

A Personalised Integrated Care Approach for Service Organisations and Care Models for Patients with Multi-Morbidity and Chronic Conditions



PICASO Architecture

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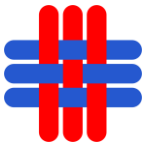
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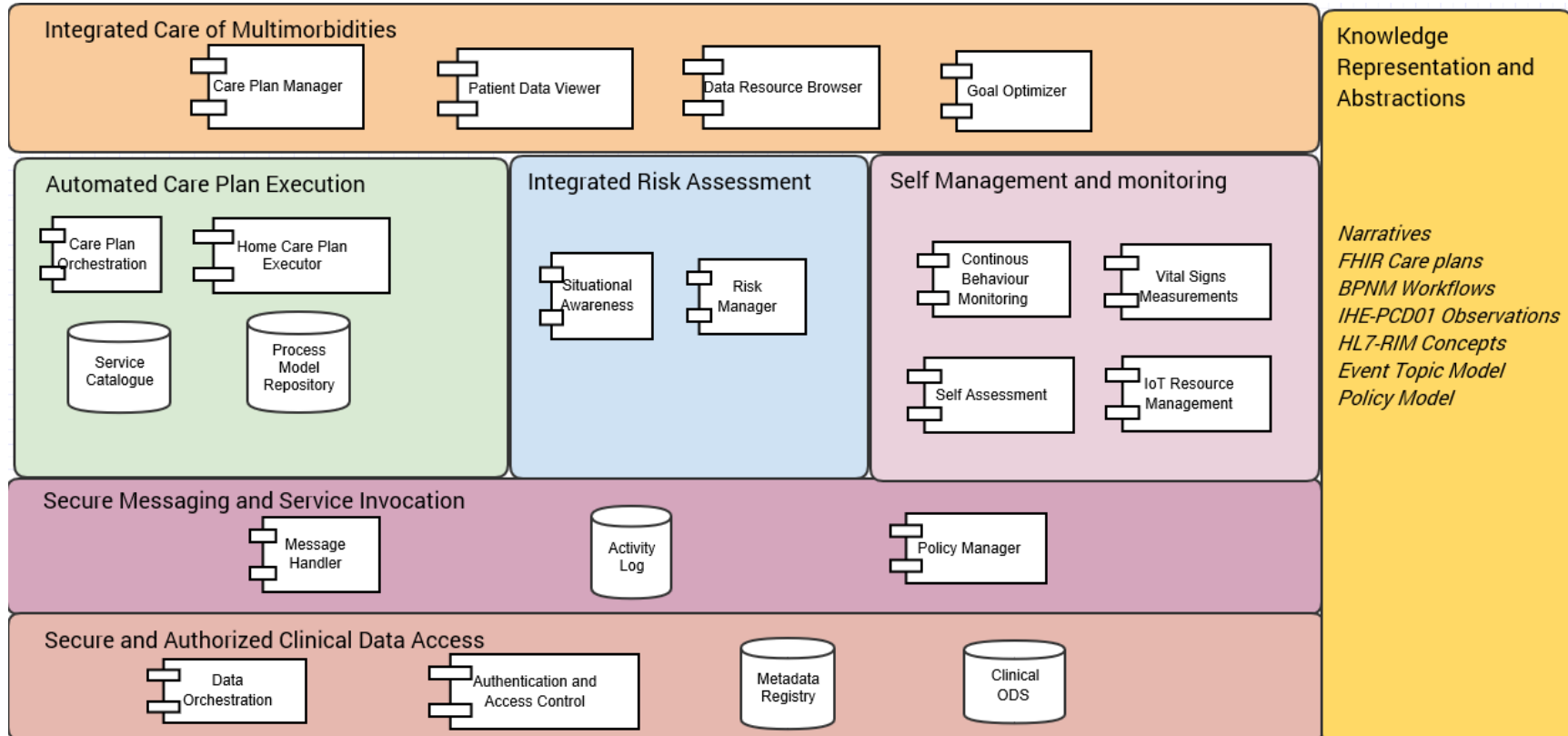


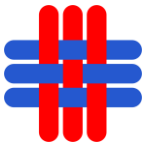
PICASO objectives

- Improve health outcomes, daily activities, and quality of life of older persons with multi-morbidities
- Reinforce medical knowledge and create new care models for management and treatment of patients with multi-morbidity conditions;
- Allow for more cost-effective care management through automated and efficient workflows
- Improve cooperation and exchange of knowledge between professional caregivers
- Support patient empowerment and self-care



PICASO Conceptual Architecture





Picaso Challenges

- Multi-morbidity care requires access to clinical data stored in several care organisations
- Care organisations needs to reduce IT costs and benefit from cloud solutions
 - Scalability
 - Resource sharing
 - Install, configure, update, maintain software in one place
- Clinical data cannot be stored outside the care organisation
- Avoid installing complete Picaso platform at each hospital
 - Huge installation and maintenance effort



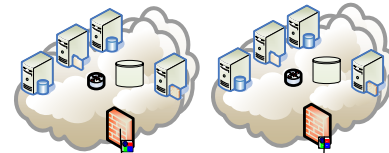
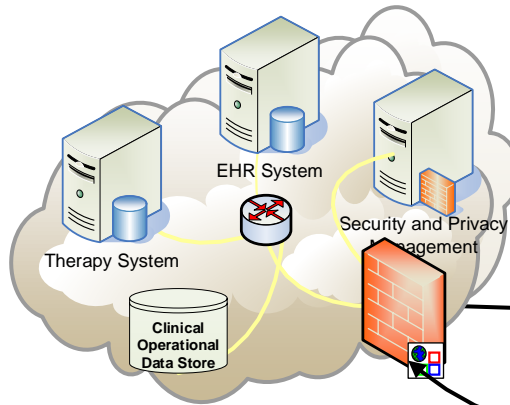
Picaso Approach: Care Management as a Service

- Federated Cloud Architecture
 - Public, Care and Patient Clouds
 - Separate software and clinical data. "Software-to-data" cloud
 - Clinical data always remains in hospital.
 - No persistence of data in public cloud
 - All data is encrypted and pseudonymised when transferred in public cloud
- Security and authorisation at component level
 - Is the requester (user/clinician) authorised to make the request?
 - Is it valid to enter this data into the clinical environment?

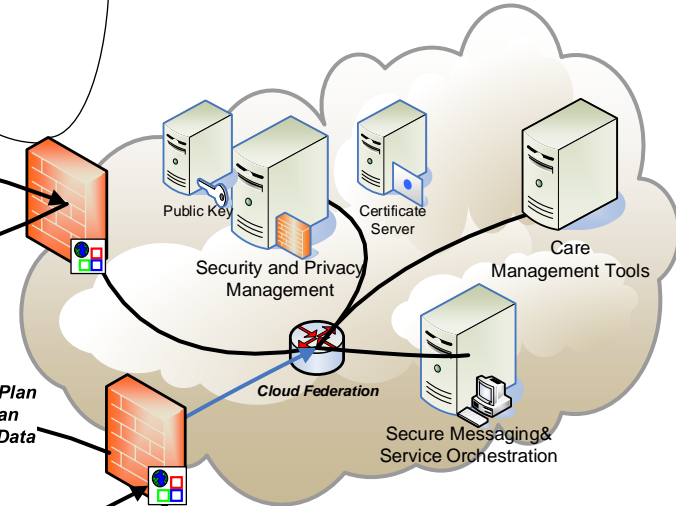


PICASO Federated Cloud Solution

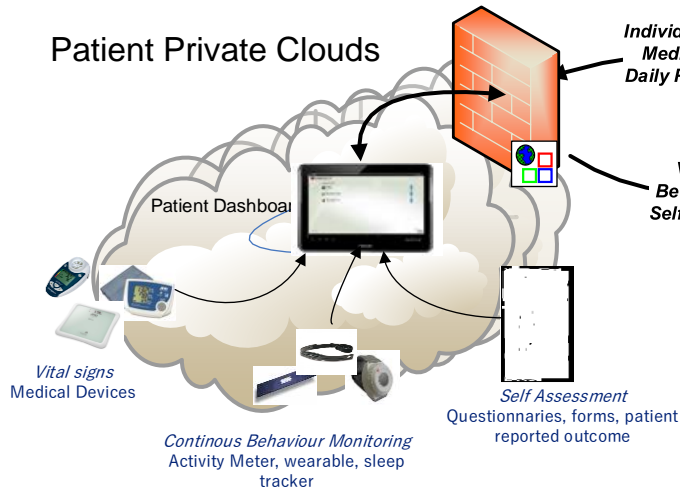
Care System Private Clouds



Integration Platform Public Cloud



Patient Private Clouds



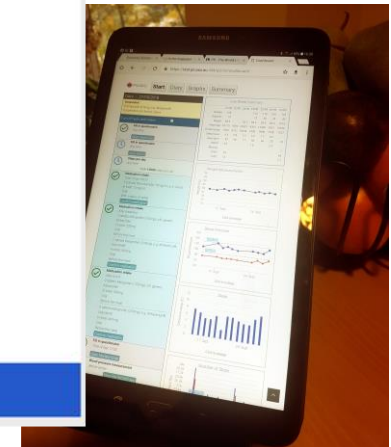
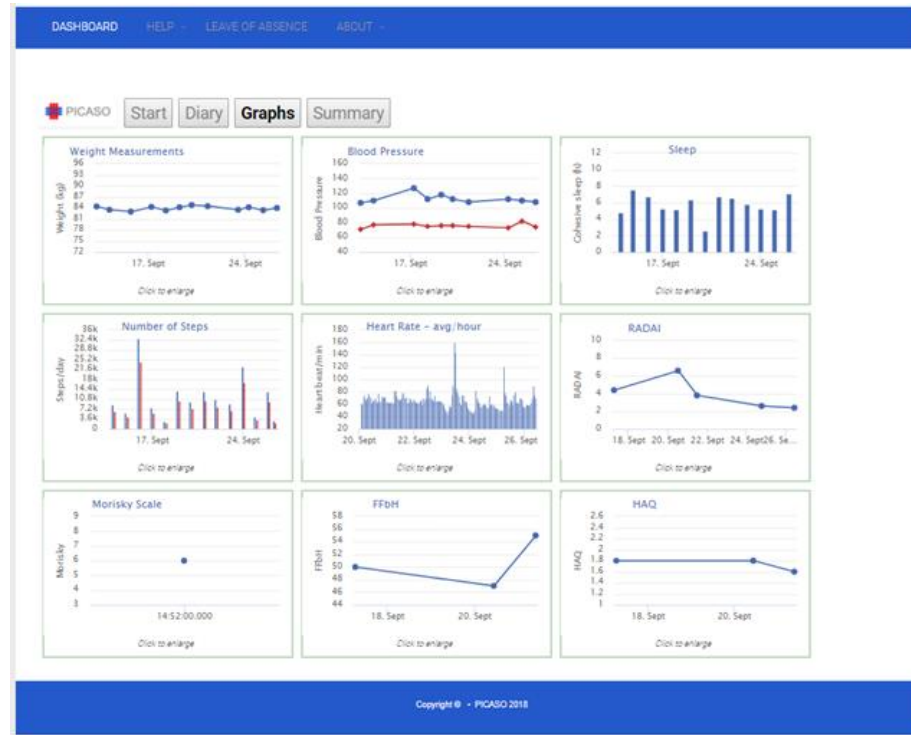
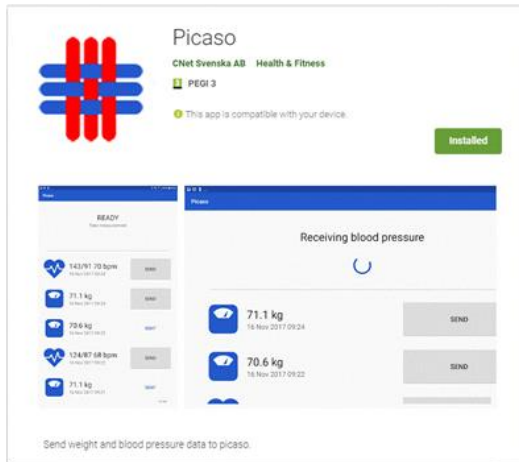
Individual Care Plan
Medication Plan
Daily Progress Data

Vital Signs
Behaviour Data
Self Assessment

Cloud Federation



Patient Self-Monitoring Framework





Integrated FHIR Care Plans for Patient Therapy Compliance

PICASO - CLINICAL DASHBOARD

Patient Selection
Data Resource Browser
Patient Data Viewer
Care Plan Manager
Communication Center
Risk Manager

Care plan information

CarePlan ID: 51e28f3a-bea5-5c53-f38f-1af04ad049d3 Patient ID: 11892629 (Peter Rosengren) Author ID: ...

Description
Test care plan

Status
Active

From:
2017-12-19

To:
2019-12-19

Delete care plan Save changes in care plan

Add care plan service

Show grouped (27 services)

Medication Appointment request Health questionnaires Blood pressure measurement Step measurement Weight measurement

Medication intake: Status 'Active'.
Medication: Alendronsäure (70mg), z.B. generic Alendronsäure.
Count per intake: 1. Total quantity: Alendronsäure (70mg), z.B. generic Alendronsäure.
Intake: From 2018-10-02 onwards, daily, 1 time(s) per day (Before dinner). No reminders
Author's role: Cardiologist

Medication intake: Status 'Active'.
Medication: Ketoprofen (100mg), z.B. generic Ketoprofen.
Count per intake: 2. Total quantity: Ketoprofen (200mg), z.B. generic Ketoprofen.
Intake: From 2018-09-05 until 2019-06-11, daily, 1 time(s) per day (Before dinner). Reminder before: 1 mins, Reminder after: 1 mins



PICASO Start **Diary** Graphs Summary

Diary - 27/09/2018

Suspended
Prampexole (0.5mg), e.g. Mirapexin®
Suspended until further notice

Turn off auto reminders

Fill in questionnaire Any time [Open FFBH/HAG](#)

Fill in questionnaire Any time [Open RADA](#)

Steps per day Any time Walk 12000 steps per day

Medication intake Time of day: 08:00
1.5 drops Brinzolamide (10mg/ml), p.e. Azopt
In total: 15mg/ml
Oral
With a glass of water [Confirm medication](#)

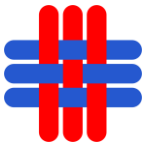
Medication intake After breakfast
2 tablets Ketoprofen (100mg), z.B. generic Ketoprofen
In total: 200mg
Oral
Before the meal
2 tablets Ketoprofen (200mg), e.g. Alheumunil®, Gablienil®
In total: 400mg
Oral
Before the meal [Confirm medication](#)

Medication intake After lunch
2 tablets Ketoprofen (100mg), z.B. generic Ketoprofen
In total: 200mg
Oral
Before the meal
2 tablets Ketoprofen (200mg), e.g. Alheumunil®, Gablienil®
In total: 400mg



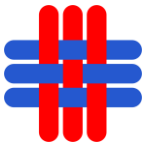
Status today

- Fully operational cloud
- Two clinical trials running
- Real patient usage over time
- UDUS (Heinrich-Heine-University Düsseldorf)
 - 15+15 patients (RA)
- UTV (University of Rome “Tor Vergata” Hospital)
 - 10 patients (Parkinson)



UDUS Usage statistics after 4 months

- 38000 patient interactions registered
 - Device measurement, Filling out Questionnaire, Confirming Medication
 - Each patient has had more than 1000 interactions during 4 months
- 6600 Bloodpressure measurements registered
- 3500 Weight measurements registered
- 3200 Activity days registered (steps, heart rate)
- 550 Health Questionnaires filled out
 - 17000 individual questions answered
- Adherence (on-time) 90%
- 25 Million steps have been walked by patients in trial



Innovation Nominations

- Picaso was nominated for the EU Innovation Radar Prize and the German Innovation Award 2019.





Summary: PICASO platform

- **Federated Cloud Architecture designed for ehealth – “Care Management As a Service”**
 - a robust, GDPR compliant, federated cloud based system
 - with role based access for carers to distribute shared data and knowledge.
 - a framework for secure, privacy compliant, and role based information sharing
 - intuitive, interactive ad-hoc information search.
- **Patient Self-Monitoring Framework**
 - Scheduled vital signs measurements
 - Continuous activity and behaviour monitoring
 - Self-assessment through questionnaires
- **Integrated FHIR Care Plans for Patient Therapy Compliance**
 - to share patient’s care plans and orchestrate dynamic services based on narratives that define the workflow
 - coach and remind the patient to follow the prescribed medication, monitoring and ordinated activities
- **Integrated Care Tools for Management of Multi-morbidities**
 - providing comprehensive decision support tools for clinicians to manage multi-morbidities
 - providing decision support for analysing risks, conflicts, constraints and limitations



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A photograph showing medical professionals in a clinical setting. A doctor in a white coat is pointing at a tablet, while another person in a white coat is pointing at an X-ray on a wall. A stethoscope is visible on the desk.

Please see us here: www.picaso-project.eu