

## Understanding and Controlling Medical Imaging Archive Return on Investment

### Introduction

With new data-intensive modalities and the growth of filmless imaging overall, today the typical healthcare facility's volume of digital imaging data is expanding exponentially. A key challenge to most medical facilities in a PACS environment is managing these storage costs and generating a sound return on investment (ROI) for an image archive.

This white paper will discuss the range of factors that make up ROI for a medical imaging archive, including the costs and benefits of various archiving hardware, architectures and management strategies. It also focuses on the economic implications of implementing a medical archive in-house compared to outsourcing storage through an application service provider (ASP) provider.

### The Complete Spectrum of Storage Costs

While a number of years ago the hard costs of storage media were the most significant archiving expense, with today's advanced storage management strategies, broader range of media and low storage media prices, calculating ROI has become far more complex. Archiving expenditures, and therefore ROI, extend well beyond hardware to include a full range of less visible soft costs that affect a facility's productivity and profitability. Healthcare IT professionals and others involved in

decisions about archive management must be aware of these considerations to make well-informed decisions about how to manage this function responsibly at their facilities.

These factors include:

#### Capital Equipment Expenses

Storage hardware and media, naturally, remain significant expenses, and financing these generates high interest charges. But even facilities that have in-house budgets for archive purchase must remember that costly storage hardware and media purchases means less money budgeted for acquisitions elsewhere in the healthcare facility, which has its own set of consequences. After all, nothing in life is free—and money is no exception.

The process of obtaining administrative approval on expenditures of this magnitude of an archive can be an onerous task in itself for a busy department, possibly causing significant delays in digital conversion.

#### IT Expertise

The time and expense of IT staffing is probably the most significant and overlooked archiving expense. A study by Strategic Research Corp. found that while hard disc storage can cost as little as \$1 per MB, IT staff archive management time costs \$8 per MB annually.

IT staff is involved in every step of the archiving

process, from selection of a solution and implementation to managing file structures and assuring adequate storage capacity. With mission critical systems and data, IT staff need to monitor the system constantly.

Additionally, IT resources are also typically spent on managing system back-ups and disaster recovery as well as for staff system training.

#### Assuring Data Integrity

A facility must implement an ongoing mechanism for assuring data integrity. This is often managed by a software solution that must be funded and monitored.

#### HIPAA and Security Issues

Appropriate facility staff must remain apprised of changing HIPAA regulations and implement archive conformance measures. Additionally, other security measures must be developed and implemented to ensure patient privacy.

#### IT and Clinician Training

Administering archive operating and management software often requires advanced IT staff training. In turn, IT staff must train clinicians on related archive system procedures. Given the high turnover rate of radiology technologists and administrative staff, training and re-training typically demands a significant portion of IT staff funding.

#### Disaster Protection

Experts agree that data protection is probably the most complex and overlooked area of archive management, with significant implications in the event of system failure. Disaster protection can be grouped into three areas—backup of the operating systems and platforms, archive duplication and business continuity in the face of system failure. The costs of overlooking any single one of these are tremendous.

Implementing all of these aspects of disaster protection means devoting funds for hardware acquisition, backup media, off-side storage, as well as significant IT management hours.

Facilities need to examine the full costs of system down

time and possible data loss in light of the expense of implementing various levels of protection.

#### Deviations From Predicted Storage Volume

Installing an archive means making assumptions about the volume of data to be stored going forward. However, frequently archive needs exceed space available, necessitating an unplanned and unbudgeted expansion project with additional hardware, storage media and IT time. The process may also require system redesign and data migration. If implemented within a short timeframe, this becomes an expensive rush project. Conversely, an overestimate of storage space needed will incur unnecessary costs for hardware that may become outmoded before ever being put to use.

#### Technology Obsolescence

Technology races forward and the state-of-the-art storage purchased today will be out of date soon after installation. The result is that a facility has to look at the ongoing trade-off between the cost of replacing out-of-date storage media and of lost productivity resulting from relatively slow, legacy storage media.

Because medical data must be kept for long time periods, facilities also need to consider how long hardware manufacturers will continue to support their legacy storage media with new hardware. Without support, as hardware is replaced, data must be migrated to new storage at additional cost.

#### Upgrades and Data Migration

When, for various reasons, a facility decides to upgrade an archive, another cost is incurred for the migration of existing data on to the new storage media. Because of the importance of maintaining the integrity and consistency across modalities, applications and sites, the process is extremely specialized and calls for substantial expertise.

#### Physical Space and Facilities Management

The physical space an archive occupies, heating and cooling, and maintenance of that space also represent archiving costs. This includes both on-site and off-side archives for primary storage and disaster recovery.

### Departmental Administration

Not to be overlooked are administrative costs for the archive, such as those for overseeing archive purchase as well as personnel costs for hiring and maintaining IT staff.

### Healthcare M&A Accommodations

In today's merger-driven healthcare business environment, when medical facilities affiliate, they often need to reconfigure data to foster better communications between facilities. The issue of how to accommodate this—and the resolution—all involve costs. Archives may be merged, connected into a network or moved to new locations—each one carrying an expense.

### Strategies to Minimize Storage Costs and Maximize Return on Investment

Facilities can implement a range of strategies to control the medical imaging archive bottom line and boost ROI without major compromises in archive function. However, many experts agree that reducing expenditures in three major areas will have the most impact. These are storage capacity, IT staffing and system reliability/uptime. However, minimizing any one of these elements often elevates expenses for the others. The right balance among these factors should be driven by the specific needs of a facility and the nature of its data.

Many medical facilities have found that a valuable way to eliminate these trade offs and minimize expenses overall is to outsource storage to an ASP, which generally manages all of the factors and contain their costs within a set fee structure.

Typical strategies for minimizing archive costs include:

#### Minimizing Storage Hardware Expenses

Facilities can invest in a storage archiving network (SAN) to enhance the capacity of a storage hardware constellation. A SAN is an archive made up of a series of networked storage devices that together share the task of data storage and are recognized by the system as a single archiving device. The arrangement enables more efficient use of each device's storage capacity and,

through better space management, generates additional storage opportunities overall.

Once a SAN is in place, facilities can elect to install storage management software to keep storage space utilization rates even higher and to help make IT staff aware of trends that may affect future hardware needs.

However, implementation of a SAN is itself costly, and a facility needs to look closely to make sure the initial expenditure for hardware and IT staff set-up justifies the money to be saved on storage media going forward. Additionally, storage software also is another capital expense.

#### Reducing IT Staffing

Generally the larger the data volume, the more IT staff is required for data management. These hours maybe minimized by purchasing archiving storage capacity exceeding a facility's actual needs. This will pare down IT staff hours devoted to monitoring and maximizing use of storage space.

Also, if a facility already has a SAN in place, storage management software will help save significant IT management time spent on allocation, volume management performance monitoring and report generation.

Implementation of these tactics, however, also brings added costs, and facilities must weigh these against the IT staff savings.

#### Reducing System Downtime

Another tactic for reducing archiving costs is employing measures that decrease system downtime. In mission critical storage applications such as healthcare, system downtime results in losses in both dollars and standards of care. This is not necessarily true in software applications where minimal downtime does not significantly slow workflow.

Implementation of a SAN and use of management software are proven ways of maximizing uptime.

#### Outsourcing the Archive

Outsourcing the archive is an excellent way for any

medical facility to contain costs without making any of the compromises detailed above, as well as managing all costs.

Generally, in an ASP model, these costs are built into the ASP subscription price and amortized by ASP providers through the fees from multiple facilities utilizing the service. Therefore, subscribers typically benefit from lower costs through an economy of scale.

All facilities considering an ASP service should look at costs closely and examine what is included in the fees.

### Benefits and Challenges of Outsourcing and Ownership

Facilities deciding between implementing an archive in-house and working with an archive ASP service provider should examine the following relative benefits and shortcomings of each model.

#### Outsourcing

With an archiving ASP provider, typically the facility pays for the archive as a service on an agreed-upon schedule. InSiteOne, for example, is a major provider of outsourced archiving services and offers a full range of services on a reasonable fee-per-study basis, which is paid as data is stored. This eliminates large upfront capital expenses and shifts the archive costs to an operating budget.

For many facilities, this financing arrangement may significantly accelerate the conversion to a digital environment by making archiving affordable, or may make conversion more manageable without cutbacks in other areas.

A managed archive service provider, such as InSiteOne, assumes full responsibility for the administration and total hard and soft costs of the archive. As a result, full archiving costs are more predictable and controlled for the healthcare institutions involved.

Further, management of the archive may be more thorough and streamlined than when managed in-house,

particularly for a small- to medium-sized facility that may be unable to support the IT expertise and large scale archive administrative responsibilities on its own. Studies show that, in particular, many facilities fail to adequately support disaster recovery functions.

Shortcomings of this model are that it restricts the facility's freedom in selecting their specific storage hardware and architecture more than with direct ownership.

#### Ownership

Ownership is a major undertaking that usually necessitates added staff and the additional expenses. Facilities should examine the full spectrum of costs carefully before deciding to select this option.

However, by contrast to an ASP, ownership allows the facility full decision making power over system design—within the parameters of budget. Naturally, it allows greater control over the management of the system as well. Also, with outright ownership, an archive becomes a business asset with intrinsic value to the site. But remember, this value diminishes over time through use and obsolescence.

Direct ownership may be economically advantageous for some large facilities with large storage volumes that will not have to finance equipment purchase, while many facilities will find an ASP a preferable choice.

### What to Look for in an ASP Archive Provider

Facilities that have decided to use an outsourced archive service provider should examine the following important considerations:

#### Fees structure

Different providers offer different fee structures. InSiteOne, the largest and oldest DICOM archive service provider, offers image archiving for one low fee for the life of the study, regardless of file size. This arrangement gives facilities a high degree of control over their storage expenses.

### Archive technology

This includes both the storage technology and the technology that communicates images to and from any off-site archive, making sure an ASP provider utilizes state-of-the-art technology from reliable vendors and maintains a solid technology upgrade path. Consider how fast images need to be made available on-site from any off-side storage and make sure your vendor can support your requirements. InSiteOne is committed to providing state-of-the-art technology and communicating images with ultra-fast speed.

### DICOM compatibility

To ensure your studies are standards-based, easily accessible to any authorized user and easily transportable, make sure your storage is in a DICOM-compliant file format.

### HIPAA compliance

Any service provider you choose should be in compliance with all HIPAA requirements as they apply to medical image archiving.

### Full range of services

Make sure your service provider offers a full range of services including on- and off-site storage, web communications, disaster recovery and data migration. Also look for any offerings and price structures for specialized storage such as mammography and cardiology. InSiteOne is committed to meeting your full range of storage needs.

### Customer Service

As a mission critical service, a medical archive imaging service must be committed to meeting your needs 24/7.

### Conclusion

ROI for a medical imaging archive is complex and extends well beyond the cost of archiving hardware. When making decisions about an archive, medical facilities would be well-served to examine the full range of hard and soft costs, from IT staffing to HIPAA compliance. Controlling costs often means striking a balance among various factors that is best for a particular facility. For many, outsourcing their archiving needs to a service provider is a sound financial and administrative choice. Facilities also would be well served to look at a full range of factors when selecting an archiving service.