



Medical Archive Solution

ARCHITECTING IT FOR THE FUTURE

The Client

As one of the leading pediatric hospitals and research facilities in the world, and the best pediatric hospital in the United States according to Child Magazine, this institution's data storage and retrieval system also has to be best of breed. So it's no surprise that the IS team proactively initiated a project to modernize its outdated data storage and retrieval systems.

A Challenge to the IS Team

Three existing requirements were the impetus behind this project. First, all pediatric hospitals are required to maintain medical histories of their patients until they reach 21 years of age. Also, to remain The Best, physicians must have access to patient records on demand. And finally, the hospital's researchers depend upon archived data to assist in their important work. But maintaining an expanding database of highly sensitive information indefinitely, while providing for the instantaneous retrieval of all this data creates a significant challenge for the IS team.

A Failing Legacy System

Burdened with aging data storage, and retrieval tape and optical library systems, the IS team was faced with two critical problems: available tape/platter slots were fast disappearing; and the systems were becoming too costly to support and maintain.

The Time-Tested Solution

Being a mission-critical process, the data storage and retrieval system needed to be a robust, fail-safe solution able to accommodate growth, and exhibit interoperability with existing IT systems. And, it needed to be provided by a trusted vendor with an excellent reputation for pre- and post-sales performance. The IS team selected the one solution that actually exceeded these rigid requirements – IBM's Medical Archiving Solution (MAS).

A WAKE Up Call

To ensure a successful deployment of the IBM MAS, the IS team made another wise decision – to retain an experienced project management consultant. WAKE Technology Services was selected based upon their long standing relationship with the hospital and their reputation for getting the job done. Soon, as the project expanded from a point solution for Radiology PACS (picture archiving and communication system) into a full-blown enterprise solution, WAKE's responsibilities expanded as well.

Business Acumen and Technical Expertise

WAKE consultants stepped up and began working with administrators from all engaged departments, the hospital's senior UNIX Administrator, and the creator of the IBM MAS. Close collaboration was required to assess the requirements of the system including the type of data being stored, retention requisites such as time and format, current sizing needs and future archiving and retrieval requirements.

Shortly after the design phase started, the hospital lost its UNIX Administrator. Fortunately, WAKE consultants have extensive technical backgrounds to complement their business savvy. They were able to successfully fill the technical void and managed to keep the project on track with no change to the timeline. They also supported the MAS for a period of time after it went live, until an internal IS resource was brought on board.

The Implementation

The design and hardware procurement phase took about six months. IBM's BCS Group pre-configured the hardware in Houston, after which testing and certification was completed before the system was shipped to the customer site in September, 2005.

Installation, on-site testing, implementation of the PACS and integration of cardiac echocardiograms began immediately and took one week, with the assistance of remote access by IBM from Houston. WAKE assisted Radiology and Cardiology with data migration from the old tapes to the new system and the final cut over. The entire process was accomplished without a hitch – on time and on budget.

Business Continuity Assurance

The one strategy employed that would yield maximum system uptime, a project requisite, is redundancy. The main MAS at the hospital is replicated at a remote data center. In the event of unplanned downtime or a localized disaster, natural or man-made, fail over to the redundant system at the offsite location will occur almost instantly.

The Configuration

The MAS is a three tier storage and retrieval system. Tier 1 maintains a fairly small, fixed amount of data. This tier uses fiber channel connectivity and a highly reliable storage area network (SAN) to enable the instant retrieval of patient studies. Tier 2, which normally holds a year's worth of data, also uses SAN for data storage. But, instead of fiber channel, less expensive Serial Advanced Technology Attachment (SATA) connections are employed. The third Tier, the only one that grows indefinitely, uses relatively inexpensive tape storage for permanent data archiving. The library holds over 200 tapes, each with a capacity of 400 GBs.

Tangible Cost Benefits

Replacing the legacy hardware yielded numerous cost benefits. Newer systems normally have much smaller footprints, freeing up expensive data center floor space. Older systems tend to consume more energy, generate more heat, require more maintenance and are often close to their end-of-life phase, at which time vendors will no longer provide affordable support.

The high availability feature of the new MAS eliminates the probability of costly unscheduled downtime which could result in prolonged inaccessibility to data. Not a tolerable scenario considering patients' well-being is at stake. With a redundant system and automatic fail-over, physicians will always be able to retrieve the patient studies from the new MAS system. And finally, having an in-house system, the hospital no longer incurs burdensome support costs, nor are they held hostage to a vendor's service level agreements (SLAs). Internal staff can provide 24x7 support at a fraction of the cost.

Zero Downtime and Instant Retrieval

The most gratifying achievement that resulted from the new system was the vastly improved response times the physicians experienced along with zero system downtime. Data retrieval from the Tier 1 storage took under 1 second. Tier 2 data could be accessed in 10 seconds or less. And, even Tier 3 data retrieval took less than two minutes. The old system could take up to five minutes or longer to retrieve data and at times the system would hang and simply time out. Availability was shaky at best. Users were understandably ecstatic with the performance of the MAS.

WAKE's Value-add

Keeping IT projects on schedule is no easy feat under ideal conditions. Keeping a mission-critical IT project on schedule that expanded in scope and was complicated by staff turnover is a Herculean achievement by anyone's yardstick. Had the hospital retained a pure project manager, costly delays would have occurred. But WAKE's extensive technical experience allowed them to take control of the entire project after the loss of the UNIX administrator. This same technical expertise resulted in significant contributions at the design stage as well.

WAKE's business aptitude also proved to be a valuable attribute. Knowing what questions to ask the business-oriented staffers allowed WAKE to extract accurate, comprehensive requirements from the various departmental resources. This contributed significantly to a properly sized and configured system that will undoubtedly improve the chances that this hospital will remain one of, if not The Best Pediatric Hospital in the world.