How Many People Does it Take to Operate a Picture Archiving and Communication System?

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The most frequently asked question without a correct answer is: “Just how many people does it take to operate a picture archiving and communication system (PACS)?” At Texas Children’s Hospital, our consensus is that we do not yet know. As soon as we felt we had adequate staffing to provide timely response for routine services, we found that including the Intensive Care Units (ICUs) increased our demand for urgent response beyond our capacity. The addition of inpatient bedside imaging to PACS also increased the demand for round-the-clock and weekend PACS services. Our answer to the staffing question changes every year, in accordance with changes in the scope of services that our PACS is expected to provide. Our administration drew up a 5-year plan for PACS implementation, concentrating on purchase and installation of equipment, but neglected to estimate requirements for full-time equivalents (FTEs) for PACS. Our administration reasonably assumed that existing employees would be galvanized into PACS personnel. It is now clear that new FTEs need to be created strictly for the PACS service. Our 5-year plan also did not anticipate significant changes in the extent of our healthcare enterprise. Our PACS accommodates limited remote service: providing a PACS Analyst to travel to the site when a problem is not resolved remotely is another demand on staffing. Our PACS service was formed using staffing numbers based on assumptions about the minimum number of employees needed to perform routine duties, field trouble calls, conduct training, and work on special projects, such as adding new acquisition modalities or troubleshooting longstanding problems. This staffing was based on a single shift operation, with on-call coverage for second, third, and weekend shifts. The number of employees also considered absences for vacation, sick leave, and training. The service has administrative overhead that should be covered by a secretary. Someone is also needed to supervise the team. Once the number of personnel is determined, detailed definition of qualifications and responsibilities is required. Each job description must accurately reflect what is expected of the employee, but must be constructed in such a way to be graded appropriately by Human Resources, without excluding potentially desirable applicants. In addition to competitive pay, other factors play an important role in recruiting and retention. These include training that the hospital provides, opportunities for advancement, relief from menial duties, adequate working space and facilities, and opportunities for self-development. There is high turnover of personnel in computer services, and we are in a highly competitive market. The correct number of FTEs must consider that we will have to operate the PACS during periods when one or more positions are open or occupied by “greenhorns.” In our case, where the vendor provides on-site service engineers, we are able to operate with fewer FTEs. The more distant and tenuous our vendor support, the more we would need to depend on hospital FTEs. While remote vendor maintenance is helpful, it is not useful in reducing the number of FTEs. Instead of adding PACS responsibilities to supervisors of imaging services, we are creating new PACS FTEs outside the PACS service. The idea is to give imaging supervisors the assets they need to perform the additional tasks involving PACS, such as first-line response to trouble, user training, and quality-control oversight. It also frees up PACS service personnel to deal with training and problems with customers outside the Radiology Department. Copyright © 2001 by W.B. Saunders Company

RATHER THAN PROACTIVELY obtaining a staff for the picture archival and communications system (PACS), many sites begin to amass a staff in response to customer complaints of delays in getting their patients’ images and diagnostic reports. Our PACS evolved from an ultrasound niche—PACS beta site to a hospital-wide filmless operation. Other factors that affect the staffing of a totally digital radiology service are projected expansions of hospital operations and additions of remote sites whose images will be interpreted at a central location. The x-ray department is often the first service converted to digital using computed radiography (CR). The first criterion of installing a PACS is the need for employees to maintain the system. How this need is addressed often sets a precedent for how future staffing needs are met. Radiology administrators debate on how many full-time employees (FTEs) are needed to adequately accommodate the hospital-wide PACS service, now and in the future.1 Our 5-year plan for PACS divided up the hospital by services and sections for the purpose of PACS equipment and
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implementation, but did not include a plan for hiring PACS FTEs.

STAFFING INITIATIVES

"Additional Duties, as Assigned"

To chart the course of our PACS implementations, a Steering Committee was formed consisting of the Chief of Radiology, a Neuroradiologist, the Director of Radiology, the Assistant Director of Radiology, and the Radiology Information Manager. Shortly after its inception, the committee voted unanimously to hire a PACS Coordinator, whose full-time job would be to continue the planning and preparation of hospital-wide filmless operations.

When our PACS effort began in 1991, as the Ultrasound Supervisor, I was the first facsimile of a system administrator on a half-time basis. In 1993, when the PACS system expanded to include additional modalities, so did the requirement for full-time PACS employees.

Initial Full-Time Employees

The PACS Coordinator was the first full-time PACS employee. This position was created at a modest level on the hospital staff. In our hospital’s terminology, a “Coordinator” is an echelon below a “Manager,” above a “Team Leader,” and parallel to a “Supervisor.” The next levels up in the hierarchy are “Assistant Director,” “Director,” and “Vice President.” From its inception, this position was ineffectual, because it was subordinate to virtually all personnel inside and outside the department that had to cooperate to make PACS a success. The PACS Coordinator reported directly to the Administrative Manager, which relegated PACS to an administrative function rather than a clinical operational function. The PACS Coordinator was subject to passive-aggressive behavior from others throughout the organization, as well as intense political pressure from middle management and above who were inconvenienced by the PACS project.

With the PACS Coordinator hired, a short-term solution in getting PACS FTEs was to scout our Radiology Department to see if we could benefit from existing employees in other services, and identify “hidden talent.” An appointment scheduler with minimal computer skills who worked on the weekends was willing to help out during the day. Another employee from the file room would help out for a couple of hours during the evening. Since the system was small enough at the time, they could handle the problems that arose. This scouting for resources was our first effort to assign PACS employees and seemed a good concept, but it did not go without resentment from the areas that had lost a FTE from their service for the purpose of accommodating the PACS service. After-hour call coverage was paid to help supplement the first PACS employees’ salaries, since Human Resources Compensation graded their duties of “Digital Imaging Specialist” as a lateral move from their prior jobs and gave no pay increase. As the months passed and these employees gained experience with the PACS equipment and expansions, the job classification caused resentment and motivated more than one employee to leave. In fact, one employee applied for a secretarial job because it was graded higher.

The next job description created was one called “PACS Analyst.” The qualifications and duties were largely plagiarized from the job description for the “Radiology Information System (RIS) Analyst,” which had likewise been plagiarized from a job description for an “Information System Analyst” in the Information Services (IS) Department. This position was graded much higher by Human Resources, resulting in disputes over whether prospective candidates were qualified.

Another staffing tactic that has not yet been successful is creation of the “PACS Technologist.” This radiographer would be shared between the Radiology Department and PACS. It was originally intended that they would perform examinations, do routine quality assurance and image accountability functions, and when problems arose, be the first response in troubleshooting. Problems that could not be corrected by the PACS Technologist would be escalated to the PACS Analyst. This was a good concept until the written job description was submitted to Human Resources Compensation for grading. The job was graded at the same rate as a beginning Radiographer, so no one ever applied. From one perspective, the job could have been viewed as an internship position to the PACS Analyst position, although that is not what was intended, because the Technologist skill set and the Analyst skill set are extremely different.

By 1998, we had a PACS Coordinator, a volun-