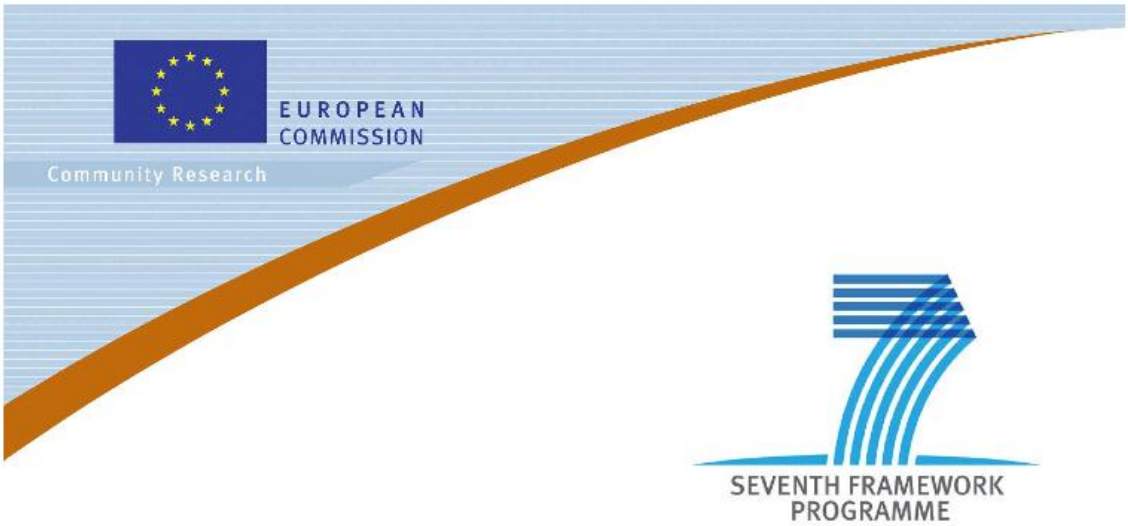

Private Public Partnership Project (PPP)

Large-scale Integrated Project (IP)

D.11.3.2: FI-WARE Market and Policy Regulation Awareness

Project acronym: FI-WARE

Project full title: Future Internet Core Platform

Contract No.: 285248

Strategic Objective: FI.ICT-2011.1.7 Technology foundation: Future Internet Core Platform

Project Document Number: ICT-2011-FI-285248-WP11-D.11.3.2

Project Document Date: 2013-04-30

Deliverable Type and Security: PP (Private)

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Contributors: FI-WARE Consortium

1.1 Executive Summary

The objective of this task is dual, on one side it is about **establishing channels that could be a useful tool to promote business and innovation concepts coined by FI-WARE** and to obtain feedback from external communities and on the other side it is to identify barriers at policy and regulatory level that could **prevent FI-WARE from a successful exploitation.**

FI-WARE aims to achieve a great impact on the Internet community, mainly targeting third party developers and companies willing to exploit its Future Internet core-platform through the **Open Innovation Lab** enabling entrepreneurs to develop and test Future Internet applications with FI-WARE technologies and that will be launched at the end of July with a huge official event in September (as part of the Campus Party; London, first week of September). For the Open Innovation Lab success **is key the fact of fostering developer communities** fall within the scope of **Open Call 3 (launched in December 2012**).

The experiments and use trials, and the involvement of European cities, Industry, as potential ecosystems, –and other communities (SMEs, entrepreneurs...) in the experiments will be crucial

Finally, we **analyze the European Context to the expansion of the service economy within the EC**, main European policies, regarding Future Internet, involvement of SMEs and entrepreneurs, Smart Cities…as well as the main regulatory barriers to overcome. The main objective of this analysis is to **present the landscape of such issues and challenges and formulate the concrete activities** to be undertaken next years

1.2 About this Document

This document is an on-going work aiming to complement the analysis carried out in WP11 under the tasks 11.1 Market and Competition Analysis and 11.2 Exploitation Strategy, FI-WARE sustainability and IPR Management. While the mentioned documents focus on the analysis of the external environment of FI-WARE from a market point of view and the definition of the FI-WARE Exploitation Strategy as such respectively, this specific report will keep an eye on those opportunities that could help FI-WARE to increase its impact in the market and/or alternatively identify those barriers that may prevent FI-WARE from being successfully exploited. We will pay special attention to those elements that fall under the categories of legal and regulatory barriers.

1.3 Intended Audience

As this deliverable contributes to defined FI-PPP Programme level activities the perspective and needs of FI-WARE and the FI-WARE consortium and related stakeholders are the addressed audience. As the dissemination level is "PP" (FI-PPP private) there is no plan to release this document to external parties.

1.4 Context of Chapter WP11 Exploitation

This work package focuses on a series of activities that identifies, create and work towards the exploitation and standardization opportunities of the FI-WARE project results. This work package approaches exploitation of the FI-WARE results from the point of view of the partners of the FI-WARE consortium, both individually and as a project. It does not intend to replace or overlap exploitation activities at the Future Internet Public Private Partnership Programme level, but to complement in a synergetic way the work that other projects within Usage Areas will do in terms of take up of the generic enablers provided by FI-WARE., therefore complementing the perspectives of the partners of this project and the related stakeholders in the ecosystems they represent.

The exploitation of FI-WARE results is not based on a purely technological approach (technology push) but on the needs and requirements of the future "customers" and "users" of FI-WARE enablers. As a result, both supply and demand are meet within this WP.

With that in mind the project's exploitation activities have as main objectives the:

- Definition of project outcomes from an exploitation point of view, including identification of stakeholders and different typologies of users that will make use of FI-WARE
- Systematic analysis and continuous monitoring of market situation and trends
- Definition of overall and individual exploitation plans
- Definition of a framework for IPR and licensing management
- Definition of a Sustainability Plan for FI-WARE results
- Policy and Regulation Considerations
- Feedback of adjustments to project plan if necessary and promotion of the FI-WARE Testbed as an Open Innovation Lab
- Business oriented communication and training activities to increase market awareness and impact
- Definition and implementation of a standardization strategy that will enable adoption and achievement of the project goals and ambitions
- Definition of impact indicators and management of those along the project duration

This WP also supports and runs the project-level Standardization Committee that is in charge of the overall strategy, planning and execution of the Standardization activities.

1.5 Structure of this Document

The document is compiled in MS word and was prepared in the private wiki of the exploitation work package; eventually this will be uploaded to the `fi-ware-review` FI-WARE wiki

D.11.3.2 Market and Policy Regulation Awareness

1.6 Acknowledgements

The current document has been elaborated using a number of collaborative tools, with the participation of Working Package Leaders and as well as those industrial partners business people in their teams they have decided to involve.

1.7 Keyword list

Market awareness, exploitation, regulation, marketing, barriers, deployment, policy, privacy and data protection, net neutrality, open access to interfaces

1.8 Changes History

Release	Major changes description	Date	Editor
0.1	Table of contents	5/04/2013	Atos
0.2	First draft	24/04/2013	Atos
0.3	Second Version	08/05/2013	Atos
0.4	Policy and Regulatory part completion	10/05/2013	Atos
0.5	Market Awareness part completion	15/05/2013	Atos
0.6	Final Version	23/05/2013	Atos
0.7	First Review	27/05/2013	Atos
0.8	Final Version including the final findings	28/05/2013	Atos

1.9 Table of Contents

1.1 EXECUTIVE SUMMARY 2
1.2 ABOUT THIS DOCUMENT 2
1.3 INTENDED AUDIENCE 2
1.4 CONTEXT OF CHAPTER WP11 EXPLOITATION 2
1.5 STRUCTURE OF THIS DOCUMENT 3
1.6 ACKNOWLEDGEMENTS 3
1.7 KEYWORD LIST 3
1.8 CHANGES HISTORY 4
1.9 TABLE OF CONTENTS 5

2 GENERAL ANALYSIS 6

3 MARKET AWARENESS 8

3.1 IDENTIFYING THE TARGET AUDIENCE 9
3.2 DESIGNING RELEVANT BUSINESS MESSAGES 14
3.2.1 Elaborate marketing material for business impact 14
3.2.2 Validate Messages 16
3.3 SELECTING COMMUNICATION CHANNELS AND ACTIVITIES 18
3.3.1 Business presentations and events 19
3.3.2 Promote Open Innovation Lab 21
3.3.3 3rd Call: Organization of Hackathons 21
3.3.4 CONCORD Working Groups 22

4 POLICY AND REGULATION 26

4.1.1 Policy and Regulatory emphasis in the FI-PPP 26
4.1.2 Digital Agenda for Europe and related actions 27
4.1.3 Horizon 2020 28
4.1.4 Future Internet studies related to policy and regulatory change 29
4.1.5 Priorities 30
4.2 SPECIFIC INITIATIVES AND TOPICS 31
4.2.1 Future Internet and entrepreneurship stimulation 31
4.2.2 Web Economy and Web Entrepreneurship 31
4.2.3 Regional innovation ecosystems boosting SMEs 32
4.2.4 Smart cities as innovation ecosystems 32
4.2.5 European Patent System 33
4.3 CONVERGENCE, REGULATION AND DEVELOPMENT TOWARDS AN INTERNET ECONOMY 35
4.3.1 Distributed Future Internet Platform Regulation 36
4.3.2 Open Internet and Net Neutrality 37
4.3.3 Open Data policies 38
4.4 FI-WARE CHAPTERS MAIN TECHNOLOGICAL REGULATORY CHALLENGES 40
4.4.1 Cloud Computing 40
4.4.2 Privacy 40
4.4.3 Security 42
4.4.4 Analysis and solutions 42
4.4.5 Consolidation 43

5 CONCLUSIONS 49

6 REFERENCES 51

2 General Analysis

The objective of this task is dual, on one side it is about **establishing channels that could be a useful tool to promote business and innovation concepts coined by FI-WARE** and to obtain feedback from external communities and on the other side it is to identify barriers at policy and regulatory level that could **prevent FI-WARE from a successful exploitation.**

The objectives are the following:

- Establishing Market Awareness
    - The success of the FI-WARE concept will depend very much on the use of the **adequate technological solutions and its ability to engage small and medium developers to use the different tools FI-WARE is going to provide**.
    - The key to the success will be a focus on the **value created for the end users, new collaborative business models and ecosystems where all participants can be successful**. **The experiments and use trials, and the involvement of European cities, Industry**, as potential ecosystems, –and other communities (SMEs, entrepreneurs...) in the experiments will be crucial
    - **FI-WARE aims to achieve a great impact on the Internet community, mainly targeting third party developers** and companies willing to exploit its Future Internet core-platform through the **Open Innovation Lab** enabling entrepreneurs to develop and test Future Internet applications with FI-WARE technologies and that will be launched at the end of July with a huge official event in September (as part of the Campus Party; London, first week of September).
    - For the Open Innovation Lab success **is key the fact of fostering developer communities** fall within the scope of **Open Call 3 (launched in December 2012**).
- Analysing the **Policy and Regulation context**, and when possible, contributing to shape it in a way that is beneficial for FI-WARE deployment and exploitation
    - **Operation of a distributed Future Internet platform across Europe**, supporting applications in a wide range of sectors. Developing a comprehensive approach towards regulatory and policy issues such as interoperability, openness, standards, data security and privacy within the context of the Future Internet complex and 'smart' usage scenarios
    - This change in the level of analysis requires a change in factors to be analyzed **and a new regulatory tool box for policy makers and regulation authorities**.
    - Probably the most of relevance for FI-PPP is **how to benefit from convergence and at the same time ensure that competition** is fostered increasing the transparency of bundled offers and avoiding customer lock-in and abuse of market power by large operators.
    - In addition to the reappraisal of regulatory frameworks and practices that the rise of platforms in ICT markets invites, FI-**WARE have identified the main regulatory challenges from the technical chapters and those non-technical aspects that could influence** FI-WARE exploitation in one way or another.

Since FI-WARE is part of a programme, these activities are executed in a wider context and this task has specifically **contributed to two working groups set up by the CONCORD** project as part of global activities of the PPP:

- Contributions to the **CONCORD EBM Working Group**

  - Provide internal and external insights into Future Internet exploitation plans and business models;
  - Support the FI-PPP projects' individual exploitation and business modelling efforts
- Contributions to the **CONCORD Policy and Regulation Working Group**
  - It is important to identify other European industry policies that are relevant in this context, what industry or economic stakeholders are relevant, what non-economic actors are involved.
  - Also it is important to establish close relations with European Commission policy makers, notably DGs other than CONNECT and towards the EP, supporting the socio-economic importance of ICT, Internet and the web

The main objective of this analysis is to **present the landscape of such issues and challenges and formulate the concrete activities** to be undertaken next years.

3 Market Awareness

The **Service industry has become the biggest employer in Europe** and tends to be a critical force to ensure economic growth. Our work within FI-WARE contributes to the expansion of the service economy by creating an IT infrastructure for Business Services where services become accessible, discoverable, composable, easily deployable, and ultimately tradable on the Internet. In doing so, our work helps the service sector to generate new value added services, develop innovative business models, and establish new business value chains.

FI-WARE aims to achieve a great impact on the Internet community, mainly targeting third party developers and companies willing to exploit its Future Internet core-platform through the **Open Innovation Lab** enabling entrepreneurs to develop and test Future Internet applications with FI-WARE technologies and that will be launched at the end of July with a huge official event in September (as part of the Campus Party; London, first week of September). For the Open Innovation Lab success **is key the fact of fostering developer communities** fall within the scope of **Open Call 3 (launched in December 2012**).

Currently, as of May 2013, FI-WARE project is facing one of its main deliveries, the Release 2 of the core-platform to be available for developers in the FI-**WARE test-bed that will become soon the FI-WARE Open Innovation Lab (OIL)**. While the test bed was a proof-of-concept setting for the FI-PPP Phase I use-case projects, **the OIL will be available to phase II projects and, at the same time, to any external developer willing to build applications in Future Internet vertical sectors**

The success of the FI-WARE concept will depend very much on the use of the adequate technological solutions and its ability to engage small and medium developers to use the different tools FI-WARE is going to provide. In the end, FI-WARE success will depend on the success of the applications that are going to be developed on top. FI-WARE will succeed if the developers using FI-WARE succeed.

In this context we have defined the following tasks and within them the according actions:

- Identifying the target audience
    - Involve SMEs, Web developers and other ICT companies to create the developers community around FI-WARE
    - Involve Relevant Actors, as Smart Cities and Large sectorial companies, as promoters of innovation ecosystems
- Designing relevant business messages
    - Elaborate marketing material for business impact
    - Validate FI-WARE messages
- Selecting communication channels and activities
    - Business Presentations and Events
    - Open Innovation Lab Promotion
    - 3rd Call: Organization of Hackathons
    - Through CONCORD Working Groups

3.1 Identifying the target audience

FI-WARE aims to achieve a great impact on the Internet community, mainly targeting third party developers and companies willing to exploit its Future Internet core-platform. The experiments and use trials, and the **involvement of European cities, Industry, as potential ecosystems, –and other communities (SMEs, entrepreneurs...)** in the experiments will be crucial

Action 1 ⇨ Involve SMEs, Web developers and other ICT companies to create the developers community around FI-WARE

Since **SMEs, web developers and other ICT companies are important for the purpose of creating the developers community around FI-WARE GE**. As it was anticipated in the strategy, FI-WARE will need the experience, contact and involvement of other associations that can act as interface to a big base of potential users/clients. These organizations will have additional elements of value to present to their communities, and FI-WARE will get access to them, resulting in a win-win situation.

The third open Call of FI-WARE has resulted in a work plan that envisages the organization or events with Chambers of Commerce and business associations that will allow us the extension of FIWARE not only geographically, but also from the sectorial point of view.

Other communities that have been approached in the last period are, for example, ICT Labs (for the purpose of extending technical works and mainly because of its potential for development of entrepreneurship initiatives around FI-WARE and future academic programmes), clusters of researchers with close elements to those of FI-WARE (ex. The IERC cluster working in IoT) and actors in the context of Smart Cities, as previously described.

Practical case: Contact with the Madrid Chamber of Commerce

In order to open channels to organizations that are totally outside the framework programme (and European projects), FI-WARE is exploring new paths. One of the channels already established is the Madrid Chamber of Commerce[1], with whom some of the FI-WARE partners have already had discussions in the context of several meetings and teleconferences.

FI-WARE has provided them with information about the project in order to perceive the willingness of spreading the benefits of FI-WARE among the members and get a first feedback from those companies that could be potentially interested in using FI-WARE from a commercial point of view. The Chamber has become a good supporter of the initiative and has already two potential options, not mutually exclusive, for channelling the project.

They are willing to present the Project in the ***"Club de Directivos del Conocimiento***". The club is composed of the Innovation directors of top Spanish business companies. They meet three times

[1] the Madrid Chamber of Commerce and Industry is a Public Corporation, a consultative and collaborative body liaising with the Administrations, which represents, promotes and defends the general interests of companies in the region http://www.camaramadrid.es/index.php?lang=EN

each year with the aim of exchanging best practices between the members. The Chamber hosts these meetings.

The second option is to present the project in ***COTEC foundation***. The COTEC foundation is a business supported institution with a view to contributing to the promotion of technological innovation and increasing society's awareness of technology. Due to the fact that Telefonica is a member of this foundation, FI-WARE has high chances to be promoted there.

With a view to developing activities based on concrete programmes and objectives, COTEC is structured into specific Commissions in which the Foundation's Board Members and their representatives participate, these commission are: Innovation Framework Commission, Technology Transfer Commission and the Innovation Resources Commission.

The Chamber of Commerce has committed to host a National event that will be scheduled close to the launch of the Open innovation Lab. The target audience will be selected from the multiple databases of the Chamber and the event will be held in their Auditorium.

Practical case: The EIT ICT Labs - FI-PPP Liaison project

The EIT ICT Labs - FI-PPP Liaison project intends to establish mutually beneficial links between the FI-PPP and the EIT ICT Labs initiatives. While the current instantiation of the FI-WARE Testbed focused predominantly on the "research related evaluation", the Testbed instantiated within the FI-PPP Liaison initiative will be used to perform "business-based assessment" of FI-WARE Technologies within well focused domains, including "Cloud-Computing" and "Smart Cities". The FI-WARE instance built for this project will glue together in a single platform, so called the EIT-Testbed, all technologies brought by partners which, already being successfully tested in real cases within the FI-PPP projects, are now market ready. The EIT-Testbed will be open to SME partners and allow a complete and realistic business integration of the FI-WARE technologies into their business solutions so as to provide new Future Internet Applications or new Business Model Approaches within the given domains.

The FI-PPP liaison project fosters the development of at least four commercial applications on top of the platform through the selections of at least four SMEs which will be integrated in the project via the sub-granting contractual schema.

The four SMEs will be selected by the project team, along the criteria described below. A pre-selection will be done by the EIT ICT Labs Business Developers among the SMEs they are coaching and helping to develop in the different EIT ICT Labs nodes (other SMEs in direct relation with some partners could be added to the pre-selection list). The selected SMEs will be those which intend to boost the adoption of Future Internet technologies with the aim of creating new and innovative jobs and businesses.

The EIT ICT Labs - FI-PPP Liaison project (FI-PPP liaison in the following) is organised according to the following three phases:

- Phase 1: SMEs selection – a set of 4 SMEs will be selected to join the project. Those SMEs will be coached and supported in the usage of the FI-WARE technologies
- Phase 2: Instantiation of the FI-WARE Testbed in specific territorial or living labs. The testbed will then be made available to the selected SMEs in order to run real and highly impacting use cases (build and deploy of new services).
- Phase 3: Organization of dedicated workshops with entrepreneurs, notably SMEs, researchers and other relevant ICT stakeholders to discuss project results about the effectiveness of the approach and how to replicate it in different environments.

Based on concrete and well defined technologies, establishing a strong and direct link between the FI-PPP and EIT ICT Labs is extremely important for both initiatives. Indeed, from one side the FI-PPP will benefit because its outputs will be directly exploited in social and business environments to foster new innovative adoptions, while the EIT ICT Labs will benefit because it will have direct access to new and emerging technologies specifically intended for greatly enhancing the current ICT technologies with respect to the Internet through

Practical case: Kicking off Collaboration with the IERC

At the recent Dublin FIA, the FI-WARE IoT team had the opportunity to meet with the IERC IoT Cluster and discuss some collaboration tasks ahead. The summary of the conclusions of this meeting are listed hereby: **The FI-WARE IoT chapter has implemented architecture of enablers working today and suitable to be opened to a broad community of developers**. Those developers will access this way data, events and resources to code new and disruptive apps. As good example is the integration of Smart Santander Outsmart scenario described in the previous section. The IERC has concluded a broad IoT architecture based on the IoT-A basics, some work might be needed to understand how FI-WARE IoT elements map to such architecture. The following action points have been agreed:

- 1. IERC to circulate links to the latest sources of their proposed architecture.
- 2. FI_WARE to create a collaboration space in the Wiki and include links to the most updated references of the IoT architecture.
- 3. IERC team to analyze FI-WARE architecture to understand which new elements might be added in the future providing key features.
- 4. FI-WARE to analyze the overall IERC architecture to agree on terminology and map elements in both descriptions.
- 5. Both teams to meet again in the forthcoming IoT Week of Helsinki (June 16-20th 2013).

Action 2 ⇨ Involve Relevant Actors, as Smart Cities and Large sectorial companies, as promoters of innovation ecosystems

Next Generation of Internet Based Services, business-enabling platforms are one trigger for this new kind of collaboration. Motivating market players to **collaborate on a common platform** is the foundation for the next generation of Internet-based services. As this Internet application and service revolution continues, successful multi-purpose transactional platforms can unlock long term and sustainable revenue streams yet to be identified.

Additionally, the greatest **business value from the transition to the 3rd Platform will come from the new generation of industry solutions and service**s just starting to emerge on top of the platform. We will describe practical examples on how **building blocks could be exploited by entrepreneurs in IT emerging areas** such as smart cities, safety, logistics of people and things, energy management, content delivery, manufacturing, smart agriculture production

Recently many companies **have adopted the strategy of using a platform to attract a mass following of software developers** as well as end-users, building entire "software ecosystems". **Therefore, the actual level of competition should be between ecosystems.** For this purpose of potential innovation ecosystems promotion, FI WARE has carried put the following actions:

- **As Smart Cities are considered as open innovation ecosystems** and playgrounds to exploit the opportunities of the Future Internet, several **European cities** have been informed, within the current dynamic of the project, about FI-WARE platform availability

- **Continuation of fostering the interaction between the European industries, ICT and sectors** through:
    - Innovative New Business Models and Sales Strategies
    - Achieving a mutual understanding
    - Addressing additional industrial branches (e.g. Industry Automation, Healthcare)
    - Establish the basis for a sustainable Vertical IT approach

Smart Cities:

The following **European cities** have been informed, within the current dynamic of the project, about FI-WARE platform availability:

City	Responsible	Action, Involvement
Malaga	Telefonica / Atos	The city of Malaga has offered its sensors networks Presentation of FI-WARE at Green Cities event
Stockholm, Sweden	Ericsson	Stockholm Royal Seaport, Smart Energy, Electro Mobility, Healthcare and other use cases. Ericsson has informed the deputy mayor of Stockholm City on the Smart City Manifesto. Ericsson intends to further discuss participation in the Manifesto. Ericsson anticipates a clear linkage between the Manifesto and FI-WARE.
Dublin, Ireland	Intel	The Intel Energy and Sustainability Lab is engaged with Dublin City Council and other partners on various smart cities initiatives and is exploring integration on top of FI-WARE when the platform becomes available.
Nice Cöte d'Azur - France	France Telecom	Nice Cote d'Azur is a group of 37 cities with various smart initiatives. a sensors network (France Telecom trial) is available for pollution, noise, lighting. Another project will begin in September on Smart Energy (national project Nice Grid) and other actions are running regarding smart mobility.
Lyon	France Telecom	France Telecom is involved in some national smart energy projects which are under evaluation by French Authorities
Seville	Telefonica	Explained to Seville the possibilities offered by installing the Testbed there. Good reaction from SMEs

Table 1: European Cities Contacted

Practical case: Smart Cities Associations.

We think that the technology and the platform provided by FI-WARE will be a very relevant asset for the development of Smart Cities applications consequently we are currently in discussions with RECI (Spanish Network of Smart Cities) in order to organize a seminar of 1-2 days to show a complete overview of the technical approach of FI-WARE. The idea is to promote FIWARE as the open platform that could play the role of "city operating system". This was further discussed in the National Info day on Future Internet organized by the Spanish Ministry.

Additionally, we attended to different workshops on Smart Cities organized by CDTI, representing FI-WARE as the ICT part that could help in some of the social challenges addressed by the "Smart Cities". Many representatives from cities were present in those workshops

European Industries

Increase **the industrial competitiveness of business sectors in Europe whose impact in the economy is relevant enoug**h so that we ensure that they do not lack behind other competitors, and furthermore that they go beyond them. The way the FI PPP will contribute to that is by bringing the technology to its adoption in those sectors.

FI-WARE, as derived from this, is a crucial piece in this puzzle, and the collaboration with all the other projects of the FI PPP in this phase and the next ones is as important as the construction of the technology foundation itself.

The largest amount of efforts in collaboration so far have been invested in cooperation with the projects within the FI-PPP in order **to fine-tune the strategy towards exploitable platform components in actual scenarios in different domains such as environmental care, transportation logistics of goods and people**.

Such an ambitious goal as we set is only affordable by the means of collaboration activities, which means FI-WARE leading and coordinating the **cooperation with the FI-PPP Use-case projects and other initiatives beyond the FI-PPP scope.**

Practical case: The FI-PPP projects exhibition at MWC-2013

During the exhibition at the MWC, several FI-PPP use-case projects demonstrated and explained to experts and interested people how FI services are to transform existing sectors such as logistics, safety, smart cities, agriculture, e-health and e-content industry.

In our case, FI-WARE showed how to materialize such ideas in a faster, easier and cost-effective way with its proposal of Future Internet core-platform of generic enablers.

Practical case: The FInES Cluster

FInES stand for Future Internet Enterprise Systems. This cluster was generated in the framework of RFID and Interoperability projects that were originally funded by the current topic 1.3 of the WP. Since recently it has been moved to the environment of Factories of the Future (FoF) projects (and specifically topic 7.3 of the WP). Wherever its position is in the set of projects funded by the European Commission the important issue is that it aims at enabling enterprises, including SMEs, by means of ICT, to exploit the full potential of the Future Internet. That falls directly under the main goal of FI-WARE. Based on that, collaboration with them is for us mandatory.

From a technological viewpoint, FInES has a strong focus on cross-domain co-operation (web semantics, web content technologies, grids, collaborative environments, service oriented architectures, eGovernment, etc.), and it maintains natural links with standardization bodies (CEN's eBIF, ICT Standardization Study, ETSI, etc). Some partners have already made presentations of FI-WARE in subsequent meetings (SAP, Atos...) even if contacts are managed through Engineering, which is an active member of the Community. It is undoubtful that FI-WARE will also keep an eye on the works and publications not only of the integrating projects, but also of the FInES clusters

Practical case: The AAL (Ambient Assisted Living) Community

It is not a secret that Ambient Assisted Living (AAL) is an interesting application domain that could greatly benefit FI-WARE with respect to the process of gathering requirements. It impacts the Internet of Services field, but also comprises many aspects related to Trust and Security and undoubtely it is the perfect showcase for technologies of the so called IoT (Internet of Things).

AAL is not part of the initial set of projects retained by the 1st Call for Proposals of the FI PPP programme as it not eHealth either. Both of them are considered by FI-WARE a main source of requirements but also good deployment environments that could really make an impact in terms of FI-WARE adoption.

From a technical point of view both of them have very strong requirements in terms of integration, IoT and security. This is complemented by the political and business relevance. While other sectors are fighting to remain competitive to their customers or "invent" new ones, AAL and eHealth do not have to find customers. The Old Europe is providing them for free, and growing continuously. That is the reason why the EC decided to set up Active and Healthy Ageing as the first pilot of the EIP (European Innovation Partnership) instrument.

FI-WARE has looked for collaboration with both communities. With respect to AAL many discussions have taken place with the AAL Forum since FIA Budapest. Besides exchange of e-mails and phone calls more active collaboration has taken place, including physical meetings and joint participation in events with the goal of reaching a common understanding about the developments of both communities**.**

Practical Case: LoFIP - Logistics Future Internet Platform

The German Hightech.NRW project "LoFIP - Logistics Future Internet Platform" has the goal of developing a software platform enabling an easy realization of software-based, federated control centers for operative logistics processes, based on innovative Future Internet technologies.

The FI-WARE WP3 Application and Services Chapter is supporting LoFIP in adopting SAPs Marketplace Generic Enabler for a logistic-specific use case which demonstrates how challenges during daily tours of parcel collection at business customers can be better solved with the means of FI-enabled Control Centers, thus e.g. including the resolution of ad hoc transport needs through integration of access to spot markets for transport capabilities into the control center

Further information can be found under: http://www.lofip.de

3.2 Designing relevant business messages

Translating technical messages into business language (marketing material)

- CONCORD has elaborated a new version of the FI PPP flyer for the purpose of marketing (in collaboration with all the projects and as part of the work in the DWG)
- New version of the FI-WARE poster for Barcelona and Dublin (attached)

3.2.1 Elaborate marketing material for business impact

Promotional material like flyers, brochures and merchandising are often a good tool to disseminate and improve the project presence, always allocating a reasonable amount of efforts for these tasks.

Action 3 ⇨ Elaborate marketing material for business impact

Promotional material like flyers, brochures and merchandising are often a good tool to disseminate and improve the project presence, always allocating a reasonable amount of efforts for these tasks.

In the last six months, **FI-WARE has produced a new poster explaining the overall vision**, the Testbed/OIL and some technical details. The poster has been part of the exhibitions in the Barcelona Mobile World Congress and the Dublin Future internet Assembly

Figure 1 FI PPP flyer

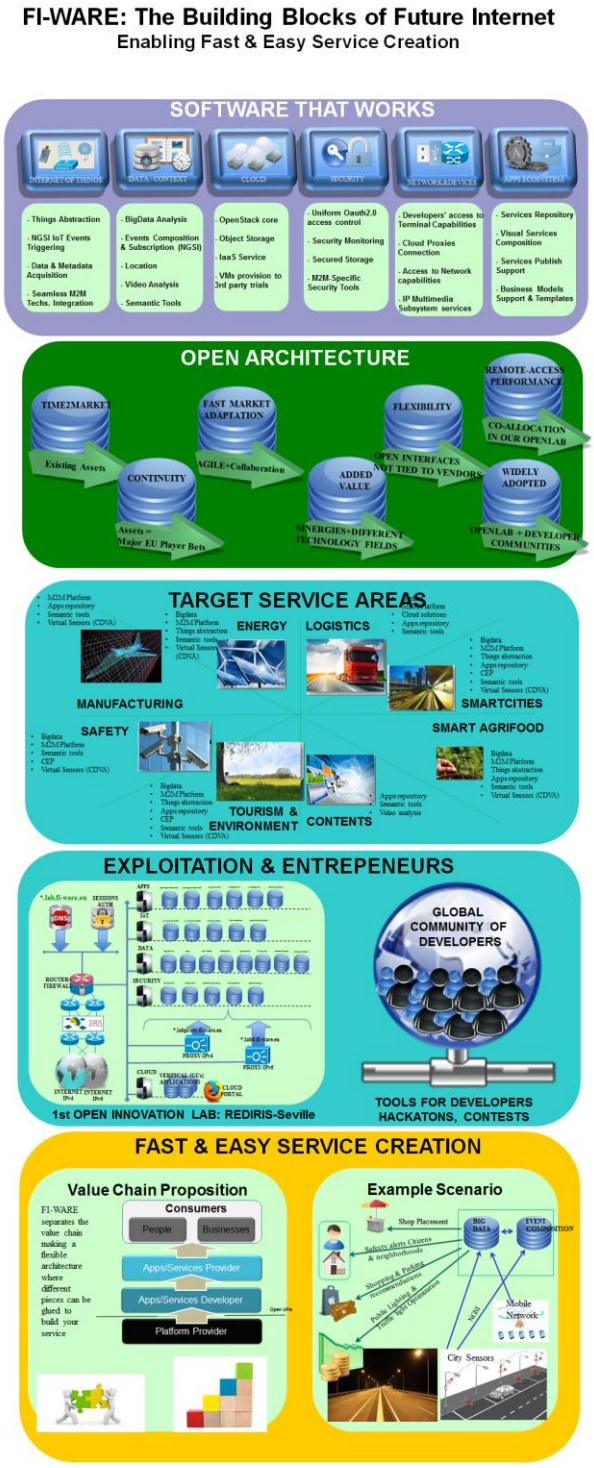

Figure 2: FI-WARE New Poster

3.2.2 Validate Messages

The objective is to extract **conclusions for the work carried out by Use Cases and SMEs** in the implementation of a working pilot using Generic Enablers of the FI WARE Platform.

- To analyse those GE that Use Case projects are planning to use in their pilots and trials
- Future internet generic enablers for SME- technical and business analysis from the TIC pilot implementation activities within Smart Agrifood project-ARIADNA Case

Action 4 ⇨ Validate FI-WARE messages

Practical case: One of the actions carried out so far in this framework has been to analyse those GE that Use Case projects are planning to use in their pilots and trials (see Figure 3). This analysis reflects which FI-WARE chapters are more relevant for each particular domain or sector, therefore helping us to align supply and demand.

FI-WARE Catalogue:	http://catalogue.fi-ware.eu									
Last upate (FI-WARE):	22-oct-12									
Status:	**02/11/2012**		**Interested UC Projects (see note 6)**							
FI-WARE GEs (see note 1)	GE implementation product(s) name(s) (see note 4) / owner	Planned/Actual 1st Deployment	**Envirofi**	**FI-Content**	**Finest**	**Finseny**	**InstantMobility**	**Outsmart**	**SafeCity**	**SmartAgriFood**
data updated on (UC):			19-09-2012	dd-mmm-yy	01/03/2013	28-09-2012	dd-mmm-yy	dd-mmm-yy	10/15/2012	19/09/2012
Cloud Chapter - I2ND										
Allocation of VMs (see note 2)	N.A.	22-oct-12	U	U			E		D	D
Allocation of Object Storage (see n	N.A.	22-oct-12	U	E	U	E	E		E	U
Cloud Proxy (see note 3)	- / Technicolor	31-ago-12	E	E	E					D
Data Chapter										
Complex Event Processing (CEP)	l Proactive Technology Online / I	23-ago-12	U		D	E	E	E	D	
Publish/Subscribe Broker	xt Awareness Platform / Telecom	26-oct-12	U	U	U	U	U	U	U	E
Publish/Subscribe Broker (see note	SAMSON Broker / Telefonica	8-nov-12	U	U	U	U	E	U	U	D
BigData Analysis	SAMSON / Telefonica	10-ago-12	E	E	D		E		U	E
Compressed Domain Video Analys	Codoan / Siemens	31-ago-12		U					D	
Media-enhanced Query Broker	QueryBroker / Siemens	1-oct-12	E	U		U	E	U	E	U
Location	LOCS / Thales Alenia Space	10-ago-12	E	E			U		E	E
Semantic Application Support	- / ATOS	23-ago-12	E		E		U		D	
Semantic Annotation	SANr / Telecom Italia	8-oct-12	E	U	E		U		E	
Apps Chapter										
Service Description Repository	ervice Description Repository / SA	10-ago-12	U		D		U	E		D
Marketplace	Marketplace / SAP	10-ago-12	U	E	D	U	U			U
Composition Editor/Execution	antic Composition Editor - COMP	31-ago-12	U		E		E	E		E
Composition Editor/Execution	Mashup Factory / DT	23-ago-12	E	E	E		E	E		D
Composition Editor/Execution	on Composition Editor (ECE) / Eri	15-sep-12	E	E	E		E	E		D
Composition Editor/Execution	WireCloud / UPM	23-ago-12	E		U		E	E		E
Mediator	Mediator_TI / Telecom Italia	10-ago-12	E		D		E			U
Mediator	SETHA2 / Thales		E		E		E			
IoT Chapter										
(Backend) Things Management GE	hings Management GE - TID/NEC	31-ago-12	E	E	E	E	E	E	E	U
(Backend) Device Management GE	N.A.	(2nd release)	E	E		E	E	E	E	E
(Gateway) Data Handling GE	bile Manager / Orange, SOL-CEP	26-oct-12	E		E	E	E	U	E	
(Gateway) Protocol Adapter GE	ZPA / Telecom Italia	5-nov-12	E			E			E	
(Gateway) Device Management GE	Ericsson Gateway / Ericsson	26-oct-12	E			E	E	E	E	E
Security Chapter										
Security Monitoring GE	SIEM (SLS) / ATOS; Attack Path E	15-oct-12		E	U	E		E	U	U
Identity Management	GCP / DT	31-ago-12	U	U	U	E	U	E	E	U
Identity Management	One-IDM / NSN	31-ago-12	U	E	D	E	U	E	E	U
Data Handling	PPL / SAP	23-ago-12	E	E	U	E	E			U
DB Anonymizer	DBA / SAP	10-ago-12		E	E					U
Secure Storage	SSS / Thales	end november		U	U	E	E		U	
Total		7	27	21	24	16	26	16	20	23

Figure 3 FI-WARE generic enablers required by use case project

- Google docs spreadsheet with info about:
  - FI-WARE GE implementations, with date of availability
  - Declaration on the planned use of FI-WARE GEis by each UC Project
- Different levels of engagement:
  - "E" – 101 - experimenting
  - "U" – 70 - already considered in the design
  - "D" – 7 - already used in PoC

Practical case: *Future internet generic enablers for SME- technical and business analysis from the TIC pilot implementation activities within Smart Agrifood project.*

Ariadna joined Smart AgriFood project working in different areas with a strong focus on the TIC (Tailored Information to Consumer) pilot. This pilot deals with advanced services about the information that is provided to consumers at retail shops and supermarkets. Once the specifications were available the Generic Enablers catalog was reviewed and a number of them selected to be integrated in the pilot.

How FI WARE applies for a SME? :

> *"The key competitive factor for an SME is specialization and the quick capability to react in order to cope with the customer needs: SMEs create applications very targeted to customer needs on top of large infrastructures provided and maintained by third parties. Most SMEs work is based on a network of reliable companies and mid to long-term business close links. The FI proposal directly targets this need: it will provide an infrastructure supporting services provision to their customers that an SME is unable to create and maintain on its own.*
>
> *[…] Therefore, the FI-WARE initiative is particularly interesting for a company like us, as it will be an "innovative infrastructure for cost-effective creation and delivery of versatile digital services, providing high QoS and security guarantees"*
>
> *[…] The experience can be evaluated as positive. The main conclusion is that our positioning with respect to the usage of Generic Enablers in real applications is much stronger than in the past: We have used FIWARE services that cover the infrastructure part of our applications and therefore we can focus on other aspects more specific to each case study or customer. We have really tested that the approach of the FI-WARE is particularly interesting for an SME: It provides a number of advanced services that in many applications are required. As software reuse is not a reality in most SME - the wheel is reinvented many times -approaches as the FI-WARE are a key element to improve software development.*
>
> *The technical approach -- REST or Web Services based integration - helps the integration of Generic Enablers into applications.*
>
> *However, we have faced a number of difficulties, most of the related to the fact that we are dealing with an implementation not yet at a production status*
>
> *The experience obtained in the work with GEs can be summarized in a few words: It is required that the whole FI-WARE implementation matures and evolves into a fully-fledged commercial product with a clear roadmap, commercial rules and SLA (Service Level Agreement) in place. However, as far as to our knowledge is concerned, today it is the only initiative that will allow SMEs to compete with large corporations in the provision of innovative services on the next future. Based on the FI-WARE services European SME will be able to provide really added value applications at a competitive cost"*

3.3 Selecting communication channels and activities

With the potential market identified and business messages clarified it is now the time to select some of the relevant activities and events where the project could expand its influence, get new potential users/customers and present its main contents to make relevant communities aware of it.

- **Business events** are a suitable tool to raise awareness and to obtain feedback from participants
- **Promote Open Innovation Lab**
- **3rd Call:** Organization of Hackathons

- **Through CONCORD Working Groups** to design a common message and positioning for the whole of the FI PPP
    - Contributions to the **CONCORD EBM Working Group**
        - Provide internal and external insights into Future Internet exploitation plans and business models;
        - Support the FI-PPP projects' individual exploitation and business modelling efforts
    - Contributions to the **CONCORD Policy and Regulation Working Group**
        - It is important to identify other European industry policies that are relevant in this context, what industry or economic stakeholders are relevant, what non-economic actors are involved.
        - Also it is important to establish close relations with European Commission policy makers, notably DGs other than CONNECT and towards the EP, supporting the socio-economic importance of ICT, Internet and the web

3.3.1 Business presentations and events

FI-WARE dissemination activities aim to **influence the broader community and foster the adoption of FI-WARE results by participating in relevant industrial events such as conferences, workshops, symposiums** or Code Camps or in events organized by the EU. Specific effort will be made to inform Open Source communities through participation at relevant events.

Business events are a suitable tool to raise awareness and to obtain feedback from participants. In order to provide a homogeneous vision of the project and facilitate the replication of the sessions (this has proven to be useful to minimize efforts and maximize the representation of the project), a typical session has been designed. See the structure below.

The project will work on three different types of events:

- **National events:** National events will focus on one particular country and they will be hosted mainly (even if not exclusively) in the following countries: France, Germany, Italy and Spain. These four countries represent a great market and there is a reasonable number of partners that could support the organization of those events and could potentially host FI-WARE instantiations (as in the case of the Seville Testbed).
- **European events:** At least one big European event will be organized with a clear business perspective. Depending on resources and opportunities that appear in the coming months more events could be envisaged. The event will be carried out in synergy with another big event that attracts main players targeted by FI-WARE. The most suitable candidate at this stage is CEBIT.
- **Vertical domain events:** as it has been mentioned in this document, the immediate users of FI-WARE will be the use case projects. Understanding their needs, requirements, language and expectations is a crucial issue to attract a wider constituency in later phases. For this purpose FI-WARE is already collaborating with current projects and disseminating its progress and results within their constituencies, which in many cases cover the whole value chain of the sector. Besides existing projects, FI-WARE has been invited in many occasions to provide presentations in the context of other application domains that are interested in establishing collaboration with the PPP, such as the case of Ambiente Assisted Living and eHealth communities. Main objectives for FI-WARE in those cases is that the audience understands well the value proposition of FI-WARE and that they can see the way FI-WARE can be used in the domains with as many examples as possible.

Action 5 ⇨ Organize National Events

Action 6 ⇨ Organize (Pan)-European Event/s

Action 7 ⇨ Get involved in sectorial Events (and understand specificities of the domains)

During the latest month, **the most relevant activities have been**:

- The organization of the FI-PPP event during the Barcelona Mobile World Congress week and
- The architect's week organized at the UPM premises (Madrid)

Organize National Events

- FI-WARE has actively worked in the organization of the Spanish workshop held in Madrid (20 June). Juanjo Hierro, made an overall presentation on FI-WARE and I tried to provide a view on how to use FI-WARE to get business value
- FI-WARE has been present in other National workshops even though not always sending a representative because of agenda problems (ex. Istanbul, where we provided a presentation that was made by an EC representative and Porto, where we counted on an INFINITY representative to present both projects). It is expected that FI-WARE presentations will happen in the next weeks in many other cities/countries.

Organize (Pan)-European Event/s

- FI-WARE has played a very active role in the organization of the FI PPP activities in the Mobile World Congress
    - Helping in the set up and presence in the FI PPP stand in MWC
    - FI-WARE stand in "Future Internet PPP event: Engage! Towards cross-border experimentation with European Stakeholders" (Palau de Congresos, Barcelona; Feb 28th-Mar 1st)
    - FI-WARE workshop (Palau de Congresos, Barcelona; Mar 1st)
- Active support an role in FIA Dublin (7-10 May, Dublin)
    - FI-WARE Pre-FIA Workshop (half a day workshop on May 7)
    - FI-WARE stands along the FIA duration (FI-WARE was presented to attendees to the event, and promoted in front of Mario Campolargo and Zoran S.)
    - Organization of the plenary session of the FI PPP where FI-WARE presented the Open Innovation lab and announced its launch in Campus Party London)
    - Presence of FI-WARE in other co-located events/sessions such as the session on EU-US Innovation Platforms or the INFINITY concertation event
        - Support to the organization of National workshops
        - Currently working in the organization of the OIL launch (Campus Party London)
        - Preparatory work to be present in ICT event 2013 done (waiting for answer on the session submitted by FI-WARE)

Get involved in sectorial Events

The largest amount of efforts in collaboration so far have been invested in cooperation with the projects within the FI-PPP in order **to fine-tune the strategy towards exploitable platform components in actual scenarios in different domains such as environmental care, transportation logistics of goods and people**.

- ***The FI-PPP projects exhibition at MWC-2013:*** During the exhibition at the MWC, several FI-PPP use-case projects demonstrated and explained to experts and interested people how FI services are to transform existing sectors such as logistics, safety, smart cities, agriculture, e-health and e-content industry

3.3.2 Promote Open Innovation Lab

Currently, as of May 2013, FI-WARE project is facing one of its main deliveries, the Release 2 of the core-platform to be available for developers in the FI-WARE test-bed that will become soon the Fi-WARE Open Innovation Lab (OIL). While the test bed was a proof-of-concept setting for the FI-PPP Phase I use-case projects, the OIL will be available to phase II projects and, at the same time, to any external developer willing to build applications in Future Internet vertical sectors.

- **Laboratory**: a place where people meet and find all the technology and access to available data they need to implement their ideas
- **Innovation**: making such ideas concrete and profitable by exercise them
- **Open**: free acces to third parties wrt to the FI-PPP, co-cretion, copetition, …..

Action 8 ⇨ Promote the Open Innovation Lab

- The Open Innovation Lab has been one of the main elements promoted in the dissemination activities carried out in the last period. Special emphasis was assigned to the OIL in the different activities developed in the context of the Future Internet Assembly held in Dublin (May 2013) or National workshops.
- The Open Innovation Lab has also been promoted in different media (ex. See article in the Open Innovation 2.0 2013 Book recently published by the EC)
- Wide dissemination at the Mobile World Congress (Barcelona, February 2013)
- Expected launch at the end of July with a huge official event in September (as part of the Campus Party; London, first week of September)

3.3.3 3rd Call: Organization of Hackathons

Once 3rd Open Call partners are involved in FI-WARE consortium, large events with hackathons and contests for thousands of developers will be performed. Hackathons are powerful tools to attract developers around the project and will serve as mechanism to assess, among other aspects, how attractive and easy-to-use the FI-WARE technology is.

Action 9 ⇨ Organize a Hackathon

3.3.4 CONCORD Working Groups

Since FI-WARE is part of a programme, FI WARE **participate in the CONCORD Working Groups** to design a common message and positioning for the whole of the FI PPP

- Contributions to the **CONCORD EBM Working Group**
- Contributions to the **CONCORD Policy and Regulation Working Group**

Action 10 ⇨ Participate in the CONCORD Working Groups

3.3.4.1 *Contributions to the CONCORD EBM Working Group*

FI WARE project has been participating in the CONCORD EBM (Exploitation and Business Modelling) working group. The main objective of the Exploitation and Business Modelling Working Group (EBM WG) is to maximise the impact and exploitation potential of the FI-PPP Programme and the individual FI-PPP projects. Its specific goals are to:

- Provide internal and external insights into Future Internet exploitation plans and business models;
- Support the FI-PPP projects' individual exploitation and business modelling efforts.

This requires the participation and contribution of the individual FI-PPP projects, especially of FI-WARE, to these programme-level efforts conducted within the WG, in addition to their own project-specific exploitation and business modelling efforts. Each FI-PPP Use Case project is contributing with a person, the UC exploitation manager.

The WG actions are oriented towards the horizontal and the vertical FI-PPP Programme level:

- Horizontal programme level: Analyse, abstract and generalise exploitation and business modelling insights from an internal (FI-PPP projects) and external (other relevant Future Internet FP7, CIP or ICT-PSP projects) perspective. The WG recognises the need for its exploitation and business modelling efforts to be subject to validation by the broader Future Internet community in order for the FI-PPP Programme to have a significant impact. Liaising with the broader community enables the FI-PPP Programme to influence the outside developments around Future Internet exploitation and business modelling.
- Vertical programme level: At the vertical programme level CONCORD proposes to provide the WG members with FI exploitation and Business modelling toolbox (this proposal is subject to approval of the WG and will be refined based on input from the WG's members).

The WG organises workshops to ensure internal and external validation of its efforts. Therefore, the workshops have both an open (external) and closed (internal) session. To facilitate this, the workshops are organised in conjunction with other large-scale events as the Future Internet Assemblies (FIAs), in order to minimise the travel burden for the participants and to allow the broader FI community to partly join these workshops. Next to the workshops the WG also seeks external validation of its efforts through the publication of discussion papers – intended for both an internal and external audience. These papers are prepared in light of workshops to provide some food for thought upfront or are the result of a workshop to keep discussions on-going afterwards.

Broader external validation is also being sought through participation in relevant communities and through the participation in and/or organisation of conferences and panels.

EBM WG is working in the definition of a document: "FI-PPP: Exploitation and Business Modelling Position Paper". This document collects and synthesizes all the exploitation and business modelling activities carried out by CONCORD during the first 2 year of the project (April 2011 to March 2013). It also reports the progress made by various FI-PPP use case projects participating Exploitation and Business Modelling Working Group coordinated by CONCORD. Its first stable version is expected to be delivered on end of May 2013, at the end of phase I use cases projects. This White Paper will be structured as follow:

1. FI-PPP Technical and Business Architecture
    - FI-PPP Core Platform: Technical and Business Architecture
    - FI-PPP Use Cases: Technical and Business Architecture
    - FI-PPP: Unified Business Architecture
2. Innovative Business Models for FI-PPP Services and Applications
    - FI-PPP Use Case Example(s) and Business Models
    - The Business Challenges and Opportunities
    - Lessons Learned and Best Practices from External Cases
    - Innovative Business Models
        - *E.g.* X as a Service models; Smart Cities/Region models, SME application stores, etc.
3. Societal Benefits and Economic Impact of the FI-PPP
    - FI-PPP Core Platform and Domain Usage Areas Benefits and Impact
    - FI-PPP Market Opportunities
    - Generic Benefits of the Future Internet

In this sense, FI WARE has contributed to the EBM WG with:

- Elaborate the technical architecture, enablers, and relate FIWARE technical architecture to current market requirements. (High Level Overview)
- Connect to the Product Vision and Sustainability of FIWARE.

3.3.4.2 *Contributions to the CONCORD Policy and Regulation Working Group*

The FI-PPP Working Group on Policy, Regulation and Governance (WG-PRG), facilitated by the CONCORD project, aims to provide contributions and **support debates related to the EU policy development and regulatory issues concerning the Future Internet.** To this end, the WG establishes relations with relevant bodies and organizations at EU and member states level and elsewhere. Expected outcomes of the work of this WG include **position papers and recommendations regarding the necessary evolution of Future Internet related policies and regulations** enabling the operation of a distributed Future Internet platform across Europe with the perspective of creating a market for trusted and secure e-services e.g. related to public sector priorities [FI-PPP Work Programme].

This Group **prepared a Working Paper** is to be considered as "work in progress". It has an exploratory nature regarding policy and regulatory issues related to the Future Internet. Point of departure in the introductory chapter is to underline the complementary role of Future Internet-related policies:

- (1) To actively create societal and economic opportunities in terms of innovation, growth and market development, and
- (2) To establish and restructure the regulatory and instrumental conditions to exploit such opportunities.

The second chapter starts with presenting an overview of current EU policy initiatives Digital Agenda and Horizon 2020 as related to the Future Internet and FI-PPP, then looks into several issues regarding convergence, regulation and development towards an Internet economy. Chapter 3 then turns to the current FI-PPP and identifies a number of policy and regulatory challenges as emerging from this initiative. Several specific challenges are covered in more depth in chapter 4. Chapter 5 concisely presents policy-related cases from most of the FI-PPP projects. The final chapter 6 provides a short outlook and agenda of work regarding policy and regulation within the FI-PPP. After the Policy Workshop 13 March 2013 this Working Paper will be revised and distributed more widely.

On 13 March 2013 a workshop of the FI-PPP programme took place in Brussels to discuss policy and regulatory challenges in relation to the Future Internet and their implications for the Future Internet PPP programme. The workshop was organised by the FI-PPP Working Group on Policy, Regulation and Governance. There were 32 registrations and 20 participants. The detailed agenda and participant list is included in the Annex to this report. In three sessions, the workshop covered three major policy-related themes:

- (1) Markets for smart infrastructures: emerging frameworks for policy and regulatory conditions such as interoperability, openness, standards, security and privacy;
- (2) Policy and regulatory issues affecting the success of Future Internet enabled networked applications;
- (3) Ensuring the impact of FI-PPP: shaping SME involvement, entrepreneurship and incubation activities.

*"The policy and regulatory challenges related to Future Internet service infrastructure platform were discussed by **Juan Bareño** (Atos), working in the FI-WARE project. A key observation is that platforms, where convergence between IT, internet, telecommunications and media services and technologies occurs, have deeply restructured how hi-tech industries operate. Most hi-tech industries have become platform battlegrounds and Platform strategy is essential to compete. From 2013 through 2020, 90% of IT industry growth will be driven by 3rd Platform technologies. Therefore, a lot of competitive energy should be focused on strengthening 3rd Platform offerings and capabilities. Platforms require a non-traditional business model. Juan explained that new services will be developed in a new value chain and therefore the interaction between a variety of ICT organizations, regulators and sector specific organizations is required. Platform regulation has to overcome a wide number of barriers such as dominance of incumbents, protectionism and entry or interoperation barriers. Main regulatory concerns from FI-WARE include on-line identity and privacy, business data integrity in relation to cloud computing, data protection, net neutrality. The message is that traditional regulatory analysis seems not to be sufficiently equipped to deal with platforms as different aspects of openness has to be dealt with (who can use it; who can offer compatible app; who can bundle it with larger platform; who can change the design etc.) and a number of issues have to be dealt with such as customer lock-in, lock in of service providers, through open standards, prize squeeze of services/content providers and cross subsidization. The current situation at EU level is that Europe seems to move towards platform regulation in general."*

The **final discussion session** confirmed the importance and relevance of identified policy and regulatory issues for FI-PPP's success. It was agreed that a classification of policies and regulations would be helpful as a basis for systematic analysis of approaches to policy and regulation. It was also emphasized that "smart" forms of policy and regulatory change would be necessary to address the sometimes complicated interactions between regulatory environment and markets. **It was recommended to establish relations with external stakeholders in the fields of policy and regulation** (European Parliament, ITU, OECD and other) **and with relevant Commission Directorates, the Digital Agenda initiatives, and the Futurium activity**. It was also recommended to continue the organization of policy workshops.

4 Policy and regulation

This section starts with presenting an overview of current EU policy initiatives Digital Agenda and Horizon 2020 as related to the Future Internet and FI-PPP, and then looks into **several issues regarding convergence, regulation and development towards an Internet economy**. Additionally several **specific policy and regulatory challenges** are covered in more depth.

In this respect we also should take into account the mission of policy and regulation related activities within FI-PPP: "Developing a comprehensive approach towards regulatory and policy issues such as interoperability, openness, standards, data security and privacy within the context of the Future Internet complex and 'smart' usage scenarios. This may also address the required methodologies, procedures and best practice needed to address transnational aspects where a high degree of public-private co-operation is needed. **Participation of the public sector in the FI-PPP will be a key asset to progress in these non-technological issues**".

These issues and challenges partly originate from the Future Internet PPP use case and platform projects, and partly they originate from wider initiatives and actions of relevance to the FI-PPP such as the Digital Agenda and Horizon 2020. The main objective of this analysis is to **present the landscape of such issues and challenges and formulate the concrete activities** to be undertaken next years.

4.1.1 Policy and Regulatory emphasis in the FI-PPP

Through its platform, infrastructure and use case projects the FI-PPP also generates insights in which enabling conditions e.g. as regards regulatory frameworks or accompanying policies should be established in order to achieve its targeted impacts. In this context the FI-PPP creates awareness and proposes building blocks for a comprehensive approach towards FI-PPP related regulatory and policy issues. In this regard the FI-PPP must connect to actions related to the Digital Agenda (e.g. regarding SMEs and entrepreneurship) and policies and regulations prepared by other Directorates.

FI-PPP vs. other initiatives Policy and regulation levels	FI-PPP role towards new policy and regulatory frameworks	Role of other initiatives or entities creating new policy and regulatory frameworks
Conditions setting	Awareness creation regarding required conditions, instruments, frameworks (e.g. for operating distributed Internet platforms, based on FI-PPP project experiences, or for innovative PPP governance models) Proposing building blocks and requirements for comprehensive regulatory and policy frameworks (for operating distributed Internet platforms)	Existing policy and regulatory frameworks e.g. market regulation, IPR, privacy (etc) Digital Agenda initiatives for re-regulation, market stimulation and innovative policy frameworks Initiatives and instruments foreseen in the context of Horizon 2020 European Patent System
Opportunity creation	FI-PPP's PPP model towards development, validation and valorisation of technologies, applications, infrastructure components, business models	CIP ICT-PSP: smart city and future internet living lab pilots FP7-ICT, Horizon 2020 (longer term

	FI-PPP's entrepreneurial and SME oriented activities	research and innovation) Digital Agenda (e.g. Web entrepreneurs, SMEs) Regional and national initiatives regarding SMEs innovation

Table 2: Policy and regulatory emphasis in the FI-PPP

The most relevant general EU policy initiative related to the Future Internet is Horizon 2020, and as part of that the Digital Agenda for Europe initiative. These are wide-ranging longer term initiatives. The FI-PPP's impact will strongly benefit from resolving the policy and regulatory bottlenecks and spearheads identified in these initiatives. The FI-PPP also explicitly contributes to achieving some of the goals of these initiatives.

4.1.2 Digital Agenda for Europe and related actions

The over-all aim of the Digital Agenda initiative (as part of Horizon 2020 strategy) is to "deliver sustainable and social benefits from a digital single market based on fast and ultra-fast internet and interoperable applications".[2] The Digital Agenda recognizes seven major challenges:

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

As noted, several of these policy and regulatory challenges are very relevant to the core issues worked on in the FI-PPP which requires such **policy and regulatory innovations in order to bring success**. In turn, 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 challenges. The solutions developed by FI-PPP in several cases require further policy and regulatory innovations, e.g. with respect to managing access to data in supply chains, and generally with respect to operating distributed Future Internet platform. The FI-PPP in itself does not resolve these policy and regulatory challenges; rather it will define them, including the new challenges ahead, and create awareness with policy makers and standards organizations

Regarding innovation[3], the Digital Agenda and Innovation Union initiatives are somehow related with this topic through the potential collaboration between the FI-PPP programme and the EIT (http://eit.europa.eu/),

[2] See: http://ec.europa.eu/digital-agenda/digital-agenda-europe

in particular the EIT ICT Labs (http://eit.ictlabs.eu/). Very recently it was discussed a new horizon for the EIT[4] and were proposed four new KICs (Knowledge and Innovation Communities), apart from the existing three KICs on Climate, Sustainable energy, and ICT. These new KICs are for example in the fields of health and demography and urban mobility, which are of interests from the environmental domain to look for cross cutting applications (e.g. health-environment, transport-environment, and energy-environment).

In summary FI-WARE proposes to address several issues that relate to the Digital Agenda.

Fragmented digital markets:

- Simplify copyright clearance, management and cross-border licensing.. Reviewing the Directive on Re-Use of Public Sector Information, notably its scope and principles on charging for access and use" should give impetus to the developments in the chapter "Data/Context Management" in which the availability of advanced platform functionalities dealing with gathering, processing
- Review the EU data protection regulatory framework with a view to enhancing individuals' confidence and strengthening their rights

Interoperability and standards:

- As part of the review of EU standardisation policy, propose legal measures on ICT interoperability by 2010 to reform the rules on implementation of ICT standards in Europe to allow use of certain ICT for and consortia standards
- FI-WARE Project partners continually study the current standards and consider when/how to include FIWARE research in new standards/protocols in order to (a) avoid "re-inventing the wheel", (b) make the most efficient use of past developments, and (c) help educate/move technology state-of-the-art towards the advantages inherent in FI-WARE

Trust and security

- Present in 2010 measures aiming at a reinforced and high level Network and Information Security Policy, including legislative initiatives such as a modernised European Network and Information Security Agency (ENISA), and measures allowing faster reactions in the event of cyber attacks, including a CERT for the EU institutions
- Present measures, including legislative initiatives, to combat cyber attacks against information systems by 2010, and related rules on jurisdiction in cyberspace at European and international levels by 2013

4.1.3 Horizon 2020

Particularly relevant for the FI-PPP is Horizon 2020' emphasis on innovation ecosystems. Regarding ICT-based e-infrastructures, "**the aim is to achieve by 2020 a single and open European space for online research where researchers enjoy leading-edge, ubiquitous and reliable services for networking and computing, and seamless and open access to e-Science environments and global data resources**". Horizon 2020 stresses the need to foster the innovation potential of research infrastructures and their human capital. Innovation should be stimulated, both in the infrastructures themselves and in their supplier and user industry, by developing R&D partnerships with industry, by stimulating the use of research infrastructure by

[3] The suggestions in this paragraph were kindly provided by Mr. Carlos Granell, JRC-EC.
[4] http://europa.eu/rapid/press-release_SPEECH-12-790_en.htm

industry e.g. as experimental test facilities or knowledge-based centers and by encouraging the integration of research infrastructures into local, regional and global innovation ecosystems. Also, Horizon 2020 promotes the use of research infrastructures to be leveraged for public services and social innovation. Throughout the Horizon 2020 there is much emphasis on the demand side, the need to engage users to create more innovation-friendly markets, and it is stated that the ICT-specific research infrastructures include living labs for large-scale experimentation and infrastructures for underlying key technologies and their integration in advanced products and innovative smart systems.

This will require actions aimed at enhancing the effectiveness, impact and sustainability of Future Internet assets such as test bed facilities, software and technologies (the FIRE programme considers comparable issues. The gaps between the technologies presently offered in FIRE as testbeds, and the gaps between the layers in which its communities have formed are large. For example, the gaps between wired and wireless networking, between networking researchers and cloud application developers, and between both sorts of developers and end user input all require bridges that do not exist today, and scenarios and user requirements to shape and drive those bridging activities.)

Particular relevant for FI-PPP, the perceived gap between future internet technology push and the demand pull of user empowered and **open innovation actually points to the importance of value networks as ecosystems within the Future Internet**. Their emergence may considerably accelerate the exploitation and sustainability opportunities of future internet facilities as developed by FI-PPP (and FIRE). Enhancing the role of user involvement in relation to both Future Internet experimental research (FIRE) and Future Internet Use Cases (FI-PPP) is one challenge for the years to come. Projects building on Future Internet and Internet of Things technologies are already taking this up. New models of collaboration and synergy between future internet facilities and use case oriented projects in open innovation settings should therefore be further developed and some good examples already exist.

Related policy challenges of relevance for FI-PPP include smart cities and regions (smart specialization), as well as boosting business impact and entrepreneurship. FI-PPP (and also FIRE) will need to engage industrial actors and SMEs into the development of technologies and facilities, in order to tackle the identified challenges of knowledge transfer from research to business and research based entrepreneurship. This requires new forms of partnerships and concrete business models ensuring future sustainability.

4.1.4 Future Internet studies related to policy and regulatory change

The Future Internet forms a rich environment for policy and regulation studies. Several studies have been carried out to explore the implications of the Future Internet in terms of policy and regulatory frameworks. Below we briefly summarize a few important studies as far as relevant for the FI-PPP.

- **Oxford Internet Institute (2010) studied the interrelations between technological, social and economic trends regarding the Future Internet**. The increasingly important role of the Internet has led to an increasing dependency which also breeds deep potential vulnerabilities. These are both technical (e.g. security and resilience) and legal, (e.g. privacy and trust). This brings in focus the role of governance and regulation. On the other hand, the internet's bottom-up evolutionary development and relative lack of regulation has made possible the flourishing of innovative applications. The report develops ten guiding principles for a needs-based future internet and looks into the functionalities realizing these principles. Finally, guidelines and future research for policy and regulation is proposed. Some of the conclusions and recommendations are, in summary:
    - A stronger link will be necessary across policy instruments e.g. R&D support, standardization, procurement and regulation; regions and sectors; government levels; stakeholder domains. Internet governance should consist of a range of technical, economic, legal and societal rules and instruments, set in a clear framework, which should encompass the transfer of useful inherited principles from other sectors into the Internet domain.

- Regulation is to be based on key principles: smart regulation, openness and transparency, Innovation-friendliness, leadership.

- **The FI3P study (Rand Europe, 2012) was set up to estimate the potential economic and societal contributions of the European Internet industry** as well as the impacts of EU support for a Future Internet Public Private Partnership (PPP). The FI3P project provides an analysis of the European Internet sector and its evolution in the period 2012-2014. The report analyses the main actors, among which the traditional actors in the telecommunications, IT and software sectors as well as the emerging sectors in the "Web Ecosystem". One of the conclusions is that in order to gain competitiveness in the Web ecosystem, EU actors need to overcome current bottlenecks and exploit web-based innovation, launch new services and applications and expand in new markets. The EC might help in supporting the development of open web platforms and removing regulatory barriers to new applications and services. The report's general conclusion is that the interaction between technology innovation and demand evolution will be the major factor shaping take-up and adoption of the Future Internet.

  The report describes how the balance between stakeholders governing the Internet is shifting and how this may have unforeseen consequences. Commercial players and users will have a much greater say in the governance of the Internet, while the small community of developers will see its influence reduced. A possible consequence of greater influence of commercial players can be seen in the debate around Net Neutrality, which may result in tiered fees structures for Internet traffic, privileging business traffic. But also the growing attempts my many governments to build fences and barriers around parts of the Internet may put at risk the openness and universality of the current Internet environments. They identified a long list of barriers to global competitiveness of the EU, which can be clustered in three categories:

  - limited access to inputs
  - obstacles to innovation; and
  - economic, cultural and legal impediments to effective market competition and cooperation

4.1.5 Priorities

Based on these envisaged FI-PPP impacts the following three priorities to be worked on within FI-PPP in the domain of policy and regulation can be identified.

1) Markets for smart infrastructures: emerging frameworks for policy and regulatory conditions such as interoperability, openness, standards, security and privacy.
   - Which business models are emerging based on FI-PPP innovations in service platforms, and how are these models constrained by existing regulations and policies.
2) Policy and regulatory issues affecting the success of Future Internet enabled networked applications.
   - Which policies and regulations affect the access to data in supply chains.
   - Which policies and regulations may support the use of data in smart networks in relation to privacy and security concerns?
3) Ensuring the impact of FI-PPP: shaping SME involvement, entrepreneurship and incubation activities.
   - Support FI-PPP projects to engage SMEs as partners in FI-PPP projects in Phase II, III.
   - Develop approaches and policies to stimulate web-entrepreneurs, working with the web-entrepreneurship initiative.

4.2 Specific Initiatives and topics

The role of FI-PPP, facilitated by CONCORD, in this respect could be in the **identification of a number of steps and activities which relate to SMEs innovation ecosystems and initiating Web entrepreneurship actions based on FI-PPP assets**. These assets include: use of FI-PPP test bed facilities, FI-PPP project networks, and knowledge & technology assets such as open source software components.

4.2.1 Future Internet and entrepreneurship stimulation

A priority challenge is the need to link promising future internet enabled platforms and commercial potential in order to create business impact and entrepreneurship. Some interesting examples exist abroad. The NSF I-Corps program brings together the technological, entrepreneurial and business know-how to accelerate the exploitation of technologies. Another recent initiative is the Canadian Digital Accelerator for Innovation and Research (DAIR), initiated by CANARIE, which is a "digital sandbox" where high-tech innovators – SMEs - can rapidly design, validate, prototype and demonstrate new technologies for world markets[5]. FI-PPP (and also FIRE) will need to increasingly engage industrial actors and SMEs into the development of technologies and facilities, in order to tackle the identified challenges of knowledge transfer from research to business and research based entrepreneurship. This requires new forms of partnerships and concrete business models ensuring future sustainability.

4.2.2 Web Economy and Web Entrepreneurship

Action 54 of the Digital Agenda is to Develop a new generation of web-based applications and services. The main problem is that Europe counts much fewer start ups founded by web entrepreneurs and the ones that are created rarely grow to global leaders. During 2012, a number of targeted actions have been undertaken to address this issue, e.g. TechAllStars campaign, OpenIdeo, Awards. However more needs to be done in terms of promotion of web entrepreneurship, strengthen the web start-up ecosystem and bring stakeholders together to pool resources. Regarding FI-PPP, it is planned that Call 3 (open 16 May 2013 and closed 10 December 2013) will provide opportunities for small and innovative tech start-ups to develop new web-based services and applications. Besides, there is a need to enhance the innovation ecosystem at local and regional level for such web entrepreneurs including a role for venture capital. The new Horizon 2020 program will stimulate innovative SMEs, including Web entrepreneurs buy facilitating access top risk capital or specific pilot projects and prizes and the sue of the SME instrument for support to promising start-ups.

The staff working paper "Strengthening the Competitiveness of the EU Web Economy" (concept, June 2012) identifies some bottlenecks e.g. EU funding instruments are too slow and EU-wide platforms for grassroots collaboration (such as Entrepreneurship hubs) is missing. Also the current innovation ecosystems suffer from fragmentation. The paper proposes an EU framework which includes several pillars such as 1. Catalyst/networking activities (networks of hubs, open collaboration spaces), 2. Awareness creation activities, 3. Training and education developing close links between entrepreneurs and universities. Recently, the EC launched a consultation for Web Entrepreneurship Support Actions closing December 2012.

The role of FI-PPP, facilitated by CONCORD, in this respect could be in a number of steps and activities which relate to SMEs innovation ecosystems and initiating Web entrepreneurship actions based on FI-PPP assets. These assets include: use of FI-PPP testbed facilities, FI-PPP project networks, and knowledge & technology assets such as open source software components. See next section.

[5] See: www.canarie.ca/en/dair. This program has started December 2011.

4.2.3 Regional innovation ecosystems boosting SMEs

The more general issue is to strengthen regional innovation ecosystems. One action for FI-PPP is to establish and strengthen the (cross-) regional innovation ecosystems around FI-PPP projects towards longer term sustainability. FI-PPP Call 1 and 2 projects should mature into networks or clusters of companies, SMEs and academic institutes in cities and regions acting as breeding grounds for SMEs and web entrepreneur initiatives. Access to infrastructure, platforms, software components and knowledge generated by FI-PPP projects should be easily available. Regional and national initiatives regarding entrpreneurship and innovation should be integrated with FI-PPP key project clusters.

Second and elaborating on the former is to establish collaboration based on FI-PPP assets with existing, promising regional entrepreneurship activities around innovation centres, science parks, venture labs and comparable business creation activities. Local collaboration agreements can be created that provide the open access to and use of FI-PPP assets to start-ups who in turn may contribute to these assets e.g. developing advanced software components or technologies, or using FI-PPP assets in commercialised products and services. Such collaboration can be facilitated with EIT ICT-Labs activities or with local / regional entities (CONCORD is arranging cooperation with EIT ICT-Labs). In terms of funding such collaboration, different sources of public and private funding can be combined (public funding at national, regional, EU-level and also Structural Funds).

Third, and related to the former, FI-PPP Call 3 opening in May 2013 is expected to provide opportunities for small and innovative tech startups to develop new web based services and applications.

4.2.4 Smart cities as innovation ecosystems

Smart cities are increasingly considered as user driven innovation environments, providing opportunities for testing Future Internet technologies in living lab settings. The FIREBALL Support Action (www.fireball4smartcities.eu) has promoted Smart Cities as innovation ecosystems for future internet research, bringing together the communities of future internet, living labs and smart cities. In addition, the concept of smart regions gains importance in smart specialization strategies. This illustrates the importance of future internet experimentation and use case projects within the context of innovation policy for achieving synergies and impact through collaboration across regional and national boundaries and through transnational approaches. Maybe less focusing on cities FI-PPP might emphasize “smart connectedness” in business and societal networks of all kinds. An issue is how this fits in current policies regarding smart cities and regional specialization and if there would be a need for a more diverse set of policies

Smart Cities are considered as open innovation ecosystems and playgrounds to exploit the opportunities of the Future Internet[6]. Cities and urban areas in general are also considered as critical for getting the Digital Agenda up and running. They have both critical mass and local engagement that is important in getting pilot projects running. The Internet provides platforms and tools that facilitate the engagement of citizens to shape their city. The role of cities as innovation ecosystems has been underlined in several CIP ICT-PSP projects, FP7 projects such as Smart Santander, as well as in FIREBALL support action (www.fireball4smartcities.eu) and also in the FI-PPP. See also the Commission communication on Cities and the Digital Agenda (Kroes, 2010).

[6] The FIREBALL Support Action has explored this area of Smart Cities, Future Internet and Living labs. See: http://www.fireball4smartcities.eu/ where a White Paper on Smart Cities as Innovation Ecosystems Sustained by the Future Internet (2012) can be downloaded.

4.2.5 European Patent System

The overall growth in patent applications can be attributed to several factors, including increased technological complexity (Hall, 2004; Heller & Eisenberg, 1998). There is some disagreement as to whether this is a result of the explosive growth in innovation in sectors like the ICT and biotechnology industry, or if it is more akin to a situation where firms have sought to establish increased property rights without dramatically increasing their overall levels of innovation (Bessen & Meurer, 2008b). According to studies in the US, this has led to both a decline in patent quality and an increase in patent litigation (Bessen & Meurer, 2005). In addition, the pendency period of applications has increased dramatically, almost doubling from 19 months in the early 1990s to 34 months in 2010 (Rai, Graham, & Doms, 2010). If these elements also applied to other patent systems such as the European one, they would create uncertainty and could undermine the ultimate goal of the patent system, which is to spur innovation. **Uncertainty in the patent system has a counter-intuitive effect; instead of using it less**, firms are choosing to file for more patents, either to fend off perceived threats or to take advantage of the weakness in the system (Hargreaves, 2011).

The combined result of all this may be *patent thickets*. A patent thicket conjures up the image of a thicket, or bramble, a large dense bush with thorns on the branches making it difficult to pass through without getting severely scratched. Thus a patent thicket is a "a *dense web of overlapping intellectual property rights that a company must hack its way through in order to actually commercialize new technology*" (Shapiro, 2001, p. 120). This makes it difficult to negotiate intellectual property rights (for example, licensing agreements1), to the point where some observers feel it might be socially inefficient (Bessen & Meurer, 2008b; Scotchmer, 1996). In such a situation, it is argued that strategic uses of the patent system by applicants may be interfering with one of the goals of the system, by obliging innovators to spend inordinate resources on transaction costs to bring new technology that builds on prior work to market. Such high transaction costs, if and when they exist, would tend to discourage innovation rather than encourage it.

One example is that of a third-party producer, a smart phone developer, whose product affects (at least) several components, many of which are based on standards, and represent thousands of patents. Another presentation estimated that such a device could utilize the technology represented in up to 15 000 patents. If a party cannot comply with a standard except via a series of bilateral negotiations with every intellectual property holder, it becomes almost impossible to actually comply with the standard, thus weakening the usefulness and diffusion of the standard and hindering interoperability of the end-products, e.g. the smartphones.

Having many patents is not a problem in and of it. **Failures arise when economic players cannot develop their business, or market players abandon their innovation activities** due to an inability to assess the validity of their intellectual property. Thus, one theme that was raised repeatedly was uncertainty over the freedom to operate (in the general rather than the legal sense), or uncertainty about the transaction costs necessary to develop and commercialize a product. In fact, the reason for the prevalence of patent lawsuits may have much to do with the effectiveness of patent offices' review processes. This may take the form of pendency and quality – and is not restricted to the US, according to the participants; even if the US system seems to magnify these problems, they are evident in Europe as well.

For this purpose the following measures have been proposed by the European Patent Office Economic and Scientific Advisory Board:

- (1) Improvements in the granting process; there should be a price system to reduce the number of low-quality applications. Patent procedural fees have been seen as an effective policy tool to increase patent quality. Other suggestions in the same vein included paying higher fees to receive a speedier decision.
- (2) Improvements in dispute resolution; better litigation system and better alternative dispute resolution mechanisms

- (3) Improvements in standards IP management; enforcing FRAND and managing Patent Pools.
- (4) Improvements in transparency; First and foremost is the issue of requiring patent holders to properly declare their ownership. Consistent with Bessen & Meurer (2008a), several experts suggested that intellectual property should be treated more like other forms of property, including having a registry requirement. **One advantage of treating IP like physical property would be the ability to attach encumbrances to it**. Previous discussions about FRAND agreements note that they are subject to the firm that owns the essential patent continuing to honor the agreement. **If instead such a FRAND commitment were to be registered to the patent itself then this would have the same effect as a deed restriction on a physical plot of land**, thus providing greater transparency and consistency in standards essential patent licensing.
- (5) Market-based incentives; SMEs were unduly burdened by the current situation but rather than trying to impose changes on the entire current system, another option might be to simply give some kind of support (information, legal advice, monetary subsidies, or legal representation) directly to SMEs to help them navigate the current IP system
- (6) Compulsory licensing.

Standard-setting organizations normally require contributors to agree to license on fair, reasonable and non-discriminatory (FRAND) terms as a means of preventing excessive rent-seeking, hold-ups, or anticompetitive practices from those members who hold IP elements of the standard (Mariniello, 2011). Unless a patent pool has been set up around the standard, there is no statutory requirement that companies license under FRAND terms; failure to uphold FRAND agreements is subject to contract litigation and competition scrutiny. **FRAND terms with fewer parties backing out would reduce the cost of litigation**, and having owners of IP in SEPs, Standards- Essential Patents, and commit to FRAND despite future ownership changes would also increase transparency.

Patent pools result from the collaborative pooling of the patents necessary to build or operate a complex product. The common circumstance necessitating a patent pool is where multiple companies own or control distinct patents that, as a whole, define or enable a product and the patents are therefore pooled and licensed as a bundled good. This enables widespread technologies such as mobile telephones to operate in a common fashion and may become the basis of an established standard, or a pool may be generated at the insistence of a standards authority. One of the first known patent pools was formed in the early 20th century so that competing companies owning patents essential to the manufacture of aircraft could freely operate in an open and competitive market (Shapiro, 2001).

Because patent pools represent an efficient means by which technology firms can obtain a bundle of licenses essential to the foundation of a product, they are more likely to have confidence in the product and, instead of focusing their attention on inventing around certain technologies, they can devote their resources to creating new innovations, thus raising the level of the market. However, depending on the legislation, **patent pools may be limited only to those patents essential to the technology, specifically patents that are complementary** and would otherwise block each other, and should not include patents that are ancillary or easily invented-around (Van Overwalle, 2010). If pools become too bloated with superfluous patents, they then act like thickets, and take on an anti-competitive role (Lerner et al., 2007; Lerner & Tirole, 2002).

The alternative to a patent pool is the distinct licensing of each technology related to a product. This introduces inefficiencies for both parties, as each negotiation may be influenced by factors unrelated to the technologies themselves, as well as uncertainty as to the final outcome and the related costs (Aoki & Schiff, 2008). This creates a tremendous amount of uncertainty in the licensing process and the markets for technology (Arora, Fosfuri, & Gambardella, 2001). Companies prefer patent pools in important areas because:

- (1) Unlike individually negotiated licensing agreements, which can take too long, they reduce transaction costs;
- (2) They are independently scrutinized by teams to check whether they comply with the standards;
- (3) They provide a level playing field where all members fall under the same rules, rather than having to face a range of different royalties that apply in different countries.

Finally, on December, 2012, the European Union sealed an agreement for the creation of a single patent system across 25 countries, bringing to an end decades of argument. The measure aims to boost competitiveness and innovation as it reduces red tape for inventors and brings patent costs in line with other economies like the U.S. and Japan. **The new patent should come into force in 2014,** and a new unified patent court will be set up in Paris with some specialist services located in London and Munich.

It will mean an inventor can file a single application with the European Patent Office with no need to validate it one by one in each country, a process that involves complex validation requirements and stacks up huge translation costs. The new unified court will also end the need to defend the patent in various national courts with the risk of different outcomes in different countries.

The EU has suffered a competitive gap with the U.S. and Japan because of the costs of patenting innovations. It is going to have a broad impact, especially on small and medium enterprises. **The EU patent will reduce the cost of patenting inventions to around a sixth of today's costs**, bringing a typical application and approval to roughly €5,000 ($6,471) from over €36,000, according to the European Commission. The same procedure costs under €2,000 in the U.S. **Money will also be saved thanks to the single court for litigation, as companies won't have to challenge a patent in each country separately**.

The introduction of the unified patent system should make European patents more valuable and **it will give innovators around the world a very valuable form of commercial protection over a marketplace of around 500 million people**. The new patent regime covers all EU nations with the exception of Italy and Spain. The two countries backed out of the agreement over a decision to limit the number of languages to English, French and German.

4.3 Convergence, Regulation and Development towards an Internet economy

As convergence of network platforms, content and business models proceeds, regulatory challenges associated with convergence are significant, e.g. networks can handle many types of converged services which means a shift in the way broadcasting and telecommunications is regulated. Emphasis of regulation is on stimulation of competitiveness. Insight is needed into the impact of convergence on competition, the regulatory and policy issues of network infrastructure and services, the promise of multi-platform competition, and the implications of greater connectivity, pricing, sustainable competition, investment and innovation. The Policy Brief is also explaining how the Internet drives innovation and business models: the Internet is transforming platforms for delivering content e.g. changing towards participative networks. The policy challenge is to encourage innovation, growth and change and develop governance that does not stifle creativity or affect openness of the Internet as dynamic platform for innovation.

Among the list of general policy making principles proposed are the following that seem relevant for FI-PPP:

- Promote the open, distributed and interconnected nature of the Internet.
- Promote investment and competition in high speed networks and services.
- Promote and enable cross-border delivery of services.
- Ensure transparency, fair process and accountability.

- Promote creativity and innovation.
- Encourage co-operation to promote Internet security.

Probably the most of relevance for FI-PPP is **how to benefit from convergence and at the same time ensure that competition** is fostered increasing the transparency of bundled offers and avoiding customer lock-in and abuse of market power by large operators.

A key issue to study here is the ability of end-users to access and distribute information or run applications and services of their choice, to **preserve the openness of the Internet as platform**.

Additionally, there are **many risks around Open Data and their potential use and this is a specific regulation** issue for the European Commission providing European guidelines and common understanding on what are Open Data and best practices to use them, including privacy aspects

4.3.1 Distributed Future Internet Platform Regulation

In relation to FI-PPP, a main issue here is what the necessary regulatory evolution is to make possible to operate a distributed Future Internet platform across Europe, with a perspective of an internal market for trusted and secure e-services (stated in the FI-PPP Work Programme). The Core Platform is conceived as an open network and service platform as specification of API's supported by Generic Enablers (software components) will be open and royalty-free. Access Rights to Foreground and for Background and Sideground needed for the use of any Foreground, outside FI PPP program activities will be granted on Fair and Reasonable and Non-Discriminatory (FRAND) Conditions. Issues that may potentially be addressed in terms for regulation and policy include the role of core platforms in competition, access conditions to critical components and interfaces, and business model aspects of exploitation of the core platform. Could such publicly-funded core platforms distort competition? Does it create lock-in conditions?

Areas that could be relevant for platforms regulation are **pricing and cross-subsidization strategies, bundling strategies and collaboration strategies**. Nevertheless, traditional **regulatory analysis is not equipped to deal with platforms activity.** In relation to Internet platforms, we identified several potential areas of **policy and regulatory issues or concerns**.

- As already noted, traditional regulatory analysis is not well equipped to address platforms activity. Issues of relevance in terms of **anticompetitive practices** include pricing and cross-subsidization strategies, bundling strategies and collaboration strategies.
- There also might be concerns related to entry or **interoperation and legal barriers**. Relevance for FI WARE Includes technology, standards, business model, contractual barriers. There may be issues related to legal or regulatory differences, inefficiencies and ineffectiveness, due to licensing, privacy and security, standards, or financial regulations.

The sheer number and complexity of instruments being used by platform owners (including investments, technology rules, information dissemination, contracting choices and pricing) is also clearly an empirical phenomenon deserving closer attention and clearer explanation. Why so many instruments? The basic terms and analytical framework suggests it may be productive to develop a contingent view of the role of private versus public regulators. The analysis here leaves open the question of whether there was in fact (much of) a deadweight loss associated with **platform regulation and pointed to a variety of factors shaping profit-taking by platform owners that should be further investigated**. These findings have important managerial implications.

- First, the scope of **strategy for platforms is significantly wider than for normal firms**: it is not limited to pricing, product design and technology, but also and critically includes control over interactions. Our analytical framework suggests a two-step approach for a platform owner:
    - 1) Maximize value created for the entire ecosystem;
    - 2) Maximize the value extracted.
- Second, there is a wide array of strategic instruments available to implement platform regulation, **including contractual, technological and information design**. While more detailed analysis of these instruments remains an area of future research, it is useful to emphasize that **even non-technology multi-sided platforms can and should use a sophisticated array of regulation instruments** (cf. Roppongi Hills).
- Third, the need for and **consequences of platform regulation may evolve over time**. Active and early orchestration of the multiple sides of a business has the potential to set powerful network effects and complementarities into motion. Establishing a MSP regulation model may be most difficult stage in early stages particularly if a firm waits while competitors do so. By the same token, **once a regulated ecosystem is successfully established,** the advantages of distributed innovation and decision making may begin to truly take hold (cf. Roppongi Hills).

The emergence of multi-sided platforms implies that **policy makers and regulators should not take for granted that simply allowing and facilitating the convergence** between IT, internet, telecommunications and media services and technologies will result in an unbundled, open marketplace in which competition will flourish (Ballon, 2009a). The rise of platforms in ICT markets that invites to **a reappraisal of regulatory frameworks and practices**. Besides inter-organizational collective action, formal law regulations and policies from government and/or regulatory authorities play an important role in enabling the vision of common service platforms.

- One relevant issue in this domain is that **sharing distributed service resources** (i.e. network infrastructure, service platform and devices) may not be in the interest of all involved actors only if there is strong added value or perhaps enforcement from market competition or regulations.
- Moreover, there is a lack of interest from actors to solve **the problem of interoperability** mainly because of related costs, complexity, and reliability or competition concerns.

Under the new Digital Agenda (2010), Europe appears to move further towards regulating platforms in general, i.e. the access to platforms, **the interoperability between platforms**, and so on. New European **interoperability rules** foreseen for the electronic communications industry, **based on antitrust rules related to the abuse of market position, referring to a significant position**. In this case, obligations will be imposed related to licensee interoperability information, **to ensure consumer choice in software as well as hardware**

4.3.2 Open Internet and Net Neutrality

During the nineties, telecommunication policy and regulation has emerged as a highly important area at national and European level, **addressing key issues in competition and market dominance, access and interconnection, privatisation and ownership as related to fixed and wireless telecommunications networks**. The Internet and related industry and market transformation has added a new wave of discussions regarding broadband stimulation, privacy, security, property rights whereas at the same time competition and market dominance issues remain of importance. An area of particular importance is open internet and net neutrality. **A key issue here is the ability of end-users to access and distribute information or run applications and services of their choice, to preserve the openness of the Internet as platform**. A European Commission communication on "The Open Internet and Net Neutrality in Europe" (2011) further elaborates the different policy directions addressing competition, traffic management, consumer protection

and other. While the topic is not of direct relevance to FI-PPP it may have some relevance in relation to the FI-PPP core platform activity, this needs further study.

A recent **European Commission communication addresses the Open Internet and net neutrality in Europe**. (European Commission, 2011). Net neutrality concerns **how best to preserve the openness of the Internet platform**. Much of the debate centres on traffic management, used by network operators to ensure efficient use of their network and high quality of service. This also may give rise to blocking or degrading legal services which compete to their own services. The Commission has set in place a framework of principles for net neutrality. A revised EU electronic communications framework has been developed which is transposed into national law, but more stringent measures could be taken.

4.3.3 Open Data policies

Open Data is a relatively new development but has received a lot of bottom-up as well as policy interest. **Many initiatives have been launched by cities and national governments**. The UK open data white paper stresses the importance of open data (e.g. geo-data, environmental data, health-related data) **for development of innovative products and services in a wide range of domains**. However there still appear to be barriers and drivers of open data policy implementation (Huijboom and Van den Broek, 2011). **One of the bottlenecks is governments' reluctance to adopt open data strategies**. FI-PPP could help developing effective open data strategies however the thematic of open data then should more explicitly be part of the next FI-PPP phases 2 and 3.

The concept of Open Data emerged some years ago but was not so well-known from a business point of-view. The definition of Open Data can be summarized by the statement ***"A piece of data is open if anyone is free to use, reuse, and redistribute it — subject only, at most, to the requirement to attribute and/or share-alike."***[7] and one of the key event which boosted the communication around Open Data is the nomination, by the British Prime Minister, in June 2009, of Tim Berners-Lee to support the British Government at making data more open and accessible on the Web through data.gov.uk.

Nowadays, Open Data websites are emerging everywhere around the world:

[7] http://opendefinition.org/

Figure 4: Open Data map (www.data.org)

At the European level, many countries have put in place an Open Data strategy during the last two years:

Website	Country	Launched date	Languages
data.norge.no	Norway	April 2010	Norwegian
data.belgium.be	Belgium	September 2011	Dutch/English/French/German
data.overheid.nl	Dutch website	October 2011	Dutch
dati.gov.it	Italy	October 2011	Italian
datos.gob.es	Spain	October 2011	Spanish/Spanish Regional languages/English
data.gouv.fr	France	December 2011	French
opendata.ee	Estonia	Mars 2011	Estonian/English
dados.gov.pt	Portugal	November 2011	Portuguese
ate.gov.md	Moldavia	October 2011	Romanian/English/Russian
data.gv.at	Austria	April 2012	German
www.opendata.cz	Czech Republic	2012	Czech/English
www.portalu.de	Germany	February 2013	German/English
digitaliser.dk	Denmark	January 2013	Danish
open-data.europa.eu	EU	2013	23 languages

Table 3: European Open Data websites

4.4 FI-WARE chapters main technological regulatory challenges

In addition to the reappraisal of regulatory frameworks and practices that the rise of platforms in ICT markets invites FI-**WARE have identified the main regulatory challenges from the technical chapters and those non-technical aspects that could influence** FI-WARE exploitation in one way or another. In the first year the project will identify those channels that could help to this purpose.

4.4.1 Cloud Computing

Cloud-based systems generally confront several challenges at the interface of ICT and policy. These include proprietarily of services and programming interfaces causing lock-in; problems with trust, security and privacy (which has legal as well as technical aspects); lack of interoperation interfaces between CLOUD (resources and services) offerings and between CLOUDs and other infrastructures and many more. Overcoming them provides Europe with an opportunity to exploit the market. (Advances in Clouds, 2011).

In case of **virtual network provision** or **cloud computing**, routing of connections (and related backup connections) may be subject to legal restrictions concerning traversal of areas under different laws (with respect to, for example, privacy, digital rights management, lawful interception, public emergency handling). These risks call for automated end-to-end security with a heavier emphasis on strong isolation, integrity and resiliency in order to provide visibility, control and automation across the cloud computing infrastructure

Another topic regarding **cloud computing includes the risks and benefits of virtual access to information.** Efficiencies which can be delivered with a cloud model can be derailed by regulation and legal constraints, such as the requirement to keep certain data within certain geographic boundaries (e.g. country). The heterogeneity of legislation across Europe covering security, privacy, trust, and digital rights is a barrier to entry for ICT SME.

Typically existing **IaaS Cloud Hosting solutions are based on a centralised infrastructure deployed usually on a few data centres** distributed geographically. However, **some Future Internet applications may require reduced latency and high bandwidth** that this approach and current network realities cannot always meet. This becomes especially problematic when the users of the hosted applications and services are using their home broadband connections. **Stricter privacy requirements that favour local-only storage of data may be an additional obstacle to the current approach,** as it would place data even further away from the computational infrastructure.

Trust and consequentially security concerns are one of the top obstacles that hinder Cloud Computing adoption today

One of the areas of high importance in the Digital Agenda is cloud computing. The Digital Agenda aims to promote the right conditions for citizens and businesses to benefit from this. An online consultation has been running in 2011 and feeds the European Cloud Computing Strategy (2012). The survey also seeks **feedback on policy issues such as data protection and liability (in particular in cross-border situations), legal and technical barriers, standardization and interoperability solutions, uptake of cloud services.** The recently published Cloud strategy includes three key actions: standards, contract terms and conditions, and European Cloud partnership as well as a number of flanking actions.

4.4.2 Privacy

A further topic is **privacy** in relation to private and sensitive customer data, events and contexts. Sensible data of citizens and objects has to be stored and managed fulfilling security, integrity and accessibility rules as established by the concerning authorities. **Internet of Things** is a dedicated topic for vertical areas where dominant players impose their views and would not share data. In this context, data property is a major

concern that could provide serious gaps across European countries depending how national regulation processes would support the deployment of new technologies. For instance, in the collaboration with the SAFECITY project, a video surveillance related scenario in Spain was affected by the following directive on protection of personal data[8].

A specific privacy concern is with private and sensitive location data of customers. As long as Big Data, Notifications and Context Events are related to different vertical applications, it comes down to the problem domain being worked on. E112 rules in Europe will enforce the need of precise positioning provided by Location Platforms. It is a key enabler for citizen safety by helping emergency services to precisely locate an end-user using its mobile terminal. As soon as cross-applications between several usage areas would appear, **privacy and risk management would become the most important topic which could aim to a major risk for Internet of Things**: stop the development. Rules and liability regarding the use of data and access to devices (smart things) should be clarified and well-known from users (people and companies) to support the emerging wave of Internet of Things. This regulation should not encompass all concerns but deal with the most relevant depending of the status of smart things and how data could be shared. This step by step approach should reassure all actors, supporting Internet of Things development.

Privacy is also an issue in relation to processing of log files containing personal data. This may be subject to prior authorisation, according to national laws. Stricter privacy regulation, such as the recent EU privacy regulation, would help to promote the use and adaption of privacy-enhancing technologies.

A related topic is **on line identity** which concerns, among others, anonymity, digital presence, and right to delete information.

Data as an asset has no value until it is extracted, given meaning and allowed to flow safely and securely. It can then be monetized through innovative services and complex analytics, such as predictive behavioural models, location-based services, life-logging and personal data vaults offering secure storage and targeted access facilities.

Consumers need trust and transparency. Protecting privacy and establishing trust through frameworks of rights and responsibilities, best practice and regulator-enforced standards are essential to enable data to flow. The consumer is centre-stage, as both the source of data and the market for value-added, personalized services. Empowering the consumer, thereby driving usage, calls for transparency on data collection and use and the ability to opt in or out of data disclosure to varying degrees on a sliding scale.

Dangers of data. Data is held, distributed and analysed globally rather than locally, with **no clear jurisdiction or established regulatory framework to deal with any disputes.** Additionally, targeted advertising may be disruptive or intrusively personal; and searches based on behavioural analysis models return restricted data, limiting exposure to new information and the spread of knowledge globally.

- **Access to business data**. Key conditions of international trade are related to data. Regulatory approaches related to data (access, privacy, security) are different across countries, which affects companies doing business in such countries. For example, in some countries (US, China) access to possibly sensitive business data is mandated by governments. It should be explored whether WTO or EU have a role to initiate regulatory regimes harmonized across countries.
- **Data and privacy breach.** Data stored in could-based systems are vulnerable for privacy breach e.g. tracking down individuals. This is something companies are concerned about, in particular

[8] http://www.agpd.es/portalwebAGPD/canaldocumentacion/legislacion/estatal/common/pdfs_ingles/Ley_Orgnica_15-99_ingles.pdf

for reasons of due process. There is a concern that electronic or physical data are not treated equally.

- **Data quality**. Quality of data is an issue, especially when data is generated by sensors and people are acting upon this data. For example in food supply chains, an issue is the responsibility if such information is not reliable and still being used and liability for failures in case of data of insufficient quality and reliability. For example, cities build transportation systems using information to enable scheduling of deliveries. Third party operators of logistics services are using these data.

4.4.3 Security

On-line relationships between customers and suppliers, in particular for ensuring **secure on-line transactions**. This would require a reinforced network and information security policy. Existing regulations are very much dependent upon the service provided online from the supplier to the consumer.

Cybercrime and cyber law issues include threats such as phishing, cracking, cyber terrorism. In France, the accessing or remain fraudulently, in whole or part of a "system of automated data processing" is an offense punishable by two years' imprisonment and a 30,000 euro fine (cp. , s. 323-1, paragraph 1) and any attempt is punishable in the same (cp., art. 323-7. In Belgium, the parliament has in November 2000 adopted new articles in the Criminal Code on computer crime, in effect from February 13, 2001 (COMPUTER HACKING - Article 550(b) of the Criminal Code). In the UK, the Police and Justice Act 2006 Chapter 48 amends the Computer Misuse Act, see Part 5 sections 35-38. The new amendments came into force on October 1, 2008, and reads as follows: Unauthorised access to computer material and Unauthorised acts with intent to impair operation of computer.

4.4.4 Analysis and solutions

As regards **virtual network provision** or **cloud computing**, **assessing the risks associated with cloud computing**, such as data integrity, recovery, privacy, and tenant isolation is critical to the adoption of cloud technologies. These risks **call for automated end-to-end security with a heavier emphasis on strong isolation,** integrity and resiliency in order to provide visibility, control and automation across the cloud computing infrastructure. **A stronger emphasis on compliance** will be also needed

In relation to **content regulation**, as long as Big Data, Notifications and Context Events are related to different vertical applications, it comes down to the problem domain being worked on. Therefore more **directives might be identified depending on the specific vertical areas and locations of application**.

Regarding use of data, the consumer must be empowered and educated to take personal responsibility for data, controlling disclosure as far as possible through meaningful consent. A framework of rights and responsibilities for both the individual and entities could establish best international online practice, including clearly-worded, accessible privacy policies, transparency in data collection, storage and use and the ability to enforce penalties for any breach. The way forward may be encouraging a form of digital citizenship, where a culture of responsibility transfers offline values to the online world; or even creating a bill of rights, stating principles that are universally accepted as the basis of a global framework of international jurisdiction eHealth itself is a jungle of devices, formats, models, applications and technologies, arising in part in response to regional specificities of geography, demography, economy, lifestyle and degree of connectivity. **Without sufficient investment, and without regulation driving standardization, quality of service, data confidentiality and interoperability**, eHealth for example will not be taken to scale - and costs will remain prohibitive

Open Data is a relatively new development but has received a lot of bottom-up as well as policy interest. Many initiatives have been launched by cities and national governments. The UK open data

white paper stresses the importance of open data (e.g. geo-data, environmental data, health-related data) for development of innovative products and services in a wide range of domains. However there still appear to be barriers and drivers of open data policy implementation (Huijboom and Van den Broek, 2011). One of the bottlenecks is governments' reluctance to adopt open data strategies. FI-PPP could help developing effective open data strategies however the thematic of open data then should more explicitly be part of the next FI-PPP phases 2 and 3.

Regarding issues in the scope of **privacy and on-line identity**, an important work to be undertaken is the compilation of the laws in Europe and in each State of European Union. This preliminary work will assess the **efforts needed to harmonize policies and regulations, particularly regarding privacy in electronic exchanges both for the commercial, industrial, cultural, medical and administrative domains**. Directions for solutions to explore further may include the following:

- **Simplify copyright clearance, management and cross-border licensing**. Reviewing the Directive on Re-Use of Public Sector Information, notably its scope and principles on charging for access and use" should give impetus to the developments in the chapter "Data/Context Management" in which the availability of advanced platform functionalities dealing with gathering, processing
- **Review the EU data protection regulatory framework with a view to enhancing individuals'** confidence and strengthening their rights.
- **The Data Protection Directive** (officially Directive 95/46/EC on the protection of individuals with regard to the processing of personal data and on the free movement of such data) is a European Union directive which **regulates the processing of personal data within the European Union**. This directive could be used or revised **to include Internet of Things subject** but in the opposite, European Union should be flexible to avoid any breakthrough with regulation on this topic in other areas around the world.

Consumers and suppliers on-line relations. FIWARE and European industrial enterprises should take initiative in order to develop solutions to ensure secure online transactions. In 2011 Publish Communication containing the principles for internet resilience and stability at the European and global level. Ensure that the heads of the respective institutions will sign the agreement to establish the CERT for the EU institutions. In 2012 ensure that the regulations on ENISA will be adopted at the EU level. Make sure that CERT becomes operational. Additional efforts are to be pursued to ensure secure transactions between customers and suppliers in online transactions.

Cyber security. It should be ensured an effective cooperation between EU States' authorities, in particular on preventing cybercrime. In March 2012, the European Commission has proposed creating a dedicated Cybercrime Centre within Europol. We must to promote the development of specialized EU agencies, such as Europol, Eurojust and CEPOL. FIWARE and European industrial enterprises must to develop cyber security solutions and to promote interconnections between Cyber Operational Centres.

Net neutrality and quality of service regulation is an enabler / opportunity for the technologies proposed in FI-WARE dealing with the QoS and open interfaces (device. network) . If the trend remains the same probably for data connections to/from OTT demanding premium services shall be regulated in the same manner.

4.4.5 Consolidation

Given the first project-specific identification of issues, we may **identify the generic, overarching issues relevant for multiple projects within the FI PPP projects** (i.e**.**net neutrality, access to use of personal and business data in networks and privacy issues..) and constitute a linkage to current concerns of policy makers

at various levels (EC, national regional etc). Behind these themes are actors and interests (telecom and ICT industry, software, ICT user industries, society at large).

Policy / regulatory concern including some details	**Why is this relevant for FI-WARE or FI-PPP, and how does this affect FI-WARE or FI-PPP impact or exploitation if not resolved**	**What solutions do you propose, and who should be active to develop or implement them? The project, FI-PPP, external parties …**
Traditional regulatory analysis is not equipped to deal with platforms activity	Pricing and cross-subsidization strategies Bundling strategies Collaboration strategies	A thorough investigation can be recommended of potential risks as a consequence of multisidedness of markets Such investigation must lead to a framework to guide NCAs, NRAs, and the EC.. It is up to the EC, and in first instance the European Regulatory Group (ERG)- presently called BEREC
Entry or interoperation and Legal barriers	Includes technology, standards, business model, contractual barriers Legal or regulatory differences, inefficiencies and ineffectiveness, due to licensing, privacy/security, standards, or financial regulation	Propose legislation on ICT interoperability
Efficiencies, which can be delivered with a Cloud model, can be derailed by regulation and legal constraints, such as the requirement to keep certain data within certain geographic boundaries (e.g., country).	The heterogeneity of legislation across Europe covering security, privacy, trust, and digital rights is a barrier to entry for ICT SME.	An important work of compilation of the laws in Europe and in each State of European Union is to be undertaken. This preliminary work will assess the efforts needed to harmonize policies and regulations, particularly regarding privacy in electronic exchanges both for the commercial, industrial, cultural, medical and administrative domains
Privacy Low Enforcement for private and sensitive customers' data, events and context	Sensible data of citizens and objects has to be stored and managed fulfilling security, integrity and accessibility rules as established by the concerning authorities Till Internet of Things is a dedicated topic for vertical areas where dominant players impose their views and would not share data, data property is the major concern that could provide consistent gap between European countries depending how National regulation	Simplify copyright clearance, management and cross-border licensing.. Reviewing the Directive on Re-Use of Public Sector Information, notably its scope and principles on charging for access and use" should give impetus to the developments in the chapter "Data/Context Management" in which the availability of advanced platform functionalities dealing with gathering, processing

	processes would support the deployment of new technologies. For instance, in the collaboration with the Safecity UC project, a video surveillance related scenario in Spain was affected by the following directive on protection of personal data: http://www.agpd.es/portalwebAGPD/canaldocumentacion/legislacion/estatal/common/pdfs_ingles/Ley_Orgnica_15-99_ingles.pdf	Review the EU data protection regulatory framework with a view to enhancing individuals' confidence and strengthening their rights The Data Protection Directive (officially Directive 95/46/EC on the protection of individuals with regard to the processing of personal data and on the free movement of such data) is a European Union directive which regulates the processing of personal data within the European Union. This directive could be used or revised to include Internet of Things subject but in the opposite, European Union should be flexible to avoid any breakthrough with regulation on this topic in other areas around the world Data protection regulations may help restrict the delivery of personal data to M2M More and more M2M and IoT customers are focusing on this issue and especially the "Patriot Act" which could strongly impact the take-up of this promising business.
In case of virtual network provision, routing of connections (and related backup connections) may be subject to legal restrictions concerning traversal of areas under different laws (w.r.t. eg. privacy, digital rights management, lawful interception, public emergency handling)	These risks call for automated end-to-end security with a heavier emphasis on strong isolation, integrity and resiliency in order to provide visibility, control and automation across the cloud computing infrastructure	Assessing the risks associated with cloud computing, such as data integrity, recovery, privacy, and tenant isolation is critical to the adoption of cloud technologies.

Privacy Low Enforcement for private and sensitive customers' location	As long as Big Data, Notifications and Context Events are related to different vertical applications, it comes down to the problem domain being worked on E112 rules in Europe will enforce the need of precise positioning provided by Location Platforms. It is a key enabler for citizen safety by helping emergency services to precisely locate an end-user using its mobile terminal. As soon as cross-applications between several usage areas would appear, privacy and risk management would become the most important topic which could aim to a major risk for Internet of Things: stop the development. Rules and liability regarding the use of data and access to devices (smart things) should be clarified and well-known from users (people and companies) to support the emerging wave of Internet of Things. This regulation should not encompass all concerns but deal with the most relevant depending of the status of smart things and how data could be shared. This step by step approach should reassure all actors, supporting Internet of Things development	More directives might be identified depending on the specific vertical areas and locations of application European Legal Framework guaranteeing privacy harmonized across Europe Need to promote FI benefits: e.g. privacy, reliability, transparency, etc. Consistent cross-border content regulation.
Processing of log files containing personal data may be subject to prior authorization, according to national laws.	Stricter privacy regulation, such as the recent EU privacy regulation, would help to promote the use and adaption of privacy-enhancing technologies	Propose by 2012 a Council and Parliament Decision to ensure mutual recognition of e-identification and e-authentication across the EU based on online 'authentication services' to be offered in all Member States (which may use the most appropriate official citizen documents – issued by the public or the private sector);
Ensure secure online transactions	Reinforced Network and Information Security Policy The existing regulations are very much dependent upon the service provided online from the supplier to the consumer.	In 2011 Publish Communication containing the principles for internet resilience and stability at the European and global level. Ensure that the heads of the respective institutions will sign the agreement to establish the CERT for the EU institutions. In 2012

		Ensure that the regulations on ENISA will be adopted at the EU level. Make sure that CERT becomes operational. Additional efforts are to be pursued to ensure secure transactions between customers and suppliers in online transactions.
Cybercrime and Cyberlaw, including phishing, cracking, cyber terrorism, etc	• In France, the accessing or remain fraudulently, in whole or part of a "system of automated data processing" is an offense punishable by two years imprisonment and a 30,000 euro fine (cp. , s. 323-1, paragraph 1) and any attempt is punishable in the same (cp., art. 323-7. • The Belgian Parliament has in November 2000 adopted new articles in the Criminal Code on computer crime, in effect from February 13, 2001 (COMPUTER HACKING - Article 550(b) of the Criminal Code) In United Kingdom, the Police and Justice Act 2006 Chapter 48 amends the Computer Misuse Act, see Part 5 sections 35-38. The new amendments came into force on October 1, 2008, and reads as follows: Unauthorised access to computer material and Unauthorised acts with intent to impair operation of computer	More needs are to be done to ensure effective cooperation between EU States' authorities, in particular on preventing cybercrime. In March 2012, the European Commission has proposed creating a dedicated Cybercrime Centre within Europol. We must to promote the development of specialized EU agencies, such as Europol, Eurojust and CEPOL. FIWARE and European industrial enterprises must to develop cyber security solutions and to promote interconnections between Cyber Operational Centres FI infrastructure operators must find ways to defend their infrastructure from malicious attacks and to ensure legitimate users will not be harmed if they use the infrastructure (i.e. to make the infrastructure secure and trustworthy).
Net Neutrality and Quality of Service	Net Neutrality: It is mainly discussed in http://berec.europa.eu/ and globally can be considered a thread unless all the technologies for controlling the network behaviour / class of QoS are not encompassed in the mare 'filtering' category. Quality of Service: In Italy and in other EU countries there is a NGN requirement, recently regulated by the authorities, called IP-Peering. It is related to the SLA and in particular on the assured quality inter carrier for voice	• This regulation is an enabler / opportunity for the technologies proposed in FI-WARE dealing with the QoS and open interfaces (device. network) . If the trend remain the same probably for data connections to/from OTT demanding premium services shall be regulated in the same manner

	services that will be migrated to the IP / Internet.	

Table 4: Consolidation Table

5 Conclusions

The **Service industry has become the biggest employer in Europe** and tends to be a critical force to ensure economic growth. **Our work within FI-WARE contributes to the expansion of the service economy by creating an IT infrastructure for Business Services where services become accessible, discoverable, composable,** easily deployable, and ultimately tradable on the Internet. In doing so, our work helps the service sector to generate new value added services, develop innovative business models, and establish new business value chains.

The success of the FI-WARE concept will depend very much on the use of the adequate technological solutions and its ability to engage small and medium developers to use the different tools FI-WARE is going to provide. In the end, FI-WARE success will depend on the success of the applications that are going to be developed on top. FI-WARE will succeed if the developers using FI-WARE succeed

FI-WARE aims to achieve a great impact on the Internet community, mainly targeting third party developers and companies willing to exploit its Future Internet core-platform through the **Open Innovation Lab** enabling entrepreneurs to develop and test Future Internet applications with FI-WARE technologies and that will be launched at the end of July with a huge official event in September (as part of the Campus Party; London, first week of September). For the Open Innovation Lab success **is key the fact of fostering developer communities** fall within the scope of **Open Call 3 (launched in December 2012**).

As convergence of network platforms, content and business models proceeds, regulatory challenges associated with convergence are significant, e.g. networks can handle many types of converged services which means a shift in the way broadcasting and telecommunications is regulated. Emphasis of regulation is on stimulation of competitiveness. Insight is needed into the impact of convergence on competition, the **regulatory and policy issues of network infrastructure and services, the promise of multi-platform competition,** and the implications of greater connectivity, pricing, sustainable competition, investment and innovation. The Policy Brief is also explaining how the Internet drives innovation and business models: the Internet is transforming platforms for delivering content e.g. changing towards participative networks. **The policy challenge is to encourage innovation, growth and change and develop governance that does not stifle creativity or affect openness of the Internet as dynamic platform for innovation**.

Probably the **most of relevance for FI-PPP is how to benefit from convergence and at the same time ensure that competition** is fostered increasing the **transparency of bundled offers** and **avoiding customer lock-in** and abuse of market power by large operators.

In line with the abovementioned objective of fostering innovation, on December, 2012, **the European Union sealed an agreement for the creation of a single patent system across 25 countries**, bringing to an end decades of argument. The measure aims to boost competitiveness and innovation as it reduces red tape for inventors and brings patent costs in line with other economies like the U.S. and Japan. **It will mean an inventor can file a single application with the European Patent Office with no need to validate it one by one in each country**, a process that involves complex validation requirements and stacks up huge translation costs. The new unified court will also end the need to defend the patent in various national courts with the risk of different outcomes in different countries.

In addition to the r**eappraisal of regulatory frameworks and practices that the rise of platforms** in ICT markets invites FI-**WARE have identified the main regulatory challenges from the technical chapters and those non-technical aspects that could influence** FI-WARE exploitation in one way or another.

- As regards **virtual network provision** or **cloud computing**, **assessing the risks associated with cloud computing**, such as data integrity, recovery, privacy, and tenant isolation is critical to the

adoption of cloud technologies. These risks **call for automated end-to-end security with a heavier emphasis on strong isolation,** integrity and resiliency in order to provide visibility, control and automation across the cloud computing infrastructure. **A stronger emphasis on compliance** will be also needed

- In relation to **content regulation**, as long as Big Data, Notifications and Context Events are related to different vertical applications, it comes down to the problem domain being worked on. Therefore more **directives might be identified depending on the specific vertical areas and locations of application**.
- **Regarding use of data, the consumer must be empowered and educated to take personal responsibility for data,** controlling disclosure as far as possible through meaningful consent. A framework of rights and responsibilities for both the individual and entities could establish best international online practice, including clearly-worded, accessible privacy policies, transparency in data collection, storage and use and the ability to enforce penalties for any breach.
- Regarding issues in the scope of **privacy and on-line identity**, an important work to be undertaken is the compilation of the laws in Europe and in each State of European Union. This preliminary work will assess the **efforts needed to harmonize policies and regulations, particularly regarding privacy in electronic exchanges both for the commercial, industrial, cultural, medical and administrative domains**. Directions for solutions to explore further may include the following
- It should be ensured **an effective cooperation between EU States' authorities, in particular on preventing cybercrime.**

Finally to conclude, the key to success in the **Future Internet will be to identify value propositions that attract consumers for profitable (or at least sustainable) services**, where current business, operational or technical barriers can be overcome through the use of Future Internet technology. Overcoming barriers should enable value propositions that are novel and hence more attractive that existing ‘current Internet’ services. One of the most important considerations is therefore to identify how FI-PPP participants will distinguish themselves from current Internet businesses and services, and **what technical capabilities and regulatory and policy challenges they need to overcome barriers to achieving this**.

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