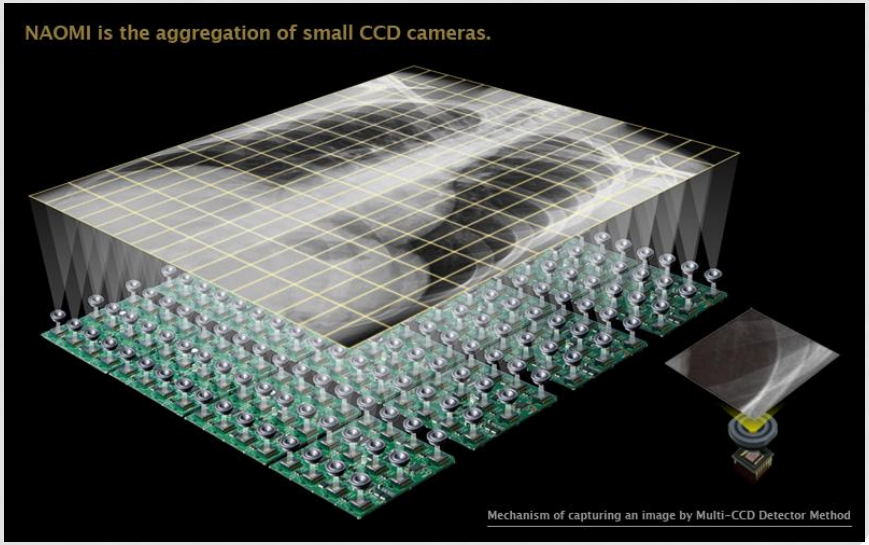
INTRODUCTION TO DIGITAL RADIOGRAPHY AND PACS

AREEJ ALOUFI

DIGITAL IMAGING

- Digital imaging is defined as any image acquisition process that produces an electronic image that can be viewed and manipulated on a computer.

- In radiology, images can be sent via computer networks to a variety of locations.



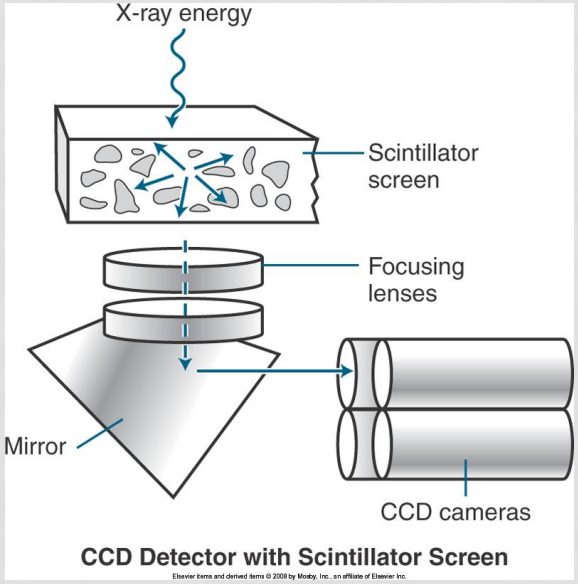
DIGITAL RADIOGRAPHY

- Cassetteless system
- Uses a flat panel detector or charge-coupled device (CCD) hard-wired to computer
- Requires new installation of room or retrofit


(Courtesy Siemens)

DIGITAL RADIOGRAPHY

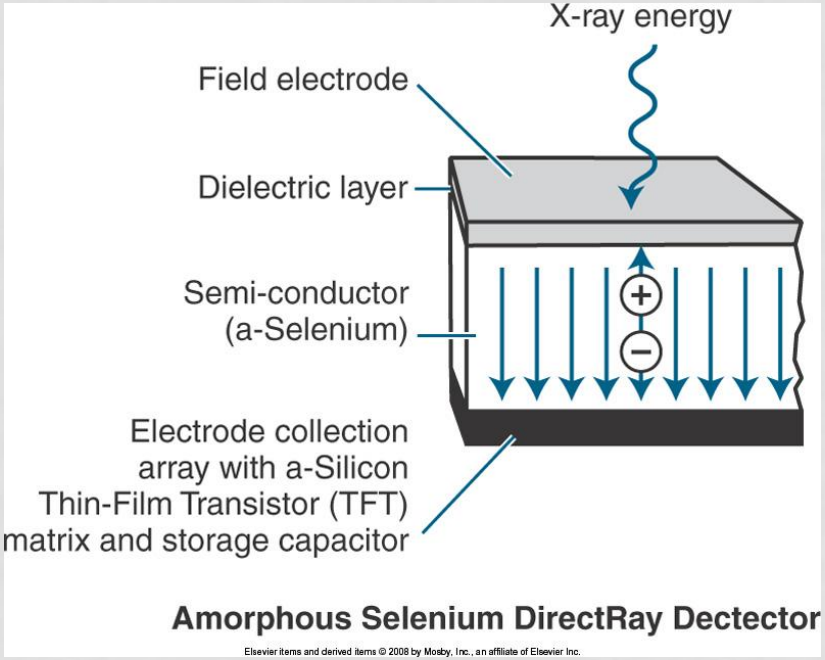
- Two types of digital radiography
- **Indirect capture DR**
  - Machine absorbs x-rays and converts them to light.
  - CCD or thin-film transistor (TFT) converts light to electric signals.
  - Computer processes electric signals.
  - Images are viewed on computer monitor.



CCD Detector with Scintillator Screen

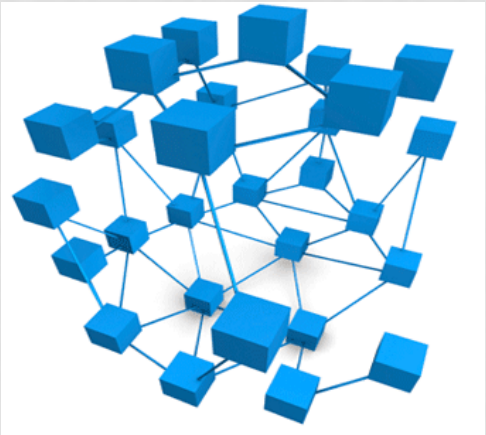
DIGITAL RADIOGRAPHY

- **Direct capture DR**
  - Photoconductor absorbs x-rays.
  - TFT collects signal.
  - Electrical signal is sent to computer for processing.
  - Image is viewed on computer screen.



PICTURE ARCHIVING AND COMMUNICATION SYSTEM

- In medical imaging, **picture archiving and communication systems** (PACS) are computers or networks dedicated to the storage, retrieval, distribution and presentation of images. The medical images are stored in an DICOM format (Digital Imaging and Communications in Medicine).



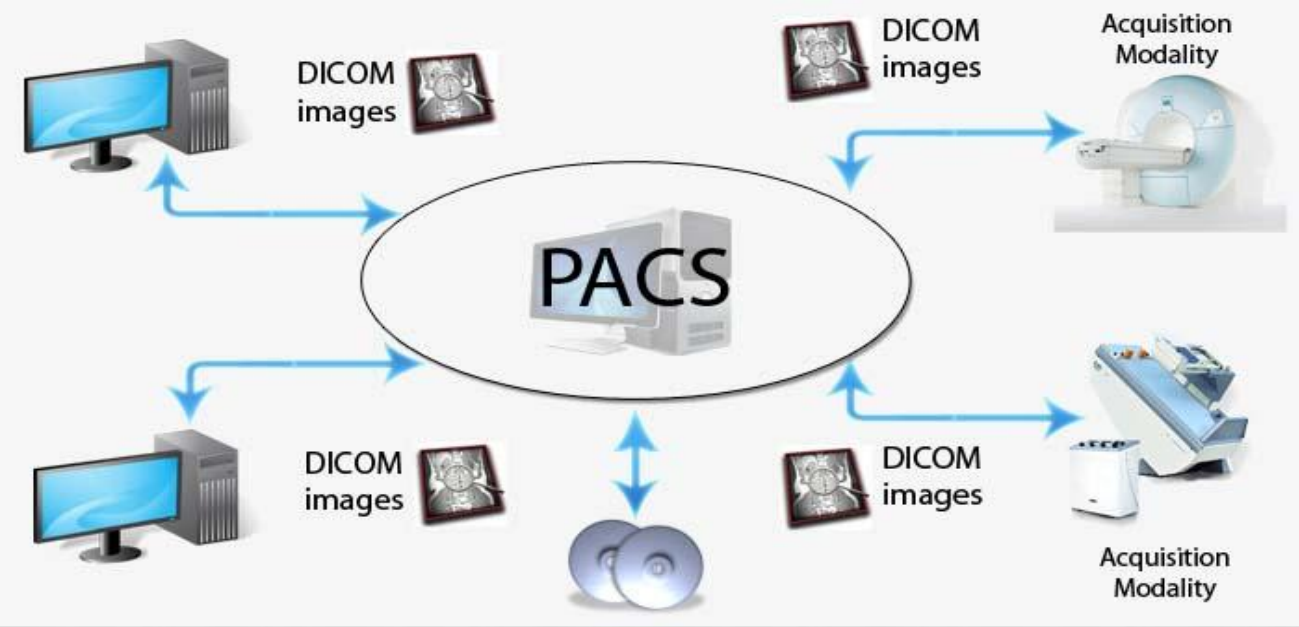
TYPES OF IMAGES

- Most PACSs handle images from various medical imaging instruments, including ultrasound, magnetic resonance, PET, computed tomography, endoscopy, mammograms, etc.

PACS USES

- Made up of different components
  - Reading stations
  - Physician review stations
  - Web access
  - Technologist quality control stations
  - Administrative stations
  - Archive systems
  - Multiple interfaces to other hospital and radiology systems

DICOM (DIGITAL IMAGING AND COMMUNICATIONS IN MEDICINE)



- (**DICOM**) is a standard for handling, storing, printing, and transmitting information in medical imaging. It includes a file format definition and a network communications protocol.

- DICOM files can be exchanged between two entities that are capable of receiving image and patient data in DICOM format.

- DICOM enables the integration of scanners, servers, workstations, printers, and network hardware from multiple manufacturers into (PACS).

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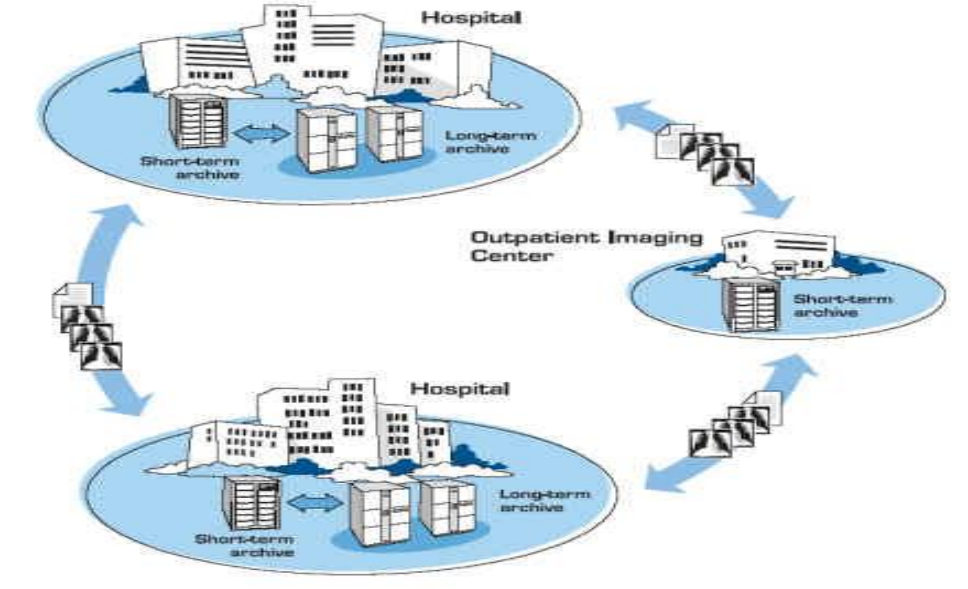

- DICOM enables the integration of scanners, servers, workstations, printers, and network hardware from multiple manufacturers into (PACS).

THANK YOU