



**CAPSIL**

International Support of a Common Awareness and  
Knowledge Platform for Studying and  
Enabling Independent Living

## **PROJECT PERIODIC REPORT D1.1**

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**Project acronym:** CAPSIL

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**Periodic report:** 1<sup>st</sup> x

**Period covered:** from 7/4/2008 to 6/4/2009

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<sup>1</sup> Usually the contact person of the coordinator as specified in Art. 8.1. of the grant agreement

<sup>2</sup> The home page of the website should contain the generic European flag and the FP7 logo which are available in electronic format at the Europa website (logo of the European flag: [http://europa.eu/abc/symbols/emblem/index\\_en.htm](http://europa.eu/abc/symbols/emblem/index_en.htm) ; logo of the 7th FP: [http://ec.europa.eu/research/fp7/index\\_en.cfm?pg=logos](http://ec.europa.eu/research/fp7/index_en.cfm?pg=logos)). The area of activity of the project should also be mentioned.

## Declaration by the scientific representative of the project coordinator<sup>1</sup>

I, as scientific representative of the coordinator<sup>1</sup> of this project and in line with the obligations as stated in Article II.2.3 of the Grant Agreement declare that:

- The attached periodic report represents an accurate description of the work carried out in this project for this reporting period;
- The project (tick as appropriate):
  - has fully achieved its objectives and technical goals for the period;
  - has achieved most of its objectives and technical goals for the period with relatively minor deviations<sup>3</sup>;
  - has failed to achieve critical objectives and/or is not at all on schedule<sup>4</sup>.
- The public website is up to date, if applicable.
- To my best knowledge, the financial statements which are being submitted as part of this report are in line with the actual work carried out and are consistent with the report on the resources used for the project (section 3.6) and if applicable with the certificate on financial statement.
- All beneficiaries, in particular non-profit public bodies, secondary and higher education establishments, research organisations and SMEs, have declared to have verified their legal status. Any changes have been reported under section 5 (Project Management) in accordance with Article II.3.f of the Grant Agreement.

Name of scientific representative of the Coordinator<sup>1</sup>: Dr. Aaron Quigley

Date: 20 / June / 2009

Signature of scientific representative of the Coordinator<sup>1</sup>: (signed version submitted to commission)

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<sup>3</sup> If either of these boxes is ticked, the report should reflect these and any remedial actions taken.

<sup>4</sup> If either of these boxes is ticked, the report should reflect these and any remedial actions taken.

## 1. Publishable summary

<http://www.capsil.org>

CAPSIL is funded within the specific program "Cooperation" and the research theme "ICT" of the 7th European Framework Program. It is an International Support of a Common Awareness and Knowledge Platform for Studying and Enabling Independent Living. This report details the delivery on the CAPSIL project in year 1, namely from April 2008 until April 2009. The first 12 months of CAPSIL have marked a number of **notable milestones**. These include:

- five international workshops (London, Tokyo, Lyon, Vegas and Washington DC) for coordination and outreach to the broader EU, Japanese and US Independent Living research community. For example, our Washington DC CAPSIL event is shown in Figure 1.
- the development of our website and materials <http://www.capsil.org>
- the development of a core set of detailed CAPSILs of knowledge available from our Wiki <http://capsil.org/capsilwiki/>
- the development of a per work package draft roadmaps and hence our overall draft roadmap which has been presented to over 200 people from policy making organisations, funding agencies along with research groups in Vegas, Washington DC and Ireland.

It is important to note that our CAPSIL Wiki is a living and ever growing knowledge repository. For example, a single snap shot of the Wiki is currently 350 pages and can be downloaded from <http://capsil.org/content/downloads> as [Annex II](#) of this report. This snap shot document is only intended to show the breath of work in this first year of CAPSIL, it is the living Wiki itself (<http://capsil.org/capsilwiki/>), which is of use to the community. The second year of CAPSIL will see us further engage the EU and Japanese research and funding community with our roadmap along with refining the respective work package roadmaps and CAPSILs of knowledge.

As described in Annex I of the *CAPSIL grant agreement* this project has three core goals. Firstly, to develop a CAPSIL Roadmap, secondly to provide knowledge dissemination through the use of "CAPSILs" of knowledge and our website and thirdly to use these resources and the CAPSIL Roadmap to help policy makers in the EU, US and Japan coordinate research agendas and funding efforts. The CAPSIL team includes members from Spaulding Rehabilitation Hospital Corp. (Harvard Medical), USA, University of Genoa, Italy, Waseda University, Japan, The Queen's University of Belfast, UK, INTEL Performance Learning Solutions Ltd., Oregon Health and Science University USA, University College Dublin, Ireland, Imperial College Of Science, Technology and Medicine, London.



**Figure 1:** Washington DC CAPSIL event (Mar 19 – 20) with over 25 US based research and funding agencies including the NSF, NIH and CAST

During the first twelve months of the CAPSIL project we have held four consortium workshops with representatives of all eight partners present. These workshops were held in London in April

2008, in Tokyo in July 2008, in Lyon in October 2008 and in Washington DC in March 2009. These workshops are very important for a consortium such as this spread across 16 time zones. Bringing together our international group with different experiences of independent living research and development on a regular basis allows us to report and reflect on the development of the CAPSILs and the roadmap developments underway. These workshops are 1, 2 or 3 day events where the entire consortium develops and shares ideas on how to develop our CAPSILs of knowledge, how to develop a per work package roadmap and how to develop an overall roadmap based on motivating user stories.

Our consortium workshops also acted as a means for us to engage with external stakeholders in each region as shown in Figure 1. Tied to these consortium meetings we have had presentations from or given presentation to over 30 external stakeholder organisations in the EU, USA and Japan. These presentations have been our approach to aiding such organisations to coordinate their research agendas and funding efforts.



Figure 2: CAPSIL Logo and CAPSIL Slide Template

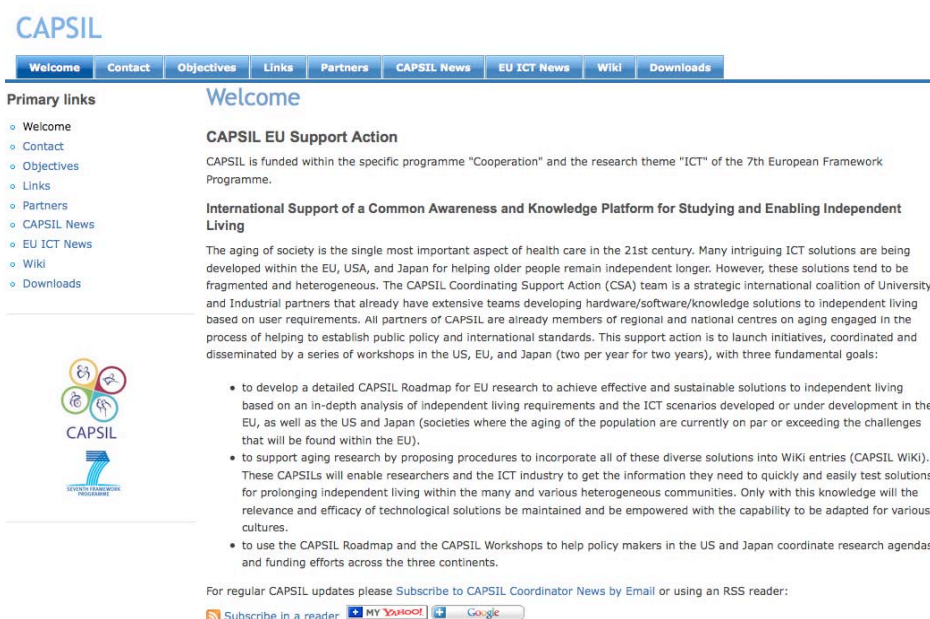


Figure 3: <http://www.capsil.org> - CAPSIL Website

In addition we have developed a strong public brand for CAPSIL including a CAPSIL logo, CAPSIL slide set as shown in Figure 2 and public website as shown in Figure 3 along with news feeds and have made contact with numerous projects in this space. In addition, we have supported a range of EU projects with presentations and participation in their events including, for example, a SENIOR workshop and at ICT Lyon meetings. We organized, hosted and presented EU, Japan and USA perspectives on independent living and our draft research roadmap at the Aging in America conference in Las Vegas in March of 2009 as shown in Figure 4. This session allowed us to present our CAPSIL perspective in terms of both of roadmap but also the international dimension of the problems and opportunities.



**Figure 4:** Aging in America event (Mar 17) – 4 CAPSIL partners from the EU, USA and Japan presented international perspectives and our draft roadmap

We have developed and delivered a four-phase roadmap development methodology for each WP. The methodology has been used by each work package and this is now in use to develop the consolidated initial draft integrated roadmap. A draft integrated roadmap slide set can be download as [Annex I of deliverable 7.11](#). Our roadmap methodology for the development of a per work-package roadmap includes these four steps:

1. **Baseline Analysis** (Where are we)  
This baseline analysis has been developed during our initial consortium meetings and through the population of our internal “Twiki”. Knowledge gathered in this process, along with an international perspective, has been transferred to our external facing Wiki or into specific CAPSILs of knowledge online.
2. **Visioning** (Where do we want to go)  
We have developed a number of stories for example "Tom's Story" to help us describe our expectations for life in 7, 15, 25 or 40 years time for an older person. These stories have been written to describe life across different countries and in different socio-economic circumstances. These stories help act as case studies in the subsequent gap analysis.
3. **Gap analysis** (What are we missing)  
What is the difference between 1 and 2 above and what type of research actions will help us move between the two?
4. **Implementation**  
Here we will document the suggested methods to realize such research actions.

Our CAPSIL Wiki as shown in Figure 5 represents a catalogue of solutions in the form of WiKi entries (CAPSILs) which describe interoperable ICT solutions to clinical requirements for Independent Living that can then be deployed throughout the EU, US, and Japan for verification of the systems and testing of clinical hypothesis of new and proposed research programs. Each CAPSIL can act as an instructive entry point for a range of interested parties in independent living research, development and deployment. These CAPSILs will enable clinicians and other care-givers to get the information they need quickly and easily test solutions for prolonging independent living within the many and various heterogeneous communities throughout the EU, the US, and Japan.

The CAPSIL pages will be moderated by an international collection of both ICT and clinical researchers initially composed of members of the CAPSIL team, but eventually expanding well beyond.

The first eight CAPSILs include: Falls Prevention, Stroke Rehab Management, Weight Management, Cognitive Training, Social Connectedness, Activity Monitoring, Driving Assistance and Robotics. Our second phase of CAPSIL under ongoing development include Sensors, User Centered Design for Independent Living, Algorithms, Business Models, Privacy & Security, Ethics, Government Policy, Standards, Digital Health Records, Connectivity, Workshops, Conferences and Portals, Initiatives and Funding. As we have noted, the Wiki is a living knowledge repository however a single snap shot of the Wiki (currently 350 pages) and can be downloaded from <http://capsil.org/content/downloads> and is referred to as [Annex II](#) of this report.

The screenshot shows a Wikipedia-style page for 'Social Connectedness' on the CAPSIL Wiki. The page layout includes a top navigation bar with 'page', 'discussion', 'view source', and 'history' tabs. The main content area features a title 'Social Connectedness', a paragraph defining the term, a sub-section 'Co-located Social Connectedness' with an image of an elderly couple, and another sub-section 'Distributed Social Connectedness' with an image of an elderly woman on a phone. A 'Contents' table of contents is visible at the bottom of the main content area.

**Social Connectedness**

Generally speaking one's **social circle**, or more specifically one's **social network**, includes ones friends, family, colleagues and acquaintances. Social connectedness is a psychological term which describes the duration, frequency, familiarity and reciprocal nature of the relationships people have with others in this circle or network.

Social Connectedness is widely delieved to play an important role in a person overall health and wellbeing. Many **Gerontology** studies have found that a strong Social Network (in terms of the strength of relationships an individual has with other individuals in his/her community) plays an important role in helping prevent and slow down the onset of cognitive and physical disorders associated with aging [4].

**Social Network Services** offer interactive web based environments for enabling people to connect and maintain social connectons, thus supporting the mirroring of real communities into virtual ones. Initially, online social networks were the playgrounds of young people, from early teens to mid-twenties but changed rapidly. With the ongoing niche stratification of the social network space there are many social network services targeting specific audiences, e.g. Eons for those aged 50+, LinkedIn for maintaining and creating professional ties. It is therefore possible to envision a spread of social network services targeted at ageing people, who are more likely to suffer from **emotional isolation**.

Social networks services is therefore a phenomena which is moving faster from its initial realtively small market segment to potentially involving users from the early education age until the rend of life.

In recent years social networks have exploded in popularity and diversity, with rough estimates indicating online social networks are a regular part of hundredths of millions of people's online lives.

**Contents** [hide]

- 1 Online Social Networks
- 2 Offline Social Networks
- 3 Online & Offline Social Network Fusion
- 4 Elder Social Networks
- 5 Staying Abreast Of SNS Research & Statistics

**Figure 5:** <http://www.capsil.org/capsilwiki/> - Example CAPSIL of knowledge from CAPSIL Wiki

Our aging of society is the single most important aspect of health care in the 21st century. Many intriguing ICT solutions are being developed within the EU, USA, and Japan for helping older people remain independent longer. However, these solutions tend to be fragmented and heterogeneous. Our goal in CAPSIL is to bring this knowledge together through our road mapping process and our CAPSILs of knowledge. The aim is to use both this living repository of knowledge and our CAPSIL roadmap to influence and help coordinate funding decisions across the EU, USA and Japan.

## 2. Project objectives for the period

### **OBJECTIVES:**

This support action is to instantiate a series of workshops, two per year for two years, with the two fundamental objectives of “a Roadmap and A Mechanism for Continual Sharing of Information”. Specific objectives include:

1. to develop an in-depth analysis of the ICT scenarios developed or under development in the US and Japan (societies where the aging of the population are currently on par or exceeding the challenges that will be found within the EU), in order to contribute to the definition of a detailed CAPSIL Roadmap for EU research to achieve effective and sustainable solutions to independent living based on clinical requirements. As part of this analysis, existing and proposed common standards of interoperability will be specifically outlined.
2. to use the CAPSIL roadmap to grow the international R&D cooperation started by CAPSIL including working with key policy makers to coordinate research strategy and funding efforts between the EU, US, and Japan. This will specifically address the objective of this call, to ensure global relevance and impact of European RTD and preparation of future research areas within ICT & ageing.
3. to strategize and propose procedures to incorporate all of these diverse solutions into WiKi entries (CAPSILs) which describe interoperable ICT solutions to clinical requirements for independent living that can then be deployed throughout the EU, US, and Japan for verification of the systems and testing of clinical hypothesis of new and proposed research programmes. This will insure that the global relevance of EU RTD on aging will be extended well beyond the end of this project. It will also begin to foster on-going collaboration between the clinical and ICT researchers of the EU.

Each CAPSIL meeting will have an increasingly expansive set of objectives in order to involve the entire independent living community from all three regions (US, Japan, and EU), in the process of developing this roadmap and instantiating CAPSILs. These meetings will be held in the EU, the US, and Japan. As outlined below, these workshops are all to be co-located with large conferences on aging. This will enable:

1. Information exchange from CAPSIL members to the Independent Living community and key policy makers
2. Information exchange from the Independent Living community and key policy makers to CAPSIL members
3. Direct discussions not only on R&D, but funding strategies amongst national agencies such as NIH, NIA, and NSF; state and provincial funding agencies such as Orcatech and the Gifu Prefectural Government.

These workshops will have the following agenda:

### **Workshop #1 (Internal CAPSIL Workshop)**

To be hosted by the TRIL Centre ([www.trilcentre.org](http://www.trilcentre.org)) in Dublin, Ireland

Objectives:

1. Presentation of international clinically-driven ICT solutions to aging – results from CAPSIL work package support work
2. Identification of international conferences to hold next three workshops

3. Establishment of research support roadmap and determination of policy stakeholders that will incorporate the roadmap into organizational policy.
4. Definitions and structure of CAPSIL modules including outcome of investigation of CAPSIL's as a social network platform such as EU-PRACTICE.eu.
5. Establishment of a CAPSIL business plan sustain the CAPSIL infrastructure beyond the end of the project.

### **Workshop #2 (CAPSIL Workshop and Open Presentations in Japan)**

To be held along side an international conference on aging in Japan such as the 7th World Congress on Physical Activity and Aging in Tsukuba in July 2008.

Objectives:

1. Presentations of Japanese aging and independent living research agenda by CAPSIL Japanese partner.
2. Presentations of EU research and policy on aging and independent living research agenda by CAPSIL EU partner.
3. Presentation and open discussion of research support roadmap
4. Presentation of international clinically-driven ICT solutions to aging – results from CAPSIL work packages
5. Internal Workshop on CAPSIL Roadmap
6. Open Workshop on CAPSIL Roadmap
7. Internal Workshop on CAPSIL modules
8. External Workshop on CAPSIL modules including discussions of contributors and moderators.

### **Workshop #3 (CAPSIL Workshop and Open Presentations in the US)**

To be held along side the 2009 Conference of the National Council on Aging (NCOA) and the American Society on Aging in Las Vegas, Nevada in the US in March 2009.

Objectives:

1. Presentations of US aging and independent living research agenda by US CAPSIL partners.
2. Presentations of EU research and policy on aging and independent living research agenda by CAPSIL EU partner.
3. Presentation and open discussion of research support roadmap
4. Presentation of international clinically-driven ICT solutions to aging – results from CAPSIL work packages
5. Internal Workshop on CAPSIL Roadmap
6. Open Workshop on CAPSIL Roadmap
7. Internal Workshop on CAPSIL modules
8. External Workshop on CAPSIL modules including discussions of contributors and moderators

### **Workshop #4 (CAPSIL Workshop and Open Presentations in the EU)**

To be held along side an international conference on aging in the EU.

Objectives:

1. Finalization of CAPSIL Roadmap
2. Presentation of CAPSIL Roadmap
3. Presentation of final CAPSIL structure and initial CAPSIL solutions.
4. Establishment of on-going CAPSIL Scientific and Moderating Group.

### 3. Work progress and achievements during the period

Work package number	2
Work package title	CAPSIL_BSN
Work package full name	Body Sensor Networks
Work package lead beneficiary	INTC

#### Summary of progress towards objectives and details for each task

The objective of this work package is to compile existing BSN by parameter category e.g. kinematic, physiological, ambient etc. To identify the key features required for embedded software development. To develop recommendations on appropriate data processing architectures and to understand how design can drive the acceptance of BSN and ensure the reliable performance. To date this work package has produced a detailed roadmap described in deliverable 2.11 and 2.12 along with many Wiki entries and supporting Wiki pages as described in deliverable 2.21 and 2.22. This work package identifies the four areas of Power and Computation, Interoperability and Standards, Usability, Practicality and Reliability and Clinical Benefits for their initial road mapping activities. They completed a literature review of the current state of the art in WBSN and identified the current gaps and trends to address these gaps. Due to copyright issues much of this baseline analysis was documented on a closed Twiki but subsequent efforts moved much of this material into the public domain on our public Wiki. CAPSIL members engaged in this work package have also made extensive use of the foreground knowledge developed in this work package in outreach and dissemination activities internationally. This is described further in deliverables 2.11 and 2.12.

#### Results

##### T2.1 Roadmap Report on Body Sensor Networks

The roadmap for work package 2 is underdeveloped and will be released as a complete deliverable as per D2.1: Body Sensor Network Roadmap (R, M21). Progress reports on the production of this deliverable have been produced in 2.11 and 2.12. These detail the work undertaken on this task in this work package.

##### T2.2 Solutions for CAPSIL Wiki Entries

This work package started by developing a Initial High Level Wiki Structure for the WBSN and a High Level Structure for WBSN Design Wiki Entries (detailed in 2.21). Using a 4-year historical timeframe a review of the literature was conducted examining both commercial and academic wireless sensor offerings. 9 relevant commercial offerings identified and reviewed. 15 academic sensors identified reviewed. From this numerous Wiki entries (<http://capsil.org/capsilwiki>) have been developed from this work package such as the 46 commercial and academic wireless sensors nodes identified in the Wiki. The Wiki page Sensors: <http://capsil.org/capsilwiki/index.php/Sensors> which many members of this work package are responsible for links to over 50 other wiki entries developed by members of CAPSIL. Further details of such are documented in deliverables 2.21 and 2.22 and Annex II of this report.

##### Significant results

CAPSILs creation contributions, Chronic Heart Failure, Falls Prevention and Gait Analysis, Privacy & Security, Digital Health Records, Standards, Connectivity. All CAPSILS posted to the CAPSIL Wiki for public access. Additional content added to the WBSN CAPSIL Wiki Entries

Work package number	3
Work package title	CAPSIL_HOME
Work package full name	Home and Mobile Monitoring Systems
Work package lead beneficiary	OHSU

## Summary of progress towards objectives and details for each task

The objective of this work package is to critically review existing technologies for home and mobile monitoring of the elders that have potential to facilitate independent living. Within this, we have identified the five areas of elder needs, sensing technologies, information relay, signal processing and adoption issues we see as key. We have performed a baseline analysis of the factors to be addressed in home and mobile monitoring systems. With a focus on the factors that provide an impediment to independent living. These factors include the measures needed in the diagnosis and care giving of specific conditions. We also use the Wiki to compile details of existing mobile and fixed sensor systems suitable for the collection of longitudinal physiological data. The collection of such sensor data is of limited use without suitable communication and aggregation infrastructures; as such these are also reviewed in our baseline analysis. Long-term monitoring infrastructures provide the opportunity for local, remote and aggregated analysis as such we review existing algorithms for processing of raw data and for detection and classification of the information derived from the sensor data. Further issues of concern in the baseline analysis in this work package include methods to monitor quality of data, social acceptability, privacy and security along with policies and reimbursement mechanisms to foster independent living in the elders.

## Results

### T3.1 Roadmap Report on Home and Mobile Systems

This work package has developed a literature review of the current state of the art in Home and Mobile Monitoring System and identification of the current gaps and trends to address these gaps. Following on from this the work package has developed an analytic framework to understand the components that influence the requirements and the design specifications of home monitoring systems. The framework has allowed the WP to provide a detailed baseline analysis as documented in deliverable 3.12. From this a number of key research challenges are outlined and draft details on future work and implementation is described.

### T3.2 Solutions for CAPSIL WiKi Entries

This work package has contributed and revised Wiki entries relating to the scope of this work. Details of such are documented in deliverables 3.21 and 3.22 and Annex II of this report.

Examples include:

[http://capsil.org/capsilwiki/index.php/Activity\\_Monitoring](http://capsil.org/capsilwiki/index.php/Activity_Monitoring)

[http://capsil.org/capsilwiki/index.php/Weight\\_Management](http://capsil.org/capsilwiki/index.php/Weight_Management)

## Significant results

Analytic framework for the study of this area and subsequent detailed baseline analysis

Draft roadmap based on the CAPSIL road mapping approach

The creation of CAPSILs within the WiKi specifically related to this work package

Work package number	4
Work package title	CAPSIL SOFTWARE
Work package full name	Software and Interfaces
Work package lead beneficiary	UGDIST

## Summary of progress towards objectives and details for each task

The objectives of this work package include the compilation and review existing software platforms that are used in the development of assisted living technology solution development along with the definition of the key interaction requirements for the various stakeholders in assisted living technology solutions. The definition of the common interface features for stakeholders. The definition of the feature set of an application developing environment and user interface development environment and the definition of the requirements and features of a data architecture and data management strategy. During the first 12 months of CAPSIL this work package has made considerable progress in the development of its draft roadmap following our established CAPSIL road mapping process. Deliverables 4.11 and 4.12 provide comprehensive details of the baseline analysis, visioning, gap analysis, and suggested implementation details on which current working roadmap is based. Detailed wiki outputs are described in 4.21 and 4.22.

## Results

### T4.1 Roadmap Report on Software and Interfaces

The preliminary roadmap development provides an overview on state of the art in the field of Ambient Assisted Living and Aging, both in the commercial and research context. State of the art activities are presented in three different subsections: acquisition, management (accessing and archiving huge amounts of data), and processing. Details of this initial work are described in deliverable 4.11 developed at month 3. By month 9 deliverable 4.12 provides a more comprehensive overview of the state-of-the-art in the field of Ambient Assisted Living and Aging. The major finding from this base line and analysis is the large gap between commercial solutions and research activities. The main reasons slowing down the reception of new technologies (research results) by the society can be traced in the following two main factors, namely the acceptability of technologies by the elderly and network availability. This work package has followed the CAPSIL road mapping process, detailed in 4.12, with initial gap analysis and implementation strategies detailed.

### T4.2 Solutions for CAPSIL WiKi Entries

The development of CAPSIL WiKi entries in this work package has been driven by a first state of the art analysis on the research activities related to Software and Interfaces developed for assisting elder or impaired people at home. As the aspects covered by this thematic are heterogeneous, this WP has defined a structure in which to organize the activities, focusing the attention on the software solutions and the management of the data. The identified categories include, Data acquisition, Data management, Data processing and, Data transfer. From this contributions to Wiki entries on Data Acquisition, Remote medical control and telemedicine, Smart house, data management, data processing, UCD for independent living, robots for the aged society. Details of such are documented in deliverables 4.21 and 4.22 and Annex II of this report.

### Significant results

Detailed draft roadmap based on the CAPSIL road mapping approach

The creation of CAPSILs within the WiKi specifically related to this work package

Work package number	5
Work package title	CAPSIL CLINICAL
Work package full name	Common Clinical Requirements
Work package lead beneficiary	HMS

## Summary of progress towards objectives and details for each task

This work package on Clinical and Ethnographic Requirements aims to develop taxonomy of clinical problems that mark the aging population in EU, US, and Japan. It also aims at defining the goals of technology-based interventions that should be put in place based on the identified needs of the elderly population. The plan to achieve the objectives of this work package is to define a roadmap of clinical requirements and by generating Wiki entries that capture multiple aspects of the problems associated with the aging population from a clinical standpoint in the perspective of facilitating healthy aging and independent living.

## Results

### T5.1 Roadmap Report on Clinical Requirements

The approach taken in this work package is to define a roadmap of clinical requirements and by generating Wiki entries that capture multiple aspects of the problems associated with the aging population from a clinical standpoint in the perspective of facilitating healthy aging and independent living. The process involved gathering preliminary information concerning the aging population in Europe, the United States, and Japan. Using this preliminary analysis of the needs of the aging population this work package defined a framework within which to further develop the roadmap during the next period of the project. The first draft of the roadmap consists material gathered and organized as a first summary of “the numbers” that mark the aging population in Europe, the United States, and Japan. In addition the first period involved gathering data concerning the diseases that affect the aging population mostly focusing in cardiovascular and neurological conditions.

## Deviations

### T5.2 Clinical Requirement Taxonomy and Data Sets for CAPSIL WiKi Entries

In the preliminary states of the project this work package identified stroke as one of the major conditions affecting the aging population and gathered data to develop a Wiki entry during the next period of the project. They used this case to develop a framework within which other entries will be developed. The first phase of the project also included the identification of major conditions that affect the aging population to be used as Wiki entries that exemplify how technology can be leveraged upon to promote healthy aging and independent living. The second phase of the project saw the development of Wiki entries related to stroke rehabilitation. Particular emphasis was placed on potential interventions that rely on technologies such as wearable systems and robotics to facilitate the achievement of functional improvements via therapeutic approaches that can be implemented in the home environment. Further Wiki material preparation on chronic obstructive pulmonary disease, congestive heart failure and Parkinson’s disease has been developed. Other Wiki on conditions that are often encountered in the aging population such as osteoarthritis, dementia, and depression were also identified. Details of such are documented in deliverables 5.21 and 5.22 and Annex II of this report.

## Significant results

The creation of CAPSILs within the WiKi specifically related to this work package

Work package number	6
Work package title	CAPSIL Intervention
Work package full name	Intervention System Requirements
Work package lead beneficiary	OHSU

## Summary of progress towards objectives and details for each task

The overall objective of this package is to identify a standard, minimum set of software tools that could be used to provide support for care of elders and help them maintain high quality of life by providing a physical and cognitive health coaching intervention, with communications system suggesting tailored interventions. Compilation and review of existing approaches to providing intervention based on data from unobtrusive monitoring in the home. Other tasks include, identify potential principles governing the interventions, identify health and lifestyle goals of a broad base of elders, develop definitions for requirements for systems to enhance communication for coaching and guidance in a wide range of areas including physical exercise, nutrition, sleep monitoring, medication management, stress management and socialization. This is a companion work package to the Software and Interface work package, which looks at the real-time analysis and interaction needs of ICT solutions.

## Results

### T6.1 Roadmap Report on Intervention Systems

There are many social, economic, and technological trends that are having a profound effect on the way medicine is practiced today. The combined deliverable reports of 6.11 and 6.12 document the detailed roadmap development ongoing within this work package. Worldwide, we see that the population is aging dramatically, and that most health care dollars are being spent on chronic disease and conditions associated with aging. People with chronic disease are now living longer and participating in their care to a much greater degree. The development and use of intervention systems that facilitate coordinated continuous care to the homes of older adults addresses both healthcare quality and cost issues. In this roadmap this work package reviews various types of intervention systems used for healthcare and the maintenance of independence for older adults. They also offer recommendations for further research and implementations. The development of this roadmap is based on an analytic framework for interpreting the influences of the characteristics of the various types of technology, the patient characteristics, and the environmental influences on elders' use of the information technology. This in turn affects intermediate outcomes, such as knowledge, self-efficacy, health behaviors, etc. which then predict health outcomes and cost. This work package has followed the CAPSIL road mapping process, detailed in 6.11/6.12, with initial gap analysis and implementation strategies detailed.

### T6.2 Intervention solutions for CAPSIL Wiki Entries

Initial Intervention Systems Public Wiki pages created and populated including Cognitive Training, Weight Management, Social Connectedness, Activity Monitoring and Smoking Cessation. Details of such are documented in deliverables 6.21 and 6.22 and Annex II of this report.

### Significant results

Detailed draft roadmap based on the CAPSIL road mapping approach

CAPSILs creation contributions. All CAPSILS posted to the CAPSIL Wiki for public access

Work package number	7
Work package title	CAPSIL STRATEGY
Work package full name	Strategy
Work package lead beneficiary	QUB

## Summary of progress towards objectives and details for each task

This work package is concerned with the development of the coordinated CAPSIL roadmap from the roadmaps and outputs developed in the other work packages. In addition this work package monitors CAPSIL Website and coordination along with plans for meetings with Policy Makers.

## Results

### T7.1 Integrated CAPSIL Roadmap

Each work package also created a first draft of a roadmap for their individual work package with baseline analysis, gap analysis and implementation recommendations. These draft roadmaps are currently under internal review by the other work package members. These will then be amalgamated into the overall CAPSIL roadmap. In order to get a better idea of what might be other 'gap' areas we created a visioning scenario of a day in the life of 'Tom', an older adult with various morbidities and needs in the year 2020. We were then able to compare this scenario with the current SOA and research directions and identify further areas of missing or limited knowledge. This visioning scenario was published on the CAPSIL Wiki with others to follow. A draft version of the CAPSIL roadmap, as a set of slides with base line, visioning, gap and suggestions is related to the details given in deliverable 7.11 and can be download from [ [Annex I](#) ].

### T7.2 CAPSIL Webpage and CAPSIL WiKi

The CAPSIL website is up and running with an overview of the project, links to the partners and public WiKi, news sections detailing information and events relevant to CAPSIL and ICT projects in the EU. Viewers can subscribe to the CAPSIL RSS feed, which will notify them of updates to the site, along with a rolling news feed of information of interest to those working in the field of gerontechnology and independent living. The initial months of the project were spent developing and agreeing on a format and structure for the CAPSIL Wiki and identifying topics for the initial 'CAPSILs'. A 'private' test Wiki (Twiki) was set up to pool the knowledge of the project partners, prototype CAPSILs and to help define the field. It was decided to use this private Wiki for the initial stages of the project in order to keep the public-facing Wiki as accurate, straightforward and consistent as possible. Details are documented in deliverable 7.21 and Annex II of this report.

### D7.3: Meeting with key policy makers in the EU, US, and Japan to achieve possible coordination of funding plans and research agenda.

As detailed in this report we have arranged extensive meeting with and between key policy and funding agencies in the EU, USA and Japan. We now have a good picture of the current research and funding landscapes, which has allowed us to identify key research areas and gaps in that research. We have also identified policy initiatives related to ageing in each jurisdiction and are concerned at the lack of coherent and concrete policies relating to independence and inclusion for older adults. Identifying the key policymakers and organizations in each jurisdiction is on going.

### Significant results

Establishment of CAPSIL website and coordination of large body of work into Wiki  
 Meetings with and between over 60 key funding, research and policy agencies in the EU, USA and Japan related to independent living.

## 4. Deliverables and milestones tables

### Deliverables (excluding the periodic and final reports)

Please note: There is a mismatch between (Table 1.3b: List of Deliverables) and the deliverables noted at the end of each work package. Take, for example, WP2. Table 1.3b indicates 8 deliverable (reports) are due by the end of year 1. Whereas the WP description on page 24 shows there are no deliverables due. Such inconsistencies within Annex 1 must be resolved for year 2 of the project.

Del. no.	Deliverable name	WP no.	Lead beneficiary	Nature	Dissemination level	Delivery date from Annex I (proj month)	Delivered Yes/No	Actual / Forecast delivery date	Comments
1.1	Year 1 Interim Project Report	1	UCD	R	PU	12	Yes	June 2009	
2.11	Body Sensor Network Roadmap	2	INTC	R	PU [ <a href="#">PDF</a> ]	3	Yes	March 2009	
2.12	Body Sensor Network Roadmap	2	INTC	R	PU [ <a href="#">PDF</a> ]	9	Yes	March 2009	
2.21	Body Sensor Network WiKi Entries	2	INTC	R	PU [ <a href="#">PDF</a> ]	3	Yes	March 2009	[ <a href="http://capsil.org/capsilwiki">http://capsil.org/capsilwiki</a> ] or [ <a href="#">Download 350 page version</a> ]
2.22	Body Sensor Network WiKi Entries	2	INTC	R	PU [ <a href="#">PDF</a> ]	9	Yes	March 2009	[ <a href="http://capsil.org/capsilwiki">http://capsil.org/capsilwiki</a> ] or [ <a href="#">Download 350 page version</a> ]
3.11	Home and Mobile System Roadmap	3	OHSU	R	PU [ <a href="#">PDF</a> ]	3	Yes	June 2009	
3.12	Home and Mobile System Roadmap	3	OHSU	R	PU [ <a href="#">PDF</a> ]	9	Yes	June 2009	
3.21	Home and Mobile	3	OHSU	R	PU [ <a href="#">PDF</a> ]	3	Yes	June 2009	[ <a href="http://capsil.org/capsilwiki">http://capsil.org/capsilwiki</a> ] or

<sup>5</sup> For Security Projects the template for the deliverables list in Annex A1 has to be used.

	System WiKi Entries								[ <a href="#">Download 350 page version</a> ]
3.22	Home and Mobile System WiKi Entries	3	OHSU	R	PU [ <a href="#">PDF</a> ]	9	Yes	June 2009	[ <a href="http://capsil.org/capsilwiki">http://capsil.org/capsilwiki</a> ] or [ <a href="#">Download 350 page version</a> ]
4.11	Software and Interaction Roadmap	4	UGDIST	R	PU [ <a href="#">PDF</a> ]	3	Yes	March 2009	
4.12	Software and Interaction Roadmap	4	UGDIST	R	PU [ <a href="#">PDF</a> ]	9	Yes	March 2009	
4.21	Software and Interaction WiKi Entries	4	UGDIST	R	PU [ <a href="#">PDF</a> ]	3	Yes	March 2009	[ <a href="http://capsil.org/capsilwiki">http://capsil.org/capsilwiki</a> ] or [ <a href="#">Download 350 page version</a> ]
4.22	Software and Interaction WiKi Entries	4	UGDIST	R	PU [ <a href="#">PDF</a> ]	9	Yes	March 2009	[ <a href="http://capsil.org/capsilwiki">http://capsil.org/capsilwiki</a> ] or [ <a href="#">Download 350 page version</a> ]
5.11	Clinical Requirements Roadmap	5	HMS	R	PU [ <a href="#">PDF</a> ]	3	Yes	June 2009	
5.12	Clinical Requirements Roadmap	5	HMS	R	PU [ <a href="#">PDF</a> ]	9	Yes	June 2009	
5.21	Clinical Requirements WiKi Entries	5	HMS	R	PU [ <a href="#">PDF</a> ]	3	Yes	June 2009	[ <a href="http://capsil.org/capsilwiki">http://capsil.org/capsilwiki</a> ] or [ <a href="#">Download 350 page version</a> ]
5.22	Clinical Requirements WiKi Entries	5	HMS	R	PU [ <a href="#">PDF</a> ]	9	Yes	June 2009	[ <a href="http://capsil.org/capsilwiki">http://capsil.org/capsilwiki</a> ] or [ <a href="#">Download 350 page version</a> ]
6.11	Intervention Systems Roadmap	6	OHSU	R	PU [ <a href="#">PDF</a> ]	3	Yes	June 2009	6.11 and 6.12 joint report
6.12	Intervention Systems Roadmap	6	OHSU	R	PU [ <a href="#">PDF</a> ]	9	Yes	June 2009	6.11 and 6.12 joint report
6.21	Intervention Systems WiKi Entries	6	OHSU	R	PU [ <a href="#">PDF</a> ]	3	Yes	June 2009	[ <a href="http://capsil.org/capsilwiki">http://capsil.org/capsilwiki</a> ] or [ <a href="#">Download 350 page version</a> ]
6.22	Intervention Systems WiKi Entries	6	OHSU	R	PU [ <a href="#">PDF</a> ]	9	Yes	June 2009	[ <a href="http://capsil.org/capsilwiki">http://capsil.org/capsilwiki</a> ] or [ <a href="#">Download 350 page version</a> ]
7.11	Coordinated CAPSIL Roadmap	7	QUB	R	PU [ <a href="#">PDF</a> ]	9	Yes	March 2009	
7.21	CAPSIL Website and Coordinated WiKi	7	QUB	R	PU [ <a href="#">PDF</a> ]	9	Yes	March 2009	[ <a href="http://capsil.org/capsilwiki">http://capsil.org/capsilwiki</a> ] or [ <a href="#">Download 350 page version</a> ]
7.31	Meetings with policy makers in EU, US, and Japan	7	QUB	R	PU [ <a href="#">PDF</a> ]	9	Yes	March 2009	

## Milestones

*Please complete this table if milestones are specified in Annex I of the Grant Agreement.  
Milestones will be assessed against the specific criteria and performance indicators as defined in Annex I.*

<b>TABLE 2. MILESTONES (PROJECT START DATE APRIL 7<sup>TH</sup> 2009)</b>							
<b>Milestone no.</b>	<b>Milestone name</b>	<b>Work package no</b>	<b>Lead beneficiary</b>	<b>Delivery date from Annex I</b>	<b>Achieved Yes/No</b>	<b>Actual achievement date</b>	<b>Comments</b>
M1.1	Workshop #1 (Internal)	1	UCD	Month 3	Yes	April 10 <sup>th</sup> 2008	Workshop – London
M1.2	Workshop #2 (Japan)	1	UCD	Month 9	Yes	July 30 <sup>th</sup> – 31 <sup>st</sup> 2008	Workshop – Tokyo
M1.3	Workshop #2 (US)	1	UCD	Month 15	Yes	March 18 <sup>th</sup> 2009	Workshop – Washington DC
M2.1	Outline of Roadmap and structure of Wiki entries BSN	2	INTC	Month 3	Yes	April 10 <sup>th</sup> 2008	Workshop – London
M2.2	Initial BSN Roadmap document presented and prototype BSN WiKi entries	2	INTC	Month 9	Yes	July 30 <sup>th</sup> – 31 <sup>st</sup> 2008	Workshop – Lyon
M2.3	First draft of BSN roadmap document and initial BSN WiKi entries	2	INTC	Month 15	Yes	March 18 <sup>th</sup> 2009	Workshop – Washington DC
M3.1	Outline of Roadmap and structure of Wiki entries	3	OHSU	Month 3	Yes	April 10 <sup>th</sup> 2008	Workshop – London
M3.2	Initial Home and Mobile System Roadmap document presented and prototype WiKi entries	3	OHSU	Month 9	Yes	July 30 <sup>th</sup> – 31 <sup>st</sup> 2008	Workshop – Lyon
M3.3	First draft of Home and Mobile System roadmap document and initial WiKi entries	3	OHSU	Month 15	Yes	March 18 <sup>th</sup> 2009	Workshop – Washington DC
M4.1	Outline of Roadmap and structure of Wiki entries	4	UGDIST	Month 3	Yes	April 10 <sup>th</sup> 2008	Workshop – London
M4.2	Initial Software and Interfaces Roadmap document presented and prototype S&I WiKi entries	4	UGDIST	Month 9	Yes	July 30 <sup>th</sup> – 31 <sup>st</sup> 2008	Workshop – Lyon

M4.3	First draft of Software and Interfaces roadmap document and initial Software and Interfaces Wiki entries	4	UGDIST	Month 15	Yes	March 18 <sup>th</sup> 2009	Workshop – Washington DC
M5.1	Outline of Roadmap and structure of Wiki entries	5	HMS	Month 3	Yes	April 10 <sup>th</sup> 2008	Workshop – London
M5.2	Initial clinical requirements document presented and prototype clinical requirements Wiki entries	5	HMS	Month 9	Yes	July 30 <sup>th</sup> – 31 <sup>st</sup> 2008	Workshop – Lyon
M5.3	First draft of clinical requirements roadmap document and clinical requirements Wiki entries	5	HMS	Month 15	Yes	March 18 <sup>th</sup> 2009	Workshop – Washington DC
M6.1	Outline of Roadmap and structure of Wiki entries	6	OHSU	Month 3	Yes	April 10 <sup>th</sup> 2008	Workshop – London
M6.2	Initial intervention system Roadmap document presented and prototype intervention system Wiki entries	6	OHSU	Month 9	Yes	July 30 <sup>th</sup> – 31 <sup>st</sup> 2008	Workshop – Lyon
M6.3	First draft of intervention system roadmap document and intervention system Wiki entries	6	OHSU	Month 15	Yes	March 18 <sup>th</sup> 2009	Workshop – Washington DC
M7.1	Outline of Roadmap, creation of webpage, and structure of Wiki entries	7	QUB	Month 3	Yes	April 10 <sup>th</sup> 2008	Workshop – London
M7.2	Initial integrated Roadmap document presented and prototype Wiki entries	7	QUB	Month 9	Yes	July 30 <sup>th</sup> – 31 <sup>st</sup> 2008	Workshop – Lyon
M7.3	First draft of CAPSIL integrated roadmap document and integrated Wiki entries	7	QUB	Month 15	Yes	March 18 <sup>th</sup> 2009	Workshop – Washington DC

## 5. Project management

Project management refers to the overall management of the CAPSIL consortium and in particular to the activities and tasks outlined in WP 1 “Management and Conference Coordination”.

### 5.1 Preliminaries

*FP7 Grant Agreement - Annex II - Articles II.2.3*

The *coordinator* shall:

- a) administer the *Community financial contribution* regarding its allocation between *beneficiaries* and activities, in accordance with this *grant agreement* and the decisions taken by the *consortium*. The *coordinator* shall ensure that all the appropriate payments are made to the other *beneficiaries* without unjustified delay;
- b) keep the records and financial accounts making it possible to determine at any time what portion of the *Community financial contribution* has been paid to each *beneficiary* for the purposes of the *project*;
- c) inform the *Commission* of the distribution of the *Community financial contribution* and the date of transfers to the *beneficiaries*, when required by this *grant agreement* or by the *Commission*;
- d) review the reports to verify consistency with the *project* tasks before transmitting them to the *Commission*;
- e) monitor the compliance by *beneficiaries* with their obligations under this *grant agreement*.

**UCD as coordinator for the CAPSIL grant has completed all the actions outlined in Articles II.2.3 of FP7 Grant Agreement - Annex II.**

*FP7 Grant Agreement - Annex II - Article II.16.5*

**Management** of the *consortium* activities includes:

- maintenance of the *consortium agreement*, if it is obligatory,
- the overall legal, ethical, financial and administrative management including, for each of the *beneficiaries*, the obtaining of the certificates on the financial statements and on the methodology and costs relating to financial audits and technical reviews,
- implementation of competitive calls by the *consortium* for the participation of new *beneficiaries*, where required by Annex I of this *grant agreement*,
- any other management activities foreseen by the annexes, except coordination of research and technological development activities.

**UCD as coordinator for the CAPSIL grant has completed all the actions outlined in Article II.16.5 of FP7 Grant Agreement - Annex II.**

## **5.2 Consortium management tasks and achievements;**

The consortium management and in particular WP 1 ensures the administrative management of CAPSIL. At the outset of project this involved significant contractual, legal and partnership management activities. The CAPSIL coordinator maintains a close working relationship with the Commission on ongoing work in CAPSIL. The CAPSIL coordinator has engaged a Programme Manager (Mr. Dan Hartnett) to manage the project's day-to-day management. The coordinator with support from the CAPSIL executive undertakes regular risk assessment and management. The consortium coordinator has ensured the coordination of the four CAPSIL workshops held to date. Finally, the coordinator has led the project review preparation and organization.

### **T1.1: Committee Organization**

At the outset of the project the coordinator established an Executive Committee that operates as per the agreement in the consortium agreement. Each workshop has also had time for a general assembly meeting where matters, which require the entire consortium to vote on, are decided. Where decisions are required between face-to-face consortium meetings then virtual roundtable meetings and votes are held. Ben Knapp chairs the Executive Committee, which is scheduled to meet monthly in a virtual roundtable meeting. With four face-to-face workshops held during the first 12 months of this project the committee has met a further four times. The Executive is responsible for priority setting and ensuring that all CAPSIL goals are being met.

#### **Achievements:**

Establishment of the CAPSIL Executive Committee

Administrative support of the CAPSIL Executive Committee

Establishment of four general assembly agendas

Completion and minuting of four general assemblies in London, Tokyo, Japan and Washington

### **T1.2: Program Management**

The Programme Manager Mr. Dan Hartnett based in UCD who is funded from the Management work package manages the day-to-day operations and overall programme of development. The programme manager reports to the reports to the coordinator Dr. Aaron Quigley and to Dr. Ben Knapp the chairperson of the Executive Committee. Mr. Hartnett is degree-qualified administrator and provides professional programme management support in order to minimize the risk of incomplete delivery of the project goals and objectives. Mr. Hartnett's primary tasks include coordination of the project website/wiki with website development support in UCD, co-ordination of workshops, coordination of agendas, deliverable reports, monitoring the financial overview of the project and management of the project administration.

#### **Achievements:**

Appointment of a program manager to the CAPSIL project

Coordination of general assembly and workshop programmes inc. local and international logistics

### **T1.3: Workshop Coordination**

The coordination of four workshops located in London, Tokyo, Lyon and Washington DC is large administration and management task. **Annex I provides a detailed report on each workshop.** For brevity, the high level achievements from each workshop are detailed here.

#### **Workshop #1 (Internal CAPSIL Workshop)**

##### **Achievements:**

1. General assembly convened and voting complete

2. Executive Committee formed
3. Detailed decisions on areas to focus the baseline analysis for each work package on.  
Subsequently this baseline analysis has been developed during in population of internal Twiki.

### **Workshop #2 (Japan CAPSIL Workshop)**

#### **Achievements:**

1. Usage Model Definition
2. General assembly convened and voting complete
3. Decision on follow up workshop plans
4. Presentation of work package baseline analysis from our internal “Twiki”
5. Development of motivating scenarios and “use cases”

### **Workshop #3 (Lyon CAPSIL Workshop)**

#### **Achievements:**

1. Specification of user story for gap analysis
2. Specification of public CAPSIL Wiki format <http://www.csi.ucd.ie/capsilwiki>
3. Delivery of 8 detailed usage models
4. Specification of conversion plans from ad-hoc internal usage models in structure CAPSILs of knowledge on Wiki

### **Workshop #4 (USA CAPSIL Workshop)**

#### **Achievements:**

5. Presentation of roadmap draft to over 100 people across 3 days in Vegas and DC
6. Engagement with 60 individuals among program officers of US and EU agencies and researchers from the US, EU, and Japan to discuss potential synergisms among EU and US federal agencies and other US Institutions with focus on research on aging and independent living
7. Specification and development of 4 geographical constrained persona's illustrating future assisted living technology impacts on health and quality of life (new life stories)
8. Presentation and development of per work package gap analysis
9. Refinement of consolidated roadmap draft

## **5.1 *Problems which have occurred and how they were solved or envisaged solutions;***

- The initial starting date for the project overlapped with many administrative tasks, such as completing the consortium agreement and a change of coordinator within UCD. The consortium requested a change of project start date to the 7<sup>th</sup> of April 2008 to reflect these facts. This change of start date was accepted by the European Commission and is reflected in all the reports and timelines presented here and in other CAPSIL deliverables.
- The CAPSIL consortium consists of members spread across 16 time zones around the world. This makes the organisation of conference calls with all members very challenging. One major solution to this has been the consortium meeting 4 times face to face in the first year, rather than twice as proposed in the original grant.

## **5.2 *Changes in the consortium, if any;***

- There have been no changes in the consortium membership
- During the first CAPSIL workshop lead partner responsibility for WP 3 and 6 was swapped between HMS and OHSU. This change is reflected in the deliverables and this report.

### **5.3 List of project meetings, dates and venues;**

#### **Project Meeting #1**

Title: “Workshop 1 (Internal CAPSIL Workshop)”

Date: 10<sup>th</sup> April 2008

Location: Imperial College Of Science, Technology and Medicine, London, UK

Purpose: First working group meeting  
First general assembly

Objectives: Presentation of international clinically-driven ICT solutions to aging  
Identification of international conferences to hold next three workshops  
Establishment of research support roadmap and determination of policy stakeholders that will incorporate the roadmap into organizational policy  
Definitions and structure of CAPSIL modules  
Establishment of a CAPSIL business plan sustains the CAPSIL infrastructure beyond the end of the project.

#### **Project Meeting #2**

Title: “Workshop 2 (CAPSIL Workshop and Open Presentations in Japan)”

Date: 30<sup>th</sup> – 31<sup>st</sup> July 2008

Location: Department of Applied Physics, School of Science and Engineering,  
Waseda University, Tokyo, Japan

Purpose: Second working group meeting  
Second general assembly  
Presentations of Japanese aging and independent living research agendas.

Objectives: Reports on baseline assessments from each work package  
Presentations from Japanese stakeholders in government and industry  
Development of detailed usage model template for further baseline assessment and analysis

#### **Project Meeting #3**

Title: “Extra Consortium Meeting Scheduled around ICT 2008 Lyon”

Date: 28<sup>th</sup> – 29<sup>th</sup> November 2008

Location: 1. ICT 2008 Lyon  
2. INSA Lyon  
3. Holiday Inn Lyon, France

Purpose: Third working group meeting  
Third general assembly  
Presentations of European aging and independent living research agendas.

Objectives: definition of success factors for CAPSIL as a co-ordination and support action  
determination on CAPSIL progress and request for extension of start date  
decision on final structure for external wiki  
decision on structure for the roadmap on a WP and CAPSIL basis  
development of ongoing roadmap development methodology

#### **Project Meeting #4**

Title: “CAPSIL Workshop and Open Presentations in the US”

Date: 17<sup>th</sup> – 20<sup>th</sup> March 2009

- Location: 1. Las Vegas at the Aging in America conference, the 2009 Annual Conference of the American Society on Aging and the National Council on Aging  
2. Washington DC NIH  
3. Washington DC European Commission Offices
- Purpose: Fourth working group meeting  
Fourth general assembly  
Meetings with key policy makers and funding agencies in the US attempt to coordinate research agendas.
- Objectives: Presentations of US aging and independent living research agenda by US CAPSIL partners.  
Presentations of EU research and policy on aging and independent living research agenda by CAPSIL EU partner.  
Presentation and open discussion of research support roadmap  
Presentation of international clinically-driven ICT solutions to aging – results from CAPSIL work packages  
Internal Workshop on CAPSIL Roadmap  
Open Workshop on CAPSIL Roadmap  
Internal Workshop on CAPSIL modules  
External Workshop on CAPSIL modules including discussions of contributors and moderators

#### **5.4 Project planning and status;**

- Due to the change of project start date and the need for the project to line up with scheduled events in Japan (Aging Conference) and the USA (Aging Conference) and the EU (ICT 2008) four workshops have occurred in year 1 instead of the planned 2. This has been very beneficial for the project development due to the noted time zone spread of the consortium partners.
- The consortium plans three further workshops. Two in Sept/Oct of 2009 (one for the EU based partners and one for the US/Japan based partners). Followed by a final workshop in Ireland during month 20 (November) of the project. This structure of workshops should allow all partners to attend (within their travel budget limits).
- A subset of the consortium partners are organising an event in Tokyo Japan for meetings with key policy makers and funding agencies there in an attempt to coordinate research agendas. This meeting follows on from the workshop held in the Japan in Jul 2008 with a few funding agencies and independent living research groups. This meeting will be structured along the lines of the CAPSIL Washington DC meeting in March 2009.
- Members of the consortium have been called upon to undertake a number of activities to support ongoing and local projects across the EU. Examples include, panel membership at ICT Lyon 2008 events, Senior workshop meetings, attending the European Connected Health Leadership Summit, aging research Netwell Centre, meeting to coordinate the four coordinating actions in FP7 on aging.

#### **5.5 Impact of possible deviations from the planned milestones and deliverables, if any;**

- As noted. The deliverables list in Table 1.3b is not consistent with the smaller more focussed set of deliverables as described at the end of each work package. The Wiki

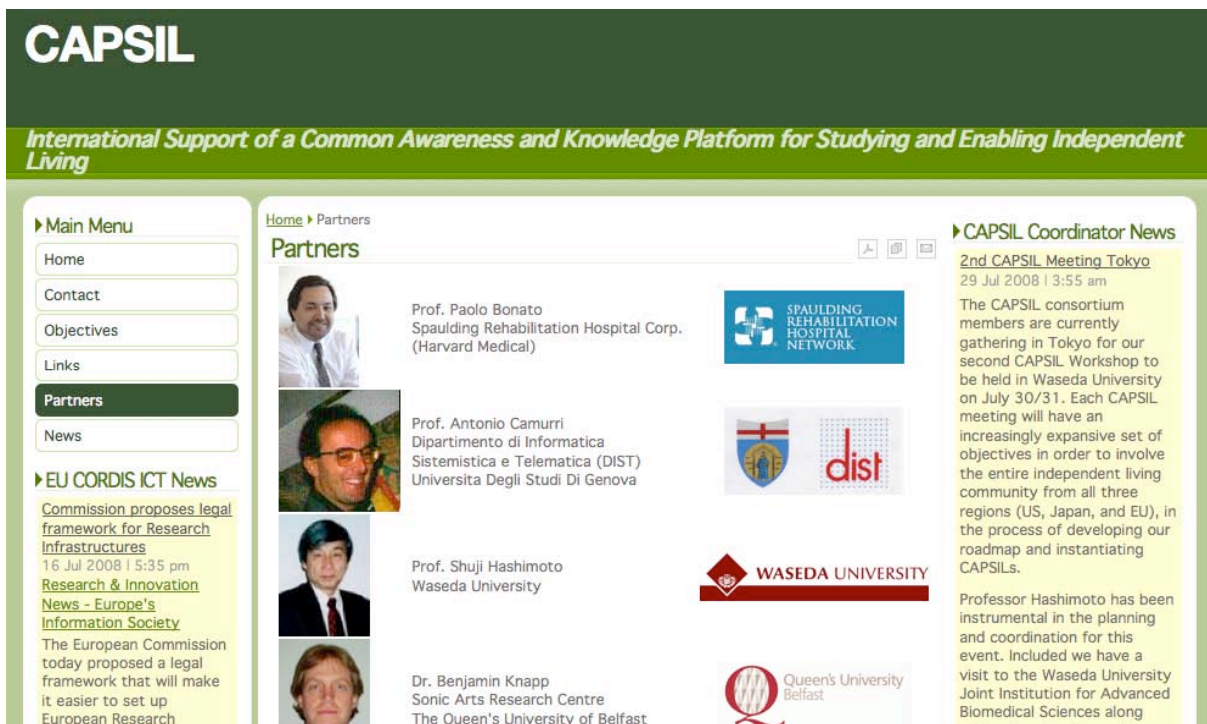
development, for example, is an ongoing work in progress and no “reporting” deliverables were envisaged in the work packages. Instead the Wiki itself was considered to be the deliverable.

**5.6 Any changes to the legal status of any of the beneficiaries, in particular non-profit public bodies, secondary and higher education establishments, research organisations and SMEs;**

- None

**5.7 Development of the Project website, if applicable;**

- Structure of CAPSIL project agreed and voted upon during first CAPSIL general assembly in London during workshop 1.
- First version of CAPSIL project website was presented at workshop 2 in Tokyo, see Figure 4.



**Figure 4:** CAPSIL website (<http://www.capsil.org>) as of July 2008 (month 4 of project)

- The second version of the CAPSIL project website was presented at workshop 3 in Lyon, see Figure 4. The final version of the CAPSIL website was presented at workshop 4 in Washington DC after it had been moved to a more suitable content management system.



Figure 5: CAPSIL website (<http://www.capsil.org>) as of October 2008 (month 7 of project)

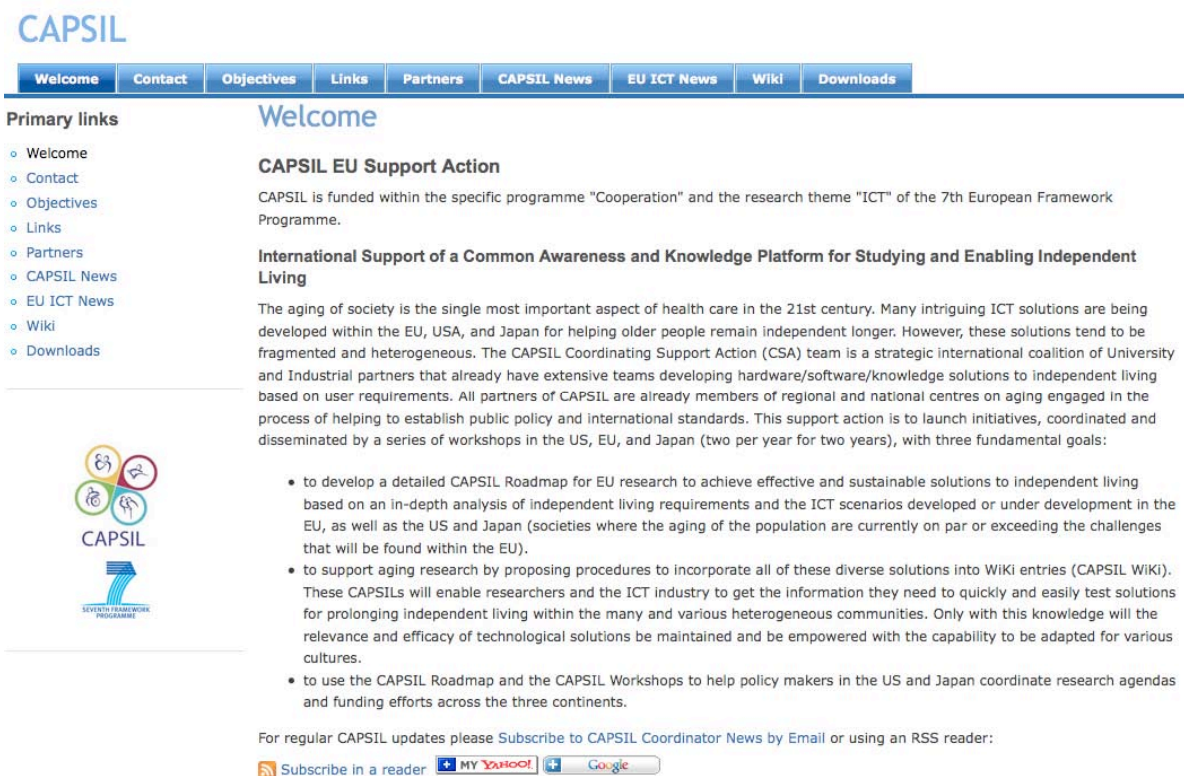


Figure 6: CAPSIL website (<http://www.capsil.org>) as of Mar 2009 (month 11 of project)

## **5.8 Use of foreground and dissemination activities during this period (if applicable).**

- CAPSIL consortium member Niall Coghlan (QUB) attended British Medical Institute (Northern Ireland) stakeholder consultation meeting on future directions for care of elderly and contributed to policy paper 'Improving the care of older people in Northern Ireland' (published 02/10/08), <http://www.bma.org.uk/ap.nsf/Content/careolderpeople>. CAPSIL listed in the Annex of contributors.
- CAPSIL consortium members Niall Coghlan (QUB) and Dan Hartnett (UCD) attended an EU FP7 consultation workshop on ICT for Inclusion in Brussels (WP2009/10 Workshop). Topics included: Virtual user concepts, BNCI / Augmented Human and Service robotics for Ageing Well. Information on CAPSIL was disseminated at this time.
- CAPSIL consortium members Dan Hartnett (UCD), Ben Knapp (QUB) and Paolo Bonato (HMS) attended the 7th World Congress on Aging and Physical Activity(7th WCAPA), Tsukuba, Japan <http://www.isapa2008.org/outline.html>
- CAPSIL consortium members Aaron Quigley (UCD) and Mick McGrath (Intel) showcased and demonstrated the BioMOBIUS™ research platform internationally at research workshop event at Amberglen Oregon, USA. This event allowed those who attended to learn how to use BioMOBIUS™ for biomedical research.
- CAPSIL consortium members Aaron Quigley (UCD), Mick McGrath (Intel) and Terry Dishongh (EMBC) presented an EMBC workshop in Vancouver, BC Canada. The event titled "Platform Oriented Approaches to Biomedical Application Development for In-lab and In-home Deployments" at the [30th Annual International Conference of the IEEE Engineering in Medicine and Biology Society](#).
- CAPSIL consortium member Guang-Zhong Yang (Imperial) can an invited talk on pervasive sensing for elderly care at the ICE 14th International Conference on concurrent enterprising, Lisboa, Portugal
- Members of the CAPSIL consortium for the development of a Common Awareness and Knowledge Platform for Studying and Enabling Independent Living attended the [ICT 2008 in Lyon](#) from the 25-27th of November. In addition to many support meetings our team are participating in a number of networking sessions as speakers and participants
- CAPSIL consortium members attended SPARC meeting Dublin, Agenda: <http://www.sparc.ac.uk/workshops/2008-12-04-interdependence/programme.asp>, This is similar to a ICT08 which was held in Lyon.
- CAPSIL hosts panel on Technologies for Successful Aging. This panel is part of the Aging in America conference, the 2009 Annual Conference of the American Society on Aging and the National Council on Aging in Las Vegas USA. This panel included an overview of CAPSIL, State of the Art of Technology in Aging in the EU, US and Asia along with our Roadmap – Recommendations for the Future.

## 6. Explanation of the use of the resources

<b>TABLE 3.1 PERSONNEL, SUBCONTRACTING AND OTHER MAJOR DIRECT COST ITEMS FOR BENEFICIARY 1 (UCD) FOR THE PERIOD</b>			
Work Package	Item description	Amount	Explanations
1,2,4,5,6,7	Personnel costs	50,321	<i>One project manager (Dan Hartnett), one postgraduate researcher.</i>
	Subcontracting	0	<i>n/a</i>
	Major cost item 'X'	0	<i>n/a</i>
	Major cost item 'Y'	0	<i>n/a</i>
	.....		
1,2,4,5,6,7	Remaining direct costs	15,897	<i>Travel to four consortium meetings</i>
	<b>TOTAL DIRECT COSTS</b>	<b>66,218</b>	

<b>TABLE 3.2 PERSONNEL, SUBCONTRACTING AND OTHER MAJOR DIRECT COST ITEMS FOR BENEFICIARY 2 (INTC) FOR THE PERIOD</b>			
Work Package	Item description	Amount	Explanations
1,2,3,4,7	Personnel costs	21,420	<i>Four part time researchers.</i>
	Subcontracting	0	<i>n/a</i>
	Major cost item 'X'	0	<i>n/a</i>
	Major cost item 'Y'	0	<i>n/a</i>
	.....		
1,2,3,4,	Remaining direct costs	3209	<i>Travel to three consortium meetings</i>
	<b>TOTAL DIRECT COSTS</b>	<b>24,629</b>	

<b>TABLE 3.4 PERSONNEL, SUBCONTRACTING AND OTHER MAJOR DIRECT COST ITEMS FOR BENEFICIARY 3 (QUB) FOR THE PERIOD</b>			
Work Package	Item description	Amount	Explanations
1,2,6,7,	Personnel costs	19,525	<i>One senior lecturer (15% time), one postgraduate researcher (50% time).</i>
	Subcontracting	0	<i>n/a</i>
	Major cost item 'X'	0	<i>n/a</i>
	Major cost item 'Y'	0	<i>n/a</i>
	.....		
1,2,6,7,	Remaining direct costs	10,105	<i>Travel to four consortium meetings</i>
	<b>TOTAL DIRECT COSTS</b>	<b>29,630</b>	

<b>TABLE 3.5 PERSONNEL, SUBCONTRACTING AND OTHER MAJOR DIRECT COST ITEMS FOR BENEFICIARY 4 (UGDIST) FOR THE PERIOD</b>			
Work Package	Item description	Amount	Explanations
4,6,7	Personnel costs	38,279	<i>Staffing costs</i>
	Subcontracting	0	<i>n/a</i>
	Major cost item 'X'	0	<i>n/a</i>
	Major cost item 'Y'	0	<i>n/a</i>
	.....		
4,6,7	Remaining direct costs	12,156	<i>Travel</i>
TOTAL DIRECT COSTS		50,435	

<b>TABLE 3.6 PERSONNEL, SUBCONTRACTING AND OTHER MAJOR DIRECT COST ITEMS FOR BENEFICIARY 5 (OHSU) FOR THE PERIOD</b>			
Work Package	Item description	Amount	Explanations
2,3,5,6,7	Personnel costs	20,654	<i>Staffing costs</i>
	Subcontracting	0	<i>n/a</i>
	Major cost item 'X'	0	<i>n/a</i>
	Major cost item 'Y'	0	<i>n/a</i>
	.....		
2,3,5,6,7	Remaining direct costs	4909	<i>Travel</i>
TOTAL DIRECT COSTS		25,563	

<b>TABLE 3.6 PERSONNEL, SUBCONTRACTING AND OTHER MAJOR DIRECT COST ITEMS FOR BENEFICIARY 6 (WUT) FOR THE PERIOD</b>			
Work Package	Item description	Amount	Explanations
2,3,4,5,6,7	Personnel costs	7462	<i>Two doctoral students and one lab secretariat</i>
	Subcontracting	0	<i>n/a</i>
	Major cost item 'X'	0	<i>n/a</i>
	Major cost item 'Y'	0	<i>n/a</i>
	.....		
2,3,4,5,6,7	Remaining direct costs	13,146	<i>Research materials (books), fees associated with hosting the second capsil consortium meeting., travel to two consortium meetings.</i>
TOTAL DIRECT COSTS		20,608	

<b>TABLE 3.7 PERSONNEL, SUBCONTRACTING AND OTHER MAJOR DIRECT COST ITEMS FOR BENEFICIARY 7 (ICL) FOR THE PERIOD</b>			
Work Package	Item description	Amount	Explanations
2,7	Personnel costs	7,490	Staffing costs
	Subcontracting	0	n/a
	Major cost item 'X'	0	n/a
	Major cost item 'Y' .....	0	n/a
2,7	Remaining direct costs	1484	Travel
<b>TOTAL DIRECT COSTS</b>		<b>8974</b>	

<b>TABLE 3.8 PERSONNEL, SUBCONTRACTING AND OTHER MAJOR DIRECT COST ITEMS FOR BENEFICIARY 8 (HMS) FOR THE PERIOD</b>			
Work Package	Item description	Amount	Explanations
2,3,5,7	Personnel costs	50,614	Staffing costs
	Subcontracting	0	n/a
	Major cost item 'X'	0	n/a
	Major cost item 'Y' .....	0	n/a
2,3,5,7	Remaining direct costs	5743	Travel
<b>TOTAL DIRECT COSTS</b>		<b>51,188</b>	

## 7. Financial statements – Form C and Summary financial report

All Form C's have been submitted online.

## 8. Certificates

List of Certificates which are due for this period, in accordance with Article II.4.4 of the Grant Agreement.

<b>Beneficiary</b>	<b>Organisation short name</b>	<b>Certificate on the financial statements provided? yes / no</b>	<b>Any useful comment, in particular if a certificate is not provided</b>
1	UCD	Not due	
2	INTC	Not due	
3	QUB	Not due	
4	UGDIST	Not due	
5	OHSU	Not due	
6	WUT	Not due	
7	ICL	Not due	
8	HMS	Not due	

## **9. Annex I: Detailed report on four consortium workshops**

### **Workshop #1 (Internal CAPSIL Workshop)**

Scheduled to be hosted by the TRIL Centre in Dublin, Ireland, instead hosted in London for logistical reasons.

Our first General Assembly Meeting followed by working sessions was held on Thursday, 10th April 2008 in the Institute of Biomedical of Engineering, Imperial College. The following people attended, Dr. Aaron Quigley, University College Dublin, Michael Fogarty, University College Dublin, Brian O'Mullane, University College Dublin, Magdalena Klocek, University College Dublin, Dr. Mick McGrath, Intel, Dr. Terry Dishongh, Intel, Dr. Ben Knapp, Queen's University Belfast, Niall Coghlan, Queen's University Belfast, Dr. Misha Pavel, Oregon Health and Science University, Prof. Shuji Hasimoto, Waseda University, Prof. Guang-Zhong Yang, Imperial College London, Dr. Benny Lo, Imperial College London, Dr. Paolo Bonato, Spaulding Rehabilitation Hospital.

During this meeting it was decided the Executive Committee members would hold a conference call each month. Members of the Executive Committee have been chosen by the Assembly and are as follows: Ben Knapp (Queens), Mick McGrath (Intel), Paolo Bonato (Spaulding) and Shuji Hashimoto (Waseda). It was decided a Monthly Newsletter is not necessary. Emails to partners will be sent out to notify about major Wiki updates. Ben Knapp will be in charge of updating Wiki. It was decided Magdalena Klocek and Dan Harnett would be on *CAPSIL Management Support Team*. It was decided to have CAPSIL Representation at the FP7 consultation by ICT for Inclusion on 28/29 April 2008, Brussels by: Niall Cogan (Queens) and Dan Harnett (UCD). Shuji Hasimoto who was proposed by our project officer will be unable to attend this meeting. It was decided not to request a change the start date of the project at this time. It was decided to have a private and public Wiki. It was decided that each WP would be responsible for the timeline; this will not be dictated by the general assembly. It was agreed unanimously that OHSU and Spaulding would be able to swap work packages if they decide to do so. It was agreed the website structure should be Welcome, Members, News, Objectives, Links, Contacts.

Following the general assembly the consortium divided into parallel working sessions to maximize planning and efficiencies.

Workshop 1 on Body Sensor Networking led by Mick McGrath discussed and decided the following items should be studied in the baseline analysis. History-design of wearable devices to be researched (2006 to date), Commercial products: General description of devices, Specs (if available), Applications, Links, Publications (general vs. specific). Data Architecture/Topology: Structure, Mobile networking, Security, Gateway devices, Distributed processing, MESH, Interference and interoperability, Storage, Standards and Ethics.

Misha Pavel led workshop 2 on Intervention. It was decided Misha would document focus areas for Intervention and detail who is doing what in the area in both commercial systems and research. Decided the initial focus for this area will be on home deployments but it will cover clinical scenarios. Decided the area should be referred to as Intervention Systems, not just Intervention. Decided the area should include on body as well as environment sensors.

Workshop 3 on Software led by Brian O'Mullane. The following topics were discussed, Firmware/ Hardware, Data acquisition, Management (Deployment/ Infrastructure, Data Missing, Persistence, Processing, User interfaces (Feedback Mechanisms, Voice Recognition, Gestures recognition and Social Networking. Architecture (building blocks): Automation, Regulations (FDA/ CE/ MHRA), Middleware (Commercial products, Standards, Scalability, Home Deployment, Access/Usage models, Existing standards/ Systems).

Misha Pavel led workshop 5 on Home monitoring Systems. The following topics were discussed, Networking-optimal location of devices, To measure bio/ clinical systems, activity and social interaction, Provision of broadband, Accessibility/ usability (support in case of failure, maintenance), Multi-person tracking, Scalability and standards, Infrastructure (retrofitting, support/ maintenance), Security (privacy, ethics, home security), Interaction (adaptability, social and personal effect), Interoperability (considering home as a part of a larger network)

Workshop 6 on Strategy led by Ben Knapp decided, the next CAPSIL meeting in Japan to be a 3-day event. A public presentation and a visit to the Waseda lab will take place on day 3. The number of hits from a sub domain should be measured. Queries will be answered by email by Dan Harnett/ Magda Klocek. The leaders of working groups will summarize the content for sub pages of Wiki.

#### **Achievements:**

General assembly convened and voting complete

Executive Committee formed

Decisions made on which areas to focus the baseline analysis in each work package on.

Subsequently this baseline analysis has been developed during through the population of our internal "Twiki".

#### **Workshop #2 (Tokyo CAPSIL Workshop)**

Our second CAPSIL Consortium Meeting was held on Wednesday - Thursday, 30th - 31st July, 2008 in Okubo Campus, Wasada University, Japan. The following CAPSIL members attended. Dr. Aaron Quigley, University College Dublin, Prof. Antonio Camurri, University of Genoa, Dan Hartnett, University College Dublin, Dr. Mick McGrath, Intel, Dr. Holly Jimison, Oregon Health and Science University, Dr. Terry Dishongh, Intel, Dr. Ben Knapp, Queen's University Belfast, Niall Coghlan, Queen's University Belfast, Dr. Misha Pavel, Oregon Health and Science University, Prof. Shuji Hasimoto, Waseda University, Prof. Guang-Zhong Yang, Imperial College London, Dr. Paolo Bonato, Spaulding Rehabilitation Hospital, Will (Guillermo) Enriquez, Wasada University.

Activities at this meeting included:

CAPSIL coordinator reporting on, new Management Support Team Coordinator, review of Twiki content, details of ICT for Inclusion, Pre-Fp7 Consultation Meeting, Brussels, 28/29th April 2008, pre-financing distribution, identification of four networking sessions to be held at ICT 2008, 25-27 November, Lyon CAPSIL would attend and support, agreement for CAPSIL members to attend and support SENIOR project at their first workshop on Ubiquitous Computing, Brussels 8th Sept 2008, agreement to promote CAPSIL via [www.ideal-ist.net](http://www.ideal-ist.net).

Following this the CAPSIL members had a tour and presentation from researchers in the Tokyo Women's Medical University-Waseda University Joint Institution for Advanced

Biomedical Sciences. Other presentations in Tokyo from external stakeholders included, Mr. Dai Hiyama (Yamatake Co.), Mr. Tatsuya Yamazaki (NICT) and Mr. Kunihiko Niwa (JST/CRDS).

Following the tour and presentations we had detailed progress reports from Individual Partners and Discussion.

Dr. Mick McGrath, Intel: Main body of work has been on baseline analysis of wireless body sensor networks. Problems in sustainable business model, standards, security, reliability, low power, operating systems, software, black-box nature of devices, radio range were detailed. Four areas requiring funding were highlighted: high level programming environments, standard interfaces for sensors, radios which provide sufficient range and reliability, and the exploration of non-contact sensing due to subject compliance issues.

Dr. Misha Pavel, Oregon Health and Science University described a number of aims related to WP6 Home and Mobile Monitoring, which were derived from an initial meta-analysis. Dr. Misha Pavel indicated that there was a huge overlap in BSN here. Prof. Guang-Zhong Yang indicated that the term linkages were more apt in this situation. Dr. Misha Pavel highlighted the major problems in this area to be: algorithms and interpretation and the fact that too many false alarms make this approach unworkable, power management and battery life, scalability, adaptability, noise and low sensitivity, sensor availability, and installation retrofit and connections.

Dr. Holly Jimison, Oregon Health and Science University indicated that her work to date had surrounded a literature review, which was presented by her. Dr. Holly Jimison stated that while the outcomes of her literature review were not yet finished, however, her provisional results indicated that: there must be a concentration on self-management systems, chronic disease is very costly and so must be targeted, the lower wage healthcare provider must be used, solutions must be scalable, and solutions must be interoperable with new and existing healthcare record systems. Dr. Holly Jimison indicated that she had found in her literature review that smoking and weight management were key areas.

Prof. Shuji Hasimoto indicated that the bulk of Waseda's work to date had been in the area of robotics particularly in the area of the expansion of communication between human and robot whereby menus become expressible rather than selectable - a command is given and the robot responds rather than the user selecting an action from a menu.

Following this were a number of meetings on the scope of the different work packages, the terminology used, common definitions, different regions, and use of questionnaire to gather information and CAPSIL structure.

Plans for upcoming meetings were discussed and preliminary plans agreed upon. Lyon France co-located with ICT 2008, Submission of a panel discussion entitled "Global Perspectives for Technologies for Independent Living" at the American Society on Ageing/National Council on Aging Joint Conference, Las Vegas, 15th-19th March 2008, investigation of what American funding agencies may be present at the Las Vegas event, proposed CAPSIL consortium meeting be held in Oslo, Norway, 24th-26th June 2009 to be collocated with a health conference (NOTE: subsequent meetings have ruled this out).

Detailed discussion and agreement on Twiki structure.

Detailed discussion on “Usage Models” which could be later converted to CAPSIL on a public WiKi. 8 agreed usage models included, Gaits/Falls Prevention - WP2, Cognitive Training - WP6, Weight Management - WP6, Stroke Rehab/Management - WP5, Social Networks - WP1, Activity Monitoring and Intervention - WP3, Assisted Driving - Prof. Shuji Hasimoto.

Work Package XXXX

Goal/Objective:

Usage Model No. 1 Description

Players/Stakeholders:

Elder, nurse.

Policy Issues:

Business

Govt

Social Constraints

Technology Issues:

Activation

Sensing

Communication/RF

Firmware

Middleware

Software

Mobile Aggregation

Stationary Aggregation

Security

Data Storage

Reliability

Communication/Network

Interaction Issues

Activation: Screens, Designs, Communication Styles.

Design: Physical....IP etc.

Compliance

Dependancies (eg Temporal medication reminding is worse than no reminding contextual awareness is needed).

Environmental

Home:

Clinical:

Outside:

Waste:

### **Usage Model One - Mobile Cardiac Monitoring**

A Patient wears a cardiac monitor for several months due to CHF. Patient must apply device himself, and is fairly mobile in the workforce currently. Patient travels monthly overnight for a few nights each month.

Stakeholder:

CHF Patient, GP, Specialist, Nursery, Mobile Aggregator Provider, ISP, Call Centre Nurse.

**Achievements:**

Usage Model Definition

General assembly convened and voting complete

Decision on follow up workshop plan

Presentation of work package baseline analysis from our internal “Twiki”

Development of motivating scenarios and “use cases”

**Workshop #3 (Lyon CAPSIL Workshop)**

Our third CAPSIL Consortium Meeting was held on Friday 28th - Saturday 29th November 2008 Lyon, France. The following CAPSIL members attended. Dr. Aaron Quigley, University College Dublin, Dan Hartnett, University College Dublin, Will (Guillermo) Enriquez, Wasada University, Dr. Paolo Bonato, Spaulding Rehabilitation Hospital, Niall Coghlan, Queen’s University Belfast, Dr. Ben Knapp, Queen’s University Belfast, Dr. Misha Pavel, Oregon Health and Science University, Dr. Terry Dishongh, Intel, Dr. Holly Jimison, Oregon Health and Science University, Dr. Barbara Mazzarino, University of Genoa, Dr. Mick McGrath, Intel, Benny Lo, Imperial College London, Dr. Ivan Porro, University of Genoa.

The meeting started with a refocus on our core mission as CAPSIL. Ben Knapp provided details of his conversations with Peter Wintlev-Jensen and his impressions of ICT 2008. The central point was that CAPSIL to act as a mechanism for information relating to EU research projects to be presented in the US and Japan and vice versa. CAPSIL should also ideally ultimately spawn EU/Japan/US collaborations arising from its work.

Dr. Knapp outlined the executive would like to see four key deliverables for this meeting:

1. An externally facing Wiki see: <http://www.csi.ucd.ie/capsilwiki>
2. The structure for the roadmap: See below
3. Progress report for Peter Wintlev-Jensen from the coordinator
4. A determination if the project start date should be changed

**The consortium unanimously voted to make a formal request for an extension of the project start date to April 2008.**

Dr Ivan Porro gave his impressions of ICT 2008, focus on industry/market/technology at ICT 2008 with little focus on policy issues, Living Labs are a popular concept, in the future non-traditional caregivers may be active in the process, One of the outputs of CAPSIL should be to stress to the Commission the importance of these issues to Commission.

Dr Aaron Quigley gave his impressions of ICT 2008, we should be setting goals such as, the implementation of technology in such a way that a similar number of medical staff be employed as now despite demographic changes, different coordination actions have very different goals (some to support others to lay the ground work for a STREP or IP), we should work with other support and co-ordination actions on information important to CAPSIL but which is outside our set of core skills as academics and industry partners, we should have associate members for CAPSIL who can access and add to the public Wiki.

After this reports on each usage model developed were given:

Cardiac Monitoring (Niall Coghlan, QUB):

Scale of information made generating a concise piece of work on this area difficult. For public facing material a methodology for condensing information needs to be found. Separating out academic research from commercial systems also important. Policy issues are also problematic in terms translating policy statements into condensed intelligible nuggets for public consumption.

Gaits/Falls Prevention (Mick McGrath, Intel):

Problems noted, scale of information huge and a large amount of activity both in research and commercially however nothing very successful in terms of prevention. The emphasis is on detection rather than prevention. Get up and go time used in a clinical setting but the efficacy of this measure is yet to be proven. In the past accelerometers have been used, but this led to many false positives. Digesting content to now multiple sensors are used. Massive resistance to camera based systems due to privacy issues. Generating a concise piece of work on this area difficult.

Cognitive Training (Dr. Holly Jimison, OHSU):

New areas associated with neurological conditions such as MS and Parkinson's and post-stroke. 2 business models exist, one service based and online, one based on clinically based cognitive training. Clinical effectiveness and scientific underpinnings not yet clear as field is in infancy. Privacy and security of information relating to cognitive performance critical.

Weight Management (Dr. Holly Jimison, OHSU):

Two models, one consumer based model with advice on BMI and facilities to record food intake, one based in disease management with aspects dealing with diabetes etc built into it. These two models drive the technology used. The data here is not so sensitive; privacy is not such a critical issue.

Stroke Rehab Management (Dr. Paolo Bonato, Spaulding Rehab Centre):

Usage model focused on two areas. Firstly, monitoring technology to assess rehab interventions in the home and community. Secondly, intervention systems in the home setting involving very simple devices to assess protocols of home care, simple robotics.

Social Networks (Dr. Aaron Quigley, UCD):

This Usage Model was not underpinned by a medical problem. There are many different kinds of social networks. They are useful for creating a web to bring people together who want to maintain social ties. Very specific groups others very large populated by many different people populate some. The usage model template did not fit well with this topic.

Activity Monitoring (Dr. Misha Pavel, OHSU):

Began by looking at what activities are desirable. But the problem here is that these activities are designed to measure other things. So instead of thinking about usage models we should think about use cases. We should look at what are the desires, what do we want, how will we get there, what are the gaps. Activities link to all the other usage models (eg weight management and calorie expenditure). Dr. Ivan Porro indicated here that exploring MFG from Germany could be a good avenue to explore in terms of what technology would be important going forward into the future.

Assisted Driving (Will Enriquez, Wasada University):

3 usage models, all of which futuristic, impossible now but within reach. 3 systems: passive partial control and full control. The usage template wasn't a bad fit however many term mean many different things to different people.

### **Discussion on agreed public CAPSIL Wiki format**

1. General Description  
3 paragraphs
2. Contents (auto generate)
3. Issues (problems/challenges) being addressed in this area  
Cross cutting
4. Scientific Basis
5. Existing Solutions  
Research Projects  
Commercial Players
6. Funding/Procurement  
VC  
Commercial
7. Business Models
8. Standards
9. Gaps
  - Gaps in technology
  - Gaps in the basic science
  - Gaps in operation
  - Gaps in implementation

Discussion on timeline for CAPSIL delivery. Future CAPSIL activities and roadmap. Presentations from Andrew Hamilton, EU Centre for Connected Health,

### **Draft of Tom's Story**

A presentation was given by Dr. Ben Knapp, which described a roadmap for a separate project created by Dr. Antoinio Cammurri. It was suggested that this format be used as a guide when formulating the CAPSIL Roadmap. In order to begin the process of gap analysis the following elements of a future scenario entitled "Tom's Story" were recorded:

- Tom is 70 years of age, divorced, CHF, Working 3 days a week, living in a smart home.
- At risk of: Social isolation, depression, and cognitive decline.
- Bed makes weight measurements; estimates sleep quality, blood pressure.
- Wakes up and requests: schedule for medication, social events, and work.
- Assistive robot helps him out of bed.
- Interactive video for exercise and evaluation, which feeds to analysis.
- Assistive robot helps as companion, walking, sensing data.
- Smart toilet: sodium analysis.
- Drug delivery: Clothing, device, transdermal, implanted.
- Dressing: Smart textiles
- Ambient reminding: medication, connection, entertainment
- Multiple redundant systems.
- Diet monitoring. Recommendation.
- Social Element: CHP Buddies.
- Transport Suggestion.

Dr. Holly Jimison agreed to write up “Tom’s Story” into a narrative to be added to the CAPSIL wiki. [http://capsil.org/capsilwiki/index.php/Tom%27s\\_Story](http://capsil.org/capsilwiki/index.php/Tom%27s_Story)

#### **Achievements:**

Specification of user story for gap analysis

Specification of public CAPSIL Wiki format <http://www.csi.ucd.ie/capsilwiki>

Delivery of 8 detailed usage models

Specification of conversion plans from ad-hoc internal usage models in structure CAPSILs of knowledge on Wiki

#### **Workshop #4 (USA CAPSIL Workshop)**

Our fourth CAPSIL Consortium Meeting was held on Thursday 18th – Friday 19th March 2009 at the National Institutes of Health, 6100 Executive Blvd, Rockville, MD, and USA. This consortium meeting was the day after members of CAPSIL hosted a presentation of EU, Japan, and USA independent living research and our roadmap at the [Aging in America, the 2009 Annual Conference of the American Society on Aging and the National Council on Aging](#) in Las Vegas. Following (and in parallel) to our consortium meeting were two days of meetings and presentations with US based funding and policy agencies.

Over the course of these four days of CAPSIL meetings the following CAPSIL members attended. Dr. Aaron Quigley, University College Dublin, Prof. Antonio Camurri, University of Genoa, Dr. Barbara Mazzarino, University of Genoa, Dan Hartnett, University College Dublin, Dr. Michael McGrath, Intel, Dr. Holly Jimison, Oregon Health and Science University, Dr. Ben Knapp, Queen’s University Belfast, Niall Coghlan, Queen’s University Belfast, Dr. Misha Pavel, Oregon Health and Science University, Prof. Shuji Hasimoto, Waseda University, Will (Guillermo) Enriquez, Wasada University, Dr. Paolo Bonato, Spaulding Rehabilitation Hospital, Atug Akay, Spaulding Rehabilitation Hospital, Rachel King, Imperial College London

The meeting on March 18<sup>th</sup> started with an introduction by Dr. Paolo Bonato and an explanation of the NIH and its associated institutes. The work-plan for the coming days was outlined. The coordinator provided the consortium a report including, deliverables received by each partner to date, possibility of changing Annex 1 of the Grant Agreement so that only month 12 and 24 reports are indicated as deliverables. It was agreed that the content for the month 3 reports be a description of the strawman used to structure the wiki. Month 9 reports are to reference to content added to the wiki.

Following this Dr. Ben Knapp lead a discussion on the overall road mapping process. Dr. Michael McGrath’s gap analysis may provide a good model for the roadmap. Dr. Michael McGrath gave a presentation on a BSN roadmap. All partners agreed that this was a good model. Dr. Misha Pavel gave a presentation on gap analysis. Follow on conference calls were agreed.

Following this the work packages **broke into sub groups to** discuss and plan gap analysis for each respective work packages. The work of each sub-set was presented to the group as a whole and Niall Coghlan produced a gap-analysis document. All partners agreed to review this document and feedback to Dr. Aaron Quigley and Dr. Ben Knapp by April 14th.

The consortium agreed to develop four further scenarios or “stories” based on the template of Tom’s Story. Members of the consortium spent some of Friday the 19<sup>th</sup> developing and refining these stories while others attended the outreach to funding and policy makers. These stories include

- Tom's Story - Tom is 75 working part time. He is living alone and has mild CHF, but his quality of life is enhanced with future technology.  
[http://capsil.org/capsilwiki/index.php/Tom%27s\\_Story](http://capsil.org/capsilwiki/index.php/Tom%27s_Story)
- Sean's Story - Sean is living in Ireland  
[http://capsil.org/capsilwiki/index.php/Sean%27s\\_Story](http://capsil.org/capsilwiki/index.php/Sean%27s_Story)
- Anna's Story - Anna is living in Italy  
[http://capsil.org/capsilwiki/index.php/Anna%27s\\_Story](http://capsil.org/capsilwiki/index.php/Anna%27s_Story)
- Mitsuko and Setsuko's Story - Mitsuko and Setsuko are sisters living in Japan  
[http://capsil.org/capsilwiki/index.php/Mitsuko\\_and\\_Setsuko%27s\\_Story](http://capsil.org/capsilwiki/index.php/Mitsuko_and_Setsuko%27s_Story)
- Jackie's Story - is living in UK, having moved from Scotland  
[http://capsil.org/capsilwiki/index.php/Jackie%27s\\_Story](http://capsil.org/capsilwiki/index.php/Jackie%27s_Story)

More than 60 individuals among program officers of US and EU agencies and researchers from the US, EU, and Japan met in Washington DC on March 19-20, 2009 to discuss potential synergisms among EU and US federal agencies and other US Institutions with focus on research on aging and independent living. Meetings were held at the National Institutes of Health and the offices of the Delegation of the European Commission in Washington DC. Paul Timmers (Head of Unit, Information Society & Media D-G, ICT for Inclusion/H3) and Peter Wintlev-Jensen (Head of Sector ICT & Ageing, Information Society & Media D-G, ICT for Inclusion/H3) led the EC delegation that met with representatives of the Agency for Healthcare Research and Quality, the National Institutes of Health, the National Science Foundation, the Office of Global Health Affairs, the Office of the National Coordinator for HIT, the Office of Disability Aging and Long-Term Care Policy, and other US institutions including associations and foundations with interest in aging and independent living.

All the presentations from this event can be downloaded here:

<http://capsil.org/content/downloads>

This program of events was called "How Technology Can Facilitate Healthy Aging and Independent Living, Exploring Synergisms Between EU and US Researchers" and was hosted by the NIH and the NSF.

The agenda included meetings and presentations from groups including:

1. Delegation of the European Commission in Washington DC,
2. Head of Sector ICT & Ageing, Information Society & Media D-G,
3. Office of Science Policy, National Institutes of Health,
4. International Research Activities and Legislative Officer, National Institute on Aging/National Institutes of Health,
5. Office of Europe and Eurasia, Office of Global Health Affairs,
6. Eunice Kennedy Shriver National Institute of Child Health and Human Development, National Institutes of Health,
7. Agency for Healthcare Research and Quality, Office of the National Coordinator for HIT (ONC),
8. Department of Health and Human Services, Center for Primary Care, Prevention, and Clinical Partnerships,

9. Department of Health and Human Services, Office of the Assistant Secretary for Planning and Evaluation, Office of Disability, Aging, and Long-Term Care Policy,
10. Cerebral Palsy International Research Foundation,
11. Cerebral Palsy International Research Foundation (CPIRF) Scientific Advisory Council,
12. US Department of Veterans Affairs,
13. Center for Aging Services Technologies (CAST),
14. American Telemedicine Association,
15. President of the European Research Council,
16. Office of International Science and Engineering, National Science Foundation,
17. Biomedical Engineering Program, National Science Foundation,
18. Computer and Network Systems Division, Computer and Information Science and Engineering Directorate, National Science Foundation,
19. Integrative, Hybrid and Complex Systems Program, National Science Foundation,
20. National Institute on Aging/National Institutes of Health.

**Achievements:**

21. Specification of 4 new user stories
22. Presentation and development of per work package gap analysis
23. Refinement of consolidated roadmap draft
24. Presentation of roadmap draft to over 100 people across 3 days in Vegas and DC
25. Engagement with 60 individuals among program officers of US and EU agencies and researchers from the US, EU, and Japan to discuss potential synergisms among EU and US federal agencies and other US Institutions with focus on research on aging and independent living

## **10. Annex II: CAPSIL Wiki Copy**

Please note Annex II of the Interim report is actually a copy of the CAPSIL Wiki drawn from (<http://capsil.org/capsilwiki>). The following PDF report (Annex II) represents the current Wiki outputs from all 7 work packages as noted throughout this document and all year 1 deliverables.

Download ANNEX II the 350 page version of the CAPSIL Wiki here:  
<http://capsil.org/files/AnnexII-CAPSIL-Wiki-Copy-01-06-2009.pdf>