



Grant Agreement No.: 632912
Coordination and support action
Call Identifier: FP7-2013-ICT-FI 1.9



**Link and Evangelize the FI-PPP from Europe to the world
for the benefit of FI research and innovation and to the
European industry business**

D3.2.1: Policy and regulation taxonomy v1

Revision: v. 2.2

Work package	WP 3
Task	Task 3.3
Due date	31/05/2015
Submission date	24/07/2015
Deliverable lead	ENG
Version	1
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Abstract	This deliverable defines a set of criteria to classify the positioning of a set of identified EU regions, in terms of policies, laws, economic regulations and existing facilities towards the adoption of Future Internet technologies. Starting from the work already done by the CONCORD PRG WG, this deliverable also proposes a questionnaire to be submitted to the regions to gather additional information on specific issues encountered while adopting FIWARE technologies (survey results will be reported in the second and final version of this deliverable).
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Keywords	FIWARE adoption, Smart Specialization Strategy, Policy Regulation and Governance (CONCORD PRG WG), Regional policies, Open innovation; FIWARE Lab usage.
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Document Revision History

Vers ion	Date	Description of change	List of contributor(s)
V1.0	27.04. 2015	First draft ToC of deliverable	Laura Pucci
V1.1	07.05.2015	Toc revised, assignments of contributions	Laura Pucci
V1.2	19.05.2015	Contribution from UPM	Jose Gonzalez
V1.3	20.05.2015	Contribution from ORANGE First contribution on Criteria	Pierre-Yves Danet Nadia Nardi, Laura Pucci
V1.4	28.05.2015	Methodology, Criteria	Nadia Nardi, Laura Pucci
V1.5	06.06.2015	Data gathering	Nadia Nardi, Laura Pucci
V1.6	18.06.2015	Introduction, conclusions, updated preliminary recommendation	Laura Pucci
V1.7	24.06.2015	Updates from UPM	Federico Alvarez
V1.8	26.06.2015	Updates from ORANGE	Pierre-Yves Danet
V1.9	27.06.2015	Implemented comments from UPM, finalized version for final review	Laura Pucci
V2.0	21.07.2015	Internal review by CREATE-NET	Federico Facca
V2.1	23.07-2015	Final version addressing review comments	Laura Pucci, Pierre-Yves Danet
V2.2	24.07.2015	Final revision and formatted version	Monique Calisti

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Project co-funded by the European Commission in the 7 th Framework Programme (2007-2013)		
Nature of the deliverable:		R*
Dissemination Level		
PU	Public	✓
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EXECUTIVE SUMMARY

The deliverable “Policy and regulation taxonomy” is intended to draw the *regional orientation and policies* concerning the adoption of Future Internet (FI) technologies, specifically in the case of FIWARE. This drawing will be implemented through a classification (taxonomy) of selected European regions on the basis of specific identified criteria. This report is the first version of the deliverable and covers the first steps needed in order to have that taxonomy, namely the specific definition criteria useful to classify the regions. The second version of this deliverable, namely D3.2.2 to be released at M24, will expose the whole taxonomy, by describing for each selected criterion, the position of each identified region and outlining the actual situation with respect of that specific topic.

The European regions that will be classified are those selected by the FI-LINKS project, since they actually represents those regional ecosystems that were (and are) more responding, interested and mature towards the adoption of the FIWARE technologies (the identification of these regions is detailed in the FI-LINKS deliverables “D3.1.1 - Updated version of the ICT region taxonomy focusing on FI-PPP”¹).

The set of criteria according to which those regions will be positioned was defined by considering policies, laws, economic regulations and any other regulations that, at regional level, could affect the adoption of FI technologies. In fact, such elements can either foster or act as a barrier for the FI adoption. Certainly the “regional level” in some cases (e.g. when national or European laws are in force) may correspond to the national or European one.

The starting point of the methodology to build the taxonomy was the elaboration of the outcomes of previous initiatives: the Smart Specialization Strategy (S3 Platform), the Coalition for Action CfA REGIO, the FI-PPP work programme; and the market analysis of the FIWARE project itself were taken into account as well. All these inputs were further refined also thanks to the feedbacks gathered from the regions representatives during the many meetings already held by the FI-LINKS Consortium.

The following step of the methodology was the formalization of a number of criteria identified in order to draw the taxonomy; this deliverable presents this set of criteria in order to position regions and classify them on the basis of their policies and orientation towards the Future Internet.

Then, the further steps of the methodology will be the data gathering, mapping each region for each given criterion, in order to obtain sufficient information for positioning regions on the basis of criteria, which is, actually, the final stage of the taxonomy. Considering that for some criteria the information are not publicly available but will be asked to the regions representatives, it is then clear that the classification of regions is something to be constantly updated on the basis of the meetings that FI-LINKS project will hold with regional representatives.

For this reason, the taxonomy of the region orientation and policies with respect to the adoption of FI technologies is to be considered at an initial stage and the final taxonomy, with a classification of the regions will be provided in the second (and final) version of this deliverable, due at the end of the FI-LINKS project lifetime.

This deliverable also deals with relevant issues - many of them are challenges to the FI-PPP - encountered at regional level in the adoption of the FIWARE technologies.

The methodology implemented here started from the issues framework already identified by the CONCORD PRG WG. This list of issues (and challenges) to be addressed for removing barriers preventing the adoption of FIWARE was mainly modeled during FI-PPP Phase 1 and 2 Use Case

¹ The deliverable will be available in the public deliverable section of FI-LINKS website, at <http://fi-links.eu/public-deliverables/>

projects. This issues framework was elaborated and updated, then validated by FIWARE coaches of three Accelerators (FABulous, FINODEX, INCENse). In this way, the list of issues was examined (and enriched) by experienced representatives from Phase 3, being in direct contact with problems and issues that users (SMEs, web entrepreneurs, etc) using FIWARE technologies are actually facing.

The following step of the methodology was to move from an issues taxonomy based on a “project” perspective (issues framework of the PRG WG, based on Phase 1 and phase 2 projects), and on a “domain” perspective (issues list from FIWARE coaches for the Accelerators) to one based on “regional” point of view. To this scope a questionnaire listing all the identified issues was set up. The questionnaire will be submitted to regions representatives in the second year of FI-LINKS project lifetime and the results of the survey will be reported in the final version of this deliverable.

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ABBREVIATIONS

FI	Future Internet
PRG WG	Policies, regulation and Governance CONCORD Working Group
S3	Smart Specialization Strategy
CFA	Coalition For Action
GE(s)	Generic Enabler(s)

1 INTRODUCTION

The evangelization of FI-PPP results is a goal that requires a series of actions and commitment at a widespread and detailed level. This is true in many ways: the exploration to find for those ecosystems (regions) that are ripe for the adoption of technologies FIWARE implies an investigation from a technological, political, economical, social, geographical point of view.

The first important outcome of this research and analysis is the identification by the FI-LINKS project, of number of EU regions that, based on the potential of their ecosystem, are ready to adopt the FIWARE Platform, as described and detailed in FI-LINKS deliverable D3.1.1 - “Updated version of the ICT region taxonomy focusing on FI-PPP”. A task running in parallel to this identification is the analysis of the selected regions in order to further understand and compare their policies regarding the adoption of Future Internet technologies.

This further classification is not meant to assess the identified regions; it will be to the benefit of the regions, since it can help them to position themselves and compare with respect to other EU regions and to find common targets to cooperate within the European FI landscape. It will be also to the benefit of the FI-PPP itself, since a deeper understanding of regional orientations and policies of diverse European regions surely can help in catching (additional) potential barriers that could prevent in those regions the adoption and the spread of the FI technologies. Understanding these barriers may mean, where possible, to model new interventions at European, national, regional to reduce or even remove them.

The first phase to build a taxonomy requires the definition of a set of criteria on which basis can be classified the identified items. In the same way, the preliminary work to this deliverable was the identification of basic criteria to classify, and understand, regions orientation and their policies (which could be read as the “level of maturity of regions”) towards the adoption of the FI technologies. This first phase began with: the analysis of the achievements of the Smart Specialization Strategy and the Coalition for Action; the work programme of the FI-PPP itself; the CONCORD PRG Working Group; inputs coming from the FIWARE project itself.

The focus and cornerstone of these initiatives and studies is the European innovation, by promoting the vision of a sustainable European growth leveraging on local strong points, centers of excellence and resources at regional level, and by basing on the perspective that fostering ICT innovation and open innovation is to the benefit of society. This viewpoint and these objectives are in line with, and included among, the targets of the Digital Agenda and Horizon 2020; to classify regions taking into account what could be local policies affecting specific needs for adopting FI solutions, means having in mind those targets too.

This first version of the *Policy and regulation taxonomy* includes the set of identified criteria on the basis of which regions will be classified. This list of criteria will be proposed to relevant regional representatives identified, to be validated and updated. They will be also partially involved in the classification exercise: since for some of the criteria the taxonomy can be deduced on the basis of available public data, for some others the position of each region must be stated by the region itself. Then, after the validation of the proposed criteria the second and final version of this deliverable will include the positioning of the regions. The plan is to start with those regions that have been identified by the FI-LINKS project as they are most responsive and interested in adopting FIWARE technologies (23 regions selected in this first phase, as described in D3.1.1 “Updated version of the ICT region taxonomy focusing on FI-PPP”).

It is worth to clarify, at this point, that in this deliverable the “FI technologies” and “FIWARE technologies” are considered almost as synonymous, since in the EU contest of ICT innovation dealt with within this deliverable, the FIWARE technology *is* the European answer to the challenges of the Future Internet.

A second section of this deliverable specifically relates to the issues and challenges concerning the

adoption of the FIWARE technologies, namely intended as the set-up of FIWARE nodes. It is intended to highlight existing or possible barriers that do or could prevent regions in adopting FI technologies. This topic actually concerns both regions on one hand and the FI-PPP on the other. In some cases those barriers could derive from regional (national) constraints due to specific laws or regulations in force, in some others those barriers could be possibly removed by taking specific actions on the FIWARE side. In order to come up with taxonomy of the issues linked to the FIWARE adoption, the methodology carried out consisted in:

1. Start from the results of the CONCORD PRG Working Group with respect of issues and challenges for the FI-PPP, namely reached with the Phase 1 and 2 projects;
2. Come up with a preliminary list of issues and have it validated by the Phase 3 Accelerators projects;
3. Move from a “project” perspective regarding issues to a “regional” one, by elaborating inputs coming from the identified regions;
4. Convert the obtained taxonomy into a questionnaire to be proposed to the regions.

The resulting questionnaire is thought to be compiled easily and quickly; it will be proposed to regional representatives and the outcomes will be reported in the second version of this deliverable. Basing on these outcomes a number of recommendations will be also developed to the FI-PPP, proposing possible actions to be put in place in order to remove or limit those issues.

A preliminary recommendation, learnt from the meetings occurred with regional representatives, is already reported in this deliverable, as it the real case of the Berlin region.

2 STARTING GRID

The assessment on Policy and Regulation Taxonomy for European regions that FI-LINKS is performing has its basis on prior efforts made in this domain. FI-LINKS will leverage on the background and achievements reached so far and will further develop such initiatives with the focus on the FI-PPP.

2.1 S3 and ICTRegio CfA: the background

National/Regional **Strategies for Smart Specialisation (S3)** are approaches to economic development through targeted support to Research and Innovation (R&I). Such concept emphasizes the principle of prioritisation in a vertical concept and defines a method to identify desirable areas for innovation policy intervention.

Smart specialisation is not one size that fits all the requirements of any region to specialise in a particular set of industries. Instead, it seeks means for finding those new activities that aim at exploring and discovering new technological and market opportunities, opening thereby new domains for building regional competitive advantages.

According to '*The goals of smart specialisation*'², efforts should be concentrated in selected domains dealing with particular kinds of technology, fields and disciplines, focusing on activities that:

- are new, aim at experimenting and discovering technological and market opportunities and have the potential to provide knowledge to others in the economy;
- have scale and agglomeration economies or produce the characteristics of coordination failures.

National and regional authorities across Europe shall design smart specialisation strategies in entrepreneurial discovery process, so that they can be used more efficiently and synergies between different policies, as well as public and private investments can be increased. The S3 platform³ offers regions a forum and a tool to prepare for this.

The **Coalition for Action on ICT in regional programmes (ICTRegio CfA)** is a European-wide network of stakeholders dedicated to bootstrap the next generation of ICT-enabled solutions to deliver economic, social and environmental benefits. Such initiative brings together diverse players to share knowledge and engender collaboration among them:

- Regional & National ICT leaders;
- ICT Research Institutions & University Bodies;
- Entrepreneurs & ICT Commercial Enterprises.

A first workshop was held at the beginning of 2012⁴ with the objective of launching such coalition, with the goal of developing a common framework to assist the regional services in charge of the development of programmes to build a realistic innovation strategy by engaging the local stakeholders and entrepreneurs from the design phase. These efforts contributed to customised strategies developed by regions, based on local evidences using a participatory process of strategic planning. A sound

² D. Foray, X. Goenega, 'The goals of smart specialization', S3 Policy Brief Series n° 01/2013. May 2013

³ Smart Specialisation Platform. <http://s3platform.jrc.ec.europa.eu>

⁴ Workshop on "Launching a Coalition for Action on ICT in regional programmes" (ICT Regio CfA), Brussels, launched in December 2011, http://cordis.europa.eu/fp7/ict/netmedia/docs/workshop_agenda_19_01_2012.pdf

innovation strategy can only be based on a strong partnership between businesses, public entities and knowledge institutions.

2.2 Which regions?

At the beginning of the project FI-LINKS, one of the first tasks was to identify the regions that are the most suitable to implement a FIWARE node. The complete process is described in D3.1.1 - “Updated version of the ICT region taxonomy” focusing on FI-PPP. In addition, following presentation of FIWARE Mundus in several conferences, some regions came back to us in order to get the FIWARE Mundus label.

At the end, 23 regions have been selected, 8 of them have the priority 1 because of their high reactivity and because of their position in the process also described in D3.1.1 - “Updated version of the ICT region taxonomy focusing on FI-PPP”.

Priority	Region	Country
P1	Helsinki (Uusimaa)	Finland
P1	Brittany	France
P1	PACA	France
P1	Picardie	France
P1	Berlin	Germany
P1	Lombardy	Italy
P1	Luxembourg	Luxembourg
P1	Norte	Portugal
P2	South Moravia	Czech Republic
P2	Copenhagen	Denmark
P2	Tallinn	Estonia
P2	Paris Ile de France	France
P2	Baden-Wurttemberg	Germany
P2	South East	Ireland
P2	Emilia-Romagna	Italy
P2	Valle d'Aosta	Italy
P2	Greater Poland	Poland
P2	Basque region	Spain
P2	Canary Islands	Spain
P2	Catalunia	Spain
P2	Malaga	Spain
P2	Navarra	Spain
P2	Stockholm	Sweden

The idea is to begin to work with these regions in order to validate the process and to identify possible difficulties. Then, if other regions are interested in joining, there is no problem to take them onboard. Obviously, the regulation and policy FI-LINKS activity has been based on the same set of regions in order to be able to provide at the end a complete support to setup FIWARE nodes in European Regions.

3 POLICIES TOWARDS FI ADOPTION: REGIONS TAXONOMY

The European Union countries, and their many regions, are diverse institutionally. Within this multi-level context, the relevant policies to the FI-PPP and regulation entities vary considerably based not only on the government and administrative structures, but also on their location within the functional and state structures. For FI-LINKS, further development of the taxonomy with regards to regions policies and regulation with respect to the Future Internet adoption is crucial to better understand the local and diverse ecosystems and compare the different policies involved in those specific regions. At the same time, expanding the taxonomy will also help regions to position themselves and, by comparing themselves to other regions, to verify their level of maturity regarding the adoption of the FI technologies, which could lead to cooperate among them on specific subjects and challenges of the Future Internet. Furthermore, the mapping of the regions to these criteria could give insights into barriers to adoption and also mechanisms/instruments which foster adoption.

3.1 Identifying criteria for positioning regions (methodology)

The taxonomy to classify the different regions orientations concerning FI adoption started with the selection of a set of criteria that could best fit to understand the position of each region and compare regional policies and regulations with regards to the FIWARE adoption.

The identification of these criteria is the first fundamental part of the methodology followed for the purpose of this classification. Without this, the following methodology steps - data gathering and regions positioning - would simply not be possible.

The starting grid was the studies already done at FI-PPP level: work programme, outcomes of the CONCORD Policy Regulation and Governance Working Group, the FIWARE project as well. The CFA ICT Regio and the Smart Specialization Strategy (S3 platform) could be considered as the guidelines for the criteria selection; all these inputs were taken into account to come up with the most comprehensive list of criteria. To this, it should be added as well the preliminary inputs coming from the many interactions occurred between FI-LINKS and identified regions.

How to choose criteria that could specifically relate to the Future Internet?

“ICT innovation”, “internet enabled markets”, “distributed internet platforms”, “Open Innovation” and other paradigms to create conditions for a competitive European growth (at business and social level) are not only the focus of the FI-PPP. Other landmark initiatives must be mentioned thanks to which, in the different European regions, the ideas of internet innovation, digital market, and technology for social benefit are echoing: Digital Agenda for Europe (DAE) and Horizon 2020.

All these initiatives stress the importance to act at local level, fostering the progress by inspiring, supporting, when not discovering, local (regional) centers of excellence. The bet of Europe is to become more and more competitive leveraging on its specific regional ecosystems.

In order to set up of criteria useful to understand the orientation of regional ecosystems towards the FI technologies, it was necessary to step back and have a deeper understanding of what can be considered a “regional ecosystem”, by detailing its boundaries from a political, economical, social point of view.

The “regional approach” to European innovation started a couple of decades ago, when it became clear that the actions and strategies needed to be competitive could not be applied only at a national level, since they could not work the same way in all regions. There were huge differences among European countries concerning their economic structure, their approach to R&D, their institutional organization, their ability to innovate. The peculiarities of regional ecosystems emphasized the importance of a local detailed approach to foster innovation. The new vision, though keeping the importance of national (and international) factors, claimed that the regional dimension was (and is) of key importance. Regions differ with respect to their industrial specialization and their innovation offering. Also the

bursting of knowledge and its flow – having a key role in the innovation processes – has often fertile soil bounded by spatial limits (regional ecosystems). Moreover, policy makers having the power to bound or foster competences, research and innovation, do exist at different institutional levels: European, national and regional.

Certainly, to better understand what are the best parameters that help describing and understanding the attitude of regional ecosystems towards innovation and Future Internet adoption, a single region cannot be considered as a standalone entity, separated by the rest of the world.

A system of regional policies is made up and influenced by **external factors**: national and European policies and rules; international organizations; other regional ecosystems (R&D and technology clusters, centers of excellence and knowledge); economic interests of big industrial companies. Between the regional ecosystem and those external factors there can be a bidirectional flow influencing policies inside and outside the region, due to a continuous activity of integration, dynamic relationship, and interaction among them.

A regional ecosystem is neither a static entity *per se*, also **internal factors** do play their role in the definition of policies and regulation that could bring and foster innovation: the regional socioeconomic and cultural setting; the system that generate and disseminate knowledge and skills (research institutions, R&D and technology centers, innovation centers, technology licensing offices, etc.) as well as educational institutions (universities, training and research institutions, etc.); industrial clusters of the region (including the whole chain of clients, suppliers and competitors as well).

Bearing in mind this overall viewpoint, it is easy to understand how some criteria are actually linked and subject to regional willpower and potentiality, since policy makers can have a crucial role in influencing and implementing regional innovation processes, if there is a certain level of regional legal and financial autonomy. On the other hand, some criteria are constrained by national (or European) bundles or influenced by relationship with other entities and organizations, and cannot easily be controlled at regional level. No doubt, many criteria are actually influenced by both internal and external factors to the regional ecosystem and depend also on synergies put in place among the many different levels of governance (European, National, and Regional).

Within this context, what is the specific frame of the FI-PPP (especially during this last Phase 3) that has to be considered in building up taxonomy of regional policies towards FI adoption?

The FI-PPP generates some specific contributions to resolving [these] challenges e.g. with respect to SMEs and web entrepreneurs. The FI-PPP works on technologies and solutions that respond to the issues and bottlenecks identified in the Digital Agenda, in particular those addressing fragmented digital markets, lack of interoperability, and missed opportunities in addressing societal challenges⁵

Actually, the challenges of the Future Internet in Europe are both included in and include those of Horizon 2020 and the Digital Agenda for Europe (DAE): they run on the same track towards a sustainable European innovation. The over-all aim of the DAE initiative is to “deliver sustainable and social benefits from a digital single market based on fast and ultra-fast internet and interoperable applications”. The Digital Agenda recognizes seven major challenges to be addressed:

1. Fragmented digital markets;
2. Lack of interoperability;
3. Rising cybercrime and low trust;
4. Lack of investment in networks;

⁵ CONCORD DELIVERABLE - D3.4.1 Policy, Regulatory and Governance Recommendations and Roadmaps – issue 1

5. Insufficient R&D;
6. Lack of skills;
7. Fragmented answers to societal questions.

The Digital Agenda initiative is highly relevant for the FI-PPP as it deals with multiple policy aspects that are transversal to the ecosystems of FI-PPP projects. The different pillars address cross-cutting issues of key importance for FI-PPP, such as e-business, standardization, trust, interoperability, security, privacy and other.⁶

Thus, a number of criteria selected are related to policies that increase the innovation capacity of regions, which means the increase of both private and public sector investment in innovation activity and to the policies for integrating technology and industrial sectors. At the same time, the adoption of technologies developed within FIWARE requires some additional specific policies to ease or allow their adoption (for example for regulating access to data, data privacy, or open data licenses). Specifically, for what regards infrastructure connected to the FI-PPP, the two main challenges to address are concerning integration and interoperability and future sustainability⁷.

The final list of criteria has to take into account the well known scope for policies and investments for promoting an internet based innovation, plus new areas of interest, more strictly related to the challenges deriving from the spreading of the FIWARE technologies.

The below Section outlines and describes these criteria. It would be worth to note that this version of the criteria could be considered as a preliminary one. Indeed, discussions with the regions are always on-going and the current criteria could be refined with time, by adding criteria or removing less relevant criteria.

3.2 Explaining identified criteria

The criteria below is presented through 6 sections and grouped by theme. When regions will be mapped to the criteria, information regarding any regulation, legislation, law and policies should be noted for each theme, summarizing from a qualitative point of view the actual situation of the region within it.

1. **Open Innovation Practices** – includes different types of policies that support open innovation and remove possible barriers to collaboration and cooperation across Europe. This criterion is particularly oriented to *fostering entrepreneurship*; it observes the presence of those mechanisms (policies and regulations) that facilitate SMEs and (Web) entrepreneurs to enter the market and participate to the Open Innovation at large.
 - ICT *smart specialisation strategy* affecting Open innovation.
 - *Collaborative innovation networks* (open distributed knowledge network) - such as Open Innovation agencies, involvement of cluster management units and supporting the sharing of

⁶ Communication From The Commission To The European Parliament, The Council, The European Economic And Social Committee And The Committee Of The Regions: A Digital Agenda for Europe. <http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:52010DC0245R%2801%29>
 Internet, Digital Agenda and economic development of European regions. European Parliament Committees, Regional Development (REGI) http://www.europarl.europa.eu/RegData/etudes/etudes/join/2013/513970/IPOL-REGI_ET%282013%29513970_EN.pdf

⁷ INFINITY Project deliverable D5.3: Set of catalogued infrastructures; analysis of technological and operational constraints (v2). <http://www.fi-infinity.eu/sites/default/files/resources/deliverable/53/5.3%20-%205.3%20-%20D%205.3.pdf>

facilities. This includes policies promote innovation in new broadband networks, applications and services, also through support to R&D.

- Legal conditions for *SME engagement/Web entrepreneurs*; avoidance of *market dominance* to facilitate competition. Regional policies addressing the European Commission Action Plan on “European company law and corporate governance - a modern legal framework for more engaged shareholders and sustainable companies”⁸.
 - Legislation regulating *new forms of (online) legal identity* to meet the needed by dynamic and diverse Future Internet businesses.
- 2. Content/Assets protection** – this criterion concerns policies, laws and regulations affecting the creation, the access to and the use of digital content. It includes policies providing incentives for the dissemination and preservation of digital content, or facilitating global access to content and recognizing rights and interests of both creators and users.
- *IP rights* - Regulation of ownership and property rights concerning both (reusable) content and (exploitable) assets.
 - *Digital Rights Management (DRM)* - different DRM technologies are likely incompatible with each other, increasing their damage to the ability of citizens to use legally purchased content.
- 3. Privacy and data protection** – this criterion is intended to address the concerns related to the invisibility of data collection and the ability to trace and profile individuals. It includes the legal framework and policies for regulation and management of data on the basis of the current EU Directive⁹. It also concerns those policies and regulations that aim at maximizing the availability of public sector information for use, which should be based upon the presumption of openness. This criterion is mainly affecting:
- Collecting personal data;
 - Informed consent;
 - Data storage;
 - Transfer of data to third parties;
 - Deletion of personal data;
 - Legislation regulating access to public data;
 - Open data licences.
- 4. Open Internet platform** – Concerns the regulation (legal framework and policies) to support the workability of distributed internet platform across Europe. This criterion concerns the development and adoption of open global standards (both within and across different sectors). It also regards policies encouraging, mainly through the combination of public and private efforts, the building of a multi-platform environment and the developing of broadband infrastructures to deliver high quality services at competitive prices. Policies encouraging the development of technology neutral regulation will be included here as well (namely interoperability and interconnection): “*In an increasingly networked environment, differences between technological*

⁸ Communication From The Commission To The European Parliament, The Council, The European Economic And Social Committee And The Committee Of The Regions. COM(2012) 740 final, <http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:52012DC0740>

⁹ On March 2014 the European Parliament voted and approved the European Commission's data protection reform <<The data protection reform will ensure more effective control of people over their personal data, and make it easier for businesses to operate and innovate in the EU's Single Market>>. European General Data Protection Regulation will supersede the Directive 95/46/EC and is expected enforcement from 2017/2018.

measures could lead to an incompatibility of systems within the Community. Compatibility and interoperability of the different systems should be encouraged. It would be highly desirable to encourage the development of global systems”¹⁰

- *(Openness of) standards*, policy and regulation concerning standards, defining and dealing with open standards, above all on taxation (fee-free?). As is often the case with new and emerging technologies, there could be different standards for their integration and interoperability that could overlap or possibly be incompatible. This will include also policies foreseeing implementation (at national/regional level) of the “against Lock-in” EC communication¹¹ concerning standards in ICT public procurement.
 - *Broadband infrastructure*, namely public/private regional investments for adequate broadband infrastructure.
 - *Net neutrality* and broadband/infrastructure open access regulation: transparency, non discrimination, compelling to provide access, price controls, etc. “96% of Europeans are without legal protection for their right to access the full open internet with uneven levels of protection and a variety of diverging rules in different Member States. This hinders the provision of services across borders and negatively impacts end-users’ willingness to consume them.”¹²
5. **Cyber security** – This criterion concerns stresses the importance that the reliance and the confidence of the end user have to the further development of the Internet. It includes those policies and legal framework that affect the process of creating trust towards the Internet and ICT networks. It includes measures that increase the security of networks, deal with reliable digital identities, aim at protecting end users and their personal information, foster transparency and neutrality. This criterion does also involve privacy issues in some ways, since addressing security risks has to take into account respect of privacy concerns, by implementing technical security and, contemporarily, privacy protection measures. This criterion concerns the legal framework in force affecting all the aspects of Internet security.
- Laws for judgement/punishment of *cyber crimes*.
 - *Trust* and trust management. Trust and inter-dependency between organisations.
 - *Secure micropayment* regulation.
6. **Adoption and Promoting adoption of FIWARE technologies**
- Regional directives for *adopting E-government based on tools and services realized through FIWARE* technologies (G2C; G2B; G2G).
 - *Promoting research* on FIWARE technologies (participation to FI-PPP): actions to facilitate SMEs, web entrepreneurs, companies in approaching and adopting the FIWARE technologies. Direct support to stakeholders interested in participating to the FI-PPP initiatives by giving information on Phase III (A16 and FI-Core) Open Calls, through regional committees or centres for studies and research; regional control/monitoring bodies; consulting centres.

¹⁰ Recital 54 of the Directive 2001/29/EC of the European Parliament and of the Council of 22 May 2001 on the harmonisation of certain aspects of copyright and related rights in the information society.

¹¹ Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Against lock-in: building open ICT systems by making better use of standards in public procurement, EC, 2013, <https://ec.europa.eu/digital-agenda/news/against-lock-building-open-ict-systems-making-better-use-standards-public>. This communication implements Action 23 of the Europe 2020 strategy: “Provide guidance on ICT standardization and public procurement” (part of Pillar II - Interoperability & Standards).

¹² EU Action on Net Neutrality. <https://ec.europa.eu/digital-agenda/en/eu-actions>

- *Economic instruments*, include *FIWARE* among *selection criteria* for the regional Open Calls using European Structural and Investment Funds (ESIF) 2014-2020¹³.

3.3 Gathering data for regions positioning

The two following steps of the methodology implemented aiming at classifying regions on the basis of their orientations towards the Future Internet are:

- 1) The gathering of data for each identified region, with respect of the identified criteria proposed above;
- 2) The positioning of regions (identified as detailed in Section 2.2 Which regions?).

The positioning of regions and their classification will start after the phase of data gathering is concluded, and will be reported only in the second version of this deliverable.

As concerns the first point, it is already on going for each regions, though it will be fully accomplished only after the validation of the list of criteria by the regions itself and the FI-LINKS reviewers. The target to achieve through the data gathering activities is to have a suitable set of information useful to position the region for a given criteria.

It is worth to mention here that, for a certain number of criteria, useful information needed to position regions cannot be publicly retrieved; in that cases regions representatives will be asked to express and position by themselves the regions. For those criteria for which needed information are actually available online (though sometimes not in English) the data gathering already began, based on the following sources.

Criterion	Details	Main source	URL
Open Innovation Practices	<ul style="list-style-type: none"> • ICT smart specialisation strategy • Collaborative innovation networks • Legal conditions for SME/Web entrepreneurs • New forms of legal identity 	Smart Specialization Strategy Platform > Registered regions	http://s3platform.jrc.ec.europa.eu/s3-platform-registered-regions
		Smart Specialization Strategy Platform	http://s3platform.jrc.ec.europa.eu/
		EUR-Lex - Access to European Union law - National implementing measures	http://eur-lex.europa.eu
		N-Lex - A common gateway to National Law	http://eur-lex.europa.eu/n-lex/
Content/Assets protection	<ul style="list-style-type: none"> • IP rights • Digital Rights Management (DRM) 	World Intellectual Property Organization	http://www.wipo.int/wipolex/
		N-Lex - A common gateway to National Law	http://eur-lex.europa.eu/n-lex/
Privacy and data protection	<ul style="list-style-type: none"> • Collecting personal data • Informed consent • Data storage • Transfer of data to third parties 	EUR-Lex - Access to European Union law - National implementing measures	http://eur-lex.europa.eu
		Legislationline.org - Access to Information and Data Protection	http://www.legislationline.org/
		Open Data portal	http://ckan.org/

¹³ http://ec.europa.eu/regional_policy/it/funding/financial-instruments/

	<ul style="list-style-type: none"> • Deletion of personal data • Legislation regulating access to public data • Open data licences 	Open Data portal	http://dataportals.org/
Open Internet platform	<ul style="list-style-type: none"> • (Openness of) standards • Broadband infrastructure • Net neutrality - open access regulation 	Portal on Open Standards	http://www.openstandards.net/
		The Internet Engineering Task Force (IETF®)	http://www.ietf.org/
		OpenStand initiative (IEEE, IETF, IAB, Internet Society and W3C)	www.open-stand.org
Cyber security	<ul style="list-style-type: none"> • Cyber crimes • Trust and trust management. • Secure micropayment 	N-Lex - A common gateway to National Law	http://eur-lex.europa.eu/n-lex/
FI technologies	<ul style="list-style-type: none"> • E-government based on FIWARE • Promoting FI-PPP Phase 3 Open Calls • Economic instruments 	Smart Specialization Strategy Platform	http://s3platform.jrc.ec.europa.eu/
		N-Lex - A common gateway to National Law	http://eur-lex.europa.eu/n-lex/
		Smart Specialization Strategy Platform > Registered regions	http://s3platform.jrc.ec.europa.eu/s3-platform-registered-regions

4 ISSUES AND FI ADOPTION: THE REGIONAL PERSPECTIVE

The promotion of the FIWARE technologies throughout Europe and all over the world cannot be split by the detection of any kind of problems and issues related to its adoption. This work is on one hand strictly related to the above taxonomy and the research for positioning regions based on their attitude towards the Future Internet, since to identify issues and challenges means to bring to light also possible gaps in the policy domain, but it goes a bit further. There are a number of barriers that could prevent, or are actually preventing, from the adoption of FIWARE technologies, some of them are depending on the policy system and legal framework in force in the different regions, but some other are actually more related to specific technological choices done within the FI-PPP, some others are challenges to the FI-PPP or, at least, are problems that could be addressed by precise actions that the FI-PPP has the power to put in place.

4.1 Issue and challenges affecting FI adoption: background

The CONCORD PRG Work Group contributed to design a framework of issues and challenges to be addressed that could affect and/or are already affecting the adoption of Future Internet technologies, also resulting in a number of recommendations to the FI-PPP.

This framework, although specific for the FI-PPP, was not so different from the analysis made some years before by the international Organisation For Economic Cooperation And Development on the challenges concerning the success of the Future Internet¹⁴: (1) encouraging the creation of infrastructure and broadband networks with higher levels of connectivity and innovative services and applications; (2) highlighting the development of the Internet to social and economic benefits; (3) fostering innovation; (4) realizing trusted and secure environment to conquer and keep the confidence of end users; (5) promoting Internet based innovation, competition and user choice; (6) ensuring the protection of personal information and intellectual property rights.

On the same tracks, the PRG WG brought to light a number of issues related to the success of the FI-PPP work plan that were to be considered challenges to be addressed. The framework of issues built up by the PRG WG reported the experiences gained during the execution and the lifecycle of the Phase I and, mainly, Phase II Use Case projects. Those issues represented (and still in most cases represent) actual difficulties or obstacles, challenges raised by the different stakeholders of FIWARE during the first two phases of the FI-PPP.

The work done within the CONCORD PRG WG was also to give evidence to all those policies (at EU, national and regional level) that could influence the spreading and the adoption of the FI technologies. This means taking into account both policies that do foster the adoption, facilitating usage by interested stakeholders, and policies that act as barriers between potential adopters and FI technologies.

Main areas (themes) in which the PRG WG grouped the identified issues affecting FI-PPP adoption¹⁵, which are the guideline for the FI-LINKS activity for spotting additional and more specific issues related to the FIWARE adoption, are:

- Access to data;
- Access to interfaces;
- SME engagement;

¹⁴ OECD, Shaping Policies for the Future of the Internet Economy, 2008, <http://www.oecd.org/sti/40821707.pdf>

¹⁵ CONCORD PRG WG deliverable D3.4.1 - Policy, Regulatory and Governance Recommendations and Roadmaps

- Identity Management;
- Sharing and interoperability of infrastructures;
- Privacy and data protection;
- Security of platforms and infrastructures;
- Ownership and IPR, open business models;
- Micropayment.

4.2 Building the questionnaire (methodology)

This framework of issues and challenges defined by the PRG WG, together with the FI-PPP workplan¹⁶ itself, was the basic starting block to further investigate if part or the whole of those issues could still apply at a regional level (considering the regions selected within FI-LINKS). To achieve this result and draw a regional perspective on relevant issues for FI-PPP, a dedicated survey will be conducted to gather information on more specific problems affecting the adoption of the FIWARE technologies. This survey will be submitted to relevant regional representatives, identified within FI-LINKS, by means of a questionnaire.

The questionnaire is thought to be easily compiled, it lists a number of issues, grouped in main areas; regions representatives will be asked to flag only those issues that did occur and were actually encountered during their experience in the regions they represent. For each area each region representative has a free text filed at disposal to add further details on that specific issue or to even suggest additional (not foreseen) ones.

Issues related to the FIWARE adoption could surely derive from a lack of national/local regulation on a given topic, or from a restrictive or impeding regulation on a given topic, or from specific terms & conditions or other technological choices carried out by FIWARE an inside the FI-PPP itself. Those first two points are the reason why, as far as concerns those issues related to policies and regulations, the questionnaire strictly reflects the identified criteria for positioning regions with respect to the FI adoption proposed in this deliverable.

The methodology adopted to build the questionnaire implemented these following steps:

- 1) *Starting grid* - The framework proposed by the PRG WG (updated to 2013 as far as concerns Phase II projects) was analysed and updated having in mind not only the latest updates from the PRG (2014 “privacy and data protection” workshop outcomes, a topic particularly relevant among issues to be addressed by FI-PPP), but also real cases experiences gathered thanks to the many meetings held with regional contact persons during the process of selecting regions for FI-LINKS.
- 2) *Project vs regions* - It was necessary to switch from a “project” perspective to a “region” perspective. The list of issues and challenges set up by the PRG WG was built and structured following a project (Phase II) perspective. Starting from that list, issues were extrapolated, classified and grouped into main areas, so to be submitted as a questionnaire to regional contacts in a structured and more easily comprehensible shape. This stage was performed bearing in mind the first outcomes and inputs coming from the meetings and interconnections already held during the first period with regional representatives.
- 3) *Phase III validation* - The questionnaire was then submitted and validated by three Accelerators, namely by the FIWARE coaches appointed for FINODEX, FABulous and INCENSE. The underlying idea - in building a questionnaire dealing with issues related to the

¹⁶ <http://cordis.europa.eu/fp7/ict/netinnovation/docs/wp2011-13.pdf>

FIWARE adoption - was to have the valuable contribution of main actors of the last Phase 3 of FI-PPP, namely the SMEs and web entrepreneurs that start using FIWARE technologies thanks to the A16 Open Calls. Being not feasible to contact them one by one, the best way was to directly involve the FIWARE coaches that are currently gathering (and addressing) most of the problems that SMEs selected by the A16 Open Calls are facing now as well all the issues and concerns they had since they were applicants. The FIWARE coaches are the proper persons to give an overview of the most common issues related to the uptake and usage of the FIWARE technologies and helped in verifying whether the questionnaire, namely the list of issues it contains, was actual and adhering to the current situation concerning the FIWARE usage. The proposed questionnaire was thus validated by the three Accelerators and the feedback was positive, it resulted to be consistent.

Thanks to the feedback gained by the FIWARE coaches, the following item issues were modelled and added to the questionnaire:

- Trust (inter-dependency between organisations).
- Platform and technology sustainability beyond FI-PPP.
- Technical support of GEs and roadmap in terms of new developments.
- New forms of Legal Identity Needed for FI business.

It is worth to note here that SMEs and web entrepreneurs that are now approaching FIWARE technologies thanks to the A16 Open Calls, seems to particularly concern about the platform sustainability, the online legal identities, the security issues in general.

- 4) *Simple* - The idea was to realize a questionnaire as easy as possible, and that could be quickly compiled by regional contact persons, by just “flagging” the correspondent issues or the related areas. The compilation of the questionnaire just requires a flag to point out whether a given issue was spotted or not. In addition, the questionnaire suggests a possible reason why a given issue was encountered, by presenting three fields (to be just flagged as well) “Due to”:
- Lack of regulation;
 - Limiting / impeding regulation;
 - FIWARE terms & conditions.

The field “Note” is a free text area for specifying details and additional information on that given issue or for suggesting possible further issues within that specific area.

4.3 The questionnaire

Preliminary survey to identify regional issues preventing FI adoption

Area/main topic	Issues related to...	Yes (flag)	Due to...			Notes
			Lack of regulation	Limiting / impeding regulation	FIWARE terms & conditions	
Cyber Security	Computer security certifications					
	Trust (trust management)					
	Trust (inter-dependency between organisations)					
	Secure micropayment					
	Risk management					
	Secure Internet transactions					
Conditions for SME engagement	Liability cross border					
	Tax policies					
	Online Legal Identity					
	Platform and technology sustainability beyond FI-PPP					
	Exploitation of content and technological assets for commercial usage					
	Technical support of GEs and roadmap in terms of new developments					
Online identity	New forms of Legal Identity Needed for FI business					
	Identity Management					
Content protection	Access to content					
	Content protection					

	IPR (ownership and Intellectual property rights)					
	Digital Rights Management (DRM)					
	Ownership and property rights of technological assets					
Open access regulation	Open access to interfaces					
	Open access to platform					
	Multiple (overlapping) Standards					
	Open access to standards					
	Open access to Broadband / Infrastructure					
Privacy and data protection	Informed consent					
	Data storage					
	Deletion of personal data					
	Access to public data					
	Open data licences					
	Transfer of data within the Programme and to third parties.					

4.4 First results and preliminary Recommendations

Though the phase of gathering data through the questionnaire will be started in the second year of the FI-LINKS project, and its results will be thus reported in the second version of this deliverable, during the preliminary phase of preparation of the questionnaire, a number of meetings and interrelations with divers regional ecosystems and their representatives already took place, thanks to which the FI-LINKS project already brought to light a “real case” to the attention of FI-PPP: it was spotted an issue that was preventing the adoption of FIWARE technologies, in the region of Berlin, Germany.

As a first result, and in order to give an example of regulation on the use of FIWARE platform, the FI-LINKS project identified the Berlin/German issue. The problem is that, at the time being, the authentication mechanism provided by the FIWARE platform is centralised on the Spanish platform. This point is against the German regulation, which makes mandatory to have such a mechanism inside the country. The Berlin region is preparing a specific call for project on the FIWARE platform and this call is stopped until this issue is solved. FI-LINKS project already provided this issue to the FIWARE project, which is now developing a specific enabler, not centralized, to manage this problem.

It is worth to mention here, as a preliminary recommendation, one of the interesting outcomes resulting by the questionnaire validation exercise executed by FIWARE accelerators coaches. The experience gained up to now by the FIWARE coaches of the three Accelerators involved in this exercise (FABulous, FINODEX and INCENSE) brings to light that one of the strongest concerns with respect to the adoption of the FIWARE technology is related to its sustainability after the end of the FI-PPP. No entrepreneur does start a business initiative by using technologies that will possibly not be maintained or even available in the following two years, not even for experimenting. This is of particular importance for the FI-PPP, considering that those who are expressing this are the leading characters of Phase 3, SMEs and (Web) entrepreneurs, and are those stakeholders towards whom most of the policies fostering innovation in Europe are oriented.

For sure the challenge of FIWARE sustainability is the most well-known in the perspective of the FI-PPP, and the huge work that is being put in place within the FI-Core project, in order to build up a FIWARE Community sustainable beyond the Programme, will be the proper answer.

5 CONCLUSIONS

The first outcomes of this deliverable, though still at its preliminary stage, still denote how important is the detailed work performed (and still to be done) for finding out experiences, issues, needs, challenges related to the FIWARE adoption. At the same time, the experience gained during the elaboration of this first version of the “Policy and regulation taxonomy” highlights the importance of synergies among actors (projects) within the FI-PPP, especially in order to bring the discovered issues and challenges to the attention of the proper person-in-charge that could perform needed actions to address, remove or limit them.

The primary target of FI-LINKS is the FIWARE promotion and dissemination all around Europe - and the world - to find the suitable conditions, at regional level, in which could be set-up additional FIWARE nodes. An important section of this target is understanding local ecosystems to search for those barriers that could prevent from the FIWARE adoption and, in case those barriers could depend on technological choices depending on the FIWARE side, to provide the right LINKS between FIWARE and the FI-PPP and those regional ecosystem, in order to find a solution.

The Berlin case is the “real case” demonstrating the importance of building these LINKS between FI-PPP and regional ecosystems interested in FIWARE. Moreover, it is worth to note that this real case was pointed out even before the starting of the survey among the regions, in order to gather info on issues regarding the FI adoption. Then, it can be presumed that the upcoming survey exercise and the resulting recommendations will be even more interesting, and will bring to light possible additional cases like the Berlin one, allowing then to unlock additional problematic circumstances regarding the adoption of FIWARE technologies, mainly considering the set-up of FIWARE nodes.

In addition to this survey, the focus for the second version of this deliverable will be the final taxonomy of the regions, by positioning them through developing the identified criteria, on the basis of their policies towards the FIWARE adoption. This work will start soon after the validation, by the regions representatives and the FI-LINKS reviewers, of the first list of criteria proposed in this version. Moreover, it will be evaluated the opportunity to enlarge the number of regions involved in this taxonomy; up to now are foreseen to be positioned in the taxonomy only those regions identified by FI-LINKS as regions with priority 1 and 2 (as described in the D3.1.1).

Another point that will be further developed is the involvement of additional Phase 3 Accelerators in the validation and possible update of the questionnaire to list the issues and challenges concerning the FIWARE adoption. For this first version of the deliverable, three Accelerators were contacted and validated the questionnaire – FABulous, FINODEX, and Incense – by involving the respective FIWARE coaches following them. The point of view of the Accelerators is essentially based on the inputs of the SMEs and (web) entrepreneurs that are approaching the usage of FIWARE after having being selected at various the Open calls. Their perspective, though more strictly related to the usage of the FIWARE Enablers, is nonetheless very interesting to the FI-PPP.

A part from minor technical issues related to the Generic Enablers and other inputs (mainly on security), which have been included in the questionnaire, it is of interest to notice some issues reported on retrieving information on what is FIWARE, how it can be used, what it is useful for. This problem is for sure addressed by the massive system of coaching put in place by FIWARE but, nonetheless, it still remains a challenge for all the FI-PPP participants to adequately and comprehensively explain the mission, the potentiality and the value of FIWARE technology. This should be seriously taken into account together with another, actually the most recurrent, question raised by SMEs and entrepreneurs, which is related to sustainability concerns on the FIWARE platform (how to start a business based on a technology whose future, after the end of the FI-PPP, is still unclear?). It is expected that in the second and final version of this deliverable this concern will have a clear and reassuring answer thanks to the FIWARE foundation.

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