DICOM NETWORK

DICOM Network

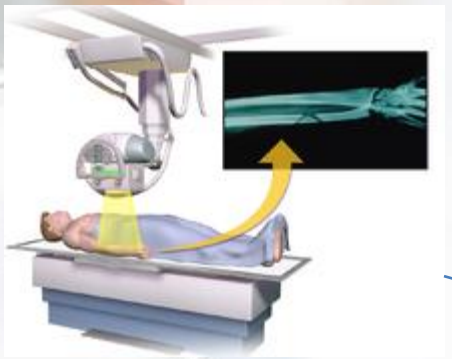
DICOM data processing optimization in medical information systems

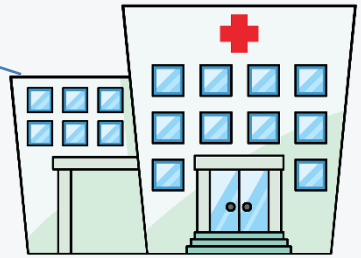
Contents

- Overview
- DICOM NETWORK
- Integration with HIS
- Optimization Problem
- Integration into VISEEM Platform
- What's Next?

Overview

Collecting large datasets of medical images provides possibility for data processing and classification.





The bottleneck for future development is insufficient Storage!

DICOM NETWORK

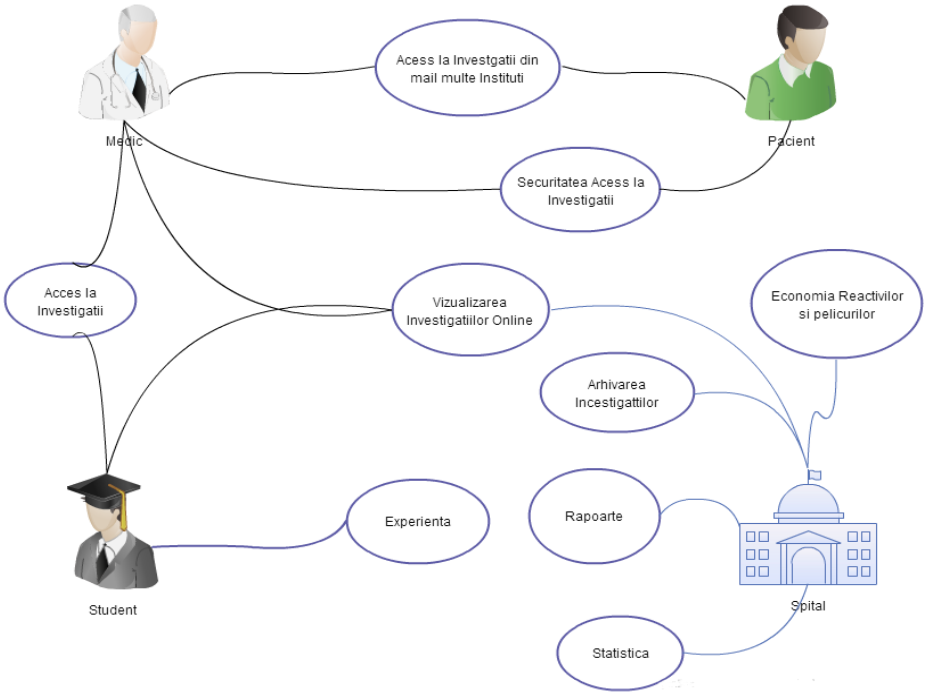
DICOM NETWORK

«DICOM Network» Informational System was planed and developed for Medical and Diagnostically Institutions for collections, processing and visualization of medical images.

This system covers all the workflow for processing and documentation of medical investigations from collecting investigations from medical equipment to archiving investigation in the patient medical record.

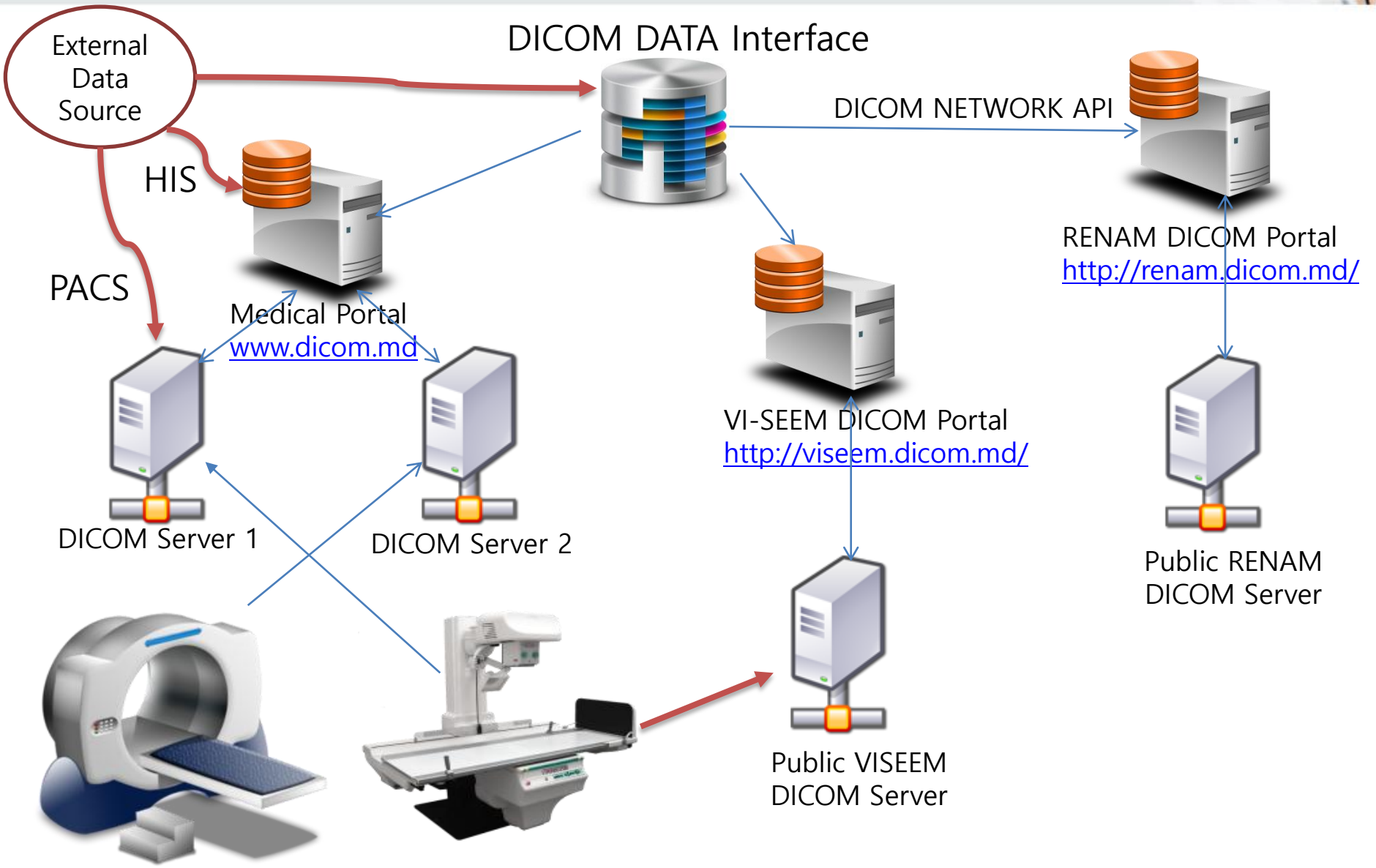
«DICOM Network» offers necessary functionality for quality medical management and secure investi gation access in ONLINE mode. This helps doctors, specialists and penitents to access, save and do cument Medical Imaging Investigations and help institutions to reduce investigation costs, enchasing quality of service.

DICOM NETWORK



General Architecture

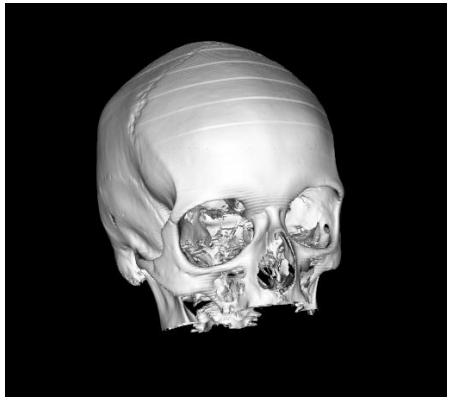
DICOM NETWORK

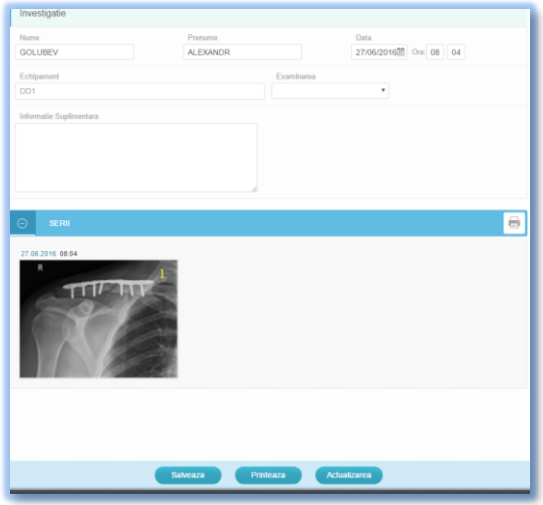


Services & Features

"DICOM Networks" informational system provides full set of function ality for data collection and processing.

- **Data Collect** – import DICOM investigations data from equipment
- **Data Archive** – full archive of investigations for several years
- **Data Access** – role based access to the investigation online with reporting and filters features.
- **Visualization** – Visualization of investigations in DICOM Viewer
- ***Data Processing*** *– data preprocess and classification.*





Numbers

DICOM NETWORK

1’st put into operation information system working in the RM, which offers d istributed data collection, processing, access and archiving of medical images

3 DICOM Portals were configured in DICOM Network.

5 DICOM Servers are colleting DICOM data in 24/7 mode.

300 Investigations average per day are collected by the system now.

216 526 Investigations are collected by the system.

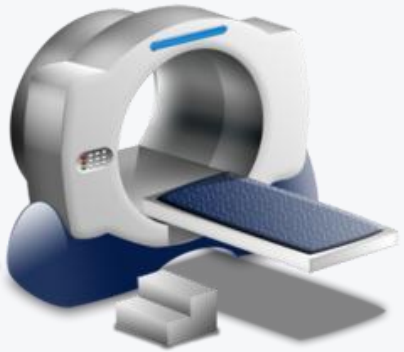
496 Doctors have access to their patients investigations from their working place

500 GB of date is collected every month.

1 278 960 MDL 62 098 euro were saved on the print consumables for i nvestigations printing in 2017 thanking to DICOM Network.

Integration with HIS

DICOM Network provides integration with existing Hospital Informational Systems



DICOM

DICOM NETWORK

Investigations

- Patient Data
- Images
- *Preprocess Info*

Hospital Informational System

DICOM NETWORK

Results

- Diagnostics
- Decision
- Treatment results
- *Drugs*
- *Procedures*

Optimization Problem

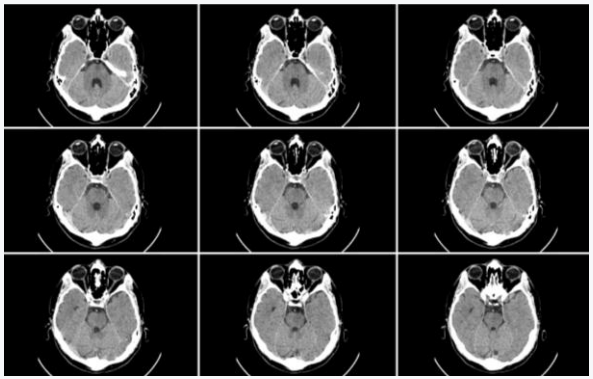
The problem of data optimization for DICOM Network can be divided into 3 stages.

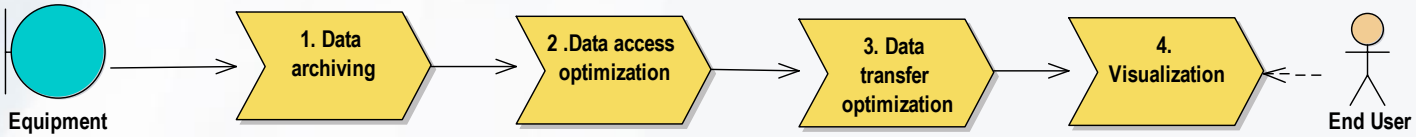
- First, when you import and write the source files on storage, you need to archive the data to minimize the volume, saving the qua lity of the images.
- Secondly, when accessing data, it is necessary to transfer the dat a to user as quickly as possible while optimizing the format to re duce the amount of transmitted images.
- Thirdly, the data should be optimized to speed up loading and p rocessing them on the local processor.

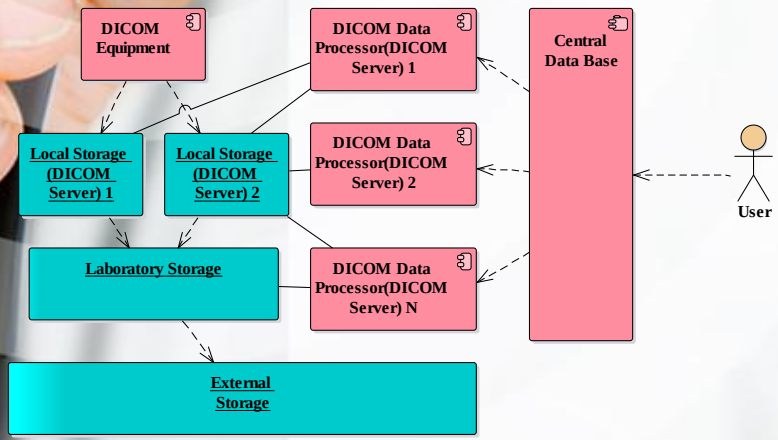
DICOM Format optimization

The problem of data handle optimization for information systems can be divided into three stages.

- Data archiving
- Data access optimization
- Data transfer optimization.
- Preprocess of data for visualization.







Integration into VISEEM Platform

"DICOM Network" was selected as pilot application for integration into distributed regional VI-SEEM platform

- What "DICOM Network" could contribute to the research comm unity of VI-SEEM Project?
  - Archive of anonymized datasets were uploaded to the VI-SEEM server http://viseem.dicom.md/ offered by Macedonian partners.
  - Impersonated metadata from integrated HIS.
  - Mechanism for sharing the patient personal data, but only on p atient approval.
- How VI-SEEM could help "DICOM Network"?
  - Resources: storage, processors, etc...
  - Promotion on international levels.
  - Connections with other researches.
- What problems were solved for VI-SEEM integration?
  - Architecture of the system was changed for fitting into VI-SEEM platform.
  - Data anonymization mechanism have to be improved to be con figurable on the DICOM Portal and institution level.

How to start working in “DICOM Network”

In Order to Setup an account in the DICOM Network:

- Setup Institution/Organization
  - •Add general info
  - •Setup Rule Based settings
  - •Setup departments
- Setup Equipment
  - •AE Title
  - •IP address
  - •Port
- Setup HIS endpoint

After Confirmation you will be allowed to setup users for access VI SEEM

DICOM Portal:

- Register Users
- In Case you will need specific datasets – start the discussion.

The current state of “DICOM Network”

Installed three DICOM Portals and four DICOM Servers in tw o countries: Moldova and Macedonia. The clinic from Cluj-Na poca in Romania and Federal University named after M.V. Lomonosov in Russia expressed their interest to install D ICOM Network.

DICOM Portals:

http://dicom.md/

http://renam.dicom.md/

http://viseem.dicom.md/

What's Next?

Future research, activities and innovations

- **Mobile applications** - a set of components and mobile applications th at will allow the system to be used outside the workplace. These comp onents will be useful in urgent medicine or in providing medical care o utside of medical institutions.
- **Optimization of data archiving** - will significantly reduce the size of st ored and transmitted data.
- **Deep Learning** for classification and automatic data processing.
- **Automatic detection** of pathologies based on previously processed datasets .

DICOM NETWORK

Vi-SEEM

Questions Session

DICOM NETWORK