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SEVENTH FRAMEWORK PROGRAMME

Network of Excellence

NEWCOM#

Network of Excellence in Wireless Communications#

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WP 3.4 – Industry Liaison and Dissemination

D3.4.1
Survey on Research Expectations of European Companies

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Abstract:	This first deliverable of WP3.4 summarizes the work carried out to make a survey on research expectations of the N# Associate Partners from Industry and reports the responses received from them. The Associate Partners were also asked to indicate the most convenient period for them to host a dissemination event. The responses received from some of them are also reported.
Keywords:	Dissemination, industry, survey

Authors

IMPORTANT: The information in the following two tables will be directly used for the MPA (Monitoring Partner Activity) procedure. Upon finalization of the deliverable, please, ensure it is accurate. Use multiple pages if needed. Besides, please, adhere to the following rules:

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Executive Summary

One of the main objectives of NEWCOM# is to improve the dissemination of research results to European industry. The first task toward this objective is to make a survey and find out how the research topics covered by NEWCOM# are in line with the needs of European companies in terms of research in wireless communications. The results of this survey are precisely the purpose of the first deliverable D.3.4 – *Survey on Research Expectations of European Companies*. In the survey, Associate Partners from industry were also asked about their availability to host dissemination events. The deliverable also reports on the (partial) answers received.

From the list of 16 associate partners from industry located or headquartered in 8 European countries (France, Germany, UK, Italy, Spain, Poland, Denmark, and Turkey), 11 answered the survey. From these, 5 are major network operators and 3 are major equipment manufacturers. The highest interest was expressed by the partners for WP1.3_Energy and Bandwidth Efficient Communications and Networking, and the lowest interest was for WP1.1_Performance limits of wireless communications. This is not surprising, because industrial partners are mostly focused on mid-term and short-term research, and energy- and bandwidth-efficiency is currently a very hot topic. Concerning availability to hold a dissemination day before the summer of 2013, only Telecom Italia and France Telecom gave a positive response, and therefore the first dissemination event will be planned at the premises of one of these two companies.

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1. Introduction

One of the main objectives of NEWCOM# is to improve the dissemination of research results to European industry. The first task toward this objective is to make a survey and find out about the needs of European companies in terms of research in wireless communications. The results of this survey are precisely the purpose of the first deliverable D.3.4 – *Survey on Research Expectations of European Companies*. In the survey, Associate Partners from industry were also asked about their availability to host dissemination events. The deliverable also report on the (partial) answers received. Based on the answers received, the first dissemination events will be planned at the premises of Telecom Italia and Orange Labs.

The deliverable is organized as follows. In Section 2, we give a list of the Affiliate Partners from industry along with the contact names and their e-mail addresses. Next, in Section 3, we give a sample survey letter sent to those partners along with the attachment to be used for their rating of our work packages. Section 4 reports the responses received from the partners. Section 5 briefly analyzes these results, and finally, Section 6 gives our initial conclusions.

2. List of Associate Partners from Industry

The list of NEWCOM# Associate partners from European industry along with the contact names and e-mail addresses is as follows:

Company	Contact Name	E-mail address
Actix (Germany)	Jens Voigt	jens.voigt@actix.com
Aeroflex Test Solutions (UK)	Li-Ke Huang	li-ke.huang@aeroflex.com
Agilent (Denmark)	Jonathan Duplicy	jonathan_duplicy@agilent.com
Avea (Turkey)	Salih Ergut	salih.ergut@avea.com.tr
Cognovo* (UK)	Gordon Aspin	Gordon.aspin@u-blox.com
Intel Mobile Comm. (Ger.)	Volker Aue	Volker.aue@intel.com
ITTI (Poland)	Witold Holubowicz	holub@itti.com.pl
NEC Labs Europe (Ger.)	Peter Rost	peter.rost@neclab.eu
Orange Labs (France)	Berna sayrac	berna.sayrac@orange.com
RAI (Italy)	Alberto Morello	a.morello@rai.it
Renesas Mobile (Denmark)	Niels Morch	niels.morch@renesasmobile.com
Samsung Poland	Piotr Jantos	p.jantos@samsung.com
Telcordia (Poland)	Michal Wodczak	mwodczak@telcordia.com
Telecom Italia Labs (Italy)	Fabio Luigi Bellifemine	fabioluigi.bellifemine@telecomitalia.it
Telefonica I+D (Spain)	Luis Cucala	lcucala@tid.es
Thales Comm. (France)	Cedric Demeure	cedric.demeure@thalesgroup.com

* Cognovo was recently acquired by the Swiss company U-BLOX.

3. Survey Letters

A sample survey letter is provided below. These letters were sent around mid-January with an attachment on which Associate partners were asked to indicate their level of interest in different work packages of NEWCOM#.

Name
Company

Date

Dear ……..,

The Executive Board of the *European Network of Excellence on Wireless Communications* (NEWCOM#) is very happy that …….. decided to join the network as an *Associate Partner*. As you know, NEWCOM# will particularly emphasize dissemination of research results to European wireless industry with the goal of helping companies innovate and maintain a strong position in the international competition. Our *Associate Partners* will be of course the first companies to benefit from the cutting-edge research of our network. To align our research objectives with the needs of our partners and their technology roadmaps, we would like to identify at this stage their expectations in terms of research. For your information, the attached table gives the titles and abstracts of the six work packages of NEWCOM#, which are dedicated to theoretical research. Could you please indicate in this table the interest of your company using a scale from 0 to 5? In this scale, a score of 5 indicates a very strong interest and 0 indicates no interest at all. We would greatly appreciate receiving your rating by Monday, 28 January. We will make every effort to concentrate research on the topics of strong interest to our *Associate Partners*.

The first dissemination event of NEWCOM# will be scheduled in the May – June 2013 time period, and other events will follow with a periodicity of one event every 3 months, approximately. These dissemination events will be organized at the premises of our *Associate Partners* from industry in order to facilitate the participation of their technical staff without incurring significant travel cost. Could you please let me know the best time period for organizing such an event at your premises?

I look forward to hearing from you and I take this opportunity to wish you a happy, healthy and successful New Year.

Sincerely,

Prof. Hikmet Sari
WP Leader, Industry Liaison & Dissemination

Associate Partners' Interests
Partner: Please fill in
Contact: Please fill in

Work Package No:	Work Package Title and Abstract	Rating by Partner*
WP1.1	**Performance limits of wireless communications** In addition to classical issues related to the development of capacity-achieving and/or non-binary channel codes for communication links, we will also tackle problems like multiuser capacity, optimal signal processing techniques for large networks, and communication security at the PHY layer. Cooperative communications via relays and network modeling, identification of optimal relaying strategies, and the relevant ultimate capacity will be some of the main focus points.	
WP1.2	**Opportunistic and cooperative communications** For cellular networks, we will address intra-cell relaying among nodes and inter-BS cooperation to achieve significant capacity and multiplexing gain, and to decrease the loss probability and improve timeliness in data delivery. In the context of "sporadic" communications, the WP will address distributed and cooperative resource allocation and routing in delay-tolerant networks in mobile ad-hoc networks. We will also cover the optimization of cooperative sensing in unstructured networks.	
WP1.3	**Energy- and bandwidth-efficient communications and networking** We will address interference management techniques for coexisting networks (multi-tier networks for the same operator or multi-operator networks sharing a band). Particular focus will be on the following four research topics: (1) power- and energy-efficient terminals, (2) interference mitigation (co-channel and adjacent-channel) at the PHY layer, (3) network resource allocation taking into account simultaneously energy consumption and interference, and (4) ad-hoc network optimization under energy related metrics.	

WP2.1	**Radio interfaces for next-generation wireless systems** The focus is on implementation of radio interfaces with emphasis on low energy consumption, low emission, and high spectral efficiency, as well as on localization techniques in wireless terminals. In order to assess the performance of these radio interfaces in realistic scenarios, a set of channel models will also be developed. Localization techniques will be addressed through the implementation of TOA and TDOA algorithms over platforms based on inertial sensors, commercial GNSS ICs, etc.	
WP2.2	**Networking technologies for the Internet of Things (IoT) with mobile clouds** Networking technologies for IoT with mobile clouds will be addressed with particular emphasis in Smart City as well as indoor applications. More specifically, work will focus on the investigation and implementation of different routing protocols for large sensor networks, schemes for delay-tolerant networking paradigms, and measurement and modeling of the mobility patterns of mobile clouds. Also, the performance of distributed and cooperative (multi-terminal) localization schemes will be experimentally assessed.	
WP2.3	**Flexible communication terminals and networks** Work will be focused on: i) hardware and software tools for flexible radio architectures; and ii) application scenarios for experimentation highlighting some of the tools: networked signal processing for collaborative communications, development methodologies for massive radio networks in support of the Internet of Things, and technical enablers for white-space exploitation in the presence of a primary communication system. The goal is to enhance existing platforms by sharing equipment, hardware and software development methodologies, facilities, and past experience in methods for experimentation with real-time radio resources.	

* Rating on a scale from 0 to 5, with 5 designating the highest interest.

4. Responses Received

The responses received from 11 partners are given below. Other partners did not respond.

4.1 ACTIX

WP #	Work Package Title and Abstract	Rating by Partner*
WP1.1	**Performance limits of wireless communications**	0
WP1.2	**Opportunistic and cooperative communications**	2
WP1.3	**Energy- and bandwidth-efficient communications and networking**	In general: 3 Your (4): 5
WP2.1	**Radio interfaces for next-generation wireless systems**	2
WP2.2	**Networking technologies for the Internet of Things (IoT) with mobile clouds**	2
WP2.3	**Flexible communication terminals and networks**	0

4.2 AGILENT

WP #	Work Package Title and Abstract	Rating by Partner*
WP1.1	**Performance limits of wireless communications**	1
WP1.2	**Opportunistic and cooperative communications**	3
WP1.3	**Energy- and bandwidth-efficient communications and networking**	4
WP2.1	**Radio interfaces for next-generation wireless systems**	4
WP2.2	**Networking technologies for the Internet of Things (IoT) with mobile clouds**	2
WP2.3	**Flexible communication terminals and networks**	4

4.3 AVEA

WP #	Work Package Title and Abstract	Rating by Partner*
WP1.1	**Performance limits of wireless communications**	1
WP1.2	**Opportunistic and cooperative communications**	3
WP1.3	**Energy- and bandwidth-efficient communications and networking**	2
WP2.1	**Radio interfaces for next-generation wireless systems**	3
WP2.2	**Networking technologies for the Internet of Things (IoT) with mobile clouds**	5
WP2.3	**Flexible communication terminals and networks**	4

4.4 COGNOVO (now U-BLOX)

WP #	Work Package Title and Abstract	Rating by Partner*
WP1.1	**Performance limits of wireless communications**	0
WP1.2	**Opportunistic and cooperative communications**	0
WP1.3	**Energy- and bandwidth-efficient communications and networking**	3
WP2.1	**Radio interfaces for next-generation wireless systems**	5
WP2.2	**Networking technologies for the Internet of Things (IoT) with mobile clouds**	0
WP2.3	**Flexible communication terminals and networks**	4

4.5 NEC LABS EUROPE

WP #	Work Package Title and Abstract	Rating by Partner*
WP1.1	**Performance limits of wireless communications**	3
WP1.2	**Opportunistic and cooperative communications**	4
WP1.3	**Energy- and bandwidth-efficient communications and networking**	4
WP2.1	**Radio interfaces for next-generation wireless systems**	2.5
WP2.2	**Networking technologies for the Internet of Things (IoT) with mobile clouds**	4.5
WP2.3	**Flexible communication terminals and networks**	Netw. Side 4 Term. Side 1

4.6 ORANGE LABS

WP #	Work Package Title and Abstract	Rating by Partner*
WP1.1	**Performance limits of wireless communications**	4
WP1.2	**Opportunistic and cooperative communications**	4
WP1.3	**Energy- and bandwidth-efficient communications and networking**	5
WP2.1	**Radio interfaces for next-generation wireless systems**	5
WP2.2	**Networking technologies for the Internet of Things (IoT) with mobile clouds**	4
WP2.3	**Flexible communication terminals and networks**	1/4 (see below)

1 for technical enablers for white-space exploitation in the presence of a primary communication system
4 for HW and SW tools for flexible radio architectures in support of the IoT.

4.7 RENESAS MOBILE

WP #	Work Package Title and Abstract	Rating by Partner*
WP1.1	**Performance limits of wireless communications**	2
WP1.2	**Opportunistic and cooperative communications**	5
WP1.3	**Energy- and bandwidth-efficient communications and networking**	3
WP2.1	**Radio interfaces for next-generation wireless systems**	2
WP2.2	**Networking technologies for the Internet of Things (IoT) with mobile clouds**	0
WP2.3	**Flexible communication terminals and networks**	3

4.8 SAMSUNG POLAND

WP #	Work Package Title and Abstract	Rating by Partner*
WP1.1	**Performance limits of wireless communications**	2
WP1.2	**Opportunistic and cooperative communications**	2
WP1.3	**Energy- and bandwidth-efficient communications and networking**	3
WP2.1	**Radio interfaces for next-generation wireless systems**	3
WP2.2	**Networking technologies for the Internet of Things (IoT) with mobile clouds**	5
WP2.3	**Flexible communication terminals and networks**	2

4.9 TELECOM ITALIA

WP #	Work Package Title and Abstract	Rating by Partner*
WP1.1	**Performance limits of wireless communications**	2
WP1.2	**Opportunistic and cooperative communications**	3
WP1.3	**Energy- and bandwidth-efficient communications and networking**	4
WP2.1	**Radio interfaces for next-generation wireless systems**	3
WP2.2	**Networking technologies for the Internet of Things (IoT) with mobile clouds**	5
WP2.3	**Flexible communication terminals and networks**	5

4.10 TELEFONICA I+D

WP #	Work Package Title and Abstract	Rating by Partner*
WP1.1	**Performance limits of wireless communications**	4
WP1.2	**Opportunistic and cooperative communications**	3
WP1.3	**Energy- and bandwidth-efficient communications and networking**	5
WP2.1	**Radio interfaces for next-generation wireless systems**	4
WP2.2	**Networking technologies for the Internet of Things (IoT) with mobile clouds**	3
WP2.3	**Flexible communication terminals and networks**	3

4.11 THALES COMMUNICATIONS

WP #	Work Package Title and Abstract	Rating by Partner*
WP1.1	**Performance limits of wireless communications**	4
WP1.2	**Opportunistic and cooperative communications**	5
WP1.3	**Energy- and bandwidth-efficient communications and networking**	5
WP2.1	**Radio interfaces for next-generation wireless systems**	3
WP2.2	**Networking technologies for the Internet of Things (IoT) with mobile clouds**	3
WP2.3	**Flexible communication terminals and networks**	4

5. Analysis and Action Plan

The average scores and standard deviations of the 6 work packages are as follows:

Work package	Average score	Standard deviation
WP1.1:	2.09	1.44
WP1.2:	3.09	1.38
WP1.3:	3.91	0.99
WP2.1:	3.32	1.01
WP2.2:	3.04	1.79
WP2.3:	3.27	1.3

First, we notice that the lowest average score is for WP1.1_Performance limits of wireless communications, which is not surprising, because industry is typically looking for more application-oriented research targeting short-to-mid-term results. Next, we observe that the highest score was given to WP1.3_Energy and Bandwidth Efficient Communications and Networking, which currently represents a very hot topic. All other work packages were quite balanced in terms of the average scores received. We also notice that the standard deviation is rather high virtually for all work packages, because companies included in our list have very different profiles ranging from small companies to very large corporations and from network operators to manufacturers and technology companies.

Large companies, particularly those with a strong R&D activity like Orange Labs and Thales Communications, show interest in a large spectrum of activities, whereas small companies like Actix and Cognovo (u-blox) are strongly focused on some work packages and show no interest at all in the others. Those aspects will be taken into account when organizing the dissemination events.

Most Associate Partners did not respond to the question of when they would be prepared to host a forthcoming dissemination event. Only Telecom Italia and Orange Labs confirmed that an event at their premises could be held next June provided that they are given a notice of 3 – 4 months. Next, Agilent and Thales indicated that they could host an event from September 2013 on. The best strategy at this point would therefore consist in organizing the first dissemination at the premises of Telecom Italia or Orange Labs in June, and then decide the following events within the next 2 – 3 months after further discussions with the other partners.

6. Conclusions

In this first period of activity of NEWCOM#, WP3.4 performed a survey to assess the interest of Associate Partners from industry in the different work packages of NEWCOM#. Interesting feedback was received, which will help us address the need of industry and also organize the first dissemination events. More specifically, 16 associate partners from industry in 8 European countries were contacted, 11 of them responded, and the received responses were analyzed. The survey results may be used for determining priorities between work packages, but most of all, they will be used for scheduling the dissemination events and determining their programs in line with the interests expressed by the industrial partners. On the basis of the answers received, the first dissemination event will be planned at the premises of Telecom Italia or of Orange Labs next June. Other events will be decided within the next few months after further discussions the other partners.

Comments and suggestions for the improvement of this document are most welcome and should be sent to:

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