PUBLISHABLE SUMMARY

Background

inCASA is a 39 months running project under the ICT Policy Support Programme, that aims at developing a system that will support the population ageing and facilitate them to stay well at their own homes. The consortium membership is set up below:

N°	ORGANISATION		URL	Country
1	REPLY	Santer Reply S.p.A. (Coordinator)	http://www.reply.eu/	Italy
2	CHC	Chorleywood Health Centre	http://www.chorleywood.org/	United Kingdom
3	CNET	CNet Svenska AB	http://www.cnet.se/	Sweden
4	IN-JET	IN-JET APS	www.in-jet.dk	Denmark
5	INSERM	Institut Nationalde la Santè et de la Recherche Medicale	http://www.inserm.fr/	France
7	NTUA	National Technical University of Athens	http://www.ntua.gr/en_index.htm	Greece
8	KGHNI	Konstantopouleio General Hospital of Nea Ionia	http://www.konstantopouleio.gr/	Greece
10	SIG	Steinbeis Innovation gGmbH	http://www.stw.de/	Germany
11	TID	Telefonica Investigacion Y Desarrollo SA	http://www.tid.es/	Spain
12	BU	Brunel University	http://www.brunel.ac.uk/	United Kingdom
13	FHC	Fundation Hospital Calahorra	http://fhcalahorra.riojasalud.es/	Spain
14	ACT Torino	Agenzia Territoriale per la Casa della Provincia di Torino	http://portale.atc.torino.it/	Italy
15	INVENT	Invent srl	http://www.invent.fr/	Italy

inCASA web site: http://www.incasa-project.eu/news.php

inCASA logo:

Main project achievements during the period M25-M39

Introduction

The present document reports activities carried out on third reporting period (M25-M39), specifically, it covers the period between 1st April 2012 and 30th June 2013, the end of the project.
The report describes final achievements, raises management issues, reached goals, open issues and measures adopted for addressing comments and recommendations provided by EC after previous review meetings.

Objectives

inCASA pursues the realization of citizen-centric technologies and a services network to help and protect frail elderly people, prolonging the time they can live well in their own home. This is achieved by integrating solutions/services for health/environment monitoring to collect and analyze data in order to profile user behaviour, implement customized intelligent multilevel

alerts/communication services. Data are made available to care services by technologies that enable access policies to preserve privacy; planning for day-by-day activities and therapies with multiple alerts; co-ordination of local public Social and Health Care Services; and help to deploy specialist community based services.
Main outcomes of inCASA are:

1. Providing elderly people with means to profile their habits, while they are at home, by using unobtrusive motion and contact sensors and a Smart Personal Platform with an embedded Habits Analysis Application;
2. Providing elderly people (and patients with special needs) with means to monitor their health conditions outside traditional healthcare environments, and more specifically while they are at home, by using state of the art personal health systems and integrated telemedicine services;
3. Providing doctors and health professionals with more comprehensive monitoring data for understanding remote user's social/physical conditions and diagnostics, allowing an early decision making for personalised care;
4. Enabling continuity of care through a wider interaction between elderly people or patients and caretakers, especially including not just health specialists but also relatives or people who has close social relations with the user

In particular, the project attains its goals through the following specific objectives:

- Validating technical and operational integration of social and healthcare information systems;
- Validating efficiency, usability, safety, satisfaction, trust and privacy of the integrated health and social model of support and service, including alerts and prevention;
- Enabling continuity of integrated care through a wider interaction between elderly people, health care professionals and caregivers.
- Validating new business models and collaborations, such as public-private partnerships that bring together payers, providers and patients, for sharing costs and revenues; identify actors and roles and the value created in terms of health, socio-economic aspects and commercial benefits.

The story so far and Project Results

The methodology we adopted is based on three (3) iterations, that aim at providing support to understand the failures of the model and of the technology and provide proofs of concept to develop open accessibility to other service providers willing to join the project.

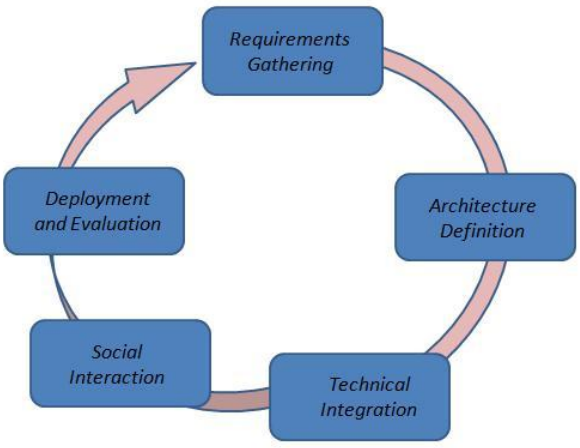

Figure 1 - inCASA Strategy

Particularly, the cyclic iterations have been applied to the following activities:

- *Requirements Gathering*;
- *Architecture Definition;*
- *Technical Integration;*
- *Social Interaction;*
- *Deployment and Evaluation*

Each iteration pursues different objectives, depending on the phase of the project. During last reporting period, inCASA consortium addressed **third iteration**, focused on integration of services, building up the basis for evaluation and exploitation.

The proposed approach, based on 3 different iteration, driven by an approach that starts from pilots experience to enhanced in the following phases, has introduced many constraints to the project workplan, combined with a request of continuous upgrade of technical features, that caused the general delay of all the project phases, and then **9 months extension** with respect to the original plan. For accomplishing inCASA objectives, integration with other organizations (internal or external to the partner) has been pursued, in order to supply additional services to frail people, that integrates "native" services provided in coherence to the specific mission (socio or health, depending form the pilot). As a matter of fact, initial pilot selections was based on the assumption that pilot partners would have supported the set up of an inCASA model from an overall perspective, each of them from its own perspective/contribution on a specific part of the model. As all the parts of the model starts working in different pilots, **an overall integration pilot has been identified** to support fully initial general assumptions. Best option seemed to work within an organization that builds natively inside its proper mission of socio-health integration.

As recognized by the project consortium, a business proposition based on the evidence of a "unique selling point" has been crucial for the project life. Market evidence shows that this is the critical reason to deploy socio/health integration services, like the new pilot proposition is expected to do in the last part of the project. In order create a solid business proposition, stakeholders involvements is mandatory, in order to certify the accomplishment of project objectives and to build together the rules underlying the future potential business model to be accomplished by the end of the project.
Consortium made notable efforts for involving different categories of stakeholders, especially by National Events organized in any country involved in inCASA project. All details on National Exploitation Event are included in D8.4, the table below summarizes stakeholders' perceptions and their interest in exploiting inCASA results.

Country	Institutions	Stakeholder type	Source	Interest in exploiting results
Greece	Ministry of Health, 1st Regional Health Authority of Attiki, Konstantopouleio General Hospital of Nea Ionia, Athens and nearby hospitals.	Health care authorities and managers	National Event	The inCASA Greek pilot is as a commendable effort that certainly contributes to the establishment of a combined framework to deliver health and social services. This framework is expected that it will reduce the fragmentation of e-health services delivery on the regional level and will allow for greater synergies to be realized in practice. The involvement of the private sector is crucial to the sustainability of the inCASA services in the long run, due to the currently limited funding opportunities available by the Greek state. In conclusion, a realistic business plan would rely on forming Public–Private Partnerships (**PPPs**) to deliver the inCASA services to the Greek market. They recommended that a niche market for these services would be the **health/social insurance sector**

				Weakness: • Limited interoperability of the e-health services and the low level of synergies with the risk to not uptake new services. • Inhibitive factor is the inadequate training delivered to the health professionals, regarding the use of the new electronic services.
Greece	Municipality of Nea Ionia	Local municipal authorities	National Event	They would endorse a program to offer combined socio-health services to the citizens of Nea Ionia where KGHNI is located, if funding was made available
Greece	Konstantopouleio General Hospital of Nea Ionia and various hospitals belonging to the 1st Regional Health Authority of Attiki	Healthcare Professionals	National Event	The inCASA service is innovative as it involves a multi-disciplinary group of professionals. The TC-TH integration requires cooperation among professionals but it offers undeniable benefits especially in early detection of deterioration signs. **Proposal**: the hospital could become an e-health services provider on behalf of private insurance companies and with the partnership of technology providers, that would be responsible for the deployment and support of the inCASA services and equipment to the remote areas.
Greece	National Technical University of Athens, Greek healthcare IT SMEs (e.g. Q-PLAN)	Technology providers	National Event	Appreciated the adoption and usage of standards inside the inCASA platform, like HL7 protocol, crucial design aspect in order to allow future integration with other healthcare systems that could form a bigger healthcare monitoring network.
UK	Chorleywood Health Centre, Public Service Academy, Marie Curie Cancer Care, Whole System Demonstrator Pilots etc.	Healthcare Professionals	National Event	inCASA could improve the sharing of info, as barriers of information sharing across different health and social organisations are still huge. inCASA solution could be of great benefit for monitoring rehabilitation of those newly discharged from hospital, Moreover, inCASA can be used for measuring patient pain level at home. By combining with other measurements, inCASA would reduce the number of visits as well provide more timely pain management to the patient. The plug and play approach to installing the equipment and reusability of the devices was described as being "ideal" for carrying around by the community teams.
UK	Staffordshire County Council, Royal Free London NHS Foundation Trust, NHS North West London Integrated Care Pilot	Health care authorities and managers	National Event	General consensus that inCASA meets the need to focus on service redesign supported by technical innovation, not the other way around. Weakness: Cost of equipment and providing such services. With the spending constraints within the NHS and public services there was concern that services like inCASA would be difficult to adopt. GP engagement in such services as a major barrier to adoption. GP's are under considerable pressure with the restructuring and it is still unclear how successful the new changes will be.
Germany	Rural community Kuhmo in Eastern	Local municipal	National Event	Main requirement here would possibly be the mostly autonomous operation of the remote systems, as no skilled

	Finland	authorities (from Finland where the event took place)		personnel would be around.
Germany	KARL STORZ GmbH & Co KG (one of the world-wide market leaders in endoscopy), Aesculap AG (forerunner in chirurgical and interventional processes)	Technology providers	National Event	They pointed out the integration challenges for the different sensors to be included into a generic system.
Sweden	Östergötland's and Västerbotten's county councils and numerous municipalities like Gothenburg city and municipality of Sundbyberg (just outside of Stockholm)	Health care authorities and Local municipal authorities	National Event	inCASA approach was appreciated for being open and based on standards, while still supporting many of the devices available on the markets. From autumn 2014, Swedish government will launch a National Personal Health Account for every citizen, an account in the cloud where everyone can store and gather all personal health-related information. CNET got several questions about connecting inCASA with the Swedish Health Account system, which is something CNET has started looking into. In general, the concept of integrating TC and TH services is seen as attractive on the Swedish healthcare market, and will be important when responsibility of elderly care is shifted down to local municipality level. The combined approach is the right path to go, both from a technical and economic viewpoint.
Denmark	Danish Centre for Health Informatics (organiser). Participants: Regional Health authorities, Municipal and local government executives, the Danish Minister for health and health politicians, practitioners and health workers, academics, patient organisations, interest groups, technical groups in eHealth, consultants, vendors of ICT infrastructure.	Health care authorities and Local municipal authorities	Future National Event to be held on December 2013	Current trends in Denmark demonstrate a focus on integration of TC and TH services in order to optimize continuity and efficiency of the Danish welfare system. Presenting the experiences from the Skive model provides a strong use case and evidence base for commercial exploitation of the inCASA platform and will play a significant role for our success in targeting Danish municipalities and regions who are responsible for provide social care and primary and secondary healthcare. In-JeT thus expects that the conference will allow us to generate a significant commercial interest in the inCASA platform and that it will expand our existing customer base. This will be a major event for launching the platform used in Skive to other municipalities in Denmark, to the association of Local Governments, to healthcare authorities interested in commercial shared care solutions, and to decision makers in the health providers responsible for cooperation with social care providers. This event will form the Kick-off of our exploitation strategy for the market for combined long-term healthcare and social care management for the chronically ill. This market is extremely interesting and In-JeT will act as a supplier of the combined LinkWatch front-end solutions and inCASA solution to bridge the gap between patient data collection and interaction and healthcare and social

				care end-points.
France	CASyM EU project stakeholders: INSERM, Lyon Biopole, Project Management Jülich, University of St Andrews, University of Rostock, EC representatives etc.	Healthcare Professionals , Health care authorities and managers	National Event	It has been remarked that inCASA solution meets the need of development of sustainable business models, based on value analysis to define economic and society benefits, evaluate how systems medicine affects cost of healthcare, include SMEs, national health systems, insurance companies. They also highlighted the need for the development of a common ethical and legal framework as long as a new educational framework focused on the usage of new technologies in Medicine
Spain	Fundación Hospital of Calahorra, Commercial unit of Telefónica	Healthcare Professionals and managers	National Event	Such a solution would be of great value to the healthcare system by avoiding placing a substantially large strain on the system in the form of providing in-hospital care for long periods of time. By making at-home care accessible, inpatient costs can be reduced and hospital space increased.
Spain	Telefónica and Andalucía Region Health Authorities	Regional Autorities and Telefónica Managers	Regional Business Meeting	This region has been informed of the evolution of inCASA and they have been following-up the solution with a lot of interested. Very recently, they have accepted to start a bigger pilot with more than 500 patients which is partially paid by the region. http://www.juntadeandalucia.es/salud/channels/portadaProfesional/Noticia23259?perfil=org&idioma=es&tema=/temas_es/&contenido=/channels/portadaProfesional/Noticia23259
Spain	Telefónica and Catalan Health Authorities	Regional Authorities and Telefónica Managers	Regional Business Meeting	The Catalan Health Institute (ICS) has been following up the inCASA project and how this tool can help on monitoring chronic patients. This region now is starting a bigger pilot with 200 patients.
Spain	Telefónica and Valencia Health Authorities	Regional Authorities and Telefónica Managers	Regional Business Meeting	The Valencian Health Agency started a big pilot with 1000 patients last year after seen the good tool we are deploying in inCASA.
Italy	Regione Piemonte	Local Autority (DG social affairs)	National Event/ Specific meeting	Interest in the solution was reflected according the two different perspective: • Social perspective: the system was interesting as enabler of a new organization of social services, extending the role of the contact center as a player for maximize social intervention • Healthcare perspective: public remote service provider can benefit form inCASA in the rural areas where hospital are closing and CAP (Centri Assistenza Primaria – Primary Care Centers) are opening The pilot will start in the ASL of Turin or Cuneo.
Italy	Regione Emilia Romagna	Regional Healthcare agency	National Event/ Specific meeting	Main focus of interest is related to the setting up of a frailty model, support by integrated care data. Regione Emilia Romagna is working on a Frailty Data Base that at the moment includes 300.000 people. Within a larger project (Case della Salute), inCASA could help in enriching with real time information, in order to classify people according to Frailty scale and re-organize the resources distribution according the real needs. The pilot will start in the ASL of Bologna.
Italy	Regione Lombardia	Local Healthcare	National Event/	May focus of interest was related to the chronic diseases, where Regione Lombardia is trying to reduce expenditure

		agency	National Event	through an innovation model (CREG) where heath territorial services are managed by groups of GPs that managed the budget associated to the "standard" care process of a specific chronic person. inCASA platform could be useful to extend Telemedicine services to residential houses, where people live independently. The pilot will start in ASL of Brescia.
Italy	Regione Puglia	Regional Healthcare agency	National Event/ National Event	Such a solution would be of great value to the regional care system by avoiding placing a substantially large strain on the system in the form of providing in-hospital care for long periods of time. Like in Piemonte regione, the project has been associated to the closure of hospitals. The pilot will start in the ASL of Bari.

Reached Objectives

inCASA achieved several objectives that demonstrate the project high performance.

The first crucial performance indicator we reached is providing at least 200 elderly people and patients with special needs, high level integrated TC-TH services, while they are at home. Our expected target has been reached and overcome, as the number of end users in five different pilot sites has been **207**.

Further different objectives have been achieved.

Pilots used technology to develop a profile of a person's behavior. The parameters set constructing these profiles were not identical among pilots as different target groups were being monitored such as cancer, CHF, COPD patients or frail elderly people living alone. As a commonality, all pilots used the inCASA platform as an assistant tool in order to observe the trend of the monitored person's profile and detect deviations from their normal behavior. More than 50 profile models have been generated during the inCASA project Pilot execution while evidence of their possible correlation with the vital signs measurements is presented in the deliverable D6.6.

The inCASA platform has proven to be able to store all incoming data from sensors and health devices which were used to monitor the end users efficiently. Statistically, the number of events coming from the health devices were 1-3 per person/day/device while the number events coming from the sensors were of high volume. For example, there were cases where the motion sensor sent 300 events in one day. Certainly, the raw data would be useless if the inCASA solution was not able to process them statistically, provide operators with summary readable results and perform data reasoning in order to generate the required alarms.

Definitely, all contributors to the project were in agreement that much more needs to be done in making integration, in terms of joint services and data sharing with external services and care networks. This is possible to be achieved only with the strong intervention of the legislators and a strong cultural change. All pilots expressed a strong will in their next steps presentation to cooperate with external organizations in order to improve their already tested inCASA service. It is also admitted that it would be very hard for a single organization, without the support of external ones, to run the entire service and cover all its aspects (care, technical, organizational, business etc.). 4 of the 5 pilot sites were able to develop integration between local services and professional groups. New pathways of care were developed, which enabled patients to be identified and referred to other services including social services, psychologists, rehabilitation services and home help services.

While ATC was not able to fully integrate it did collaborate closely with other services in order to respond to incoming data. For example, making calls to social workers, other community services including the police, relatives and neighbours in order to respond appropriately to an event.

The inCASA service enabled patients to be supported by health and social professionals as well as other community providers. This enabled patients to stay safe and well within their home where otherwise they may not have been able to. This is particularly demonstrated via the CHC pilot who reported a reduction in length of hospital stays during the pilot. In addition, through the patient perception questionnaire, the patients themselves reported feeling better supported and receiving enhanced care within their own homes.

Another important result was that within last year of the project running, inCasa platform was integrated with In-JeT's LinkWatch frontend and was replicated in Denmark for the first time.
Moreover, five countries were analyzed in depth (policies and market conditions) in deliverable D7.1 Market Analysis completed in year 1. A European Market Analysis was performed in D7.2 Preliminary Business Plan in year 3. It also included monitoring of a number of eHealth projects in 10 countries. Finally, the healtcare systems and policies in eight countries were analysed in D7.3 Final Business Plan.

All possible competitors have been analyzed and inCASA added value has been specified already at the end of last reporting period. Preliminary Business Plan (D7.2) details this aspect.

After having presented the good practices, Deliverable D7.2- Preliminary business Plan, delivered within last reporting period, presented SWOT analysis applied to inCASA business. With the help of this analysis we focused and summarized the relevant "strategic" elements to build the inCASA business models.

Two opposite business organization and therefore legal model have been discussed during the project run: (i) a centralized approach, based on a new (European) start-up, participated of potential interested partners; (2) a decentralized approach, based on local/national business organization relying on one or more inCASA project partners. The second one is the agreed model, adopted by inCASA business partners, where each partner, interested to deploy inCASA services, will follow an autonomous strategy in its target (Local/National) markets. This model relies on a cooperation agreement among the project consortium members stating contractual rights and obligations. This reached objective is well described within Final Business Plan (D7.3) and IPR Management (D7.4).

Moreover, each service provider in inCASA has described its deployment strategy for enrolling regional authorities into the inCASA service, exploitation strategies of industrial partners are included in D7.2.

Finally, a deployment plan after the project ends, involving different countries and different service providers, has been well defined in the D7.3.

WPs Highlights

WP2-User Requirement

The collection and evaluation of the user requirements combines the investigation of the needs and concerns of users with technical requirements leading to a successful implementation. The main goal of WP2, within last reporting period, is to refine user requirement analysis under different perspectives: (i) Strengthen end-user requirement acquisition by direct user involvement; (ii) Refining and aligning user requirement with iterative development approach (Iteration 3); (iii) Addressing comments by EC on deliverable status, concerning deliverables: "D2.4 - Requirements Consolidation and Prioritisation Iteration 2" and "D2.5 - National Pilot Blue Print.

The main achievements for WP2 in the third reporting period are:

- production of an update of the deliverable D2.3 European policies and ethical package as recommended at the previous review. The update, entitled D2.3 ANNEX - The main update concerns the Ethical Board's Activities and Methods as the Ethical Board agreed to carry out personal visits to each of the pilot site in order to assess the pilots' ethical soundness in a more direct and face-to-face manner.
- Reworking D2.4 - Requirements Consolidation and Prioritisation Iteration 2, for addressing review recommendation: in order to collect all user requirements in an update of D2.4, while strictly technical requirements can remain as an Annex to D2.4. The requirements reported in D2.4 Requirements consolidation and prioritisation iteration 2 were refined, updated, and consolidated for this final phase. Furthermore, the new use cases and new requirements demonstrating an integration of Telehealth and Telecare were defined and reviewed with the pilots.
- Reworking D2.5 - National Pilot Blue Print, according with Review Recommendation: It is recommended that the consortium provide an update of D2.5 for the go/not go check point (Sept 2012), in order to reflect in the report the actual status of the pilots.
- D2.6 Requirements consolidation and prioritisation iteration 3 was submitted on time in M31.
- Finally, ethical guidelines and deliverables were consulted in order to provide input to the pilot evaluation in WP6.

WP3 – Architecture Design

Main goal of WP3 is to analyse and evaluate the user requirements specifications from WP2 and unfold detailed design principles for the inCASA infrastructure and software architecture. The outcome has direct effect on the implementation in WP4 Solution Implementation.
The architecture design setting follows an iterative approach. Design and evaluation of the complete inCASA system architecture also considers non-functional system properties such as privacy, scalability, dependability, energy supply and autonomy, usability and safety.

Work package 3 ended on M32, then, most of work performed on the last reporting period is already described within the 3rd Interim Report (D1.4.3).
The inCASA project started the first iteration of the architecture in WP3 considering the diverse implementations chosen by each of the pilots. This diversity was the result of the selection of the most efficient approach in order to start up the trials in each country. The second iteration of the architecture was characterized by the attempt to harmonize this diversity. This third iteration of the design of the system architecture has refined last issues and consolidated the final architecture.
Some effort has been spent in analysing the feedback provided by the Commission in order to address the last issues of the architecture in D3.4. Some works have been done, especially in the server side, (i.e. LinkSmart and SPP) to address the integration of the Telecare and Telehealth information.

Moreover, we have been watching carefully the final turnaround that the project has taken after the last review. This WP has followed the new strategy that came out after the GO/NO GO meeting in Brussels. In the last period, WP3 has produced D3.4 with the input of D2.6.

WP4 - Solution Implementation

Solution Implementation" deals with the iterative implementation of all the parts of the inCASA system as well as the technical testing of its functionality. The implementation and test planning process takes place in the beginning of WP4 and involve:

- A development plan describing how the different software modules, subsystems and systems developed in inCASA shall be integrated
- A test plan and testing of individual components

The results are tested and validated, according to the validation criteria and needs for adjustments of the project user requirements specifications and design specifications are determined.
The iterative approach for the implementation of the solution is followed.

As this work package ended at M27, its activity mainly addressed concluding implementation of the system components and addressing issues, which arose during the integration of the system conducted in WP5 Solution Integration.
The work in WP4 has focused on the implementation and integration of various components and their customisations according to requirements. Main activity was the refinement of the SARA Client and Hydra middleware to meet the projects requirements and handle information exchange.
Inside the SPP module the development required for the second iteration has involved the Reasoner, which had to extend the reasoning and the alert management to the Telehealth measurements, and the EPR, which had to store this kind of information and be able to return it when queried.
The development phase has been followed by an integration test phase which involved the whole inCASA solution. A notable effort has been spent for the optimisation and refinement of the Activity Hub and related components.

WP5- Solution Integration

The main objective of this work package is to integrate the inCASA platform components and its services into a cohesive working system able to:

- Combine user behaviour and user clinical condition into a unique behavioural model
- Manage a user socio-clinical profile ready for access from social-care, hospital and emergency services to provide a scalable and open platform that allows easy integration of additional monitoring networks and related alert services.

WP4 follows the iterative approach for the solution integration. Input for improvement came from the pre-pilot phase and they have been addressed as much as possible such as all five pilots are up and running.

WP5 main achievements within last reporting period have been mainly related with the stabilization and the finalization of the SIG activity hub and the connectivity of the sensor set. These works included intense tests of the reworked firmware architecture in the lab and support of the partners at the pilots, i.e. in Italy and in Greece.
Functional analysis has been performed regarding the unified management of Telecare and Telehealth measurements and alerts; in particular the effort has been spent in finding out the IEEE 11073 terms which best suited the alert management.
The inCASA architecture is evolved toward a more open and interoperable solution.

During last reporting period, different technical partners supported the Skive Pilot deployment in the framework of the inCASA transferability test activity.
Consumer Applications, which is the inCASA Web Portal developed during the project life cycle, were customized in order to cover the requirements from Skive.
Skive use cases have been analysed in order to accomplish the transferability desk. The best combination of inCASA modules and telecare and telehealth devices have been identified and the inCASA platform has been successfully deployed to the Danish site.
The deployed Skive Consumer Application offers the unique feature that a patient can also access their data via the Web Portal. In the inCASA Pilots, access to the Consumer Application was given only to the Professional Users. In Skive transferability test though, it was included in the requirements to allow patients to enter the Portal and be able to view only their own data and nothing else. Another Role-Based Access Mechanism was therefore developed in which when the user logs in with credentials associated with a patient, they can only view their data and there is nothing rendered from any other patient.
Apart from the above extension, new unique visualizations were added to the Skive CAs due to the addition of new monitored parameters like smoke or activity.

WP6 - Pilot Use Cases

The main objective of the Use Cases WP is establishing the pilots for the inCASA solution in different European countries to validate the proposal as support to improve autonomy, safety and self-confidence of elderly population.
The pilot allows find out common strategic basis for a wider application and specific aspects, related to the cultural and organizational aspects, proper of each country. The pilot moreover focus in smooth passage from healthcare to social care aspects.
Pilot sites have to follow a planned progression of introduction and implementation and they shall be subject to a rigorous continuous evaluation process. The technology employed by the pilots is a mix of Telecare, Telehealth and information integration.
According with recommendations included in the last review report, especially with the *Recommendation R3*, pilot evaluation became a crucial objective within WP6 activities. In the last review period, specific objectives refer to:

- Evaluating the impact of the system on the involved actors through user satisfaction surveys;
- Evaluating the relationship between the system and the user population in terms of acceptability, safety, quality and usability of the monitoring system;
- Evaluate the relationship between the system and the health and social professions in terms of usability, its effectiveness, efficiency and satisfaction;
- Evaluate the impacts of the solution on organisational efficiency of an integrated social and health care model;

Pilots were set up in France, Greece, Italy, Spain and the UK. Between March 2012 and May 2013, **207** patients across the **5 pilot sites** were enrolled onto the inCASA services.
An evaluation methodology was selected to be used for the inCASA pilots that would enable a common set of data to be collected and analysed across all 5 pilots.
The technology employed by the pilots are a mix of telecare, telehealth and information integration.
Deployment of the pilots within each of the countries followed a plan, and was subject to interim reporting and final evaluation procedures in order to support shared learning, continuous quality measures and validate the solution.
In addition to implementation of the pilots as a response to a number of issues raised during the review meeting and interim review meeting in September 2012, each pilot worked to address the

issues raised and to prepare to provide evidences to the reviewers that these issues had been addressed.

Within the inCASA project, pilots used technology and services to develop a profile of a person's behaviour. Different disease groups including cancer, COPD and CHF were targeted by three of the pilots. One pilot focused specifically on the older frail patient and another focused on individuals at risk in their home environment. Pilots chose technology which they determined to be most relevant in the monitoring of specific indicators based on their patient profile. Each pilot worked with different organisations and groups to develop new and redesigned integrated pathways in order to respond to the information collected in a targeted and appropriate way.

An evaluation methodology was selected and used to measure the outcomes of the pilot's aims against the aims of the overall inCASA proposition. The evaluation framework which was developed for inCASA and is described in Deliverable 6.1, has been based on the MAST Methodology, a validated methodology which enables the collection of a common set of data which can be analysed across all 5 pilot sites. The common evaluation domains included: Patient Perception, Professional Perception, Clinical Outcomes, Organisation / Resource aspects, Economical aspects, Ethical Considerations and Safety.
The study design used for the pilots was a prospective cohort design. This is a longitudinal observational study that follows a group of people over a period of time. The evaluation has assessed the services from the perspective of the stakeholders and organisations involved in the service and have involved multiple data collection methods including interviews, questionnaires and record review.
The following framework describes the minimum data set that was used by all pilots within the evaluation.

Indicator	Stakeholder	Data source / method	Domain
Quality of Life / Wellbeing	End User / Patient / Informal Carer	SF36 Edmonton Frail Scale	Patient Perception
Perception of Service Privacy	End User / Patient / Informal Carer	Questionnaire Interviews	Patient Perception
Perception of Technology	End User / Patient / Informal Carer	Questionnaire Interviews Contact Logs Installation Records	Patient Perception
Clinical Outcomes Degree of change in clinical values	End User / Patient / Informal Carer	Questionnaire Interviews Record / Case Review	Patient Perception
Health and Social Resource Usage Integration	End User / Patient / Informal Carer	Questionnaire Interviews Record / Case Review	Patient Perception

Indicator	Stakeholder	Data source / method	Domain
Perception of Service	Relevant Staff	Questionnaire Interviews Logs Records	Service Provider / Professional Perception
Perception of Technology	Relevant Staff	Questionnaire Interviews Logs Records Training records	Service Provider / Professional Perception
Clinical Outcomes	Relevant Staff	Questionnaire Interviews Record / Case Review	Service Provider / Professional Perception
Health and Social	Relevant Staff	Questionnaire	Service Provider /

Resource Usage Integration		Interviews Record / Case Review	Professional Perception

Indicator	Stakeholder	Data source / method	Domain
Resource Usage	Relevant Staff	Logs Records Interviews Questionnaires	Organisational Change / Service Model Aspects
Service Integration	Relevant Staff	Referrals between organisations Questionnaire Interviews Logs	Organisational Change / Service Model Aspects
Business Models / Pathway Redevelopment	Relevant Staff	Logs Records Interviews Questionnaires	Organisational Change / Service Model Aspects

Indicator	Stakeholder	Data source / method	Domain
Resource Usage	Relevant Staff Patient	Logs Records Interviews Questionnaires	Clinical Effectiveness
Health Interventions	Relevant Staff Patient	Record / Case Review Questionnaires	Clinical Effectiveness
Clinical Change	Relevant Staff Patient	Record Questionnaires	Clinical Effectiveness

Indicator	Stakeholder	Data source / method	Domain
Running costs of delivering the telemedicine service	Relevant Staff Organisations	Logs Records	Economic Aspects
Effects on patients use of health care:	Relevant Staff Organisations	Logs Records	Economic Aspects
Running costs of delivering the telemedicine service	Relevant Staff Organisations	Logs Records	Economic Aspects

Indicator	Stakeholder	Data source / method	Domain
Adverse Effects Service Technical Integration	Relevant Staff End users / Patient	Logs Records Interviews Questionnaires	Safety

More details of evaluation results are described below in the Progress Report. All evaluation process and results are included within the deliverable *D6.6 - Pilot Evaluation Report and inCASA platform validation and recommendation*.

WP7 -Business Modelling and Deployment

Main objectives in WP7 during the analyzed reporting period are the following:

- To dress a final business and deployment plan that will permit to attract investors;
- To identify a common approach related to the inCASA IPR management;
- To develop transferability models with supporting toolkits that can facilitate the transfer of the project results

The aforementioned objectives fully address *Recommendations R2, R3 – from September 2012 Review Report*. Finally, this WP addresses potential business models to be implemented, including an analysis of infrastructure costs, ownership and maintenance, IPR strategy.
During the deployment of the inCASA platform, lessons learned are collected in every aspects of the deployment and used to build the transferability model. In order to facilitate the deployment and capture the process for later use, a set of guidelines, instructions, support documents and training material are developed. This set of tools, at the end of the deployment, constitutes the inCASA transferability toolkit.

The main achievement during last reporting period has been the production of the Final Business and Deployment plan that provides evidence of sustainability and exploitation plan effectiveness.
The major points dealt with in the document concerned:

1. A country analysis of the health national legislations and market frameworks to understand the real deployment potential of inCASA solution;
2. The deployment plan of the inCASA industrial partners that will bring the project results, or some of them, to the market in the short term (1/2 years after the project end). The health national legislations analysis has been carried out to investigate the real market opportunities of the project partners' countries for which it is expected that in the near future inCASA will be deployed. Single partners' exploitation plans have been also described in the document; such plans follow on the present exploitation and dissemination ehealth initiatives where the industrial partners have been already involved.

The Final Business Plan takes care of describing the pilots follow confirming the industrial partners' commitment to continue the work carried out during the project. In fact, they have expressed the willingness to support the present pilots in continuing their tests and even to support the pilot scaling up in order to include more users.
Another WP7 achievement has been the managements of InCasa IPR: A considerable effort has been spent in developing the InCASA IPR management report in order to define the background and foreground knowhow. An overall mapping of the project partner preliminary knowhow has been identified so as the overall background resulting at the end of the project. All the work performed has been described in the Deliverable 7.4 inCASA IPR management report that is the basic document to elaborate a future cooperation agreement for the market deployment of inCASA services. A preliminary version of the cooperation agreement is annexed to the D7.4.
Finally, transferability models have been implemented, according with review team recommendations.
IN-JET defined the Skive integrated demo and transferability model in the document Skive Kommune – Integrated Pilot Requirements Consolidation and Prioritisation with the purpose of presenting this to the consortium for approval. The document provides background information on Skive, aims and objective of the pilot, target group, recruitment process, parameters, the organisational aspects, pilot structure, user profiles and responsibilities, service delivery process, service installation, scenarios, use cases, business process model, deployment strategy, schedule, equipment and architecture. It is important to note, that Skive is not an additional inCASA pilot, but rather a site for the demonstration of inCASA solution transferability (and shall thus be referred to as "SKIVE transferability model").
Extensive preparations have been carried out including defining use cases and user requirements, translating material such as user questionnaires, defining the user interface of the inCASA Consumer Application, testing and error corrections of devices and the system, installations in users' homes and demonstration of how to operate the system, continuous maintenance and support to SKIVE and elderly users. In particular, the testing of device communication with the platform has demanded a lot of resources and significant efforts were also necessary when it became clear a couple weeks

before the planned kick-off of the SKIVE Exploitation Demonstrator that we had to find an alternative host for the server.
The experiences from SKIVE has demonstrated that the inCASA platform can sourced, installed, configured and put into operation quite easily and quickly (it took only a total of 5 weeks in the Skive case). Based on the experiences and activities in SKIVE, IN-JET has collected as set of different tools (check list, guidelines, manuals etc.) that can be used by future customers of the inCASA solution. These tools identify the main issues to be considered and investigated when deploying the inCASA solution in a new setting/country thereby easing the implementation process.
The overall evaluation carried out in this connection shows that the transferability capacities of the inCASA platform are very satisfactory.
All the transfer activities, including a brief description of the Skive model, tools, and user and technical evaluation results have been described in the deliverable *D7.5 The inCASA transfer toolkit and transferability activities,* which was submitted on time (M39).

WP8-Dissemination
WP8 runs along all project. Primary objective of dissemination WP, during third reporting period is to provide an active and professional dissemination of the project results according to the adopted dissemination strategy, and making many extra efforts for addressing *Recommendation R3* – from last *Review Report*. Dissemination is strictly related to exploitation: feedback from dissemination activities represents the tool for inCASA result exploitation. Particularly, feedbacks collected in National Events represent the creation of transferability opportunity.
Such a strategy ensures that the results of the project are properly disseminated, and lay the foundation for an appropriate commercial and non-commercial exploitation of the project results.

Most of WP8 achievements, during last reporting period, represent the actual implementation of the agreement among partners for closer synergy between business exploitation (WP7) and dissemination (WP8). According to reviewer's comments (*Recommendations R1, R2 R3 from last Review Report*), a new task has been added, **Task 8.4 - National Exploitation Events**, in order to strengthen stakeholders' involvement through a series of national events. Moreover, D8.4 was changed from "Report on Scientific Event Attendance and Publications" to "Report on the organisation and outcome of National Events (M39)" in order to reflect the emphasis on the new task 8.4.
All inCASA partners planned the National Events in which:

a. They could be the organizers of the Event taking care of the whole agenda, the invitation and active participation from the part of target stakeholders (National Ministry of Health, Local Municipal Authorities, Local SMEs, Frail Senior Citizens etc) and, finally, the dissemination of the Event's outcome.
b. They could participate into and appropriately disseminate the inCASA project and its business perspective. This option could be valid if the inCASA participation / representation would have taken place inside a large and significant National Event where the responsible partner(s) could organize an inCASA workshop or a round-table open discussion with experts and target stakeholders. In this option too, the participation inside a bigger National Event and its outcome should be reported and disseminated appropriately.

inCASA consortium prioritized the dissemination and exploitation activities as this was the last period of the project before its official end. Meanwhile, inCASA outcomes have become more solid and this helped their communication to the target audience.
An overall description of the organization of these events was reported in the deliverable *D8.4: "Report on the organisation and outcome of National Events"* where the feedback from the

participants was also analysed and led to the production of national as long as common conclusions and guidelines towards the exploitation of the project.

The following table shows all deliverables released during last reporting period (M25-M39). Some of them have been reviewed and accepted by EC review team, the remaining ones, that should be reviewed yet, are highlighted in light-grey.

Deliverables produced in third reporting period

Document	Responsible	Due Date	Revised	Status
2nd Progress Report (reworked)	INVENT	M24	M28 (updated Version)	Submitted and **Accepted**
D1.4.2 Interim Activity Report (Intermediate Review 1)	INVENT	M18	-	The document has been submitted on time, but was never reviewed. Re-Submitted at the end of the project
9th Quarterly Activity Report (intern document)	INVENT	M27	-	Completed
10th Quarterly Activity Report (intern document)	INVENT	M30	-	Completed
10th -Update to M32- Quarterly Activity Report (intern document)	INVENT	M32	-	Completed
D1.4.3 Interim Activity Report (Intermediate Review 2)	INVENT	M32	-	Submitted
11th Quarterly Activity Report (intern document)	INVENT	M36	-	Completed
12th Quarterly Activity Report (intern document)	INVENT	M39	-	Completed
D1.5.3- 3rd Progress Report (present document)	INVENT	M39	M40	Submitted a draft version, still missing last financial info
D1.6 - Final Report	REPLY	M39	M40	Submitted
D2.4 Requirements consolidation and prioritisation iteration 2	REPLY	M24	M29 Updated version_2	Submitted and **Accepted**
D2.5 Annex - National Pilot Blueprint Package Update	REPLY	M12	M29 Updated version_ 1.3	Submitted and **Accepted**
D2.6 Requirements consolidation and prioritisation iteration 3.	IN-JET	M31	--	Submitted 31 October 2012
D3.4 - Reference Architecture iteration 3	TID	M32	03/12/2012	Submitted
D5.4 - Description of installation and extensions	CNET	M34	15/03/2013 (M36)	Submitted
D6.1 - inCASA European Pilot: aims, sample, methodology	CHC	M20	M29 Updated version	Submitted and **Accepted**
D6.3 - All pilot Installation Reports	CHC	M30		Submitted and **Accepted**

D6.5 - Trail progress data reports	CHC	M34		Submitted
D6.6 - Pilot Evaluation Report and inCASA platform validation and recommendation Report	CHC	M39		Submitted
D7.2 - Preliminary business plan	INVENT	M22	M29 Updated version	Submitted and **Accepted**
D7.3- Final Business and Deployment plan	INVENT	M39		Submitted
D7.4 - inCASA IPR management report	INVENT	M36		Submitted
D7.5 – The inCASA Transfer Toolkit and Transferability Activities	In-JET	M39		Submitted
D8.4 Report on the organisation and outcome of National Events	NTUA	M39		Submitted
D8.5 Final plan for the dissemination of knowledge	CHC	M39		Submitted

Milestones produced in third reporting period

Document / Milestone	Responsible	Due Date	Revised	Status
MS4 - Equipment Procurement public tender	CHC	M30		Reached
MS8 - Pilot Usability and Business indicator Second Evaluation	CHC	M32		Reached
MS10 - Pilots Evaluation Go/No-Go WP6	CHC	M34		Reached
MS12 - IPR Agreement	INVENT	M36		Reached
MS11 - Final Business Plan and Deployment Road map	INVENT	M39		Reached

Effort Distribution

During third reporting period, a different amount of efforts has been spent on different WPs. The graph below shows an overview of spent efforts distributed on WPs and the coherent different percentage of spent efforts, with respect to planned ones. Efforts are calculated in PM.

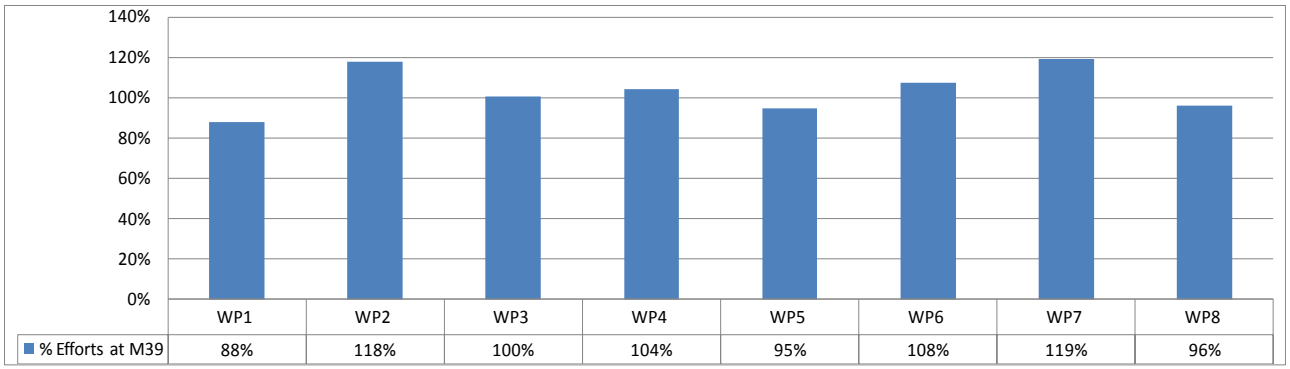

Figure 2 – Effort Breakdown in InCASA

The distribution of spent efforts among WPs during the last reporting period (M25-M39) and the cumulative distribution for the whole project are reported below.

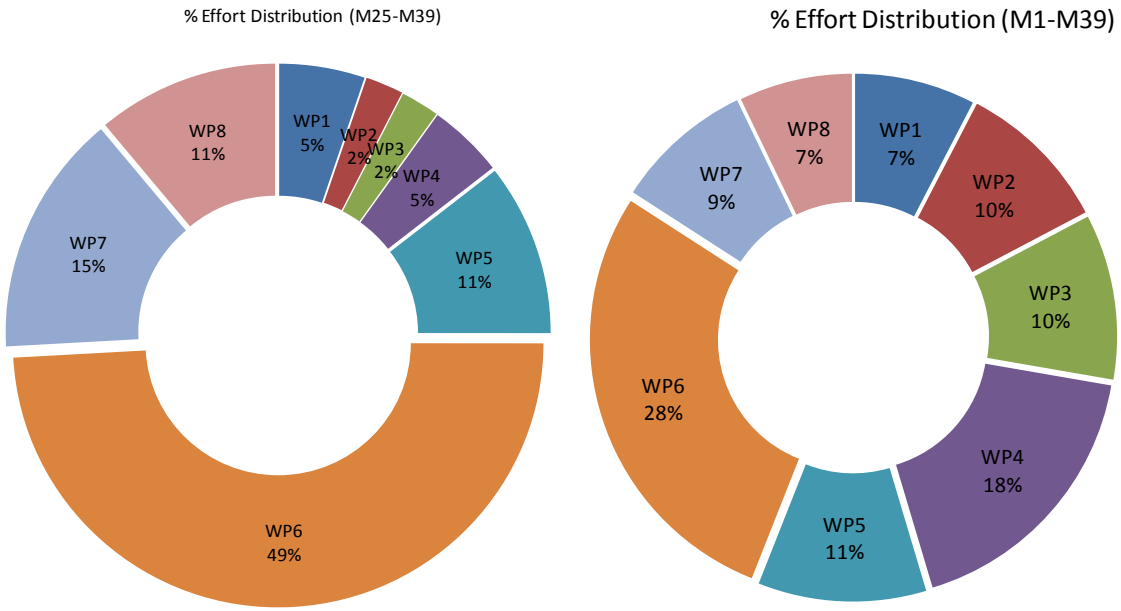

Figure 3 – Effort distribution among WPs within this reporting period (left) and for the whole project (right)