



## D5.3 - Final Exploitation/Dissemination Report

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## Executive Summary

This document corresponds to deliverable 5.3 of the ULOOP project. The document provides a summary of the activities conducted during the three-year lifespan time of the project in WP5 to generate awareness in regards to ULOOP positioning, to setup dissemination instruments and channels, to organize ULOOP events, to spread the results of ULOOP, and to put effort towards standardization and related bodies. The actions are grouped into several categories: dissemination, standardization and exploitation, which are covered by three different tasks in the ULOOP project. The activities conducted in each category and the corresponding results are detailed in the corresponding sections.

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## 1. Introduction

This document aims at summarising the methods and activities of ULOOP dissemination and exploration plans. In ULOOP, WP5 has the responsibility of promoting and disseminating ULOOP concepts and outcomes. With such purpose, WP5 has been split into 3 different tasks. Briefly speaking, Task 5.1 deals with global dissemination; Task 5.2 deals with interfacing towards standardization and related entities; Task 5.3 is dedicated to the exploitation of ULOOP results.

The dissemination of ULOOP results and event organization are dealt within Task 5.1. During the lifespan period of ULOOP, in order to continuously and timely disseminate knowledge and transmit project results and the final outcome to the global R&D community but also to the common public domain, multiple tools and activities (website, web 2.0, scientific events, industrial events, etc.) are adopted in Task 5.1. The dissemination and contribution to standardisation bodies and technical platforms are managed within Task 5.2 in order to support an anchoring of ULOOP results. Task 5.3 handles exploration of the ULOOP results in the ways of defining five-year roadmap to exploit the relevant results, initialising the market opportunity, and developing training scheme and a training guidebook to target future market.

The rest of this document is organized as follows: Section 2 reports dissemination tools and activities. Section 3 details standardisation monitoring results and contributions. Section 4 provides details of exploration plans. Section 5 lists the most relevant involvements of ULOOP members in alliances, standardization bodies, groups, technological platforms, scientific committees, etc.



## 2. Dissemination

This section reports the tools and activities in the ULOOP project for disseminating the ULOOP project outcomes.

### 2.1 ULOOP Website

The ULOOP Website, responsibility of UniUrb under Task 5.1, is based on a custom theme for WordPress. ULHT has registered and acquired the domain [www.uloop.eu](http://www.uloop.eu) on behalf of the consortium. The ULOOP website is hosted by ULHT and updated regularly. It comprises input concerning each WP, list of deliverables, ULOOP documents, events, news. The Website is also fed with Web2.0 information, which partners provide on an automatic basis (Tweeter and Facebook). The main sections and features of the Website are outlined in the following subsections.

#### 1) Homepage

The homepage provides a slide show of participants, the preview of the project news, brief introduction of recent publications, deliverables and events. Also, Web 2.0 tools are listed.

#### 2) The project

The main page of this section (<http://www.uloop.eu/project>) contains the abstract and the main innovation aspects of ULOOP. Then the section is organized into three subsections that provide: 1) the full ULOOP fact sheet, 2) the partnership, with the official logo of each partner, and 3) the structure of the project, with a short description of each workpackage.

The main page of this section reports an active list of work packages with the details of the tasks. The names of the work packages are active links to the corresponding subsections.

Subsections devoted to work packages are directly managed by the corresponding WP leaders. By default, they contain a brief description of the WP, a brief description of each task, the corresponding Gantt chart, and the details of milestones and deliverables. Links to additional pages can be added for each work package.

#### 3) Events

The main page of this section looks like a blog providing a list of tagged, categorized, and time-stamped posts announcing events. The posts are managed by means of a specific plugin. Two

subsections are available to distinguish between “ULOOP events” and “related events”. The subsections appear as the main one, with a filtered list of events.

#### 4) Documents

This section provides a searchable list of tagged and categorized documents, managed by a custom plugin based on a MySQL database and on the media library of WordPress. The main page provides a list of categories which correspond to the subsections directly accessible from the drop-down menu:

- Deliverables, which includes all the publicly accessible deliverables of the project, posted as soon as they are approved;
- Press releases, which contains the press releases officially approved by ULOOP members;
- ULOOP publications, which contains references to all the ULOOP scientific contributions;
- White papers, which grant access to the white papers on the results of ULOOP;
- Presentations, which contains the slides of ULOOP presentations;
- Gallery, which contains pictures and audio-video documents.

#### 5) News

A page (<http://www.uloop.eu/news>) used to post news, possibly linked to specific pages.

#### 6) Contacts

A page (<http://www.uloop.eu/contacts>) containing standard contact information.

## 2.2 Web 2.0 positioning

Several Web 2.0 services and tools have been adopted in order to foster awareness on the potentials of user-centric wireless networks, to stimulate discussions, to disseminate results, and to receive informal feedbacks. The main tools used so far in ULOOP, besides the blog which is part of the web site, are Twitter, Facebook, and LinkedIn. Their role in ULOOP is outlined in the following subsections.

### 2.2.1 Twitter

A Twitter account has been created for ULOOP, called uloopproject. Moreover, a specific keyword (twitter hashtag), namely #uloopproject, has been officially adopted to identify posts related to ULOOP. The adoption of a username and a keyword allow all the tweets originated from the official account or

including the #uloopproject keyword to be automatically filtered and notified to interested users. In particular, a Twitter widget tuned to #uloopproject has been inserted in the home page of the ULOOP Website.

## 2.2.2 Facebook

A page has been created for the project on Facebook [2] in order to post informal announcements and invitations, to increase the awareness on ULOOP, to stimulate open discussions, and to provide evidence of internal meetings and public events. The Facebook page is available at <https://www.facebook.com/pages/Uloop-Project/178955125474832>.

## 2.2.3 LinkedIn

An open group has been created for the project on LinkedIn [3] in order to establish relationships with professional communities that are relevant for ULOOP. The LinkedIn group will be used to post comments on ULOOP-related topics, to stimulate discussion on ULOOP positions, and to spread public achievements. All the participants in ULOOP are registered as group members, and their personal involvement in other relevant groups can provide an effective mean of dissemination. In particular, ULOOP members are entitled to recommend relevant discussion and to invite external people to join the group.

## 2.2.4 Automated Delivery

In order to speed up the delivery and to maximize the diversity of tools used to spread news, several automated delivery mechanisms have been set up:

1. Twitter is dumped to the side bar of the Website
2. Posts on the Website automatically go to Facebook and Twitter
3. Dlvr.it routes have been from our site (rss feed) to Facebook and LinkedIn

## 2.2.5 Recommendations

The following recommendations have been adopted to ensure that the Web 2.0 tools that have been set up for ULOOP are regularly used and updated.

1. Authors of new documents posted on the ULOOP Website are asked to post a comment on LinkedIn related to the document.
2. Participants to ULOOP-related events are asked to post a comment on Twitter.

3. Leaders of active tasks are asked to start and manage a discussion thread on LinkedIn. Participants to the task are asked to keep the discussion alive by posting at least one comment.
4. Researchgate (<http://www.researchgate.net>) is suggested for partners publishing the project outcomes.

## 2.3 ULOOP Events

In its DoW, ULOOP proposed at a first glance a set of concrete events for the lifespan of three years, namely, two scientific workshops co-located with well-established conferences, two industrial events, and two networking events for the purpose of demonstrating ULOOP operation in realistic settings. Over time, the events realized were rearranged, based on feedback that the project had. ULOOP held the following events:

- Two industrial workshops, the first hosted by HWDU and ALBLF in Berlin in 2011, and the second hosted by ALBLF in Villarceaux in 2012.
- One scientific workshop, UNET 2012, co-located with ICC 2012, organized by UniK, ULHT, and TUB.
- One ICT participation, ULOOP exhibition, hosted by ULHT.
- A session on Trust Management in ACM SAC 2013, hosted by UNIGE
- A national workshop, Neutralaccess 2013, hosted by UniUrb.
- A demonstration of trust management in INFOCOM 2013, organized by ULHT, UNIGE, and FON.

In addition, the consortium organized but did not complete the following events:

- ICIN2012 workshop, proposed by ALBLF.
- ULOOP Summer School 2013, proposed by ULHT
- Two networking events, to be hosted by FON and ZON. The consortium discussed the feasibility of this plan, having the partners opted to develop longer experiences in operational settings, to gather more meaningful results. This is explained in QMR9.

The two aforementioned events were organized and both were cancelled due to lack of meaningful audience, having been reported in the respective QMRs – QMR7 and QMR8. The ICIN2012 was

proposed as the site for the second industrial workshop. After the change, the second ULOOP industrial workshop was hosted in Villarceaux France at the Alcatel-Lucent Open Days 2013 on June 19<sup>th</sup>, 2013, as shown in QMR9. The ULOOP Summer School was proposed as the second scientific event. Due to the change, the second scientific event was then organised an ICT 2013 event in Vilnius, Lithuania, where results from ULOOP were demonstrated, and will be shown in QMR10.

All of the events organized had a report published publicly, summarizing the main results achieved, and types of audience.

### 2.3.1 First Industrial Event

The first industrial event, entitled “The rise of user-centric wireless networks” [4] was hosted by Huawei Research GmbH and Alcatel-Lucent in Berlin (Germany) on September 27, 2011. This workshop attracted 39 participants including members of the ULOOP consortium and people outside the ULOOP project. A custom version of the ULOOP survey on user-centric networking was administered to workshop attendants to get their feedback. Details of the workshop can be found in [5].

### 2.3.2 Second Industrial Event

The second industrial event is the second industrial workshop of ULOOP. It was originally proposed to be taken place in ICIN2012. In order to attract more meaningful audience, especially from industries, it was then hosted by Alcatel-Lucent in Villarceaux France at the Alcatel-Lucent Open Days 2013 on June 19<sup>th</sup>, 2013. This workshop provided:

1. A series of technical proof-of-concept demonstrations, showing the innovation developed in ULOOP and how it can be easily extended to other scenarios.
2. A platform for discussing the different views with industry leaders.
3. A discussion concerning standardization impact and tools to assist in the final standardization steps in ULOOP.

Details of the workshop can be found in [6].

### 2.3.3 First Scientific Event

The ULOOP first scientific event corresponds to a workshop proposal entitled *User-centric Networking (UNET2012)* [8][9]. This was a third edition of a previous workshop, and was organized by UniK together with ULHT and TUB. The event was accepted by 2012 IEEE International Conference on Communications (ICC 2012) and held on 11<sup>th</sup> June 2012 in Ottawa, Canada. UNET2012 was a one day workshop. It attracted 39 participants, in which more than 40% belonged to external organizations of the ULOOP project representing academia, network equipment vendors, network operators looking

at network convergence, service providers, but also non-commercial community network providers, and government and public administration. Details of the scientific event, including the workshop program, participants, article acceptance ratio and other statistics can be found in [9].

### **2.3.4 Exhibition in ICT 2013**

Originally, and as explained, ULHT proposed to arrange a training summer school associated with a local PhD programme – New Media and Pervasive Systems, having the consortium accepted the plan as the second scientific event to be organized. Due to lack of audience, which has been reported in QMR7, the consortium agreed to divert it to be “User-centric Wireless Local Loop Exhibit” (10830) in ICT 2013, Vilnius, November, 2013 [10]. This exhibition, also hosted by ULHT, provided a global perspective on technology (open-source software) derived from the work developed between 2010 and 2013 in the ULOOP project and covered demos concerning each of the ULOOP technical blocks, namely, trust management, resource management, and mobility aspects. Interaction with the audience were provided, which also showed the capability of testing ULOOP software in loco.

### **2.3.5 Demonstration in INFOCOM 2013**

A demonstration session, titled “A User-centric Approach to Trust Management in Wi-Fi Networks” [11], was held in IEEE INFOCOM 2013 on April 16, Turin, Italy. In this session, not only Trust Management in ULOOP project was demonstrated, the concept and expected results were disseminated.

### **2.3.6 ACM SAC 2013**

Demonstrations of ULOOP trust management were shown at the end of the trust and reputation track of the ACM Symposium of Applied Computing in Coimbra, Portugal, on March 21st 2013. [12]

### **2.3.7 NEUTRALACCESS 2013**

During the 6th ULOOP plenary meeting, project partners also attended a co-located workshop “Neutralaccess 2013: User Centricity in Future Mobile Networks” (<http://blog.neutralaccess.net/NA13/>) [13] to disseminate the ULOOP Project on 2nd October 2013 in Urbino, Italy. A live experiment was conducted among attendance in NeutralAccess 2013 to test the functions developed in ULOOP. 44 attendees provided feedback to the survey of the ULOOP experiment. Based on the feedback to the live experiment, most of the attendees would make use of ULOOP if it was available. In a scale from 1 (never) to 5 (for sure) the average opinion was 3.7.

## 2.4 Publications

ULOOP has targeted partner-co-authored publications which include not only research papers, but also white papers and presentations.

### 2.4.1 Journal and Conference Papers

The detailed journal and conference papers published are listed in Annex 1.

### 2.4.2 ULOOP Book and Book Chapters

1. The proposal of a ULOOP book, titled “User Centric Networking”, has been submitted to and approved by the publisher Springer and will appear in the series Lecture Notes in Social Networks. The contract has been signed. The submission deadline agreed with Springer is 15 December 2013. This book includes five main chapters, each of which is led and edited by a ULOOP partner:

- PART I : User-centric Environments and Business Models (Rute Sofia, Univ. Lusofona)
- PART II: Trust Management and Cooperation Incentives (Jean-Marc Seigneur, Univ. of Geneve)
- PART III: Resource Management in User-centric Environments (Huiling Zhu, Univ. of Kent)
- PART IV: Mobility in User-centric Environments (Fikret Sivrikaya, Technische Universitaet Berlin)
- PART V: Market Perspective and Analysis (David Valerdi, FON Wireless Ltd)

2. A book chapter is proposed in a WiNemo book.

### 2.4.3 White Papers

White papers and presentations are used to spread the public results of ULOOP. A common template is adopted for all the ULOOP white papers. In total, ten white papers are published to disseminate ULOOP outcomes:

- **ULOOP White Paper 01, ULOOP Framework**, edited by ULHT, is based on the results of T2.3 [15].
- **ULOOP White Paper 02, The ULOOP Use Cases**, edited by FON, is based on the results of T2.1 [16].



- **ULOOP White Paper 03, The Socio-Economic Impact of ULOOP**, edited by UniUrb, is based on the results of T2.2 [17]. The socio-economic aspects of ULOOP were also the subject of a keynote speech given by A. Bogliolo at NetWare 2011 in August 2011, entitled *User-centric wireless local loop: use cases and socio-economic aspects* [10].
- **ULOOP White Paper 04, ULOOP Software Bootstrapping Guidelines**, edited by CMS, describes how to bootstrap ULOOP software onto selected hardware and software platforms, so that users can easily obtain and take advantage of the features developed in ULOOP [18].
- **ULOOP White Paper 05, Cooperative Networking in User-centric Wireless Networks**, edited by ULHT, introduces user-centric networks and a cooperative networking model to sustain the deployment of low-cost user-centric wireless networks based on solutions in ULOOP to deploy cooperation incentives and mechanisms [19].
- **ULOOP White Paper 06, Secure User-Friendly Wi-Fi Access Point Joining**, edited by UNIGE, describes a new solution has been developed as part of the ULOOP project in order to provide wireless access in a more user-friendly and secure way [20].
- **ULOOP White Paper 07, Trust Management in ULOOP**, edited by UNIGE, disseminates ULOOP concepts and raises awareness towards trust management in user-centric wireless networks [21].
- **ULOOP White Paper 08, Mobility Coordination Aspects in ULOOP**, edited by HWDU and TUB, provides a description on the Mobility Coordination Aspects in ULOOP project on how to dynamically select the mobility anchor point in a dynamic and distributed network environment [22].
- **ULOOP White Paper 09, Crediting Aspects in ULOOP**, edited by UniUrb, focuses on the reward-based incentive system for resource sharing developed within ULOOP and on the virtual currency system designed to manage such incentives [23].
- **ULOOP White Paper 10, An AGILE European Project**, edited by FON, explains how to rollout an Agile software development methodology in the context of the ULOOP project [24].



### 3. Standardisation

The standardisation activities are managed by Task 5.2 in ULOOP. In this task, a periodic milestone, milestone MS10, is provided as guidelines to Task 5.2 concerning potential standardization bodies, technological platforms, technological alliances, fora, or other relevant entities that the consortium may be involved upon and also reports related activities where the ULOOP results might generate impact. It started on Month 12, and proceeded until the end of Task 5.2, on month 36. The report is updated every 6 months. A deliverable D5.2 [25] was provided to describe the standardization related activities conducted during the first two years in Task 5.2. D5.2 also outlines the relevant ULOOP concepts for the standardization bodies, technological platforms and alliances, and provided a summary of the standardization plan and an overview of the existing and potential contributions in ULOOP.

#### 3.1 Standardisation Entities

The standardisation entities were first proposed in Month 12's period report of milestone MS10 and followed in Month 18's MS10 period report. The standardisation entities addressed in ULOOP include 3GPP, IEEE, IETF, IRTF, ESTI, and ITU-T.

##### 3.1.1 3GPP and ULOOP Involvement in 3GPP

The *3rd Generation Partnership Project (3GPP)* [26] is a union of several telecommunications standards bodies, which has as purpose to prepare, approve, and maintain globally applicable technical specifications and technical reports for an evolved 3rd Generation and beyond Mobile System based on the evolved 3GPP core networks, and on radio access technologies. The 3GPP specification work is split into in *Technical Specification Groups (TSGs)* and *Working Groups (WGs)*. Currently, there are four TSGs: GERAN (GSM/EDGE Radio Access Network, RAN (Radio Access Network), SA (Service and System Aspects) and CT (Core Network and Terminals).

From the four 3GPP TSGs, the most relevant to ULOOP are the SA and the CT specification groups. While all four working groups of CT are relevant to ULOOP, from SA, the, WG1 (*Services*) and WG2 (*Architecture*) working groups are the ones that are the most relevant to ULOOP.

TSG SA WG1 is responsible for feasibility studies and requirement analysis of future network services. In the ULOOP context, the interworking between 3GPP access with the non-3GPP access is of particular interest, as it may be used for disseminating information about ULOOP community networks. It was considered as the target standardization group for some results of ULOOP Task 3.1 (Trust

Management and Cooperation, Task 3.2 (Resource Management), Task 3.3 (Mobility Aspects), and Task 3.4 (Interoperability Aspects).

TSG SA WG2 is in charge of developing the architecture of the 3GPP network. Based on the services requirements elaborated by TSG SA WG1, it identifies the main functions and components of the network, how these components are linked to each other and what is the information that they exchange. TSG SA WG2 was considered as the target standardization group for some of the ULOOP architecture and interfaces being designer in Task T2.3 (Overall Specification), interfaces which were detailed in WP3.

TSG CT is responsible for specifying terminal interfaces (logical and physical), terminal capabilities and the Core network. We believe that some of the results developed in WP3, in particular concerning the ULOOP node architecture design, is related to this TSG.

From the overall ULOOP consortium, both ALBLF (as a subsidiary of the Alcatel-Lucent group) and HWDU are the most active partners in 3GPP standardization, including involvement in the TSG SA WG1, TSG SA WG2, and TSG CT. These two partners therefore monitored relevant aspects to ULOOP, which were periodically, through MS10, reported to the consortium to seek the possibility of disseminating ULOOP results into 3GPP adequate TSGs.

### 3.1.2 IEEE and ULOOP Involvement in IEEE

The *Institute of Electrical and Electronics Engineers (IEEE)* [27] is the world's largest professional association dedicated to advancing technological innovation and excellence for the benefit of humanity. IEEE and its members inspire a global community through IEEE's highly cited publications, conferences, technology standards, and professional and educational activities.

The *IEEE Standards Association (IEEE-SA)* is a leading consensus building organization that nurtures, develops and advances global technologies, through IEEE.

From the IEEE-SA, there are two categories of groups: *working groups (WG)*, *study groups (SG)*. Moreover, IEEE also holds a potential to discuss changes to standards, or innovative aspects in the form of *Project Authorisation Requests (PARs)*.

In the early stage of Task 5.2, partners have discussed which concrete groups will be monitored and/or where ULOOP is expected to contribute. The targeted groups included: Communications Area, Dynamic Spectrum Access Networks (P1900), LAN/MAN (P802) IEEE 802.11 WLAN WG, IEEE 802.21 HIC WG, and IEEE 802.16. During the development of ULOOP, IEEE 802.11 – High Efficiency

WLAN (HEW) SG [28] became the special target of the innovative resource management scheme, Elastic Resource Management (ESM), which has been submitted as an IPR (reported in QMR9).

Among ULOOP partners, ALBLF (as a subsidiary of the Alcatel-Lucent group) and HWDU are active in IEEE standardization activities.

### 3.1.3 IETF and ULOOP Involvement in IETF

The *Internet Engineering Task Force (IETF)* [29] is a large open international community of network designers, operators, vendors, and researchers concerned with the evolution of the Internet architecture and the smooth operation of the Internet.

The IETF is a serious candidate for ULOOP to input. ULOOP has put special focus on the IETF Network-Based Mobility Extensions (NETEXT) WG [30] and IETF Distributed Mobility Management (DMM) WG [31], in regards to mobility management.

### 3.1.4 IRTF and ULOOP Involvement in the IRTF

The *Internet Research Task Force (IRTF)* [32] focuses on longer term research issues related to the Internet while the parallel organization, IETF, focuses on the shorter term issues of engineering and standards making. The IRTF is organized into several *Research Groups (RGs)*.

The following RGs are relevant to be monitored by ULOOP, and also considered in ULOOP for providing contributions: IP Mobility Optimizations Research Group (MOBOPTS) [33], Routing Research Group (RRG) [34] and Delay-Tolerant Networking Research Group (DTNRG) [35].

Some partners are actively involved in the IRTF, in the mentioned groups. For instance TUB and ULHT are involved in the DTRNG. ULHT is also involved in the MOBOPTS.

### 3.1.5 ETSI

The *European Telecommunications Standards Institute (ETSI)* [36] is officially recognized by the European Union as a European Standards Organization. It produces globally applicable standards for Information and Communications Technologies (ICT), including fixed, mobile, radio, converged, broadcast and internet technologies.

Although, currently, there is no technical topics in ETSI, which is closely relevant to the ULOOP project, ETSI is considered as an option standardization entity as new technical topics closely relevant to the ULOOP project may be open in ETSI. In ULOOP both ALBLF and HWDU are active elements of the ETSI.

### 3.1.6 ITU-T

The *ITU Telecommunication Standardization Sector (ITU-T)* [37] is one of the sector of the International Telecommunication Union (ITU); it coordinates standards for telecommunications.

Even though, currently, there is no technical topic in ITU-T that is relevant in terms of ULOOP scope, ULOOP partners ALBLF and HWDU are active in ITU-T standardization activities.

## 3.2 Standardisation Activities

The standardisation activities in ULOOP were first reported in Month 24's MS10 report, then updated in Month 30 and Month 36. The standardisation activities include monitoring standardisation and making standardisation plan for ULOOP contributions.

### 3.2.1 Standardisation Monitoring

This section provides description on monitoring the relevant standardization activities in the period of Task 5.2. In ULOOP, the standardisation entities addressed in Section 3.1 are monitored. Special efforts are lying on: 3GPP, IEEE and IETF.

### 3.2.2 ULOOP Focus on Standardisation

In ULOOP Task 5.2, based on the analysis on the ULOOP concepts and its relevance to the standardization activities, some contributions to standardisation are proposed.

#### IETF NETEXT

Draft-zhou-netext-lmac-dynamiclma is prepared to present the Mobility Coordination Function concepts in ULOOP T3.3 Mobility Aspects.

The draft describes local mobility anchor coordination functionality and corresponding mobility options for Proxy Mobile IPv6. The mobility anchor coordination targets LMAs with a dynamic service provisioning behaviour, and is achieved by Proxy Binding Update and a Proxy Binding Acknowledgement message exchange between a Local Mobility Anchor (LMA) and a Local Mobility Anchor Coordinator (LMAc).

The draft is prepared by HWDU, TUB and ULHT, and is targeted to be submitted to IETF NETEXT until the end of 2013.

## IETF DMM

An IETF draft is prepared by ULHT to present the Mobility Tracker concepts in ULOOP T3.3 Mobility Aspects.

The draft describes the Mobility Tracker concepts. In ULOOP, the wireless coverage is expended by the ULOOP network, however, the ULOOP networks are constructed by the ULOOP nodes and the ULOOP nodes are unreliable nodes and have the dynamic behaviour, the appearance and disappearance of the ULOOP network are based on the mobility patterns of the ULOOP nodes, the mobility patterns of the ULOOP nodes is tracker in ULOOP T3.3, and is targeted to be submitted to IETF DMM at the end of 2013.

## Others

Via ALBLF and during the second industrial workshop, the consortium has discussed ULOOP results with standardization colleagues from ALBLF. The guidelines were useful in assisting ULOOP to the IEEE802.11 HEW study group. The colleagues from ALBLF also suggested the project to analyse and to consider HotSpot 2.0 directives and documents as a potential reference point for the work developed in ULOOP – where ULOOP is providing a report (until November 2013) and also to the MANET IETF working group.

### 3.2.3 ULOOP Contributions on Standardisation

The following standardisation contributions are planned to be submitted until Dec. 2013.

**Table 1. Contribution plan until the end of 2013**

Responsible	Task / Topic	Target entity	Description of purpose
ULHT, UniK	T3.2 ESM	IEEE HEW	The Elastic Spectrum Management concepts developed in T3.2 resource management.
ULHT	T3.3 Mobility Tracking	IETF DMM	The Mobility Tracking concepts into the dynamic mobility management environment.

HWDU, TUB, ULHT	T3.3 Mobility Cooperation	IETF NETEXT	The mobility coordination concepts and adapt it into the PMIP solution.
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The following standardisation meetings are planned to be participant by the ULOOP partner after the end of ULOOP project.

**Table 2. Meeting participant plan after the end of the project**

Target entity	Meeting	Date	Participant Partner	Purpose
IEEE 802.11	Plenary Meeting, Beijing, China	16 ~ 21, March, 2014	ULHT, UniKent	To present the ESM concepts developed in T3.2 resource management and get feedbacks
IETF	89th IETF meeting, London, United Kingdom	2 ~ 7 March 2014	ULHT, HWDU	To present the mobility aspects to IETF DMM and NETEXT and get feedbacks.

## 4. Exploitation

The exploitation is carried out in Task 5.3 and started from M25 of the ULOOP project. The main activities in exploiting the outcomes of ULOOP includes: analysing market opportunities for user centric wireless technologies, providing promotion events, make plan for future exploitation after the ULOOP project, and provide a training guide book.

### 4.1 Market Analysis

The first approach on how key features of ULOOP can be perceived as added values by main players involved in ULOOP ecosystem was investigated in the deliverable “D2.2: ULOOP socio-economic sustainability report” [38], Then, a profound market analysis was carried out in ULOOP deliverable D5.4 [39] by extending the value chain in the first analysis with the inclusion of additional stakeholders. In this analysis, device vendors and infrastructure vendors were added as equipment and technology providers who sell both to and through operators or service providers or directly to end users and consumers. A market assessment from a technology perspective are also given in ULOOP D5.4 [39] to identify main existing and future technologies that may represent potential enablers or barriers for ULOOP concepts exploitation and to assess whether these technologies can benefit ULOOP potential market opportunities or not. Details can be found in Section 2 of ULOOP deliverable D5.4 [39].

### 4.2 Promotion

ULOOP consortium also produced and diffused different promotional materials to promote outcomes of ULOOP:

- The ULOOP fact sheet, available on the ULOOP Website at: <http://www.uloop.eu/about-uloop/full-factsheet>
- The press release on the ULOOP kick-off meeting, available on the ULOOP Website at: [http://www.uloop.eu/wp-content/uploads/2011/01/ULOOP\\_PressRelease\\_KickOff.pdf](http://www.uloop.eu/wp-content/uploads/2011/01/ULOOP_PressRelease_KickOff.pdf)
- The press release on ULOOP plenary meetings, available on the ULOOP Website at: <http://www.uloop.eu/>
- The flyer of the 1<sup>st</sup> ULOOP Industrial Workshop, available on the ULOOP Website at: [http://www.uloop.eu/wp-content/uploads/2011/07/flyer\\_uloop.pdf](http://www.uloop.eu/wp-content/uploads/2011/07/flyer_uloop.pdf)

- The flyer of the 2<sup>nd</sup> ULOOP Industrial Workshop, available at <http://siti.ulusofona.pt/~uloop/industrialworkshop2/> [6]
- The flyer of the 1<sup>st</sup> ULOOP Scientific Workshop, available on <http://uloop.eu/unet2012/> [8].
- A ULOOP poster presented on the Portuguese TechWeb conference, Lisboa, May 2011.
- A presentation about ULOOP project has been presented at the IARIA Netware 2011 conference (August 2011, France).
- Presence in the Future Internet Assembly (FIA) event in Poznan, October 2011
- A ULOOP presentation delivered in SESERV Workshop: The interplay of economics and technology for the Future Internet, January 31, 2012, Athens, Greece.
- A ULOOP presentation delivered in SESERV Workshop: Socio-economic Certainties and Change for the Future Internet, June 20 2012, Brussels, Belgium.
- Videos, white papers and posters exhibited and distributed in ICT 2013 [10].

## 4.3 Exploitation Plan

All the partners in the ULOOP project present their exploitation plans based on their interest and expertise. They have different interests on what ULOOP will produce and due to their respective nature (industry or academic) their directives mark different guidelines on how to produce benefits from the project. The details of exploitation plan are given in the ULOOP deliverable D5.4 [39].

## 4.4 Training Guidebook

A training guidebook is provided in the ULOOP project to give a complete view of ULOOP project basics, goals, main outcome and deployment guidelines. The Training Guidebook will be applied in dissemination events targeting markets such as access operators and to facilitate the exchange with other related projects. The guidebook begins with an introduction on user centric networks concepts followed by a complete overview of ULOOP project. Then, ULOOP main architecture and functions are tackled in further detail. The deliverable ends with a description of ULOOP software suite, which also covers guidelines to generate and distribute the different software blocks. Details can be found in the ULOOP deliverable D5.5 [40].



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## Annex 1: List of Journal and Conference Papers

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- [P4] R. Sofia, P. Mendes. Building Trust-based Connectivity Models in User-centric Environments. UNDER SUBMISSION.
- [P5] A. Bogliolo, L. Klopfenstein, S. Delpriori, B. Bucciarelli, G. Luchetti, A. Seraghiti, E. Lattanzi, "Introducing openBOXware for Android: the Convergence between Mobile Devices and Set-Top Boxes," International Journal on Advances in Internet Technology, vol. 5 no. 1 & 2, 2012 (44-53).
- [P6] A. Bogliolo, E. Pigliapoco, "Fairness for growth in the Internet Value Chain," International Journal on Advances in Internet Technology, vol. 5 no. 1 & 2, 2012 (69-77).
- [P7] T. Jamal, P. Mendes, "Wireless Cooperative Relaying Based on Opportunistic Relay Selection," International Journal On Advances in Networks and Services, vol. 5 no. 1 & 2, 2012 (116-128)
- [P8] A. Aldini, "Formal Approach to Design and Automatic Verification of Cooperation-Based Networks," IARIA Int. Journal on Advances in Internet Technologies, vol. 6, no. 1&2, 2013 (42-56).
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[P42] T. Jamal and P. Mendes, “Cooperative Relaying for Dynamic Networks,” accepted as a book chapter by a Springer LCNS WiNeMo book

[P43] R. Sofia, “Bringing the Home Network to the Core,” accepted as a book chapter by the ULOOP book

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- [P50] A. Aldini, “Formal Approach to Design and Automatic Verification of Cooperation-Based Networks,” submitted to Int.I Journal on Advances in Internet Technologies
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