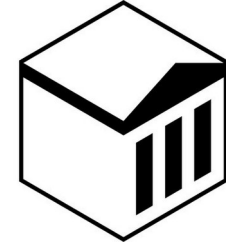


Incorporating Digital Public Goods in the European Healthcare System



Digital
Public
Goods
Alliance



Luis Falc3n, MD
Stand-in:
Gerald Wiese

About Luis



Luis Falcón

Founder, GNU Solidario

Author of GNU Health

falcon@gnuhealth.org

Education

- Computer Scientist
- Physician
- Genomics & Medical Genetics

Activism

- Social Medicine
- Animal Rights



Gerald Wiese – Computer Scientist

- Scientific Employee at Leibniz University Hannover (Germany)
- Working on Ansible deployment: <https://docs.gnuhealth.org/ansible/>
- Host of GNU Health Con & Orthanc Con 2023



Computational
Health
Informatics



Leibniz
Universität
Hannover



GHCon2023
VIII International GNU Health Conference
September 29th - 30th
Leibniz University Hannover, Germany
#GHCon2023



ORTHANC



GNU Solidario



GNUSolidario
ADVANCING SOCIAL MEDICINE

Non-profit organization

Works globally

Focused on Social Medicine

Fights for the right of human and nonhuman animals

The organization behind GNU Health

Promotes Libre Software and Open Science



Global**Exposome**



GNUHealth

The Libre Digital Health Ecosystem



ROMPIENDO CADENAS



GNU Solidario around the globe



HEADQUARTERS

HEALTH INSTITUTIONS

ACADEMIC INSTITUTIONS

REGIONAL OFFICES

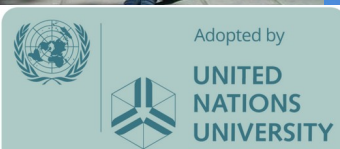
ANIMAL RIGHTS

HUMANITARIAN MISSIONS





Chosen by Research Institutions, Hospitals, Labs around the globe



Fundación Jérôme Lejeune Argentina adopts GNU health research on Trisomy 21 and intellectual disabilities of genetic origin





Hospital Management Information System (HMIS)

Core of GNU Health: **Client Server Architecture**

Based on **Tryton** (Enterprise Resource Planning Tool)

Written in **Python**, using **PostgreSQL** database backend

Adding modules to Tryton for hospital functionalities



PostgreSQL



GNUHealth
EMBEDDED



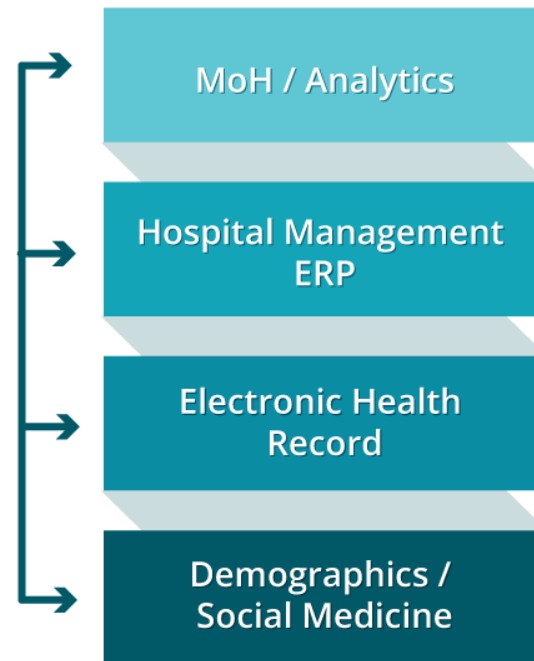
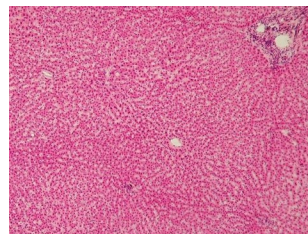
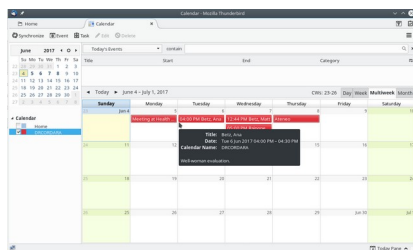
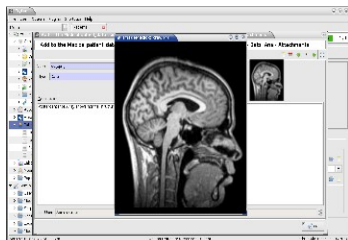
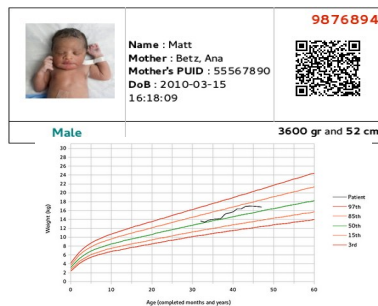
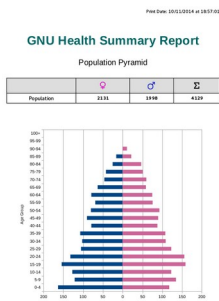
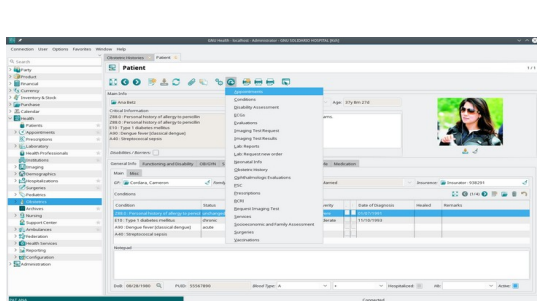
GNUHealth
LABORATORY / LIMS



GNUHealth
BIOINFORMATICS



GNU Health HMIS component



Strong reporting engine

The screenshot displays the GNU Health Hospital Management software interface. The main window shows the 'Health / Imaging / Imaging Test Result' section for patient Ana Isabel Betz. It includes fields for patient name, age (42y 4m 18d), test number (TEST006), date (01/15/2023), and time (20:01:18). The test is identified as 'Chest X-ray' requested by Cordara, Cameron. The report text describes pulmonary aeration and bronchial wall thickening. To the right, there are two X-ray images: a frontal view and a lateral view, each with a detailed caption and a reference to the case source.


Date: 01/15/2023 20:01:18
Study ID: TEST006
Order: 006
Requested by: Cordara, Cameron
Evaluated by: Cordara, Cameron
Print Date: 01/15/2023, 20:24:05

Patient : Ana Isabel Betz PUIID : GNU777ORG	DoB: 08/28/1980 42y 4m 18d	Sex: Female
Study: Chest X-ray		Context: J18 : Pneumonia, organism unspecified


Interpretation:
Pulmonary aeration is significantly increased bilaterally. There is marked bronchial wall thickening on the right and left in the perihilar zone extending to the lung base in keeping with inflammatory lower airways disease. There are non-segmental patchy lung opacities in the lower lobes bilaterally (right lower lobe posterior basal segment; left lower lobe anterior basal segment; right middle lobe medial segment). There are also increased interstitial markings with lower zone predominance.

** Case courtesy of Alborz Jahangiri, Radiopaedia.org, rID: 45781 **

Resources:



Frontal chest x-ray
In GNU Health you can add multiple images to the same study.
Case courtesy of Alborz Jahangiri, Radiopaedia.org, rID: 45781



Lateral chest X-ray
In GNU Health you can add multiple images to the same study.
** Case courtesy of Alborz Jahangiri, Radiopaedia.org, rID: 45781 **

atypical-pneumonia-mycoplasma.jpg



Integration with Orthanc DICOM Server

- Artikel
- Währungen
- Health
 - Books of Life
 - Patients
 - Appointments
 - Prescriptions
 - Health Professionals
 - Institutions
 - Imaging
 - Orthanc
 - Patients
 - Studies**
 - Dx Imaging - New
 - Dx Imaging Requests
 - Dx Imaging - Results

Studies 5 / 7

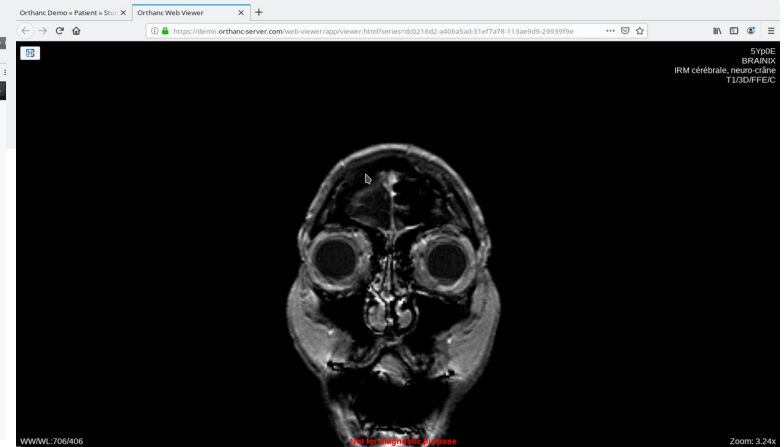
Patient: PHENIX Description: CT2 TÊTE, FACE, SINUS
 Date: 27.09.2005 Institution: HUG
 Referring Physician: CHIR-PED^CHIR-PE ID: 1361
 UUID: 49974143-ec23cb52-6b2a1c46-14d5daa0-0822ce1a URL:
 Server: Orthanc_Demo Test:

Orthanc Demo - Patient + Study - Series - Multi-Frame

Orthanc Demo - Patient + Study - Series

Instance	SOPInstanceUID	TemporalPositionIndex
Instance - 1	1.3.46.8.1098.1.1.8.11.4.2.8.8745.5.396.200612011448357070	1
Instance - 2	1.3.46.8.1098.1.1.8.11.4.2.8.8745.5.396.200612011448356709	1
Instance - 3	1.3.46.8.1098.1.1.8.11.4.2.8.8745.5.396.200612011448357069	1
Instance - 4	1.3.46.8.1098.1.1.8.11.4.2.8.8745.5.396.200612011448356008	1
Instance - 5	1.3.46.8.1098.1.1.8.11.4.2.8.8745.5.396.200612011448356007	1
Instance - 6	1.3.46.8.1098.1.1.8.11.4.2.8.8745.5.396.200612011448357006	1
Instance - 7	1.3.46.8.1098.1.1.8.11.4.2.8.8745.5.396.200612011448356005	1
Instance - 8	1.3.46.8.1098.1.1.8.11.4.2.8.8745.5.396.200612011448352004	1

Buttons: Send to DICOMweb server, Transfers accelerator, Orthanc Web Viewer





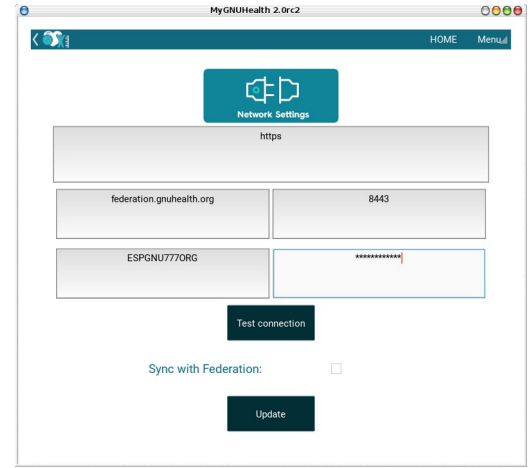
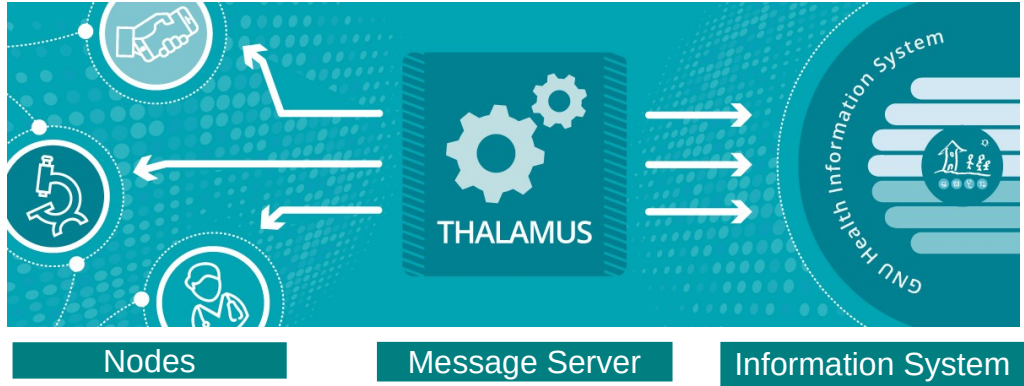
GNU Health ecosystem components



MyGNUHealth 2.0 released at #GNU40!



Integration into the GNU Health Federation



Every person is a node in the GNU Health Federation

Uniquely identified

The person is a member of the public health system

Information shared in real time with their health professional

Privacy: Person is in control of what to share

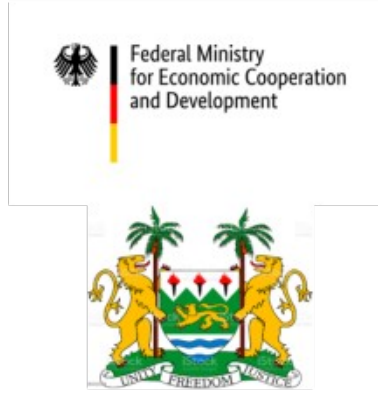
Chosen as real time epidemiological observatory



GNU Health declared Digital Public Good



Digital
Public
Goods
Alliance





GH at the European Commission (JoinUP / OSOR since 2011)


 An official website of the European Union [How do you know?](#) 



[Interoperable Europe](#) [Interoperability Solutions](#)



GNU Health Hospital Information System

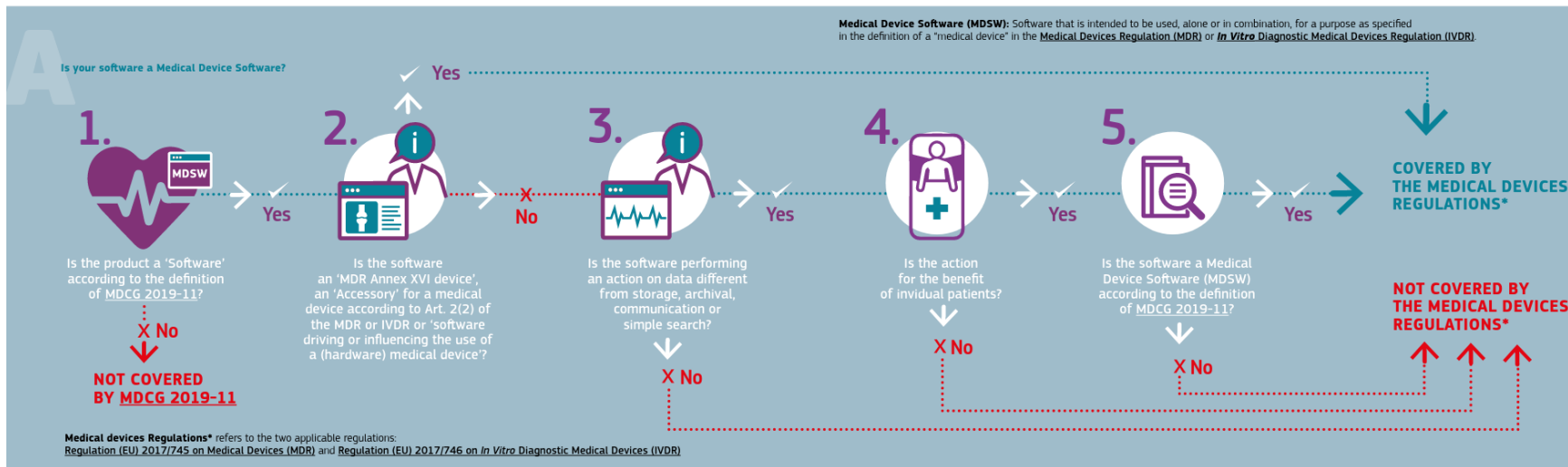
 GNU Health Topics: [Open Source Software](#) [eHealth](#) [Science and technology](#) [Demography and population](#) [eInclusion](#)

[Overview](#) [Members](#) [About](#)





Decision steps to assist qualification of **Medical Device Software (MDSW)**



https://health.ec.europa.eu/system/files/2021-03/md_mdcg_2021_mdsw_en_0.pdf

GNU Health Hospital Management is not a medical device

MDCG 2019-11

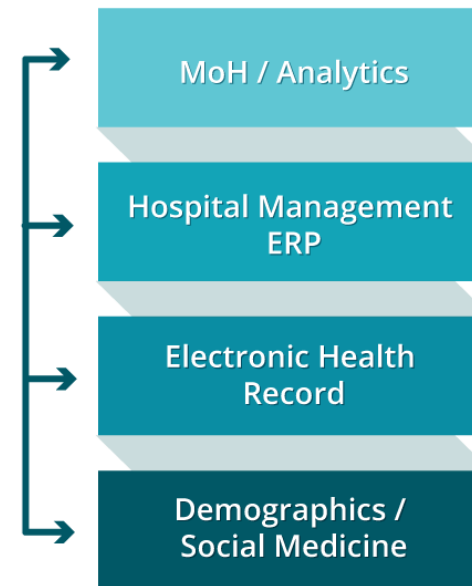
Guidance on Qualification and Classification of Software in Regulation (EU) 2017/745 – MDR and Regulation (EU) 2017/746 – IVDR

October 2019

Hospital Information Systems

Electronic Medical Records

Are **not** Medical Devices
nor Software as a Medical Device



GNUHealth

Regulations, Transparency and Adoption



Proprietary software in public healthcare is a contradiction

European Public administration should run entirely on Free/Libre Software

Public Hospitals in Europe run closed-source / private HMIS / electronic health record

Too much bureaucracy and lack of funding for Free Software projects

Need pilot projects to show that successful implementations of GNU Health and Orthanc in other parts of the world can be replicated in the European Public health system

Public Money, Public Code!



PUBLIC MONEY

PUBLIC CODE

Why is software created using taxpayers' money not released as Free Software?

We want legislation requiring that publicly financed software developed for the public sector be made publicly available under a [Free and Open Source Software](#) licence. If it is public money, it should be public code as well.

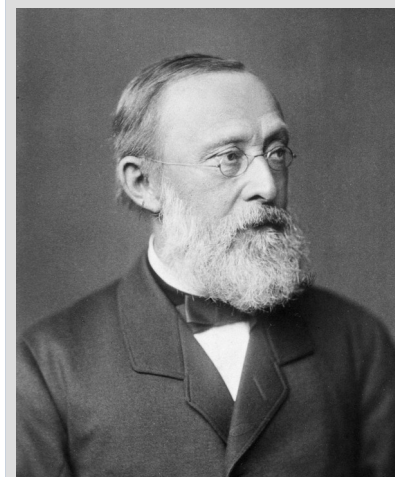
Code paid by the people should be available to the people!

<https://publiccode.eu/en/>

GNU Health is a social project, with a bit of technology behind



Santiago del Estero, Argentina, 2006
(Initial project)



“Medicine is a social science, and politics is nothing else but medicine on a large scale”

Rudolf Virchow

 www.gnuhealth.org

 info@gnuhealth.org

 [@gnuhealth@mastodon.social](https://mstdn.social/@gnuhealth)