
AKGÜN
SOFTWARE

# AKGÜN Corporate


**AKGÜN RESEARCH-DEVELOPMENT CENTER**

**Certified by TR Ministry of Science, Industry and Technology**

# AKGÜN Corporate

- Established in 1986, in Turkey
- Research, Development, System Integration & Maintenance Services
- 700+ Expert Staff (150+ R & D)
- Turkey Structure: Headquarter–Ankara AKGÜN Plaza/ R&D Center & Trabzon Office at KTU University Technocity
- International Branches: Azerbaijan, Kazakhistan, Georgia, United Kingdom

# Regional Offices and References

# Some Important References City Hospitals

**Yozgat City Hospital**

No. Beds: 500
No. Outpatients per day: 3.500
No. Doctors: 140
No. Nurses: 430
No. Total Users: 1.870

**Isparta City Hospital**

No. Beds: 780
No. Outpatients per day: 6.000
No. Doctors: 219
No. Nurses: 918
No. Total Users: 3.000

**Adana City Hospital**

No. Beds: 1.550
No. Outpatients per day: 10.387
No. Doctors: 532
No. Nurses: 1.650
No. Total Users: 5.100

# National and International Quality Standards

R-D Center Certified by Ministry of Science, Industry and Technology Republic of Turkey

CMMI LEVEL 3 Certificate

NATIONAL CONFIDENTIAL Classified Facility Security Clearance

NATO CONFIDENTIAL Classified Facility Security Clearance

All Types of Military and National Security Software Production License Certificate

TS ISO/IEC 15408 Information Technology Security Evaluation (Common Criteria) Certificate

Made in Turkey

ISO 27001 Information Security Management System Certificate

ISO 10002 Customer Satisfaction Management System Certificate

Kazakhstan Information Security Certificate

TS 13298 Electronic Document Management Standard Certificate

TS ISO/IEC 25051 Product Quality Requirements and Evaluation of Software Products Delivered to the Market

ISO 13485 Medical Devices Quality Management System Certificate

ISO 9001 Quality Management System Certificate

OHSAS 18001 Occupational Health and Safety Management System Certificate

HIMSS Digital Hospital EMRAM Model Compatibility

Health Level 7 Standard Compatibility

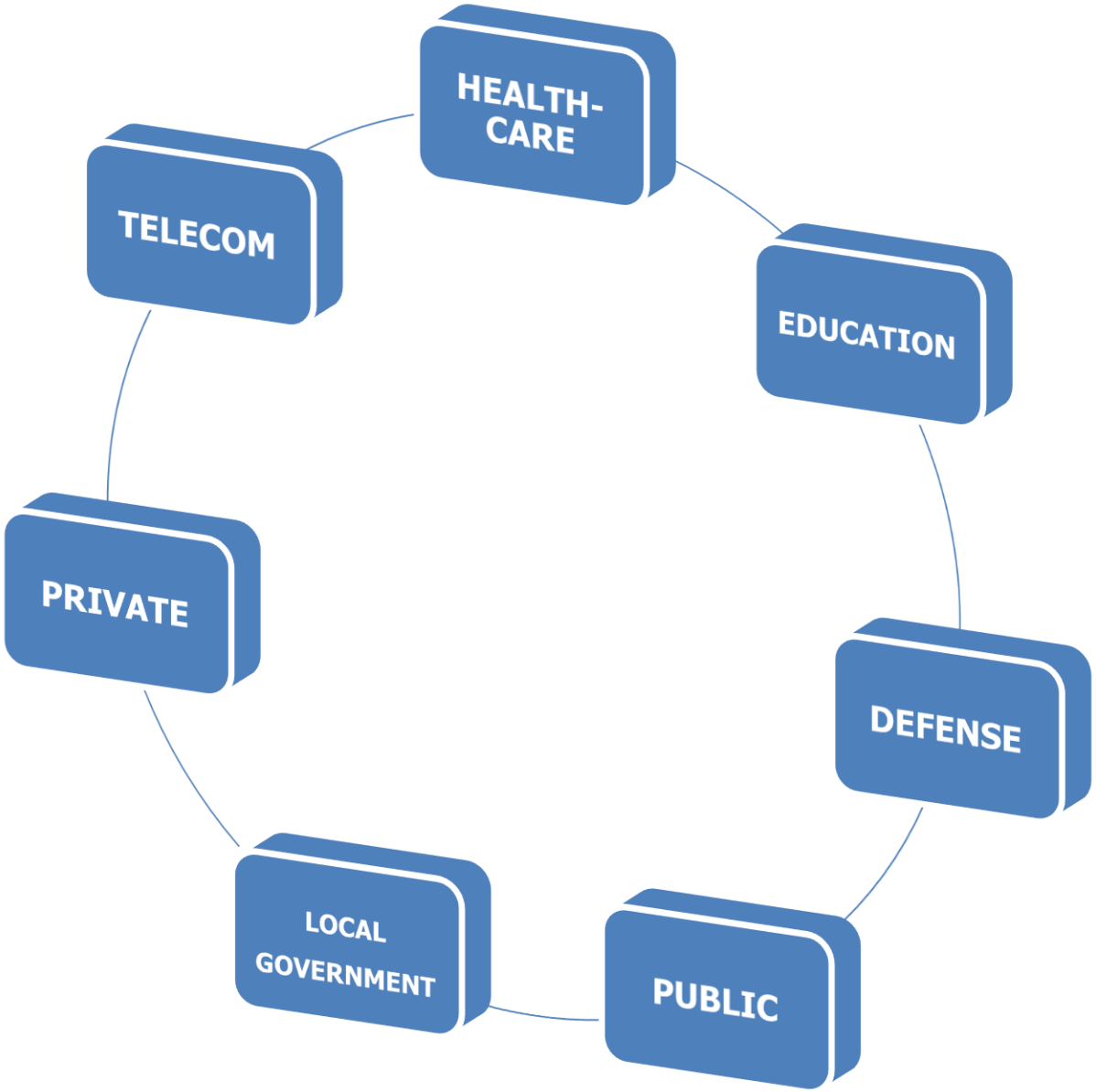
IHE (Integrating the Healthcare Enterprise) Integration Test Certificate of Achievement

DICOM (Digital Imaging and Communications in Medicine) Standard Compatibility

CE Marking Certificate

TSE Service Qualification Certificate

# Sectoral Activities



# AKGÜN Expertise

# AKGÜN Healthcare Informatics Solutions

# AKGÜN Healthcare IT Solutions

Hospital Information System

Quality Practices (Emergency Service, Verbal Order ..)

Radiology Information System

Mobile Health

Laboratory Information System

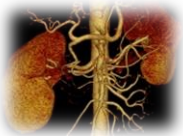
Health Solutions

Family Medicine Information System

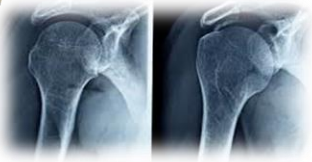
PHA ERP

Computer Aided Diagnosis (X-Ray Mamography)

Picture Archiving and Communication System



3-D PACS (VRT, MPR, MINIP, SSD)



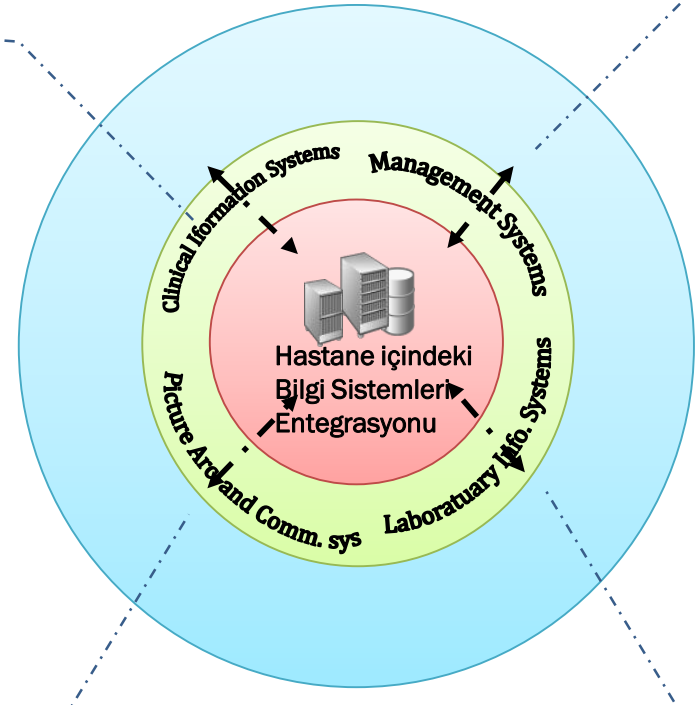
# Health Information System - End to End Solutions

## AKGÜN HIS

- ✓ Electronic Health Record
- ✓ Emergency
- ✓ Outpatient
- ✓ Inpatient
- ✓ Surgery
- ✓ Pharmacy
- ✓ Oral and Dental Health
- ✓ Intensive Care Unit System

## AKGÜN ERP

- ✓ Inventory and Asset Management
- ✓ Purchasing
- ✓ Document Management
- ✓ Business Intelligence




Mobile Devices

## AKGÜN RIS
## AKGÜN PACS

- ✓ Appointment Management
- ✓ Reporting Services
- ✓ Image transmitting, archiving and viewing
- ✓ Image Processing

## AKGÜN LIS

- ✓ Pre-analytical, analytical and post analytical process
- ✓ Inventory Management

Data integration based on standards

# AKGUN TURNKEY SOLUTIONS

# Value-Added Applications

- Patient Portal
- Internet Appointment Management System
- Sampling Call Management System
- PDKS - Personnel Attendance System
- Mobile Anka Application
- Training Portal
- Kiosk - Self Service Patient Reception
- Temperature and Humidity Monitoring System
- Business Intelligence


AKGÜN iVital

Intensive Care Unit Clinical Management System

# Monitoring system for vital signs in the intensive care unit

# Patient and treatment information

### Registration and storage

of patient information in an electronic environment is an integral part of modern medical care.

### Patient data

are rarely grouped in such a way as to quickly obtain information for correct and effective decision-making.

### Treatment records

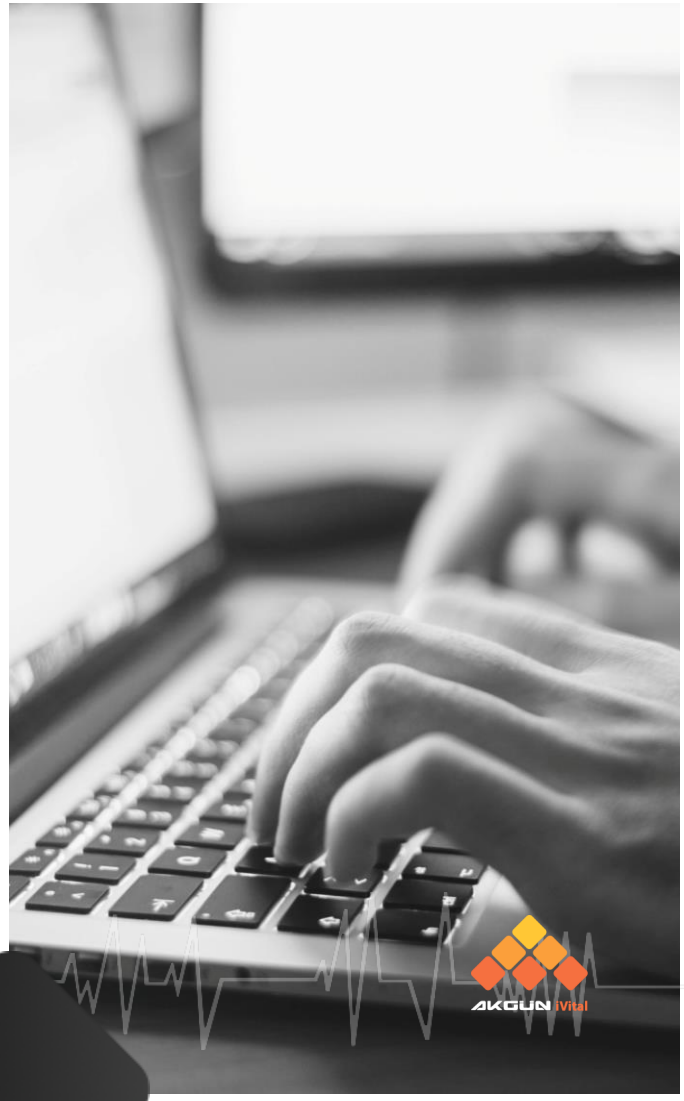
As medical care becomes more complex and voluminous, treatment records can become increasingly fragmented.

# The current situation in the ICU

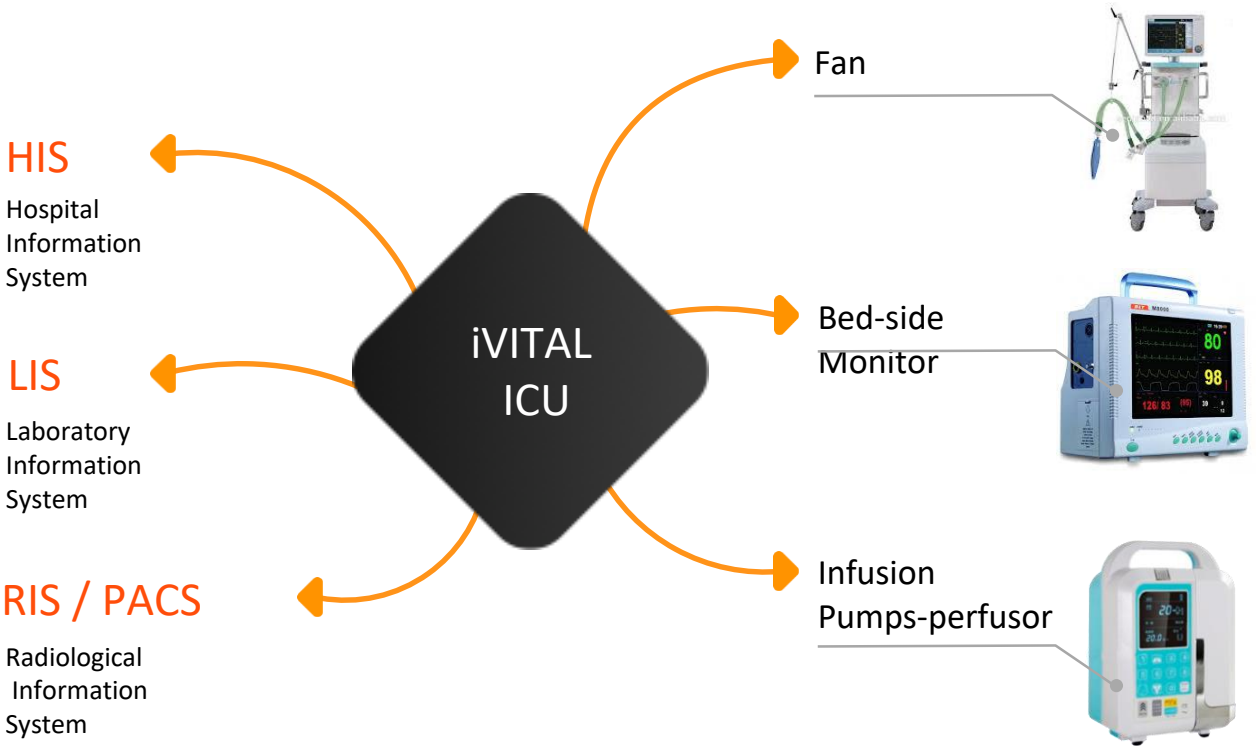
- Nursing forms of observation for each patient;
- The parameters from the monitors, laboratory results, etc. are written on paper monitoring chart
- Case analysis and decision-making processes based on paper records
- Patient monitoring and manual alarm control

# Expectations

- Converting paper forms to electronic format
- Operational access to patient data (ADT information)
- Automatic recording of parameters in the electronic system
- Integration with laboratory, radiology
- The integration of devices supporting and monitoring automatic data transmission in the form
- Setting up notifications
- Monitoring of patients from one center



# The architect of the interaction between the system and the ICU



# iVital Technology

Web-based solution

Browser independent

Mobile application support

App Market support

Multilingual support

Support for different devices

User friendly interface

# Artificial Intelligence - Computer Aided Diagnosis Systems For Cancer Detection


X-Eye Toraks Computer Aided Diagnosis in Lung X-Ray Images

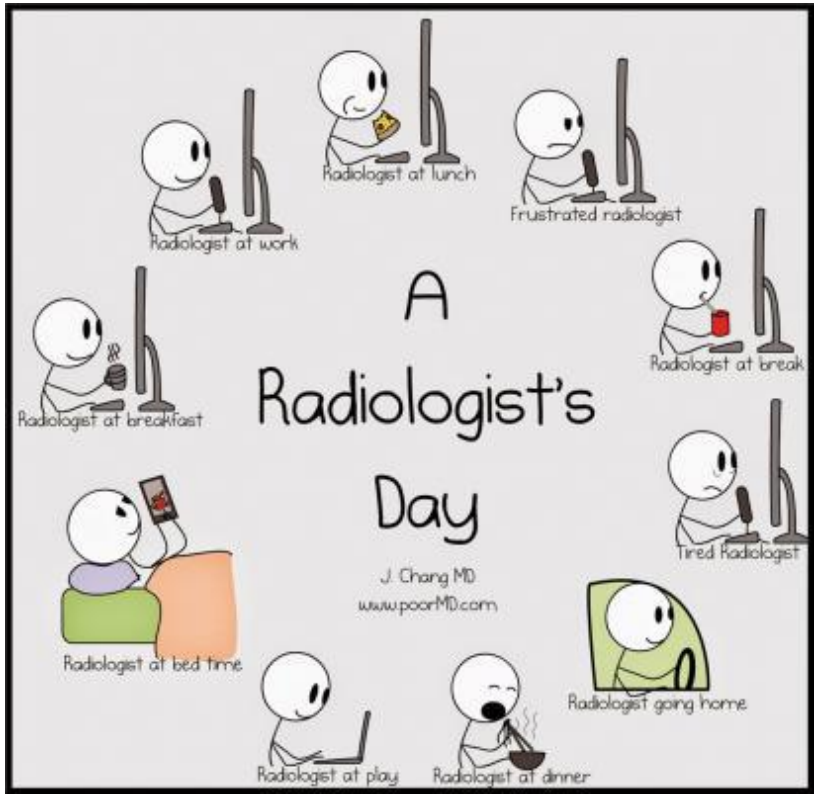

X-Eye Ribout Elimination of Ribs


X-Eye Mammo Computer Aided Diagnosis in Breast Images

# X-Eye Toraks Computer Aided Diagnosis in Lung X-Ray Images

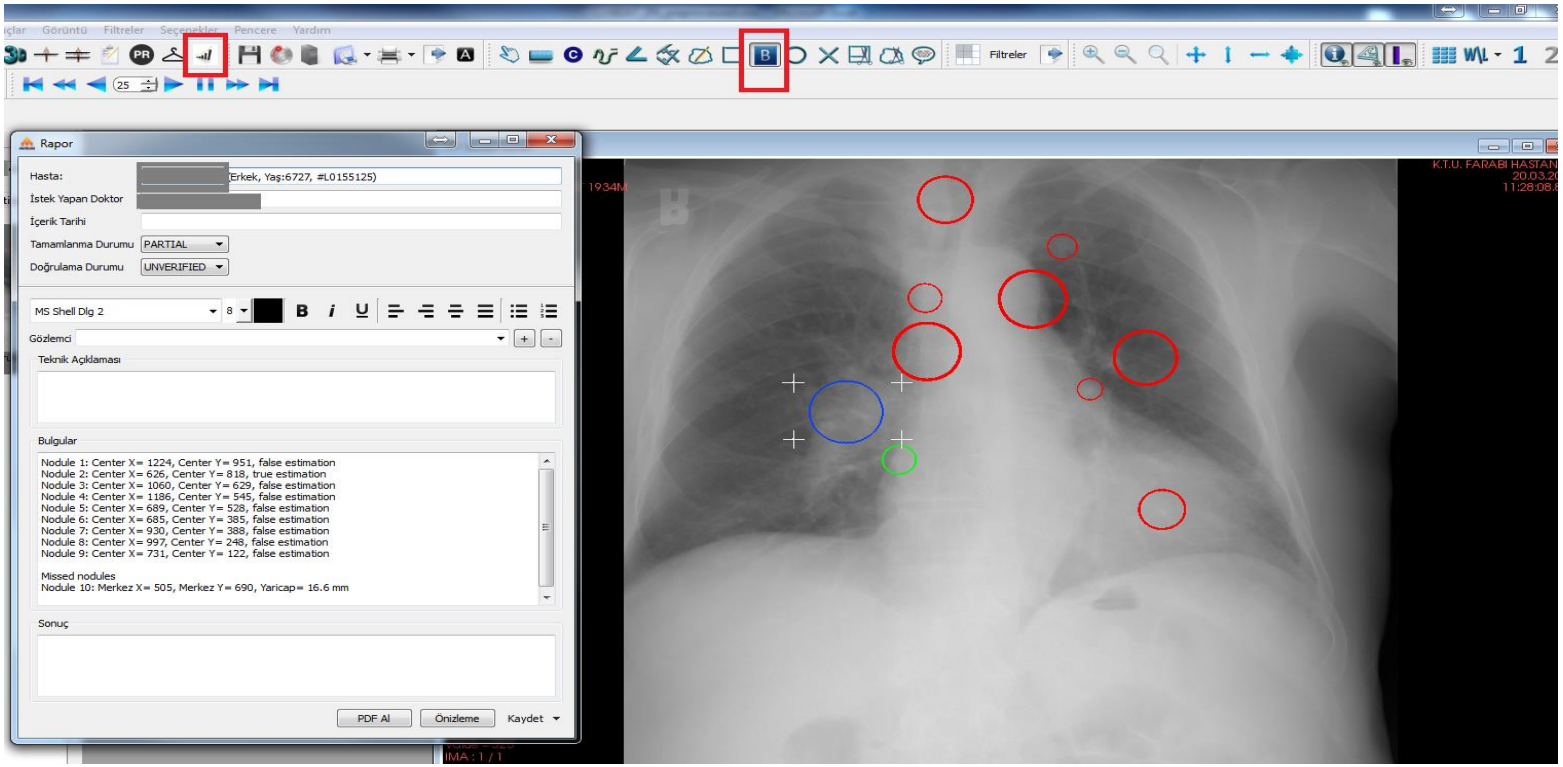
Many difficulties may exist for a radiologist to diagnose nodules on radiological images

- Large image volumes,
- Smallness of nodules,
- Hidden behind another tissue,
- Un-clarity of the difference between normality and abnormality,
- Eyestrain and heavy workload,



# X-Eye Toraks Computer Aided Diagnosis in Lung X-Ray Images

- Detects abnormalities that may be overlooked by radiologists,
- Increases the accurate diagnosis rate,
- Helps early diagnosis of lung cancer.



# 2 Questions

What will be the;

1- Bone Intersections

2- Sensitivity

**Answer is;**

**X-Eye Ribout Elimination of Ribs**

## X-Eye Ribout Elimination of Ribs

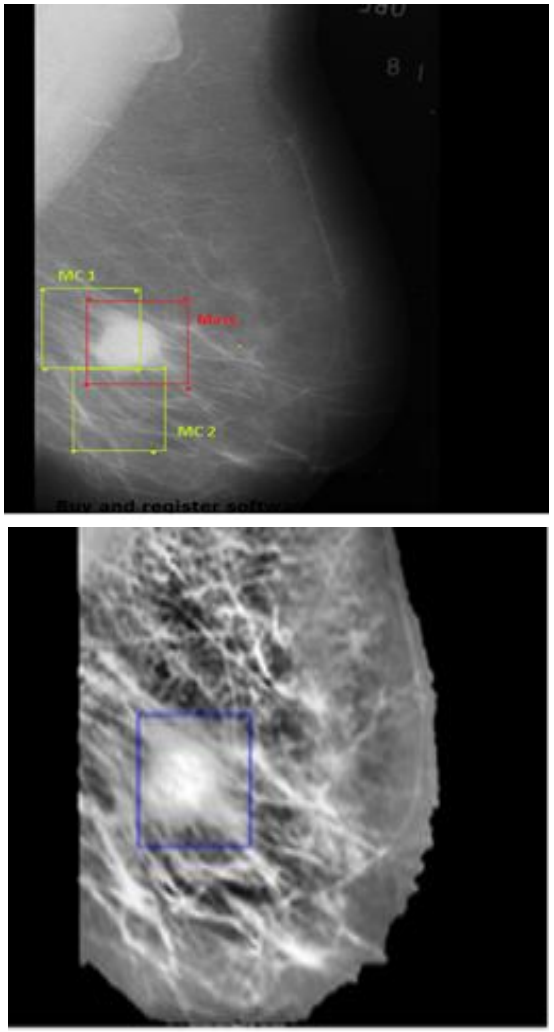
The system virtually separates the lung from the ribs and detects the nodules under the ribs


**Benefits;**

- Lung nodule detection with higher processing sensitivity
- Less error rates

## X-Eye Mammo Breast Cancer Computer Aided Diagnosis System

- Helps early diagnosis of breast cancer
- Early detection of masses and micro-calcifications on mammography images,
- Identifies anomalies that may be overlooked as a result of restrictions arising from human examination,
- Provides an assessment of benign/malignant likelihood of two anomalies (mass and micro calcification) seen in breast cancer cases.




Mammography

# TELE-RADIOLOGY

(Centralization of radiology departments of medical institutions at the regional/city level

# Tele-Radiology

## ECONOMY

the cost of the film

## EFFICIENCY

access to images and inability to transfer data

- ✓ No possibility to transfer images from one polyclinic to another, as well as from polyclinics to hospitals

# **Tele-Radiology** Archive

No ability to view previously taken pictures, as well as visual comparison

- ✓ A special problem with mammographic images, as there is no possibility of access to previous images, which is very important for the comparative analysis of the dynamics of treatment;
- ✓ Over time, the image quality deteriorates, making it difficult to compare with current images;
- ✓ When you change the clinic lost previous pictures

# **Tele-Radiology** Quality

improving the quality of diagnostics

- In case of incorrect posture of the patient or position, it is necessary to re-study, which is very harmful to health (additional radiation);
- In case of poor-quality development, it is necessary to re-study, and the time spent on the search for the patient delays the process of prescribing treatment

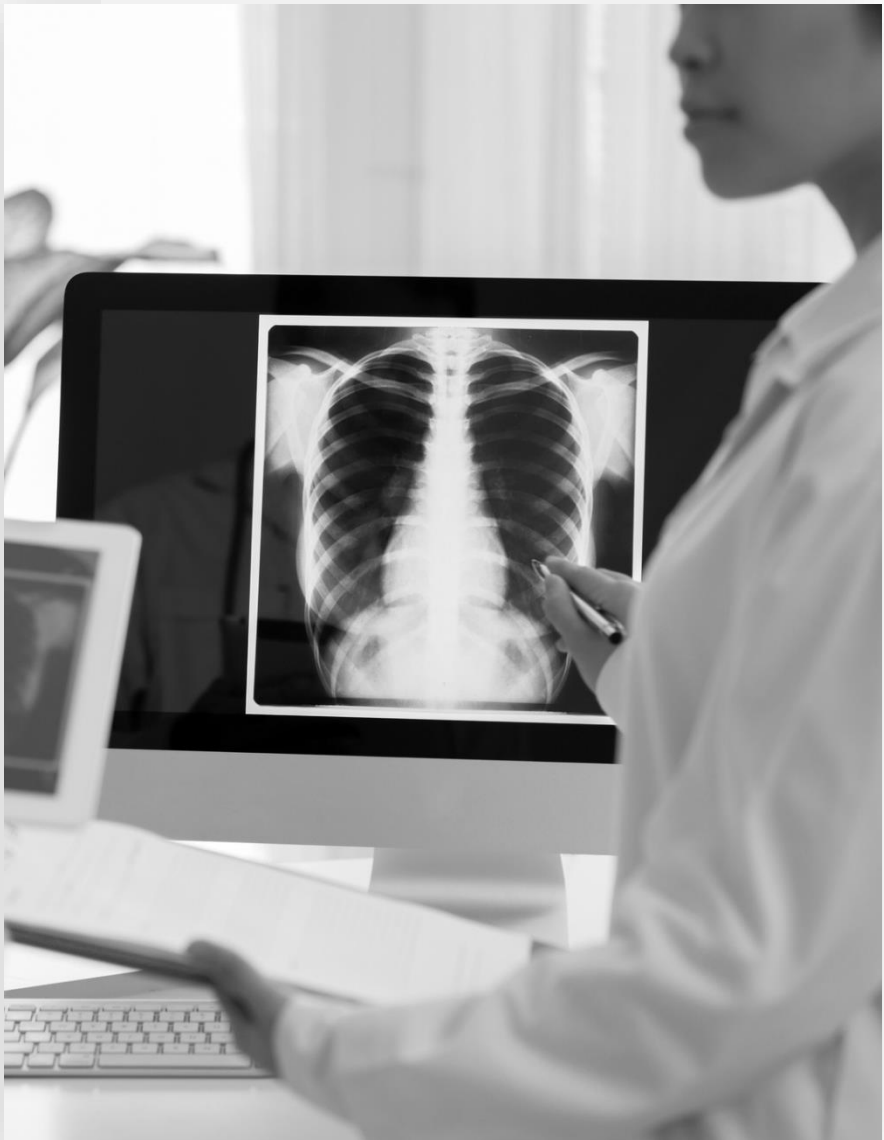
# **Tele-Radiology** Process Archiving

The research request comes from the RIS

Then, the program sends a request to the equipment

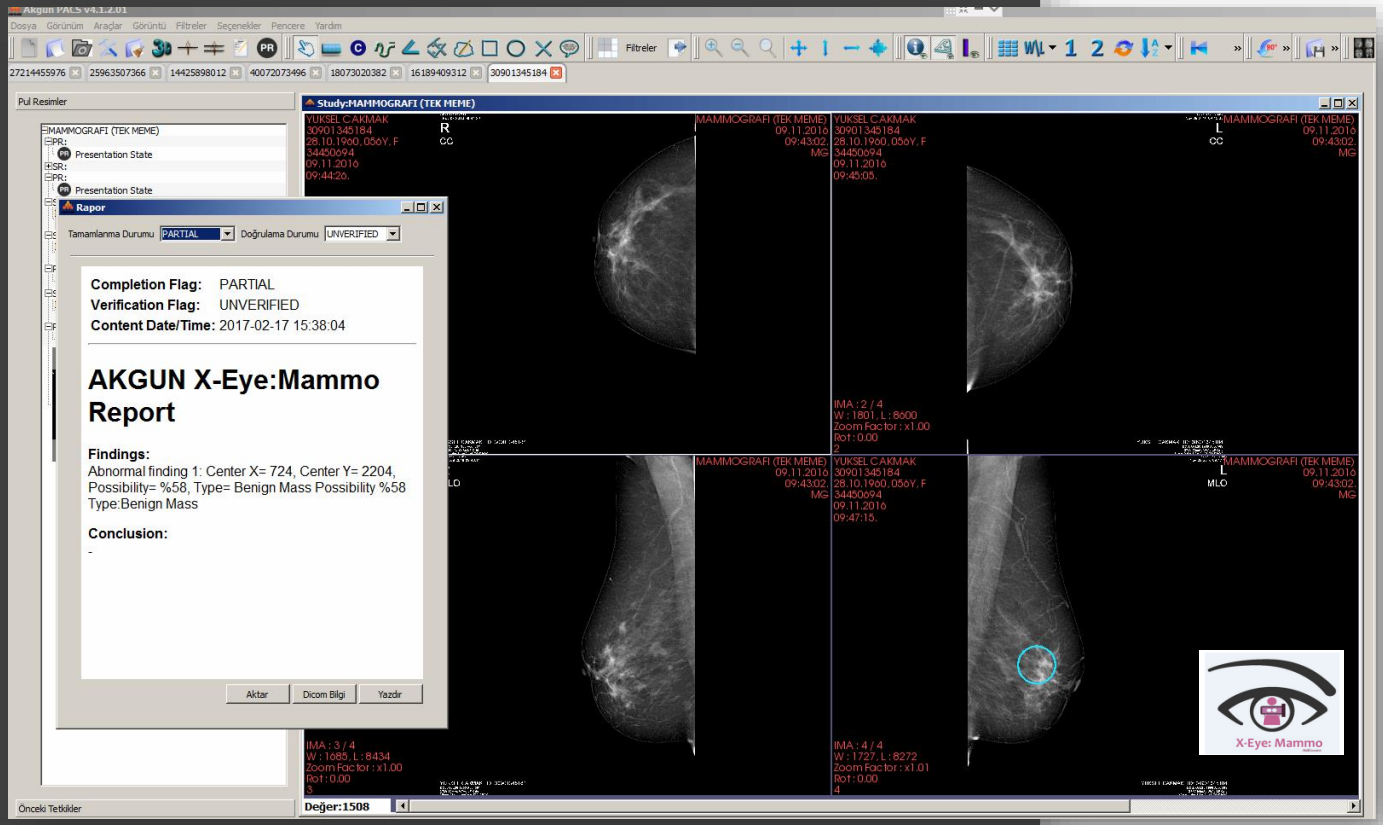
The images are stored in the mini archive of the clinic

Then, sent for long-term storage to the Central archive of Teleradiology



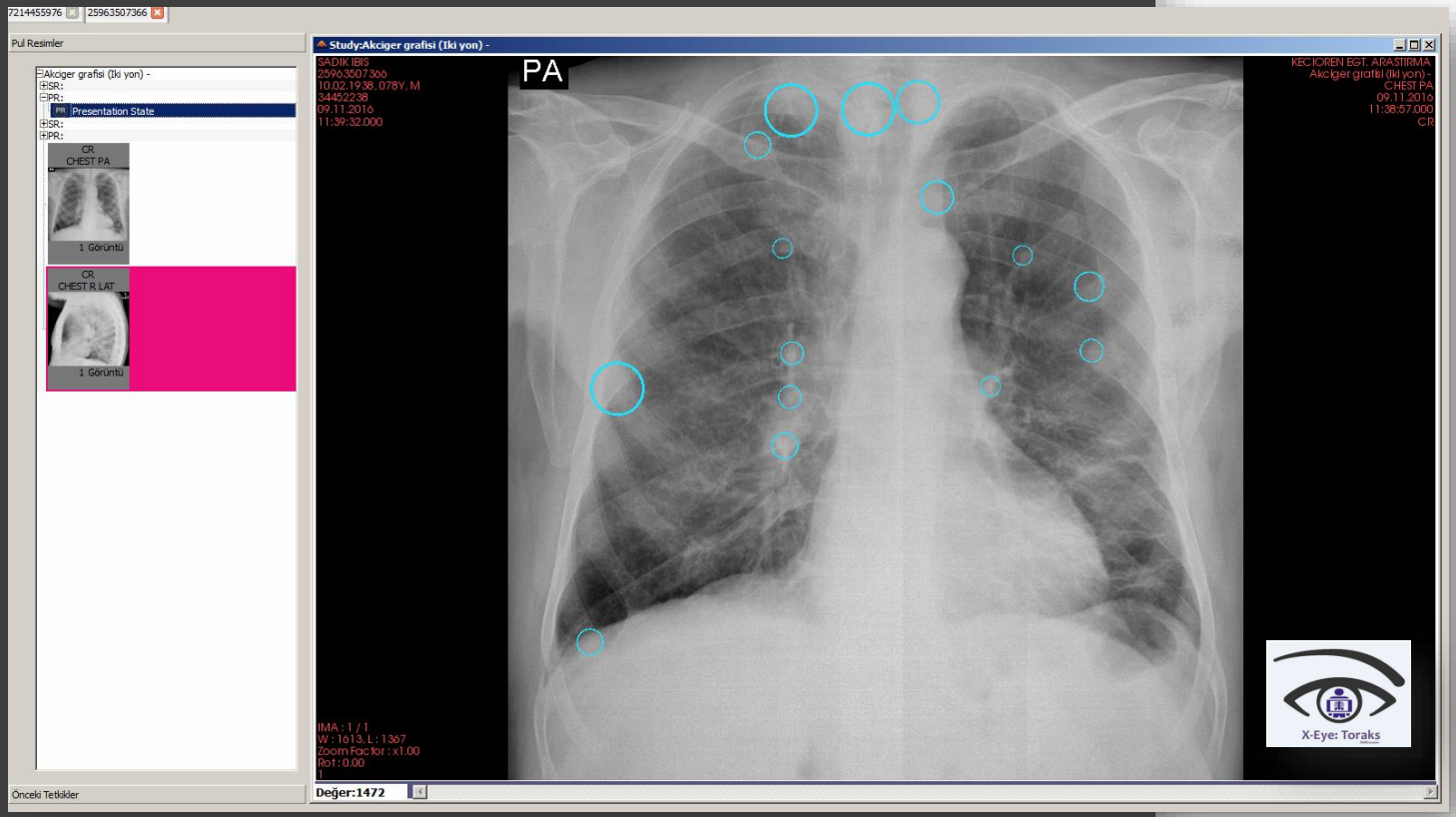
# **Tele-Radiology** Innovative Solutions

The project includes innovative solutions:
X-EYE Mammo



# **Tele-Radiology** Innovative Solutions

The project includes innovative solutions:
X-EYE Toraks



# **Tele-Radiology** Benefits

- Tele-radiology system can be supported by our artificial intelligence computer aided diagnosis systems for early detection of breast cancer and lung cancer.
- Possibility of comparative analysis of images in dynamics;
- Evidence-based medicine: a machine learning gives a second opinion physician to the radiologist in placing a diagnosis;
- The ability to transfer images from one health facility to another in accordance with the constructed request;

# **Tele-Radiology** Benefits

- No need for physical space and special conditions for storing images;
- Prompt receipt of the required high-quality image (90 seconds and the Center of Tele-radiology to the local database)
- No cost of consumables (chemicals, etc.);
- Does not harm the environment;
- The possibility of increasing the quality of diagnosis (adjustment of contrast, Sharpness of borders, zooming, Scaling, Rotation, Mirror image, Inversion of colors, distance Measurement and angle);

# **Tele-Radiology** Benefits

- PACS is a single environment for viewing data and working with clinical applications with a single software interface for all users — both inside and outside the institution.

RT PET/CT Angiography interventional radiology ultrasound

CT

MRI

RADIOGRAPHY

MAMMOGRAPHY

# **Tele-Radiology** Conclusion

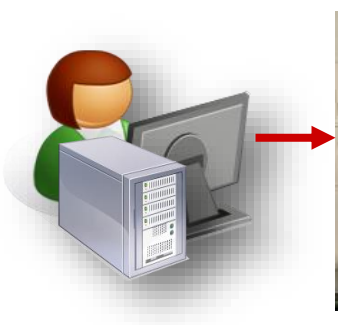
The expediency of equipping health facilities with PACS system is the need to combine all diagnostic equipment into a single network, which will lead to the possibility of centralized image storage and optimization of the process of their transmission and processing.

The creation of digital archives will lead to significant savings in the cost of consumables (film and chemicals), as well as the maintenance of large film fire-hazardous archives.

The PACS system also contributes to the consolidation of health facilities into a single working mechanism. The use of PACS systems puts the work of health facilities on a fundamentally new level of quality that meets modern views on the organization of the diagnostic and treatment process.

# Central Laboratory Information System

# Central LIS: Bussiness Processes



| Test Reguest | Material Collection | Material Barcoding | Sending Materials |
|---|---|---|---|

# Central LIS: Process Description

Test results are offered to hospitals and patients via the Internet


Demands are forwarded to the laboratory via the Internet

Test Results are automatically transferred to the system

Materials are archived

# Central LIS: Advantages

Laboratory results are available from all hospitals as soon as they are approved. This prevents time loss for the distribution of results..

Patient; In case of going to the hospitals included in the system, the quality of treatment is increased by accessing the previously studied results of the patient.

Repeated testing of the tests is avoided, thereby reducing laboratory costs.

# Technology Infrastructure

# Technology

Web-based solution

Browser independent

Mobile application support

App Market support

Multilingual support

Support for different devices

User friendly interface

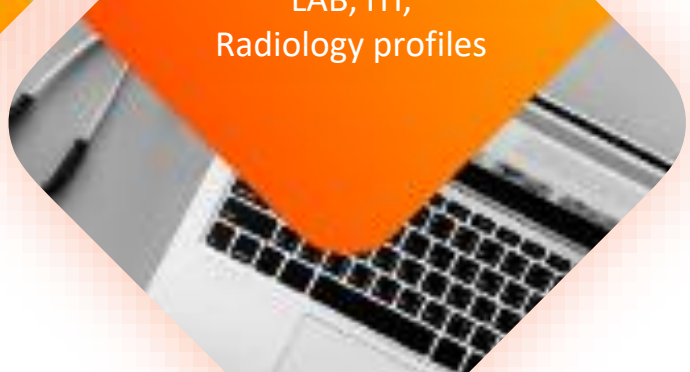
# Integration Standards

IHE (Integrating the Healthcare Enterprise) Certificate of successful integration

Health Level 7 compliance

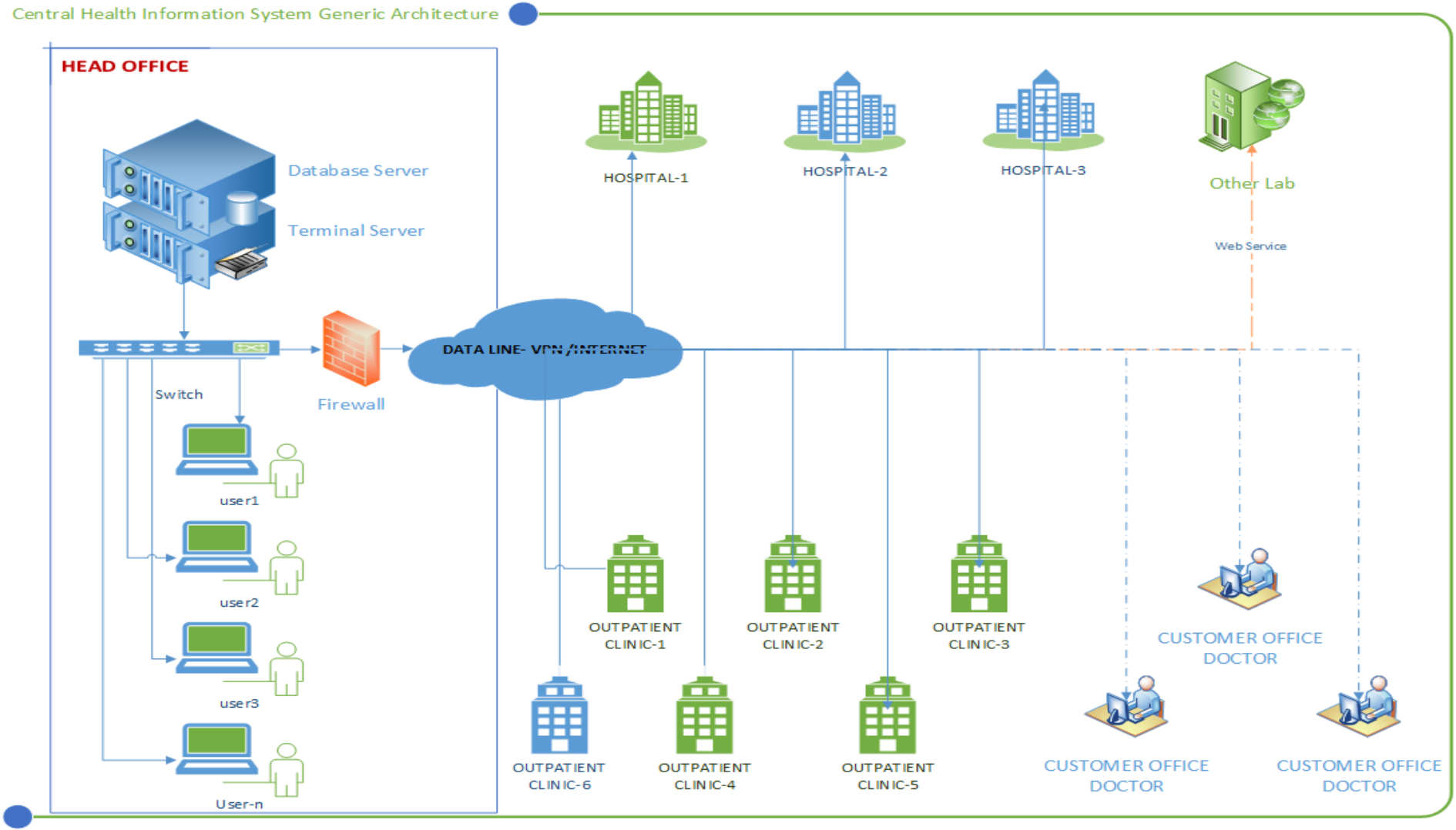
Adaptation to the features of the clinic

Support for PCD, LAB, ITI, Radiology profiles



# Centralized Healthcare Information System

# Central Health Information System



# Central HIS Advantages

Electronic patient records are collected in a single center and all institutions are authorized to access patient data.

The activities of the Health Institutions are monitored from a single center.

Fast access to patient data. Thus, the treatment process is accelerated and patient satisfaction is increased.

# Central HIS Advantages

HIS is specialized for different branches in your hospital and includes specially produced modules considering the process differences (hemodialysis, oral and dental health, etc.). In this way, customization is provided according to the needs of different hospitals from one center.

With the patient portal and mobile app; patients are given the opportunity to make an appointment and access to treatment information.

# Thank you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