PACS/IMAC Technology Assessment

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According to Peter Ogle of Digital Imaging (San Francisco, CA), "Radiologists should help identify common values for the use of information technology in medicine." Achieving a set of common values often requires a framework for organizing the thought process involved. That is the focus of this article in addressing the subject of picture archiving and communication system (PACS) technology assessment.

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THE FRAMEWORK selected below for picture archiving and communication system (PACS) Technology Assessment applies whenever an entity (eg, a hospital) considers a significant allocation of resources (eg, purchasing PACS) to facilitate an end result (eg, to increase productivity).

The framework selected to address PACS Technology Assessment is referred to as "Real-Win-Worth." "Real" will address the presence of a market in terms of real needs on the part of the buyer and real products to serve those needs, as provided by the seller. "Win" considers the ability of the entity pursuing the opportunity to perform effectively versus competition. This article will consider the entity to be a radiology service or a hospital. "Worth" is based on financial considerations, as well as satisfaction of the needs of the end-user customer (the patient).

IS IT REAL?

Real Need

There are many factors at work today that are fueling the growth of the PACS market. Managed care requires a significant improvement in data management and handling. Regionalized health-care has placed demands on networks for integrating and communicating data rapidly within the region. To serve the rapidly growing area of "expert-on-demand," the infrastructure of teleradiology is receiving a boost. Productivity improvement and value enhancement in medical practices are major drivers for information and communica-

tion systems. This is supported by the results of the PACS Tracking Study performed by Technology Marketing Group (TMG), which identified the need for fast file and image access for multiple users, fast communication with remote locations, and reduced costs and archiving space. Perhaps the most important need, but a difficult area to measure accurately, is that of better healthcare decisions. PACS fundamentally addresses this area by providing more timely information.

Real Product

One indication that the product is real (in meeting the need) is the size and growth of the market for PACS. According to Diagnostic Imaging's "Global Perspective Study," the PACS market is on the order of \$200 million and growing at approximately 20% per year. Some of the specific areas noted above are growing even faster. Another important indicator is the commitment being made by major corporations in the imaging business. Film companies, information system and communications vendors, diagnostic imaging OEMS and small dedicated PACS companies are participating individually or in teams to provide the best service to the customer. The latest entrants appear to be major software vendors.

The basic technology developments required to support complete PACS systems have made significant strides in the last few years. Developments in acquisition, display, storage, compression and communications have been impressive. In addition, standards have either arrived or are "really" just around the corner. This is the result of over 10 years of effort put forth by the American College of Radiology-National Electrical Manufacturers Association (ACR-NEMA) toward the creation of Digital Imaging and Communications in Medicine (DICOM). The product area can be considered to be "above threshold" in meeting many of the needs required for effective PACS systems. This is demonstrated by many definitive PACS performance articles published in journals such as the *Journal of Digital Imaging*. Table 1 summarizes the discussion of IS IT REAL?

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Table 1. Is It Real?

Real Need
Managed care
Regionalized healthcare
Links to experts
Productivity/value increases
Better healthcare decisions
Real Product
\$200 million market at 20% growth rate
Significant commitment by the majors
Technology availability
Standards
Beyond threshold

CAN YOU WIN?

This question will be considered from the perspective of a radiology service and from the perspective of a hospital. Strategic advantage (v competition) gained from the acquisition of PACS is the desired result.

Radiology Service

The opportunity exists for radiologists to become the “healthcare information managers” by aggressively adopting PACS as their tool for the future. The acquisition and “control” of information, by radiologists, may be a prerequisite for a meaningful future for radiology. As healthcare information managers, radiologists will be positioned to become a member of the “primary care team.” Improved and more timely information will result in better healthcare decisions due to increases in diagnostic accuracy. Through improved information flow patient outcome data will come to fruition. In addition, the radiologist will have the knowledge to become the change agent for improvements in productivity—serving more patients in less time at less cost and with better quality.

It is clear that PACS offers significant opportunity for the radiology community to solidify its position in healthcare. PACS also represents an opportunity for “other players” to strengthen their position. Today radiology has the advantage of having the most knowledge about the information contained in “the image.” The timely extension to the areas described above while providing excellent service to all the “users of information” will insure the future of radiology.

Hospital

The opportunity exists for hospitals to significantly improve their position as the “value provider” by effectively using PACS.

PACS is a key component in the hospital achieving an “integrated information system.” The integration of PACS, RIS (radiology information system) and HIS (hospital information system) will provide the hospital with the tools to understand and control costs. PACS is also required for the hospital to participate in regionalized healthcare. In addition, the improvement in information quality and timeliness, due to the use of PACS, is expected to result in improved patient care.

The combination of benefits outlined above will position the hospital competitively as a value provider of healthcare services and enable the hospital to better compete for managed care contracts by providing better service and support. Table 2 summarizes the discussion of CAN YOU WIN?

IS IT WORTH IT?

This question will be considered from the perspective of a provider of services (eg, radiology service or hospital) and from the perspective of the patient (the end-user customer receiving service).

Provider of Services

At a very basic level, the use of PACS is required for survival. Without PACS it is difficult to understand how a provider can compete effectively in meeting the market needs outlined above. The use of improved information for better healthcare decisions and for achieving a better understanding of costs will ultimately lead to higher productivity and financial payback. A detailed understanding of present costs is fundamental to any rational comparative assessment of investment in PACS.

The dependence of medicine on information can only continue to increase. Preparation for the future requires every provider to be positioned for expansion of information technology. Business success,

Table 2. Can You Win?

Radiology Service
Information managers
Primary care team
Better healthcare decisions
Improved patient outcomes
Change agent for productivity improvements
Hospital
Integrated information system
Understanding and control of cost
Regionalized participation
Improved patient care/outcomes
The value provider

among providers of healthcare services, will tie directly to their ability to manage information effectively.

The Patient

The patient has a primary requirement to receive quality care at reasonable costs. The impact of PACS on both quality and costs is expected to be positive, resulting in overall improvement in the value of healthcare. Data demonstrating both higher quality and lower costs is becoming available.

Access (anywhere/anytime) is another important consideration for the patient that is made possible via PACS. The ability to connect the patient to the appropriate clinician is significant considering the mobility of the average patient. Improved information content in the healthcare system will also allow the patient to be better informed about their state-of-health and alternatives to care. With greater information and access come the issues of security and privacy. Patient (as well as provider) security and privacy must be maintained.

Table 3 summarizes the discussion of IS IT WORTH IT?

Table 3. Is It Worth It?

Provider
Survival
Understanding cost
Financial payback
Prepared for the future
Business success
Patient
Quality of care
Reasonable costs
Access
Patient communications
Security and privacy

Using the framework of “Real-Win-Worth,” a set of common values for PACS technology assessment has been established. This is summarized in Tables 1 through 3. The values selected in Tables 1 through 3 are an example. Any particular entity (eg, a hospital), when considering the purchase of PACS, would modify the values shown in Tables 1 through 3 to meet their own specific needs.

The world of PACS is changing rapidly. By establishing a framework for PACS Technology Assessment, an organization can effectively discuss and incorporate change into its planning.