HOSPITALS' USE AND INVESTMENT PLANS TOWARDS 2015 FOR HEALTH ICTs

In 2011, COCIR launched the COCIR Market Intelligence Overview, which was published for the first time in the COCIR "eHealth Toolkit". It provided figures on the 2008 health ICTs (information and communication technologies) market, along with a forecast for 2012. One year later, this second edition gives an overview of the availability and use of health ICTs in European hospitals in 2010, along with a forecast for 2015.

COCIR key findings

1. **The European hospital health ICTs market totaled €2.5 billion in 2010 and is estimated to grow to €2.8 billion by 2015.** (See 1.1)

2. **The level of equipment of European hospitals in health ICTs varies greatly between types of systems and between countries.** (See 1.2 and 2.3)

3. **While hospitals are relatively well equipped with administrative information systems, they are insufficiently equipped with clinical information systems and show modest investment plans for these technologies which are crucial to improve healthcare delivery.** (See 2.3 and 2.4)

COCIR recommendations

1. **Collect evidence on the clinical and economic benefits of health ICTs**
    Given the low adoption of health ICTs by medical professionals, healthcare providers and payers, it is urgent to encourage adoption by demonstrating the benefits of these technologies both in clinical and economic terms. The shortage of studies documenting the economic benefits of health ICTs, clinical information systems in particular, is a challenge. Industry encourages governments and payers to finance such studies and to look into existing evidence when considering investments in health ICTs.

2. **Build IT skills among healthcare professionals**
    Even when health ICT solutions are available in hospitals, healthcare professionals are not always equipped with the right set of IT skills to use those solutions. This can be explained - amongst other things - by resistance to innovative information technologies and a lack of time to learn how to use these new tools. This should be addressed by embedding IT skills in the medical curriculum and by providing IT training to healthcare professionals, including healthcare managers.

3. **Invest in clinical information systems to increase efficiency of healthcare delivery**
    Clinical information systems are enabling tools: they increase the efficiency of healthcare delivery by supporting data transfer, workflow and decision-making. More investment in clinical information is needed to move today's healthcare delivery models to the next level of efficiency and quality. Industry calls for more investment in order to move to integrated, more efficient, safer and patient-centered healthcare systems.

1. HEALTH ICTs IN EUROPEAN HOSPITALS: GENERAL OVERVIEW OF THE MARKET (2008-2015)

1.1 A MARKET WORTH €2.5 BILLION IN 2010

The European hospital health ICTs market totaled €2.5 billion in 2010. Moving forward, COCIR anticipates this market to reach €2.7 billion by 2015. These figures cover ICT solutions used in hospitals in Western and Eastern Europe: administration information systems, clinical information systems, laboratory information systems and imaging information systems (in the field of radiology and cardiology).

GRAPH 1 Health ICTs in European hospitals: market's evolution from 2008 to 2015 (M€)
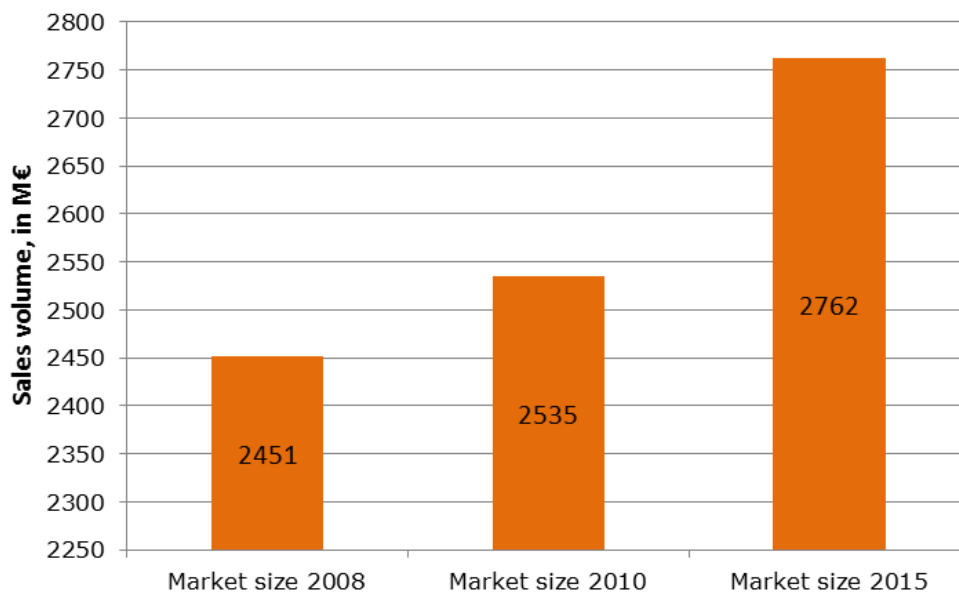
1.2 HEALTH ICTs: A VARIETY OF SYSTEMS SUPPORTING HOSPITALS' MULTIPLE DEPARTMENTS AND FUNCTIONS

Health ICTs offer five types of information systems serving different purposes in hospitals:

- **Administrative information systems**
  Market size in 2010: 940 M€.
  Estimated market size by 2015: 971 M€.
  Availability: 90% of hospitals are equipped with administrative IS. The market is saturated and moving towards a replacement cycle.

- **Cardiology IT (Cardiology Information Systems and Cardiology PACS)**
  Market size in 2010: 55 M€.
  Estimated market size by 2015: 69 M€.
  Availability: Cardiology IT is still limited, with 10 to 30% of hospitals equipped. COCIR expects this small market to develop in the short- to mid-term.

- **Clinical information systems**
  Market size in 2010: 787 M€.
  Estimated market size by 2015: 936 M€.
  Availability: The availability of clinical IS is uneven, both between countries and between systems. The growth of this market is expected to be limited in the coming years.

- **Laboratory information systems**
  Market size in 2010: 220 M€.
  Estimated market size by 2015: 242 M€.
  Availability: 80 to 100% of hospitals are fully equipped. The market is saturated and moving towards a replacement cycle.

- **Radiology IT (Radiology information systems and PACS)**
  Market size in 2010: 533 M€.
  Estimated market size by 2015: 544 M€.
  Availability: The availability of radiology IT varies from country to country. UK and German hospitals are well equipped (70-95%), while France lags behind with 30% of hospitals equipped. 5% growth is expected in France over the period 2010-2015, perhaps more if national and regional plans under the "France sans film" programme are confirmed.

GRAPH 2 Hospital Health ICTs market per market segment in 2008 and 2010, and projected for 2015
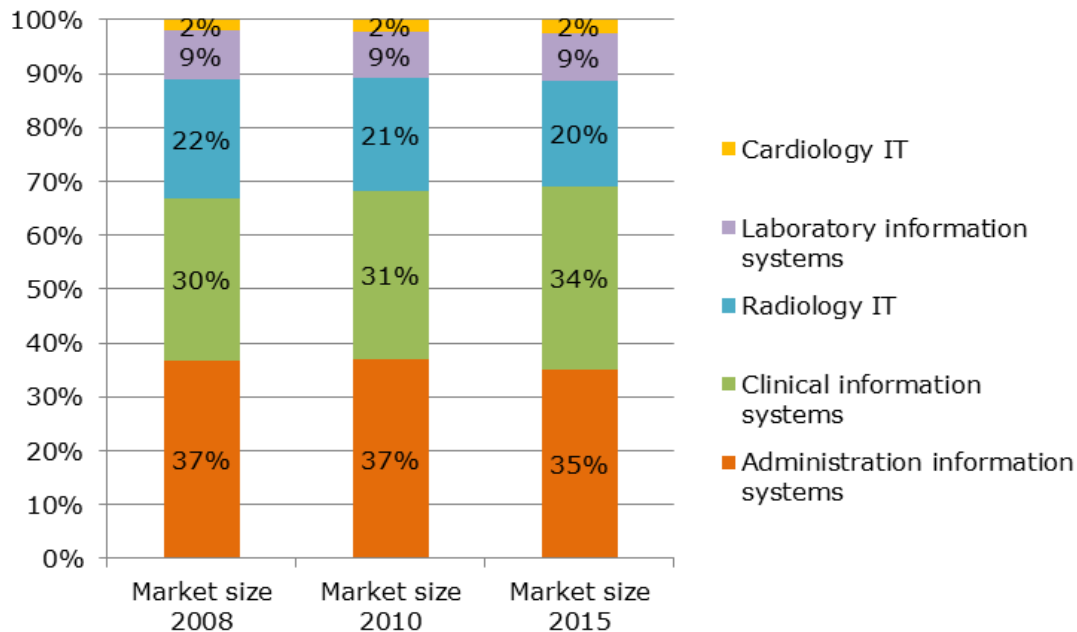
2. INVEST IN CLINICAL INFORMATION SYSTEMS TO INCREASE EFFICIENCY OF HEALTHCARE DELIVERY

2.1 WHAT ARE CLINICAL INFORMATION SYSTEMS?

Clinical information systems are integrated systems designed to support the clinical functions of a hospital across departments.

They are complex systems composed of one or more software components (e.g. electronic patient record information systems, medical document management information systems, computerised physician order entry, etc.) as well as a large variety of sub-systems in medical specialties (e.g. oncology information systems, orthopedic information systems, etc.) and service departments (e.g. laboratory information system, radiology information system, etc.)

2.2 WHY ARE CLINICAL INFORMATION SYSTEMS SO IMPORTANT FOR IMPROVING AND MODERNISING HEALTHCARE DELIVERY?

The use of clinical information systems increases the efficiency of healthcare delivery by:

- Archiving patient data in an automated manner
- Providing healthcare professionals and hospital departments with faster access to patient data
- Guiding healthcare professionals when making medical decisions

2.3 LIMITED AVAILABILITY OF CLINICAL INFORMATION SYSTEMS

The availability of Clinical IS is uneven both at the application level and across countries, as reflected in the five largest European markets (see Graph 3).

Computerised Physician Order Entry (CPOE) are extremely useful systems for the placement of clinical orders for patient services, medications, procedures, examinations, nursing care, diets, laboratory tests, etc. - with subsequent automated distribution of the clinical documentation in the relevant departments.

However, figures show that CPOE is not yet a reality in most hospitals, with up to just 10% of hospitals equipped - with the exception of the UK.

Electronic Patient Record Information Systems (EPR IS) present the benefit of grouping all information relative to a patient in a central, easily accessible location, allowing better cooperation between healthcare professionals, as well as diagnosis, treatment and follow-up. EPR IS can thus be considered the basis of a modern, efficient patient-centered healthcare system.

More than half of European hospitals are equipped, with the exception of France ranking behind with 35% and the UK with 5 to 10% of hospitals equipped. Even when available, wide clinical adoption remains a challenge.

Clinical Decision Support Systems (CDSS) are designed to assist doctors and other healthcare professionals with decision-making by linking individual patient health observations (e.g. monitored in an electronic patient record) with a common clinical knowledge management system (e.g. a set of rules derived from experts and evidence-based medicine).

These systems are of great help to doctors in sorting information overload, and therefore deliver better and safer diagnosis, treatment and follow-up on the basis of most the relevant information only. Nevertheless, the figures demonstrate that CDSS are almost nonexistent in European hospitals (less than 1% of hospitals are equipped).

GRAPH 3 Level of equipment of hospitals in Clinical IS compared to Administrative IS, in five European countries
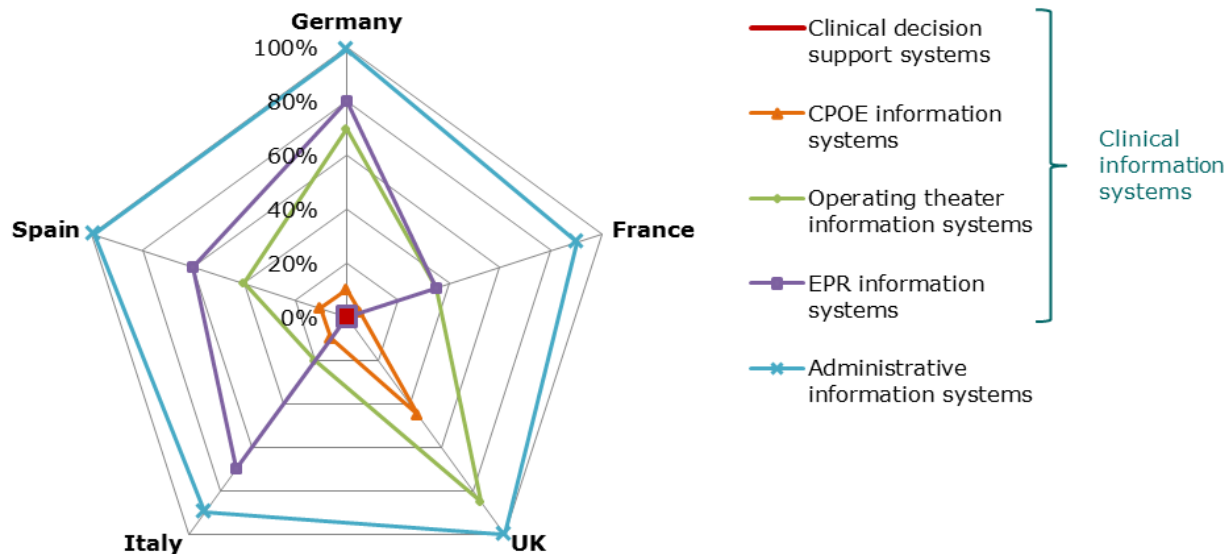
It is worth noting that the availability of clinical information systems is much lower than that of more conventional information systems such as administrative information systems (e.g. billing information systems or admission information systems), as reflected in Graph 3.

This reveals a lack of investment in recent, clinical oriented solutions (e.g. electronic patient record systems).

2.4 MORE INVESTMENT NEEDED IN CLINICAL INFORMATION SYSTEMS TO IMPROVE AND MODERNISE HEALTHCARE DELIVERY IN EUROPE

Despite the role that clinical information systems can play in improving the efficiency of healthcare delivery, investment in these systems has remained static over the past few years. Hospitals' total spending on clinical information systems progressed from 735 M€ in 2008 to 787 M€ in 2010. COCIR estimates that it will reach 936 M€ by 2015.

This translates into a modest 3.5% compound annual growth rate. None of the Western European countries show growth prospects over 5% (see Graph 4) when COCIR estimates double-digit growth (above 10%) would be required to significantly modernise healthcare delivery.

By comparison, the market for Electronic Patient Record (EPR) in the United States is expected to grow at an average compound annual growth rate of 18.1% between 2009 and 2015[1], partially driven by federal initiatives to expand EPR adoption.

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[1] *Markets and markets, U.S. Electronic Medical Records (EMR) Market, 2010-2015 (Market Share, Winning Strategies and Adoption Trends). http://www.marketsandmarkets.com/Market-Reports/us-emr-market-401.html*

GRAPH 4 Estimated size of the Clinical IS market in 2010 and estimated growth for 2015 in five European countries (M€)
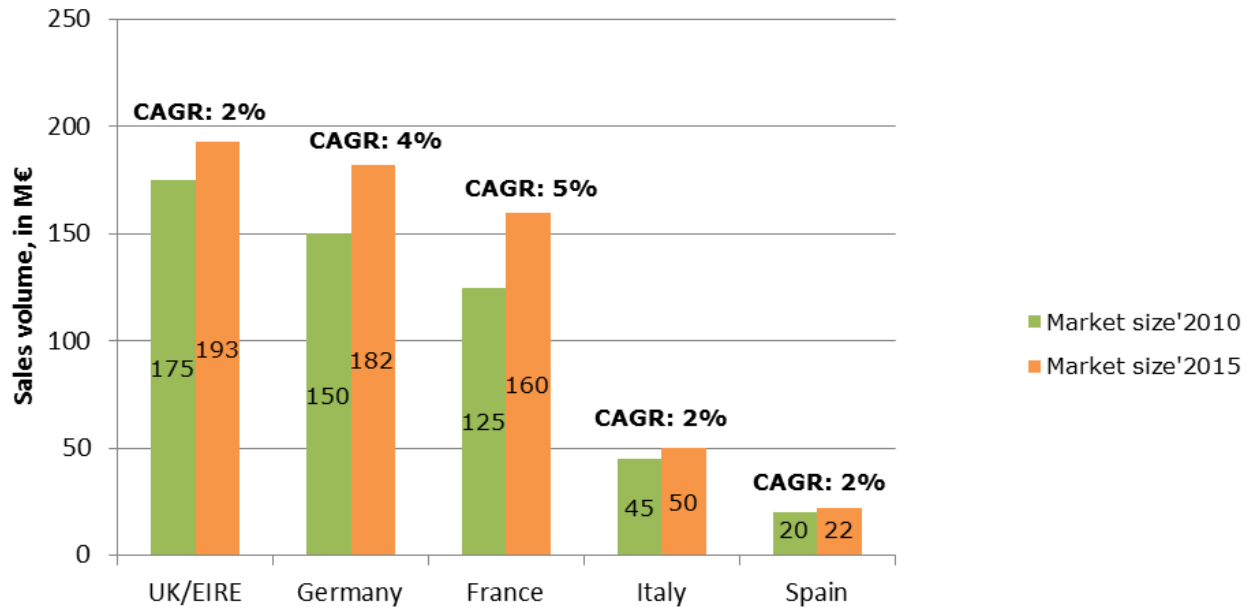
COCIR believes that the current situation of the CIS market (limited availability, limited adoption by healthcare providers and modest investment) will not allow healthcare systems to deliver more patient safety, more efficiency and more patient-centered healthcare, all of which are necessary improvements in healthcare.

As stated in the **COCIR eHealth Toolkit**, real healthcare transformation cannot happen without scaling up the availability of information at the health professionals' level. Focus should be placed on in-depth institutional solutions to allow information cross-sharing and decision support at the point of care.

It is worth noting that the United States adopted an incentive programme in 2009 to support the adoption of health ICTs by the healthcare sector over a five-year period. The industry recommends that the European Commission and Member States closely monitor the impact of this stimulus plan for the eHealth market and eventually draw learnings which can be applied to the EU market.

3. COCIR METHODOLOGY

Since 2008, COCIR has been monitoring the availability, use and investment plans for health ICTs in European acute care hospitals.

The figures provided in this paper are based on a survey conducted among CIOs (Chief Information Officers) from acute care hospitals in Europe. CIOs were interviewed about the availability, use, replacement and investment plans for 41 types of information systems in their hospitals. The data collected through the survey has been analysed by COCIR members.

The methodology was tested through a pilot project in 2008. The ongoing research programme started in 2009, focusing on Western European countries and one emerging market, Poland.

Data collection methodology

- The data is collected by an external market research company (HAE) on the basis of interviews with hospital CIOs (Chief Information Officers).

- The interviews consist of online questionnaires and a follow-up telephone interview to ensure completeness and accuracy. The data is collected from acute care hospitals only.

- The questionnaire has been developed by COCIR in partnership with the market research company and is refined on a regular basis to reflect market evolution.

- The definitions for each of the 41 information solutions identified in the survey have been developed by COCIR members and are updated on a continuous basis. They are available in the COCIR eHealth Glossary of Terms.

- The research sample is randomly drawn from the total number of acute care hospitals in each country: it includes small, medium, large, public and private hospitals and represents a minimum of 16% of the total number of acute care hospitals in the country.

4. COCIR GLOSSARY OF TERMS

ADMINISTRATIVE INFORMATION SYSTEMS

Administrative or Hospital Information Systems manage the administrative and financial aspects of a hospital (patient administration, finance, accounting, logistics, human resources, materials management, etc). This includes paper-based information processing as well as data processing devices. Hospital information systems include business process support systems, finance and accounting systems, logistics and resource systems, patient administration systems.

ACUTE CARE HOSPITAL

Acute care hospitals provide a wide range of diagnoses as well as inpatient care and treatment for seriously ill or injured patients. Typically, services include consultation with specialist clinicians; emergency treatment; routine, complex and life-saving surgery; specialist diagnosis procedures; close observation and short-term care of patients with worrying symptoms. Some acute care hospitals are specialised (e.g. maternity hospitals or cancer hospitals), while others are general, covering different clinical specialities.

CARDIOLOGY INFORMATION SYSTEMS

Cardiology Information Systems are used by cardiology departments to store, manipulate and distribute patient cardiological data and imagery. The system generally consists of patient administration, scheduling, examination, reporting, accounting, statistics and system administration. The RIS can be standalone or integrated in a Picture Archiving and Communication System (PACS) or the Hospital Information System (HIS).

CLINICAL DECISION SUPPORT SYSTEMS

Clinical Decision Support Systems (CDSS) are an interactive computer program designed to assist physicians and other health professionals with decision-making tasks by linking dynamic individual patient health observations (e.g. monitored in an Electronic Patient Record) with a common clinical knowledge management system (e.g. a set of rules derived from experts and evidence-based medicine).

CLINICAL INFORMATION SYSTEMS

Clinical Information Systems (CIS) refer to comprehensive, integrated information systems designed to manage the clinical functions of a hospital. Clinical Information Systems aim to increase the efficiency of healthcare delivery by archiving patient data, providing faster access to patient data between healthcare professionals/hospital departments and guiding healthcare professionals when making medical decisions.

Clinical Information Systems can be composed of one or more software components with core functions such as electronic patient record information systems, medical document management information systems, computerised physician order entry as well as a large variety of sub-systems in medical specialities (e.g. oncology information systems, orthopedic information systems, etc.) and service departments (e.g. laboratory information systems, radiology information systems).

Clinical Information Systems include clinical knowledge and decision support systems, clinical order communication management systems, medical record systems and medico-technical service department systems.

COMPOUND ANNUAL GROWTH RATE
Compound annual growth rate (CAGR) is an average growth rate over a period of several years.

COMPUTERISED PHYSICIAN ORDER ENTRY SYSTEMS
CPOE information systems allow for the placement of clinical service orders for patient services or medications, including medications, procedures, examinations, nursing care, diets, laboratory tests, etc. - with subsequent automated distribution of the clinical documentation processed as a result of this order. They also include special electronic signature, workflow and rules engine functions.

eHEALTH
eHealth describes the application of information and communications technologies (ICTs) across the whole range of functions which affect the health sector. "eHealth", "healthcare IT", "health ICTs" and "health informatics" are synonymous.

eHealth includes tools for health authorities and professionals as well as personalised health systems for patients and citizens. eHealth can therefore be said to cover the interaction between patients and health-service providers, institution-to-institution transmission of data, or peer-to-peer communications between patients and/or health professionals. It can also include health information networks, electronic health records, telemedicine services, and personal wearable and portable communicable systems for assisting prevention, diagnosis, treatment, health monitoring and lifestyle management.

eHealth comprises five types of systems:
• Hospital Information Systems
• Clinical Information Systems
• Telemedicine Solutions and Services
• Secondary-Usage non-Clinical Systems
• Integrated Health Information Networks

ELECTRONIC PATIENT RECORD
Electronic Patient Record (EPR) refers to an individual patient's medical record in digital format, generated and maintained in a healthcare institution, such as a hospital or a physician's office. Such records may include a whole range of data in comprehensive or summary form, including demographics, medical history, medication and allergies, immunisation status, laboratory test results, radiology images and billing information.

The function of an EPR/EMR is to centralise a complete record of patient encounters, allowing for automation and streamlining of workflow in healthcare settings and increasing safety through evidence-based decision support, quality management and outcomes reporting.

HOSPITAL IT
Hospital IT - also often referred to as Enterprise IT - is a generic term referring to ICT-based products, systems, solutions and services used in hospitals to:
• manage healthcare processes
• manage the hospital administrative and business processes

Hospital IT includes Administrative (or Hospital) Information Systems (patient administration systems, finance and accounting systems, logistics and resource systems, etc.) and Clinical Information Systems (radiology

information systems, oncology information systems, computerised physician order entry systems, electronic patient records, etc.).

LABORATORY INFORMATION SYSTEMS

Laboratory Information Systems (LIS) provide complete support for the laboratory department from an operational, clinical and management perspective. LIS can cover a number of different laboratory or pathology systems, including different specialities such as hematology, histopathology, microbiology, etc. The system provides an automatic interface for laboratory analytical instruments to transfer verified results to nurses' stations and even to remote doctors' offices. It allows the user to receive orders from any designated location, process the order and report results, and maintain technical, statistical and account information. Laboratory Information Systems are available as standalone solutions or as module(s) of hospital and clinical information systems.

OPERATING THEATRE INFORMATION SYSTEMS

Operating Theatre Information Systems provide automated functions in the operating theatre department. OT IS might include peri-operative, post-operative and pre-operative functionalities. They might also include OT scheduling functionalities. OT IS can be standalone solutions or modules of hospital and clinical information systems.

PICTURE ARCHIVING AND COMMUNICATION SYSTEMS

PACS are defined as a coherent system including a networked digital archive with online and near-line storage components, dedicated reading workstations, and all associated software required to store, manage and view cardiology/radiology images.

RADIOLOGY INFORMATION SYSTEMS

Radiology Information Systems are used by radiology departments to store, manipulate and distribute patient radiological data and imagery. The system generally consists of patient administration, scheduling, examination, reporting, accounting, statistics and system administration. RIS can be standalone or integrated in a Picture Archiving and Communication System (PACS) or the Hospital Information System (HIS).