**Modality Integration**

**Picture Archiving and Communication System (PACS)**
A picture archiving and communication system (PACS) consists of medical image and data acquisition, storage, and display subsystems integrated by digital networks and application software. The PACS infrastructure design provides the necessary framework for the integration of distributed and heterogeneous imaging devices and makes possible intelligent database management of all patient-related information. Moreover, it offers an efficient means of viewing, analyzing, and documenting study results, and thus a method for effectively communicating study results to the referring physicians.

**Digital Imaging and Communications in Medicine (DICOM)**
DICOM is an object-oriented principle which is the most important standard for data and services in the medical field. It is not just an image or file format for medical images and related data, but it includes network-oriented services such as: image transmission, query of an image archive (PACS) – modality integration. A DICOM image consists of a list of data elements related to patient information (name, sex, identification number), also includes the modality and imaging procedure information (device parameters, calibration, radiation dose, contrast media), and image information (resolution, windowing).

**Modality Broker Server**
To solve the language barrier, a translation was needed between HL7 and DICOM. Enter the broker: a software and hardware device that accepts HL7 messages from the RIS then translates, or maps, the data to produce DICOM messages for transmission to the PACS. With RIS information now available electronically, PACS and modalities could accept RIS data (Figure 2). Technologist workflow requires patient and exam information from the RIS to flow to the modality. The broker provides support for this by taking advantage of the DICOM Modality Worklist (DMWL). Scheduling messages are transmitted from the RIS to the broker and stored. The technologist is then able to request the list of scheduled studies by sending a query from the modality to the broker using the DMWL service. The result of the query would, in effect, provide a list of technologists' “work to do”
Health Level Seven (HL7)

HL7 is a Standard for exchanging information between Medical Applications and is an Abbreviation of “Health Level Seven”. “Level seven” refers to the seventh OSI layer protocol for the health Environment. In general terms, HL7 is a protocol for data exchange. It defines the format and the Content of the messages that Applications must use when exchanging data with each another in Various Circumstances. Hospitals and other medical institutions typically use many different types of systems to communicate with one another. Everything, from patient records to billing information, is tracked and recorded in computer systems. In order for these different types of systems to communicate with each other, they Use a standard like HL7.