D4.2 THE BEYONDSILOS PROTOTYPE SYSTEM

WP4 System implementation & test

Version 1.2 / 5th February 2016

Document information

Organisation responsible

TSB

Editors

Valero Ramón, Zoe (TSB)

Juan-Carlos Naranjo (TSB)

Contributing partners

HSCNI
CPRH
BSA
LAFE
Campania
Amadora
SCMA
PT
Kinzigtal

Dissemination level

P   Public

Version history

Version	Date	Changes made	By
0.1	08th January 2015	TOC	TSB
0.2	12th February 2015	Compiled Contributions - Draft	TSB
0.5	13th February 2015	First draft	TSB
0.6	16th February 2015		TSB
1.0	25th February 2015	Initial version for issue	John Oates
1.1	16th September 2015	Final version for issue	TSB
1.2	5th February 2016	Table 1 and section 3.1 updated for Amadora	TSB

Outstanding issues

None

Filename

D4.2 v1.2 BeyondSilos Prototype system

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This deliverable contains original unpublished work except where clearly indicated otherwise.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

The aim of BeyondSilos is to develop and pilot integrated care services delivered with the help of a multifunctional ICT infrastructure. These services are to be based on two generic care pathways cutting across boundaries which typically separate healthcare from social care. These boundaries can be identified both at the level of service provision and technology. Third sector organisations and informal carers are to be included in the information loop where meaningful in order to facilitate self-care.

This document sets out what new elements have been finally integrated, and the result of this integration process at each pilot site. New elements and the result of testing are different as a consequence of different sites maturity and needs. Partners at the pilot sites have the freedom to choose their own ICT infrastructure, so as to reflect the fact that each site is already working with IT systems in place, and has specific requirements in terms of the service(s) to be implemented locally.

This deliverable details how each pilot achieves the final prototype system, specifying the last step of the methodology followed within WP3 and WP4 in order to correctly complete the delivery of integrated care in all pilot sites, describing what has been finally integrated in each pilot site, and the result of the integration process of these new building block with the rest of the pilot site systems.

Table of Contents

List of Figures

List of Tables

1 Introduction

1.1 Purpose of this document

This document provides details of the final implementation and prototype system at each pilot site for the two defined pathways:

- Integrated short-term home support services.
- Integrated long-term home care support services.

This test report builds on the identification of the new needs in the different pilot sites in order to correctly deliver the integrated care set out in the first iteration of the WP4 (D4.1 BeyondSilos prototype test report). This first iteration was focused on the implementation and testing of the old infrastructure with the newly defined components to cover new needs.

This first approach is now carried forward and completed in this document D4.2 The BeyondSilos Prototype System which fully specifies what has been done in each pilot sites and the result of the integration process.

1.2 Notes for version 1.2

During the winter of 2015, Amadora has updated the services offered. This updated v1.2 reflects the latest status of the pilots. Valencia also updated some deployment dates.

Version 1.1 included the experts' recommendation #R1 to clarify and update the buildings blocks and main components of the BeyondSilos integration infrastructure listed in the DoW table 4 page 49.

1.3 Structure

The deliverable details for each pilot site the technical description of the new developments that have been included in each pilot site, and result of the integration process of testing new and old systems.

Each pilot site's prototype system is detailed, with a clear functional description of each new component / building block of the implemented system identified in deliverable D3.2, and finally implemented at this stage of the project, and how it has been done.

Technical deployment plans were set out in the first iteration of WP4 (D4.1 BeyondSilos prototype test report). In this document, each site describes their results based in the test methodology described in D4.1, and how they finally conducted the tests.

The document closes with a conclusions section that summarises the results of the methodology followed to achieve different pilot site prototype systems.

1.4 Glossary

ADI	Assistenza Domiciliare Integrata (Integrated Home Care)
AOU	Azienda Ospedaliera Universitaria
ASL	Local Health Authority
BSA	Badalona Serveis Assistencials
CGM	electronic patient record system (Kinzigtal)

CHF/CHD	Congestive Heart Failure / Coronary Heart Disease
COPD	Chronic Obstructive Pulmonary Disease
CR	Care Recipient
DICOM	Digital Imaging and Communications in Medicine
EHR	Electronic Healthcare Record
EIP	European Innovation Partnerships
EMR	Electronic Medical Record
ERP	Enterprise Resource Planning
ESB	Enterprise Service Bus
EU	European Union
GUI	Graphical User Interface
GP	General Practitioner
GPS	Global Positioning System
HL7	Health Level Seven International
HSCB	Health and Social Care Board (Northern Ireland)
HTML	HyperText Markup Language
ICR	Integrated Care Record
ICT	Information and Communications Technologies
IFR	Informal Carer
LCID	Northern Ireland Community information
NIECR	Northern Ireland Electronic Care Record
NOMHAD	Platform for chronic conditions property of TSB, S.A
OSGi	Open Service Gateway initiative
PT	Portuguese Telecom
SAAS	Software as a Service
SCP	Shared Care Plan
SCR	Social Care Record
SOAP	Simple Object Access Protocol
SQL	Structured Query Language
TIA	Transient Ischemic Attack
TSCP	Social Care Provider
WebRTC	Web based Real Time Communication
WP	Work Package

2 Background: BeyondSilos Prototype System

The aim of BeyondSilos is to develop and pilot integrated care services delivered with the help of a multifunctional ICT infrastructure. These services are based on two generic care pathways cutting across boundaries which typically separate healthcare from social care. These boundaries can be identified at the level of both service provision and technology. Third sector organisations and informal carers are included in the information loop, where meaningful, in order to facilitate self-care.

This deliverable sets out what has been finally implemented in each pilot and details how these elements have been tested in the integration process with the rest of the system.

2.1 Inputs

The inputs to the deliverable are outputs from two other work packages, WP2 and WP3, and from the first iteration of this work package, WP4:

- WP2: Organisational models and service process models identify the process gaps that currently exist and need to be filled to implement an integrated service. The most important output of this WP is the final definition of the two defined pathways.

- WP3: Integration Infrastructure Architecture and Service Specification identify the technical gaps that currently exist and need to be filled to implement an integrated service.

- WP4: System implementation and test in its first iteration determines the new ICT to be implemented by each pilot site to cover technical gaps.

In order to achieve the final prototype systems in each pilot site included in this document, a methodology was defined to be followed in WP3 and WP4 in order to correctly complete the delivery of integrated care in all pilot sites. This methodology is:

- **First step: Architecture draft**. This step of the methodology had the purpose to collect information from other input projects in the field (SmartCare, CommonWell and Independent) as good practice examples, experience and hard evidence from which BeyondSilos could learn. This step also included information from literature and existing IT systems at BeyondSilos pilot sites. The result was a draft of the BeyondSilos infrastructure architecture based in a set of building blocks with specific functionality included the document D3.1.
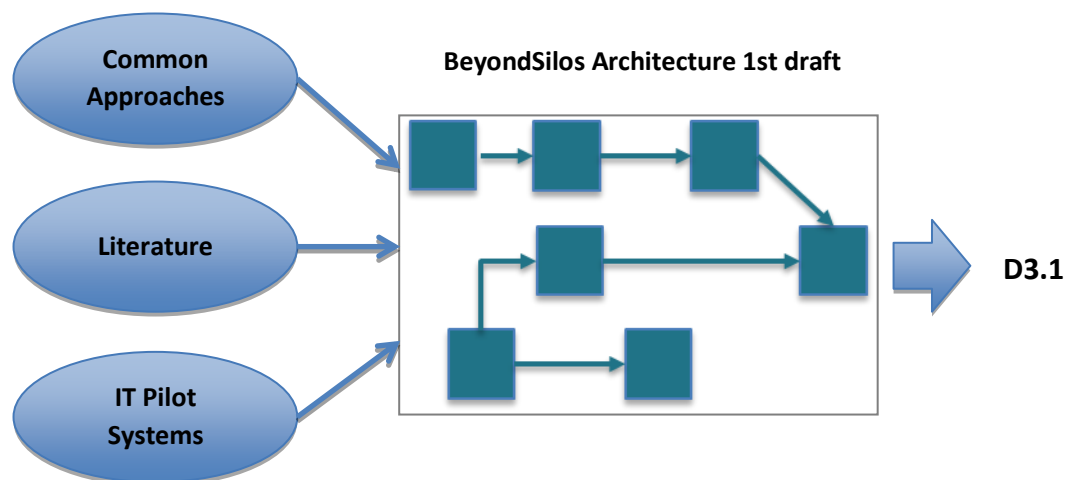
Figure 1: First step: Architecture draft

- **Second Step: Module specification**. This second step corresponds with the second iteration of the architecture definition; the result was the final architecture description with a detailed module specification, taking into account the new input of WP2, new pathways (Integrated Short-term Home Care Support and Integrated Long-term Home Care Support), and the new pilot sites' needs, this information comprised the deliverable D3.2.
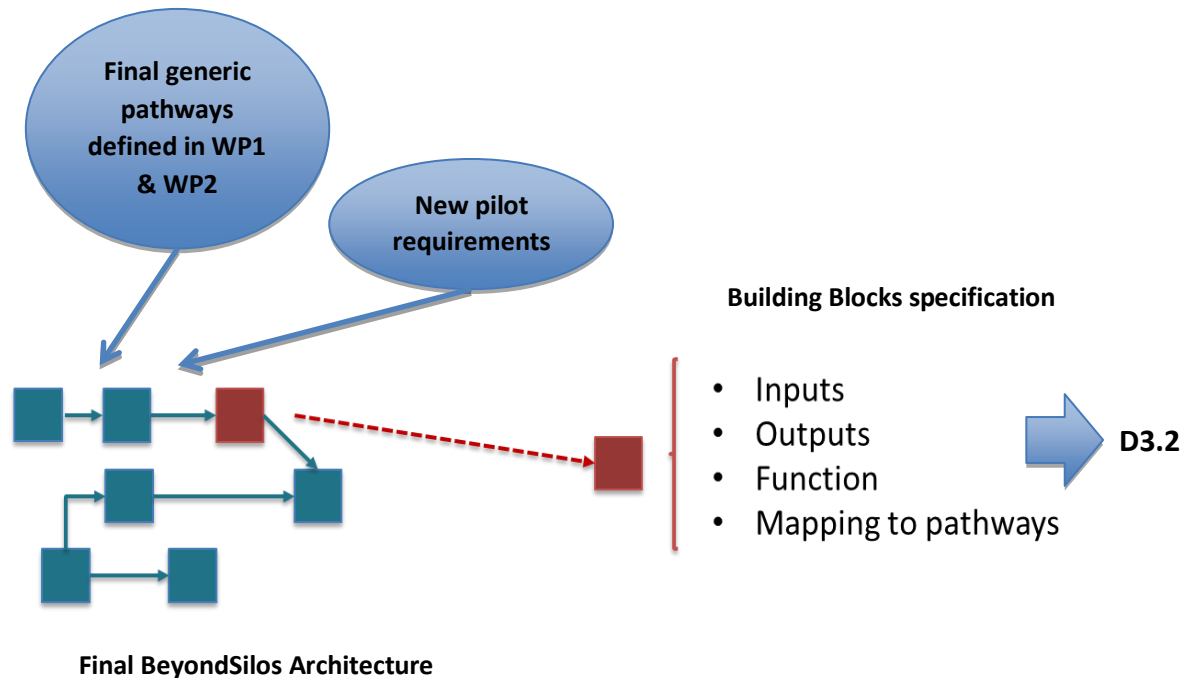
Figure 2: Second step Module specification

- **Third Step: Pilot IT infrastructure**. At this point of the methodology, each pilot site has to describe its current IT systems in detail. This information was also included in the document D3.2.
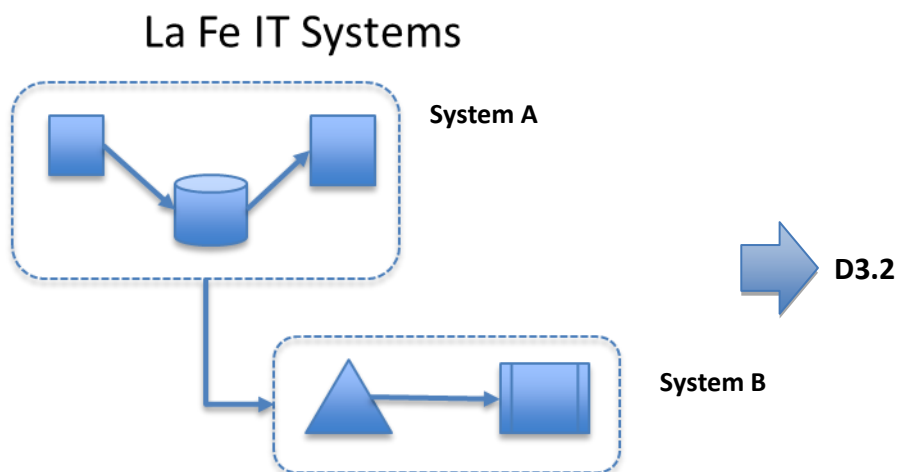
Figure 3: Third Step: Pilot IT infrastructure

- **Forth Step: Pilot mapping**. In this step, pilot sites had to map their current IT infrastructure to the BeyondSilos common architecture defined, in order to analyse the alignment with the BeyondSilos building blocks and processes, collected in D3.2.
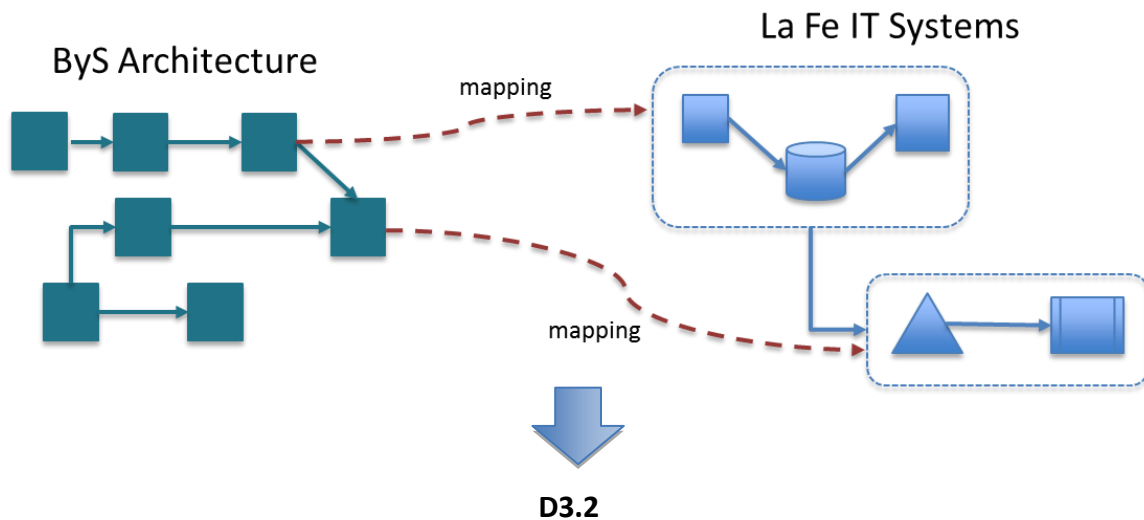
Figure 4: Forth Step: Pilot mapping

- **Fifth Step: Identifying gaps**. After the pilot mapping, each pilot sites has to declare their intention to fill some of the gaps detected thank to the mapping. Not all the gaps have to be incorporated in the IT system of a pilot site, as the pilot sites have the freedom to choose their own infrastructure and system; they only have to incorporate missing building blocks interesting for them. The result of this step is included in the deliverable D3.2.
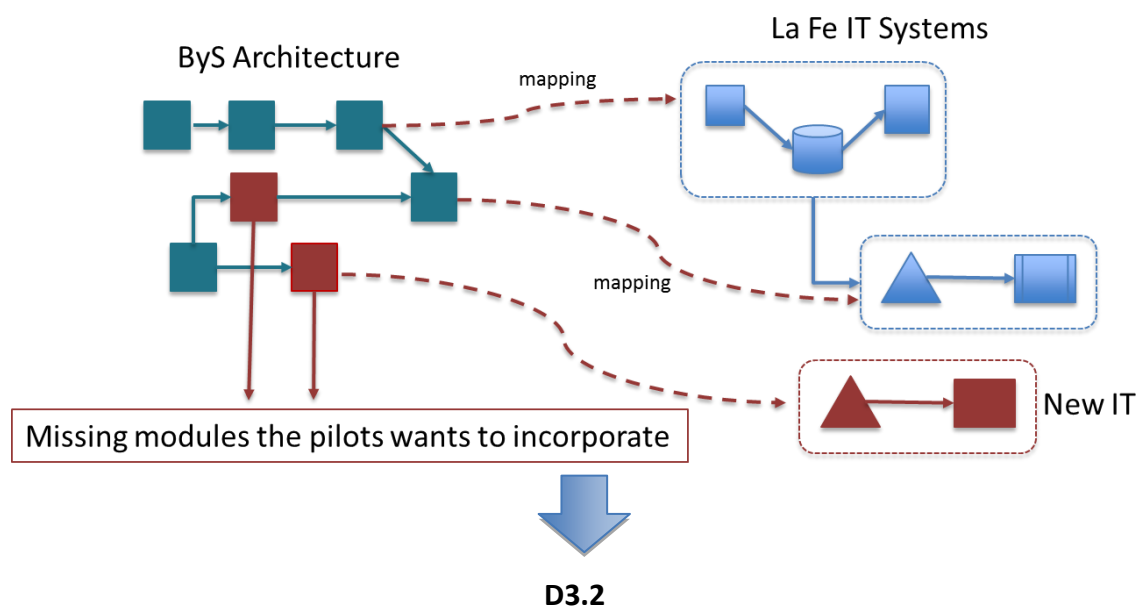
Figure 5: Fifth Step: Identifying gaps

- **Sixth Step: Definition of new IT**. Based in the gaps identified in the previous step, each pilot site had defined the functionality of each new module to be implemented and integrated with the rest of the systems, mapping each new module to the reference model in the BeyondSilos architecture. This information was reported in the document D4.1.
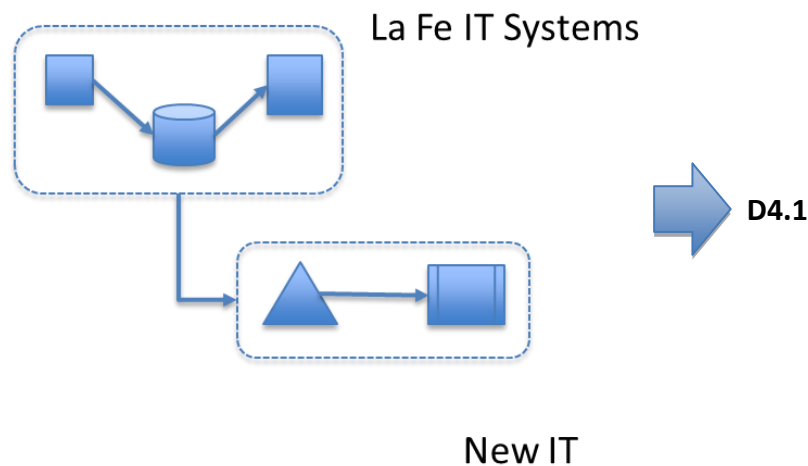
Figure 6: Sixth Step: Definition of new IT

- **Seventh Step: Testing Plan**. The next step in the methodology is to prepare the integration of the old systems and the new modules specified in the previous step. Only new elements need to be tested, and testing only needs to take place at integration level, so in this step pilot sites explained their integration plan for the new building blocks, and the plan for testing the integration, all reported in D4.1.
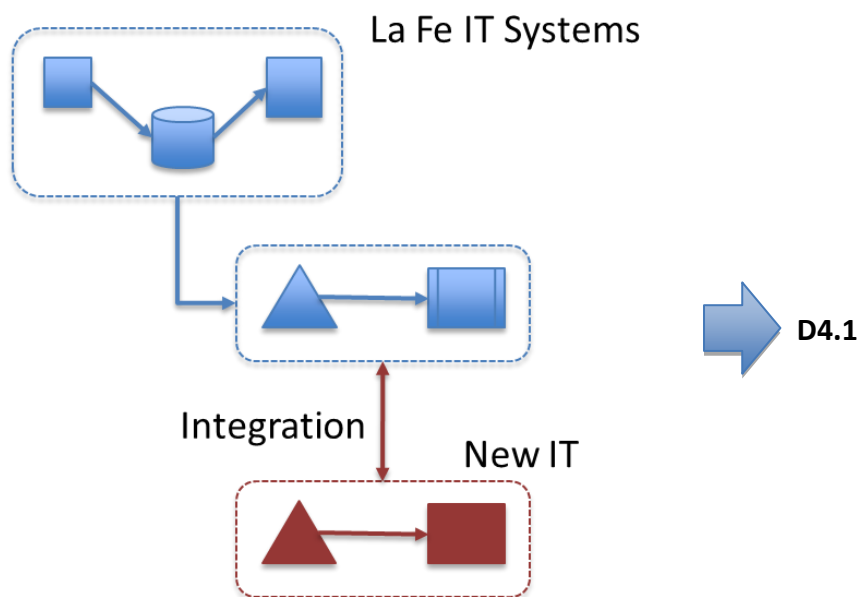
Figure 7: Seventh Step: Testing Plan

- **Eighth Step: Developing new IT**. This is the last step of the methodology; it correspond with the work collected in this deliverable, the description of what has been finally integrated in each pilot site, and the result of the integration process of these new building block with the rest of the pilot systems. This step is included in this document.

2.2 Buildings blocks mapping

As a result of the process previously described, it is interested to reflect how the pilots have finally configured their IT infrastructure. At the time of producing the first version of the Description of Work (DoW) of the project, some information was not still available. Due to operational changes, the IT has to be adapted to new scenarios and priorities.

Table 1 below presents the building blocks of the common architecture, and reflects the important changes and implications of the common architecture developed in the project to support the Integrated Care process. See deliverable D3.2 for a description of each Building block and the main components

Table 1: ICT building blocks developed for BeyondSilos

ICT-based core integration building blocks	Main components	Northern Ireland		Sofia		Badalona		Valencia		Campania		Amadora		Kinzigtal	
A=Available before BeyondSilos; N=New in the Pilot		A	N	A	N	A	N	A	N	A	N	A	N	A	N
Triage	List of patients.	X			X	X		X		X		X	X	X	
	Search and follow up of patients.	X			X	X		X		X			X	X	
	Triage report	X				X		X		X				X	
	Patient form	X			X	X		X		X		X	X	X	
	Triage process	X				X		X		X				X	
Data Management	Patient master index	X			X	X		X		X		X	X	X	
	Admission	X			X	X		X		X		X	X	X	
	Inpatient management	X				X		X		X			X	X	
	Outpatient management	X			X	X		X		X			X	X	
	Emergency management	X			X	X		X		X		X	X	X	
	Theatre management	X						X		X				X	
	Waiting list management	X				X		X		X					
	Inpatient billing	X				X		X		X				X	
	Reporting	X			X	X		X		X			X	X	
	Compliance	X		X	X	X		X		X					
Workflow / Decision Support	Computerised alerts and reminder	X		X	X	X		X			A	X	X	X	
	Clinical guidelines			X	X	X		X			A			X	
	Condition-specific order sets					X		X		X		X	X	X	

ICT-based core integration building blocks	Main components	Northern Ireland		Sofia		Badalona		Valencia		Campania		Amadora		Kinzigtal	
A=Available before BeyondSilos; N=New in the Pilot		A	N	A	N	A	N	A	N	A	N	A	N	A	N
	Documentation templates		X(SCP)			X		X		X			X	X	
	Diagnostic support / Contextually relevant references to information			X	X	X		X		X				X	
	Focused patient data reports and summaries	X		X	X	X		X		X			X	X	
Scheduling	Calendar			X	X	X		X		X		X	X	X	
	Address book			X		X		X		X		X	X	X	
	Appointment calendar				X	X			X	X		X	X	X	
	Appointment reminders			X		X			X	X		X	X	X	
	Appointment attachments				X	X			X	X			X		
Telecare Communication	videoconferencing			X	X								X		
Questionnaires						X			X	X		X	X	X	
Learning / Training platform	Videoconferencing				X							X	X		
	Document reader				X							X	X		
Tele-rehabilitation	Videoconferencing module			X											
	Sensors and body monitoring			X											
	Connection with EH&SR			X		X									
Behaviour Monitoring	sensor network				X	X									
	Reasoning					X									

ICT-based core integration building blocks	Main components	Northern Ireland		Sofia		Badalona		Valencia		Campania		Amadora		Kinzigtal	
A=Available before BeyondSilos; N=New in the Pilot		A	N	A	N	A	N	A	N	A	N	A	N	A	N
Vital Sign Monitoring	Sensors and devices	X		X	X		X		X		X	X	X		
	Local data storage at patient's site	X		X	X		X		X		X				
	Connection with the centralised EH&SR data repository		X	X	X		X		X		X	X	X		
Ambient monitoring	Environmental sensors that measure ambient parameters.	X		X	X							X			
	Home automation actuators											X			
	Local data storage at patient's site			X	X										
	Connection with EH&SR		X	X	X							X			
Remote Device Administration	Device manager	X		X	X	X			X		X	X	X		
Third party services	Interface systems					X			X		X				
Alerts Management	Multimodal alert system	X		X	X		X		X		X	X	X		
Contact Centre	Health intervention module	X		X	X	X		X				X	X	X	
	Social intervention module	X		X	X	X			X			X			
Emergency Communication	Multichannel communication	X		X	X	X		X		X		X	X		
Electronic Health and Social Record	Medical data		X (TNI)	X	X	X		X		X		X	X	X	
	Social Data		X (eNISAT)	X	X	X			X			X			
	Digital interoperability		X			X			X						X
	Care & outcomes tracking	X				X		X							X
	Reporting	X	X(SCP)	X	X	X		X				X	X		X

ICT-based core integration building blocks	Main components	Northern Ireland		Sofia		Badalona		Valencia		Campania		Amadora		Kinzigtal	
A=Available before BeyondSilos; N=New in the Pilot		A	N	A	N	A	N	A	N	A	N	A	N	A	N
Predictive Modelling	assessment and adjustment of risk behaviour						X		X						
Personal Data Protection	Secure Data layer	X		X	X	X		X		X		X	X	X	
	Communication protections	X		X	X	X		X		X		X	X	X	
	Access policies	X		X	X	X		X		X		X	X		X
	Secure access	X		X	X	X		X		X		X	X		X
	Log & auditing module	X		X	X	X		X		X		X	X	X	

3   Pilot site prototype system description and testing

For each pilot site, the prototype system implementation and the result of the testing and integration process are described.

3.1   Santa Casa da Misericórdia da Amadora (SCMA) pilot site prototype system

3.1.1   Introduction, point of departure

As a wellbeing and telemonitoring platform, there is a need for constant monitoring of a large number of patients. As they can be at either the main institution or at home, there is a need to schedule not only daily measurements, but also other tasks that can be performed by the healthcare professionals and group them as a work plan, allowing the institution as task leader to easily keep track of what was done, and what to do next. From the institution's point of view, easy planning is vital to keep it usable. Besides planning, there is a need to retrieve and print a list of all tasks done, and timings, so they can analyse execution performance.

The starting point is to keep real-time vital signs monitoring for each patient, including automatic and custom alerts, as well as a daily work schedule for the health professionals for patients. Indicators and listings should be extractable from the data collected.

To implement the solution as a whole, there are some initial activities required for each of the services considered in the pilot:

1. Tele-assistance emergency platform

- Creation the exclusive PT's phone number for Santa Casa da Misericórdia da Amadora (SCMA).
- Association with tele-assistance service (24h/7days).

2. Telemonitoring platform

- Users' (care recipients and professionals) registration on the platform.
- Telemonitoring equipments configuration:
    - ForaCare W310 balance;
    - ForaCare D40 Series sphygmomanometer;
    - ForaCare IR20 thermometer.
- Installation of the telemonitoring Android app on the smartphone of each carer (SCMA professional or voluntary).
- Configure the links between end-users (elderly people) and respective carers, as well as between the vital signs devices and the respective cares or end-users who can use each device.
- Gather and collect the measurements through the smartphone app from the telemonitoring devices.

3. LMS eLearning Management System

- Parameterise SCMA instance on the system.
- Assure creation of users.
- Introduction of training contents.
- Management of training processes.

There are some other technical and generic requirements, in a macro-view, to supply the solutions:

- Tele-assistance platform
  - Patients with PT's fixed-line network; and
  - Fixed-line telephone equipment (Teleassistência); or
  - Patients with PT's Mobile line (MEO); and
  - Mobile phone equipment (True-Kare).
- Tele-monitoring platform
  - Internet access;
  - Access to a PC for end-users and professionals / carers;
  - Access to Android app using smartphone;
  - Access to IPTV app for PT's fixed-line / fibre triple-play service.
  - Web portal.
- elearning platform:
  - Internet access.
  - Access to a PC.
  - Adjusted contents.

3.1.1.1 Specific technical requirements

- SCMA infrastructure's layers and requirements:
  - Application server:
    1. CPU: 2 Core;
    2. RAM: 16GB;
    3. HDD: 100GB;
    4. SO: Windows Server 2008 R2 x64 Standard Edition;
    5. Outro: IIS 7 com .NET Framework 4.5.
  - Data base server:
    1. CPU: 4 Core;
    2. RAM: 16GB;
    3. HDD: 500GB;
    4. SO: Windows Server 2008 R2 x64 Enterprise Edition;
    5. SGBD: SQL Server 2008 R2 x64 Enterprise Edition.
  - RA server:
    1. CPU: 2 Core (Intel E5-2680 @ 2.7GHz);
    2. RAM: 4GB;
    3. HDD: 100GB;
    4. SO: RedHat Enterprise Linux 6.
  - SDP server:
    1. CPU: 2 (Intel E5-2680 @ 2.7GHz);
    2. RAM: 4GB;
    3. HDD: 500GB;
    4. SO: RedHat Enterprise Linux 6;
    5. SGBD: PostgreSQL 9.2.
- Care recipients' network requirements:
  - Fixed (copper or fibre) connection to Internet: minimum of 2Mbps.
  - Mobile / smartphone connection to Internet: minimum 3G network.
- Infrastructure "backend" (servers) network requirements:
  - Connection: minimum of 100Mbps.
- Care recipient computer / tablet infrastructure:

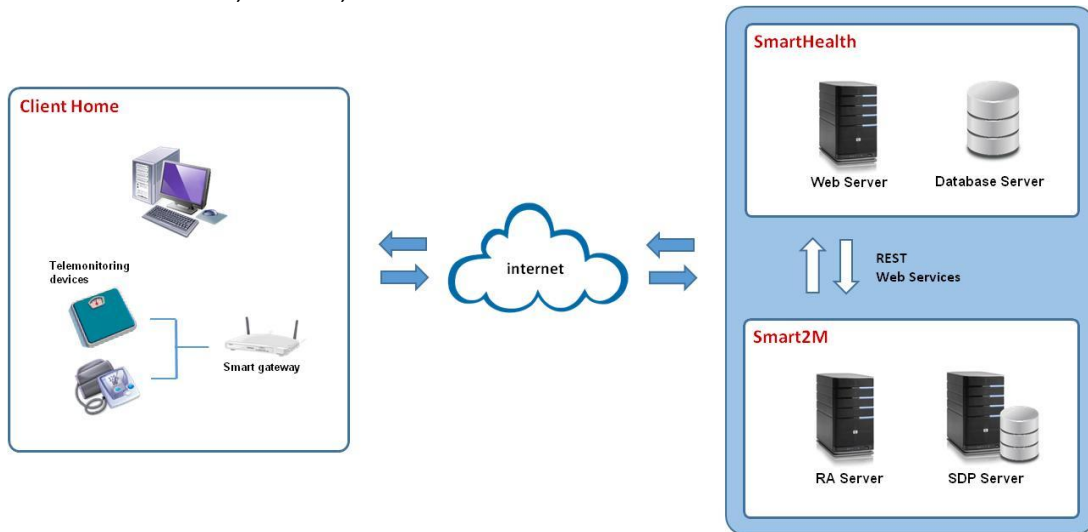- Browser: IE9+, Chrome, Firefox or Safari.

Figure 8: Telemonitoring platform – physical perspective

3.1.1.2   External Health system integration with SmartLiving

The user has a unique username for login on the telemonitoring platform, enabling data exchange and information update. Each user has a role that gives him/her permission to access certain features, for example, the DOCTOR can access the medical information of his patients, but someone with the MANAGER role cannot.

Data considered in this service to send to the telemonitoring platform by external systems:

Table 2: Data to send to the telemonitoring platform – care recipient information

ATTRIBUTE	DATA TYPE	DESCRIPTION
IdRole	int	Role id: • ADMIN • MANAGER • DOCTOR • USER • VOLUNTEER • AUXILIARY
IdGender	int	Gender id 1. Male 2. Female
Name	String	Full name
DateOfBirth	Date	Birth date
Username	String	Unique username, for login
Password	String	Password for login
SocialSecNumber	String	Social Security Number
Phone	String	Phone number
Email	String	Email address

ATTRIBUTE	DATA TYPE	DESCRIPTION
MaritalStatus	String	Marital Status: • SINGLE • MARRIED • WIDOWED • DIVORCED
Job	String	Current job
SNSNumber	String	SNS number
Avatar	Blob	Photo
BI	String	BI number
Height	int	Height in cm
Address	String	Home address
PostalCode	String	Home postal code
City	String	Home city

3.1.1.3   Integration of measured data on the tele-monitoring platform

The telemonitoring platform offers a web service to record the care recipient's measurements. When a known device with Bluetooth capabilities takes the measurement, the MAC is stored. Otherwise a flag is used indicating, that the source of the measurement could not be validated. Optionally, if the measurement was taken by a caregiver on behalf of the patient, the caregiver's username is also registered.

Data considered in this service to send to the telemonitoring platform:

Table 3: Data to send to the telemonitoring platform – measurement list to send

ATRIBUTE	DATA TYPE	DESCRIPTION
Mac	String	MAC of the Device used
Username	String	Patient's username
FormalUsername	String	Caregiver's username
Date	Date	Measurement date
Manual	bool	Flag indicating if this measurement comes from an automatic device or if it is a manual insertion
DataList	List<float>	List of values

3.1.1.4   Consulting measurement data on the telemonitoring platform

The telemonitoring platform provides a table with a list of all the measurements on the user record. It can be searched by: data range; type of measurement; measurement's status (by omission, it only shows confirmed measurements).

3.1.1.5   Measurement data alerts on telemonitoring platform

After receiving a measurement for a specific care recipient, the solution will check whether that measurement is above or below the normal range of the recorded data for that care recipient, for that

type of measurement. If the received measurement data is out of range, the system will send two types of alerts to the health professional users with the profile "profissional de saúde":

- Alert on the telemonitoring platform (this alert is shown on the entry page of the portal), after authentication: it should consider a filter of the care recipient and the type of measurement.

- SMS alert (via GlobalChannel): the alert / SMS must show the care recipient, type of measurement, the measurement value, and the maximum and minimum registered values for the care recipient / type of measurement.

- Email: the alert is sent to the email address registered by the health professional.

3.1.1.6 Create a new "Profissional de Saúde" user profile on the telemonitoring platform

If needed, the telemonitoring platform will provide a new "Profissional de Saúde" profile that allows them to consult the user's records, including the measurement alerts and the measurements themselves.

The other application profiles will not have access to the care recipient's measurements or alerts.

3.1.2 Final Prototype Implementation

Once the service specification was defined, the telemonitoring platform has been updated to support the new requested functionalities; this is now called *SmartLiving.* This defines the web portal for telemonitoring, and for health professionals and informal caregivers to plan and register their daily activities.

The *SmartLiving* platform supports distinct ambient assisted services and environments, while also supporting a multilingual GUI customised through different terminals; it is based on SAAS open platform to support cooperation between different digital service providers.
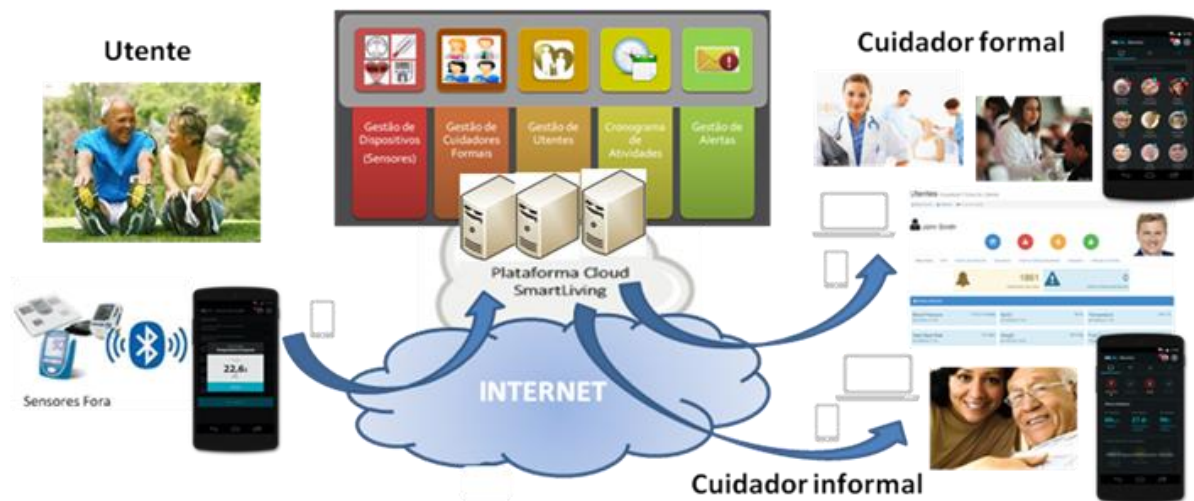

Figure 9: Global architecture of *SmartLiving* platform

Smartliving has been developed to carry out the following functions:

1. Device Management: define devices for vital signs measurement (see equipment referenced below) in the database and association of users and /or health professionals.

2. Caregivers Management: Manage different profiles, assigned with different tasks and associated to multiple devices.

3. User management: management of users' profiles, either administrative or clinical.

4. <u>Alerts Management</u>: thresholds management (maximum and/or minimum) from vital signs that can generate alerts.

5. <u>Notification Manager</u>: planning activities such as medical appointments, daily life activities and/or medication hours.

6. <u>Vital signs measurements</u>: real-time and historic reports anytime anywhere.

7. <u>Health professionals work plan</u>: plan daily tasks to be performed by health professionals for patients (measurements or custom tasks), indicating possible alert situations.

8. <u>Indicators</u>: build a report based on several system / entity indicators.

To develop the present ICT solution of telemonitoring, e-learning and tele-assistance we have considered a *Health Service Exposure Framework* (Figure 10). In this Framework we have built core components, which aggregate the main functions transversal to all services, namely:

1. <u>Application Enablement</u>: Manages all users' information, including the authentication and authorisation mechanisms.

2. <u>E-Health Repository</u>: stores the clinical information, such as appointments, electronic medical records, among other information.

3. <u>Operational Management</u>: Set of functions the enables the platform operation. It includes back office, reporting, alarms and infrastructure monitoring.

4. <u>e-Health Communication</u>: Layer that handles the communication with: 1) medical equipment, such as the sphygmomanometer, thermometer, among others, 2) HL7 Protocol allowing a more direct integration with other e-Health Systems.
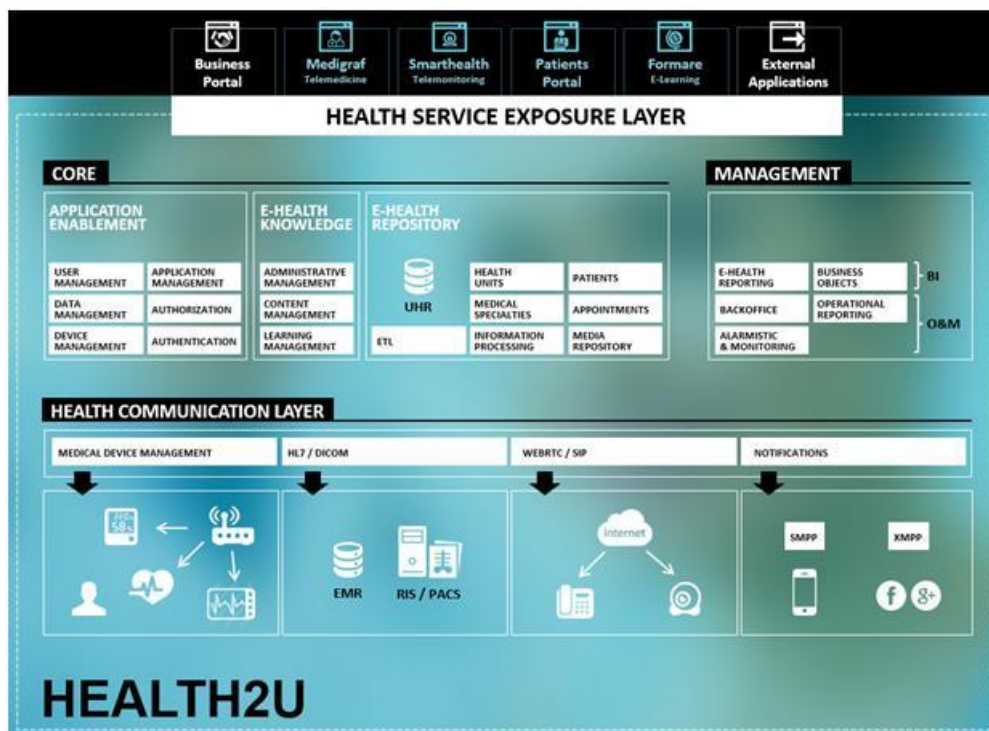

Figure 10: High Level Architecture

Also, all applications provided in the system are based on a common set of features, which are described below:

- Web interfaces, user-developed in accordance with current usability standards.

- Navigation compatibility on mobile devices (tablets, mobile phone) with a web browser.

- Integrated authentication based on the system used by the health organisation (Active Directory).

- Integration based on Web Services.

The *Smartliving* platform developed has a set of services that allows:

- Integration with telemonitoring devices.

- Interoperability with other information systems and databases, based on the main standards used in healthcare, including HL7 and DICOM.

- Real-time communication via web browser, using video conferencing, chat and sharing of tests without the need to install plug-ins or WebRTC.

- Notifications via email and SMS.

- Context and presence services integrated with Auth standards.

From the **physical point of view**, the solution was design to be multi-tenant, supporting different medical institutions. Figure 11 presents the physical high level perspective:
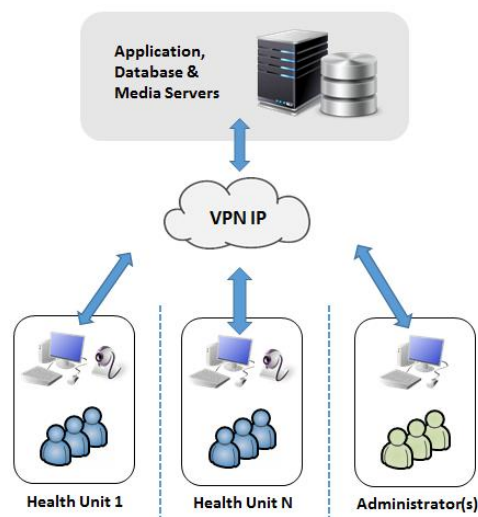
Figure 11: Physical architecture

SCMA pilot features

Using mobile devices, patients, health professionals and informal caregivers can control and interact with the *SmartLiving* and eLearning platform.

If the end user is a patient, he/she can manually insert the vital signs measurements, i.e. weight, temperature, blood pressure; or if the medical equipment is certified and recognised by the system, it can collect this information automatically. In this latter case, the patient always needs to confirm the measurements.

If the end user is a doctor, the application gives an overview of all patients, and more importantly, an overview on pending tasks, critical patients, and measurements for patients with manual or automatic devices.

The next set of figures show some screenshots of the mobile version of the application:
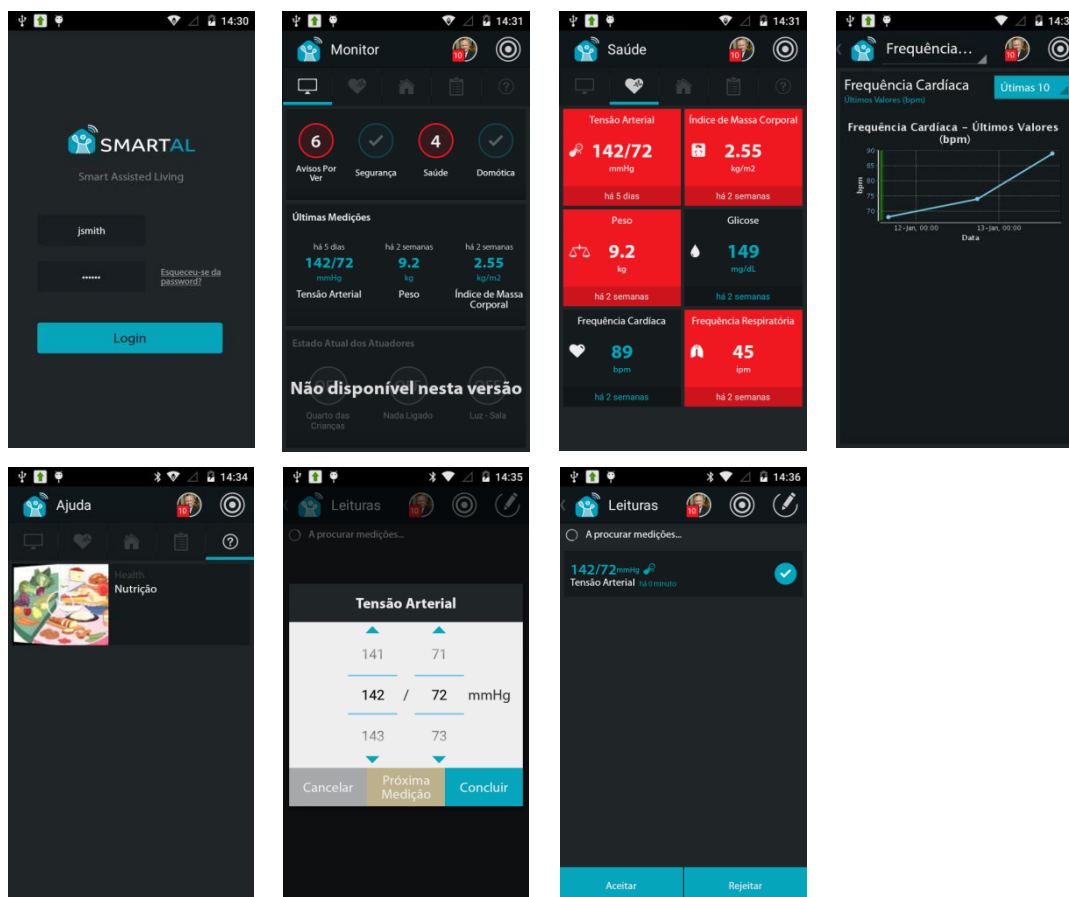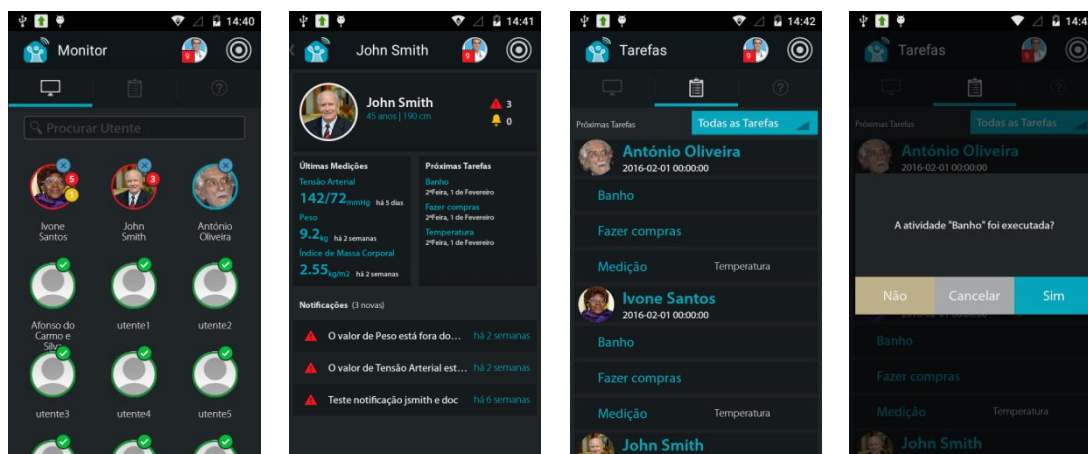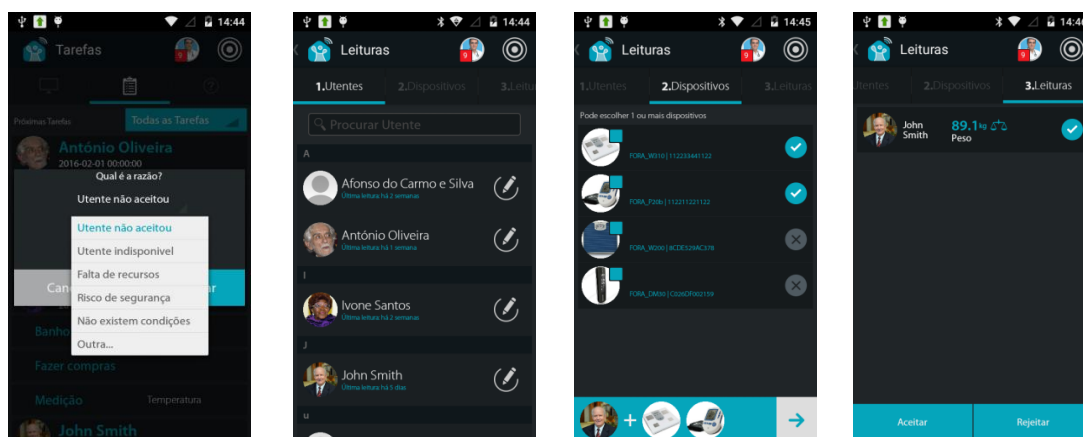
- Patient view

Figure 12: *SmartLiving* mobile version for patients

- Caretaker / Caregiver / Professional

Figure 13: *SmartLiving* **mobile version for health professionals**

In the case of a tablet, the same smartphone app can be used, or a web browser portal URL. If the Web Portal is used, only manual measurements can be performed.

The *Smartliving* also has a back office application, so that the caregivers can control the solution, equipments, patients, alerts, and so one.
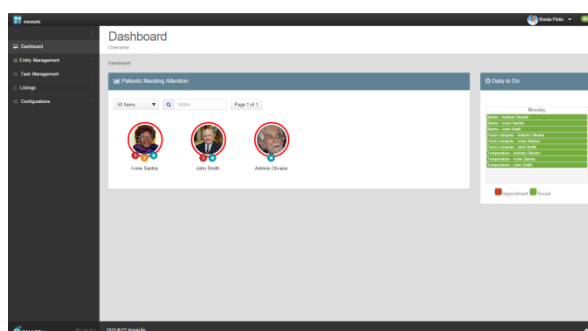
Figure 14: *SmartLiving* **caregivers web portal**
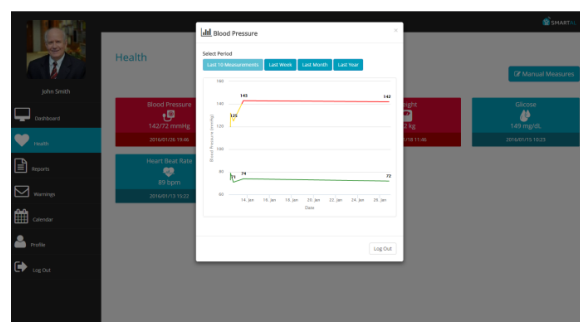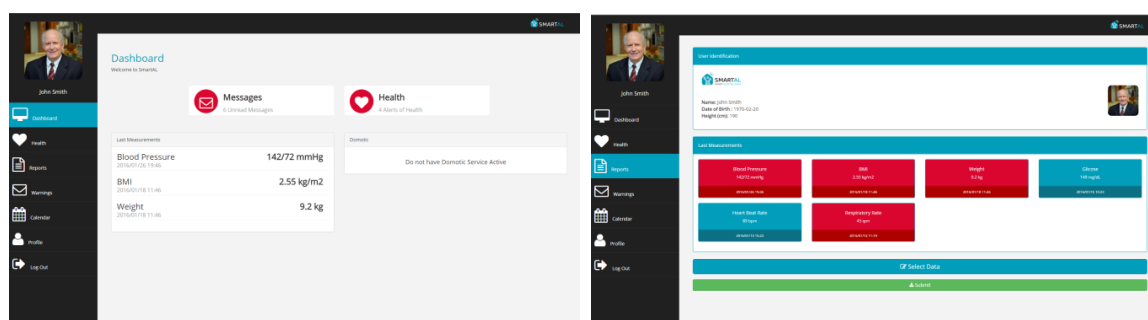
Figure 15: *SmartLiving* **patient web portal**

3.1.3   Integration Result

This section describes the three phases of the integration process of SCMA pilot.

3.1.3.1   Preparatory work

The selection of the patients for the test is the responsibility of SCMA and CMA, and will be according to the needs of the pilot, in terms of social and healthcare, and assuring the requirements for the considered ICT solution.

After the selection, the steps to do the tests are:

- Deliver the equipment to the care recipient.
- Test the activity signal of the equipments.
- Test the telephone.
- Test the e-learning Formare platform.
- Do a specific measurement.
- Validate if the care recipient data was created and available in the *SmartLiving* platform.

3.1.3.2   How tests are conducted

To conduct the pilot tests, it should be assured that:

- One care recipient will be accompanied during one whole day.
- The care recipient's indicators will be measured in the morning, the afternoon and in the evening.
- The availability of the measured data will be validated.
- It will be checked if a call from SCMA will be done to the configured number, in case of suspect abnormal measured results.

3.2   Badalona pilot site

3.2.1   Introduction, point of departure

The BeyondSilos pilot in Badalona responds to the need of improving the collaboration between all the stakeholders involved in the provision of social and health services. As has been outlined in the context of WP1 and also mentioned in D4.1, BSA is the only organisation responsible for the provision of such services within its target population.

The ICT systems already in place support the provision of services as they are now, and are the result of 20 years of deployment. The history dates back to year 1995, which was the first time a BSA strategic plan contained a specific ICT deployment plan. Since then, it has always been a key topic when defining the organisation's strategy. The process started with the implementation of the Electronic Medical Record (EMR). At that point, the key driver for BSA to start the implementation process of the EMR was its distribution in the territory of Badalona. The organisation is formed by 11 centres which are wide spread around the city of Badalona (and two of them in two other small cities nearby, Montgat and Tiana). Even though the distance is not big, it was not secure moving all the patient data in paper from one site to another on a daily basis. The information was not in place, the information could be lost, there were a lot of duplicate tests, etc. It was not efficient in terms of quality of care and costs for both the patient and the organisation.

At the beginning, the main objective was solving the problems derived from that territorial distribution. In a second stage, a new key factor appeared, which was to become an IT leader in the region (there was a race between some healthcare providers in the region of Catalonia which leaded to a kind of competition to be the first). Finally, during the last few years, due to the change to the capitation funding model and also because of the continuous cuts in the funds coming from the Catalonian National Health Service, another key driver has appeared, which is to increase the efficiency and the cost-effectiveness of the services provided, in order to deliver the best services as possible with the lowest amount of money per citizen.

Some of the interesting phases / milestones in the deployment of the EMR:

Phase	Year
Laboratory, Rd, Pharmacy	1995
Clinical data repository	1999
Nursing / Clinical documentation	2002
CPOE	2002
PACS	2002
Closed loop medication administration	2010

Even though the EMR plays a central role in a healthcare organisation, BSA could not stop in there. And this is because BSA has a special characteristic that distinguishes it from all the rest of the healthcare providers in Catalonia: it also provides social care services for the region of Badalona and three other towns surrounding it. Originally in Catalonia, there has been (and still is) a separation between the Department of Social Welfare and Family and the Department of Health. In terms of welfare, this separation has not proven to be the most suitable to provide effective and quality care to the patient who receives benefits from both types simultaneously. Because of that, BSA, with the support of Badalona's Council, decided in 2000 to change the conceptual model, centring it on the patient. This model was implemented at the operating level by transferring social services to BSA, a company originally dedicated to the provision of health services thus a perfect fusion between the conceptual and operational level was obtained.

The way to that fusion was not easy, both organisationally and technologically speaking. Regarding the organisation, and specifically the way to deliver joint provision of services, was something really hard to achieve. There was almost no previous experience at that time on how to do so, and the union of those two different worlds, historically separated, generated a lot of problems. Professionals from either side thought their way of doing things was the most appropriate one. Finally, things started to get better, with the creation of the Homecare Service, the concept of the Case Manager, and the establishment of the multidisciplinary teams meant to act as home supporters. This process took around one year and a half. By that time, we can say that the first phase of the integration between the social and the health care provision was finished.

The second phase was meant to decide on the ICT systems to support the provision of services in the new model provision. This ended up with the development of the Social Care Record (SCR) and the Homecare Department software tool (also called the Integrated Care Record), which sat between the EMR and the SCR. That process took another year and a half, making the end of the overall process in 2003. Since then, plenty of improvements to those initial solutions have been performed, such as the inclusion of third party organisations within the provision of services. These service providers are able to access some subsets of the Homecare Department software tool, including the integrated shared care plan, which has

shown to be a great tool to improve care coordination between the different stakeholders involved in the provision of care. This provided a really good environment for an integrated care way of working.

This does not mean, though, that things cannot be improved; there is always a good chance to look towards the future. One example of the things that BSA wants to improve within the context of the BeyondSilos project is the formalisation of the relationship with the third sector care providers. BSA has been working with some of them for many years, but up till now, this collaboration has happened in an informal way. That means that not all the GPs are engaged (or even know) about the services offered. In addition, the communications between them and BSA occurs informally, which means that some documentation, such as some personal health and social data, is being moved by ordinary email. BSA wants to take advantage of the situation and formalise the situation, giving access to those providers to some subsets of the ICR, e.g. from demographic data to the shared care plan and some other information useful for them to provide their services. So far, BSA has agreed to collaborate with "Fundació Roca I Pi" which is a foundation that funds home fixings and repairs for people needing this. The other organisation BSA has agreed to collaborate with is "Amics de la gent gran", which is a volunteers organisation approaching elders in isolation situation to avoid exclusion.

Secondly, BSA wants to improve the knowledge about the benefits of using a telemonitoring platform to maintain stable multimorbid patients at home. So far, BSA has tested many of those platforms in different projects and has demonstrated their capacity to better control such patients. Even though this has been already demonstrated, BSA lacks a good economic viability assessment to be able to convince the policy makers (in our case, the City Council of Badalona as our unique shareholder, and the Catalonian National Health Service) to fund it. BSA would like to have a good economic assessment, demonstrating that the BeyondSilos service model as a whole is sustainable and, of course, better for the patients, to convince decision makers to fund it and convert it into a full scalable model through routine practice.

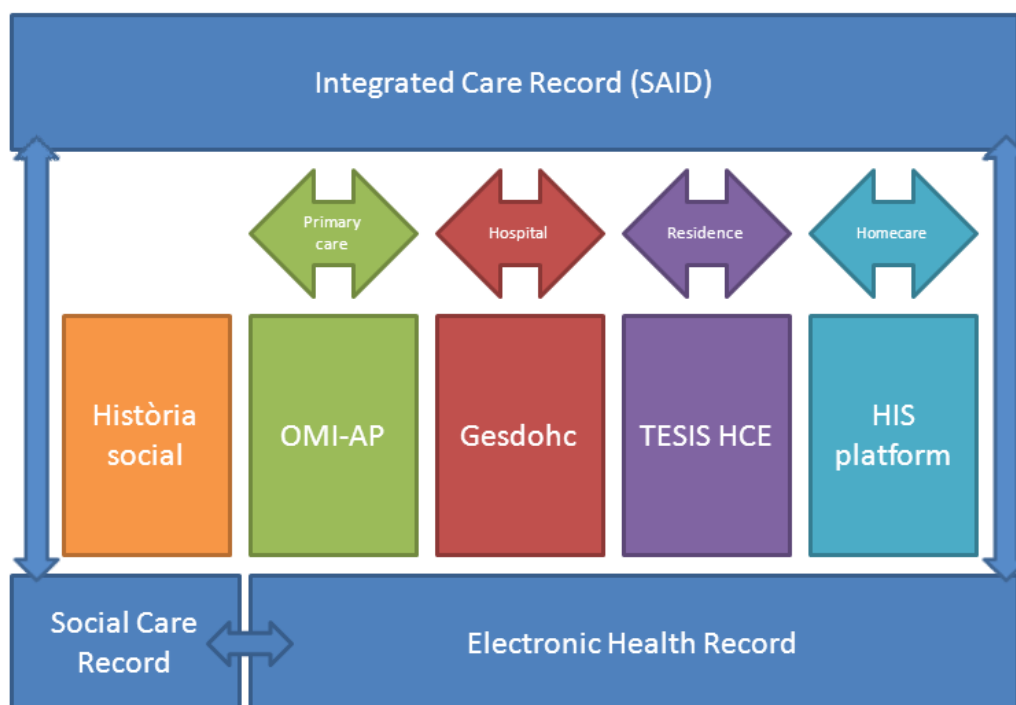From a conceptual point of view, the architecture will be as follows:

Figure 16: BSA ICT architecture for the BeyondSilos project including the telemonitoring platform

According to the BeyondSilos architecture and the pilot design from Badalona explained in the previous paragraphs, some changes to the existing ICT systems will have to be made. Those changes are related to the ICR, as was outlined in D4.1, and can be summarised as:

- Inclusion of the involved TSCPs ("Fundació Roca I Pi" and "Amics de la gent gran") as new services available to be chosen by any professional inside the ICR.

- Grant TSCPs access to the ICR. According to role permissions, they will be given access to the demographic information of every patient, shared care plan, and a summary of the most relevant social and health information.

- Integration of the telemonitoring tool with the ICR.

Those changes, mapped with the ICT building blocks, will be as follows:
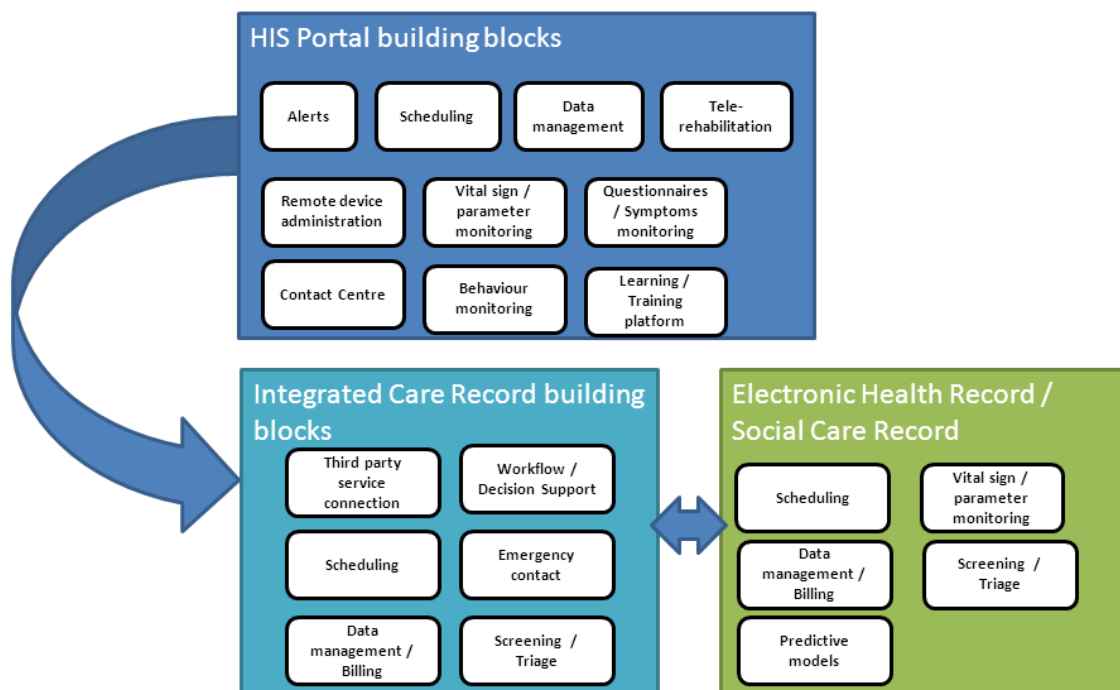
Figure 17: BSA prototype mapped with BeyondSilos architecture

3.2.2   Final Prototype Implementation

The implementation of the prototype has been done, according to the proposed technical deployment plan specified in D4.1. The plan proposed a set of three different integrations, the planned finishing dates, and the party responsible of each strand of work.

In addition, D3.2 outlined a set of gaps between the common architecture and the building blocks available in Badalona's pilot, as can be seen in the following diagram:
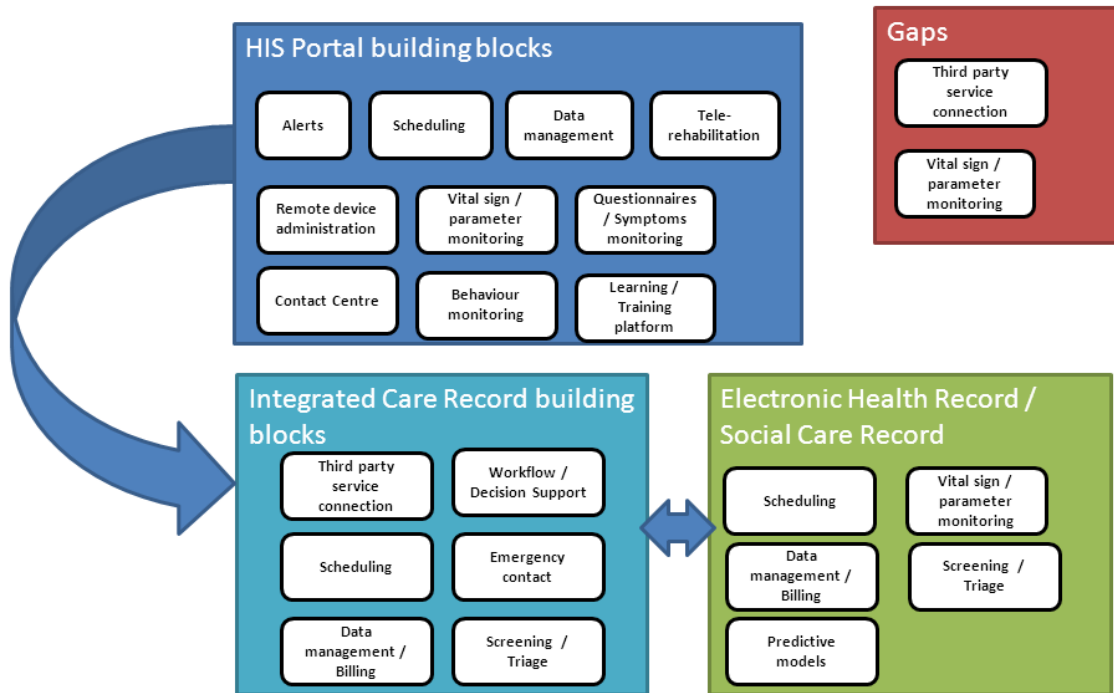
Figure 18: Missing gaps within the common architecture for the Badalona pilot site

All the activities have mainly been carried out by the Software Development team from BSA, because the involved piece of software is the ICR which has been fully developed by that team. The tool is accessible by all the stakeholders involved within the provision of homecare services, which means that the tool is already prepared to integrate with other service providers.

The work done by the Software Development team has been mainly setting up and profiling the ICR in order to be able to fit the requirements of integrating the TSCPs. To identify these requirements, the BeyondSilos coordination team at BSA had a meeting with the two TSCPs that are involved in the BeyondSilos project. Coming from those meetings, a couple of application forms were identified to be implemented within the ICR. The workflow to be followed after the implementation of the forms is the normal one within the ICR, which means: once the form is completed by any professional, an email is sent to the person responsible for that service; that person is then able to access the ICR and activate the application, or send it to the waiting list until there are enough resources to deal with it.

Afterwards, the coordination team of BeyondSilos at BSA sent these forms to the Software Development team to be implemented. Finally, a profiling of the ICR was held to give access to the professionals identified by those suppliers. Both the forms and the end result of the ICR can be seen in Appendix A: BSA.
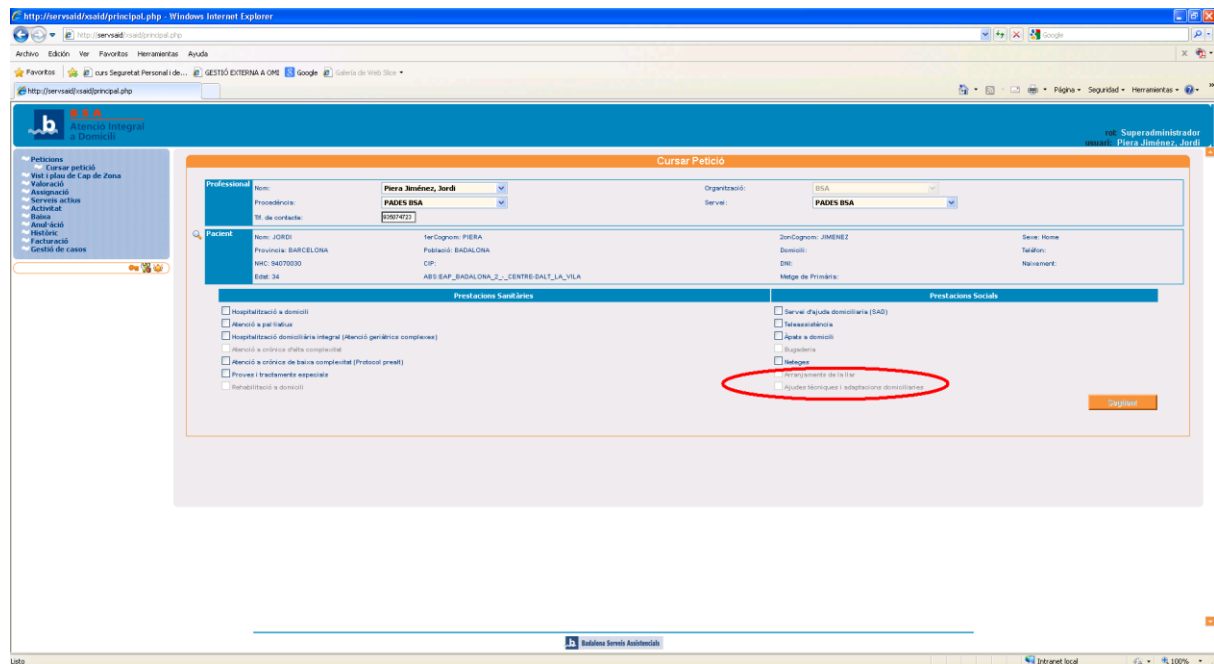
Figure 19: Profiling of the ICR

In parallel, the Software Development team worked very closely with Health Insight Solutions (HIS) on the integration of the telemonitoring tool with the ICR. The process was relatively easy because it was only meant to link their portal with the ICR. There was much discussion around the need integrate the personal data generated from the telemonitoring tool into the EMR. Some professionals thought that these data, gathered by the patients themselves, are not trusted enough to go into the EMR, while others said that it could give very valuable information. After a while, the conclusion was that even if it was interesting to have it, the EMR was not ready to do all the data fusion and analysis that the HIS platform itself does, so it was better to keep it external, but totally linked to the EMR/SCR/ICR.
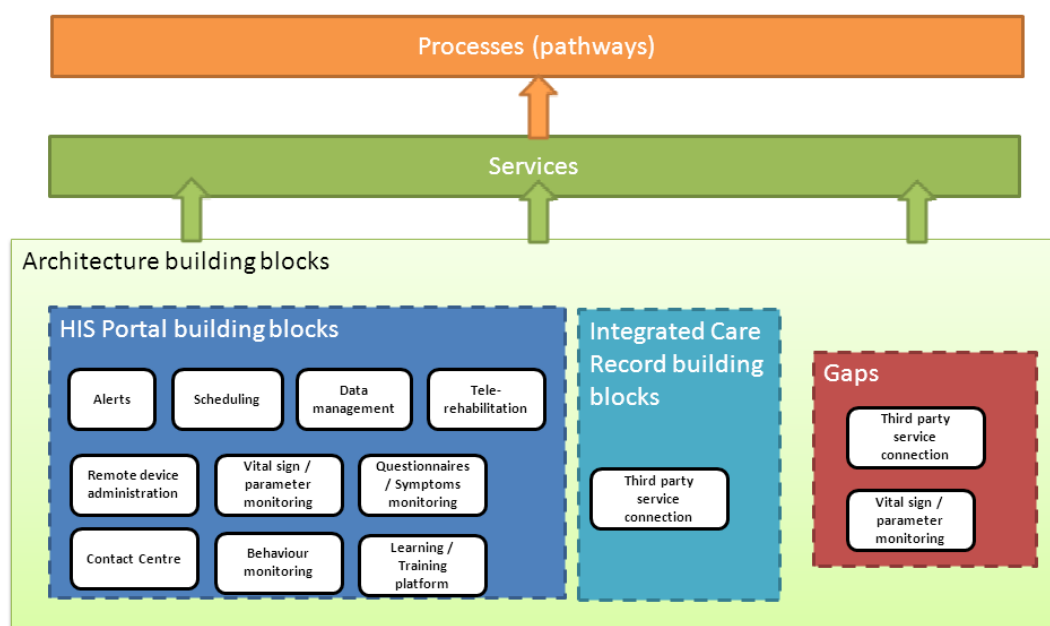
Figure 20: Developments and deployments carried out at Badalona

The implementation schedule, according to the planning and the completion dates is shown in Table 4 below.

Table 4: BSA implementation schedule

Item	Plan	Responsible	Completed
TSCP as new available service in the ICR	January 2015	Software Development team	16/01/2015
Access to the ICR for TSCP	February 2015	Software Development team	20/01/2015
Integration of the telemonitoring tool with the ICR	February 2015	Software Development team & Supplier of the telemonitoring tool	19/01/2015

3.2.3   Integration Result

Regarding the integration process, and as was previously mentioned, BSA addressed two different fields:

- Integration with the TSCP.
- Integration with the telemonitoring solution.

Regarding the integration of the TSCP, BSA developed, tested and deployed two different solutions:

- Integration with "Amics de la Gent Gran", which is an NGO dedicated to fighting social exclusion and social isolation of elderly population.
- Integration with "Fundació Roca I Pi", which is a Foundation aiming to help the elderly population in adaptations and fixtures in their homes.

The previous situation before BeyondSilos was that individual professionals, dealing with either one or other TSCP provider, identified the needs of a single user and interacted with them in an informal way; this was done maybe by email, or by telephone, or in whatever other way. Of course, such a situation did not guarantee the security of the information transmitted, it was not legally appropriate, and the services of the TSCP were not available for all the professionals working within BSA.

To solve such a situation, BSA decided to take advantage of the BeyondSilos project in order to formalise the situation with those two TSCPs, by including them within the Integrated Care Record (ICR) as a service fully available to all the professionals of BSA and in order to solve the security and legal issues. Because of this, BSA met with both providers to do a requirements elicitation phase; two forms were agreed during bilateral meetings with the TSCPs to be implemented within the ICR (see Appendix A).

The Software Development team from BSA identified and implemented the requirements, which included the forms and the access rights for the TSCP professionals having to interact with the ICR and the new functionalities. After the development of the proposed forms, the programmers followed the unit testing methodology in a closed laboratory testing environment to check whether the different pieces of source code for the two new application forms worked as expected or not. Afterwards, real life testing was conducted with one professional from BSA and two professionals of the TSCP (the coordinators of each of the organisations). The personnel involved in this process were:

- Josep Lluís Vega – Homecare social worker from BSA.
- Jordi Garcia – Coordinator of the "Fundació Roca I Pi".
- Raül Villar – Coordinator of "Amics de la gent gran".

The real life testing period for the integration of the TSCP started 20/01/2015 and ended 30/01/2015, just in time to be able to start the provision of the BeyondSilos service in the first week of February 2015.

Regarding the integration of the telemonitoring solution, BSA started to work with Health Insight Solutions (HIS) early in October 2014. Within the process, BSA checked jointly with HIS in two face-to-face meetings the possibilities to fully integrate the measurements made by the medical devices within the

EHR. Even though the conclusions were that such an exercises was totally feasible, the clinicians from BSA, after long discussions, decided that this data should not go into the EHR, and that it should be kept in the telemonitoring solution, because this provides much more interesting features such as data visualisation that do not need to be replicated in the EHR.

Finally, the clinicians from BSA decided that the only interesting thing to do was to grant the single sign-on to the professionals in order to access directly the telemonitoring tool from the EHR. This change, which was done through web SSL communication, was finished in January 2015.

3.3   Campania pilot site prototype system

3.3.1   Introduction, point of departure

The University of Salerno is acting as the coordinator of the Campania pilot site for the project. The AOU San Giovanni di Dio and Ruggi d'Aragona is the University Hospital. The hospital hosts servers for the Wincare eHealth Record and database of patients with chronic disease accessing the AOU. These servers represent the core of the ICT architecture for the Campania pilot site. The Salerno ASL servers also host the ICT for the delivery of the ADI in the Salerno area, and the financial reporting.

The management of the servers within the hospital is taken care of by the Office for Informatics services, whose director is doctor Giuseppe Versace. The servers are accessible through the internet using an HTML protocol from the commercial internet provider. Recently (Nov-Dec 2014), a new internet provider has taken over the service. This has required the implementation of new security protocols that have affected accessibility from the internet. This has slowed the pace of the implementation of the ICT, as it has resulted in slow access to the hospital servers from remote locations.

In Campania, a Home Care service is active to provide integrated care to patients in need. The service is provided by the regional Local Health Authority (ASL) districts through the ADI, an office that includes personnel from the public health and the social care network. At the moment, these services are not provided with telemonitoring. Indeed, the ADI in Salerno is outsourced to a third party that was identified in November 2014, which also provides ICT for the cost reporting of the service. This platform is called "Curedom".

During the analysis of the gaps, we identified the following level of intervention:

- Access to third party information.
- Learning / training platform.
- Behaviour monitoring.
- Safety / ambient monitoring.
- Electronic social records.

The most relevant gap is the lack of a single EHR, due to the fact that multiple databases are present on servers of different health authorities (hospitals, ASL).

3.3.2   Final Prototype Implementation

TSD is the company that produces and manages the electronic healthcare record systems (EHR) Wincare and Webcare[1] for the AOU University hospital. After a round of consultations with the ADI of Salerno and Napoli, we identified that the EHR needed implementation for the assessment of the needs for patients

---

[1]   http://homecare.sangiovannieruggi.it

accessing the Assistenza Domiciliare Integrata (Integrated Home Care) (ADI). The company was therefore asked by the University of Salerno to implement the assessment modules that are in use in the ADI, (SVAMA schedes). The last release of the EHR was issued on 22nd January 2015, when Webcare was implemented with the SVAMA schedes for the ADI. The EHR is accessible through login/password authentication through a HTML protocol. The website is accessible at the HTTTP address homecare.sangiovannieruggi.it. The testing of the website has been performed by the university personnel on mock patients on an intermediate release.

Magaldi Techno is responsible for the management of the ICT of the ASL[2]. The company belongs to the group of Magaldi Life, which has been awarded the tender for the management of the ADI by the ASL. TSD and Magaldi Techno are working together to integrate the two systems. This will overcome the fragmentation of the different databases on the different servers.

The technical development plan has gone through a series of steps:

- First step: server space on provider server: we have now secured data protection on the server of Magaldi Life, which has been identified as a subcontractor for the programme as they are the provider for home care for ASL Salerno. This has been taken care by the ICT office of the University Hospital "Sangiovanni e Ruggi d'Aragona" with the ICT office of Magaldi Life.

- Second step was the open access of the database through the internet. This step has been accomplished by the acquisition from TSD project of the Webcare module. This module was not previously available on the hospital server, and was acquired by the University within BeyondSilos programme. This is now available. A screen shot of the login page is shown below.
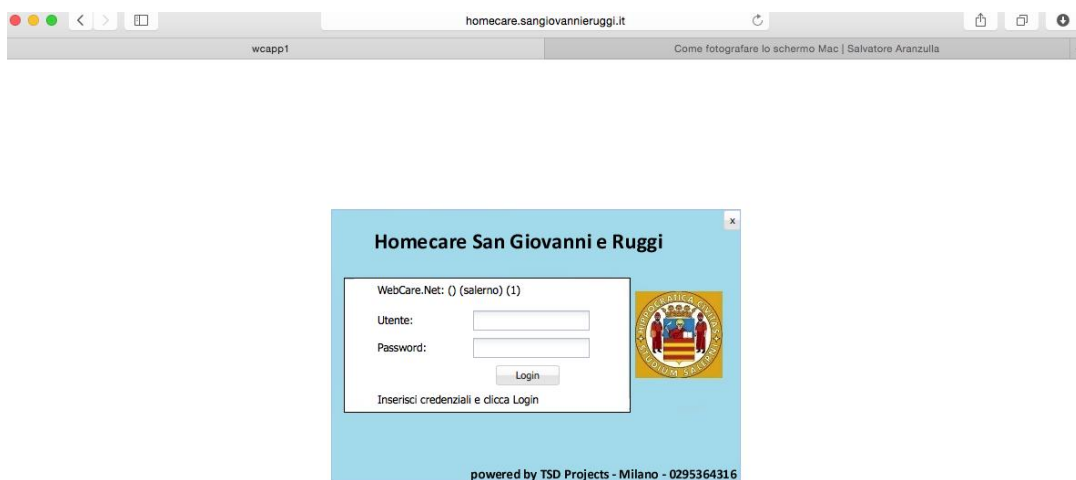
Figure 21: Access page to the Webcare Module

- Third step was to including modules for the social care assessment within Webcare. Wincare and its web based counterpart are based on a clinical approach, and do not include social aspects / assessments. To overcome this problem, modules including social needs evaluation have been commissioned and implemented within the database (SVAMA schedes). This activity was acquired within the financing programme of BeyondSilos. A screen shot is shown below:

---

[2]   http://curedom.aslsalerno.it
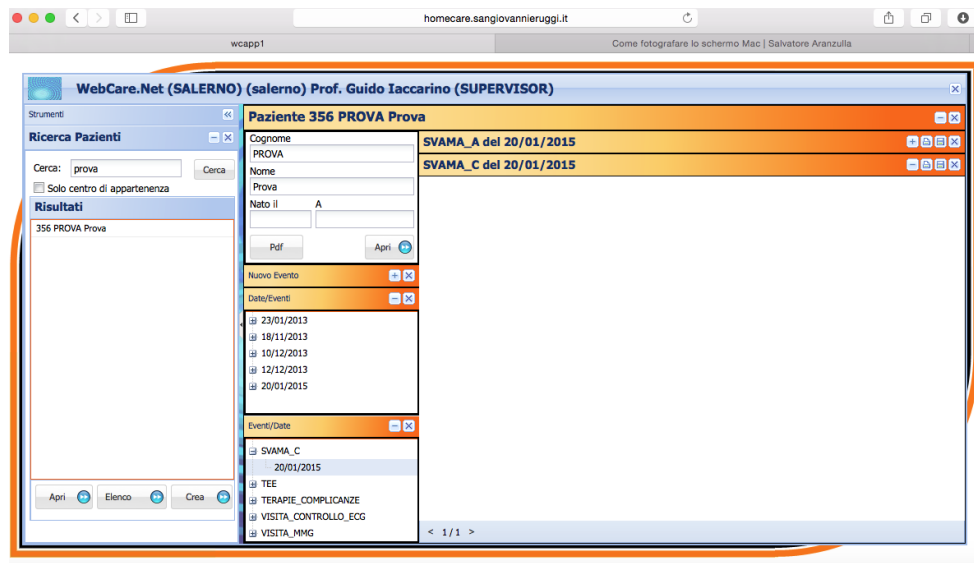
Figure 22: Patient IC record

- Fourth step regards the integration of Wincare / Webcare with remote monitoring: In Campania, we have chosen to open a call for tender for the home monitoring of clinical conditions. The tender was given to Magaldi Life, which is also the company that offers services of home care to the patients of the ASL of Salerno. Given the complexity of the different ICT solution within different districts of Salerno, Magaldi has developed a proprietary ICT solution that includes tracking the integrated care plan, and monitoring of nurse and social care workers accesses at the house of patients. This ICT will implement the remote monitoring of clients.

Figure 23: Salerno platform

Magaldi Life and TSD are working in order to allow the transfer of customer data between the ICT solutions.

3.3.3   Integration Result

The technical development plan has gone through a series of steps, through which we have realised the technical solutions that represent the result of the integration of the existing technology, and the implementation requested by BeyondSilos:

- First result: server space on provider server: we have now secured data protection on the server of Magaldi Life, which has been identified as a subcontractor for the programme as they are the provider for home care for ASL Salerno. This has been taken care by the ICT office of the University Hospital "Sangiovanni e Ruggi d'Aragona" with the ICT office of Magaldi Life.

- Second result: Login based, remote access to the server. This step has been accomplished by the acquisition of the Webcare module. This module was not previously available on the hospital server, and was acquired by the University within the BeyondSilos programme.

- Third result: Integration of the monitoring system within the Curedom website. Magaldi Life identified Health Information Systems (HIS) as the technical provider of the home monitoring system. The ICT office of Magaldi Life and HIS worked out a solution that allows the storing of the home monitoring data directly on the Curedom server at Magaldi Life, in order implement safety and appropriate alignment of data storage.

3.4   Kinzigtal pilot site prototype system

3.4.1   Introduction, point of departure

In 2013, the implementation of an electronic patient record system named CGM net was finished for the GPs and specialists in Gesundes Kinzigtal in cooperation with Compugroup medical. The chances will rise for the physician to receive adequate information, instead of asking the same questions about patient´s health status and treatments a second or third time. Not only for the physician (by saving valuable time) but also for the patient and social care institutions. This is an important aspect in terms of getting a confidential relationship, relief of staff, more transparency between the stakeholders in the care system, and a higher level of quality of care. The idea for BeyondSilos project is to expand the electronic information and communications system by adding social care institutions of Gesundes Kinzigtal. Till now, a linked documentation system between those two sectors does not exist (see Figure 24). The social care provider owns a documentation database system which holds the patient's data referring to social attention, but has no access to the patient's medical records or information that may be useful, and in some cases important, to the decision making. Similarly, social providers and healthcare providers maintain separated records of the assistance procured and services consumed by patients, without access or data sharing among them. There is no horizontal inter-organisation integration, making the coordination of activities more difficult.
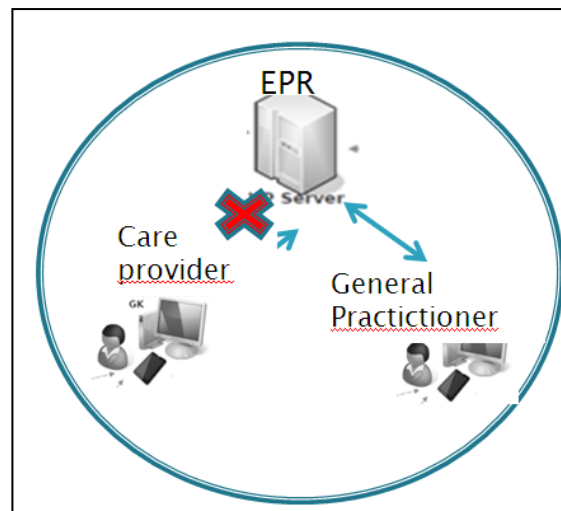
Figure 24: IT infrastructure before beyond silos

Against this background, the contextualised implementation of the BeyondSilos pilot service aims to provide a common framework that allows the coordination of health and social professionals, along with a common patient data set, and permits the provision of integrated care, not only for discharge cases, but also for patients in long term care at home.

The different technical components that Gesundes Kinzigtal is operating are described in D4.1. See detailed information about the already established building blocks and their application / functionality of these in D3.2.

Before BeyondSilos, there was a gap between those two systems, and they were operating separately.

Referring to D3.2, the missing building block is a common Electronic Health and Social Record to see relevant data for social care and health care. To connect the social care documentation software AscleonCare and the electronic patient record CGM net of Gesundes Kinzigtal, a special interface is needed. This interface will be done via client software DocAccess. Doc Access provides a protocol in which the relevant data of the social care sector is written and translated (see Figure 25). This data package can be seen by GPs in the electronic patient record. On the other hand, social carers have access via DocAccess to the electronic patient record, and are able to see specific GP information. On the AcleonCare platform, a special button has been created to start the DocAccess interface.

The technical part will be realised by Medical Networks in cooperation with Gesundes Kinzigtal GmbH to link the social care documentation system AscleonCare with the electronic patient record CGM net.
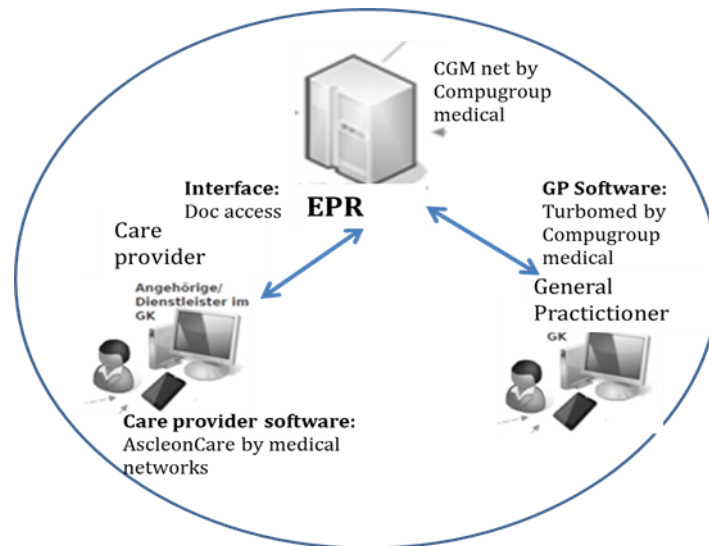
Figure 25: Planned IT infrastructure in beyond silos

3.4.2 Final Prototype Implementation
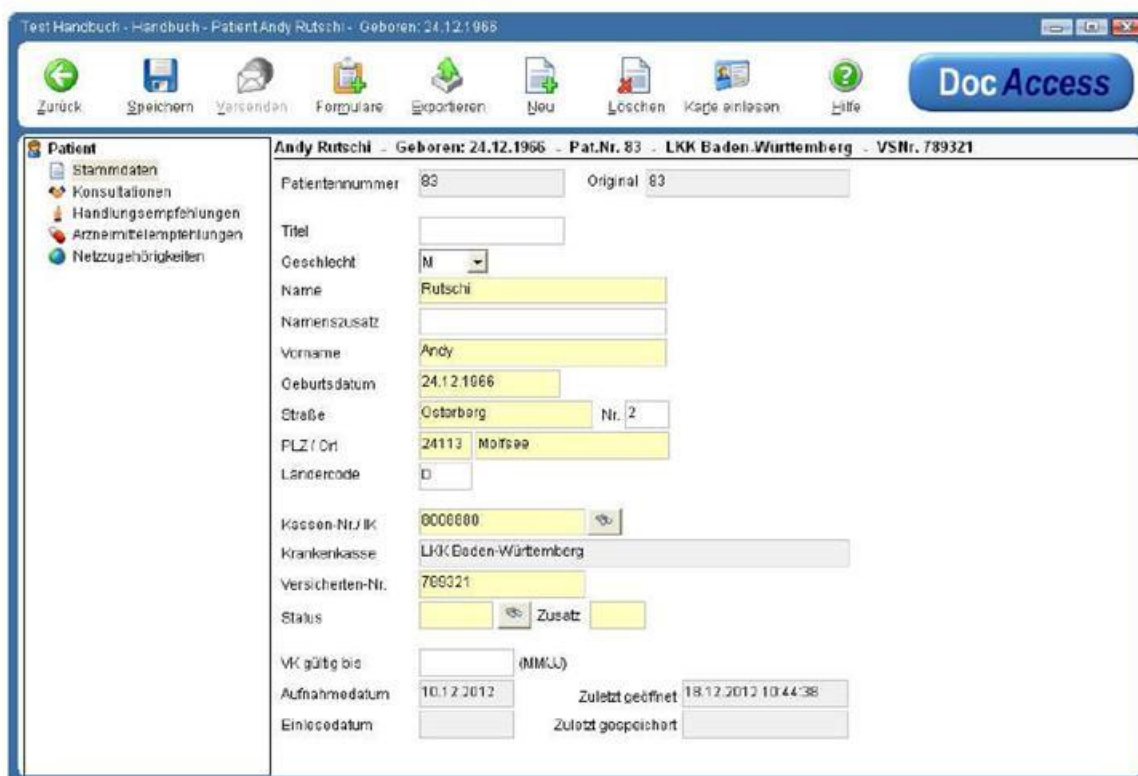
For implementation of the prototype, certain preparations had to be done first. The first step was to install CG-Java and telemed.net on operating system Win 8.1 on every device (tablets) that the social care staff will use to access the electronic patient care record. After that, the server component of DocAccess was installed successfully. The next step was to install client component of DocAccess on the hardware devices. After installation on the different components, the first operating check was done by starting DocAccess via a desktop button. The program starts without errors, and opens registration window to create GP accounts. GP accounts are registered successfully with BSNR and LANR numbers of GPs and personal data. After registration of GP accounts, telemed.net and IV module Gesundes Kinzigtal have been activated by entering specific password. The last step to implement the prototype was to check if patient accounts can be registered and activated; this check was successful too. With these actions, 70% of testing was finished. Still missing is testing DocAccess interface in real life system with AscleonCare and CGM net.

After the pre-testing phase mentioned above is finished, test patient accounts have to be created in AscleonCare (see Figure 26). Testing started with entering into DocAccess only the basic data of the patient, such as name, insurance number, gender, birth date, currently address, via BDT or GDT interface (see next figure).

Figure 26: Screenshot of importing patient data folders in DocAccess

Figure 27: Screenshot of test patient master data imported in DocAccess

After this testing is successful, more test data is written in the protocol. Data in the second testing phase contains relevant health information (see Figure 28). Relevant data is defined in focus groups between social carers and health carers.
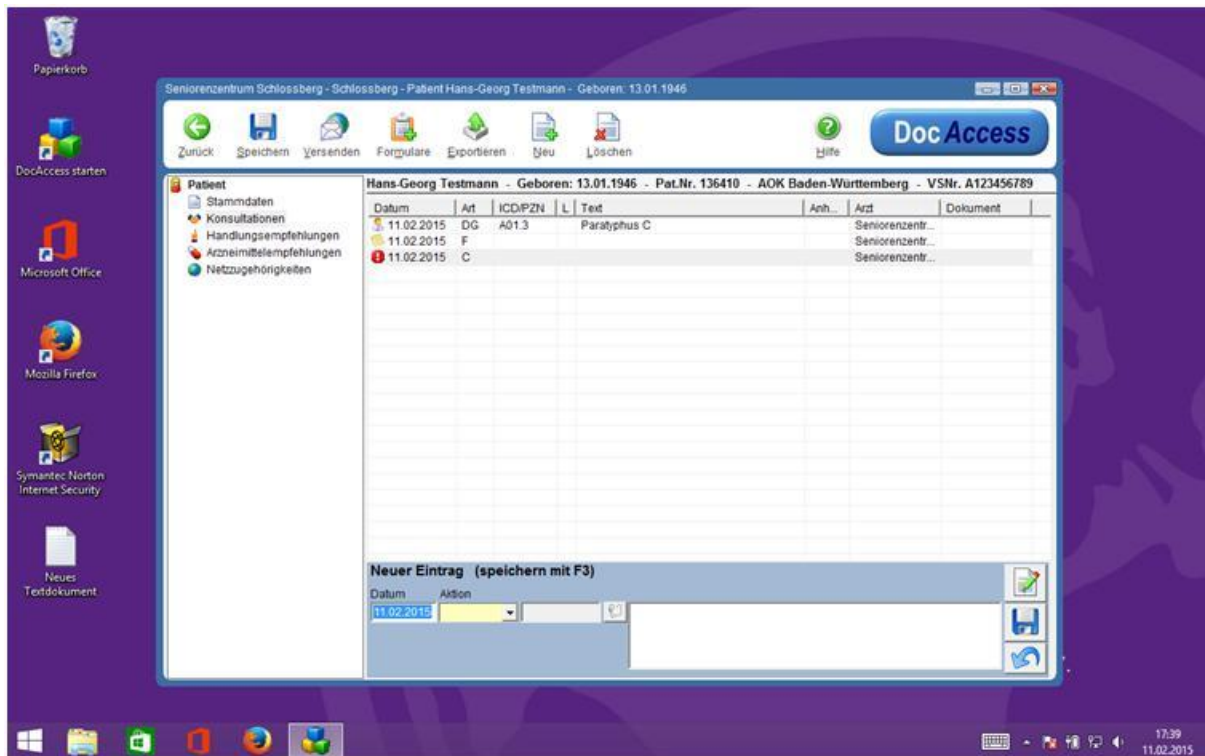
Figure 28: Screenshot of test patient medical data imported in doc access

If this prototype testing phase with a duration of a couple of days is finished without any failure, and no technical changes are needed. the final test phase in BeyondSilos infrastructure starts. This means that whole system has to operate with devices which are used in care process. In this case, devices are tablets for home care units on which staff access electronic patient record via DocAccess. Appropriate tablets (see Figure 29) have to be acquired by social care provider, and DocAccess software has to be installed on them.
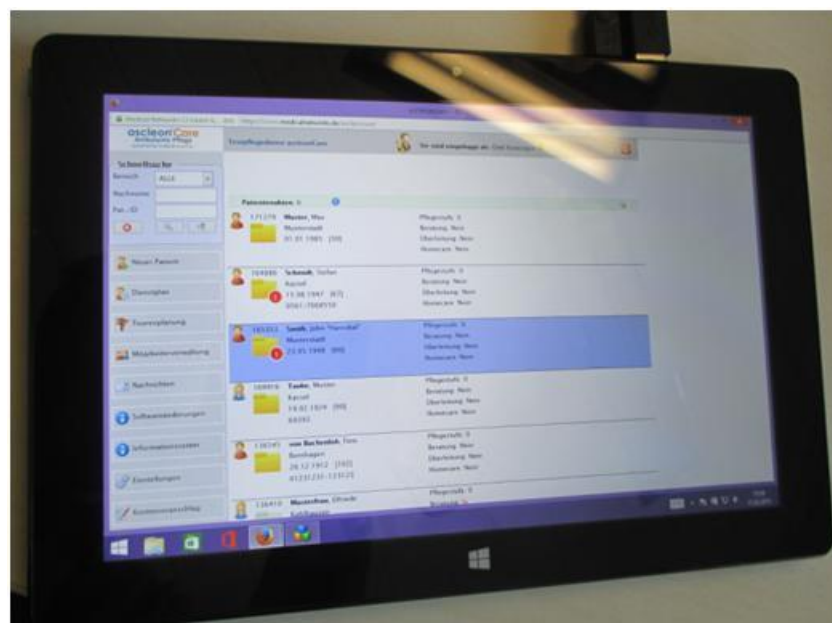
Figure 29: Tablet with AscleonCare software running

The software runs on tablets and PCs of home care unit with the following hardware requirements:

- Display: 25,7 cm (10,1 Zoll) Touchscreen

- Resolution: 1280 x 800 Pixel

- Processor: Intel Atom Z3735F (standard)

- Graphic: Intel HD Graphics

- Main memory: 2 GB

- Store: 16/32 GB

- Operating system: Win 8.1

- Communication: WLAN 802.11 b/g/n, Bluetooth

This means it is operational, and ready to communicate with other software. If DocAccess interface is successfully installed and operating properly on the hardware devices (tablets), and GDT interface is defined in AscleonCare (see Figure 30), then system is ready to communicate with other software such as CGM net.
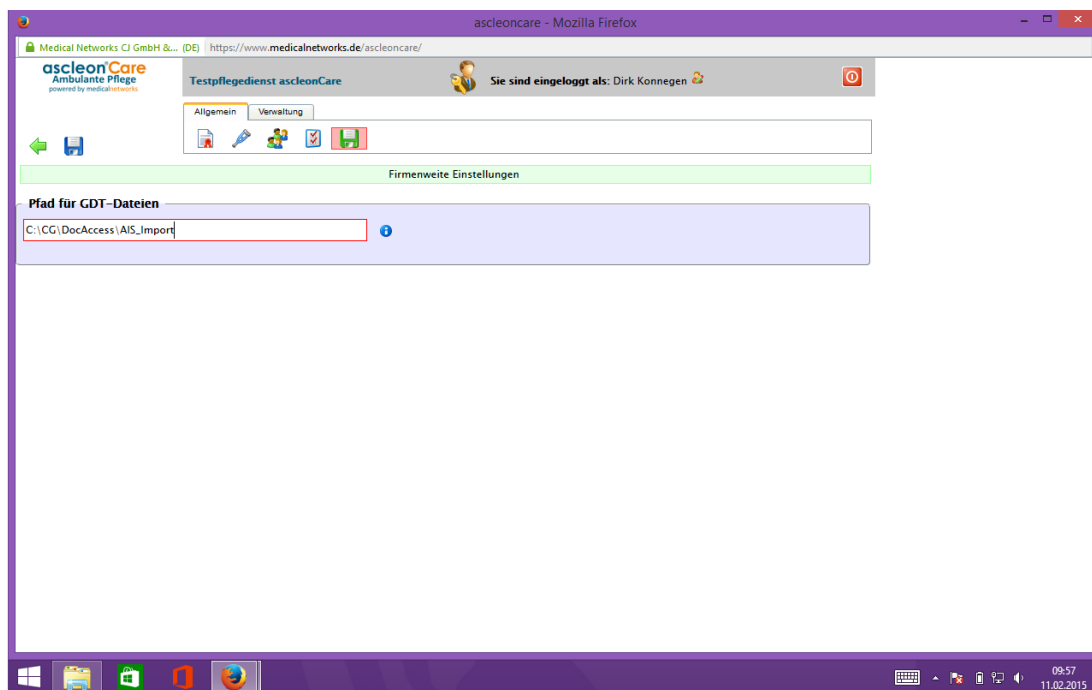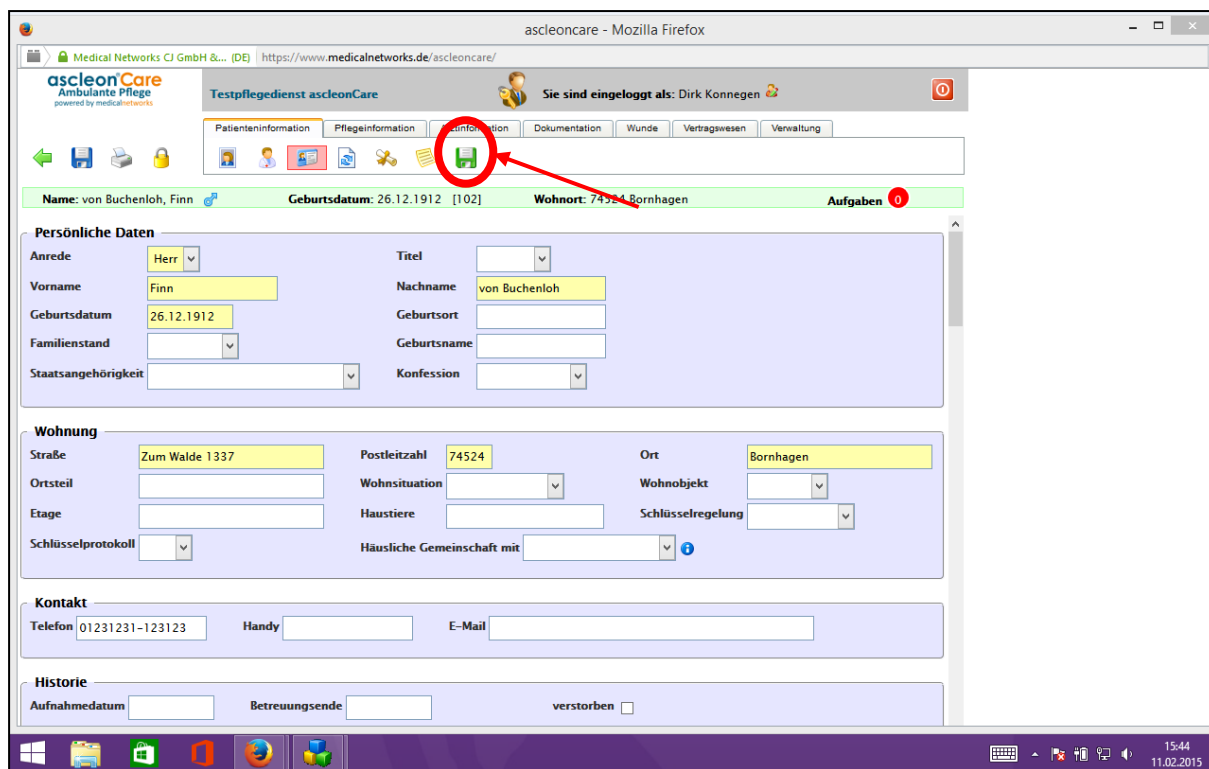
Figure 30: Screenshot of GDT interface pathway

Social care staff enters DocAccess via Ascleon web client (see Figure 31 screenshot of AscleonCare front end with link button). By clicking on green floppy disc symbol, data will be transferred from AscleonCare to DocAccess.

Figure 31: Screenshot patient data in AscleonCare with link button

On the other hand, social care staff may upload relevant social care data into CGM net (see Figure 32).

Figure 32: Screenshot electronic patient record "CGM net

The original test specification protocol for prototype testing is attached at Appendix B: Kinzigtal.

3.4.3   Integration Result

After prototype testing was finished successfully, the technical architecture was integrated into the whole system. Once the patient is entered into database of CGM net by GP practice (see Figure 33) he must also be registered at AscleonCare by social care institution (see Figure 34). When clicking on button "Neuer Patient", registration form pops up to fill out patient data (see Figure 35). Procedure of data sharing follows according to previous sections. From now on it is possible to share information between social care staff and GP about every patient who is enrolled in integrated care system of Gesundes Kinzigtal (see Figure 36).

Figure 33: Screenshot electronic subscription in CGM net
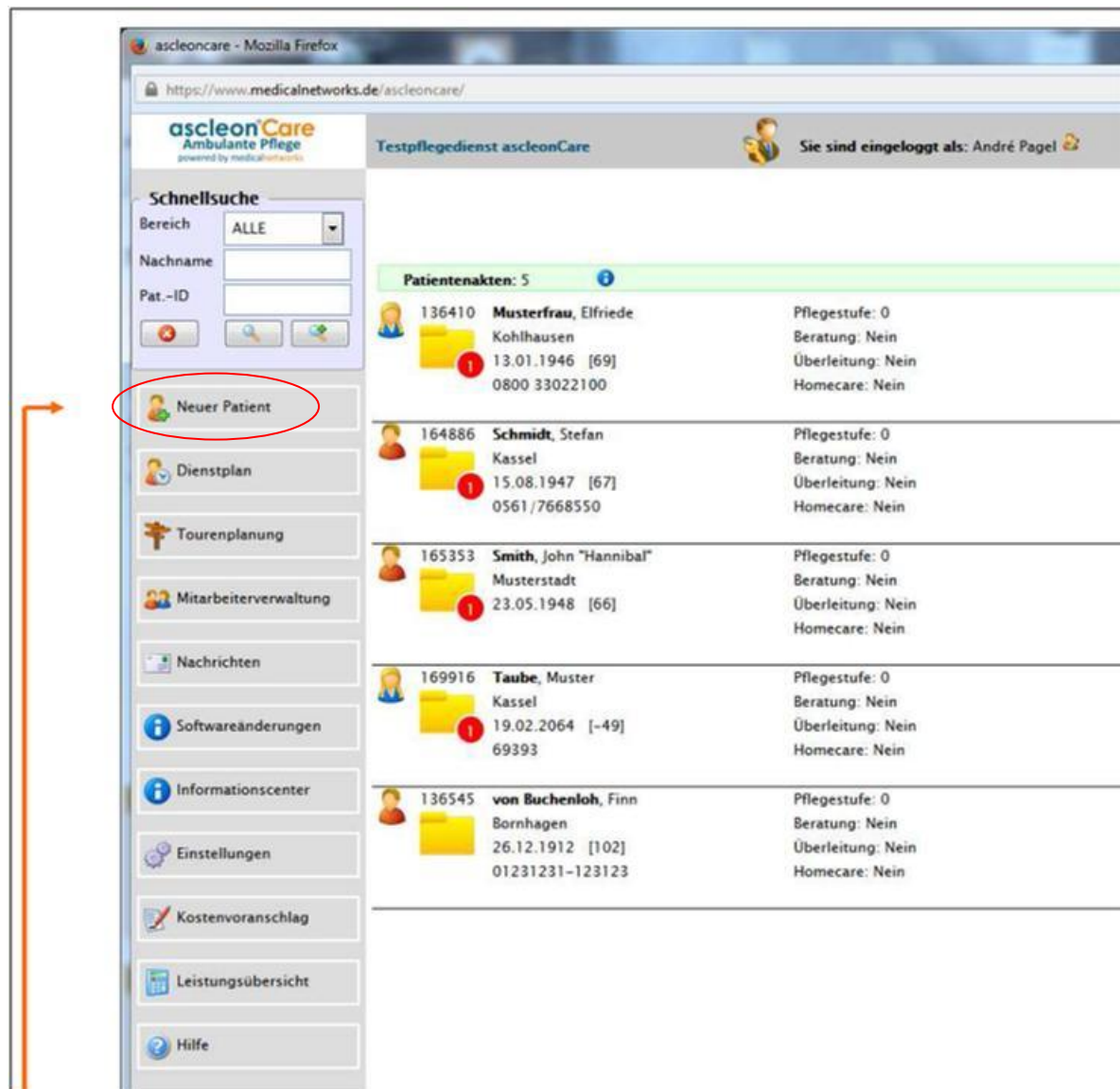
Figure 34: Screenshot of registration of new patients in AscleonCare
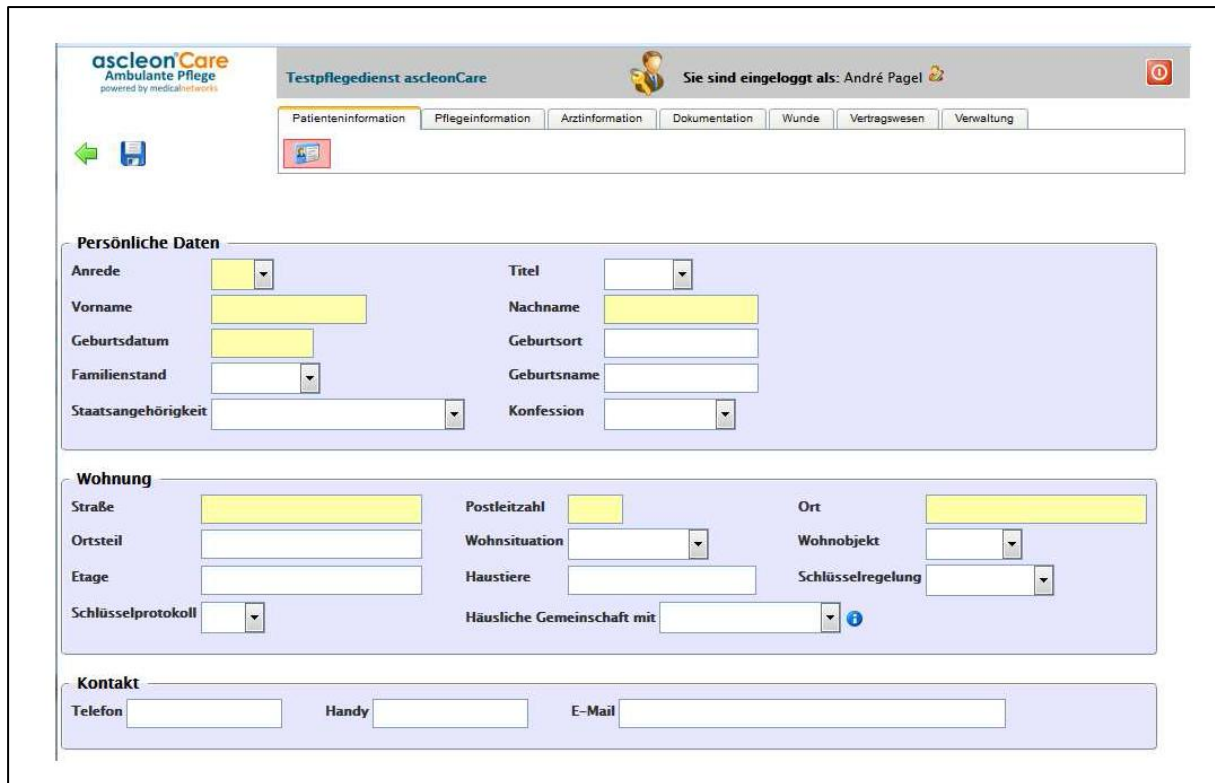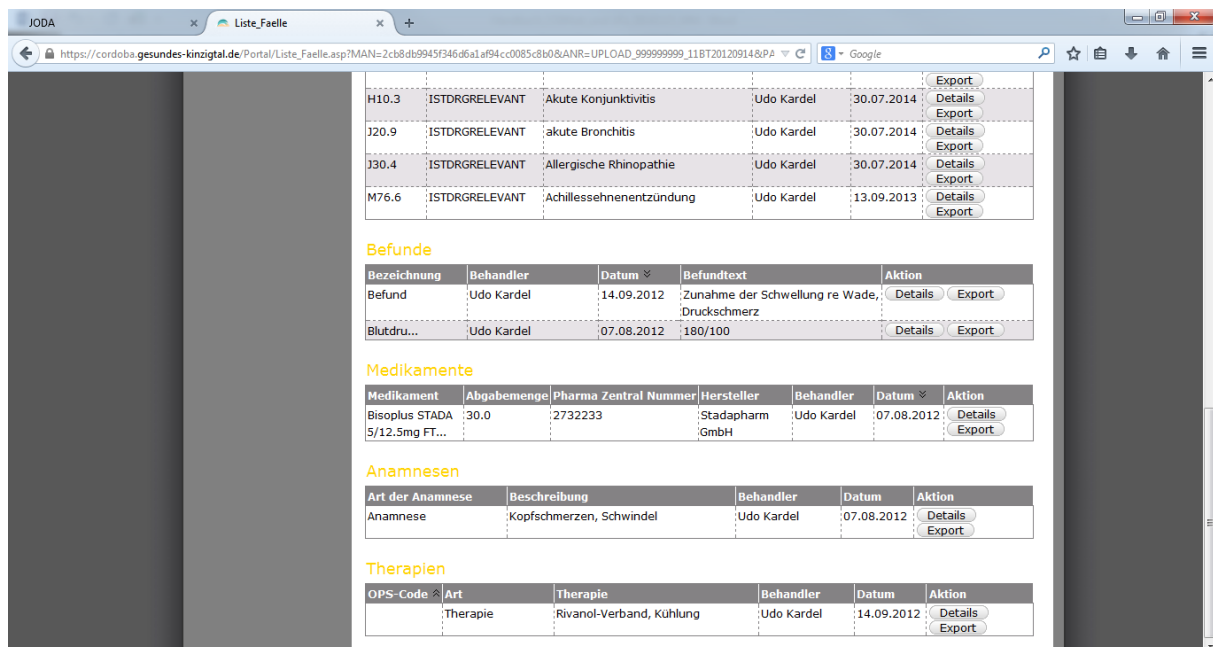
Figure 35: Screenshot patient registration form in AscleonCare

Figure 36 Screenshot of shared patient data in Electronic patient record "CGM net"

3.5 Northern Ireland pilot site prototype system

3.5.1 Introduction, point of departure

With the advent of the Northern Ireland Electronic Care Record (NIECR) bringing together labs, radiology, drugs, allergies, clinical documents, referrals and more, into a single best view of the service user health

record, the opportunity exists to enhance and further Integrate primary, secondary and community information in the form of a mobile, integrated care plan and pathway.

The existing NIECR information which can be used to automatically populate and update elements of any plan developed in NIECR is summarised below:

- Service user demographics and GP Practice details.

- Details of service users outpatient, inpatient day case, OOH and ED attendances from the service user administration systems, the eEMS ED systems and the Symphony ED systems.

- Correspondence letters from the Service User Centre systems e.g. in-service user, out-service user, discharge and results.

- Primary care eReferrals.

- Radiology reports from NIPACS, GE (BCH) and Phillips (RVH).

- Laboratory results from all HSC laboratories.

- Recent acute and all current, and recently discontinued, repeat prescriptions from GP systems.

- Recorded allergies and adverse reactions from GP systems and ED systems.

- Demographic details from the Master Service user Index.

- Service user contact telephone number as recorded by GP.

- Service user's GP address and phone number.

- CaPPS Oncology MDM lists.

- CaPPS Oncology GP letters.

- Immediate Discharge letters from SHSCT.

- OOH GP letters.

- LCID Community information for selected NHSCT users.

- 'Resources' menu item, that allows non-NIECR web links for all or groups of users, such as online training support.

Fully developed integrated care models require information to be available from multiple care environments if the potential for faster, safer, better care is to be maximised. Integration with community, social and remote telemonitoring systems is essential to the success of this project, including eNISAT (electronic Northern Ireland Single Assessment Tool) and remote Telemonitoring NI (TNI) systems integration into NIECR and the Shared Care Plan (SCP).

The Northern Ireland BeyondSilos project team has identified gaps in its current Regional Electronic Care Record (NIECR) (see D3.2 BeyondSilos Service Specification Section 4.5.3). These gaps are to be filled by the integration of TNI and eNISAT, and the other community based systems outlined below, with the NIECR, and the incorporation of an online SCP into the NIECR to pull available information together at patient level, and enable easy access to details in the plan that are held in other systems that integrate with the ECR.

- Integrate eNISAT.

- Telemonitoring NI (TNI) system.

- LCID (NHSCT and SEHSCT).

- Soscare across five HSCNI Trusts.

- PARIS (BHSCT, SHSCT and WHSCT).

Each of these systems must be analysed to ensure the optimal use of source information to best inform NIECR.
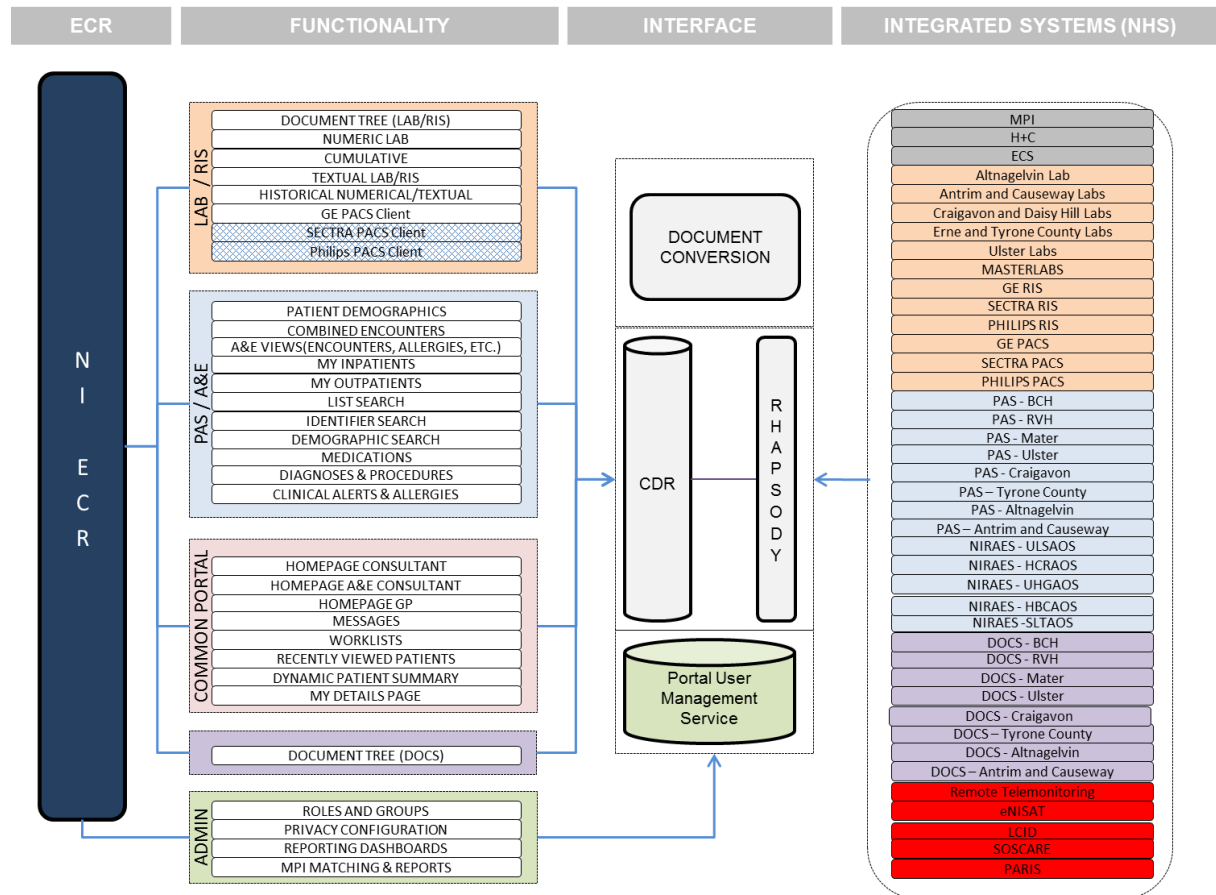
Figure 37: IT systems at HSCNI

The gaps identified in our current NIECR architecture which need filled for BeyondSilos are identified in red in Figure 37 above.

For the Share Care Plan, the gap identified in D3.2 BeyondSilos Service Specification Section 4.5.3 for Northern Ireland looks like this:
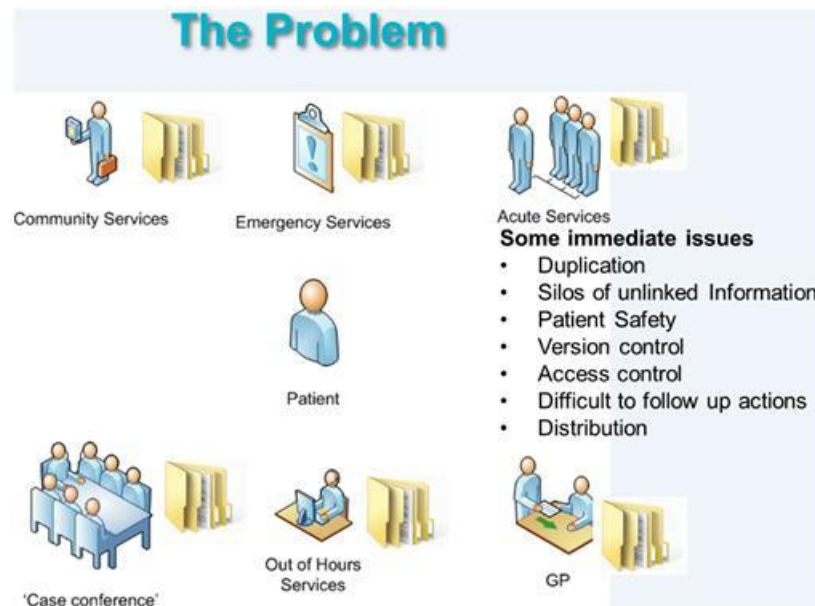
Figure 38: HSCNI Problem

The solution proposed for Northern Ireland is to have information created once, and viewed in a common platform so that anyone involved in a patient's care can access quality information to improve decision making anyplace, anywhere within the Northern Ireland Health and Social Care Network; at a high level, the solution Northern Ireland proposes looks like this:

Figure 39: HSCNI Solution

3.5.2 Final Prototype Implementation

A prototype has been developed to elaborate the data fields and presentation requirements within NIECR from eNISAT and TNI systems using existing community information systems.

Community information is essential for integrating care. NIECR has a structured format for presenting the key community and social care information to users. See Figure 40 below for example from LCID.

	Service	Team	Key Worker	Start Date	Last Contact	Closed Date	Source
	OCCUP THERAPY PAEDS	OT COMM PAEDS BMENA					LCID - NHSCT
	COMMUNITY DENTAL SERVICES	COMMUNITY DENTAL TEAM					LCID - NHSCT
	ORTHOPTICS	ORTHOPTICS TEAM					LCID - NHSCT
	PODIATRY	PODIATRY CAUSEWAY TEAM					LCID - NHSCT
	PAEDIATRIC PHYSIOTHERAPY	PAEDIATRIC PHYSIOTHERAPY TEAM				20/08/2014	LCID - NHSCT
	PAEDIATRICS	PAEDIATRICS TEAM				15/04/2014	LCID - NHSCT

Figure 40: Key community and social care information

It was recognised during the design phase of the LCID integration that more information about the services a service user was in receipt of would be helpful to contextualise the service beyond the key information. To provide more information, NIECR uses the blue book icon, which when selected presents more detailed information in a pop-up:

LCID Encounter Detail

Service	PODIATRY	Team	PODIATRY CAUSEWAY TEAM
Key Worker		Primary Prog. Of Care	FAMILY AND CHILD CARE
Start Date			
Referral Source	PHYSIOTHERAPY	Hospital	
Referral Urgency	ROUTINE		
Waiting List Start Date		Date Closed	
Assessment Date		Discharge Reason	
Assessment Result	ACCEPTED FOR REVIEW		
Intervention Start Date			
Last Contact Date			
Last Contact Interventions			
1	ISSUE AND REVIEW OF ORTHOSES	2	ADVICE/SUPP TO PATIENT F TO F
3	ORTHOTIC PRESCRIPTION	4	

Figure 41: LCID encounter detail

Discussions have begun with the eNISAT supplier's technical solutions architects to establish the data model and data fields within eNISAT which could be useful within NIECR, as well as develop an interface to NIECR.

TNI data is not available to HSCB clinicians without prior configuration of accounts and roles in the TNI platform, at which point the clinician / social care professional will be permitted to log in directly to the

platform and view the appropriate information. By enabling the sharing of data between the TNI service and the NIECR, two major benefits can be achieved:

- Information not already part of NIECR, such as vital sign data and telecare alarms: this makes valuable, up-to-date information available to various clinical and social care stakeholders who would otherwise be unable to access it. This includes ED clinicians, GP out-of-hours, secondary care clinicians, and community clinical and social care professionals. Intelligent use of data, such as vital signs data, from TNI to update and inform pathways and forms which might already exist in NIECR including the SCP.

Once the integrations have been completed, there will be a dual benefit to integrated care:

- Having community and social care information more widely available to users in the context of a clinically rich NIECR dataset will allow more informed and better decision making about a service user.

- NIECR will have the ability to reuse this information to develop shared care pathways. This has the potential to reduce duplication of effort, and allow a single environment for presenting and updating key service user information.

Shared Care Plan

The Beyond Silos project will use NIECR dynamic forms to develop a shared care plan reusing information gathered from the community, eNISAT, TNI, and social care integrations, as well as information already known to NIECR. The project will create easily accessible points to enrol service users from GP practices participating in the BeyondSilos project, and update related information directly into a care pathway.

This has potential to significantly reduce the duplication of information recording: record once, use many. Any information contained within NIECR can be reused on any form created within NIECR. The plan is designed to trigger tasks and reviews of key information at particular points in the service users' care. The plan allows for progress and clinical notes to be recorded against the service user's record by appropriately authorised health and social care professionals involved in the service user's care.

A prototype pathway developed for diabetes has been used below to give a sense of what is possible for Beyond Silos:
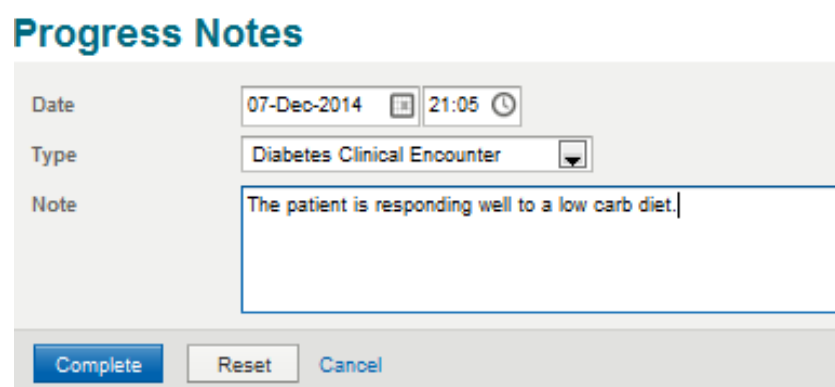
Figure 42: Progress notes

The pathway forms allow for different encounters to be dynamically recorded and stored against the service user's NIECR record.

Figure 43: Clinical Encounter

The pathway will also enable the collection of vital sign data, such as blood glucose levels, blood pressure, etc., from the TNI system, for example; then they could be used automatically to pre-populate elements of the pathway where that information is already known to NIECR.

Figure 44: Vital Signs

3.5.3   Integration Result

To test the outcome of the LCID integration prototype, a user survey was carried out with those users involved in the ECR community pilot, asking for their feedback on the community information showing on ECR from LCID.

Four questions were asked, with the answers available being yes or no. Below is a graph showing a summary of the responses received.
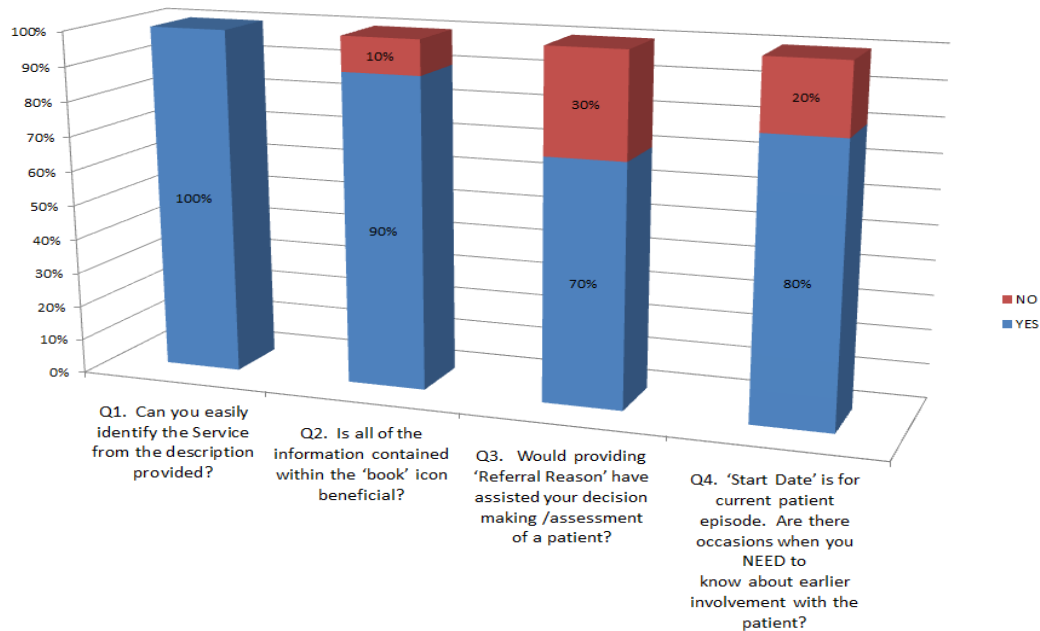
Figure 45: Result Questionnaires

Question 1: All respondents agreed that they could easily identify the service from the description provided.

Question 2: 90% respondents replied that they found all of the information contained within the 'book' icon beneficial, with the only differing comment being more related to LCID.

Question 3: 30% of respondents confirmed that providing 'Referral Reason' would not have helped them with their decision making; however 70% replied it would have helped. The general consensus was it would give a more complete picture and provide clarity on a client's history.

Question 4: Although 20% of respondents confirmed they did not need to know about earlier involvements with a patient, 80% of respondents replied that there are occasions when they do need to know.

It is also the question which generated the most additional comments, with respondents replying that knowing earlier involvement would be beneficial:

- For mental health cases.
- For awareness of a patient's history.
- If a patient was a poor historian.
- If the problem is a recurring one.

There was an additional comments / suggestions section. 50% of respondents took the opportunity to add comments to this. Comments included:

- Asking for CRHTT (Crisis Response Home Treatment Team) involvement.
- Including a patient's medical history.
- For SOSCARE to have named worker details instead of last visit (as only 6-monthly reviews are input).

- Being able to check if other professionals / hospitals have put onward referrals to community; this would enable care planning / avoid duplication.

Comments made during training indicated staff would like to be able to view eNISAT information and also any community letters sent to a GP.

The inclusion of eNISAT as an outcome in the survey was very welcome, and further reinforces and supports the intentions of the BeyondSilos project.

Data Sharing Model

The following is a summary of the datasets and functionality which was tested as part of the release of community information via NIECR for the BeyondSilos Project. More details of the test plan can be found in Appendix C.

Table 5: Summary of the datasets

	LCID Referral data for all services	LCID Treatments for all services	SOSCARE Referral data For all services
Level 1 **(Group)**	**Yes** **(ALL)**	**Yes** **(ALL)**	**Yes** **(ALL)**
Consultants and GPs			
Community Team Leaders			
Exceptions			
Level 2 **(Group)**	**Yes** **(ALL)**	**Yes** **(ALL)**	**Yes** **(ALL)**
Doctors			
Nurses			
Midwives			
Community Social Workers			
Pharmacists			
Clinical Psychologists			
Community AHPs			
Community Nurses			
Exceptions			
Level 3 **(Group)**	**No**	**No**	**No**
Clinical Admin			
Pre-Reg Pharmacists			
Exceptions			
Level 4 **(Group)**	**No**	**No**	**No**
Health Records			
Health Care assistants			
Exceptions			

	LCID Referral data for all services	LCID Treatments for all services	SOSCARE Referral data For all services
Level 5 **(Group)**	**No**	**No**	**No**
Student Doctors			
Student Nurses			
Student Midwives			
Student AHPs			
Social Work Students			

Testing Conclusion

The community elements of BeyondSilos were successfully tested through development, test and pre-production environments. These tests were performed and signed off for release by health and social care professionals in Northern Ireland.

At each stage of testing the source community system (LCID, Soscare) was compared directly against the NIECR representation of the data to ensure the integrity and accuracy of the data when presented in NIECR.

A variety of common use cases were developed as part of the testing strategy and patients were selected for testing based on the richness and complexity of the data in the record.

This development on behalf of the BeyondSilos project went live in NIECR between February and June 2015.

3.6 Sofia pilot site prototype system

3.6.1 Introduction, point of departure

Sofia's IT pilot site baseline will be established after the prototype implementation, since there is no ready product implementation yet.

The primary point of departure is the initial agile business requirements high level documentation that can be found at:
https://docs.google.com/document/d/1u63uXTUb2HB3rqdcXfR0s7YiH72gJF-7Q_DWMhILvVQ/edit#

The list of requirements as a point of departure is shown in Table 6. Since the methodology of delivery is Agile, bear in mind that some of the requirements might change or drop depending on their priority during the project.

Table 6: Sofia requirements

Web portal and database	Integrated Patient File Database
	Health / social care events
Mobile devices deliverables	Patient Notifications Mobile Module (Alarm Call)
	Patient events calendar
	Drug administration notifications

	Social visit notifications		
	Other notifications	Medical Care Provider Mobile Module	Environmental measurement plug-ins
			Patient vital signs measurement plug-ins
			Blood pressure measurement
Web Portal Module	Patient file		
	Patient record		
	Patient data		
		Social care data	
	Integrated Health & Social Care Plan		
	Patient summary		
	Vital signs		
	Blood pressure		
	Pulse		
	Aritmic alarms		
	Patient drug assignment		
	Other patient statistics		
	Social activity records		
	Current patient geo location		
	Alarms		
	Reports		
Mobile devices setup	Teleconferencing setup		
	Geo location settings		
	Serious games		
Security	Connection encryption		

3.6.2   Final Prototype Implementation

A beta v0.8.1 release of the IT pilot infrastructure is implemented, including the following building blocks:
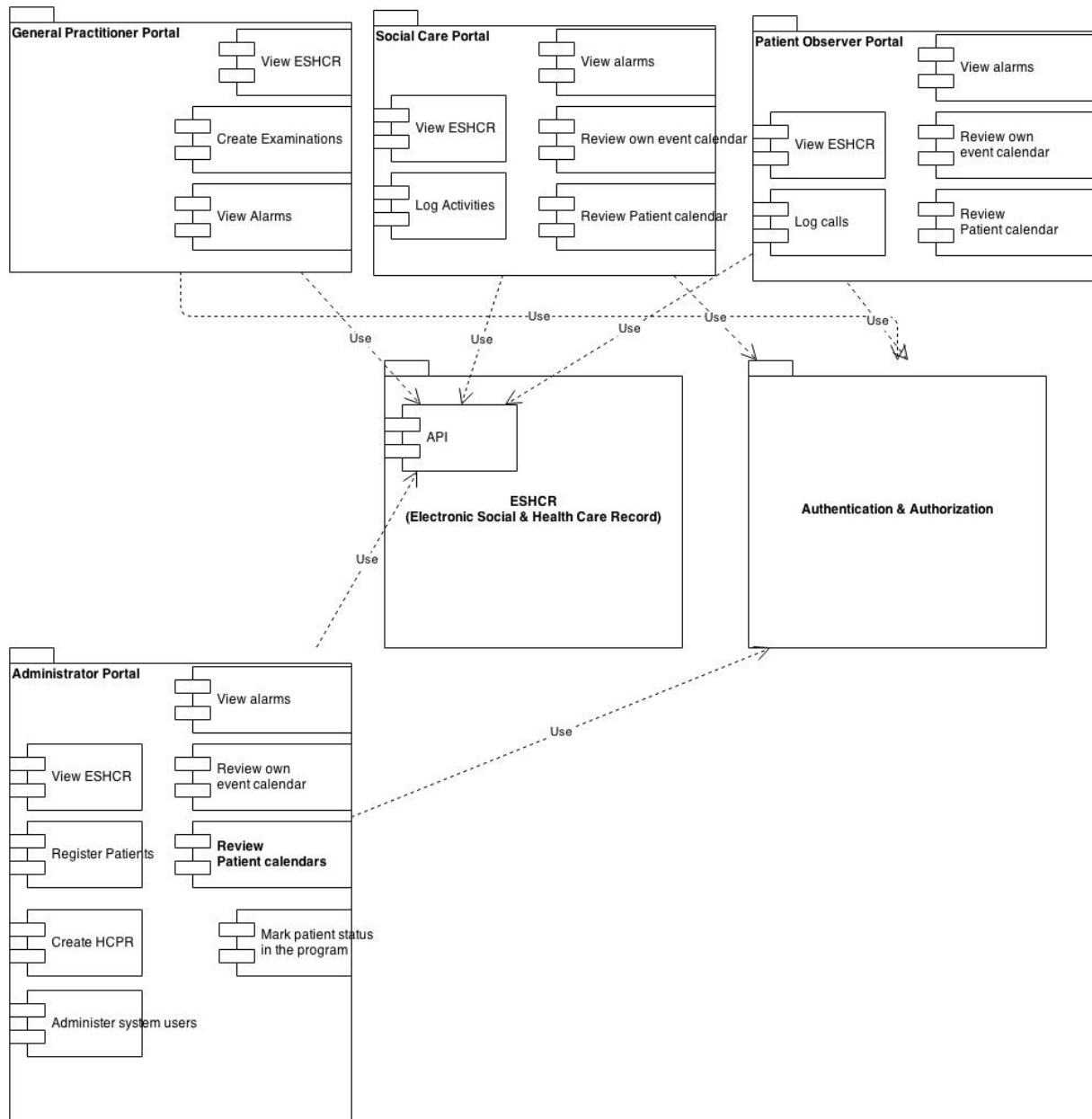
Figure 46: Sofia Building Blocks

The pilot has been released at: https://bs.czpz.org

Below are some selected screens from the pilot.

Figure 47: Call centre

Figure 48: GP screen

Figure 49: Appointments screen

Figure 50: Patient details
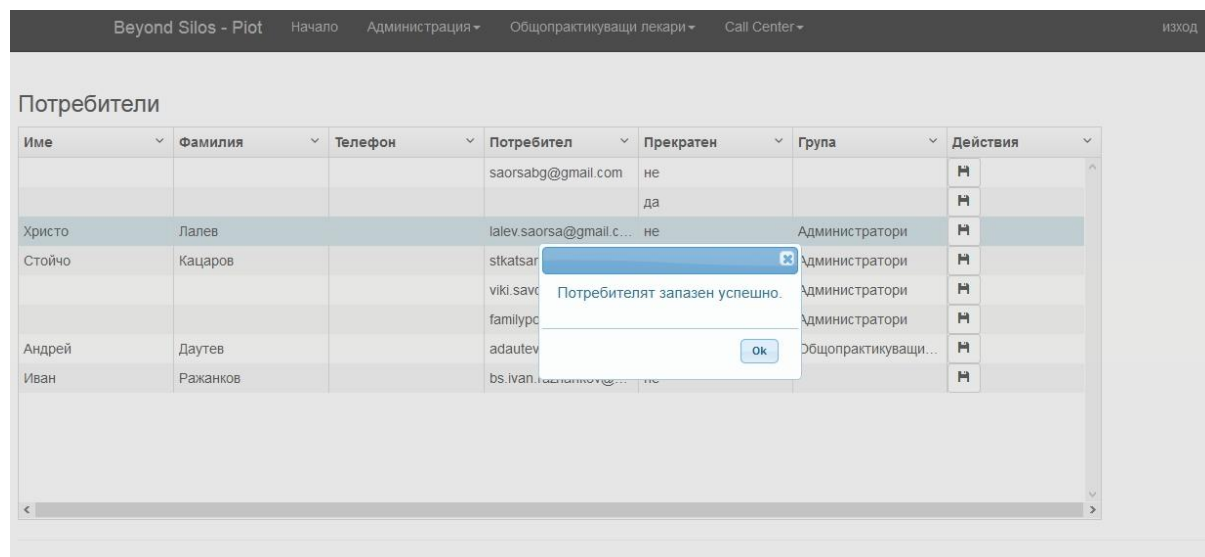
Figure 51: User management

The infrastructure used is:

- Databases
  - Microsoft Server 2014.
  - Microsoft Entity Framework v 6.1.2 as a data access framework.

- Web Portal Modules
  - ASP.NET MVC 5 or higher.
  - REST endpoints.
  - ASP.NET MVC WebApi 2.1 or higher.

- OPENID/OAUTH 2 authentication and authorization providers.
  - Google accounts are used for user authentication.
  - A local standard ASP.NET role provider is used to assign users to different claims.

- Mobile devices development
  - Android JellyBean 4.3 or higher serves as mobile devices platform.
  - Bluetooth LE 4 is used for inter device communication.

3.6.3 Integration Result

The following tests were performed:

- Smoke tests and heartbeat monitoring.
- Beta v0.8.1 UAT testing.
- Automated unit testing for every code commit.

Product integration status:

- Technological:
  - All product interfaces are stable, up and running.
  - All external interfaces (google authentication, google calendar) are stable, up and running.
  - Mobile device integration is stable. An authentication improvement is being planned.

- Operational:

Product is being monitored for the following:
  - Security issues.
  - Application exceptions.
  - Cloud security attacks.
  - Regular product backup is up and running.

Source control is stable and well versioned.

3.7 Valencia pilot site prototype system

3.7.1 Introduction, point of departure

Valencia Pilot site was organised around the three main systems presented in deliverable D3.2; these are:

- Abucasis: central repository for health information about each individual patient regarding primary care activities.

- Orion clinic: central repository for health information about each individual patient regarding Hospital La Fe activities.

- NOMHAD: telemonitoring platform, integrated with Orion Clinic for health purposes.

Mapping these three systems with the BeyondSilos architecture had shown how Valencia pilot site follows the architecture to support pathways and processes.
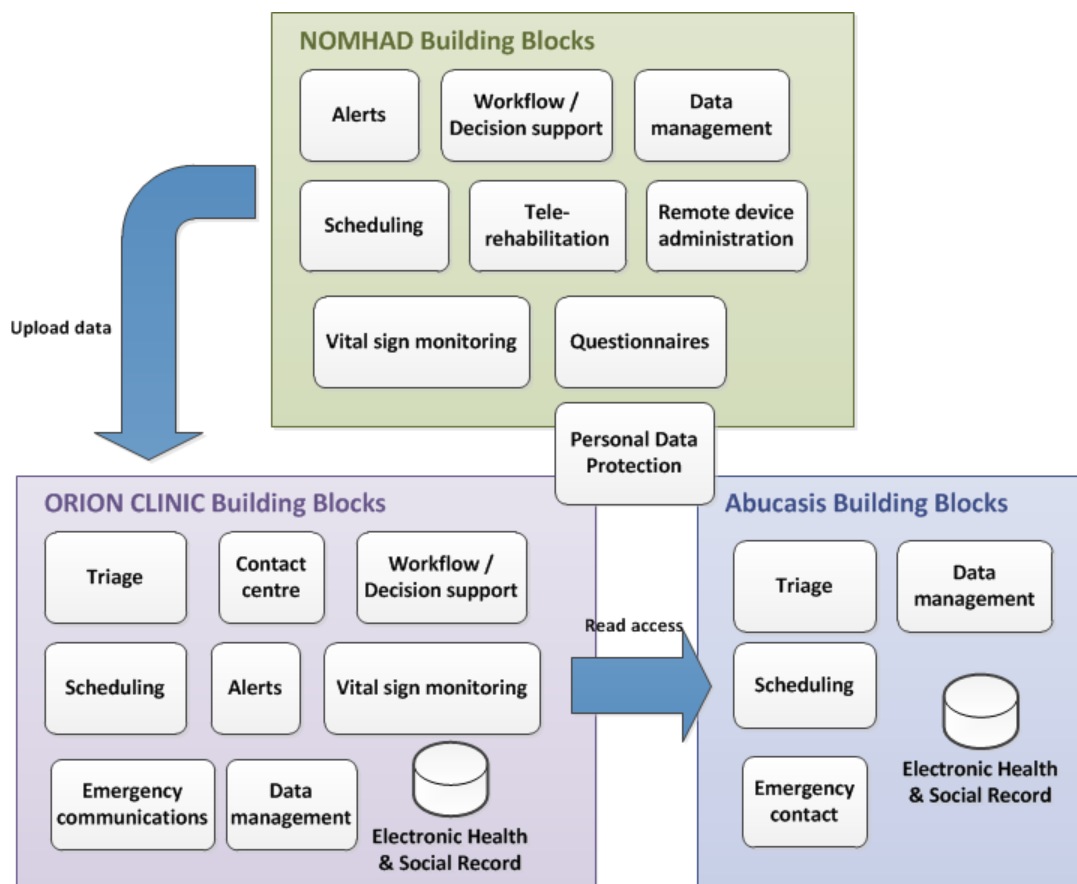
Figure 52: Valencia pilot mapping

The result of mapping these three systems with the BeyondSilos architecture had detected the following gaps:

- Missing building blocks: third party services, learning / training platform, telecare communication (videoconferencing), behaviour monitoring, ambient monitoring, and predictive modelling. Valencia pilot sites specified its intention to incorporate the new building block Predictive Modelling in order to go a step further and improve assessment and adjustment of risk behaviour.

- Global improvements: to achieve the project objectives and after the gap analysis carried out in D4.1, a global or longitudinal gap was detected that was the need to integrate social dimension in the reality of Valencia pilot site at the level of intervention and follow-up in the care plan; although an initial social assessment is done with Orion Clinic, as shown in Figure 53:
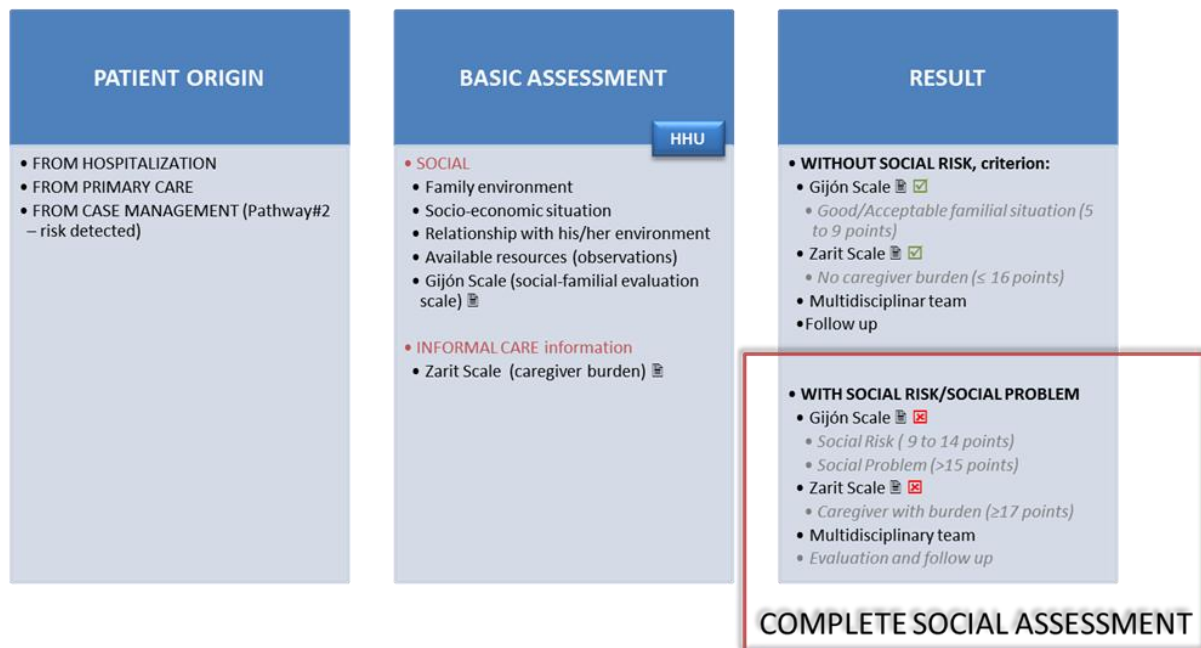
Figure 53: Initial social assessment carried out in Valencia pilot

A continuous assessment, intervention and follow-up are missing in the pilot, and have to be incorporated in order to achieve project and pilot objectives.

The integration of these new functionalities and Predictive Modelling building block need the adaptation of Orion Clinic and NOMHAD

3.7.2 Final Prototype Implementation

As already explained, two main gaps to be integrated in the pilot site infrastructure were detected during the technical analysis performed in the WP3. These gaps are the integration of the new building block Predictive Modelling, and the inclusion of the social dimension in the care process of La Fe. This last integration supposes the adaptation of Orion Clinic and NOMHAD systems. The following sections explain the implementation of both gaps.

3.7.2.1 Final implementation of predictive modelling building block

Predictive modelling in health and social care is an analytical process involving assessment and adjustment of risk behaviour, as applied to a given population based upon available data, for the purpose of stratifying that population by their future probability of incurring a given outcome or behaviour.

Predictive modelling is essentially a way to take specific data sets from EH&SR implementation, and use them to predict future trends. The objective is to identify individual opportunities for intervention or action before the projected outcome has occurred, and in this way to mediate hospital (re)admissions.

One ambitious way in which integrated care could benefit from predictive modelling is in the improvement of patient outcomes. Models which are capable of doing this will make use of Big Data, EH&SR and workflow implementations. Predictive modelling for clinical outcomes will essentially allow integrated care providers to monitor patient outcomes by taking into account specific patient factors; for example, a patient population can be examined based on a chronic condition. Predictive modelling can take into account patient factors such as age, severity, gender, primary diagnosis, etc., and see what correlation there is with the onset, worsening, or development of the disease. Going a step further, predictive modelling can provide statistics on what has worked most effectively to treat a specific disease from a care perspective, and can indicate optimal care for specific patient groups based on their historic data to provide the optimal outcome.

With increasing costs associated with drug, health and social services provision, public sector and health and social providers need a way to analyse their data quickly and efficiently to ensure that business decisions are reliable, and better care is provided to the population from an integrated care perspective, and emphasising prevention as a way to deliver optimal care.

Valencia pilot site has implemented the Predictive Modelling building block through commercial software called SAS Visual Analytics.
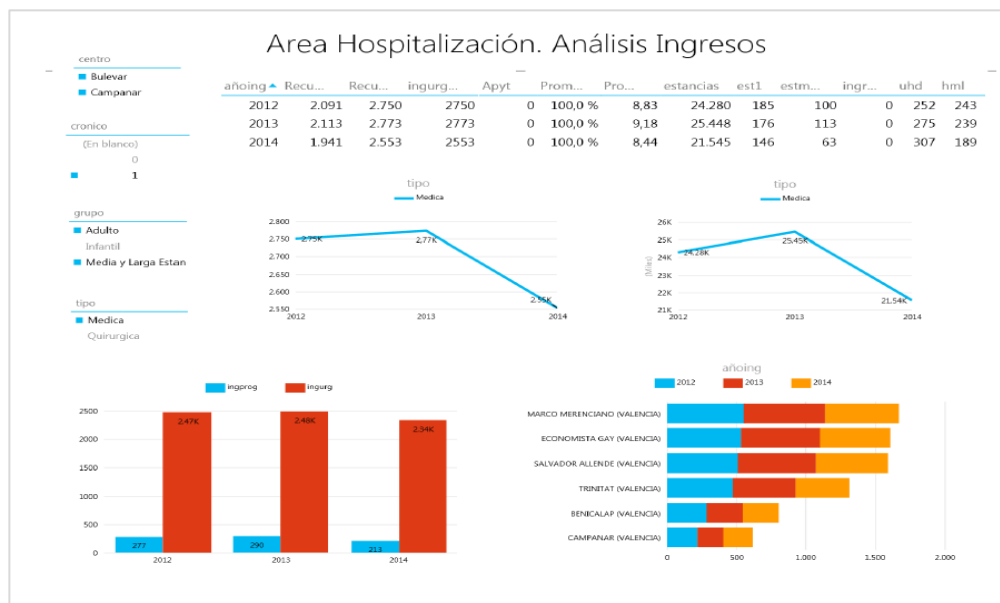
Figure 54: SAS predictive module

SAS Visual Analytics software is a high performance analytics tool developed for organisations in any industry working with data. Users are able to quickly explore and gain insight from their data by identifying patterns and trends using the simple-to-use descriptive and predictive analytics tasks available, with no coding required.

SAS Visual Analytics is an easy-to-use, web-based product that leverages SAS high-performance analytic technologies. SAS Visual Analytics empowers organisations to explore huge volumes of data very quickly to identify patterns and trends, and to identify opportunities for further analysis. SAS Visual Data Builder (the data builder) enables users to summarise data, join data, and enhance the predictive power of their data. Users can prepare data for exploration and mining quickly and easily. The highly visual, drag-and-

drop data interface of SAS Visual Analytics Explorer (the explorer), combined with the speed of the SAS LASR Analytic Server, accelerate analytic computations and enable organisations to derive value from massive amounts of data. This creates an unprecedented ability to solve difficult problems, improve business performance, and mitigate risk rapidly and confidently. SAS Visual Analytics Designer (the designer) enables users to quickly create reports or dashboards, which can be viewed on a mobile device or on the web.

SAS Visual Analytics empowers business users, business analysts, and IT administrators to accomplish tasks from an integrated suite of applications that are accessed from a home page. The central entry point for SAS Visual Analytics enables users to perform a wide variety of tasks such as preparing data sources, exploring data, designing reports, as well as analysing and interpreting data. Most important, reports can be displayed on a mobile device or in the SAS Visual Analytics Viewer.

Using SAS Visual Analytics, users can enhance the analytic power of their data, explore new data sources, investigate them, and create visualisations to uncover relevant patterns. Users can then easily share those visualisations in reports. Traditional reporting is prescriptive. That is, you know what you are looking at and what you need to convey. However, data discovery invites you to plumb the data, its characteristics, and its relationships. Then, when useful visualisations are created, you can incorporate these visualisations into reports that are available on a mobile device or in the viewer.

SAS Visual Analytics provides users with the following benefits:

- enables users to apply the power of SAS analytics to massive amounts of data;
- empowers users to visually explore data, based on any variety of measures, at amazingly fast speeds;
- enables users to share insights with anyone, anywhere, via the web or a mobile device.

3.7.2.2   Final care process in La Fe

La Fe has a complex process for providing integrated care to those patients that are part of the Case Management programme. In BeyondSilos, this complex process has been complemented with the collaboration of a social provider Atenzia. The final process where the use of technology is highlighted in the following figure.
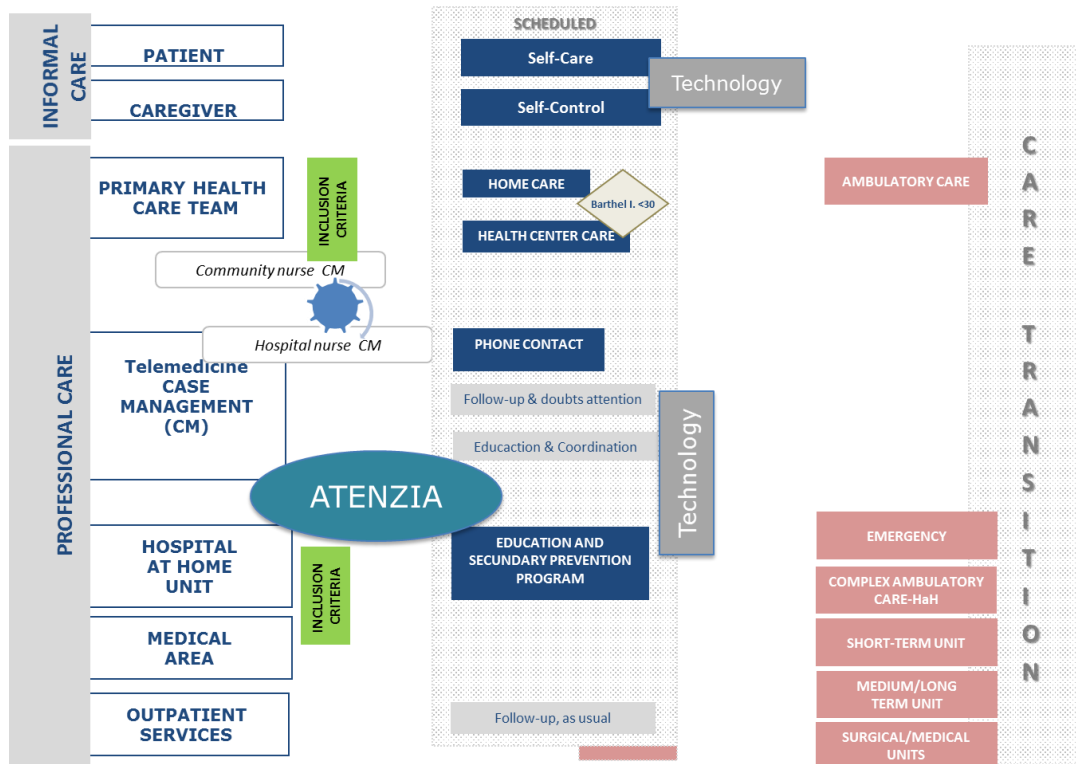
Figure 55: Valencia IC process with technology

The main role played by the technology is focused on the use of systems for the self-care and self-control by the patient and relatives, now including the social perspective, and the technology used by the social provider in order to keep the person safe and independent at home. The information gathered by the social provider now is shared with the Case Management programme at the hospital, and vice versa, providing a whole and integrated vision of the person social-care dimension.

Figure 56: Data gathered at home

Atenzia is a social provider collaborating with the public sector in the provision of social services. They respond to the demand for home provision of formal care through the use of new technologies. Its main activity is the telecare service, both for public health system customers, integrated into subsidised programmes, as well as private clients, who are directly engaged in the service.

Atenzia provides services to people suffering from loss of autonomy, elderly, sick adults, chronic patients and disabled people, so they can continue living in their homes. They offer a 24 hours / 365 days service guaranteeing clients help at any time, especially in emergency situation. The telecare service is a terminal connected to a portable push button (red button) which can be worn as a bracelet or medallion. Pressed,

the system is activated by connecting the person to the Atenzia care centre, allowing talking from anywhere of the house in "hands-free" mode.

Following the telecare service installation, the client is connected permanently, being cared for by a team of qualified professionals, ready for immediate response to any emergency, either with its own resources, or in coordination with other resources (public emergency services, security, family, etc.), 24 hour/day, 365 days/year.

The telecare service includes:

- 24 hour, 365 days connection: the client is connected permanently to the Atenzia care centre.
- Immediate attention in case of emergency.
- Home and mobility coverage.
- Direct contact with emergency services (medical services, ambulance, firemen, …).
- Periodic follow-up calls (usually every 15 days).
- Call reminder for medical and important appointments.
- Key safekeeping: with high security measures, Atenzia keeps user keys so that in case of emergency or absence of relatives, care personnel can enter into user's home without causing any damage.
- Mobile unit: if necessary, specialised personnel are mobilised for home visits, staying with the user until relatives or emergency services arrive.
- Complete social assessment or re-assessment at home after discharge.
- Contact with relatives in case of need.
- Interesting activities: in its own facilities or public ones, Atenzia organises periodic activities interesting for users, such as for example risk prevention at home, healthy walks, etc. These activities are totally free, and suppose a meeting point for users and an extra motivation to do new things.

New developments/functionalities in NOMHAD

New developments to be implemented in NOMHAD to integrate and improve the social dimension in the reality of Valencia pilot have been addressed in two releases with the following characteristics:

- Release 1

Table 7: NomHAD Release 1 requirements

Module	User Requirement	Description
Care plan configuration module	Configure scales / questionnaires	Barthel, Pfeiffer, EVA Dolor, Downtown, Euroqool, Edmonton. Nurse assessment
Integration	Access to Orion Clinic	Direct access to EH&SR of Orion Clinic via NOMHAD
Care plan: appointments	Register medication in the information of a home appointment	NOMHAD has to allow including medication information when the health / social professional does a visit at patient's home
Care plan: appointments	Register questionnaires in the information of a home appointment	NOMHAD has to allow including questionnaires information when the health / social professional does a visit at patient's home
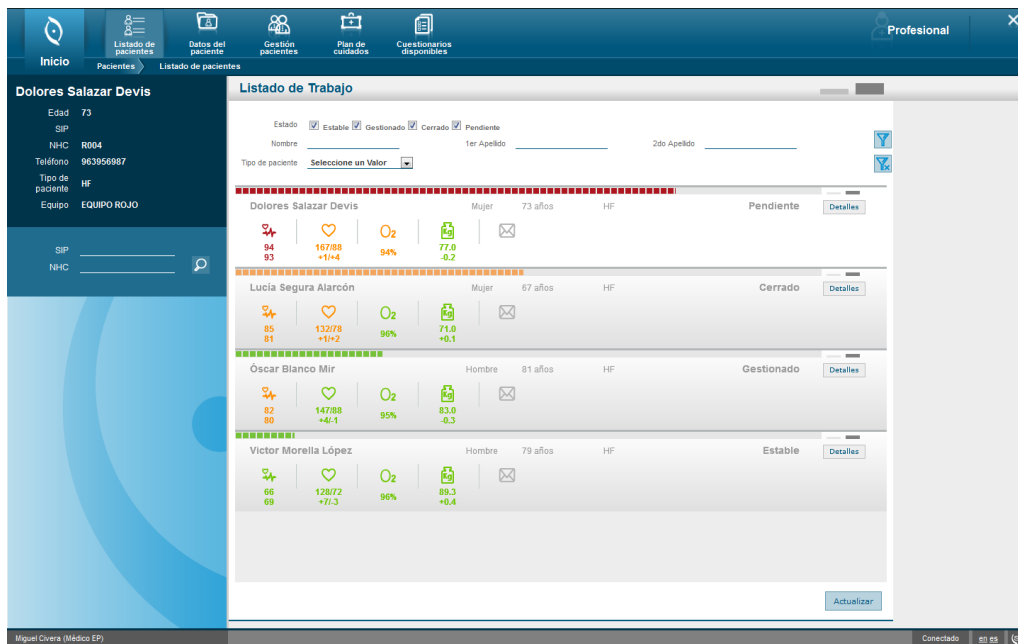
Figure 57: Nomhad dashboard
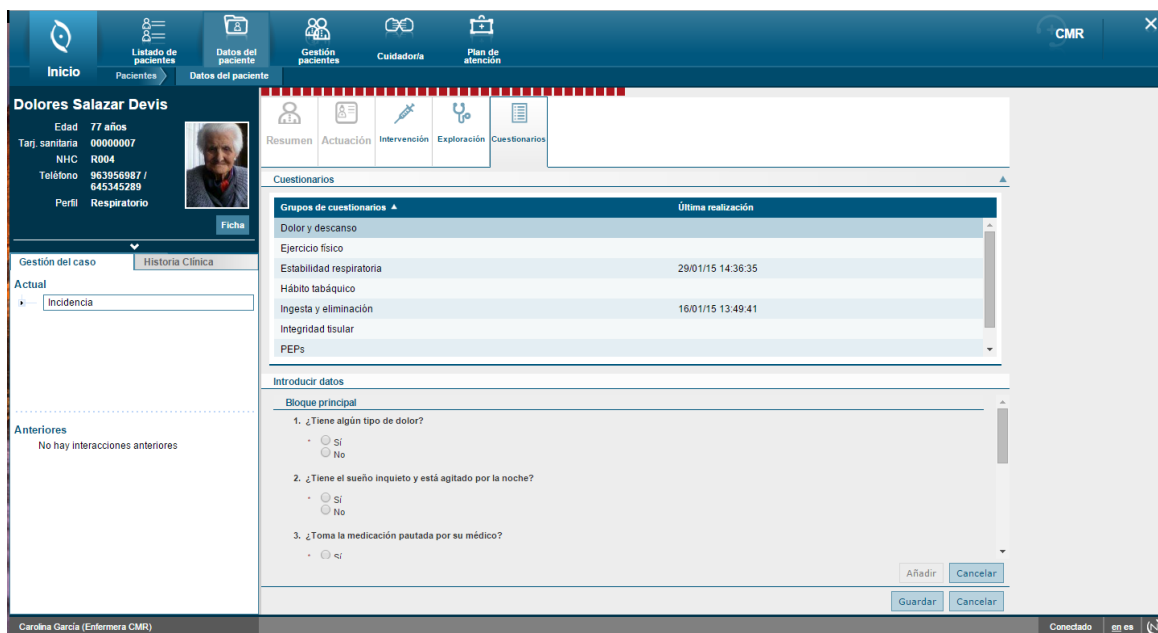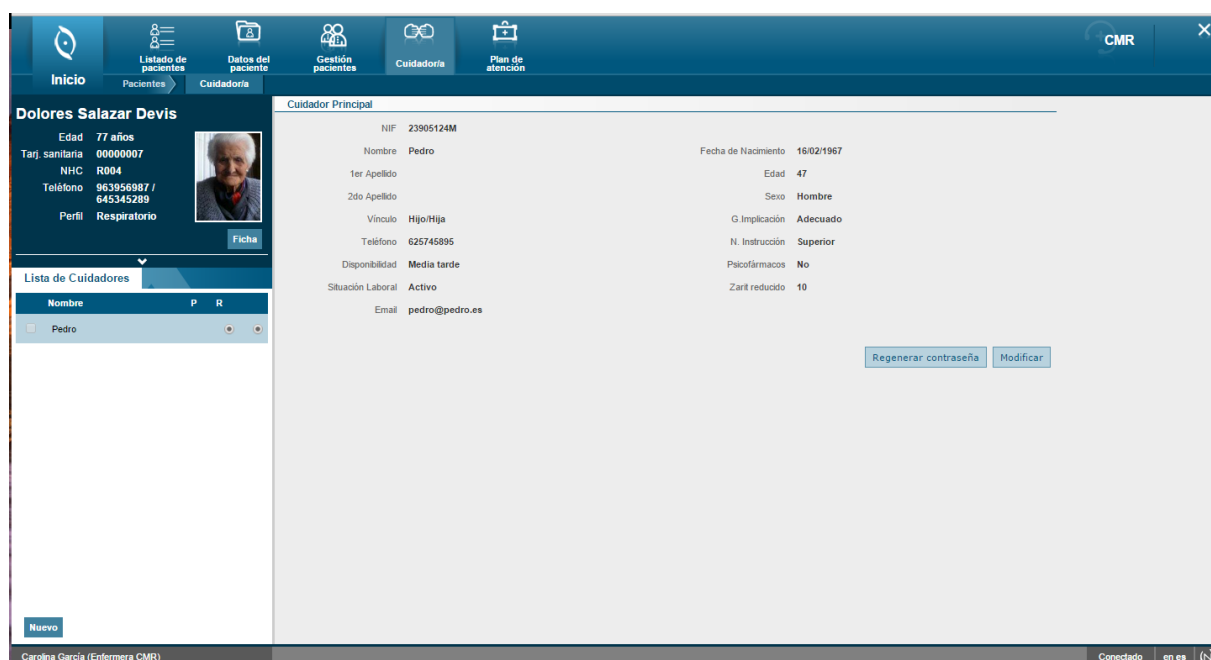
Figure 58: Pain questionnaire – Eva Dolor

Figure 59: Caregiver record

- Release 2

Table 8: NOMHAD adaptation: release 2

Module	User Requirement	Description
Alert assessment	Create alert of social risk	Define and introduce in NOMHAD a specific social questionnaire to be passed by contact centre managers in their daily activities with patients.
		This questionnaire will be included in each patient alert plan Establish different alerts associated to this questionnaire.
		Define and include the different interventions associated with alerts in the alert plan.
Care plan: monitoring	Monitoring plan for carer	Include in the care plan a specific periodic appointment corresponding with the social assessment of the carer.
		This social assessment is the Zarit Index.
		The carer social assessment will be available through the carer session and visible through the patient calendar.
		This carer social assessment will create social risk alters in the patient alter plan.
Care plan: appointments	External appointments of the patient	External patient appointments (primary care, techniques, …) will be available for social contact centre staff in order to generate calendar reminders or direct calls.
Integration	Access to Atenzia data	Enable access to Atenzia software via NOMHAD in order to collect formal social data associated with the patient.

Figure 60: Pain alert

Figure 61: External appointments

Figure 62: Social questionnaire – Orion

Figure 63: NomHAD social questionnaires

The integration with Atenzia is still going on because negotiations with the company started late in the project. During last quarter of 2014, the discussion with Atenzia reached an agreement thanks to the intervention of the Vice-Minister of Social Care of Valencia Region.

The integration is being done during January-March 2015, and is expected to be fully operational for the second quarter of 2015.

3.7.3 Integration Result

The technical deployment plan described in the document D4.1, the results of which are presented here, considered the integration of the old IT infrastructure with the new developments explained in the previous section; in other words, the components already working and those integrated during the pilot.

Health Department Valencia-La Fe Pilot site had three components already working at the beginning of the project; these components are Abucasis, Orion Clinic and NOMHAD. This corresponds with the "old IT" to be integrated with the following new developments:

- Predictive Modelling building block; and

- The integration of the social dimension in the care process of La Fe.

Below is presented a summary of the technical deployment plan elaborated in D4.1 and the results obtained after its implementation. The integration of the new developments can be seen in the Figure 64:
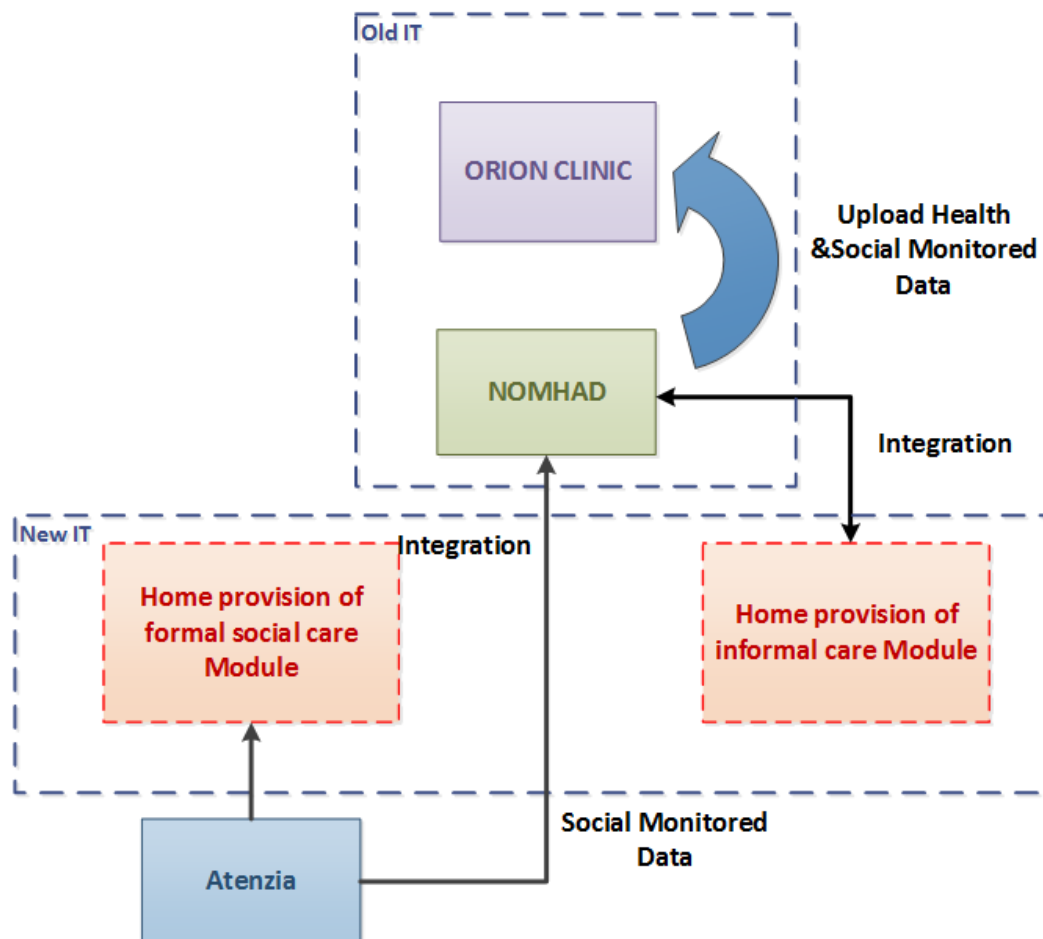
Figure 64: Integration among old and new IT in Valencia pilot site

The technical deployment plan specified the following steps:

- Development of the previous adaptations in NOMHAD module: development of new functionalities and modules in NOMHAD (by January).

- Integration of new modules: integration of Atenzia software / system with NOMHAD (by March).

- Integration of NOMHAD with the rest of the system via Orion Clinic (by January).
- Deployment of NOMHAD module in patients' homes: home provision of formal care (social and health care) through NOMHAD (by January).
  - Check specifications of tablets in order to test compatibility with NOMHAD module.
  - Installation of NOMHAD module in the 100 Android tablets set up for this purpose.
  - Orion Clinic and Abucasis are already deployed, so no special measures are needed.
- Testing integration with Atenzia
- Pilot starting.

Only new elements involved in the implementation of BeyondSilos Integrated services have to be tested, and testing only needs to take place at integration level. The objective of this testing plan is the integration of the new IT modules developed with the old IT modules already working in the system.

For that reason, only the integration of the new version of NOMHAD, home provision of formal social care module, and home provision of informal care module with the rest of the system have to be tested; this test will be conducted in a laboratory setting.

Integration Results

Based in the previous steps defined in the technical deployment plan, Valencia pilot faced the integration process of the new developments quite successfully. All the steps have been covered, although with some delays in the timetable. These are the results of the steps covered:

- Development of new version of NOMHAD module: development of new functionalities in NOMHAD to integrate social dimension through two releases:
  - Release 1 was finalised on 15th January.
  - Release 2 will be finalised on 15th February.
- Integration of new modules: integration of Atenzia software / system with NOMHAD, included in the Release 2 of NOMHAD.
- Integration of NOMHAD with the rest of the system via Orion Clinic, included in the Release 1 of NOMHAD.
- Deployment of NOMHAD module in patients' homes: home provision of formal care (social and health care) through NOMHAD.
  - Check specification of tablets in order to test compatibility with NOMHAD module and peripherals (3G card, Bluetooth adapter, blood pressure, blood glucose, …): this task was carried out during the beginning of January.
  - Installation of NOMHAD module in the 100 Android tablets set up for this purpose: this task was carried out after Release 2 finalisation.
  - Orion Clinic and Abucasis are already deployed, so no special measures are needed.
  - NomHAD Integration with Atenzia was verified and the operators of the call center are able to access selected medical information.

4 Conclusions

This document has presented the status of the prototypes adapted for the BeyondSilos pilots.

The different prototypes have been adapted from their previous status, with the objective of filling in the gaps detected in the analysis process of matching with the Beyond Silos architecture and the processes defined in WP2 and WP3. The result are new and improved modules that have been added to the existing IT infrastructure in order to provide technical support and better tools for the professionals, caregivers and patients for the integrated care pathways.

The new technology has been integrated and tested following each organization´s quality standards, although in this first draft some of them are still ongoing.

After the finalisation of these test integrations, the pilots are technically ready to start deployment.

With this deliverable WP4 is finished.

Appendix A: BSA

Fundació Roca I Pi" Form

SOL·LICITUD DE SERVEI D'ARRANJAMENT

DADES DEL PROFESSIONAL	
Equip:	UNITAT TERRITORIAL
Nom i Cognom:	
Telèfon de contacte:	e.mail:

DADES DE L'USUARI	
Nom i cognom:	DNI:
Adreça:	Telèfon:
Nom i cognom de la persona de referència:	
Telèfons de la persona de referència:	

DECLARACIÓ DE LA UNITAT DE CONVIVÈNCIA I DELS INGRESSOS DE LA UNITAT DE CONVIVÈNCIA[i] (únicament per aquells casos que no tenen petició de serveis d'ajuda a domicili)

NOM I COGNOMS	ANY DE NAIXEMENT	RELACIÓ AMB L'USUARI	INGRESSOS ANUALS PROCEDENTS DEL TREBALL O LA PENSIÓ	RENDIMENTS ANUALS PROCEDENTS DEL CAPITAL MOBILIARI

Total d'ingressos mensuals per cada membre de la unitat familiar[ii]	

INFORMACIÓ DE L'HABITATGE

REGIM DE TINENÇA:	
o Propietat	
o Cessió d'ús	Declaro que la persona que m'ha cedit en ús l'habitatge m'autoritza a fer l'arranjament: Si NO
o Arrendament	

Contracto indefinit: SI   NO   Data finalització contracte:

Declaro haver informat a la persona arrendadora i tenir la seva autorització per fer l'arranjament: SI   NO

DECLARO NO TROBAR-ME EN LLISTA D'ESPERA DE CENTRE RESIDÈNCIAL PÚBLIC O PRIVAT NI ESTAR EN ESPERA DE CANVI DE RESIDÈNCIA EN EL TERMINI INFERIOR A 6 MESOS: SI   NO

Badalona Serveis Assistencials

Ajuntament de Badalona

IDENTIFICACIÓ DE L'ARRANJAMENT[iii]

PETITES REPARACIONS	

- o Solucionar problemes amb la cisterna del wàter
- o Refer desguassos: _____
- o Petites reparacions d'electrodomèstics: _____
- o Canvi d'aixetes: _____
- o Muntatge i desmuntatge de mobiliari: _____
- o Instal·lació de llums: _____
- o Canvis en el gir la porta: _____
- o Modificació d'endolls i punts de llum: _____
- o Buidatge de mobiliari: _____
- o Reparació de mobiliari: _____
- o Reparació de portes: _____
- o Reparació d'instal·lacions: _____
- o Adaptacions del llit: _____
- o Instal·lacions d'ajudes tècniques: _____
- o Petites adaptacions de la dutxa: _____
- o Canvi de manetes:_____
- o Modificació de la ubicació d'un telèfon: _____
- o Col·locació d'ajudes tècniques: _____
- o Altres:

  _____
  _____

ACTIVITATS DE MILLORA DEL DOMICILI

- o Pintura de parets: _____
- o Refer rajoles: _____
- o Canvi de paviment: _____
- o Refer instal·lacions: _____
- o Eliminar humitats: _____
- o Tractament antilliscant del paviment: _____
- o Altres:

  _____
  _____

ACTIVITATS D'ADAPTACIÓ DE L'ENTORN (s'inclou en arranjaments que no modifiquin l'estructura de l'habitatge)

- o Instal·lació d'aigua calenta
- o Substitució del wàter
- o Elevació del wàter
- o Ampliació de portes: _____
- o Eliminació de graons: _____
- o Canvi de cuina de gas per cuina elèctrica
- o Substitució de banyera per dutxa: _____
- o Substitució del lavabo: _____
- o Eliminació del bidet: _____
- o Instal·lació del bidet: _____
- o Anivella paviments: _____
- o Canvi d'electrodomèstics: _____
- o Altres:

  _____
  _____

DESCRIPCIÓ DE L'ARRANJAMENT:

DOCUMENTACIÓ NECESSÀRIA (únicament per aquells casos que no tenen petició de serveis d'ajuda a domicili)

- o Informe social
- o Certificat d'acreditació de la situació de dependència
- o DNI

DECLARACIÓ JURADA

Declaro que són certes totes les dades facilitades per la tramitació del Servei d'Arranjaments a Domicili.
Estic assabentat que l'aportació de dades o documents falsejats o inexactes o omissió d'aportació d'alguna documentació podrà ser motiu per cancel·lar o deixar sense efecte la meva sol·licitud, sense perjudici que es puguin emprendre accions legals procedents

I Accepto la realització de l'arranjament esmentat a la petició del servei

Signatura del / la sol·licitant o persona de referència

Nom i cognoms: _____ DNI: _____

Badalona,   de   201

Signatura del professional de referència

---

[i]Hem d'incloure a l'usuari
[ii]Es sumaran el total d'ingressos mensuals de cada membre (procedents del treballa/pensió + els rendiments nets) i es dividiran entre 12 i posteriorment es tornaran a dividir pel total de membres de la unitat de convivència
[iii]Tots els arranjaments que superin en pressupost els 300€ S'hauran de tramitar amb ajuda econòmica per l'usuari

"Amics de la gent gran

---

amics de la gent gran

Grassot 3, 1r   Fax: 932 076 774
08025 Barcelona   info@amicsdelagentgran.org
Tel. 932 076 773   www.amicsdelagentgran.org

SOL·LICITUD DE SERVEI

ACOMPANYAMENT A DOMICILI	Visita domiciliària setmanal a una persona gran per donar-li suport emocional.			
NOM PERSONA QUE DERIVA			TELÈFON	
E-MAIL				
CENTRE/SERVEI			DATA	

DADES PERSONALS DE LA PERSONA GRAN

NOM I COGNOMS			
ADREÇA		C POSTAL	
		DISTRICTE	
ESTAT CIVIL		NÚMERO DE FILLS	
TELÈFON(S)		NIF	
DATA NAIXEMENT		LLOC NAIXEMENT	

PERSONA DE REFERÈNCIA

NOM I COGNOMS		RELACIÓ	
		TELÈFON	

SITUACIÓ SOCIAL (Xarxa familiar,veïns, amistats, recursos socials i sentiment de soledat)

SITUACIÓ FÍSICA/PSÍQUICA

MALALTIES DIAGNOSTICADES[1]:

[1]Qualsevol circumstància física, psíquica o neurològica que es consideri important per a l'acció voluntària

PER QUÈ VOL UN/A VOLUNTARI/A?[2]

[2]Raó principal per la qual la persona gran accepta la figura d'un/a voluntari/a

---

Appendix B: Kinzigtal

Testspezifikation DocAccess   **Protokoll**

Dokumentname:	Testspezifikation_DocAccess_v1.71_Build1300
Eineindeutige Kennung dieses Dokuments	
Dokumentersteller / Datum:	Frank Rosito/22.01.2015
Zuständiger Ansprechpartner:	Frank Rosito/Entwicklungsleitung
Für diesen Test	
Gültigkeit Dokument:	☐ AIS ☐ X Sonstige: DocAccess
Für wen gilt diese Testspezifikation?	
Datum der letzten Änderung:	04.02.2015
Aktuelle Revision:	1300
In ganzen Zahlen hochzählen (1, 2, 3..)	
Link zum Fachkonzept:	ohne Relevanz

Freigabe dieser Dokumentation (Auftraggeber)			
Revision	**Datum**	**Vorname, Name**	**Anmerkungen**

Änderungshistorie			
Version	**Datum**	**Autor**	**Änderung**
1300	22.01.2015	Frank Rosito	Dokument erstellt
1300	05.02.2015	Frank Rosito	Dokument ergänzt

1. Zweck

In dieser Anweisung werden die erforderlichen Testfälle aufgeführt.

Es wird überprüft, ob die geforderten Anforderungen implementiert sind und alle Fehler beseitigt worden sind. Das Ziel dieses Prozesses ist es, die einwandfreie Lauffähigkeit und Funktion eines neuen Release des Programms zu prüfen.

2. Geltungsbereich

Die Testspezifikation gilt für alle Mitarbeiter der Gesundes Kinzigtal GmbH, die Entwicklung, Anforderungsmanagement sowie Produktmanagement im Bereich Vernetzung und Versorgung. Da diese Dokumente auch der Compugroup Medical AG zur Verfügung gestellt werden, haben sie auch dort Gültigkeit.

Testspezifikation DocAccess   **Protokoll**

Inhaltsübersicht

3. Allgemeine Informationen

Machen Sie hier Angaben zur allgemeinen Vorbereitung dieses Tests. Z. B. einschalten des Logings.

3.1. Fehlermanagement AIS

Bitte lassen Sie zunächst eine Problemanalyse durch Ihre eigene Entwicklungsabteilung durchführen!

3.2. Fehlermanagement Intern

Sollten Fehler auftreten, werden diese mit Logfile und Beschreibung im QM System der Gesundes Kinzigtal GmbH dokumentiert.

4. Testfälle

Führen Sie nachfolgend alle erforderlichen Testfälle auf.

4.1. CG-Java installation

Funktion
Java.exe
Vorbereitung
Laden Sie die Installationsroutine auf die entsprechende Hardware
Kunde
Seniorenzentrum Schlossberg
Anzeigeregion / Einschränkungen
Alle Kassen
Arztdaten
Ohne Relevanz
Patientendaten
Ohne Relevanz
Testablauf
Führen Sie die CG-Java.exe aus und folgen Sie den Anweisungen des Programms
Erwartetes Ergebnis
CG-Java wird installiert und ausgeführt

Testspezifikation DocAccess   **Protokoll**

4.2. Telemed.net installation

Funktion
Telemed.net.exe
Vorbereitung
Laden Sie die Installationsroutine auf Ihre Hardware, stellen Sie eine dauerhafte Internetverbindung bereit
Kunde
Seniorenzentrum Schlossberg
Anzeigeregion / Einschränkungen
Alle Kassen
Arztdaten
Ohne Relevanz
Patientendaten
Ohne Relevanz
Testablauf
Führen Sie die telemed.net.exe aus und folgen Sie den Anweisungen des Programms
Erwartetes Ergebnis
Telemed.net wird installiert und ausgeführt bei Programmstart, grüner Ball muss in Statusleiste ersichtlich sein

4.3. DocAccess Serverkomponenten installation

Funktion
DocAccess Serverkomponenten.exe
Vorbereitung
Laden Sie die Installationsroutine auf Ihre Hardware
Kunde
Seniorenzentrum Schlossberg
Anzeigeregion / Einschränkungen
Alle Kassen
Arztdaten
Ohne Relevanz
Patientendaten
Ohne Relevanz
Testablauf
Führen Sie die DocAccess-Serverkomponenten.exe aus und folgen Sie den Anweisungen des Programms, verwenden Sie die vorgegebenen Pfade
Erwartetes Ergebnis
DocAccess-Server Routine läuft durch und beendet sich durch Klick auf „Ok".

Stand: 05.02.2015   Revision 1300   Seite 4 von 8

4.4. DocAccess Clientkomponenten installation

Funktion
DocAccess Clientkomponenten.exe
Vorbereitung
Laden Sie die Installationsroutine auf Ihre Hardware
Kunde
Seniorenzentrum Schlossberg
Anzeigeregion / Einschränkungen
Alle Kassen
Arztdaten
Ohne Relevanz
Patientendaten
Ohne Relevanz
Testablauf
Führen Sie die DocAccess-Serverkomponenten.exe aus und folgen Sie den Anweisungen des Programms, verwenden Sie die vorgegebenen Pfade
Erwartetes Ergebnis
DocAccess-Client Routine läuft durch und beendet sich durch Klick auf „Ok"

4.5. Programmstart und Check

Funktion
DocAccess Desktop Icon
Vorbereitung
Durchgeführte Installationen
Kunde
Seniorenzentrum Schlossberg
Anzeigeregion / Einschränkungen
Ohne Relevanz
Arztdaten
Ohne Relevanz
Patientendaten
Ohne Relevanz
Testablauf
Starten Sie die DocAccess.exe auf dem Desktop
Erwartetes Ergebnis
Das Programm startet fehlerfrei, Anmeldemaske erscheint für „Arzt anlegen"

4.6. Arzt anlegen

Funktion
DocAccess.exe
Vorbereitung
Programm gestartet
Kunde
Seniorenzentrum Schlossberg
Anzeigeregion / Einschränkungen
Ohne Relevanz
Arztdaten
Folgende Parameter müssen erfasst werden: - LANR   - BSNR   - Stammdaten Arzt
Patientendaten
Ohne Relevanz
Testablauf
Geben sie alle erforderlichen Parameter in die gelben Pflichtfelder ein. Gehen sie anschließend auf „speichern" und legen sie nach Aufforderung ein Administrations-Kennwort fest
Erwartetes Ergebnis
Pflichtfelder werden gefüllt, gespeichert und Passwort wird festgelegt

4.7. Freischaltung telemed.net

Funktion
Telemed.net.exe
Vorbereitung
Programm gestartet,
Kunde
Seniorenzentrum Schlossberg
Anzeigeregion / Einschränkungen
Ohne Relevanz
Arztdaten
Stammdaten Arzt
Patientendaten
Ohne Relevanz
Testablauf
Über den Reiter telemed auf der Programmoberfläche wechseln Sie zum Menüpunkt Posteingang. Durch „Klick" auf „Beantragen Arztkonto" und „Beantragen Standortkonto" werden die notwendigen „telemed.net IDś" automatisch generiert und hinterlegt.
Erwartetes Ergebnis
Konten werden freigeschaltet, Fenster mit Aufforderung zum sichern der IDś poppt auf und kann bestätigt werden.

4.8. Freischaltung IV-Modul „Gesundes Kinzigtal"

Funktion
ivassist
Vorbereitung
Programm gestartet,
Kunde
Seniorenzentrum Schlossberg
Anzeigeregion / Einschränkungen
Ohne Relevanz
Arztdaten
Stammdaten Arzt
Patientendaten
Ohne Relevanz
Testablauf
Wechseln sie von der Programmoberfläche auf „Formulare". Über den Reiter „Freischalten" werden sie zur Eingabe des Freischaltcodes aufgefordert.Bitte verwenden sie hier den Freischaltcode, den sie von Ihrem Anbieter „Gesundes Kinzigtal" zum freischalten des Moduls erhalten haben. Mit Klick auf „Ok" bestätigen
Erwartetes Ergebnis
.Modul lässt sich erfolgreich freischalten

4.9. Anbindung Zertifikat

Funktion
Ivassist, cordoba, DocAccess.exe
Vorbereitung
Programm gestartet,
Kunde
Seniorenzentrum Schlossberg
Anzeigeregion / Einschränkungen
Ohne Relevanz
Arztdaten
Stammdaten Arzt
Patientendaten
Ohne Relevanz
Testablauf
Wechseln sie von der Programmoberfläche zum Reiter „Arzt". Unter dem Menüpunkt „Arztnetze" starten Sie mit „Klick" auf das Browser Icon den Browser Firefox.Dieser muss als Standardbrowser hinterlegt sein. Geben Sie als Anmeldedaten ihre Telemed.net ID des Arztkontos ein.Im nächsten Schritt bestätigen sie mit „Klick" auf den Menüpinkt „zertifikat installieren".schliessen Sie im Anschluss den Browser.
Erwartetes Ergebnis
Zertifikat wird installiert, Meldung über erfolgreiches installieren des Zertifikats erscheint.

4.10.   Patient anlegen

Funktion
DocAccess.exe
Vorbereitung
Programm gestartet,
Kunde
Seniorenzentrum Schlossberg
Anzeigeregion / Einschränkungen
Ohne Relevanz
Arztdaten
Stammdaten Arzt
Patientendaten
Stammdaten erfass
Testablauf
Wechseln sie von der Programmoberfläche auf den Reiter „Patient anlegen".Geben sie alle Daten in die gelbmarkierten Pflichtfelder ein.Gehen sie im Anschluss auf „speichern".
Erwartetes Ergebnis
Patient lässt sich abspeichern.

Appendix C: HSCNI Testing

Community information integration with NIECR

1. LCID integration testing

The purpose of this is to provide generic testing scripts and outcomes from quality assurance testing required as part of the integration of the LCID Community data within the NIECR. The data required was previously agreed (see prototype) with the relevant community professionals and as reviewed by the Regional NIECR Clinical Content Group.

2. Testing scope (high level testing)

By running the tests included in the scripts, the integrity of the data available will be tested. The extracted SET data goes back to June 2012, and is currently updated every evening. Updates are therefore currently running a day behind, which staff testing had to bear in mind. The first testing phase was high level testing with LCID comparison taking place against the SET Extract within the NIECR pre go-live environment. The SET professionals tested patients with LCID systems staff to ensure appropriate data displays.

A selection of patients identified by the systems team were used as part of the high level testing process.

The test plan and outcomes are described below.

3. Feedback

The SET Implementation Manager provided testing outcome feedback via this document which was reviewed, and where necessary corrected, by the NIECR central team. Initial observations were recorded within the provided testing scripts.

TEST PLAN

Table 9: Using selected patients complete the following checks

	Test Method	Test Patients Used	Results / Observations – Data displays as expected? Yes or No – If No provide details	Additional Information
No.	**Referrals**			
1.	Confirm that referrals are **not** showing on NIECR. NIECR should only display episode level information	Removed for privacy	No referral appears No referral appears No referral appears No referral appears	Referral on LCID = DN 19/11/12
	Episodes (Open)			
1.	Confirm that all open episodes for a patient are showing in NIECR	Removed for privacy	No open episodes appear (Rapid Response, District Nursing, OT, Clinical Psychology – No related contacts appearing – See Screen Dump 1 Appearing as expected	Episodes from June 12 to Oct 14 – Not appearing
2.	Confirm that all open episode information is correct: Patient Summary Screen: • Service • Team • Keyworker • Start Date • Last Contact (Not currently included) • Source (always LCID – SEHSCT)	Removed for privacy	Appearing as expected (4 services) Appearing as expected (6 services) Appearing as expected (7 services) – Incontinence not appearing as was pre 2012 (8 on LCID).	Relevant close dates appearing. Last contact not appearing

	Test Method	Test Patients Used	Results / Observations – Data displays as expected? Yes or No – If No provide details	Additional Information
3.	Confirm that all open episode information is correct: LCID Encounter Detail Screen: • Service • Team • Keyworker • Primary POC • Start Date • Referral Source • Hospital (Depending on Referral Source) • Referral Urgency • Waiting List Start Date • Assessment Date • Assessment Results • Intervention Start Date • Last Contact (Not currently included) • Last (4) Contact Interventions (Not currently included)	Removed for privacy	Appearing as expected Note: e.g. within Podiatry – obsolete assessment result code doesn't display the description (X2E). Other codes display the full description	Encounter Details – High level summary only available (to ensure teams are aware of this). Some fields not completed by users e.g. Referral Urgency
	Episodes (Closed)			
1.	Confirm that closed episodes only display if there is no current episode open for the service only from the last 5 years.	Removed for privacy	Working as expected	
2.	Confirm that episode Information is correct (as listed above) and that: • Closed date is included in the patient summary screen • Date closed & Discharge Reason are included in the LCID Encounter Details Screen	Removed for privacy	Working as expected	

	Test Method	Test Patients Used	Results / Observations – Data displays as expected? Yes or No – If No provide details	Additional Information
	Episodes (Updates)			
1.	Update information on LCID and ensure it carries across on NIECR : • Add New Episode (added for 31/10/14) • Update Team • Update Key worker • Add Initial Assessment • Add Contact (Not currently included) • Add additional contact (should overwrite previous – not currently included) • Close Episode • Delete Episode (?)	0044107500 (Temporary Number) – To re-check after 1st November 14 (HG)	No. Checked 2nd and 3rd November – Patient not appearing. See screen dump 2	Only able to use a temporary number for this test – Test Patient Added to OT Team was VW Virtual Ward – Original Key worker was Nikki Brown – updated to MD Temps service manager. Referral Date 31/10/14 for test patient. Initial assessment = 31/10/14 Contact = 31/10/14 Close Episode = 31/10/14 Deletions to be checked at later date.

Please use this blank test plan to record any additional tests and observations

	Test Method	Test Patients Used	Results / Observations – Data displays as expected?	Additional Information
No.	**Additional tests**			
1.	Patient has different address	Removed for privacy	Patient address the same on NIECR and H+C Index but listed as previous address on LCID	Note: Client Screens etc. being reviewed for change by Yarra.

	Test Method	Test Patients Used	Results / Observations – Data displays as expected?	Additional Information
2.	Father / Son – Deletions to be tested as activity recorded against incorrect patient. Checking activity is appearing correct on NIEC	Father - Removed for privacy Son – Removed for privacy	Son NIECR still displaying deleted LCID episodes which were recorded in error against the son. Examples are virtual ward, Respiratory Service is still appearing on NIECR (virtual ward deleted on LCID 28/10/14 – Removed by lunchtime 28/10/14) – Respiratory service deleted 14/10/14). No information is displaying for the Father on NIECR. See Screen Dump 3	Father – DOB 13/04/1944 Son – DOB 16/05/1975 Deletions are frequent – This will need reviewed by NIECR Central Team. * Note with Soscare deletions and merges are even more frequent than LCID – Cases re-opened, deceased patients incorrectly recorded as deceased.
3.	Screen Display		Insufficient Privileges message appearing – Search Error Message appearing	
4.	Temporary H+C Number issued on LCID	0044107500 (Temporary Number)	Jim Test – No episodic information is appearing.	Temporary Numbers not appearing. Note: 710 numbers are a particular problem – Temporary numbers therefore have to be used. Note: Soscare – H+C is not mandatory (cannot make this mandatory as pre-birth details are recorded)
5.	Check patient with old and new activity	Removed for privacy	Nothing is appearing for this patient – Podiatry information is current. OT activity opened Oct 2011 and closed May 2012. District Nursing opened 21st Oct 2011 and is still on-going. Tissue viability opened Mar 2014 and still open.	
6	Test no activity appears on NIECR if before June 2012	Removed for privacy	No activity appearing as expected. Deceased Flag appears however date of death is different NIECR Date of death 14/03/2012 matches H+C however LCID = 13/03/2012	Date of Death mismatches are common.

Soscare Integration Testing

The purpose of this section is to provide generic testing scripts and outcomes from quality assurance testing required as part of the integration of the Soscare Community data within the NIECR. The data required was previously agreed (see prototype) with the relevant community professionals and as reviewed by the Regional NIECR Clinical Content Group.

1. TESTING SCOPE (High Level Testing)

By running the tests included in the scripts below the integrity of the data available will be tested.

Soscare data was extracted from the live Northern Health and Social Care Trust (NHSCT) Soscare System and loaded into NIECRs test environment for Unit and User Acceptance testing. The requirements against which the data was to be tested are as follows.

Where a client has a record in Soscare the following information is requested by daily extract.

Current Client

Demographics

- 3 character code identifying the Soscare system from which the record has originated - (UCT for initial extract).

- Soscare Client Number as held in source system.

- Surname as held in source system.

- Forenames as held in source system.

- Postcode (max 8 digits alphanumeric characters (Upper case), (space between the Outcode and Incode)).

- Date of Birth (8 digit numeric (DDMMYYYY).

- Gender as held on source system.

- H+C No – must be 10 digit numeric and first 2 digits not less than 32 – (records with no H+C no should not be extracted).

- GP Code.

- GP Practice Code.

- Date case closed (Blank for current cases, most recent for former cases).

Groups

- For each of the 9 Groups please include an entry in the extract as follows
  - Current Group membership - "Y" if the client is currently in the group or "N" if not and a "C" if previously in a the Group in the last 5 years.
  - Where there is a "C" in the previous field, please enter most recent date Group closed.
  - Staff member name for group.
  - Staff member contact telephone number.
- The order of groups returned in the extract should be as follows:
  - 1: Visually Impaired,
  - 2: Hearing Impaired,

- 3: Physically Impaired,
- 4: Learning Disability,
- 5: Mental Health,
- 6: Child Protection,
- 7: Dementia,
- 8: Vulnerable Adults, (i.e. has an ongoing case conference record)
- 9: Elderly at Risk.

Key case worker

- Social work involvement key worker name
- Social work involvement key worker work contact number

Services

- For each of the Services listed below please include an entry in the extract as follows:
    - A "Y" if client is in receipt of service and an "N" if not in receipt and a "C" if previously received the service in the last 5 years.
    - Where there is a "C" in the previous field, please enter most recent date service closed.
    - Staff member name for service and
    - Staff member contact telephone number
- The order of services returned in extract should be:
    - 1: 11,
    - 2: 17,
    - 3: 26,
    - 4: 27,
    - 5: 41

Investigations
- If there is an ongoing investigation,
    - If Current Childrens ongoing investigations – "Y" otherwise "N"
    - Current VA ongoing investigations – "Y" otherwise "N"

Former Client (Closed case)

Demographics: as above

Groups: as above but for the most recent former/inactive groups the client was a member of, with date of most recent group closure – within the last 5 years.

Key case worker: as above but the most recent within the last 5 years

Services: as above but for the most recent former/inactive services 11,17,26,27,41, the client was in receipt of with date of closure – within the last 5 years.

Investigations: as above, where available, in the last 5 years (case closed without registration)

62 patient records were identified by the Systems Team as representative of the use cases suggested by the requirements and were used as part of the high level testing process.

As well as testing the system functionality the team also had to amend and test the Role Based Access and Consent model associated with NIECR in order to accommodate the more sensitive nature of information recorded in the Soscare, Social Care System

In preparation for this data sharing a document was drafted to prompt thought and discussion about what Community information the different NIECR users should see based on their role.

The following agreement was reached and tested.

Community Information

The following referral information will be included from LCID and SOSCARE
- Service
- Team
- Key Worker
- Date Referred
- Last Contact
- Discharge Date.

Users / Roles
- Team Leader
- Social Worker
- Community Nurse
- Community AHP
- Admin.