

Integrated Health Information System

JUNE 2015

Who we are?

We are the team of experts in:



Information Technology



Healthcare



Finance



Management

What we do?

- Automate business processes In/Outpatient organizations
- Establish and implement Coding standards for Diagnoses and Procedures
- Integrate Insurance systems and check patient eligibility
- Create medical experts system
- Develop and maintain Health Information Systems

Where are experienced come from?

USA, England, Malta, India, Armenia

Integrated HIS. What is it?

The goal of Integrated HIS is universal modernization of health system via implementing modern information and communication technologies providing high-quality, safe, available and cost-effective medical services to the society with the purpose of improving the quality of public health and achieving increase of citizens' satisfaction with the health system. The solution is flexible, scalable and future proof information system that is based on open platform technologies and architecture principles that makes this solution easy to integrate with existing and future external systems and cost effective regarding the maintenance and extension of the solution with new functionalities. Integrated HIS solution describes as centralized healthcare information system that offers various services to healthcare stakeholders with the main goal to automatize processes and enables exchange of information among all participants.

Expected benefits

Citizens, through

- *Higher quality of provided health care,*
- *Patient safety through reducing diagnostic and therapeutic errors, improving diagnostic processes and monitoring the whole therapeutic process,*
- *Convenience in using health services, ability to communicate electronically within the health system,*
- *Time and cost savings,*
- *Enhanced satisfaction with health services.*

Government, through:

- *Higher level of health care quality,*
- *Health system transparency assurance,*
- *Better statistics; Internal and external reporting*
- *Enhanced efficiency of policy development and management,*
- *Lower costs of health care by removing duplicities in treatments, fictive treatments and wrong prescriptions, errors in diagnostic, treatments and prescriptions*
- *Lower costs for administrative activities.*

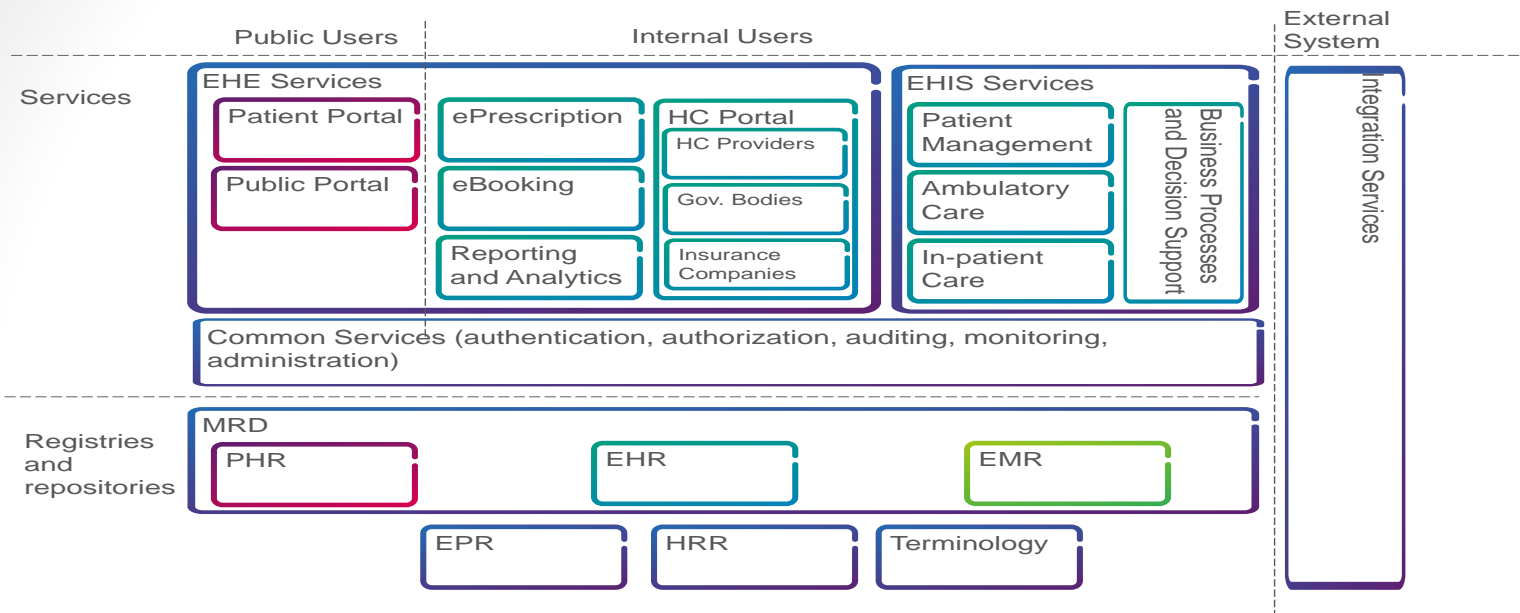
Health care providers, through:

- *Better efficiency and productivity through ICT systems,*
- *Lower costs of administrative activities,*
- *Availability of data for decision making, evidence-based management,*
- *Reduction of clinical risks and errors,*
- *Improved prescribing practices.*

Insurance companies, through:

- *Lower costs on provided health care through removing treatment duplicities, reducing the mistakes in treatment and shortening the time necessary for carrying out medical services,*
- *Lower costs of administrative activities,*
- *Defined electronic identifiers for patient and for health care providers,*
- *Data for near on-line monitoring of provided medical services,*
- *Communication with health care providers in a secured electronic form and thus being more effective.*

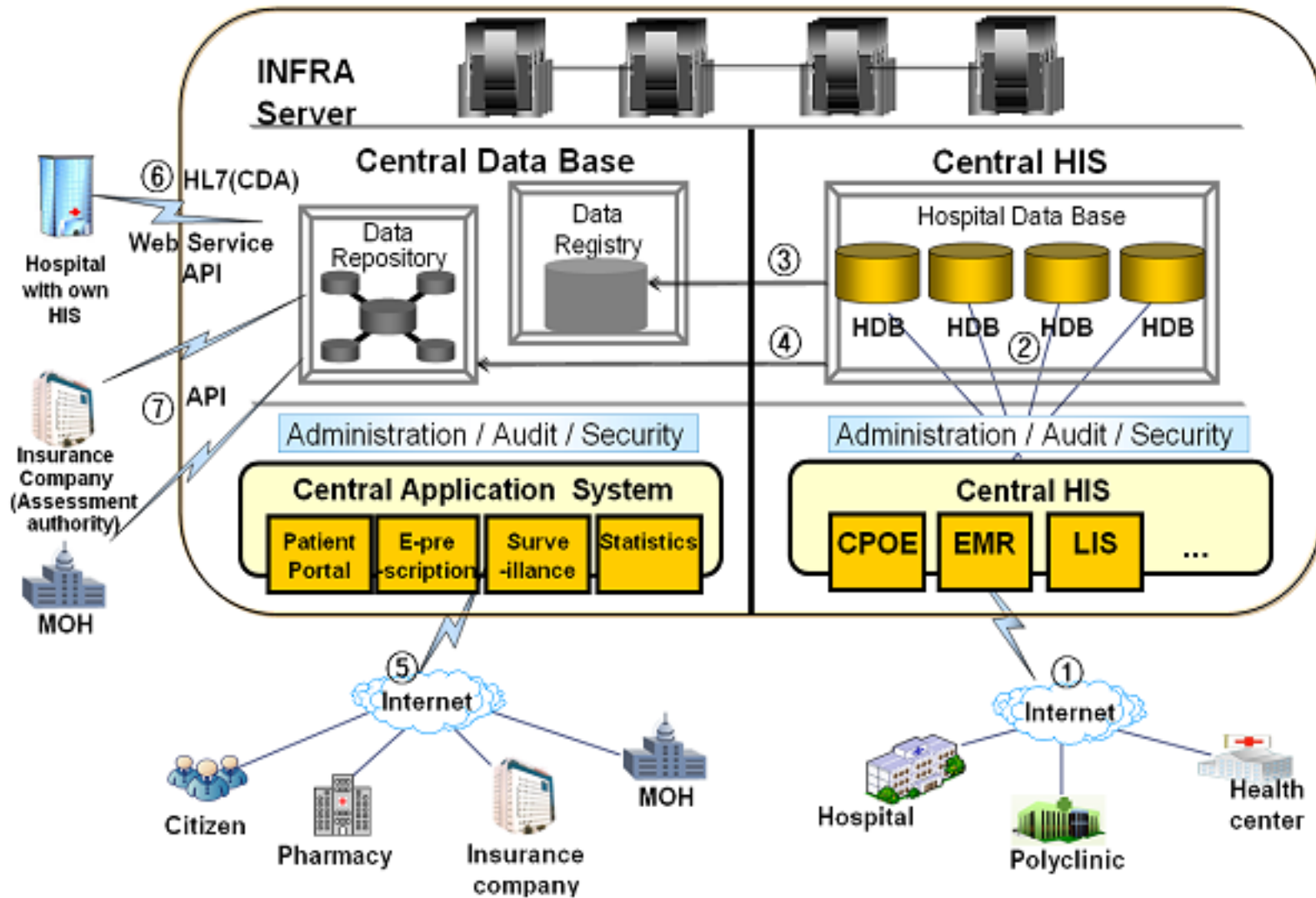
Main Services



- Patient Management
- In-patient/Out-patient Care
- Business Processes and Decision Support Systems
- E-Prescription services
- E-Booking services
- Patient Portal
- Public portal
- Reporting and analytics
- Integration Services via HL7

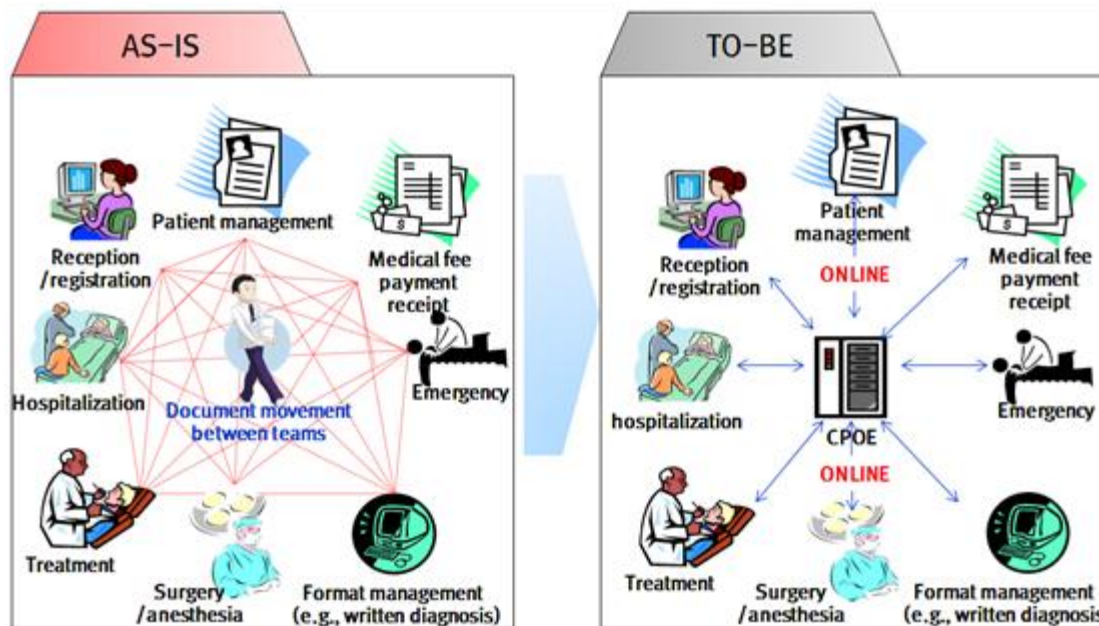
- Security services with Intrusion Prevention System
- Monitoring Tool
- Registries and data repositories
- Electronic Medical record
- Business Registry
- Electronic patient register integrated with State population register
- Drug and medication registry
- Terminology (code lists like ICD-10, procedures, ...)

IHIS Architecture



IHIS Components. CPOE

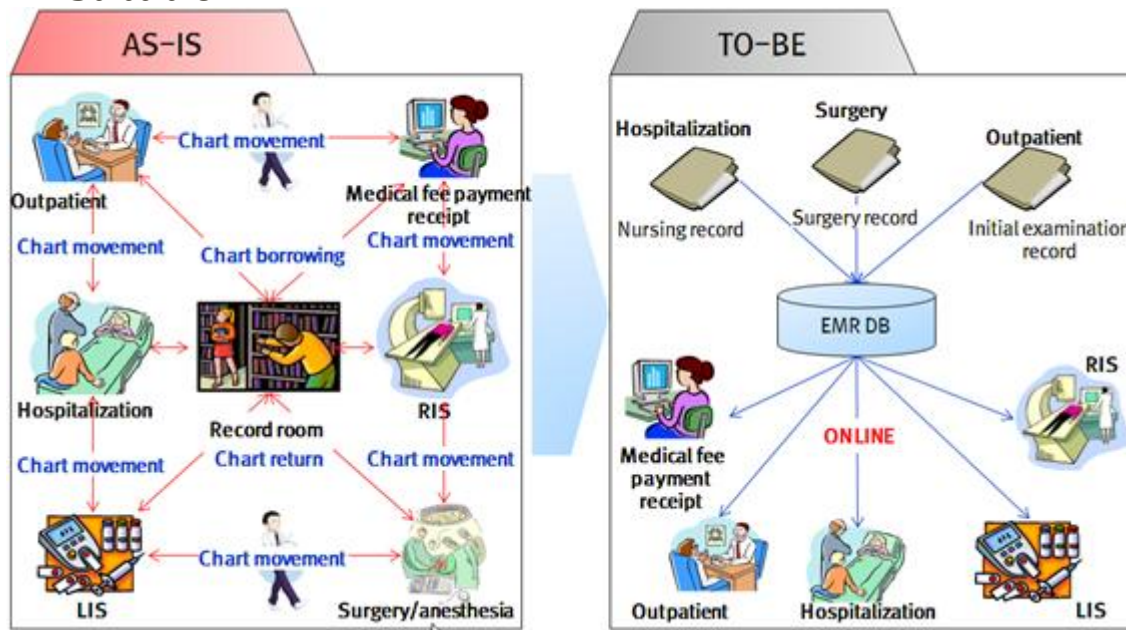
Computerized Physician's Order Entry (CPOE) is the core system of hospital information system which the medical treatment support departments (medical examination department, radiology department, pharmacy, etc.) can share information as the doctor's prescription is connected to the computer through network.



CPOE automates these all processes, removes the overlapped information of the hospital, and can ensure all departments to search the consistent information immediately online. That is, it results in the patient's health protection and the cost deduction by improving the processing efficiency

IHIS Components. EMR

Electronic Medical Records (EMR) is the paperless system of computerizing all the medical information on the patient treatment. EMR electronically records all the medical information, health status, disease history, examination result, medical examination details, prescription, drug reaction, hospitalization/discharge records generated from the patient treatment at the medical institution.



Hospitalization, outpatient and follow up records

Diverse documents management

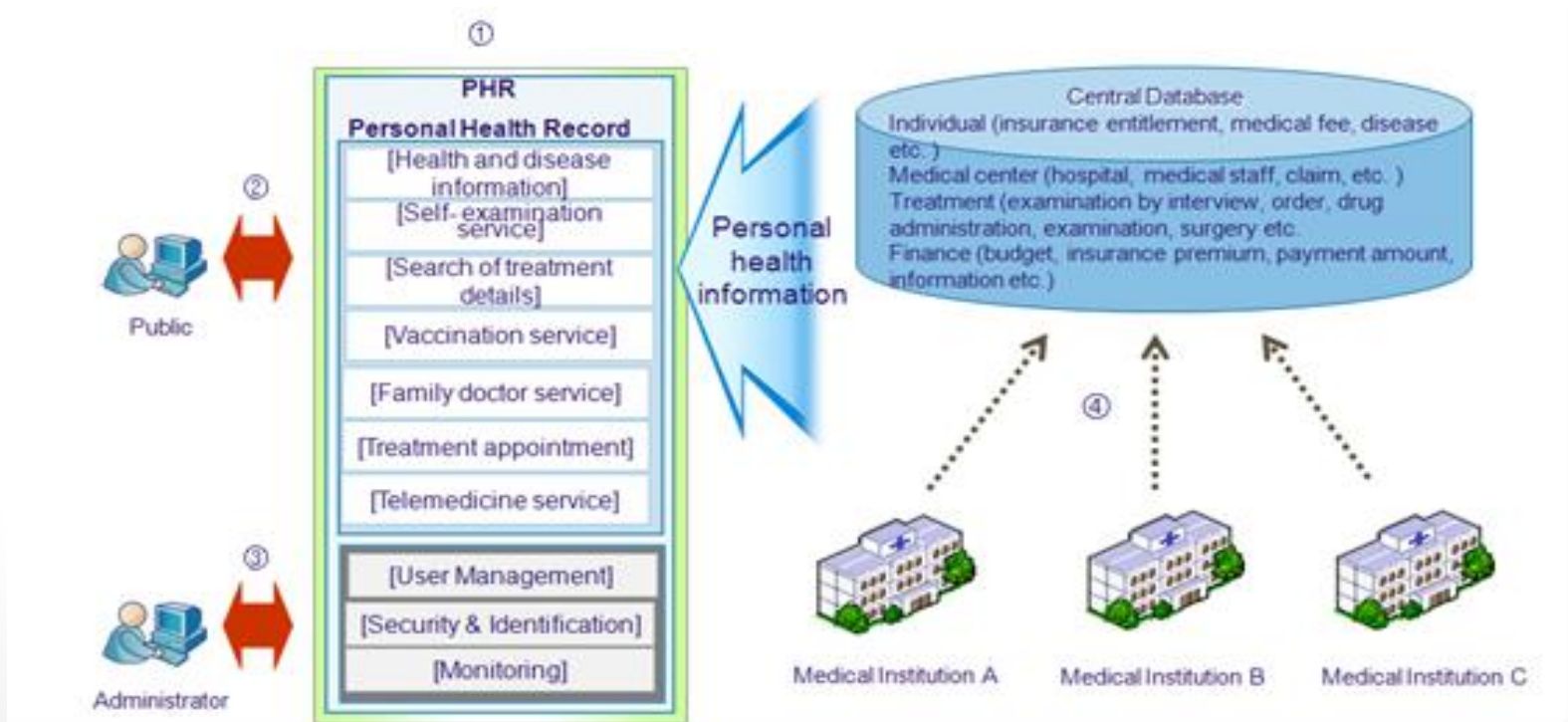
Problem and progress lists

Template, image edition and documenting function

Laboratory records and discharge summary

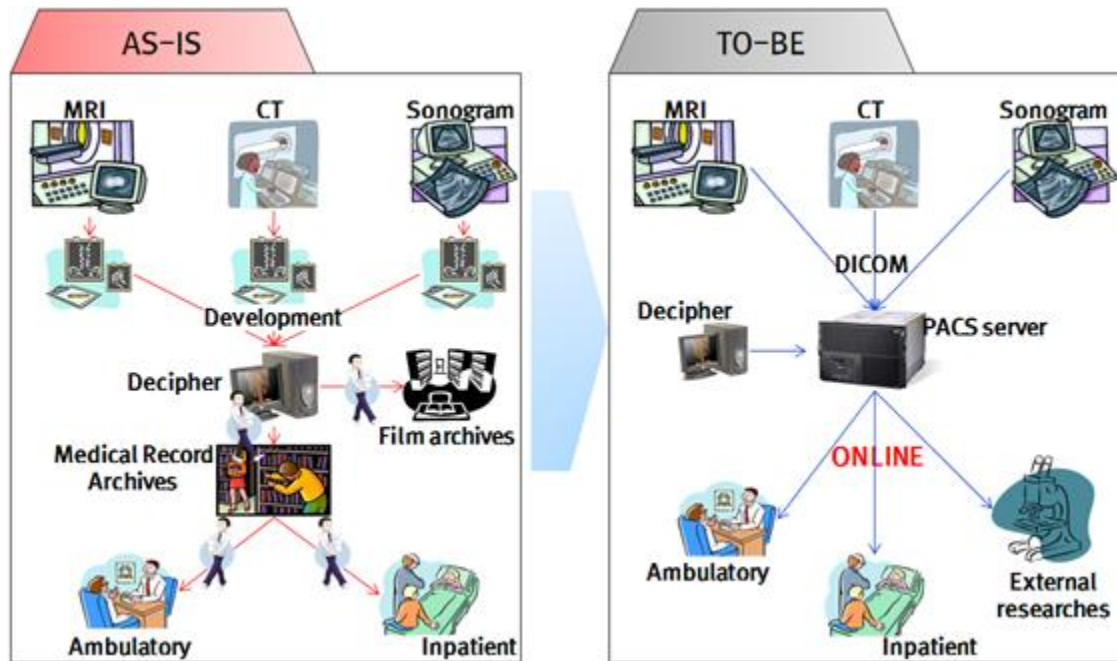
IHIS Components. Patient Portal

Patient portal public service tool which enables system participants to access data irrespective of time and place.



IHIS Components. PACS

Picture Archiving & Communication System (PACS) acquires the radioactive treatment-related medical images in the digital image, and archives and transmits the comprehensive digital images to allow doctors to treat the patients by using it after converting and storing in the digital data by transmitting it to the network.

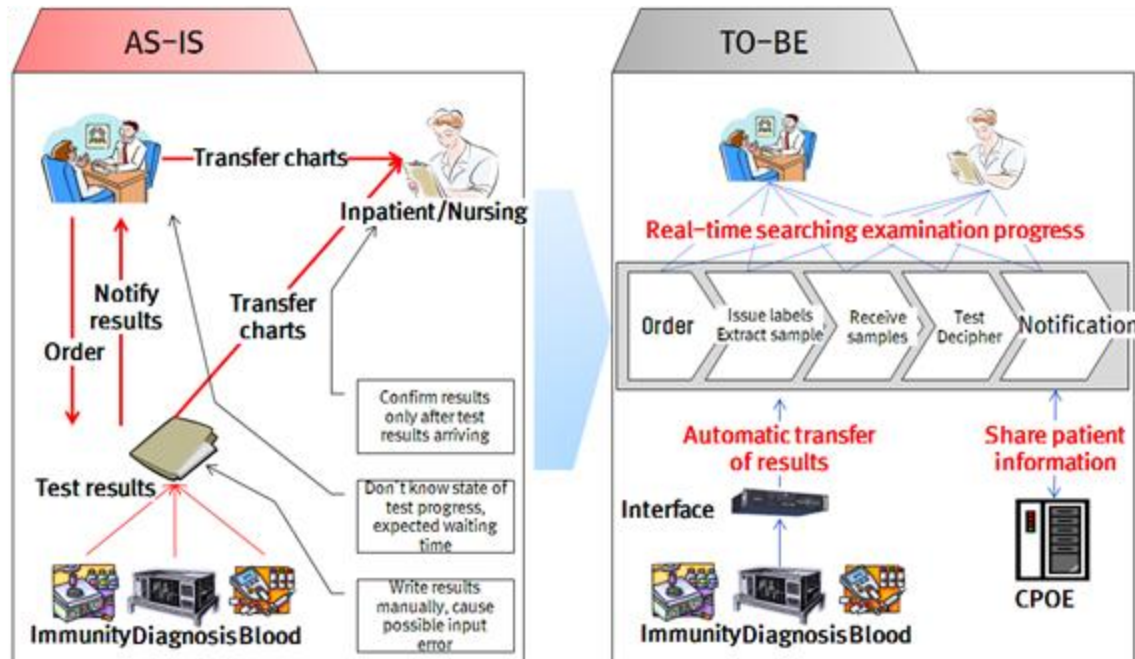


Main Functions:

- Picture acquirement and archiving
- Picture Search

IHIS Components. LIS

Laboratory Information System(LIS) automatically and electronically inputs the examination results by linking with diverse equipment with delivered prescription information and automatically informs the doctors.

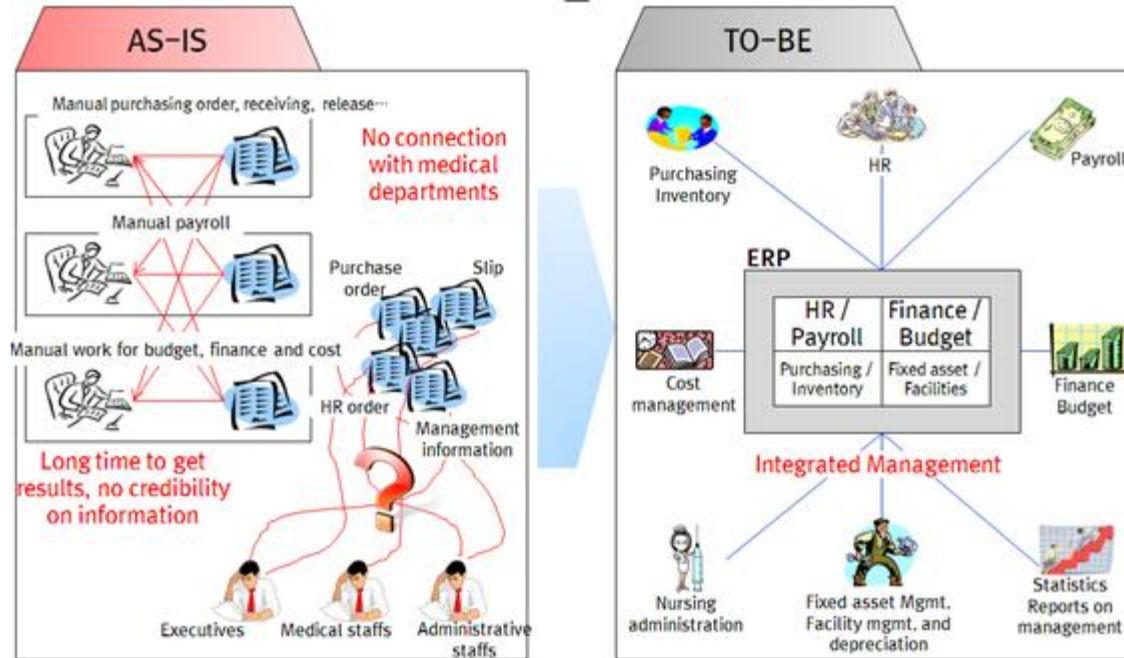


Main Functions:

- General external and special examination
- Blood and microbial management
- Clinical Pathology
- Nuclear Medicine

IHIS Components. ERP

In Enterprise Resource Planning(ERP), the internal human resources management, financial management and logistics management parts of the hospital are integrated in the single code system from the hospital's perspective, and are organically integrated with the treatment and treatment support parts.



Main Functions:

- Personnel, time and payroll management
- Accounting and cost management
- Fixed assets management
- Inventory management

IHIS Components. Reporting and Analytics

Reporting and Analytics subsystem of Integrated HIS allows creation of reports and BI dashboards upon various data sources. Facts and dimensions (*Healthcare Level, employees, provider, specialization, diagnosis and etc.*) should be designed in effective manner to ensure their ease of use in designing KPI related charts/graphs on BI Dashboards and Reports.

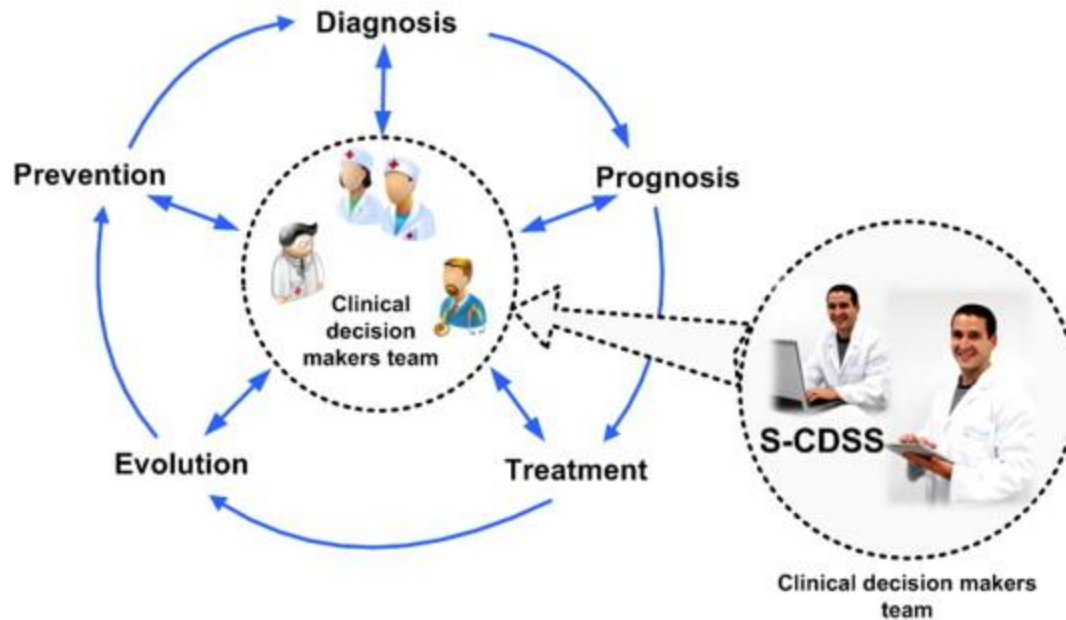


Main Functions:

- KPI
- Mobile analytics and ad-hoc reports
- Data Quality and Master Data Management systems
- Data Mining
- Graphs and BI dashboards

IHIS Components

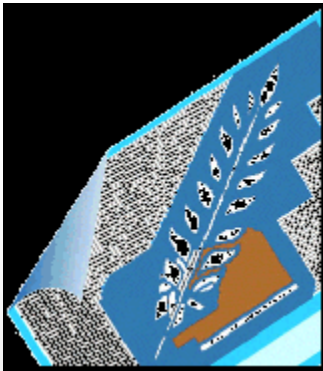
- **e-Prescribing System** is subsystem of IHIS that supports business processes for electronic prescribing and dispensing of medication
- **Medical Decision Support System** is designed to assist professionals to set in the diagnosis and treatment process based on expert knowledge.



- **Health Management System** provides accurate and up-to-date financial information and medical statistics enabling better and more efficient healthcare planning, organization and financing.
- **eBooking** is subsystem that supports business processes for electronic referrals and booking patient to appointments or visits.

Integrated Registers

- **Business Register**
- **HR Register**
- **Hospitals and medical resources Register**
- **State Population Register**
- **Drug Register**
- **Basic Beneficiary Package and Disability Register**
- **Blood Register**
- **Civil Register**



Patient-Hospital-Insurance ECO-System

Each HCl has it's own list of risks (currently not coded)

Health insurance policy
(contract between insured person & Healthcare Insurance)

- **RISK 1**
 - SubRisk1.1
 - SubRisk1.1.1
 -
 -
 -
 - SubRisk1.1.X
 -
 -
 - SubRisk1.Y
- **RISK N**
 - SubRiskN.1
 -
 -
 -
 - SubRiskN.Z

Defined by
(This is done by each VHI alone)

| Risk / Subrisk | Diagnosis (ICD 10) | ind. / excd | Procedure | Excl. Diagnosis (ICD 10) | Covered medications |
|----------------|--------------------|-------------|-------------|--------------------------|---|
| Risk X | Diagnosis 1 | + | Procedure 1 | Diagnosis P, Diagnosis L | Medication A; Medication B; - Medication S |
| | Diagnosis 2 | + | Procedure 2 | - | |
| | | + | | | |
| | Diagnosis N | + | Procedure N | Diagnosis F | |
| | Diagnosis X | - | Procedure X | - | |

Inherited
(with more details)

| Risk / Subrisk | ICD 10 | Comment | ICD 10 | ICD 10 | Covered medications |
|----------------|--------|---------|--------|--------|---------------------|
| Subrisk X.Y | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Each HCl has it's own list of risks (Individually mapped to CPT*-ICD10 combination with additional limitations**)

* Any negotiated codes can be used instead of CPT (ICD10 PCS, local codes...)
** Additional limitation can be set (e.g. total price per time year or month, number of services provided within a year, total price per one visit etc.)



| Service | is procedure (set) - CPT | for any of following diagnosis (ICD 10) | Contracted with | Value (DRAMS) |
|-----------|----------------------------|---|-----------------|---------------|
| Service A | procedure 1 procedure 2 | Diagnosis 1 | INGO | Value 1 |
| | | Diagnosis 2 | | |
| | procedure M | Diagnosis N | SHA | Value 2 |
| | | Diagnosis X | | |
| Service B | procedure Y | Diagnosis 1 Diagnosis 3 | SHA | Value 3 |
| Service N | | | | |

ICD 10
(translated in HC system should be used for diagnosis)

CPT ICD10 PCS or some internal codes must be used for procedures (within CPOE)
(If international codes are used it must be translated and adapted for Armenian HC system)

Service report
Each Health Insurance negotiates services with hospitals. Reports are then send in a procedure – diagnosis combination. Again ICD 10 is used for diagnosis and commonly agreed coding system for procedures (CPT, ICD 10 PCS, internal...)



Patient

CPOE

Healthcare provider performs some procedure (CPT, ICD 10 PCS...) for some diagnosis (ICD 10)



Hospital

Alternatively if common codes are not used, each insurance company and each institution will define mutually negotiated codes. Those codes are than used both for CPOE and reporting (this is strongly discouraged)

Thank You!