



**216715 NEWCOM<sup>++</sup>**  
**DI3.1**

**Report on first year researchers exchange and joint publications**

**Contractual Date of Delivery to the CEC:** T0+12

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**Workpackage number:** WPI.3

**Nature:** I

**Total Effort Spent:** 2 PM

**Dissemination Level:** external

**Version (1,2,...):** 1.0

**Abstract:**

The report is dedicated to the description of the actions that have taken place during the first year of NEWCOM<sup>++</sup> within WPI.3 – Valorization of human capital.

This WP is inserted in the integration activities of NEWCOM<sup>++</sup>; the integration among partners gives the opportunity to researchers to meet and exchange their talents. This positive trend gives a benefit to the network as a whole and it is a chance for researchers to improve their knowledge and values.

Therefore, in order to have some indicators on the degree of integration among the partners, data on joint papers, researchers' exchange and grants, are presented.

A final paragraph is dedicated to gender issue, as the importance of this topic involves NEWCOM<sup>++</sup> life too.

As a result, 38 scientific exchanges of a short term and long-term durations have been taken place, 47 joint papers have been published, 2 mobility grants for projects implementation have been given by the NEWCOM<sup>++</sup> Mobility Panel, as well as one grant for the PhD student to participate in the ICT Mobile Summit 2008.

**Keyword list:**

Mobility, researchers' exchanges, joint papers, grants, international conferences, gender issue

**TABLE OF CONTENTS**

List of Acronyms.....	3
1 Introduction.....	4
2 Activities.....	5
2.1 Researchers exchanges.....	5
2.2 Joint Publications.....	6
2.3 Mobility grants.....	8
2.4 NEWCOM <sup>++</sup> PhD student to ICT 08.....	8
2.5 Gender issue.....	9
3. Conclusions.....	11
ANNEX A - Researchers exchanges.....	12
ANNEX B - Joint Publications.....	13
ANNEX C - Mobility grants – Call for projects.....	14
ANNEX D - Report of PhD student at ICT 08 in Lyon.....	16

**LIST OF ACRONYMS**

CNIT	Consorzio Nazionale Interuniversitario per le Telecomunicazioni
CTTC	Centre Tecnologic de Telecomunicacions de Catalunya
EWPS	European Platform of Women Scientists
ICT	Information Communication Technologies
ISMB	Istituto Superiore Mario Boella
IST	Instituto Superior Tecnico
KAU	Karlstads Universitet
N <sup>2</sup>	Networking Networking Women
NOFDM	Non-Orthogonal Frequency-Division Multiplexing
PUT	Poznan University of Technology
RWTH	Rheinisch-Westfaelische Technische Hochschule Aachen
WP	Workpackage

## 1 INTRODUCTION

This report, as long as the WP it refers to, is dedicated to the valorization of human capital in NEWCOM<sup>++</sup>. The valorization has been enhanced by promoting the mobility within the project and the production of joint papers, by giving grants to researchers that best answer to the proposed call for projects, by sponsoring the participation of young researchers to international conferences; all of these initiatives enlighten that the integration and sharing of the knowledge is the distinctive benefit of a Network of Excellence as NEWCOM<sup>++</sup>.

The report is divided in five chapters, each of them describes the different actions that, during the first year of the project, have contribute in valorizing the human capital of the network:

- The first chapter is dedicated to the mobility actions of the researchers; some figures are given on numbers and duration of the visits;
- The second chapter is devoted to joint papers and it gives some figures on conference and journal papers written by two or more partners of NEWCOM<sup>++</sup>;
- The third chapter reports on the “mobility grants” that have been given to two young researchers enhancing the face-to-face research;
- The fourth chapter describes the grant devoted to a NEWCOM<sup>++</sup> PhD student to ICT 08 in Lyon;
- The fifth and last chapter gives some figures on gender in NEWCOM<sup>++</sup>.

A last section is dedicated to the conclusion.

Documents are reported in the annexes. In particular some tables with the numbers that have been used to create the figures and graphs reported in the deliverable itself, the call for projects promoting the “mobility grant” and finally the report of the PhD student that attended ICT 08 in Lyon.

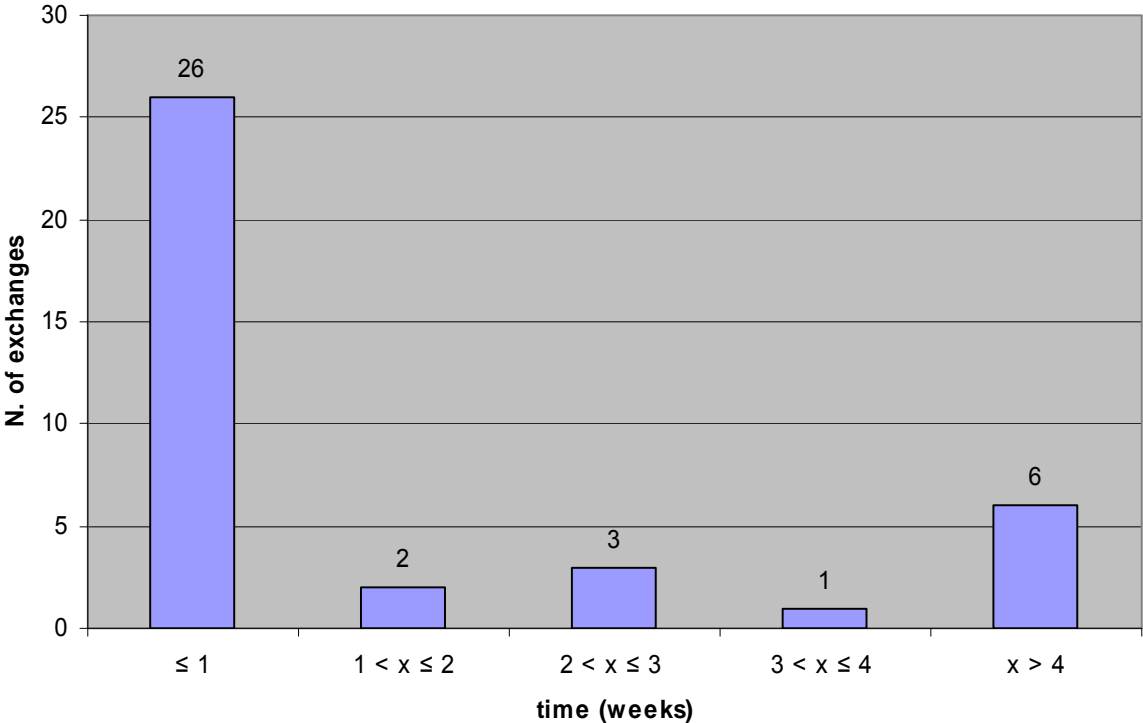
**2 ACTIVITIES**

**2.1 Researchers exchanges**

During the first year of the project several researchers spent a period of their working time at some other institutions within NEWCOM++. These face-to-face research periods are the engine that promotes real integration among partners, they allow them to create relationships, and strengthen the existing liaisons among different institutions. In some cases they endorse new collaborations that can bring new enthusiasm to the life of the NoE.

The following charts show some figures on the researchers’ exchanges occurred in the first year of NEWCOM++. The numbers used here after have been extrapolated using the table in Annex A.

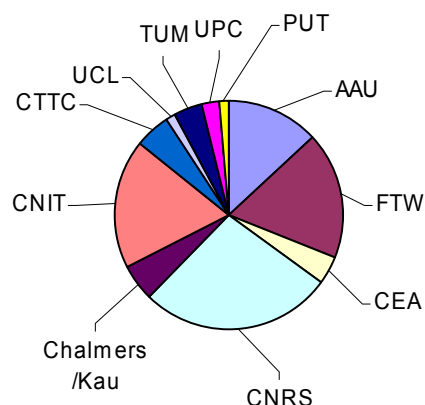
As shown in Fig. 2.1, dedicated to the time duration of these exchanges, during the first year of the project there have been 38 visits of researchers.



**Fig.2.1 - The number of visits versus duration.**

The above figures could show that NEWCOM++ researchers mostly find short visits (shorter than one week) the most effective ones. However, long exchanges (above 4 weeks) are the second most preferred ones.

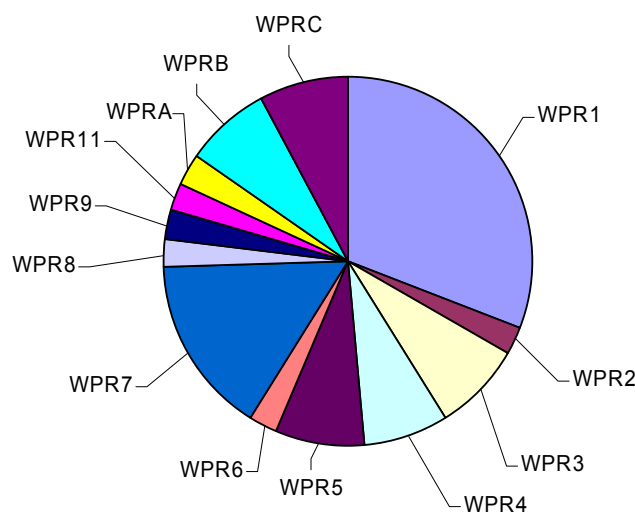
As for the short visits, they usually have the purpose of initiating the collaboration and set forth the framework for future joint work, which then will be executed in parallel by the joint partners from their home institutions. Most of the time, this results in joint publications and is usually followed by subsequent visits.



**Fig.2.2 - The involvement of partners in researchers' exchanges.**

As for the involvement of partners in the exchange actions, Fig. 2.2, it should be noted that this chart suggests that the bigger the partner, the higher the number of exchanges it implemented. This is the case of CNIT and CNRS which are the partners with the highest number of researchers in NEWCOM<sup>++</sup>.

The graph in Fig. 2.3 highlights the WPs involved in the joint research where the visits were dedicated to.



**Fig.2.3 - The involvement of NEWCOM++ WPs in researchers' exchange.**

Fig. 2.3 reflects cooperation activities in terms of the face-to-face meetings and visits taking place within different workpackages. WPR1 and WPR7 seem to have the leading position, however it should be noted that virtual meetings are being organized within NEWCOM<sup>++</sup> quite often, using the Easymeeting software tool. This allows other work-packages to organize their cooperation also very efficiently. These data are not considered in the pie chart above because most of them take place informally.

## 2.2 Joint Publications

By joint publications it is meant papers made by two or more partners of the consortium.

The joint publications within a network of excellence are an important indicator of the integration established among different partners.

Reference DI3.1

Considering that NEWCOM<sup>++</sup> started on January 2008, the results, in terms of papers accepted by international conferences and journals, are pretty good. In particular the papers submitted and accepted on international journals are 8 while on proceedings of international conferences are 39. Therefore, joint publications accepted in the first year of NEWCOM<sup>++</sup> are 47.

The following table reports figures on partners involved:

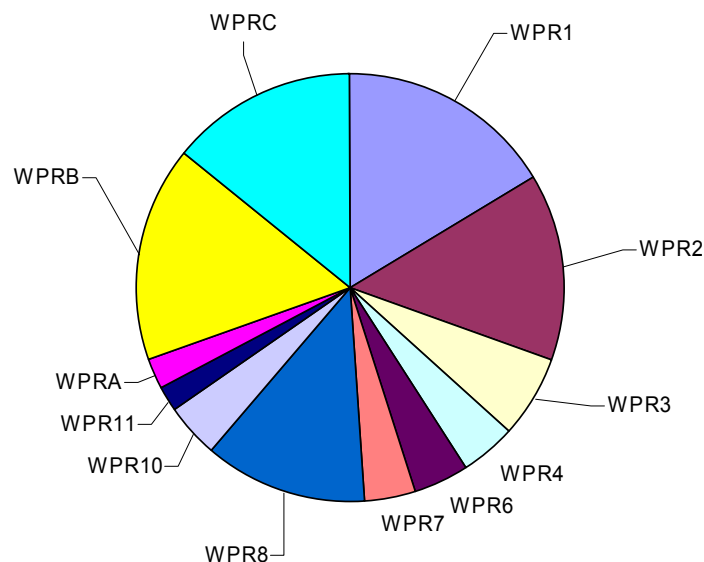
	2 partners 1 country	2 partners 2 countries	3 partners 3 countries	Total
<b>conferences</b>	20	17	2	<b>39</b>
<b>journals</b>	2	5	1	<b>8</b>
<b>total</b>	<b>22</b>	<b>22</b>	<b>3</b>	<b>47</b>

**Table.2.1 - The number of joint papers published or accepted in the first year of NEWCOM<sup>++</sup>**

It is difficult to have joint research efforts resulting in accepted papers in international journals in less than one year's life for the Network. These numbers above are, nonetheless, pretty good and we conclude that they reflect the continuing impact of the first Newcom and the continuation of activities and collaborations established therein.

It's interesting to notice that some joint papers have been produced by two or more NEWCOM<sup>++</sup> partners and authors coming from institutions external to NEWCOM<sup>++</sup> consortium. In particular, institutions external to NEWCOM<sup>++</sup> consortium have been involved in 7 conference-papers and 1 journal-paper. This is a positive trend because it is an indicator of the interest that the NoE gain from external actors. Moreover it's an actual spreading of the outputs of the project.

Concerning the contents, the following chart presented in Fig. 2.4 shows the involvement of the different WPs in the publication of joint papers. The numbers used can be extrapolated from the table in annex B.



**Fig.2.4 - The involvement of NEWCOM<sup>++</sup> WPs in joint papers**

Two conference-papers have been produced by two workpackages jointly. In particular one conference-paper has been made together by WPR2 and WPR8; the other one was prepared jointly by WPR1 and WPRB.

## 2.3 Mobility grants

In order to promote the face to face research and enhance a healthy competition among researchers, two prizes have been given to the best mobility projects.

A mobility panel have been created in order to discuss the rules for the submission of proposals, to prepare the “Call for projects” and to evaluate the proposals. The following persons have been nominated by the Executive Board (at the meeting in Lisbon on April 14-15 2008) as members of the mobility panel: Luis Correia (IST), Carles Anton (CTTC), Silvano Pupolin (CNIT), Paola Biglia (ISMB).

On July 30<sup>th</sup> 2008 the call for project was opened on the web site at the following URL:  
<http://www.newcom-project.eu:8080/Plone/mobility/grants-for-mobility>

Annex C to look at the complete text of the call.

A brief description of the winning projects follows:

- Researcher’s name: Adrian Kliks, PhD student at Poznan University of Technology (PUT).  
 Title of the project: *Adaptive Modulation and Coding Algorithms for Non-Orthogonal Multicarrier Systems*.

Adrian Kliks will spend one month (February 2009) at Consorzio Nazionale Interuniversitario per le Telecomunicazioni – University of Pisa (CNIT –Pisa), Italy.

The research that will be conducted is related to the topics of the following workpackages of NEWCOM<sup>++</sup>:

- WPR.3 – Adaptive modulation algorithms for NOFDM systems;
- WPR.3 – the influence of the non-linearities on NOFDM systems
- WPI.4 – new algorithms for IT<sup>++</sup> base

- Researcher’s name: Flavio Fabbri, PhD student at Consorzio Nazionale Interuniversitario per le Telecomunicazioni - University of Bologna (CNIT-Unibo)  
 Title of the project: *Discovering Connectivity and MAC properties of Static and Mobile Wireless Sensor Networks: the Impact of Non-Poissonian Nodes Distributions and of Realistic Mobility Patterns on Network Throughput*.

Flavio Fabbri will spend three months at RWTH - Dep. of Wireless Networks, Aachen, Germany; the starting date has already been scheduled on Jan-15<sup>th</sup> 2009. The research that will be conducted is strictly related to the topics of WPR.10 and WPR.11.

In particular, the research within WPR.10 focuses on the impact of different node spatial distributions on connectivity and MAC issues of wireless sensor networks; while the research related to WPR.11 deals with novel scenarios for wireless ad-hoc and sensor networks.

## 2.4 NEWCOM<sup>++</sup> PhD student to ICT 08

In August 08 the Project Officer invited NEWCOM<sup>++</sup> to participate to an initiative promoted by ICT 08. In particular, the ICT 2008 Steering Committee decided that all NoEs active at the time of the event were invited to select one PhD student from their Network to travel to Lyon for ICT 2008. The participation would have been an active one since two things were required of the selected PhD student:

1. the conference organisers would assign one plenary, keynote or parallel session from the conference programme to the selected PhD student. Following their attendance at the session, they would write a report on the session's proceedings;

2. when they return to their university they would be required to give a presentation to their fellow students on their overall ICT 2008 experience in addition to the most interesting new developments they came across (in the conference, exhibition or networking sessions) and career opportunities / avenues in ICT Research they learnt of at ICT 2008.

NEWCOM<sup>++</sup> decided to support this initiative. 3 PhD students sent their own cv and Marcel Cavalcanti de Castro (Karlstad University) has been selected.

This initiative has been a good opportunity for PhD students to participate to an international conference as actors more than observers; more over it has been a chance to insert NEWCOM<sup>++</sup> in a “network of networks”.

The report on the Conference is presented in Annex D

## 2.5 Gender issue

During the first year of the project, a simple survey has been conducted within the consortium in order to observe the gender situation in NEWCOM<sup>++</sup>.

The following table (Table 2.6) is a picture of the people active in the project and their role:

partner	Gender	Full professor	Associate professor	Assistant Prof./Lecturer - Senior/junior researcher	Post-doc	PhD student	Administrative staff	Total
total	Women	7	11	5	0	20	22	65
	Men	51	46	52	20	100	8	277
	Total	58	57	57	20	120	30	342

Table.2.2 - Figures on positions and gender of NEWCOM<sup>++</sup> staff

The consideration that under-representation of women in science, engineering and technology is a factual issue is true also for the area of information technologies as the picture shows. The women in NEWCOM<sup>++</sup> are roughly 20% of the total personnel devoted to the project (see Fig. 2.7).

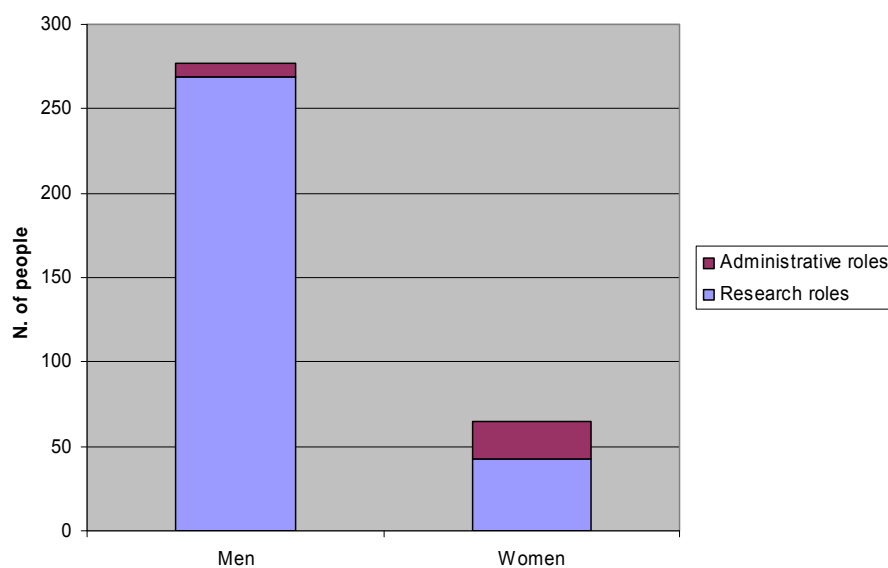


Fig.2.5 - Man and Women in NEWCOM<sup>++</sup> with references to different roles

It seems that there is the necessity to support women researchers in their activities. The increase of the number of female students to become PhD candidates and successful researchers in the future can be one of the positive side-effects of NEWCOM<sup>++</sup>. Through mobility support, exchange of students, international cooperation, dissemination opportunities both female and male students receive support for their academic careers.

In the discussions among female researchers in NEWCOM<sup>++</sup>, it has been noticed that there are world-wide organizations gathering female researchers in telecommunications, computer science, electronics and related fields. These organizations aim at supporting women in their academic and research careers. One of them is European Platform of Women Scientists (EPWS). One of the main objectives of EPWS is to foster networking activities for women scientists in Europe. Therefore, in order to help and advise those interested and willing to create networks of women scientists and those running networks, EPWS is launching the preparation of seminars on the creation, running and financing of networks and association of women scientists and/or promoting women scientists. The EPWS website can be found at: <http://www.epws.org/index.php>

Another organization in closer research-focus relation with NEWCOM<sup>++</sup> is IEEE community: Networking Networking Women (N<sup>2</sup> Women) within IEEE Communications Society. N<sup>2</sup> Women is a discipline-specific community for researchers in the communications and networking research fields. The main goal of N<sup>2</sup> Women is to foster connections among the under-represented women in communications, networking, computer science, and related research fields. N<sup>2</sup> Women allows women to connect with other women who share the same research interests, who attend the same conferences, who face the same career hurdles, and who experience the same obstacles. Information about meetings, open positions, funding and scholarship opportunities for female researchers can be found at: <http://www.comsoc.org/n2women/>

### 3. CONCLUSIONS

Valorization of human capital depends on the organizational system that enables communities to stimulate, activate, evaluate and reward their human resources, thereby making these communities actively committed to common objectives, and, at the same time, being able to maintain all the existing diversities. The intention and mission of NEWCOM<sup>++</sup> valorization of human capital in the first year has been to develop and create conditions for the development of new scientific ideas and innovation within NEWCOM<sup>++</sup> Research Work-Packages and for the cooperation between partners involved in these work-packages. Thus, in the first year of its operation, NEWCOM<sup>++</sup> has been implementing procedures, which aimed at this desired outcome. Actions have been undertaken to support the increase of competences of involved partners and competitiveness of the network as a whole. As a result, 38 scientific exchanges of a short term and long-term durations have been taken place, 47 joint papers have been published, 2 mobility grants for projects implementation have been given by the NEWCOM<sup>++</sup> Mobility Panel, as well as one grant for the PhD student to participate in the ICT Mobile Summit 2008.

Through mobility grants, projects grants, exchanges of researchers, promotion of joint activities (including joint papers) and other ways of cooperation support, NEWCOM<sup>++</sup> implements human capital valorization strategy as the integral part of its global strategy to create the network of true and increasing excellence.

## ANNEX A - RESEARCHERS EXCHANGES

home institution	hosting institution	period of the visit		WP involved in the joint research
		from (dd/mm/yy)	to (dd/mm/yy)	
AAU	FTW	7/1/08	21/1/08	WPR1, WPR4
AAU	FTW	11/2/08	15/2/08	WPR1, WPR4
AAU	FTW	10/3/08	15/3/08	WPR1, WPR4
AAU	CNRS	18/4/08	23/4/08	WPR1
AAU	CNRS	10/9/08	12/9/08	WPR1
AAU	CNRS	21/4/08	23/4/08	WPR1
AAU	FTW	27/2/08	29/2/08	WPR1
AAU	CNRS	10/9/08	15/9/08	WPR1
AAU	FTW	27/2/08	29/2/08	WPR1
CEA	CNRS	26/5/08	30/5/08	WPRC
CEA	CNRS	24/11/08	5/12/08	WPRC
CEA	CNRS	1/12/08	3/12/08	WPRC
CHALMERS	CNIT	16/10/08	17/10/08	WPR.B
CNIT	CNRS	2/5/08	31/10/08	WPR8
CNIT	CHALMERS-KAU	10/12/08	12/12/08	WPR.11
CNIT	CHALMERS	07/05/08	08/05/08	WPR.B
CNIT	CTTC	24/9/07	1/3/08	WPR6
CNIT	UCL	31/1/08	5/2/08	WPR3
CNIT	CTTC	31/10/08	30/4/09	WPR3
CNIT	CTTC	23/4/08	31/10/08	WPR3
CNIT	TUM	10/6/08	22/6/08	WPR.5
CNIT	TUM	6/9/08	21/9/08	WPR.5
CNRS	FTW	6/5/08	22/5/08	WPR7
CNRS	FTW	27/5/08	3/7/08	WPR7
CNRS	FTW	21/7/08	22/8/08	WPR7
CNRS	FTW	8/9/08	29/9/08	WPR7
CNRS	CNIT	26/1/08	29/1/08	n.a.
CNRS	CNIT	12/3/08	14/3/08	n.a.
CNRS	CNIT	11/11/08	15/11/08	n.a.
CNRS	FTW	22/4/08	23/4/08	WPR7
CNRS	UPC et CTTC	20/10/08	22/10/08	WPR2
CNRS	FTW	14/4/08	18/4/08	WPR1
FTW	CNRS	21/1/08	25/1/08	WPR7
FTW	CNRS	18/2/08	21/2/08	WPR1, WPRA
FTW	AAU	16/4/08	18/4/08	WPR1
PUT	CNRS	1/12/08	4/12/08	WPR9
TUM	CNIT	13/3/08	14/3/08	WPR.5
UPC	CHALMERS	07/05/08	08/05/08	WPR.B

**ANNEX B - JOINT PUBLICATIONS**

<b>WPs involved</b>	<b>papers accepted /published</b>
WPR1	8
WPR2	7
WPR3	3
WPR4	2
WPR6	2
WPR7	2
WPR8	6
WPR10	2
WPR11	1
WPRA	1
WPRB	8
WPRC	7
<b>total</b>	<b>49</b>

Please notice that 2 papers have been counted twice since they have been produced jointly within 2 WPs. This explains why the total number is 49 instead of 47 (which is the actual number of papers accepted or published).

**ANNEX C - MOBILITY GRANTS – CALL FOR PROJECTS**

Opening of the call: July 30, 2008

Project acronym: NEWCOM<sup>++</sup>

Type of contract: NETWORK OF EXCELLENCE.

Contract N°: 216715

Project URL: <http://www.newcom-project.eu:8080/Plone/>

<b>GENERAL ASPECTS</b>	
<b>Purpose</b>	The aim of the mobility grants is to enhance the face to face research cooperation, promoting exchanges of researchers among different institutions.
<b>Participants</b>	Researchers from any of the NEWCOM <sup>++</sup> partners can participate to the call and submit a project.
<b>Duration</b>	The duration of a project is not fixed, as long as it is within NEWCOM <sup>++</sup> duration.
<b>Budget</b>	The total budget allocated for a single grant is € 1.500,00. At this stage the budget allows to issue 3 grants, two of them will be issued during the first year of N <sup>++</sup> , the third will be issue in the second year of N <sup>++</sup> .
<b>Claim and proof</b>	<p>The prize will be given directly to the winner, the coordinator (ISMB) will claim the cost in the annual financial statement to the EC.</p> <p>At the end of the stay the researcher will send to the coordinator copies of the boarding passes (or train tickets) as proof of the travel and a short report of the results obtained.</p>
<b>EVALUATION OF PROPOSALS</b>	
<b>Criteria</b>	<ul style="list-style-type: none"> <li>▪ Relevance to the objectives of NEWCOM<sup>++</sup> (links to WPs).</li> <li>▪ Feasibility and clarity of the objectives.</li> <li>▪ Integration. The extent to which:               <ul style="list-style-type: none"> <li>○ the mobility gives an add value to</li> </ul> </li> </ul>

	<p>already existent liaisons (importance of the choice of the hosting institution);</p> <ul style="list-style-type: none"> <li>○ increase of links between institutions</li> <li>○ new collaborations</li> <li>○ “Cross-fertilization” (The person that move should have complementary knowledge with respect to the one of the hosting institution in any case helpful for the research)</li> </ul> <ul style="list-style-type: none"> <li>▪ Priority: to PhD students or young researchers.</li> <li>▪ Results (e.g., papers, exchange of results, models vs. measurements)</li> </ul>
<p><b>Procedure</b></p>	<p>Each project will be evaluated by the Mobility Panel.</p> <p>Conflict of interest will not be accepted. The corresponding member of the panel will be replaced by a person chosen by the Executive Board.</p>

#### SCHEDULE

The applicants should send the Proposals to Paola Biglia at [N++office@newcom-project.eu](mailto:N++office@newcom-project.eu)

Deadline for submitting the proposals: October 30, 2008

Notification of the ranking: December 15, 2008.

#### PROPOSAL TEMPLATE

The template can be found on:

<http://www.newcom-project.eu:8080/Plone/mobility/grants-for-mobility>

## ANNEX D - REPORT OF PhD STUDENT AT ICT 08 IN LYON



### Individual Report

**Young Reporter: Marcel Cavalcanti de Castro (marccava@kau.se)**

**PhD student  
Karlstad University, Sweden**

### Introduction

The ICT 2008 illustrated research and development achievements in ICT and outlined EU common ambitions for the future. The main objective of ICT 2008 was to mobilise the European ICT research and innovation stakeholders - industry, business, the academic research community and policy makers - around the ICT agenda for the next decade. It strived to achieve this through three main strands in the conference programme: "Inventing the future", "Innovation & Creativity" and "Impact through policy".

In addition ICT 2008 also launched the ICT Work Programme 2009-2010 and figures for EU funding for ICT research. During ICT 2008 several sessions outlined the conference aims, where the overall content and funding schemes of the Work Programme took place. There were also sessions on specific R&D fields ("WP Objectives" and "Networking" sessions) that were addressed in the Work Programme.

Therefore, this report presents a summary of one session in the strand Innovation & Creativity called "Sustainability I - Energy efficiency", two sessions on WP Objectives called "WP Objective 5.1 & 5.2: Personal Health Systems / ICT for Patient Safety", one Networking session called "Cognitive Reconfigurable Radio Systems and Networks", and some minor comments on other sessions during ICT 2008.

### Session report 1: Sustainability I - Energy efficiency

The session Sustainability I – Energy Efficiency was presented in 26<sup>th</sup> of November 2008 at the Auditorium Pasteur of Centre de Congrès, Lyon, France. The session was organized by Mr. Manuel Sanchez Jimenez from EU commission, and chaired by Mr. José A. Cobos from UPM<sup>1</sup>, with Mr. Alain Zarli from CSTB<sup>2</sup>, Mr. Pier Nabuurs from Kema<sup>3</sup>, Paul Kompfner from ERTICO-ITS<sup>4</sup>, and Ms. Berit Wessler from OSRAM<sup>5</sup> as contributors.

Mr. José A. Cobos chaired the section with the message "*ICTs should be seen as an enabler to improve energy efficiency across the economy, increasing the visibility and improving the understanding of ICTs for energy efficiency*". He presented his talk titled "Enhancing energy efficiency towards R&D efforts on electronics components" by exploring the challenges and impact regarding new power requirements in ICT. One special example was giving to the deployment of "smart data centers" where standardization should be encouraged in order to provide minimal energy consumption. Another example was in Radio Frequency (RF) transmission where nowadays RF devices consume same energy despite of current device load (e.g. same energy consumption if device

<sup>1</sup> <http://www.upm.es>

<sup>2</sup> <http://www.cstb.fr/>

<sup>3</sup> Commercial enterprise specialised in energy management, <http://www.kema.com>

<sup>4</sup> ERTICO – ITS Europe is a multi-sector, public/private partnership pursuing the development and deployment of Intelligent Transport Systems and Services (ITS), <http://www.ertico.com/>

<sup>5</sup> <http://www.osram.com>

operates at 100% or 0% of load). Therefore, as address by Mr. Cobos, one solution could be to drive the power amplifier in a different way, by for example, using dedicated power supplier to the chip. The concept of “Energy Efficient Systems” was introduced as “*the minima energy to perform a function*”. The use of energy efficiency as a performance goal (e.g. percentage of performance per Watt) was encouraged and could be achieved by partitioning the system supply in different voltages, which can lead in some cases to 75% of power reduction. Important points such as how to drive the technology efficiently and how to quantify and know the minimal and possible energy to use were also address to the audience by Mr. Cobos.

Ms. Bent Wessler presented her talk entitled “Sustainability I: The role of Photonics – Energy Efficient Lighting”, and pointed out the current impact of lighting on a global scale which accounts for 19% of global electricity consumption. She emphasize that one third of the lighting energy could be saved by just applying current lighting technologies such as Solid State Lighting (SSL). ELC<sup>6</sup> and CELMA<sup>7</sup> propose lighting implementation measures under the EuP (Energy using Products) directive such as minimal performance requirement for each lamp. By applying such directives and using new technologies such as SSL, it should be possible to save 30% of the energy going to lighting, according to ELC. And by combining LEDs, sensors and embedded software in ambient intelligent lighting networks could increase and additional of 40% in energy reduction, according to the results of the Ad-hoc Advisory Group for ICT and Energy Efficiency. However, Ms. Wessler pointed that in order to realize such energy reductions the intelligent light systems should consider intelligent drivers, low power sensors, suitable communication between lamps, and energy monitoring of luminaries.

Mr. Alain Zarli presented his talk entitled “Turning ICT challenges into opportunities for energy efficiency in the building sector”. He started his talk by pointing out the shortage expectancy of current known energy reserves, such as oil/petrol (~40 years), natural gas (~70 years), uranium (~80 years), coal (~230 years), and the dependency of Europe Union in energy imports from unstable countries. Therefore, he highlighted the importance of intelligent energy efficient buildings through for example the “energy-generating home” where technologies such as wind turbines, solar panels, fuel cells, energy recovery/transformation, OLED lightning, sensors, new materials (e.g. insulation, radiant heat barrier, photovoltaic, electrochromatic), and automation & control could be adopted. Examples such as Edelia Energy box and ENOLE were cited as solutions to optimize energy consumption and detect potential leakage or usage deviations. However, Mr. Zarli argued that even with all current solutions there are still challenges that need to be addressed, such as continuous improvement in standards and regulations, empower consumers to control and manage their energy consumption/demands, intelligent energy management systems for controlling/optimizing energy and user interactions, smart building technologies show cases, citizen awareness of environment sustainability issues, business incentives, and methodologies for impact assessment. He also described the benefits of “ICT-enabled smart buildings” research by showing important energy savings while using ICT solutions such as control and management of energy systems (e.g. HVAC and lighting), embedding of ambient intelligent in buildings, and miniaturization. However research activities are still needed in several topics, including: design and simulation tools, interoperability and standards, building automation, smart metering, and user awareness tools.

Mr. Pier Nabuurs, present chairman of the European technology platform SMARTGRIDS<sup>8</sup>, presented a talk titled “Computing sustainability from challenges to opportunity”. In this talk, he exposed the potential of the upcoming liberal market of power for ICT, in the context of what Jeremy Rifkin called the “third industrial revolution”: renewable energy based "continent-wide, fully-integrated intelligent intergrid [that] allows each EU member state to both produce its own energy and share any surpluses with the rest of Europe in a 'network' approach"<sup>9</sup>. The uni-directional flow of power from production to consumers has been designed 30 to 40 years ago. “We are just starting to use renewable energy”, but “we should expect large-scale changes in the future”. We can expect Europe-scale exchanges of

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<sup>6</sup> European Lamp Companies, <http://www.elcfed.org/>

<sup>7</sup> <http://www.celma.org>

<sup>8</sup> European Technology Platform for the electricity networks of the future, <http://www.smartgrids.eu/>

<sup>9</sup> See more on <http://www.euractiv.com/en/energy/interview-third-industrial-revolution-nigh/article-170003>

“wind power” from the North and “solar power” from the South, and the emergence of an “internet-like” power grid, with a multi-directional flow of energy. How is ICT concerned? It represents only 2% of the energy consumed! Pier Nabuurs makes his message of the European Union: ICT is a key for the reduction of energy used in other domains, and should take advantage of the 150 billions of euros that the European society needs to inject into the system to make this revolution happen.

Paul Kompfner presented the following talk on “Cooperative Mobility for Energy & the Environment”. He exposed the problems of excessive dependence on oil for transportation and of climate change requiring the reduction of CO<sub>2</sub> emissions. The progress expected in vehicle oil consumption is not sufficient to achieve the changes required. Other areas of action are on the infrastructure and the driving behaviour. ICT could get participate in this green measures by providing Intelligent Transport Systems and Services (ITS) for a greener driving support, traffic monitoring, and pre-trip information. The vision is to equip both infrastructure and vehicles with “cooperative mobility systems” that communicate, share information in a global network. Traffic monitoring relying on collection of real-time environment and traffic data could inform the drivers about congested conditions and give infrastructures the means to adjust the speed limits to the conditions of circulation; this would increase the road capacity and make traffic smoother, so as to reduce energy consumption in total jams. Systems informing the driver of the speed to reach the next light at green<sup>10</sup> could cut down the most expensive energy lost in city transportation. Intelligent pre-trip planning could save energy by the avoidance of hilly roads, the choice of smart places to halts, etc. Eco-driving support could ensure the persistence of an adequate tire pressure. Eco-incentives could include CO<sub>2</sub>-emission-dependent parking charge as in Milan. The goal in the reduction of energy consumption for 2020 sets the objective of a decrease of 25% for the road. The connection of vehicles and infrastructure will help save energy.

These presentations raised several questions. Ms. Berit Wessler was questioned on the real potential of LEDs to replace incandescent bulbs, though the device costs about 8 times more. Research needs to be done to improve efficiency of LED warm white lighting, and deal with the decrease of efficiency at higher temperatures, but the technology is ready for 100 lumens/W LEDs that should take over the fluorescent bulbs 3-5 years from now. Interrogated on energy management in the house, Alain Zarli attributed the failure of smart home to the lack of interoperability between old interfaces; statistics are needed about the living habits of different kinds of people, as the models for energy management vary with the familial settings. About the barriers against a multi-directional energy flow, Mr. Cobos insisted that ICT should facilitated energy management and make the energy flow management effortless. On how much energy could be saved by cooperative mobility systems, Mr. Kompfner asserted that 10% could be easily saved by relative eco-driving, and a better synchronisation of traffic lights, following the model set in place in London, could lead to similar gains; as a proof of concept, a big national try is launched next year in Germany.

As a conclusion, ICT for sustainability will be constituted of inter-disciplinary approaches, and its success will be partly dependent on consumers efforts for eco-driving, better lighting, etc.

Session report 2: WP Objective 5.1 & 5.2 WP 2009-2010: Personal Health Systems / ICT for Patient Safety

The work programme 5.1 (Personal Health System) and 5.2 (ICT for Patient Safety) were organized together in the session entitled “Personal Health Systems / ICT for Patient Safety”, presented in 27th of November 2008, at the Auditorium Pasteur of Centre de Congrès, Lyon, France. The session was organized and chaired by Mr. Loukianos Gatzoulis from EU commission, having Mr. Safdar Ali from Fraunhofer-IBMT11, Ms. Johan Van Der Lei from University Medical Centre Rotterdam, and Ms. Flora Giorgio from EU commission as contributors.

<sup>10</sup> Audi traffic light detection system, <http://www.autoblog.com/2008/09/21/audi-traffic-light-detection-system-gets-the-green-light/>

<sup>11</sup> Fraunhofer-Institut Biomedizinische Technik, <http://www.ibmt.fraunhofer.de>

Mr. Gatzoulis started the session with the presentation “Challenge 5 - Towards sustainable and personalised healthcare”. In his presentation, Mr. Gatzoulis emphasized important challenges of Personal Health System (PHS) such as demographic changes, increased prevalence of chronic diseases and citizens’ expectations/demands for high-quality care, inadequate safety standards and quality control, inefficiencies and staff shortages, reactive model of healthcare delivery, and rising healthcare costs. In order to address such challenges, the important question of “how to offer high-quality & affordable care” needs to be address first, where actions such as technology improvement, offer of personalized health care solution, action before symptoms appears, and industrial partnerships are important. Therefore, PHS, patient safety, and virtual physiological human were the three main directions proposed.

From the research center’s point of view, Mr. Ali discussed the evolution of PHSs with the presentation titled “Personal Health Systems: Minimal invasive PHS and ICT-inspired solutions for artificial organs and mental disorders – state of the art and future prospects”. During his presentation, Mr. Ali presented several examples of products (e.g., Vitaphone, STATPATCH, CoreBELT, eWatch, AMON Wrist Monitoring, American TeleCare, etc.) and projects (e.g. Project Motion Aware Clothing, FP5 project TOPCARE, FP5 project Amon, Viterion TeleHealthcare, Philips Patient Telemonitoring Set, Telcomed Multiparameter Monitoring System, etc. ) symbolizing the evolution of stationary and mobile telemonitoring solutions. Despite all the challenges of such technologies, Mr Ali emphasized the importance of considering user friendly, reliable energy saving and energy generation problems. Minimal Invasive Health Systems, such as “brain shunt” and “intraoral drug delivery micro system” were also described, emphasizing the need of no re-operations, close loop systems with sensor and actuators, more controllable devices, minimal human body rejection, and epileptic seizures prevention for new solutions. Application and evolution of artificial organs such as artificial heart and artificial liver were also described, where for example, artificial heart could be applied when total heart failure as a long term application in order to avoid keeping patient inside the hospital.

In his second presentation, Mr. Gatzoulis discussed the importance of connecting individuals with Health Information Networks, by enabling individuals to manage their own health. He stated that “persons should have the ability to wear portable devices, and respond to requests from doctors and systems, in a way where the patient is putted in the centre of the system”. Acquisition of information (e.g. physical activity and environment where person is located), data processing (e.g. portable and wearable device), and intelligent decision making (e.g. decision in local levels - wear device, or dedicated locations-special centres) were the three major components discussed. Therefore, minimally invasive systems, mental health and support actions on prevention of diseases and interoperability of PHS were the three target outcomes expected. According to Mr. Gatzoulis, wearable implanted devices should provide high data quality and accurate measurements while been remotely controlled. Multi-parametric monitoring should also help on the personalized context monitor of, for example, patient’s activity. For Mental Health target, he stressed the importance of focusing on persons suffering from stress, depression or bipolar disorders, as other mental disorders are not in scope of the call. At the end, budget figures were shown where expected impacts in reducing hospitalisations, economic benefits, industry support, and standard establishment were requested.

Mr. Johan Van Der Lei presented the talk entitled “The Challenge of Patient Safety: The potential of ICT-enabled research”. He addressed the importance of ICT as an enabler for patient safety, where four important attitudes towards actions are:

- Communication: by using electronics patient records and semantic interoperability, and making sure that what you try to describe is understood by others;
- Prepare and decide: by planning intervention, simulating response and following protocols;
- Monitor: by keeping track of adverse events, error rates, infections and complications;
- Learn: by understanding the importance of each lesson and prescription, and learning from own experience and mistakes.

Mr. Van Der Lei cited the ALERT project as an example of PHS project where federation of medical record databases, day-by-day care records, and side effect recognition over 30 millions Europeans is

present. However important challenges such as differences in coding, false positives, and methodological pitfalls are still open.

The last presentation was given by Ms. Flora Giorgio entitled “Challenge 5 - Strategic Objective: Patient Safety”. Ms. Flora GIORGIO concentrated her talk in four important points:

- ICT for safer surgery;
- ICT for integration of clinical research and clinical care;
- ICT-enabled early detection of public health events;
- Support Actions: State-of-the-art and research roadmaps;

She stated that “ICT can provide the most benefits in surgical intervention, and also help to prevent the outcome of such”. Through ICT, health care systems can be more personalized. The focus on modelling simulation and visualization (e.g. 3D models) should help to predict in real time the outcome of a surgery. Validation also should compose quantitative indicators to monitor their outcomes, particularly in the surgical intervention. The link of clinical care and clinical research, together with better and faster identification of patient, data protection and security, and focus on the definition and validation of core data set were also points cited inside in ICT for integration of clinical research and clinical care.

After the presentations questions were made by the audience. One of the first questions was related to what specifically the WP5.1 and WP5.2 calls were aiming to. The chairman addressed it by telling that STREP projects should be privileged regarding how proposal should demonstrate patient safety impact. In the other hand, the need of involving modelling and 3D simulation (e.g.: model of tissues and organs) were also reinforced. Later on, the definition of real time and “near” real time requirement was argued. To address this question, Ms. Giorgio emphasized the need of tools to simulate chirurgical interventions and the use of it in the planning and performance of a surgery operation as an important added-value.

Other sessions:

The plenary “Setting the ICT Agenda for the Next Decade” was chaired by Viviane Reding (European Commissioner for Information Society and Media) where speakers emphasized the importance of sharing and collaboration in a future true global collaboration world. In his talk, Mr. Esko Aho<sup>12</sup> discussed the importance of productivity, energy saving, and key differences between USA and Europe research strategies. Mr. Michel Cosnard<sup>13</sup> pointed out also the importance of “information and communication everywhere” in the context of Network of the Future. Mr. Ben Verwaayen<sup>14</sup> complemented it by explaining the necessity of trust and business models for the internet of the future. One of the main messages from this plenary were the importance of a collaborative world where trust, security and privacy are necessary, together with “smart” govern policies.

In the plenary “ICT Excellence Matters” several interesting challenges to ICT were discussed. The speakers<sup>15</sup> emphasized that Europe should be attractive to the researchers and innovative companies, and young talent researchers need to be valued. Web digital service and sustainability/Green ICT were also discussed together with the importance of ICT in Europe.

Inside the session Future Internet Experimental Facility and Experimentally-Driven Research, Mr. Christophe Diot from Thomson- Paris Research Lab emphasized that “the future of internet is the aggregation, however the challenges are many.” He also pointed out the importance of building large scale testbed infrastructure thorough GEANT. From his point of view, new projects should be encouraged to reuse current lab platforms, where the governments and large companies should provide expensive infrastructure (e.g. frequencies, 4G, etc.). At the end of his talk he commented the necessity to drive more experimentally research inside new communication services such as social, P2P, and

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<sup>12</sup> Executive Vice President of Nokia Corporation

<sup>13</sup> CEO and Chairman of INRIA

<sup>14</sup> CEO of Alcatel-Lucent

<sup>15</sup> Part 2: Panel Discussion, [http://ec.europa.eu/information\\_society/events/cf/item-display.cfm?id=774](http://ec.europa.eu/information_society/events/cf/item-display.cfm?id=774)

content networks. During the session, the speakers also described briefly the current testbeds OneLabs, PII, Vital++, WISEBED, and Frederica.

#### Networking session

The Networking Session 4 titled “Cognitive Reconfigurable Radio Systems and Networks” was chaired by Mr. Radoslaw Piesiewicz<sup>16</sup>, having Mr. Honggang Zhang<sup>17</sup>, Mr. Dominique Noguét<sup>18</sup>, Mr. Eduard Jorswieck<sup>19</sup>, and Mr. Jens Gebert<sup>20</sup> as participants. The main message of the chairman was “the ability of Cognitive Systems/Networks to ensure optimum coexistence and inter-networking between various radio and communication systems”. The chairman also described some supporting projects in Cognitive Systems/Networks such as IP E3, IP EUWB, and COST (coordinated by University of Rome, La Sapienza, to be submitted in January 2009) projects. Mr. Zhang emphasizes the necessity of break the cellular concept by instead applying grid and cloud concepts together with bio-inspired approaches (e.g. swam intelligence). Mr. Noguét talked briefly about the necessity of opportunistic systems which could exploit available opportunities such as unused channels and agile antennas. Mr. Jorswieck described some important interdisciplinary problems in Cognitive Systems/Networks such as business model, social, physiological and regulatory issues. Mr. Gebert described the scope of ETSI TC RRS (Reconfigurable Radio Systems) working group. He also described briefly the “Cognitive Pilot Channel” technique where nodes exchange information over a pre-defined channel for all technologies. After all presentations, questions were done by the audience. Important aspects such as which kind of application (e.g. QoS applications, data mitigation application, etc.) should be required in Cognitive Systems/Networks, the complexity and cost of Cognitive Systems/Networks, the spectrum availability, and the benefit/problem for the operators to change their business model were discussed.

#### Synthesis and overall impressions

ICT 2008 event presented Europe's priorities for ICT research, development and funding. Through the sessions, plenaries and discussions, it also presented ideas on how Europe can lead the ICT agenda for the next decade.

The three days conference was an important meeting on ICT research agenda, giving to the participants the opportunity to meet future collaborators. From my point of view, ICT 2008 was a very interesting conference which gave me the opportunity to strength the knowledge on my research area and also the possibility to know other interesting research areas inside ICT.

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<sup>16</sup> Create-Net, Italy

<sup>17</sup> Zhejiang University, China

<sup>18</sup> Cea-Leti, France

<sup>19</sup> TU Dresden, Germany

<sup>20</sup> Alcatel-Lucent, Germany