Chapter IX
PACS Quality Dimensions

BACKGROUND

A large number of studies have attempted to identify the factors that contribute to good PACS quality, such as that shown by Reiner et al (2003). Results from these studies (Bauman, 2000; Ralston, 2000) reveal that the success of PACS requires healthcare organizations and managers to adequately address various types of challenges: technological (e.g., integration with other information systems), managerial (e.g., project management), organizational (e.g., availability of resources), behavioural (e.g., change management), and political (e.g., alignment among key participants). Most investigations have considered a single, or at best, a small number of factors contributing to a fragmented view of PACS success. Broadly, these studies may be classified into those that consider the impact of PACS on radiologists’ workload and productivity (Gale, 1999), those that consider its clinical implications (Hertzberg, 2000) and those associated with performance of the radiology department (Hayt, 2001).

Rather than measuring the quality of the PACS performance, other researchers have preferred to focus on the quality of the information, that the system produces, primarily in the form of images and reports. For instance, Lou et al. (1997) considered the data integrity and completeness of acquired images. Quality of images
in terms of timeliness, accuracy, completeness, and so forth, was also considered to be a key success factor in several evaluative studies (Cox, 2002; Pavlicek, 1999; Pilling, 2003; Blado, 2002).

Indeed, Cox’s work was part of a wider evaluation exercise undertaken to assess the impact of the introduction of a PACS on the adult intensive care unit (AICU) at the Royal Brompton NHS Trust in London. The objectives of the research were to evaluate the perceptions of PACS of the medical and ancillary staff working within AICU as well as to undertake a preliminary assessment of its impact on the workload of radiographers. Questionnaires, interviews and a process analysis were undertaken. The research findings indicate that the overall perception of staff towards the introduction of the PACS was positive. The impact of the system on the workload of radiographers was significant, reducing the time taken to obtain an image from 90 to 60 minutes. However, lessons to be learned for future PACS implementations include the need to ensure compatibility with existing IT systems and adequate IT support. In short, once this expanded, but rather fragmented view of PACS success is recognized, it is not surprising to find that there are so many different measures of PACS quality in the literature depending upon which aspect of PACS the researcher focused his or her attention.

**PACS OPERATING PROBLEMS**

In spite of the adherence to various PACS-QA programs and the presence of various theoretical quality frameworks for the hospital administration, operating problems are still encountered in most PACS. For instance, in the image-guided surgery environment, the problems can generally be grouped under the four categories: hardware, software, hardware/software integration and human factors.

The goal of image guided surgery is the seamless creation, visualization, manipulation and application of images in the surgical environment with fast availability, reliability, accuracy and minimal additional cost. A computer network devoted to image-guided surgery ensures fast and efficient transfer of images from the scanner to the surgical navigation workstation in the operating room. The network server also serves images to desktop PCs where pre-surgical planning can be done. The network for image-guided therapies at Hong Kong hospitals generally includes connections to all CT and magnetic resonance imaging scanners, as well as connections via a dedicated server to home and office PCs and surgical navigation workstations. This smooth workflow and the presence of a multidisciplinary team that includes surgeons, radiologists, radiation oncologists, physicists and engineers with a competent technical support staff should offer the key to good PACS quality. However, following problems were observed in two Hong Kong hospitals: