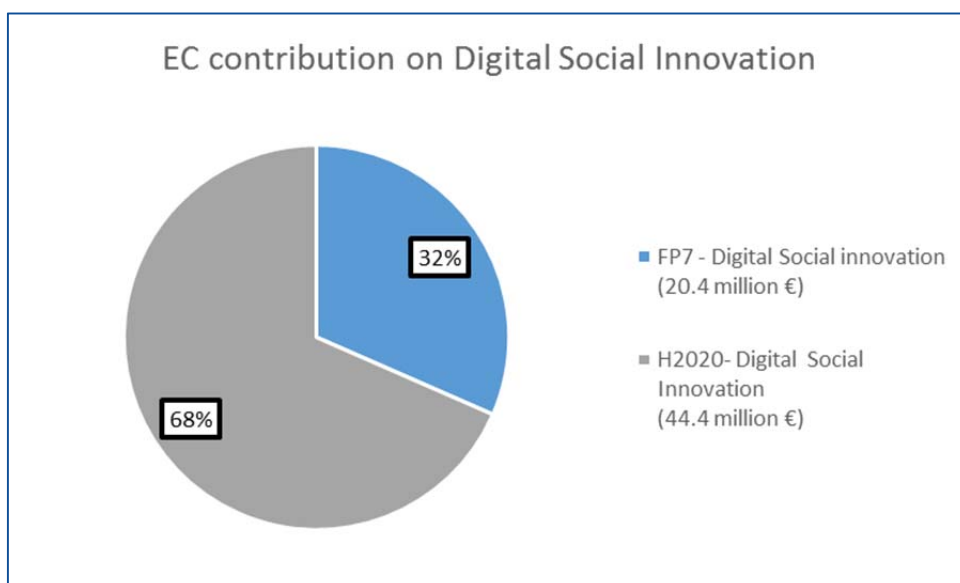


Figure 4: EC contribution on Digital Social Innovation



Open Innovation and Open Science are analysed together since these topics are complementary. Open Innovation must help to connect and exploit the results of Open Science and facilitate the faster translation of discoveries into societal use and economic value⁴. The screening of the data was conducted by keywords in order to narrow down the projects that are related to open innovation and open science.

According to CORDIS, 41 projects related to open innovation and open science were implemented within the framework of FP7 and H2020. Only three projects were implemented with the collaboration of US organisations, within the framework of the H2020 programme. (Figure 5)

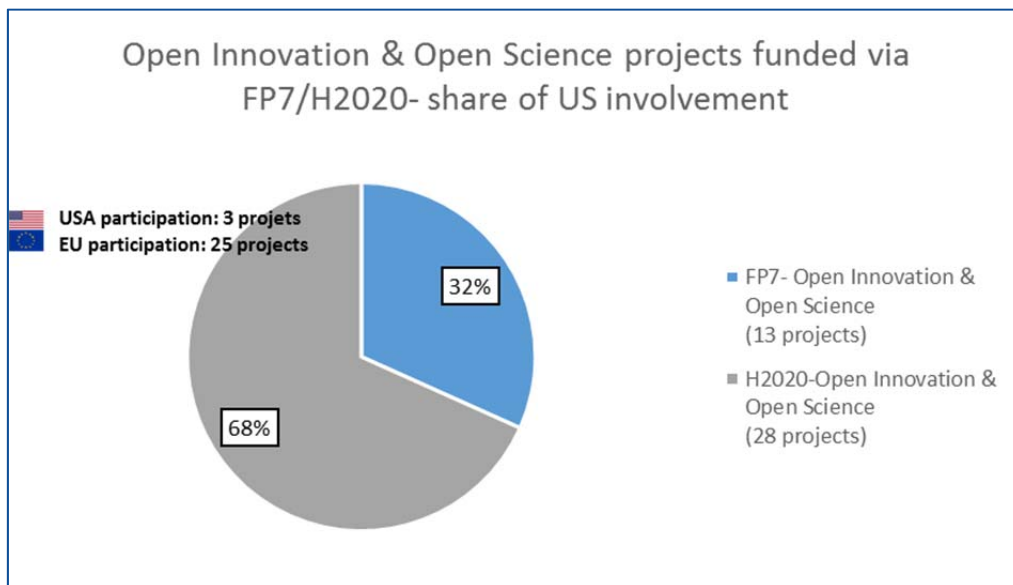


Figure 5: Open Innovation & Open Science projects funded via FP7/H2020- share of US involvement

The EU has already invested in this area, by funding these projects by the total amount of 124.361.024,39€ (Figure 6)

⁴ Open innovation, open science, open to the world – a vision for Europe (<https://ec.europa.eu/digital-single-market/en/news/open-innovation-open-science-open-world-vision-europe>)

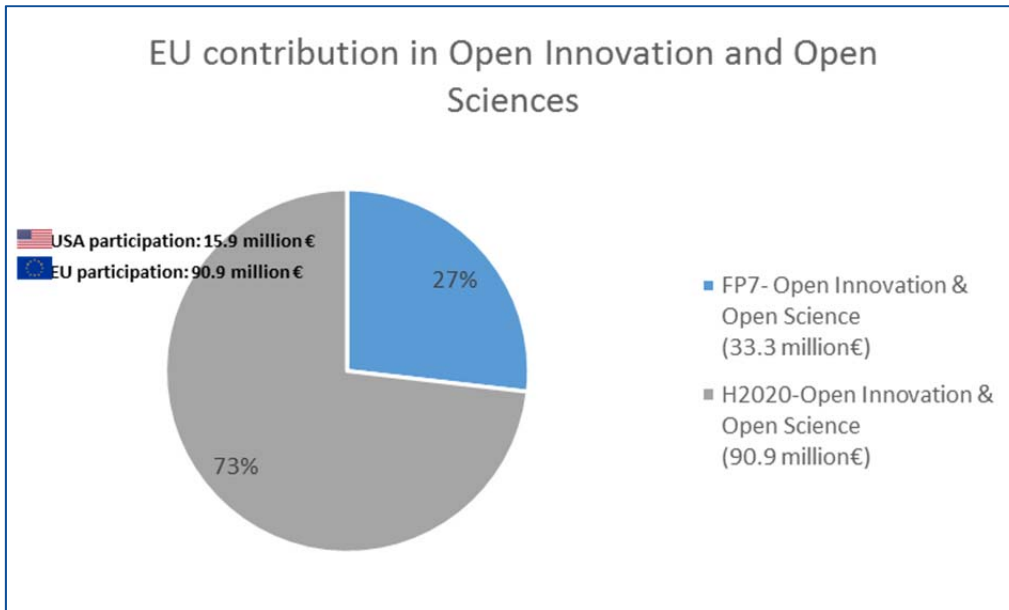


Figure 6: EU contribution in Open Innovation and Open Sciences

The data has shown that new strategic priorities should be set up to foster the collaboration between the EU and US, since the rate of collaboration in these thematic areas is very low, in total only five projects have been identified to have US partners from the total amount (Figure 7).

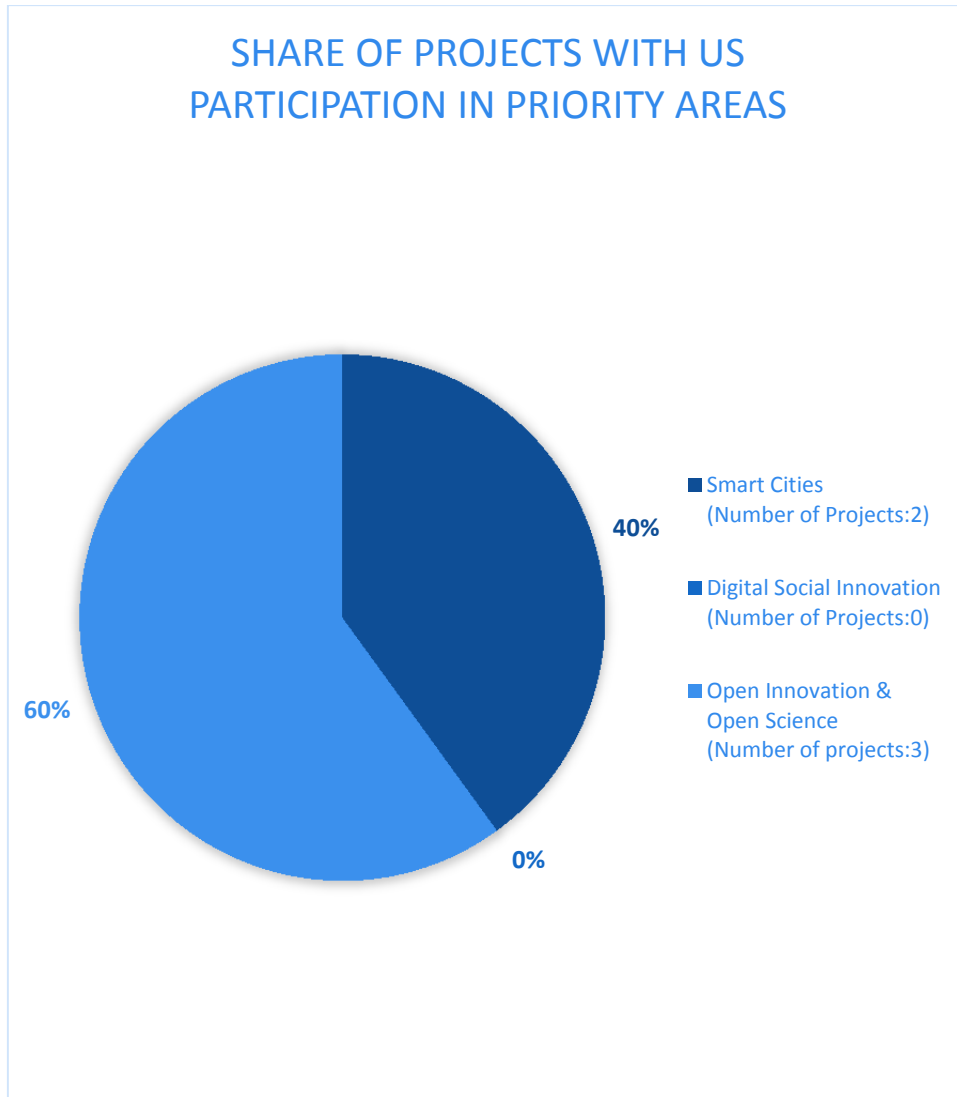


Figure 7: Share of Projects with US participation in priority areas

By looking into the data one can see which countries are more active in creating synergies with the USA in these thematic areas. More specifically, the most active countries in creating synergies in these areas are Belgium and Germany, which are involved in four out of the five projects mentioned in this report. Ireland comes next with three projects. (Figure 8)

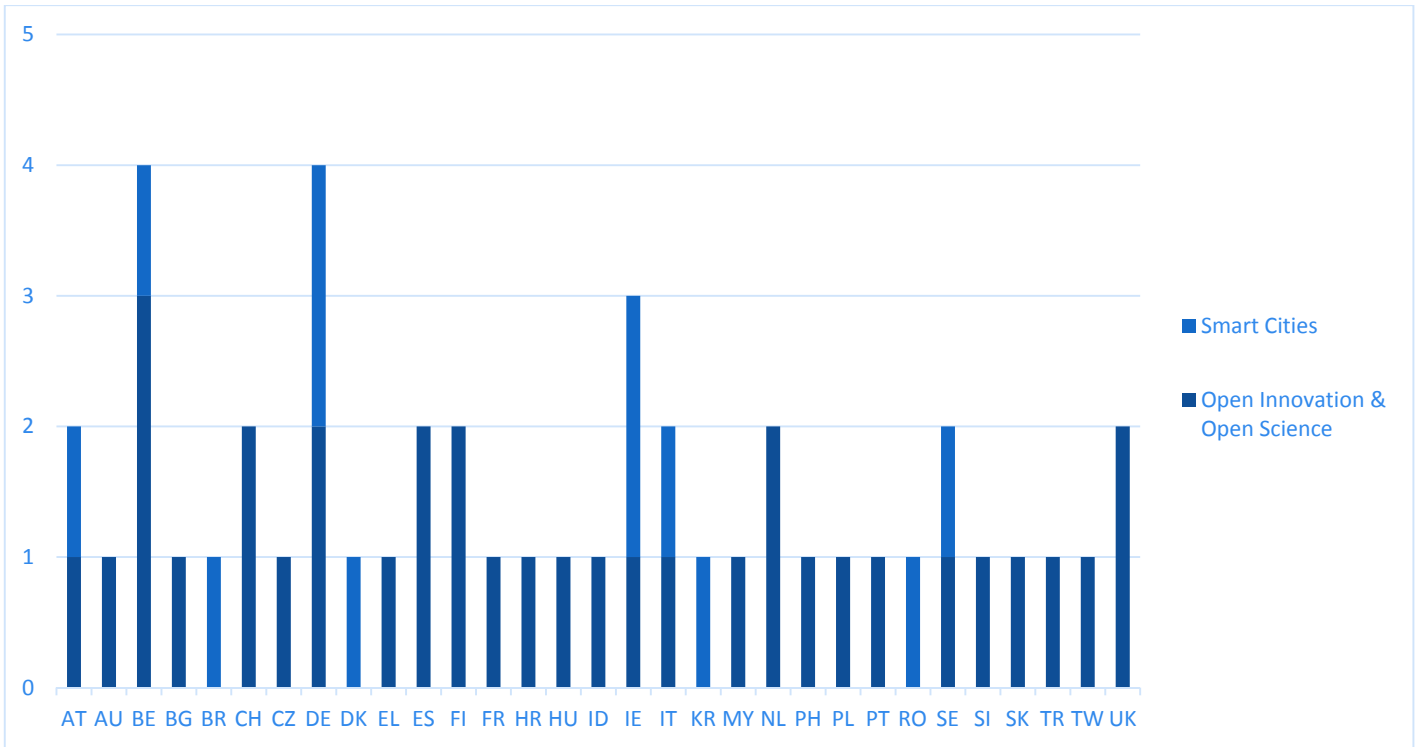


Figure 8: Share of projects in priority areas between U.S. and EU – NO DSI have been recorded

Characteristics of the US Partners

In the CORDIS database are five value parameters assigned to the activity type of an organisation that participates in FP7 projects: Higher or Secondary Establishments (HES), Research Organisations (REC), Private-for-profit entities (PRC), Public Bodies (PUB) and Others (OTH). There are six participants in these five projects, and five of them are characterised as Higher or Secondary Establishments, while only one is under the category of “Other”. (Figure 9)

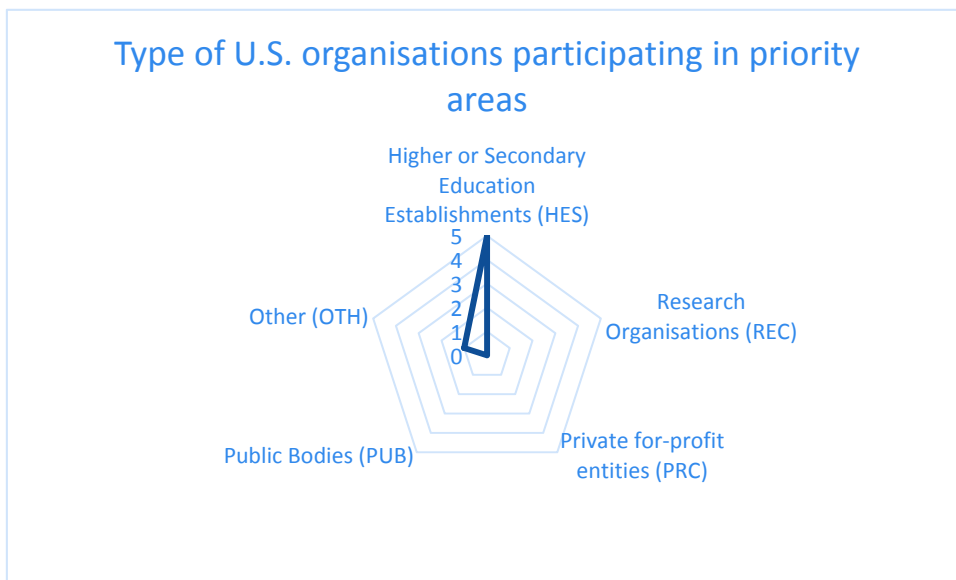


Figure 9: Type of U.S. organisations participating in priority areas



More specifically, the US partners that were involved in projects related to OI and OS were the Trustees of Indiana University, The University of North Carolina at Chapel Hill, the Public Library of Science, the Arizona Board of Regents, while the Wright State University and Rutgers, the State University of New Jersey, collaborated in projects related to Smart Cities.

CO-PUBLICATIONS

The co-publication analysis is expected to provide a summary of EU-US co-publications⁵ – observed by Scopus⁶ – of collaborations in selected emerging/hot research fields outlined above (cf. Objectives of this report, p. 8). The analysis covers the years 2005 to 2016. The methodology underlying this analysis can be found in the annexes (pp. 34).

In the frame of analysing co-publications, this report connects to the D2.1 project deliverable called “Status quo and EU-US STI Cooperation patterns” that provides insights into EU-US co-publications in general. While that report further concerns itself with established research topics, this analysis explores collaboration patterns in terms of co-publications in selected emerging/hot research topics. Those topics are of mutual interest⁷ on both sides of the North Atlantic and may be gaining momentum but have not yet received the full attention of strategic transatlantic research collaboration.

The sections below provide an in-depth analysis on the thematic level. For Smart Cities research and research on Open Science & Open Innovation, the presented results concern EU-US co-publications and cover aspects such as the development over time, the impact (where available), a list of countries and a list of organisations that are most involved in these collaborations, and a list of the most used keywords. The same is true for the third topic, i.e. Digital Social Innovation, but the respective section will cover just EU publications as the EU-US co-publications amount to just one joint article.

Since we apply the same methodology as described in the above-mentioned report on EU-US STI-Cooperation patterns, the analysis reaches back to 2005. As will become apparent in the sections below, co-publications often occur much later, i.e. towards the end of the chosen period of time, which is to be expected from an observation of emerging topics.

EU-US CO-PUBLICATIONS IN SMART CITIES RESEARCH

EU-US co-publications in Smart Cities research (with a focus on transport) between 2005 and 2016 amount to 25; without the focus on transport, this number would be close to 110. As the figure below illustrates, the first EU-US co-publication on the topic appears in 2001. That said, a considerable increase can only be observed from 2015 on.

⁵ in the context of this report, when talking about the EU we consider the EU28 plus selected countries associated to the EU Framework Programme, i.e. Iceland, Israel, Norway, Ukraine, Switzerland, and Turkey

⁶ see the according Wikipedia entry for more information, URL: wikipedia.org/wiki/Scopus

⁷ that interest has been expressed by policy-makers and research funders that were consulted in a previous task of the workpackage activities



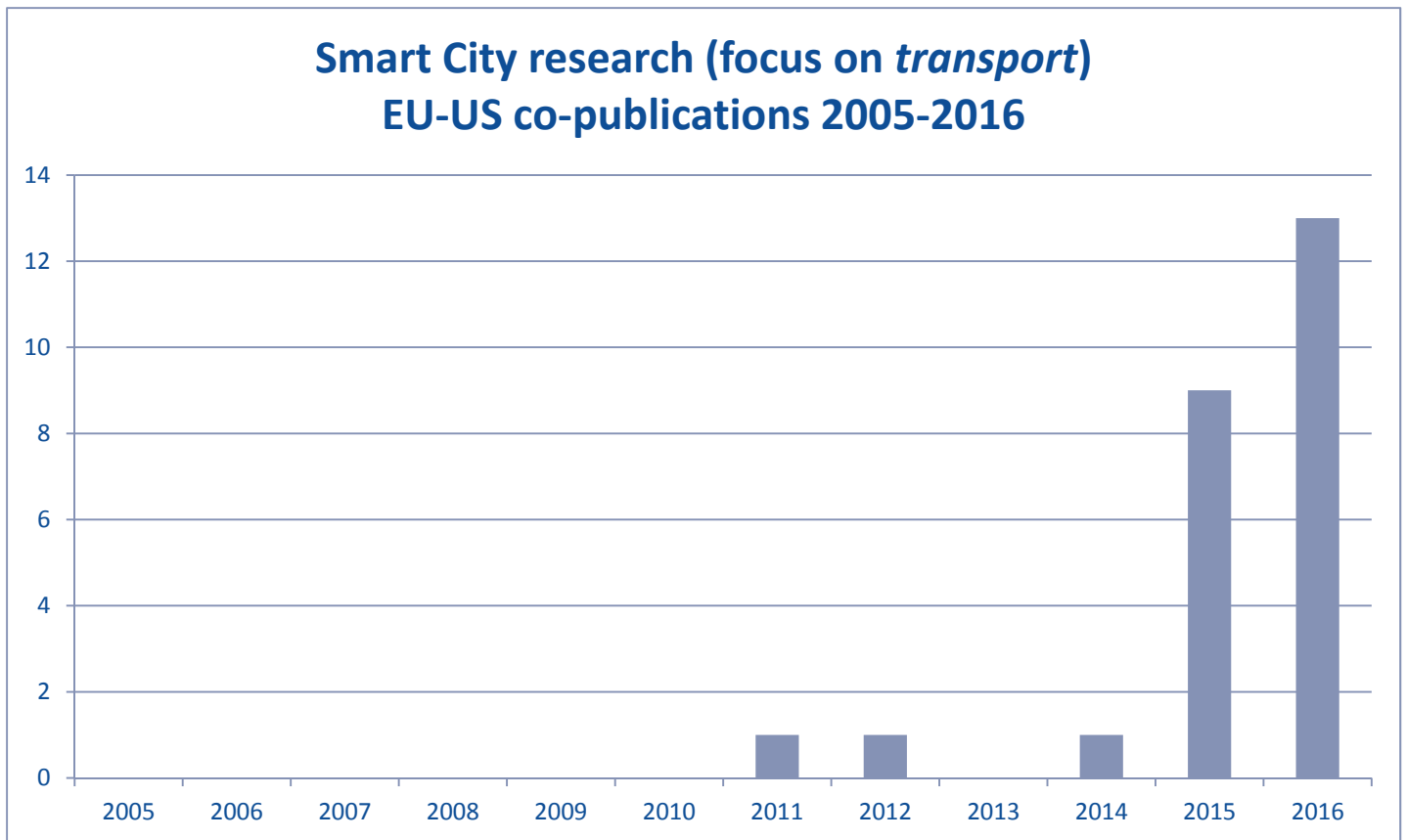


Figure 10: EU-US co-publications in Smart city research (with a focus on *transport*), 2005 and 2016

Considering the research areas involved in EU-US Smart City research output, Computer Science leads the field (see table below), which is no real surprise as ICT is deeply ingrained in the Smart City concept and considered *the* enabling technology. Computer Science is followed by Engineering and, somewhat behind, by Social Sciences.

Table 1: Research areas in EU-US Smart City research (with a focus on *transport*), 2005-2016

Subject areas	Co-publications
Computer Science	19
Engineering	10
Social Sciences	3
Mathematics	2
Business, Management and Accounting	1
Chemical Engineering	1
Chemistry	1
Decision Sciences	1
Earth and Planetary Sciences	1
Energy	1
Medicine	1
Multidisciplinary	1



Apart from *Smart City/-ies* and *transport(ation)*, the keywords most frequently used in the EU-US co-publications in Smart City research are *Cloud* (and *Cloud Computing*, respectively), *distributed computer systems*, *traffic control*, *vehicles*, and *intelligent transportation systems*. The table below contains the full list of the top 12 keywords.

Table 2: Most used keywords (top 12) in EU-US Smart City research co-publications, 2005-2016

keyword	CO- publications
Smart City/-ies	16
Transport(ation)	7
Cloud (incl. Cloud Computing)	5
Distributed Computer Systems	5
Traffic Control	4
Vehicles	4
Intelligent Transport Systems	4
Digital Storage	3
Intelligent Systems	3
Internet Of Things	3
Motor Transportation	3
Public Transport	3

With regard to the countries involved in Smart City co-publications with the US, Spain, Germany, and the United Kingdom head the list, followed by Italy and France (cf. table below). There are also a number of third countries involved in those EU-US research collaboration (marked in grey).

Table 3: List of countries most frequently involved in EU-US Smart City research co-publications (2005-2016)

country	co-publications
United States	25
Spain	6
Germany	5
United Kingdom	4
Italy	3
Brazil	2
France	2
Argentina	1
Austria	1
China	1
Czech Republic	1
Finland	1
Greece	1
Hong Kong	1
Iran	1
Ireland	1
Malaysia	1
Pakistan	1
Romania	1



Saudi Arabia	1
Singapore	1
Sweden	1
Switzerland	1
Turkey	1

As the number of EU-US co-publications is fairly low, the number of involved organisations is limited – and most of them are involved in relevant co-publications once. The exceptions to the unique presence, are the Universitat Politècnica de Catalunya (ES) with three and Università degli Studi di Roma La Sapienza (IT) with two co-publications on the EU side and the IBM Almaden Research Center with 3 and the Massachusetts Institute of Technology with two co-publications on the US side.

EU CO-PUBLICATIONS IN DIGITAL SOCIAL INNOVATION RESEARCH

EU-US co-publications on Digital Social Innovation (and related topics) are basically non-existent – only one co-publication could be identified by the chosen keyword sets (cf. annexes, p. 34). 50 co-publications could be observed worldwide, 30 of which involved at least one EU country. Consequently, this section will describe what is going on regarding this topic on the EU side.

The figure below shows the development over time – although DSI as a term has emerged fairly recently, search terms were used that are strongly related to the DSI concept. Examples are *social innovation* in connection with digital technologies, *internet science* in connection with social issues, or *social innovation* in connection with open data (see the methodology section in the annexe for a full list of search terms, p. 34).

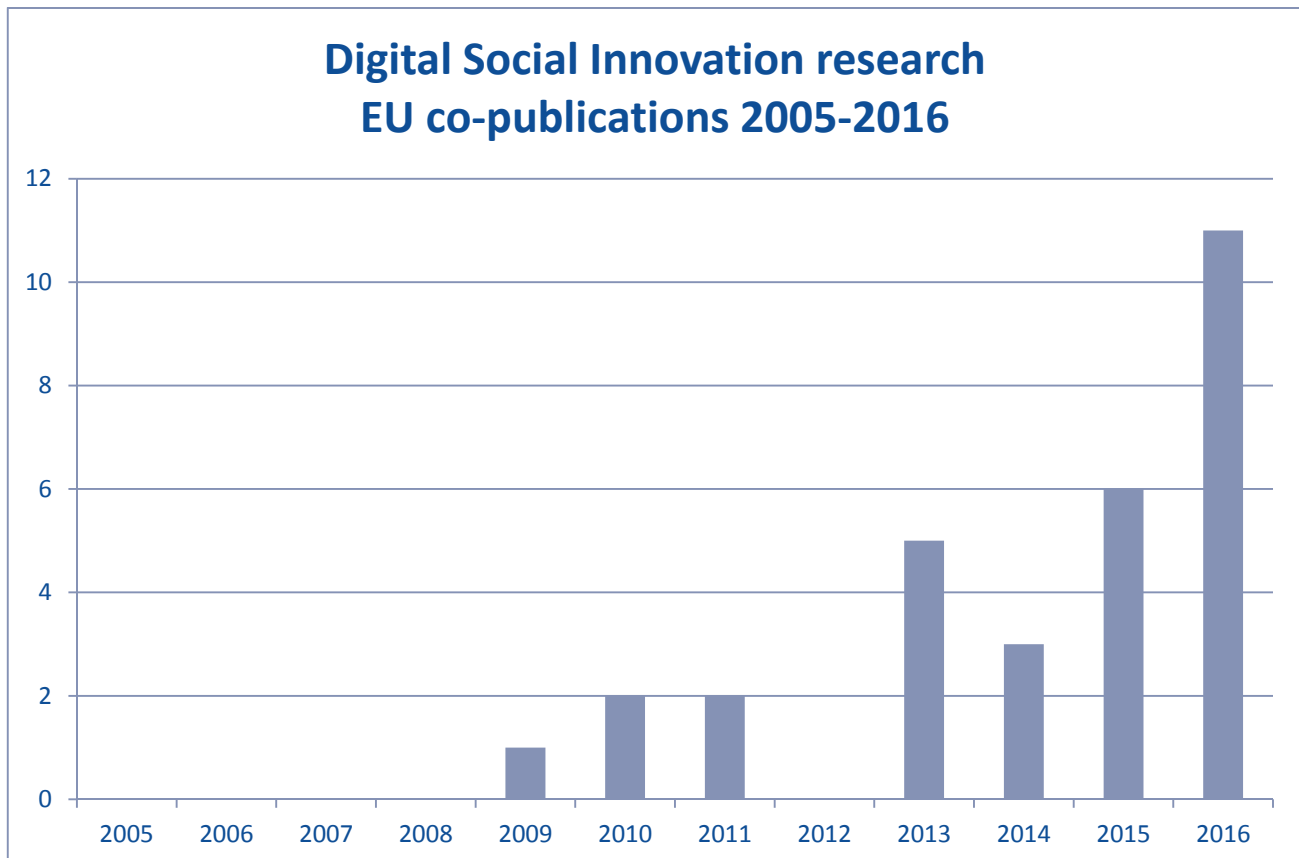


Figure 11: EU co-publications in Digital Social Innovation (DSI) research, 2005 and 2016



Similar to the Smart City concept, ICT is *the* enabling technology for *Digital Social Innovation*. Thus, it is not surprising that Computer Science is strongly represented in DSI publications (see table below). Mathematics and social sciences have been observed most frequently as well.

Table 4: Research areas in EU Digital Social Innovation research co-publications, 2005-2016

subject areas	co- publications
Computer Science	20
Mathematics	8
Social Sciences	6
Business, Management and Accounting	4
Decision Sciences	3
Engineering	2
Arts and Humanities	1

The keywords mentioned most in the EU co-publications in DSI (Digital Social Innovation) research are *social innovation(s)*, *innovation*, *internet*, *digital social innovation*, and *social online networking*. The table below contains the full list of the top 20 keywords.

Table 5: Most used keywords in EU Digital Social Innovation research co-publications, 2005-2016

Keyword	co- publications
Social Innovation(s)	20
Innovation	12
Internet	6
Digital Social Innovation	5
Social Networking (online)	5
Crowdsourcing	3
Human Computer Interaction	3
Social Media	2
Collaboration	2
Collective Awareness Platforms For Sustainability And Social Innovation (CAPS)	2
Digital Inclusion	2
Digital Storage	2
Digital Technologies	2
European Commission	2
Internet Use	2
Knowledge Management	2
Social Challenges	2
Social Inclusion	2
Societies And Institutions	2
Sustainable Development	2



With regard to the countries most involved in EU Digital Social Innovation co-publications, Italy and the UK lead the field. After that, the field is close and the number of co-publications fairly low (cf. table below). Third countries involved in those EU publications are China, UAE, and the US (marked in grey).

Table 6: List of countries most frequently involved in EU Digital Social Innovation co-publications (2005-2016)

Country	Co-publications
Italy	8
United Kingdom	8
Germany	4
Greece	3
Spain	3
Netherlands	2
Portugal	2
Sweden	2
Austria	1
Belgium	1
China	1
Denmark	1
Finland	1
France	1
Hungary	1
Ireland	1
Poland	1
United Arab Emirates	1
United States	1

Among the organisations most involved in EU research on DSI are the Università degli Studi di Firenze (IT) with three co-publications and with two co-publications each the Lancaster University (UK), the Center For Research and Technology (GR), the Universitat Pompeu Fabra (ES), and the Universität Dortmund (DE).

EU-US CO-PUBLICATIONS IN OPEN SCIENCE & OPEN INNOVATION

Of all three analysed topics, Open Science and Open Innovation is the one that has gained most momentum in recent years – in the US alone, roughly 2 200 publications could be observed during 2005 and 2016. Co-publications involving at least one EU member state amount to close to 5 200 in the same period of time. Worldwide, this figure is close to 9,600, of which the EU share is close to 54% and the US share is close to 23%.

EU-US co-publications in research on Open Science and Open Innovation amount to close to 480 between 2005 and 2016. As the co-publications output started with under 10 co-publications in 2005, the growth potential was quite high. Accordingly, the number of co-publications increased by a factor of close to 16 in 2016. It would be reasonable to use the number of co-publications of 2015, considering that the consulted citation database has not finished its coverage of 2016 publications, which is why the number of co-publications in 2016 is lower than in 2015. If this was done, the growth factor would be roughly 18. The figure below shows the development over time – from 2009 on, a steep increase can be observed.



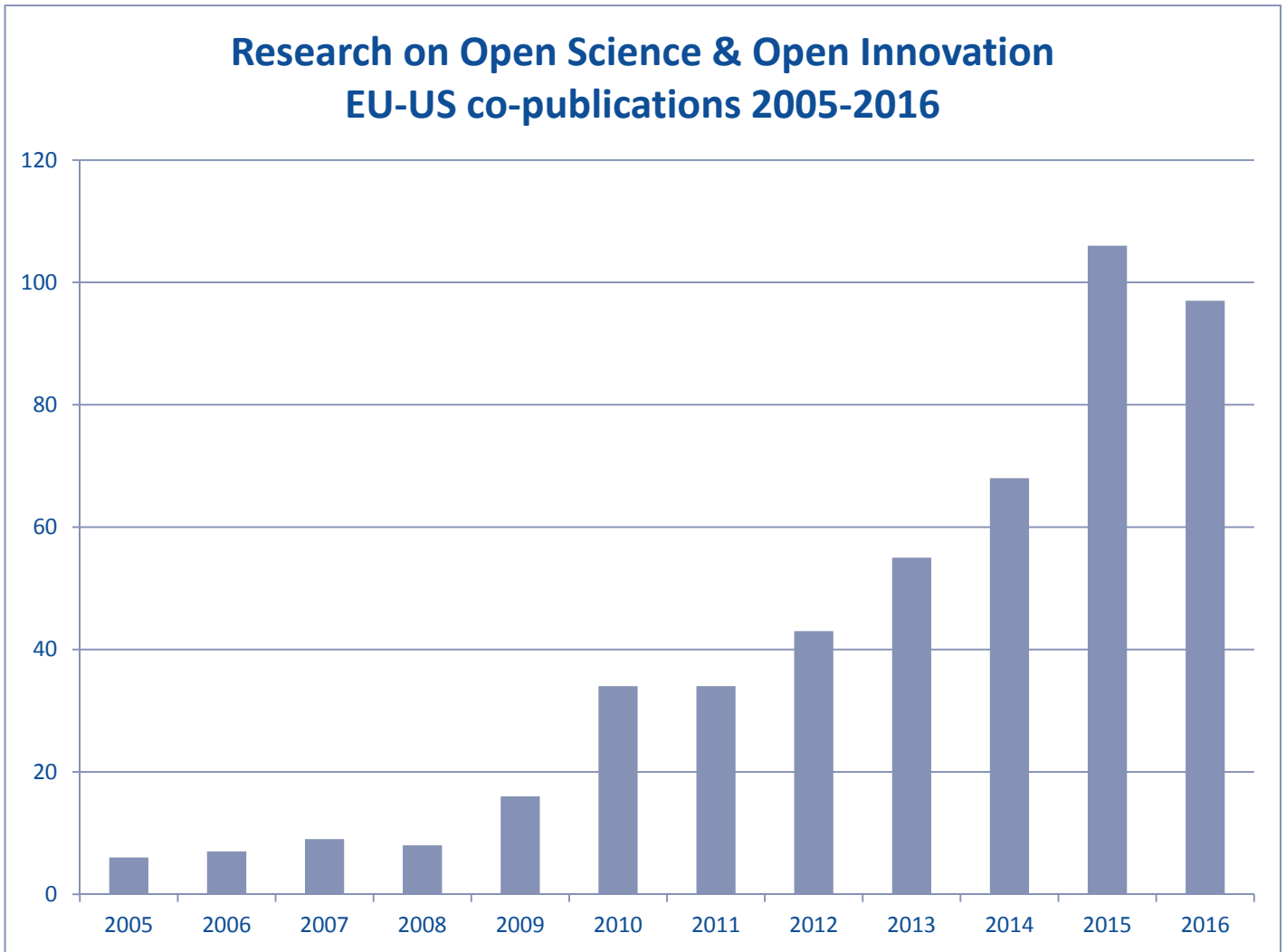


Figure 13: EU-US co-publications in Open Science and Open Innovation research, 2005 and 2016

Considering the research areas involved in EU-US Open Science & Open Innovation research output, *Computer Science* heads the list by far, which is unsurprising as digital technologies are a key enabler. Among the other most frequently observed subject areas are *Business, Management, and Accounting; Medicine; and Engineering*. The table below lists further subject areas.



Table 7: Research areas in EU-US Open Science and Open Innovation co-publications, 2005-2016

Subject areas	Co-publications
Computer Science	203
Business, Management and Accounting	82
Medicine	75
Engineering	61
Biochemistry, Genetics and Molecular Biology	53
Mathematics	53
Social Sciences	52
Psychology	40
Neuroscience	37
Agricultural and Biological Sciences	29
Immunology and Microbiology	29
Decision Sciences	28
Physics and Astronomy	24
Economics, Econometrics and Finance	20
Earth and Planetary Sciences	16
Arts and Humanities	15
Pharmacology, Toxicology and Pharmaceutics	15
Environmental Science	14
Chemistry	10

With regard to the keywords most frequently used in EU-US co-publications in Open Science and Open Innovation, *data* (open, linked; handling; movement) and semantic web (+ semantics in general) are close to the top of the list (see below), apart from the main terms (open) innovation and science. Interestingly, *open materials* has also been mentioned relatively frequently, as has *research* itself. We would usually exclude such meta-terms (other examples: *study, trial, experiment*) but this one is relevant as it refers to *Open Science* changing the way of doing science.



Table 8: Most used keywords in EU-US Open Science and Open Innovation research co-publications, 2005-2016

keyword	CO- publications
Open Innovation	74
Innovation	57
Open Data	53
Semantic Web	36
Open Science	35
Data Movements	27
Semantics	27
Data Handling	25
Linked Datum	25
Open Materials	21
Linked Open Data	20
Quality Control	20
Research	20
Linked Data	17
Information Dissemination	18
Decision Making	17
Linked Open Datum	17
Open Datum	17
Social Networking (online)	16
World Wide Web	16

The EU countries most involved in research on Open Science and Open Innovation with the US are the United Kingdom, Germany, and – with some distance – the Netherlands and France (cf. table below). Third countries involved in those EU-US research collaborations are Switzerland, Canada, Israel, Norway, China, and Japan (marked in grey).

Table 9: List of 20 countries most involved in EU-US Open Science and Open Innovation research co-publications (2005-2016)

Country	Co-publications
United States	483
United Kingdom	167
Germany	113
Netherlands	51
France	49
Switzerland	44
Italy	42
Spain	37
Sweden	31
Ireland	30
Canada	27
Finland	24
Israel	21
Austria	17



Norway	17
Australia	16
Belgium	16
China	16
Japan	16
Denmark	15
Greece	10

While research on Open Science and Open Innovation seems to be concentrated in terms of organisations involved, the number of involved research organisations on the EU side is quite high. The US organisations most involved in EU-US co-publications on this topic are Science Exchange, the Center for Open Science, the University of Virginia, and Stanford University. On the EU side, among the most involved organisations are the University of Oxford (UK), Mendeley (NL), the Universität Leipzig (DE), and the University of Edinburgh (UK). The table below shows the complete list of the 15 most involved organisations. Please note that the entries in a table row do not represent a pairing of organisations.

Table 10: US and EU organisations most involved in EU-US Open Science and Open Innovation research co-publications (2005-2016)

US organisations	CO- publications	EU organisations	CO- publications
Science Exchange (US)	19	University of Oxford	22
Center for Open Science (US)	18	Mendeley (NL)	15
University of Virginia (US)	18	Universität Leipzig (DE)	10
Stanford University (US)	16	University of Edinburgh (UK)	10
Fermi National Accelerator Laboratory (US)	13	Hebrew University of Jerusalem (IL)	9
University of Washington, Seattle (US)	13	UCL (UK)	9
UC Berkeley (US)	13	University of Manchester (UK)	8
University of Pennsylvania (US)	12	London Business School (UK)	8
Duke University (US)	12	Imperial College London (UK)	8
Columbia University in the City of New York (US)	12	University of Cambridge (UK)	8
University of Maryland (US)	11	University of Amsterdam (NL)	7
University of Wisconsin Madison (US)	11	National University of Ireland Galway (IE)	7
University of Colorado at Boulder (US)	10	Friedrich-Alexander-Universität Erlangen-Nürnberg (DE)	6
Harvard University (US)	10	Uppsala Universitet (SE)	6
University of Chicago (US)	10	University College Dublin (IE)	6



FUNDING OPPORTUNITIES

As it has been described in deliverable 3.1 “Analysing report on consultation process with funders and policymakers”, the cooperation between the EU and the US may be supported through a number of mechanisms. Horizon 2020 is the biggest EU Research and Innovation programme with nearly €80 billion of funding available over seven years (2014 to 2020). H2020 is the financial instrument for funding STI EU-US cooperation. US researchers submit applications to Horizon 2020, usually in areas of excellent science and societal challenges. The most common action types that US researchers apply for, include Marie Skłodowska-Curie actions (MCSAs) and research and Innovation Actions (RIAs)⁸. The table on the following page presents the funding opportunities in Horizon 2020. These calls are related to the topics of Smart cities, Digital Social Innovation and Open Innovation & Open Science. The information depicted in this report is collected through the Participant Portal of the European Commission⁹.

⁸ Deliverable 3.1 *Analyzing report on consultation process with funders and policymakers-*
http://www.eusscienceandtechnology.eu/assets/content/deliverables/bilatusa4.0_d3.1_final_forwebsite.pdf)

⁹ Research & Innovation Participant Portal of the EC,
<https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/index.html>



CALL	Topic Identifier	Call	Deadline	Budget	Scope	link
INFORMATION AND COMMUNICATION TECHNOLOGIES	ICT-03-2016	Startup Europe for Growth and Innovation Radar	25/04/2017 17:00 (Brussels time)	12.000.000,00 €	support expansion of startups; stimulate further tech entrepreneurship and the creation of new high growth businesses and jobs, seeking maximum synergies through European innovation ecosystems	http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/ict-32-2017.html
SMART AND SUSTAINABLE CITIES	SCC-02-2016-2017	Demonstrating innovative nature-based solutions in cities	Deadline two stages 2016: 08/03/2016 - 06/09/2016 Deadline two stages 2017: 07/03/2017 - 05/09/2017	40.000.000,00 €	nature-based solutions for regional and local city authorities; enhance climate and water resilience in cities; address inclusive urban regeneration in cities	http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/scc-02-2016-2017.html
INTERNET OF THINGS	IoT-03-2017	R&I on IoT integration and platforms	25/04/2017 17:00 (B	35.000.000,00 €	innovation in components, systems, networking and web technologies in relation to the needs of future IoT systems in terms of scalability, heterogeneity, complexity and dynamicity; identify the added value of the proposed approach specific to IoT in compariso to generic solutions	http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/iot-03-2017.html
HORIZON 2020 DEDICATED SME INSTRUMENT 2016-2017	SMEInst-01-2016-2017	Open Disruptive Innovation Scheme	visit website	126.000.000,00 €	provide support to a large set of high risk innovative Startups and SMEs in the ICT sector; potential for disruptive innovation and fast market up-take	http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/smeinst-01-2016-2017.html
HORIZON 2020 DEDICATED SME INSTRUMENT 2016-2017	SMEInst-06-2016-2017	Accelerating market introduction of ICT solutions for Health, Well-Being and Ageing Well	visit website	30.500.000,00 €	overcome the current gaps in exploitation of promising research results in ICT for Health, Well-being and Ageing well; stimulate increased availability and market uptake of relevant ICT products and services	http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/smeinst-06-2016-2017.html
HORIZON 2020 DEDICATED SME INSTRUMENT 2016-2017	SMEInst-09-2016-2017	Stimulating the innovation potential of SMEs for a low carbon and efficient energy system	visit website	96.000.000,00 €	develop resource-efficient, cost-effective and affordable technology solutions to decarbonise and make more efficient the energy system in a sustainable way	http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/smeinst-09-2016-2017.html
HORIZON 2020 DEDICATED SME INSTRUMENT 2016-2017	SMEInst-10-2016-2017	Small business innovation research for Transport and Smart Cities Mobility	visit website	118.800.000,00 €	innovation activities; facilitating the start-up and emergence of new high-tech SMEs; Actions to develop new services, products, processes, technologies, systems to achieve the EU goals	http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/smeinst-10-2016-2017.html
HORIZON 2020 DEDICATED SME INSTRUMENT 2016-2017	SMEInst-12-2016-2017	New business models for inclusive, innovative and reflective societies	visit website	22.200.000,00 €	attract business to use public platforms to create more value as current business models do not adequately exploit the benefits of participation and collaboration with government; enable SMEs in traditional and new sectors to innovate and grow across traditional boundaries	http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/smeinst-12-2016-2017.html
2016-2017 MOBILITY FOR GROWTH	MG-4.1-2017	Increasing the take up and scale-up of innovative solutions to achieve sustainable mobility in urban areas	Deadline two stages: 26/01/2017 - 19/10/2017 17:00 (Brussels time)	N/A	Traffic and travel avoidance, Optimising the use of existing infrastructure, design and use of multi-modals hubs, Supporting modal shift towards more efficient modes, New governance models for freight and passenger transport	http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/mg-4.1-2017.html



CONCLUSIONS

This report has analysed EU-US research collaboration patterns in terms of participation in projects funded by the EU via the Framework Programme on Research and Technological Development (short FP) and Horizon 2020 and in terms of publications co-authored by researchers in the US and researchers in the EU. As a result of the consultation process with policy makers and the EC the priority areas covered through this report are Smart Cities, Digital Social Innovation and Open Innovation & Open Science. In these three thematic areas, ICT has been portrayed as a cross-cutting issue valuable for supporting research and development.

Since these thematic areas are new, it is not surprising that the share of projects with US collaboration is low, compared to the results of Del 2.1 “Report on Status quo and EU-US STI Cooperation patterns”.

Regarding the area of Smart cities, only two projects have been implemented with the collaboration of the US, out of 85 that have been funded by the EC. For the “Digital Social Innovation”, there was no US collaboration identified among the 36 projects that were funded both under FP7 and H2020. When it comes to open innovation and open science, only three projects have been identified with US partners out of the total of 41 projects.

Thus, for all three thematic areas identified, only five projects have US partners. The overall funding for these priority areas amount to roughly 23.7 million- about 7.7m went to smart cities and 16 million to open innovation and open science, whereas, no projects with US partners related to DSI were funded.

The majority of the US partners in these five projects come from the Education sector, since five of them are universities and only one is categorised as “other” (Public Library of Science).

The most active countries in creating synergies in these areas are Belgium and Germany, that are involved in four out of the five projects mentioned in this report. Ireland comes next by participating in three projects.

Regarding the co-publications, of all three-analysed emerging/hot topics, *Open Science and Open Innovation* seems to have gained the most momentum so far. The number of EU-US co-publications in research *Digital Social Innovation* is so low that the overall EU co-publications on this subject (with or without US involvement) were regarded to gain an understanding of recent developments.

It goes without saying that ICT plays a key role in all three topics as it is *the* enabling technology in each of those concepts. Consequently, Computer Science and, to a lesser degree, Engineering can be observed in the list of most frequently involved research subject areas.

The list of EU countries most involved is typically headed by the “EU Big Three”, i.e. the UK, Germany, and France. However, this does not necessarily apply to the three topics under scrutiny – while the UK is very visible and, to a lesser extent, also Germany; France is not as present as one would expect. Instead, Italy and Spain are among the top in the list of the three topics. That said, this could quickly change in the future when those topics pick up more momentum as the bigger countries kick off their respective research.

Regarding the organisations that are most involved in EU-US co-publications, the analysis did not yield any significant results for two of the three focus topics as the number of respective co-publications is fairly low and the number of



organisations relatively high. Consequently, the organisations involved in research on Open Science and Open Innovation were used. On the US side, Science Exchange, the Center for Open Science, the University of Virginia, and Stanford University are most involved in co-publications on this topic. On the EU side, the most visible organisations are the University of Oxford (UK), Mendeley (NL), the Universität Leipzig (DE), and the University of Edinburgh (UK).

It could be concluded that these thematic areas have an increased research interest, as described in this report, but the rate of US cooperation patterns is still very low, since the average rate of US participants in EU research projects in these specific topics, is only 3%, five projects out of 162 that were identified. In addition, the lack of common policies or strategy in these research fields justifies also the low rates on EU-US join publications. All the aforementioned conclude into the need for further actions to be planned in order to foster the EU - US cooperation.

In order to further examine if these thematic areas should be further enhanced by actions to promote US cooperation, a set pilot workshops is planned. During the pilot workshops, top level researchers and policy makers will be brought together to discuss if these areas are appropriate to be included in the 'established' thematic areas of EU-US cooperation. The outcome of these workshops will be a policy brief with suggestions for the future cooperation development in these thematic fields. In addition, the policy brief will also include risks, scale and scope considerations for the area, and possibilities to bundle capacities through EU-US cooperation.



ABBREVIATIONS

Acronym	Full name
AC	Associated Countries to Horizon 2020
AT	Austria
AU	Australia
BE	Belgium
BG	Bulgaria
BR	Brazil
CH	Switzerland
CZ	Czech Republic
DE	Germany
DK	Denmark
DSI	Digital Social Innovation
EL	Greece
ES	Spain
EU	European Union
FI	Finland
FP7	Framework Programme 7
FR	France
H2020	Horizon 2020 – the EU’s 8th Framework Programme for Research and Innovation
HR	Croatia
HU	Hungary
ICT	Information Communication Technologies
ID	Indonesia
IE	Ireland
IT	Italy
KR	South Korea
MCSAS	Marie Skłodowska-Curie
MS	Member States
MY	Malaysia
NL	Netherlands
OI	Open innovation
OS	Open Science
PH	Philippines
PL	Poland
PT	Portugal
RO	Romania
SE	Sweden
SI	Slovenia
SK	Slovakia
STI	Science Technology Innovation
TR	Turkey
TW	Taiwan
UK	United Kingdom
US	United States



DISSEMINATION PLAN

LINK ON THE PROJECT WEBSITE FOR DISSEMINATION:	http://www.euussciencetechnology.eu/
MAIN TARGET GROUPS OF THIS DELIVERABLE	EU & US-Researchers, EU & US-Research organisations, EU & US-funding agencies, EU& US policy makers
WHAT IS EXPECTED AS A GOOD BENCHMARK FOR HITS ON THE WEBSITE FOR THIS ACTIVITY LINK?	200-300
HOW IS THE DELIVERABLE REACHING TO TARGET GROUP?	Online Database; printed version; PDF
WHICH CHANNELS ARE USED?	Project web-site, newsletter, partner networks, WP3 workshops

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ANNEXES

Annex A. Collaboration Research Projects Analysis

In the context of this deliverable an advanced search and analysis was conducted in the open data of the EC, provided by CORDIS. More specifically, two separate data sets were collected from CORDIS. One was related to the participation date in research projects during the implementation of the FP7 programme and the other was participation data in H2020. The data related to FP7, were fairly complete since the projects have ended and the last update from CORDIS was on 11/11/2015, while for H2020 who could only access the data that were updated on the 22/12/2016, since the programme is still In process. The data were extended/improved by information obtained from online research, as there was originally no data available in the database. Other than that, no external information was added to the database. For both data sets, a keyword search was conducted based on the three topics. For each thematic topic, a set of keywords was created in order to optimise the search results of the data base. After collecting the search results, the outcomes were scanned to confirm that the projects were related to the three thematic areas. Then, the short lists of the research projects were further analysed, to identify if there were any US partners. The analysis of this data sets was conducted by conventional suite of Office 2016.

SMART CITIES:The following terms in the objective of each project to identify which projects were relevant to Smart Cities were used. In addition, the funding calls were also used to double check the objective of the project.

- *smart cit & transport
- *smart & urban but NOT smart phones
- *smart cit & infrastructures
- *smart cit & Information Communication Technolog

OPEN INNOVATION & OPEN SCIENCE:

- *open research data
- *open science & open innovation & open data
- *open governmental data
- *open innovation
- *open data
- *data movement & open innovation
- *open government & open data & open innovation
- *open government & open data
- *open research & open innovation

DIGITAL SOCIAL INNOVATION:

- *internet science & social
- *social innovation & digital
- *social innovation & internet
- *social needs & digital
- *social challenges & digital & innovation
- *social innovation & collective awareness platform
- *collective awareness
- *social innovation
- *social innovation & awareness network



Annex B: Co-publications analysis – Methodology

In the context of the co-publication analysis, a co-publication is considered a cross-border publication, i.e. where at least one author affiliated with at least one organisation in a country jointly publishes a scholarly work with at least one other author affiliated with at least one organisation in a different country. E.g. a publication involving an author affiliated with the MIT and another one affiliated with the Pennsylvania State University is not considered by this study as a co-publication, because only one country is involved; the interest of this study is to capture international collaboration, hence the cross-border nature of the co-publication definition.

The co-publication analysis relies on the correctness of the data provided by Scopus. It is safe to assume that the data are incomplete, contain errors, and are skewed in terms of the coverage of scientific disciplines. It is recommended to view the offered results merely as indicative that should be triangulated with qualitative expertise, both methodologically and related to the research domain.

The three emerging priority research areas that are of interest in the context of this study are Smart Cities research with a focus on transport, research on Digital Social innovation, and research on Open Innovation and Open Science. Since neither of these themes are well classified by Scopus, i.e. there are no predefined subject areas that could be directly used in our database search, a nuanced search using keyword sets were necessary. Below, the information on how the database queries were constructed, is provided. Note, that “*” (asterisk) indicates a wildcard parameter, meaning that a term + anything afterwards is considered as relevant – e.g. transport* would include e.g. transportation.

All scholarly works co-published (EU-US) between 2005 and 2016 were queried. As indicated in the main part of the document, when talking about the EU, the EU28 plus selected countries associated to the EU Framework Programme were considered, i.e. Iceland, Israel, Norway, Ukraine, Switzerland, and Turkey.

SMART CITIES RESEARCH (WITH A FOCUS ON *TRANSPORT*)

The following terms to search in the title, abstract, or keywords part of a publication to identify relevant works were used:

- smart cities
- smart city
- transport*

At least one of the first two terms had to be present, the third term had to be present in any case.

Scopus query: TITLE-ABS-KEY({smart cities} OR {smart city}) AND TITLE-ABS-KEY("transport*") AND AFFILCOUNTRY (united states) AND PUBYEAR > 2004 AND PUBYEAR < 2017 AND (AFFILCOUNTRY (austria) OR AFFILCOUNTRY (belgium) OR AFFILCOUNTRY (bulgaria) OR AFFILCOUNTRY (croatia) OR AFFILCOUNTRY (cyprus) OR AFFILCOUNTRY (czech republic) OR AFFILCOUNTRY (denmark) OR AFFILCOUNTRY (estonia) OR AFFILCOUNTRY (finland) OR AFFILCOUNTRY (france) OR AFFILCOUNTRY (germany) OR AFFILCOUNTRY (greece) OR AFFILCOUNTRY (hungary) OR AFFILCOUNTRY (ireland) OR AFFILCOUNTRY (italy) OR AFFILCOUNTRY (latvia) OR AFFILCOUNTRY (lithuania) OR AFFILCOUNTRY (luxembourg) OR AFFILCOUNTRY (malta) OR AFFILCOUNTRY (netherlands) OR AFFILCOUNTRY (poland) OR AFFILCOUNTRY (portugal) OR AFFILCOUNTRY (romania) OR AFFILCOUNTRY (slovakia) OR AFFILCOUNTRY (slovenia) OR AFFILCOUNTRY (spain) OR AFFILCOUNTRY (sweden) OR AFFILCOUNTRY (united kingdom) OR AFFILCOUNTRY (switzerland) OR AFFILCOUNTRY (norway) OR AFFILCOUNTRY (turkey) OR AFFILCOUNTRY (israel) OR AFFILCOUNTRY (iceland) OR AFFILCOUNTRY (ukraine))



RESEARCH ON DIGITAL SOCIAL INNOVATION

Since Digital Social Innovation is not yet an established field nor a well-developed concept, several keywords that involve related concepts, such as *social innovation* in connection with digital technologies, *internet science* in connection with social issues, or *social innovation* in connection with open data were used.

Scopus query: TITLE-ABS-KEY(({digital social innovation} OR {digital social innovations}) OR ({internet science} W/15 social) OR ((({social innovation} W/15 digital) OR ({social innovations} W/15 digital))) OR ((({social innovation} W/15 internet) OR ({social innovations} W/15 internet)) OR (({social need} W/15 digital) OR ({social needs} W/15 digital) AND NOT {non-digital}) OR (({social challenge} W/15 digital) OR ({social challenges} W/15 digital)) OR (({social innovation} W/15 "open data") OR ({social innovations} W/15 "open data")) OR ((({social innovation} W/15 "collective awareness") OR ({social innovations} W/15 "collective awareness"))) AND PUBYEAR > 2004 AND PUBYEAR < 2017 AND (AFFILCOUNTRY (austria) OR AFFILCOUNTRY (belgium) OR AFFILCOUNTRY (bulgaria) OR AFFILCOUNTRY (croatia) OR AFFILCOUNTRY (cyprus) OR AFFILCOUNTRY (czech republic) OR AFFILCOUNTRY (denmark) OR AFFILCOUNTRY (estonia) OR AFFILCOUNTRY (finland) OR AFFILCOUNTRY (france) OR AFFILCOUNTRY (germany) OR AFFILCOUNTRY (greece) OR AFFILCOUNTRY (hungary) OR AFFILCOUNTRY (ireland) OR AFFILCOUNTRY (italy) OR AFFILCOUNTRY (latvia) OR AFFILCOUNTRY (lithuania) OR AFFILCOUNTRY (luxembourg) OR AFFILCOUNTRY (malta) OR AFFILCOUNTRY (netherlands) OR AFFILCOUNTRY (poland) OR AFFILCOUNTRY (portugal) OR AFFILCOUNTRY (romania) OR AFFILCOUNTRY (slovakia) OR AFFILCOUNTRY (slovenia) OR AFFILCOUNTRY (spain) OR AFFILCOUNTRY (sweden) OR AFFILCOUNTRY (united kingdom) OR AFFILCOUNTRY (switzerland) OR AFFILCOUNTRY (norway) OR AFFILCOUNTRY (turkey) OR AFFILCOUNTRY (israel) OR AFFILCOUNTRY (iceland) OR AFFILCOUNTRY (ukraine))

NB: to include the US, one would need to add the parameter AND AFFILCOUNTRY (united states)

RESEARCH ON OPEN INNOVATION AND OPEN SCIENCE

Both *Open Innovation* and *Open Science* have recently picked up momentum in both scientific research and policy-making. Consequently, they can be directly used as keywords. To emphasise the spirit of openness, the strongly related concepts *open data*, *open research data*, *open governmental data*, *data movement* were included:

- open science
- open innovation
- open data
- open research data
- open governmental data
- data movement

At least one of these keywords had to be present.

Scopus query: TITLE-ABS-KEY({open science} OR {open innovation} OR {open data} OR {open research data} OR {open governmental data} OR {data movement}) AND AFFILCOUNTRY (united states) AND PUBYEAR > 2004 AND PUBYEAR < 2017 AND (AFFILCOUNTRY (austria) OR AFFILCOUNTRY (belgium) OR AFFILCOUNTRY (bulgaria) OR AFFILCOUNTRY (croatia) OR AFFILCOUNTRY (cyprus) OR AFFILCOUNTRY (czech republic) OR AFFILCOUNTRY (denmark) OR AFFILCOUNTRY (estonia) OR AFFILCOUNTRY (finland) OR AFFILCOUNTRY (france) OR AFFILCOUNTRY (germany) OR AFFILCOUNTRY (greece) OR AFFILCOUNTRY (hungary) OR AFFILCOUNTRY (ireland) OR AFFILCOUNTRY (italy) OR AFFILCOUNTRY (latvia) OR AFFILCOUNTRY (lithuania) OR AFFILCOUNTRY (luxembourg)



OR AFFILCOUNTRY (malta) OR AFFILCOUNTRY (netherlands) OR AFFILCOUNTRY (poland) OR AFFILCOUNTRY (portugal) OR AFFILCOUNTRY (romania) OR AFFILCOUNTRY (slovakia) OR AFFILCOUNTRY (slovenia) OR AFFILCOUNTRY (spain) OR AFFILCOUNTRY (sweden) OR AFFILCOUNTRY (united kingdom) OR AFFILCOUNTRY (switzerland) OR AFFILCOUNTRY (norway) OR AFFILCOUNTRY (turkey) OR AFFILCOUNTRY (israel) OR AFFILCOUNTRY (iceland) OR AFFILCOUNTRY (ukraine))

