FI-LINKS summary of outcomes: final summary

FI-LINKS objectives

FI-Links had as objective to support the process of evolving FI-PPP and FIWARE to a worldwide champion of Internet innovation by taking into account the specific business requirements of both large European industries and SMEs, supporting the adoption of the FI-PPP in non-covered EU regions and beyond, and validating the long-term vision of FI-PPP.

To achieve these goals, FI-Links aimed at establishing a number of worldwide and regional links. These links had a two-fold purpose: on the one hand, to define a long-term vision for FI-PPP technologies and business models, taking into account equivalent research and innovation schemes in the US, Japan, Canada and the BRICs, as well as other countries when deemed relevant; and on the other hand, to promote the adoption of FI-PPP results in EU regions and emerging economies, where it was believed that the take-up of Internet innovation could occur quickly and impact local markets.

To facilitate the identification of new EU and international stakeholder groups and support the exchange of knowledge and best practices between the FI-PPP and the larger FI community, FI-Links planned to organize European-level conferences and workshops. The project had also planned to leverage on results from FIWARE/FI-PPP such as FIWARE Ops, FIWARE Lab, FIWARE products, the Coalition of Action for the European Regions, XiPi and XIFI, and the maturing community of FI-PPP developers ecosystem.

FI-LINKS summary of achievements

FI-LINKS has achieved several relevant results which can be split into three main categories: 1) the creation of a Future Internet Roadmap and its promotion; 2) the international adoption of FIWARE as technology and ecosystem; and 3) the European evangelisation of FIWARE. For all the activities related to 2) and 3), FI-Links decided to operate under the brand “FIWARE Mundus”.

1. The Future Internet Roadmap, focused on FIWARE technologies

The Future Internet Roadmap released by FI-Links provides the forecasted evolution of the Future Internet, taking into consideration FIWARE as the platform to support that future. The content presented

is based on i) the challenges identified in previous project outputs (deliverables and white papers) and ii) their updates following the outcome of the feedback received on the white papers from the FIWARE community. The set of open challenges, solutions and temporal evolution was classified into five areas, mapping the FIWARE technology Chapters: Media Internet, Big Data, Internet of Things, Cloud Computing and Communication Networks.

Starting from the business and technological challenges identified in the previous project outcomes, the roadmap provides:

- An overview of the roadmap for the evolution of the FIWARE technology. The overview takes into consideration current technologies and highlights dependencies and relations across key technology developments in the mentioned technology areas. The overview also highlights dependencies on other fundamental innovation factors, such as availability of high speed connectivity.
- A short introduction of the FIWARE business vision and roadmap for the creation of a European Future Internet Ecosystem. This introduction is complemented with a discussion of the FIWARE value chain and fundamental levers for the realization of the FIWARE vision. Taking on from that discussion, this document presents current market trends in the adoption of FIWARE technologies and potential future adoption markets.
- A summary that includes a number of suggestions for the priorities to be covered within the evolution of FIWARE and, beyond that, in Future Internet-related H2020 initiatives.

A set of more specific roadmaps covering each of the five areas identified above are summarised in the document and with an extended version in the annexes of this document (and in the FIWARE Mundus website www.fiware.org/mundus). All those specific roadmaps extend the general concepts introduced in this deliverable and provide:

- A discussion on the value chain and levers for the specific technology area;
- An overview of current developments in the specific technology area in the context of FIWARE;
- A roadmap for the evolution of FIWARE technologies in the given area, including priorities to be covered in the short term within FIWARE;
- A short summary including suggestions for priorities related to the specific technology area to be covered in Future Internet-related H2020 initiatives.

The roadmap document includes the feedback from experts involved in various workshops, both technical experts in each of the areas presented, and business experts. Opinion from contributing FIWARE architects is also included in the technical section.

The Roadmap can be found at www.fiware.org/mundus.

2. The international adoption of FIWARE

The effort towards the promotion of the use of FIWARE and the adoption as international technology, can be summarised as follows:

- In **North America,** The effort of FIWARE Mundus led to a direct repercussion on the FIWARE community. FI-LINKS coordinated the preparation and participation of FIWARE into the "Global City Teams Challenge" initiative, led by NIST, the US National Institute of Standards and Technology. FIWARE contributed to several GCTC events, for example in Washington D.C. on 1st June 2015, with a FIWARE delegation composed of FI-CORE, FI-LINKS, Speedup Europe and three of their start-ups, and the City of Valencia; with a dedicated FIWARE Workshop that was held on 15th -16th July 2015 again in Washington D.C. and hosted by the EU delegation in the US, in order to take advantage of the success of the participation in the GCTC Festival in June 2015 and attract industry and cities. Further exchanges also happened with NIST in particular

to finalise FIWARE's contribution to the GCTC 2015 Report. FI-LINKS participated afterwards in the GCTC Kick-off meeting near Washington DC in November 2015, presenting the FIWARE Technology platform and engaging with international stakeholders, especially from North America, to make progress in forthcoming opportunities of collaboration around FIWARE.

On November 19th, 2015, FI-LINKS established a formal partnership with the Global City Teams Challenge programme, while at the same time helping many start-ups and SMEs involved in the "FIWARE Accelerate" Programme to start discussions with US organisations for potential cooperation and business, opening up opportunities for those start-ups and SMEs and also for European cities and other key FIWARE stakeholders from industry. FI-LINKS coordinated the participation of the FIWARE delegation in a dedicated trip to the US West Coast in February 2016, and prepared the FIWARE attendance to the GCTC Tech Jam in March 2016.

In this context, FIWARE is being promoted as one of the key platforms to be used by GCTC 'action clusters', i.e. worldwide teams working together to achieve common pilot projects to develop and deploy solutions for smart cities. FI-LINKS encouraged European start-ups, cities and service providers to join forces with other US cities and organisations around common GCTC action clusters. Business partnerships are also being considered and are under discussion between European start-ups and US organisations. FI-LINKS also organized the FIWARE presence at the GCTC Expo in Austin, Texas, in June 2016, in order to promote the adoption of FIWARE technologies, the enlargement of the Open Source community worldwide and strengthen of the cooperation between cities and companies from Europe and the USA, with FIWARE as the link to facilitate the joining effort. FI-LINKS also covered actions to encourage the deployment of new FIWARE Lab nodes and instances, as detailed in Deliverable D2.2.2.

In addition, meetings with the World Bank and with the Inter-American Development Bank took place in Washington D.C. to promote FIWARE in emerging economies and more particularly in Latin America, and define a potential cooperation with those banks to provide funding for such actions.

- In **Canada,** FI-LINKS participated in a workshop with national and regional authorities in March 2015, and arranged the participation of three representatives from the FIWARE accelerators (European Pioneers, Speedup Europe) to a symposium in Canada on 24th -25th, June 2015. FI-LINKS participated in a couple of events in Toronto to promote FIWARE. As a result, the University of Toronto was the first North American organisation to build a prototype using the platform. Several discussions have been pursued with other stakeholders, including the Edmonton Research Park, the City of Edmonton, the Edmonton Public Library, the Province of Alberta, and Clinysis –an SME from Edmonton. A visit was organised in Europe in Paris and Seville in June 2016. The impact has been so successful that the set-up of a FIWARE Lab node in the Edmonton Research Park has been formally acted at the ERA-CAN+ final event held in Rome on 15 September 2016.
- In **Latin America**, FI-LINKS supported activities in Mexico, Brazil and Chile that are all in the process of adopting FIWARE and have already set up FIWARE Lab nodes. In Mexico, a FIWARE Lab node was established within the frame of the FI-Core project. FIWARE was also present at the largest national council of municipalities. As a result of these engagement activities, two Mexican cities (Leon and Cuatula) became part of the Open and Agile Smart Cities initiative (OASC), and additional ones showed interest in FIWARE and OASC. The City of Guanajuato become a Smart Tourist destination with FIWARE as one of its technological pillars. In Chile, a team from the FI-Core project together with UPM carried out several training actions. In Brazil, new actors are becoming active on FIWARE, including Instituto Metropol Digital which is currently deploying a FIWARE Lab Node in Natal; the Federal University of Recife, that organised different hackathons and training based on FIWARE; and CESAR that is developing different IoT services based on FIWARE. Additional contacts were made in Recife

during the Beyond 2020 event that was organised with the support of FIWARE Mundus. As a result, the Softville Foundation is exploring in collaboration with FIWARE Mundus the adoption of FIWARE for their start-up programme.

- In **Africa**, FI-LINKS has been very active in particular with Senegal and Tunisia, and to a lesser extent with other countries such as Egypt and Morocco. FI-LINKS participated in the IST Africa 2015 conference. Several meeting with representatives from Senegal, Tunisia and Mauritius paved the way for potentially setting up FIWARE ecosystems in those countries. In particular, a meeting with the Minister of Research and Education of Senegal was organised in July 2015, with participation from the EU delegation in Senegal and some local actors, in order to initiate the set-up of a FIWARE ecosystem. This meeting was followed by a meeting with DG DEVCO in September 2015 in order to discuss the possible use of European development funds to support this initiative. A meeting was also organised in Tunisia in September 2015 in order to kick off a similar process. Other meetings were organised during the second year of the project. As a main result, a FIWARE Lab node is being set up in Senegal and another one shall follow shortly in Tunisia. More details on the activities carried out in Africa are available in Deliverable D2.2.2.
- In **Asia,** there were several events where the FI-LINKS project was invited to present FIWARE. Due to one of those meetings, specific activities were performed with China, and FI-LINKS received some requests to support activities in India. In China, after a visit from FI-LINKS and a visit from a Chinese delegation to Europe in June 2016, the City of Hengqin has also initiated the set-up of a FIWARE Lab node, while Hong Kong Telecom is considering launching a commercial instance. Other Asian countries such as India and Vietnam are also showing interest. The activities performed by FI-LINKS with regards to Japan can be summed up in the exchange of best practices related to the vision on Future Internet in international cooperation opportunities, mainly via the 5th EU-Japan Symposium in ICT Research and Innovation. Worth noting is also the great interest of the Start-up Europe initiative in India, with several events being planned in the last months of 2016.
- FI-LINKS also lunched the "FIWARE Mundus Survey" among all FIWARE stakeholders, with the objective to understand who was interested in activities/market places outside Europe. The objective of this survey was twofold: 1) the FI-LINKS project looked at prioritizing its next FIWARE Mundus activities at international level to match the business interests and expectations from the European industry, and in particular the organizations that have been involved in the FI-PPP; 2) to keep those organisations interested in a given country/geographical area in the loop of what is going on, and take advantage of FIWARE Mundus support for further activities in those areas. FI-LINKS analysed the 42 responses received, and from those responses dedicated mailing lists with the contact of the companies who expressed the willingness to be informed about the next activities/opportunities were created, and were used to disseminate information and engage those stakeholders whenever relevant. The results of this survey is available in D2.2.2. (see http://fi-links.eu/public-deliverables/).

3. The European evangelisation of FIWARE

FI-LINKS established a strategy to evangelise European Regions, that with the help of other projects of the FI-PPP dealing with regional aspects such as i-Hubs, improved the knowledge and use of FIWARE in Europe.

The objective was to set up a sustainable European FIWARE ecosystem together with the decision makers and the players of the regional innovation ecosystems (e.g. local and regional authorities, innovation agencies, industry clusters, accelerators, incubators, etc.), in order to help them mobilize the players of these ecosystems (i.e. SMEs, start-ups, web entrepreneurs) so as to develop new products, solutions, and applications around FIWARE.

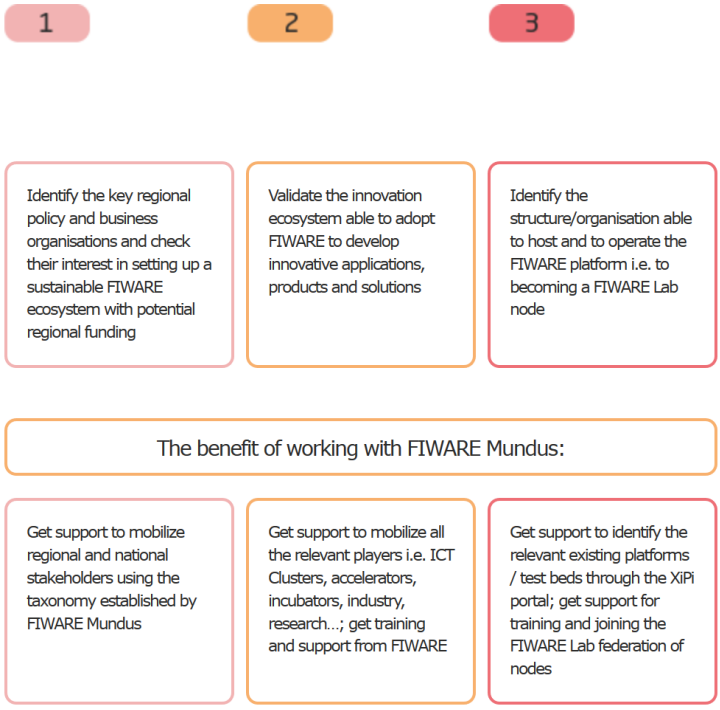
FI-LINKS identified the most relevant regions, which can support and mobilize their innovation ecosystem to develop new applications and services with FIWARE throughout a study carried out over 180 regions.

23 of them were contacted in order to understand their interest on the FIWARE Mundus initiative. The major outcomes of this study are publicly available here (PDF)

The selection criteria included:

- ICT as one of the top smart specialisation topics
- European ICT Pole of Excellence (EIPE)
- Already involved with FIWARE
- (experiments, nodes, accelerators) Active ICT cluster(s)

FI-LINKS defined seven steps in order to become a FIWARE region:



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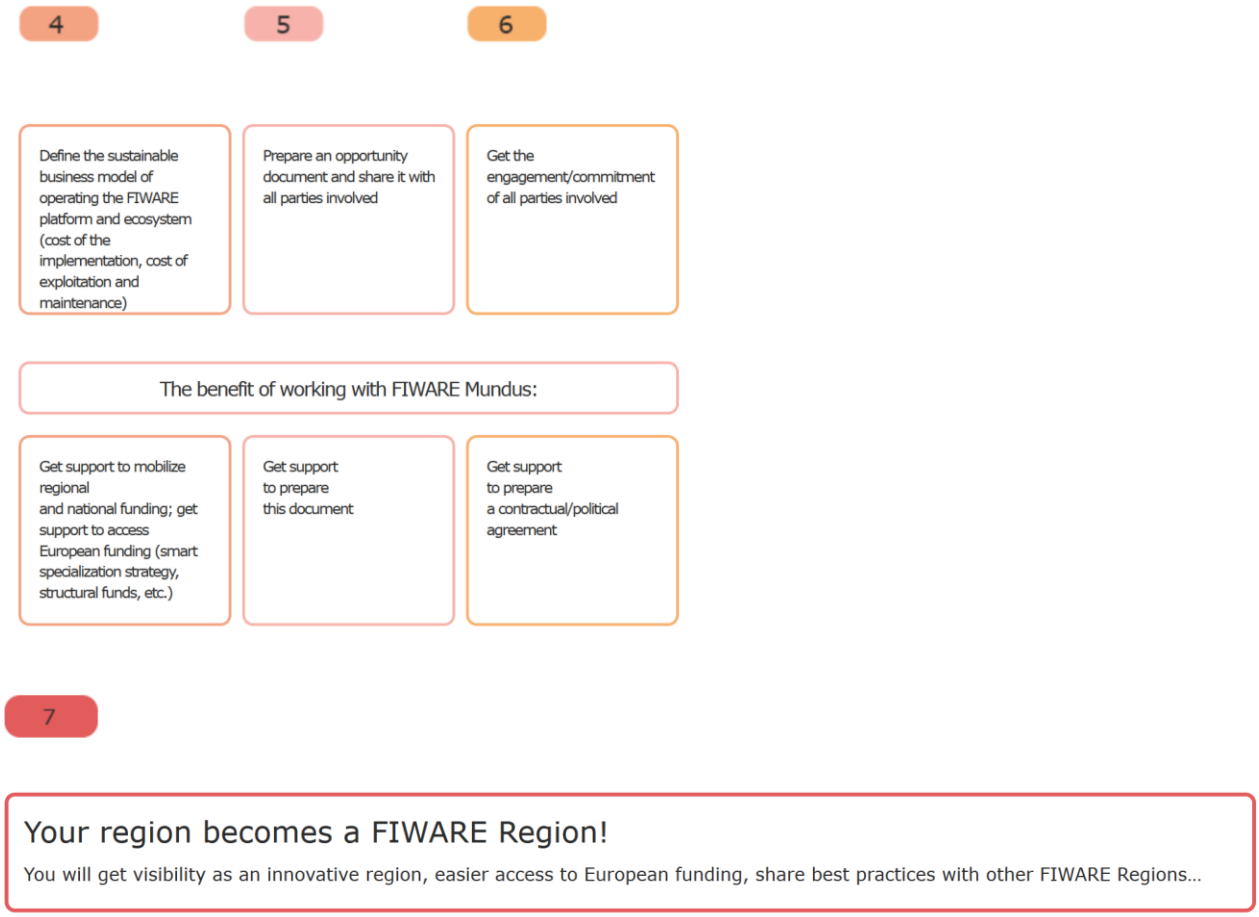

The objective was to define a way to reach the regions in order to establish the signature momentum has been established. In parallel, activities with regions still continue but we are still waiting the results of the FICORE Open Call for commercial nodes. Policy and regulation questionnaire has been finalised and were sent to the regions early in 2016.

Several meeting took place with European organisations DG REGIO, Committee of Regions, Open Innovation Strategy and Policy Group (OISPG), … in order to better understand how it should be possible to use the different funding tools that are available (Horizon2020, European Cohesion Funds ('ESIF, ESF, …), EIB, Erasmus+, Regional funds, national funds, Interreg, ERC, EIT/KIC, private funds. The recommendations are part of the Deliverable D3.1.

The Questionnaire on issues related to the FIWARE adoption was sent to the main regional contacts.

Partners were involved in several high profile events including the organisation of a FIWARE session at the Brastislava Innovation Camp organized in Bratislava in July 2016, and a participation in the 2nd IIH Bootcamp in Vienna on May 26th -27th 2015 to present FIWARE Mundus to the new innovation hubs. FI-LINKS also sponsored and participated as speaker at Codemotion Milan and the FIWARE meetup event in Trento, organized and disseminated the "FIWARE BUSINESS CHALLENGE", attended the A16 meeting on June 11th -12th and participated in the "Community" related sessions, organized and disseminated a FIWARE hackathon held in Bologna, Emilia Romagna region, on September 15th-16th www.fiware.org/event/fiware-business-challenge/.