

D4.2 SmartCare Field Test Report Version 1

WP4: System Implementation and Test

Version 1.0, 18th April 2014

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Document information

Abstract

This document describes the field test procedures as planned (first and second wave pilots) and performed (first wave pilots) before the launch of the pilot's operation. Consequent actions in case of problems identified after analysis of the tests results are also discussed.

Key words

Field Tests, Integrated Care, Prototypes, Evaluation methodology, User Interface, Electronic Health Record.

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Filename

D4.2 v1.0 SmartCare Field Test Report (V1)

Statement of originality

This deliverable contains original unpublished work except where clearly indicated otherwise. Acknowledgement of previously published material and of the work of others has been made through appropriate citation, quotation or both.

Executive summary

This deliverable describes in detail the prototype validation mechanisms per site before the official launch of the pilots. This particular validation mechanism is known as field test, as it is conducted in conditions as near as possible to the actual operation.

Version 1 describes mostly the first wave pilots, however second wave pilots also appear in the current version with varying degrees of maturity per site.

All sites have to answer the same set of questions; these are:

- Introduction, Scope and Objectives.
- Methodology.
- Users, Time and Location.
- Prototype Description.
- Evaluation.
- Conclusions and Further Work.

The individual conclusions and further work sections per site reflect the level of existing infrastructure as well as the maturity of the solution and the overall implementation plan. It is important to note that all sites expect to run evaluation sessions prior to official pilot launch, to make sure that functional requirements are met.

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1. Introduction

1.1 Purpose of this document

The scope of this deliverable is to describe in detail the prototype validation mechanisms per site before the official launch of the pilots. This particular validation mechanism is known as field test as it is conducted in conditions as near as possible to the actual operation.

D4.2 comes in two versions, Version 1 and Version 2. Version 1 focuses mainly on the first wave pilot sites, which by now have proceeded with the setup of the required infrastructure to host extensive testing before launch of the SmartCare services. Second wave pilot sites also appear in Version 1, but despite the fact that they provide input under the same headings, the depth of analysis varies according to the degree of maturity per site.

1.2 Structure of document

There is one section for each pilot site. The structure of information per site is identical. The topics discussed are the following:

Introduction, Scope and Objectives: This section is dedicated to explain briefly the scope of each site and to state the objectives as these were set out in the Technical Annex. This set of objectives, materialising into technical and functional specifications, is the guideline against which performance will be measured.

Methodology: Testing, depending on the implementation under scrutiny, can be a very complex process, so the descriptions per site vary according to the size and maturity of the offered service. A common principle for establishing a sound methodology is to follow closely the objectives set from the early stages of designing the services.

Users, Time and Location: Criteria and selection process for the end users participating in the field tests will be detailed, as well as the time frame and/or duration of tests and the available venue or venues including the end users' home environment.

Evaluation: Evaluation in the SmartCare context is defined as a continuous process; field tests are no exception to this. In this section, the means used for the site should be described in detail and adequately explained.

Conclusions and further work: The test results will have an impact on the original design, as well as the implementation followed for the offered services. In case problems are identified, then there will be consequent actions in an effort to rectify them and return to operation according to all technical and functional specifications. Even if operation is flawless, there are other parameters that might be identified that could benefit from reconsideration, e.g. promotion or educational material for the end users / patients or training and technical support issues for the professional end users and technology provider.

1.3 Glossary

API	Application Programming Interface
EHR	Electronic Healthcare Record
FVG	Friuli Venezia Giulia



GP	General Practitioner
HCP	Healthcare Professional
ICT	Information and Communication Technology
IS	Information Systems
LiU	Living it Up (Scotland)
RSD	Region of Southern Denmark
SCP	Social Care Professional

2. Prototype FVG (1st wave pilot)

2.1 Introduction, Scope and Objectives

As FVG has decided to subcontract the whole service of the SmartCare Project, the field test will be designed and implemented by the company that is awarded the contract.

The field test is scheduled to start in May 2014.

3. Prototype Aragon (1st wave pilot)

3.1 Introduction, Scope and Objectives

For the successful provision of services and coordination of the agents providing integrated care within the SmartCare project, it is necessary to design, develop and implement a set of building blocks and functionality not already covered by existing infrastructure and services, neither by SALUD's information systems, nor by the various participating social and informal providers of the project.

The main objective of the SmartCare project is to provide a common framework that allows all agents easy access to all the information needed to coordinate actions in providing integrated care. Likewise, it is aim of the project to ensure that the protocols of actions in the different organisations are not heavily modified, so as to guarantee the continuity of developments and successful future use, minimising the impact on procedures. Therefore, this framework should allow:

- a) access to information from different information systems, integrating those data that will permit easy access to all the information needed for the provision of a service at a single site;
- b) access to the agenda of integrated care that allows coordination of actions by different suppliers; and
- c) consultation of the event history of actions performed.

Since the web site is a place that combines information from different information systems from different vendors, the scope of the testing phase is not the evaluation of the functionality of already existing systems, but the new developments. That is, the ones implemented within the scope of the web portal.

Different objectives pursued in the testing phase:

- Implementation compliant with the requirements. Requirements are very often not well defined in the initial stages, and/or they vary over time. Therefore, the testing phases permit modification of the implementation to ensure that the requirements are fulfilled.
- Ensure its use: The use of a solution depends on several criteria, but the testing phase will permit enhancement of many facets that ease its future use (i.e. compliant with requirements, user-friendly interfaces, corporate look & feel, compliant with current procedures, etc.).
- Reliability and quality assurance.
- Performance of the system. Performance is an important feature of any computer system. In some cases, this can directly influence its usability while in other cases; it may directly invalidate the purpose of a system. Performance tests seek, at the lowest cost possible, to minimise these problems as much as possible.
- Agile and ensure fast development.
- Implementation at the minimum cost. Beginning the testing phase at early stages of the implementation should help to minimise development costs.

3.2 Methodology

The solution will be to implement a methodology that permits the development team to implement quality software, at a low cost, and quickly. Therefore, the strategy will be to involve all actors in the testing phase from the start of the development.

The testing methodology will consist of the following steps:

- Management of the resources and environments to reproduce the live environment. After the phases of analysis, design and development, the software will be tested in an isolated environment on a pre-production server that will have similar conditions to the production server, to ensure its proper running in that future phase. The aim is to minimise the uncontrolled differences between the development and production environments. Server, databases and middleware will be set up with same configuration as in the production environment. Testing will be performed, followed by migration to the production environment.
- Definition of the cases to test: A clear identification of the modules to test will be defined so as to test the just newly developed modules. This step will also ensure that current procedures are minimally impacted, and that the solution is compliant with the requirements.
- Continuous testing. The later an error is detected, the more expensive will be its correction. Therefore, the methodology is oriented to the early detection of errors in the development and implementation phases, and on the potential risks to the project. The people that will be testing will be involved from the early phases of the implementation of the software, and will be testing continuously.
- Distribution of the test workload and the responsibility of the tests between different users / teams of users. Different types of users will be chosen for the different tests, so that they form an evaluation team that covers all the points of view, avoiding single points of view or conflicting priorities; i.e. usability, healthcare and social care protocols, compliance with requirements, ensure software quality, performance, etc.
- Avoiding the cost of the transfer of knowledge, by involving staff from the health and social organisations in the testing.
- Shorten the correction cycle. As soon as errors are detected, they are solved, so that there is no long period between versions. That is possible through the involvement of both testing and user staff in the development phases.

The development will be guided by a test-driven development (TDD), where there is a cycle of development, transformation of requirements into unitary tests, testing, solving of errors, and a new cycle of tests. The aim of this test-driven development is to get clean working code that guarantees that the software is compliant with the established requirements.

3.3 Users, time and location

Traditionally, the burden of testing was concentrated in the areas of Quality Assurance testers, which in some cases caused conflict of interests between the developer and the tester, or resulted in software invalid or useless for the final users, as their expectations were not met. The SmartCare approach will be to involve in testing as many different users and roles as possible.

Therefore, the software developer, the test analyst, and the quality assurance user will perform modular and unit tests, along with “stress testing” to ensure that any module of

the system works correctly in an independently manner. These persons have a vast experience that permits them to detect large number of errors in minimum time.

In addition, other persons will play a significant role, with different interests to the developer and testers. These are the final users, who will participate from the beginning of the development. Social workers, healthcare professionals; GPs, nurses and specialists, and informal cares will be involved in the testing. These users will identify errors related to procedures, meaning of information, etc., which are not related to the coding, but to the caring systems and proper working and coordination, and that will ensure that the software, after their approval, will be useful and valid for them to perform their daily tasks correctly.

The timeline for testing, as already stated, will be for the whole duration of software development. The start of the development is January 2014, with parallel testing tasks. By the start of the pilot in May 2014, the first version of the software development will be ready and tested, and migration to the production server will be performed. For a couple months, the testing and development phases will continue so as to collect feedback from all users, and implement any new requirements or software adaptation if needed, resulting on a new version (v2.0).

Id.	Nombre de tarea	Comienzo	Fin	Duración	T1 14			T2 14			T3 14	
					ene	feb	mar	abr	may	jun	jul	ago
1	Development	01/01/2014	16/05/2014	19,6s	█							
2	Testing	01/01/2014	16/05/2014	19,6s	█							
3	Start of pilot (v1.0)	28/05/2014	28/05/2014	0s				◆				
4	Enhacements	02/06/2014	18/09/2014	15,8s							█	
5	Testings	02/06/2014	18/09/2014	15,8s							█	
6	Enhancements (v2.0)	25/08/2014	25/08/2014	,2s								

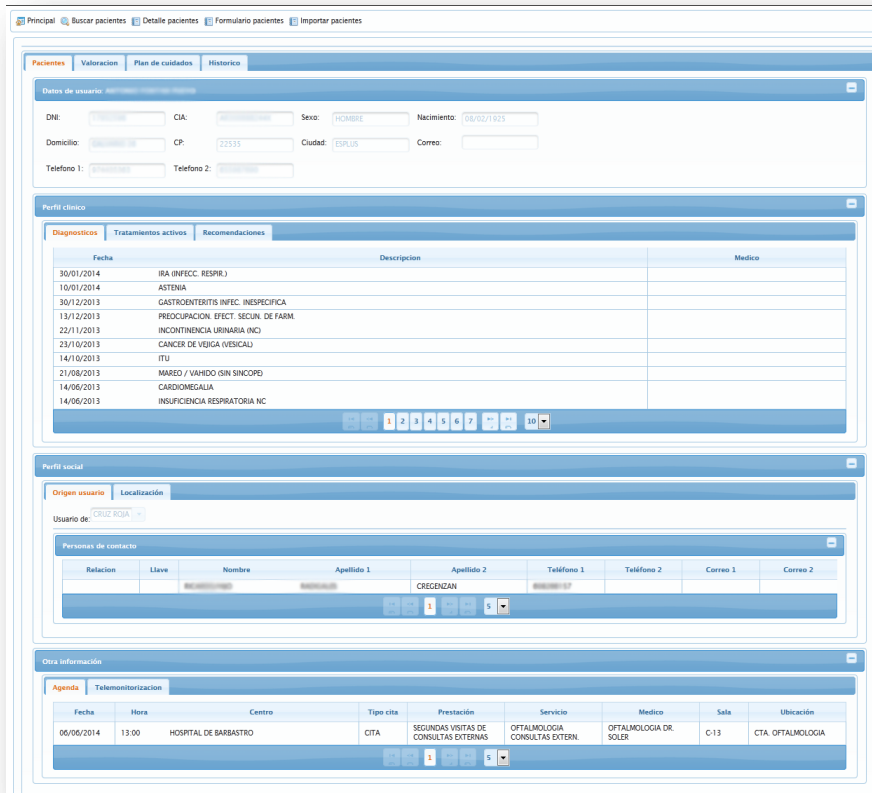
Figure 1: Gantt diagram for testing

3.4 Prototype Description

The Aragon SmartCare Integrated Care Portal is a web portal composed of information coming from the different service providers' legacy systems, databases and records, and information generated from the development of the SmartCare system. The website will have different views and roles for the different type of users.

The web portal will permit access to information from different information systems, integrating those data that will permit:

- easy access to all the information needed for the provision of a service at a single site;
- access to the agenda of integrated care that allows the coordination of actions by different suppliers; and
- consultation of the event history of actions performed.



Principal | Buscar pacientes | Detalle pacientes | Formulario pacientes | Importar pacientes

Pacientes | Valoración | Plan de cuidados | Historico

Datos de usuario

DNI: CIA: Sexo: HOMBRE Nacimiento: 09/02/1925

Domicilio: CP: 22535 Ciudad: ESPLUS Correo:

Telefono 1: Telefono 2:

Perfil clinico

Diagnosticos | Tratamientos activos | Recomendaciones

Fecha	Descripcion	Medico
30/01/2014	IBA (INFECC. RESPIR.)	
10/01/2014	ASTENIA	
30/12/2013	GASTROENTERITIS INFECC. INESPECIFICA	
13/12/2013	PREOCUPACION EFECT. SECUN. DE FARM.	
22/11/2013	INCONTINENCIA URINARIA (NIC)	
23/10/2013	CANCER DE VESIGA (VESICAL)	
14/10/2013	ITU	
21/08/2013	MAREO / VAHIDO SIN SINCOPD	
14/06/2013	CARDIOMEGALIA	
14/06/2013	INSUFICIENCIA RESPIRATORIA NC	

Perfil social

Origen usuario | Localización

Usuario de: CREZ ROSA

Personas de contacto

Relacion	Llave	Nombre	Apellido 1	Apellido 2	Teléfono 1	Teléfono 2	Correo 1	Correo 2
				CREGENZAN				

Otra información

Agenda | Telemonitorización

Fecha	Hora	Centro	Tipo cita	Prestación	Servicio	Medico	Sala	Ubicación
06/06/2014	13:00	HOSPITAL DE BARBASTRO	CITA	SEGUNDAS VISITAS DE CONSULTAS EXTERNAS	OFTALMOLOGIA CONSULTAS EXTERN.	OFTALMOLOGIA DR. SOLER	C-13	CTA OFTALMOLOGIA

Figure 2: SmartCare Integrated care portal example

Therefore, the following functional modules will be implemented:

- **Identification of users:** The identification of users is critical to ensure the security of patients. Patients can access their summarised EHR through their digital certificate on their National Identification Card. Moreover, users are identified differently by the SALUD organisation (by the Healthcare Card) and by the social care providers (by National identification number or name). Therefore, a user identification mapping will have to be constructed so as to properly identify users on the different information systems.
- **Search of care receivers:** This module will enable a search for care receivers on the SmartCare database.
- **Care receiver profile:** This will show the personal data and contact persons' data, and the integrated care shared EHR (minimum social and clinic data set). The health profile will show the diagnosis, drug prescriptions, recommendations, etc. The social profile will permit to consult information coming from the different social providers' information systems. The agenda for health events / consultations will also be included in this module, along with telemonitoring information.
- **Assessment module:** The assessment module will allow sharing of the different evaluations performed by the different actors at different times, which will be accessible to the SmartCare Evaluation Committee through the SmartCare portal. These assessments will be those of health assessment, social risk assessment from different providers, function of the family role, etc. Pdf scanned documents or other formats can be reached.

In addition, this module will be used by the SmartCare Evaluation Committee to justify the inclusion or denial of participation of a user into the SmartCare

programme (based on the previous documentation). And if the user agrees to participate, the signed consent form will be linked.

- **Integrated Care Plan Module:** This module will create a first approach of services requested by the user and an integrated care plan. Its main functionality is the definition of the services required, the social provider in charge of providing the service, the status of the applications, and the plan of activities to perform together with its frequency and those responsible. This will allow coordination of actions, agents and providers to ensure integrated care.
- **Integrated Care Record Module:** This will permit not only the definition of the Integrated Care Plan, but also hold a history of records on the integrated care, with information about the provision of services: services provided, actions performed, agents responsible, etc.

3.5 Evaluation

Although an evaluation on the testing phase is not planned, a review of the process can be performed at the end of testing.

3.6 Conclusions and further work

No conclusions can be reached yet.

4. Prototype Scotland (1st wave pilot)

4.1 Introduction, Scope and Objectives

The aim of SmartCare in Scotland is to "improve the health, care and wellbeing of 10,000 people aged 50+ within Ayrshire and Clyde Valley, by enabling a better co-ordinated and more effective approach to falls prevention and management ... focusing on the role that ICT services and applications can play in supporting integrated care".

The SmartCare programme will link service provision across health, social care, family, informal cares and the third and independent sectors. It will use familiar technology to support people and their carers, to share information about their health and social care needs and coordinate the daily activities which keep them independent.

The existing platform of Living it Up (LiU) (www.livingitup.org.uk) was developed over 2012/13, and will be used to support SmartCare.

Initial on-site testing of the LiU technology platform to be used for SmartCare will be undertaken by two local health and social care partnerships in the Lanarkshire area in May 2014. Subject to the outcome of this testing, use of the platform will then be extended to the other five partnership areas over June and July 2014. To identify the ICT tools necessary to integrate care pathways across organisations and locations, a SmartCare Implementation Sub Group was established in November 2013. The group includes the Programme Manager, local Project Managers, and other support resources as appropriate.

From October 2013 to January 2014, this group has scoped out the service improvement opportunities and gaps which need to be addressed by ICT in support of better integration and co-ordination of the falls management and prevention pathways. In particular, the group has reviewed how existing technology and platforms can be opened to cross sectoral teams (acknowledging many of the challenges around data governance and the plethora of IT systems within the public sector). It was agreed that suitable technology and platforms need to support:

- Increased collaboration across agencies to develop the local falls service to address common aims as set out in national guidance.
- Improved data collection which indicates the number of fallers and nature of outcome.
- Improved ability of service users and carers to better manage chronic health conditions at home and deal with increasing frailty.

All of the work to date has helped inform the service and technical requirements of the SmartCare model. This consists of four main components:

- **Community Connector:** SmartCare will support self management and well being by linking staff, users and carers to relevant information, services and products in their chosen community. SmartCare will use the existing LiU digital platform which currently operates across five geographic regions in Scotland as a cost effective and innovative solution to link them to their 'circles of care'. LiU has functionality to support an intuitive information search engine which will pull personalised information, services and products towards the person and their interests based on information captured within a personal profile. Scoping of the relevant information, products and services in relation to falls management and prevention is already underway (being led by one of the Project Managers), and a Community Manager Post is in the process of being recruited to brand and upload the SmartCare resources onto the LiU platform from April 2014.

- **Care Co-ordination:** In support of more effective care planning and co-ordination for the individual and their carers, a web-based digital diary / calendar and associated tools will be developed. Initially, the health and/or care professional will work in collaboration with the individual and their family and friends to complete a person centred diary which is then shareable with a range of relevant care providers and the person's 'circle of care'. We are exploring the best links with health and care systems in the local areas with a view to supporting service providers to make appointments / send reminders / share information. The diary will be designed in a way which recognises the challenges for family carers and people living with dementia.
- **Person Held File (PHF):** This digital file will support the person to retain information on their health, care and wellbeing. Updates from GPs, community nurse, social workers, etc., can be stored in the PHF; it is anticipated this can be used in emergency situations, out of hours, etc., to help prevent inappropriate admissions to hospitals and care home. The person's anticipatory care plan (ACP) and Key Information Summary (KIS) could also be stored in the PHF for review and updating over time.
- **Digital Tools for Independence and Re-ablement:** Digital tools for self assessment, screening and multi-factorial assessment will be developed to ensure an accurate assessment of need. Service delivery programmes of intervention will be supported by exercise apps using gaming techniques and personal outcomes to sustain motivation and improve confidence.

4.2 Methodology

The first stage in approach to developing digital services to support and integrate the falls pathway was to consult widely with all the key stakeholders involved in the delivery of the falls services and people using the existing service. We needed to develop a broad consensus on the redesign of the pathway and the type of digital solution we could bring to the pathway to improve integration and co ordination. To achieve this, a number of consultation events were held.

October 2013: This event was an event specifically for users and carers, and was held as part of Scotland's Telehealth & Telecare week. The event took place at Scotland's national football stadium at Hampden Park on 31st October 2013, and involved 165 participants. In addition to a large number of users and carers, there were representatives from each of the three Health Board and seven Local Authority partners involved in the project, plus Scottish Ambulance Service, Scottish Fire Service, Police Scotland, Telecare & Telehealth service and equipment suppliers, Carers UK, Alzheimer's Scotland, Telecare Services Association, Quarriers Scotland, and NHS Forth Valley. The purpose of this event was to raise general awareness of SmartCare with carers / service users and patients, and to highlight how technology can support their health, care and wellbeing; to offer an introduction to the programme which will be progressing in their local area; and to encourage service users / carers and patients to become involved in co-designing and developing care pathways, and to understand the benefits of using assistive technology to support them in the community.

January 2014: This event was also held at Hampden Park in Glasgow and was branded as a SmartCare 'Show & Tell' event. There were 186 participants at the event, and 21 industry / technology suppliers exhibited their products to a wide range of staff, users and carers. (Ref: Feedback Report from Show & Tell Event). The specific purpose of the Show & Tell event was threefold. It aimed to engage potential industry partners in the project, and review current technology offerings and products which could be of interest. It also raised awareness and understanding of service providers, users and carers on the effective role

that technology could play in the service redesign of integrated falls pathways, and in supporting individual health and wellbeing.

A key outcome was the commitment to forming local reference groups to co-produce the SmartCare digital solutions and test prototypes as they emerge.

Each local area has also held events to further progress implementation. The outcome of these events will be local reference groups who will work with us to complete the design of the SmartCare ICT tools.

The LiU platform is currently undergoing adjustments to include the geographical areas of SmartCare. This work will be completed for the go-live in May 2014.

In addition, preparation work on the Community Connector element has commenced. A sub group to the Implementation Group is currently mapping, reviewing and importing local information and tools relevant to falls management and prevention across the seven partnership areas. This information will be complete for the Lanarkshire Area by the 1st May 2014, with planned expansion to the other areas during June and July 2014. Sub groups for the three other ICT elements have been established with a clear lead role in place.

The formal tendering process was launched in early April 2014, with the issuing of a PQQ invitation. The aim of this is to identify partners who will work in collaboration with Scotland to cost, develop and implement the remaining three ICT components of the SmartCare model. A reduced scope may be required if costs are unaffordable. Any partners will be required to meet the open standards approach adopted in LiU, and use the API guidelines. All additional ICT tools and developments will require to be embedded within the common LiU platform to ensure integration, better communication, and support care co-ordination. This work will proceed over the next three months.

An audit of existing systems in each local area has been undertaken to ensure we establish the potential to link with existing local systems.

4.3 Users, time and location

Three project managers from each of the local areas have received a briefing on the existing LiU platform, and are now using the site to identify opportunities for development specifically in relation to falls management and prevention. They have also introduced LiU to service users and carers at the local events, and collated feedback on the relevance of the site to people who have fallen or are at risk of falling. This feedback is being used to develop the LiU platform to accommodate the needs of SmartCare users. At present, this has involved 45 users and carers.

Approximately 60 staff have been introduced to the site, and again their feedback is being used to further develop digital services on the site to support their falls prevention work. Staff have been particularly interested in the connect service which can facilitate consultation with professionals, or enable the person to participate in local exercise classes even though they are housebound.

This activity has ensured we have a well informed group of users, carers and professionals.

From 1st May 2014, a larger number of people receiving falls services for recovery and prevention will be using the LiU site.

4.4 Prototype Description

A key element of new development will be a SmartCare application that offers a personally held tool to build an integrated record for care provision, also a care diary / calendar, digital tools for self assessment and independence, and information about events and activities to promote wellbeing.

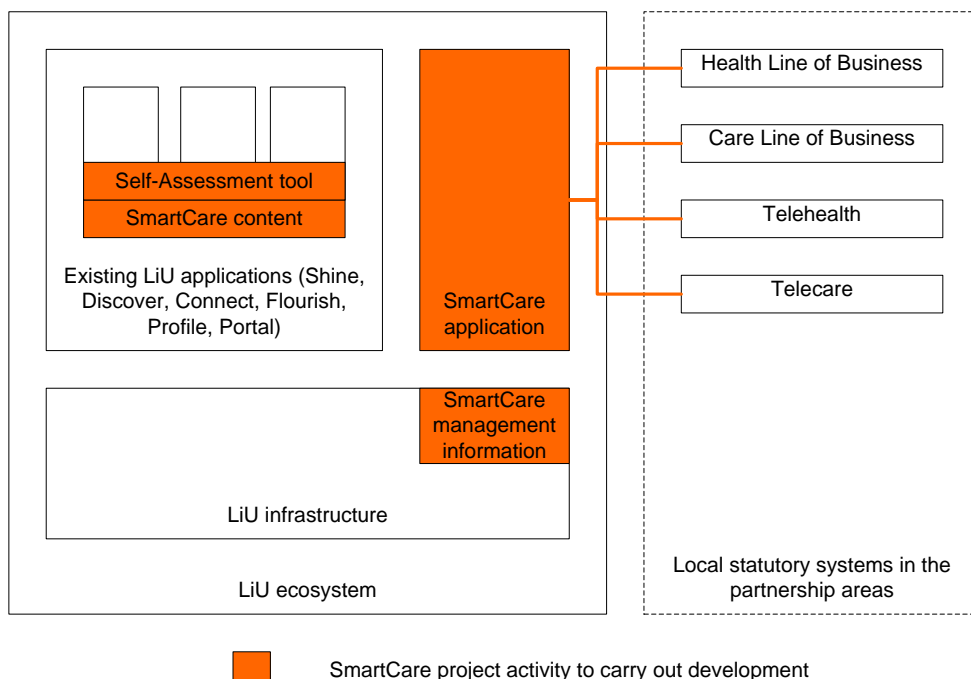


Figure 3: Living it Up and SmartCare integration

4.4.1.1 The approach to the SmartCare application

A working assumption is made that there will be a single new application in the LiU ecosystem that takes care of unique new functionality to support the SmartCare pathways.

The application is expected to be browser based, designed for use by the general public on consumer devices. It will include suitable security for holding sensitive personal information and for user authentication supported by the LiU infrastructure. It is also expected to support integration with systems in the statutory domain.

The Scottish SmartCare concept emphasises that this application contains information owned by the user, with access by other parties controlled by the user. This application will become the location of an integrated record to allow a more timely and informed response by professionals.

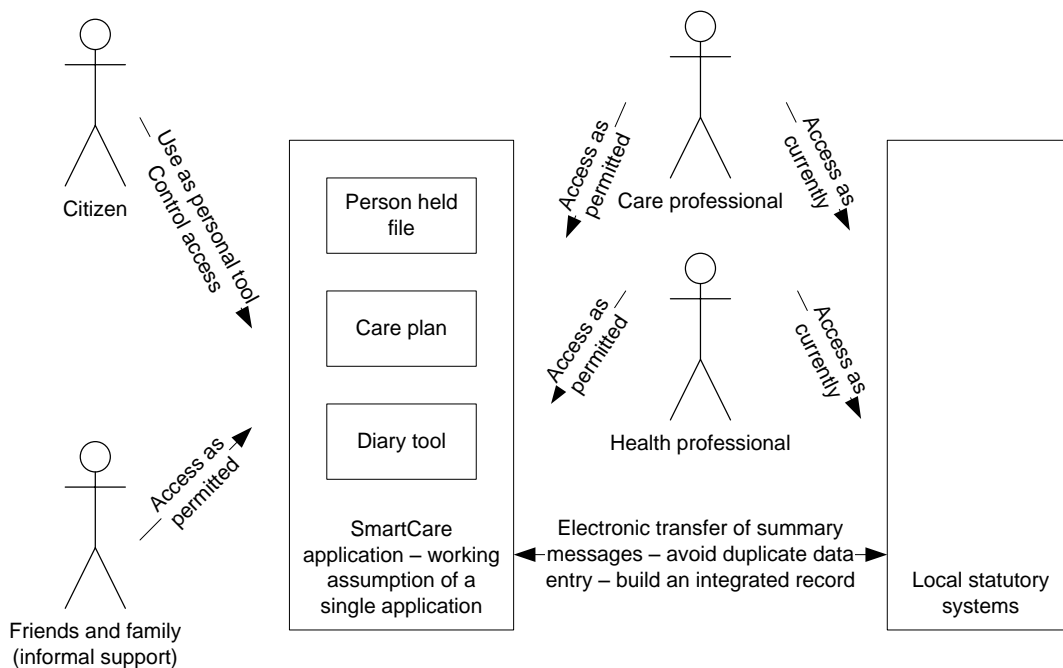


Figure 4: Concept of the SmartCare application

4.4.1.2 Integration with existing local statutory systems

Integration with existing local statutory systems is intended to avoid duplicate data entry and timely availability of summary information.

As a general policy, SmartCare expects the application to natively support open interoperability standards.

Further analysis is needed to identify those standards because they depend on details of the summary messages to be exchanged and whether a fit-for-purpose standard is available. In the healthcare domain, this may well lead to standards from the HL7 area. Equally, we will need to consider relevant health and social care integration standards being developed in the UK (including Scotland) between the NHS and Local Authorities.

We may find some level of constraint around standards support by what is available from systems that are already deployed. In this case, we will seek to use integration technologies to build adapters rather than attempt to introduce bespoke extension into existing products. In the case of NHS Scotland, we will be able to build on the national investment in an integration product. For Local Authorities the situation is unclear at the moment.

4.4.1.3 Integration with the LiU platform

In order to participate in the LiU ecosystem, procurement will specify a number of non-functional requirements to ensure interoperability.

Some of these will require integration with the platform API. Some are policies that need to be reflected in the way the application is designed and delivered.

Cross-browser and cross-device support

The LiU policy is that applications are supported on mainstream consumer browsers and devices. Currently:

- On PC:
IE 8, 9, 10;
Chrome - latest;
Firefox - latest;
Safari - latest.
- Plus default browsers on iOS and Android handheld devices - latest versions of browsers on latest version of the OS.

Under normal circumstances, applications should be browser-based, written in HTML 5 and use an adaptive grid for rendering on a variety of form factors.

Detailed UX guidelines are available.

4.4.1.4 Common login and SSO

The application is expected to accept LiU as Identity Provider (in other words, users can use their existing LiU login). This requires support for the authentication protocols that LiU provides.

4.4.1.5 Common navigation

The application is expected to support movement across all applications of the ecosystem. This can take various forms, such as the inclusion of the LiU global navigation bar in an IFrame, or adoption of other UI components in the page code.

4.4.1.6 Personalisation using the profile

The application is expected to utilise the LiU Profile in order to improve the overall user experience for an individual that moves between applications, such as:

- retrieve information to avoid duplicate questions (e.g. demographics when setting up the SmartCare application and person held file);
- store information that would be relevant for other applications (e.g. interests that other applications can use for content searches).

4.4.1.7 Common branding and UX, common domain URL

This is an area that will be driven by business needs and by end-user need for a straightforward user experience.

The current LiU applications demonstrate a very high level of adoption, but from a technical point of view it would be equally possible for an application to show a high degree of its own identity.

4.4.1.8 Business intelligence

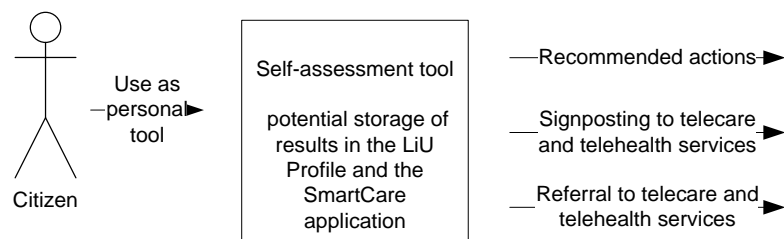
The application is expected to provide management information via Google Analytics and potentially by submitting additional information to the LiU infrastructure API.

Elements of development on LiU to support SmartCare

In order to support SmartCare, a number of related developments will take place on the LiU platform itself.

- Provision of content aimed at the SmartCare user population. This can take various forms:

- Adding articles to the LiU Content Management systems (Drupal) which support Portal and Flourish;
- Adding information on local services and events to third party sites (such as <http://www.aliss.org/>) that are linked to LiU through web services. These support Shine and Discover to provide tailored information;
- Messages and videos on social media (Twitter, Facebook, YouTube);
- Adoption of SmartCare branding and hyperlinks.
- Adding support for SmartCare management information:
 - Picklist options to allow users to identify themselves as SmartCare participants;
 - Dataset extracts;
 - SmartCare reports.
- Development of the self-assessment tool:
 - This is likely to be a feature development in the Flourish application.



4.5 Evaluation

The evaluation process has been established and a working group is meeting every four weeks to progress this work. Questionnaires are being developed for implementation on 1st May 2014. A methodology acceptable to both health and social care is being explored.

Specific evaluation of the digital tools developed will commence around September 2014. From May to September, we will collect data on the community connector service and the benefits achieved.

4.6 Conclusions and further work

SmartCare in Scotland is a direct service to users and carers; it has been critical that we developed the service along with them rather than for them. This is in line with national policy in Scotland, ensuring services are co-produced and outcome focused. This approach requires a significant investment in partnership working which is very time intensive. The positive outcome is that you develop a service which is fit for purpose and sustainable in the future. This investment should help us generate expected referral numbers early in the process, and sustained interest as the service is genuinely meeting need as identified during the co-production process.

Our tendering process will be complete at the end of August 2014, and we can then work more intensively with suppliers to create the products we need to support the falls pathway.

5. Prototype RSD (1st wave pilot)

5.1 Introduction, Scope and Objectives

The development of the Shared Care Platform originally started in April 2012. In the development process, both social care and healthcare professionals, e.g. doctors and nurses, have been involved; care coordinators, physical therapists and patient associations also provided input.

The Shared Care Platform has been in use since May 2013 after the initial development process ended. The platform was tested by three nurses and one secretary in their daily work with heart disease patients in Svendborg. Since they have tested the system in their daily workflow, they have been able to provide many useful inputs, e.g. on response time and adjustments to the system.

When new users get access to the Shared Care Platform, they get access to the test environment for approximately one month. The test environment is a safe way to get to know the system and test the functionalities before committing to the actual platform. The support team in the Health Innovation Centre of Southern Denmark also uses the test environment to build up new interfaces and test coming releases from the provider (IBM).

We have chosen this approach because we believe that the best test results come from “live” testing close to the user’s actual workflow. The goal has been to ensure that the system actually works in a real life setting. The pilot group has been very limited on purpose, since it is demanding and challenging for the professionals and potentially the patients to be part of a pilot starting phase.

In addition, seven patients have had access to the system from their home to provide input on the patient user interface. Their input, and additional input, was collected at a patient workshop held on 20th March 2014.

In April, some selected GPs and social care providers will start testing the system in their everyday work so they can provide input on their needs and requirements.

Having a couple of selected users ensures that not all potential users have to spend time on the test. Testing a new system is time consuming; this way, we ensure that time is not wasted.

5.2 Methodology

As described above, small specialists groups were appointed to test the system; at the same time, the support team at the Health Innovation Centre of Southern Denmark conducted different tests every time there was a new release.

During the development process, interviews were conducted and meetings were held with the different actors. The meetings were individual meetings where the Shared Care Platform was assessed by the users. Follow up meetings have been held on a regular basis to make sure that all questions have been answered and all requirements have been taken into account.

A special support e-mail account has been opened so the users can ask questions to the Shared Care support team in the Health Innovation Centre of Southern Denmark. There has also been telephone contact with the users and they have also had the opportunity to call the support team to ask questions or comment on the system.

Different requirements, wishes, comments and needs have been brought to the provider IBM at the monthly project meetings that have been held throughout the process.

5.3 Users, time and location

Three nurses and one secretary have been involved from May 2013 in their own setup.

Since May it has been an ongoing process to give patients access to the platform. Since May 2013, seven patients have been granted access to use the platform from their own home. Even though only seven patients have access so far, many more patients' data have been entered into the platform. Specialists have entered data for about 120 patients so far and the number is rising all the time.

The support team from the Health Innovation Centre of Southern Denmark has been testing the system from the office since 2012. Whenever there has been a new release from the provider (IBM), the support team has tested the changes in the test environment before the users get access to new releases.

From April 2014, one social care providers and four GPs will get access to use the platform in their own setup to test the system before deployment starts in May.

5.4 Prototype Description

The Shared Care Platform builds on existing systems and standards such as SAM:BO and MedCom messages that have been described thoroughly in other deliverables.

The Shared Care Platform is described thoroughly in deliverable D4.1. Basically, the Shared Care Platform is a web based system built up around generic building blocks; it is therefore also possible to configure the system for other disease areas.

The following elements have been developed and tested along with response time in the prototype:

- Forms.
- Activities.
- Portlets developed based on the workflow at the hospitals with focus on the conversation with the patient.

These following are examples of portlets in the Shared Care Platform.

Diagnoser		
Dato	Navn	Historik
29-08-13	AKS (NSTEMI med PCI)	Vis
06-09-13	Risikofaktorkontrol	Vis
06-09-13	Familier hyperkolesterolaemi	Vis
29-08-13	Diabetes type 1	Vis
06-09-13	KOL	Vis

Vis slettede

This portlet describes the diagnoses entered by the specialists.

Symptomer				
Værdi	Måling	Dato	Ny måling	Vis graf
Svimmelhed	Nej	29-08-13		
Træthed	Ja	29-08-13		

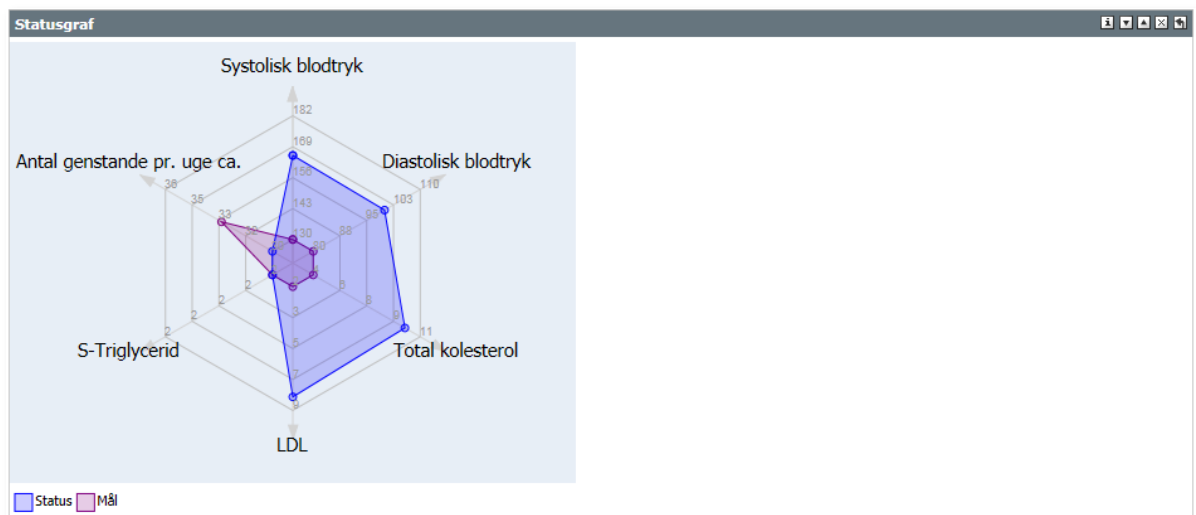
Vis slettede

This portlet describes the symptoms the patient has, including the latest measurements.

Mål og status				
Værdi	Mål	Status	Historik	
Systolisk blodtryk	under 130	155 mmHg	Vis	
Diastolisk blodtryk	under 80	95 mmHg	Vis	
HbA1c	under 6,5	7,8 mmol/l	Vis	
Total kolesterol	under 4,0	6,3 mmol/l	Vis	
LDL	under 1,8	2,0 mmol/l	Vis	
S-Triglycerid	under 1,7	4,0 mmol/l	Vis	

Vis slettede

This portlet describes the goals and status for the patient.



This portlet has a graph illustrating the goals and the status.

Målinger					
Værdi	Måling		Dato	Ny måling	Vis graf
Systolisk blodtryk	165	mmHg	19-08-13	Ny måling	Vis
Diastolisk blodtryk	100	mmHg	19-08-13	Ny måling	Vis
Højde	1,80	M	21-06-13	Ny måling	Vis
Vægt	69,0	Kg	18-06-13	Ny måling	Vis
BMI	21,3	Kg/m2	23-08-13	Ny måling	Vis
EKG	Atrieflimren		10-04-13	Ny måling	

Tilføj værdi Vis slettede

This portlet describes the measurements taken at appointments with care providers. The patient can also enter data.

Laboratorieværdier					
Værdi	Måling		Dato	Ny måling	Vis graf
HbA1c	7,8	mmol/l	29-08-13		Vis
Total kolesterol	6,3	mmol/l	29-08-13		Vis
LDL	2,0	mmol/l	29-08-13		Vis
S-HDL	1,4	mmol/l	29-08-13		Vis
S-Triglycerid	4,0	mmol/l	29-08-13		Vis

Vis slettede

Svar fra 0 ud af 9 laboratorier hentet 03-10-13 10.22

This portlet describes the lab values measured.

Egenomsorg					
Værdi	Måling		Dato	Ny måling	Vis graf
Socialt	Kontakt til hjemmeplejen		29-08-13	Ny måling	
Antal genstande pr. uge ca.	30	Stk	10-04-13	Ny måling	Vis
Motion antal timer pr. uge ca.	9	Timer/uge	12-06-13	Ny måling	Vis
I behandling for hypertention	Ja, er sat i behandling under dette forløb		12-06-13	Ny måling	

Tilføj værdi Vis slettede

This portlet describes self care abilities. The social care provider will benefit the most from this portlet.

Pårgørende				
Prioritet	Fornavn	Efternavn	Telefon	Relation
1	Anders	Andersen	86146622	Ægtefælle
2	Alice	Andersen	39823388	Datter
	Ulla	Nielsen		Ægtefælle

Tilføj

This portlet contains information on the patient's relatives.

Rapporter
Samlet Information Om Borgeren Hjerterehabilitering / Sekretaerrapport Hjerterehabilitering / Borgerens Plan

This portlet contains different reports that can be printed out.

Aktivitetsliste						
Deadline	Aktivitet	Ansvarlig	Organisation	Formular	Udført	Historik
06-12-13	3 månederskontrol	Tovholder			<input type="checkbox"/>	Vis
29-11-13	3 månederskontrol	Allan Nasser	Region Syddanmark		<input type="checkbox"/>	Vis
06-09-13	Udfyld spørgeskema inden samtale	Borger		Åbn Formular	<input type="checkbox"/>	Vis
06-09-13	Visitationssamtale	Tovholder			<input type="checkbox"/>	Vis

Vis slettede Vis udførte

This portlet contains the activity list for the patient.

Sundhedsfaglige Kontakter				
Rolle	Ansvarlig Person	Ansvarlig Organisation	Vis Kontaktinfo	Historik
Kommunekontakt		Nyborg Kommune	Vis Kontaktinfo	Vis
Tovholder	Jesper Rødtne	Odense University Hospital	Vis Kontaktinfo	Vis

Tilføj kontakt Vis slettede

This portlet describes the care professionals included in the care pathway and their contact details.

Noter til patienten				
Dato	Note type	Note	Ansvarlig	Historik
29-08-13	Note til patienten	Remember to take your medicine!	Allan Nasser	Vis

Vis slettede

This portlet contains notes sent from the care professionals to the patient.

Vejledninger				
Dato	Notetype	Note	Ansvarlig	Historik
09-09-13	Vejledning	Linkt til dit træningsprogram	Allan Nasser	Vis

Vis slettede

This portlet contains instructions on e.g. workflows or links.

Patientens egne noter				
Dato	Notetype	Note	Ansvarlig	Historik
26-09-13	Egne noter	Idag har jeg haft en forfærdelig hovedpine	Anne	Vis
23-09-13	Egne noter	Jeg har det rigtig godt idag. Har gået 5 km.	Anne	Vis
09-09-13	Egne noter	Jeg har glemt at tage mine piller i går :-(Jeg hat taget dobbelt portion idag - håber ikke at det gør noget?	Anne	Vis

Tilføj Vis slettede

This portlet contains the patient's own notes.

5.5 Evaluation

There has been an ongoing evaluation based on the feedback from the pilot users. These are the overall comments they had:

- Issues with response times in the system. This problem has been solved by using a new browser; more work will be done to optimise speed in Internet Explorer. Soon it will be changed to version 8 which should solve some of the issues.
- A number of minor adjustments have been made during the testing process.
- There is still no clarification regarding the report that is currently printed out for the secretary. This is due to the missing integration with the hospital system Cosmic, because adjustments still have to be made in order for it to work properly. There will be a meeting with the secretary on 27th March to discuss this matter. Hopefully the Cosmic integration will be in place before the pilot starts in May.

We have agreed on having a closer dialogue with the pilot testers, since it is crucial that they keep sending feedback on their requirements, wishes and needs regarding the platform, so that they do not return to their usual workflow and habits. This is also to ensure that all of the requirements are taken into consideration and approached more systematically, also in regards to further development. An overview has been prepared; this will be updated on a regularly basis at meetings.

In the future it might be necessary to appoint local project managers in each test site to ensure progress and collect input along the way as the number of users increases.

5.6 Conclusions and further work

The tests of the system have been very useful for the further development of the platform. It has made it possible to solve any issues along the way, because the tests have been an ongoing process. Test users have had to spend a lot of time testing the system, but it has benefitted the project.

We will continue using this approach. However, we are aware that this method requires a lot of follow up and dialogue at the beginning. Lessons learned throughout the process will be documented as a recommended implementation process to benefit other new locations.

The requirements received so far will be considered for further development; resources will be used to describe and develop the system to fit new needs and requirements when new pilot users are included in April.

6. Prototype Tallinn (2nd wave pilot)

6.1 Introduction, Scope and Objectives

The main idea of the SmartCare portal is to improve the independency and well-being of elderly care receivers who are suffering from heart failure. Improved health situation and stronger sense of security is expected from utilising the SmartCare integration infrastructure. Bringing together social and medical care givers and sharing information about the cared-for person between SCP, HCP and I/FCP is also a very important aspect for creating the portal.

Everyday users of the portal will be the cared-for persons who will make the vital measurements at home, and the SmartCare Contact Centre workers who regularly monitor these measurements. The specialty doctors and nurses, GPs, and in some cases the social worker are also expected to use the portal on a weekly basis.

6.2 Methodology

For the prototype testing, a set of equipment is going to be provided to the test subjects who represent the elderly cared-for persons, and to one or more GPs and specialty doctors. The Contact Centre workers will also have access to the SmartCare server prior to the start of the pilot, to test it and make suggestions.

Later, the opinions and suggestions of the testers will be evaluated; when the need arises, changes will be made.

6.3 Users, time and location

The first users of the portal are going to be the testers at the SmartCare Contact Centre. Later on, access will be granted to the health and social care providers. The end users will be involved once the portal is functioning without any problems.

The end users can access the portal through the tablet at home. SCP, HCP and relatives can access the portal through the web, either at home or at work.

6.4 Prototype Description

The SmartCare portal is a web-based system working on an android operating system. Access to the portal can be achieved either by a computer or a tablet. Through the portal, information about the cared for persons can be obtained and video connections can be established. The most important function of the portal is to gather the values of vital signs measurements taken by the elderly at their homes.

The standard set of SmartCare equipment involves the tablet, blood-pressure meter, weight scale and a social alarm-button.

6.5 Evaluation

The initial evaluation is going to be done after the initial testing of the SmartCare portal and equipment. Later, the evaluation is an on-going process based on the feedback of stakeholders.



6.6 Conclusions and further work

System testing is expected to have a very beneficial outcome, and changes to the system are going to be made taking into account the feedback of users.

7. Prototype Kraljevo - Serbia (2nd wave pilot)

7.1 Introduction, Scope and Objectives

Development of the integrated SmartCare portal will start in June 2014. From the beginning of the Project in March 2013, both social care and health care professionals have been involved in the process and contributed with their inputs to better envelop their needs into an integrated solution.

It is planned that first prototyping of the new services will be possible in early September 2014. Platform will be tested by selected professionals in their work environment with regular patients.

New users will be instructed to gain access to the system, and will have a chance to get used to the test environment for 14 days. This will allow them to safely acquaint themselves with the system before they access the live platform.

7.2 Methodology

Method used for choosing test groups of users will be performed by decision makers in the Centre for Social Work Kraljevo and Medical Centre Kraljevo. On the other hand, the system vendor will be at their disposal for any kind of help and questions, either through telephone assistance or email support.

7.3 Users, time and location

The number of professionals in the test period and exact time of the initial phase of testing will be decided in the near future.

7.4 Prototype Description

7.5 Evaluation

On-going evaluation will be performed throughout the testing period by the pilot users. All their comments will be collected, and face-to-face contacts with users will be recorded to further develop and adjust the system.

7.6 Conclusions and further work

To be defined.

8. Prototype South Karelia Social and Health Care District (2nd wave pilot)

8.1 Introduction, Scope and Objectives

South Karelia Health and Social Care District (Eksote) provides health services, family and social welfare services, and services for senior citizens that promote the health, wellbeing, and ability of residents to function well in everyday life. The District provides both health and social services in nine municipalities of South Karelia. Services for the elderly aim to promote their wellbeing, health, ability to function, and working capacity with high-quality, cost-efficient and flexible services that are adaptable to the service needs and age structure of the population. Eksote's multidisciplinary staff have a rehabilitative approach to developing the care of the elderly, and also make good use of modern technology. Particular attention is given to enhancing the remaining resources of the elderly and supporting independent living.

The aim of SmartCare Project's South Karelia site is to integrate social and health services more tightly together. This will be done by integrating SmartCare system with part of the home care services. There are two developing paths in the pilot: SmartCare platform and Contact Centre. The platform will be tendered and Contact Centre will be established during 2014. Also, remodelling of home care processes will be a very important part of the SmartCare project.

8.2 Methodology

Until now, the South Karelia site has focused on the development of the technical solution, tendering procedure and informing the nursing staff and informal caregivers.

8.3 Users, time and location

There will be (2015) ten health professionals and two social workers involved in the SmartCare Project. Most of them are working in the Contact Centre, and are part of the assessment of service needs team. The project staff have developed the SmartCare platform and have prepared the tender for the platform. The tendering procedure will be finished during autumn 2014, and pilot will begin in January 2015.

8.4 Prototype Description

The description of the prototype is not yet available because the tendering procedure of the platform is still in progress. The figure below shows how the patient data will be moved between different stakeholders, and how this will tightly integrate the social and health sectors. The SmartCare portal will be integrated into the eHealth platform of South Karelia Social and Health Care District. On the portal, there will be a professional view for both social workers and healthcare workers. Clients and their relatives will have their own view on the SmartCare portal.

South Karelia

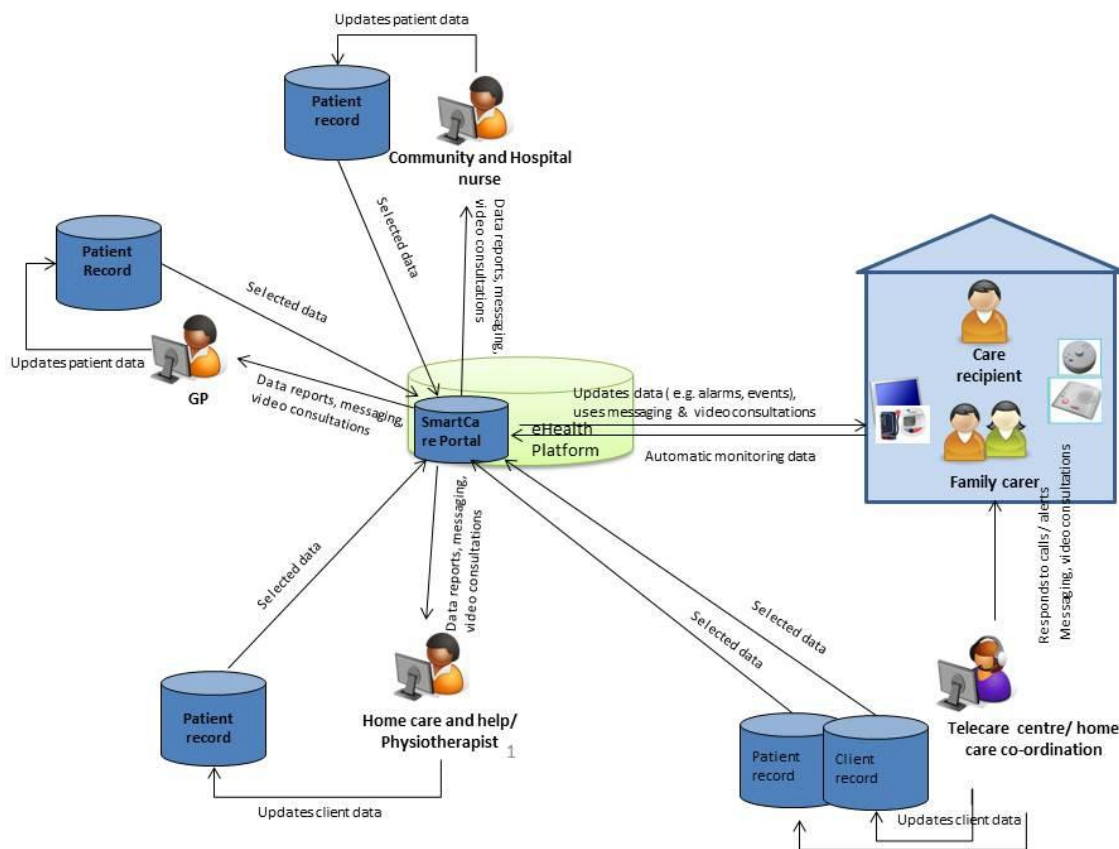


Figure 5: South Karelia data architecture

8.5 Evaluation

During the pilot there will be an ongoing evaluation based on feedback from users of the SmartCare platform. In South Karelia, we are also investigating how the SmartCare platform can support clients to live in their homes longer and safer. One of the study subjects will be how the system can impact on the solitude of clients. Informal caregivers will also be part of our study. The pilot clients will be evaluated by RAI assessment during the project.

8.6 Conclusions and further work

The pilot of the SmartCare platform and Contact Centre will began in January 2015. Then next steps in South Karelia's pilot site will be: finishing the tendering procedure, recruiting the nursing staff and social workers for the pilot, and after that pick and choose the clients and informal caregivers.

9. Prototype Attica (2nd wave pilot)

9.1 Introduction, Scope and Objectives

The Attica pilot site belongs to the 2nd wave pilot sites and its operation is forecast to start 1st January 2015 at the latest. Currently, the identification phase for the missing blocks in order to implement a SmartCare compatible service has been completed, and it is now followed by the development phase.

SmartCare, as an ICT enabled project, requires a significant testing phase for its prototypes before the prototype is released to a wider audience. This phase includes all tests of the operational aspects of the service to be piloted, together with compliance testing to the technical specifications and general standards.

Coherence of functional specifications *per se*, as well as qualitative parameters of the service such as usability, user friendliness, accessibility etc., will be tested after the prototype release, and they will be part of formal testing. The results of this phase are very critical to the overall SmartCare evaluation process, as they also have an impact at design level, in case of serious problems are identified.

9.2 Methodology

Training is of outmost importance for the “expert users”, i.e. the professionals (social and healthcare domains) who will be responsible for conducting the field testing. A principle of train the trainers will be used, where the technology provider of the site (Vidavo S.A.) will offer training sessions to the Attica site professionals who in turn will assist end users and test groups alike to familiarise with the system and introduce it into their everyday life.

Vidavo S.A. will offer its support throughout the field testing period, and closely follow the evaluation process so as to integrate all findings into the offered solution.

9.3 Users, time and location

The full technical solution is expected to be ready for testing by end of September 2014. All tests will be conducted at the premises of the three municipalities contained in the Attica pilot site, namely Palaio Faliro, Ag. Dimitrios, and Alimos. There are two categories of end users: the professionals and the patients. The professionals will perform first stage of testing during their training and familiarisation sessions, while the patients will only go through this phase once, and with the assistance of the professional carers. The recruitment period will start as early as possible, even before August, coinciding with the dissemination events that the municipalities will hold. Hence, we expect at the end of September to have an adequate number of users to take part in the field test period.

9.4 Prototype Description

The prototype description is not yet completed.

9.5 Evaluation

Evaluation for the Attica site is an ongoing process throughout the pilot period. It will be performed by various means, but mostly in the form of questionnaires either uploaded to the portal where the end users can reach them and fill them in, or depending on the type of usage level, these might even be in the traditional paper form and collected by the



responsible SmartCare team member for further analysis. The findings of evaluation and testing period are going to be incorporated into the provided service.

9.6 Conclusions and further work

At this stage and since testing has not even started, there are no conclusions to be discussed; however, when this phase is completed, we intend to retune the Attica implementation of SmartCare according to the findings of the testing period, so as to ensure maximum user compliance and satisfaction.