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# Electronic Document Imaging Project Real Property Services Appraisal Services Unit



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**STATE DOCUMENTS**

## Executive Summary

The Appraisal Services Unit of the Real Property Services division within the Office of General Services is responsible for providing replacement cost and valuation data to the Office of Insurance Services for buildings and improvements insured by the Insurance Reserve Fund.

One of the primary functions of the Appraisal Services Unit is the collection of specific property data to insure accurate calculations of replacement cost for buildings and improvements. Data collection activities over a number of years have produced ten vertical file cabinets of paper documents and supporting addenda. These vertical files occupy approximately one hundred and sixty square feet of office floor space located in close proximity to offices of the Appraisal Services Unit. The paper documents and addenda provide supporting data that is critical in the process of producing accurate replacement cost estimates and therefore must be preserved for future use.

In recent years the process of preserving records and documents has improved with the onset of digital imaging. Documents can now be scanned to a digital format that is accessible by a standalone personal computer. Digital imaging is also a supported format for record retention by the South Carolina Department of Archives and History.

Although the Appraisal Services Unit is based in downtown Columbia, South Carolina, appraisers travel to appraisal jobs located in all areas of the state. An additional benefit of imaging of the documents and supporting addenda to a digital format is improved accessibility. Appraisers will have access to records and documents in a disconnected environment away from the base office facility thus improving time efficiency and flexibility for the Appraisal Services Unit.

The Appraisal Services Unit's documents and supporting addenda should be imaged to improve preservation and accessibility of these critical records. In addition, the imaging of the documents and addenda would free up valuable rented office space now occupied by the vertical document files.

## **Introduction**

If the building where your critical records are kept were suddenly destroyed by fire or some other disaster, what would you do? Today many governments and corporations around the world are beginning to pay close attention to their record and document archives. In a paper-based world, large sums are spent annually on the administration of managing paper-related workflows. The introduction of personal computers into business has drastically changed the archiving environment. The process of preserving records and documents has improved with the onset of digital imaging. Documents can now be scanned to a digital format that is accessible by almost any standalone personal computer. The advantages of establishing and continually building an electronic archive are numerous and beyond the scope of this report. Only those directly related to the Appraisal Services Unit of the Real Property Services Division are the subjects of this report.

The Appraisal Services Unit has as one of its primary functions to collect specific property data to insure accurate calculations of replacement cost for buildings and improvements. Data collection activities over a number of years have produced numerous paper documents and supporting addenda files. The paper documents and addenda provide supporting data that is critical in the process of producing accurate replacement cost estimates and therefore must be preserved for future use. These document and addenda files also occupy valuable rented office space that could be freed up as a result of imaging the file records. Further, the conversion of the Appraisal Services Unit's documents and supporting addenda to a digital format will allow appraisers to have access to records and documents in a disconnected environment away

from the base office facility. Electronic digital imaging provides a cost effective solution to each of these problems.

Two options for providing an electronic document imaging solution for the Appraisal Services Unit are explored in this report. One is an outsourced solution (#1) and the other is an in-house solution (#2). The purpose of this report is to examine the two different options and recommend a solution for implementation.

### **Project Development and Implementation**

Two possible solution alternatives were discovered in the data collection and problem-solving phase of this project. Solution #1 is an outsourced option and Solution #2 is an in-house option. Solution #1 will be examined first.

#### **Solution #1**

Solution #1 is an outsourced option supplied by a local digital imaging and microfilming vendor. This solution offers the use of Tag Image File Format (TIFF) imaging technology to view documents electronically. TIFF is a standard format for scanned images that provides an exact rendition of the original image. TIFF format is used in many high volume document archive systems, but has the limitation that it cannot be searched without the use of custom designed database search software. The vendor has proposed the use of a similar software application that requires the purchase of a license as well as a professional service charge for software installation at a cost of \$7,000.00. Additional report distribution software to produce CD archives at a cost of \$3,900.00 and a change in server software by in-house staff is also suggested by the vendor.

One of the more expensive requirements of implementing any digital imaging solution is the cost of professional services. These include software and hardware installation; application design; system testing; operator, user and administrative training and documentation. The vendor has suggested a cost range for these services to be \$14,000.00 to \$15,000.00.

Any purchase of computer software or hardware requires an allowance for annual maintenance. This includes the cost of new software releases and upgrades, telephone and on-site support as well as the cost of parts, labor and travel to maintain computers and scanner equipment. The vendor has suggested an annual cost of \$2,651.00 for software maintenance and \$1,050.00 for hardware maintenance.

Creating a scanned back file of documents presently located in the Appraisal Service Unit's vertical file system is ultimately the desired result of implementing a digital imaging system. The vendor has determined that at present approximately 220,000 to 240,000 document images exist to be scanned. At a price of \$0.14 per image, the total estimated outsourced cost to produce a digital imaged back file is \$30,800.00 to \$33,600.00.

The total cost of Solution #1 outsourced option ranges from \$37,401.00 to \$38,401.00, without a created back file. With a created back file, the estimate is \$68,201.00 to \$72,001.00 (see Table #1) (see Appendix A).

Table #1-

**ELECTRONIC DOCUMENT IMAGING PROJECT**

<i>Start-up Costs- Computer Hardware and Software- Solution #1</i>	<i>Cost</i>
1. Purchase price of hardware and software components to be used for document imaging implementation	\$19,700.00
2. System-related charges not included in line above (Maintenance)	3,701.00
3. Cost of professional services (Software installation, System Testing, Training etc.)	<u>15,000.00</u>
4. Total of amounts on lines 1,2 and 3, this amount is the total start-up cost for purchased hardware and software	\$38,401.00
<i>Start-up Costs- Outsourced Scanned Back File- Solution #1</i>	<i>Cost</i>
1. Estimated outsourced cost to produce a digital imaged back file	<u>\$33,600.00</u>
<b>Total Cost of Solution #1 with a created back file</b>	<b>\$72,001.00</b>

**Solution #2**

Solution #2 is an in-house option to be implemented by our present in-house staff. This option offers the use of Portable Document Format (PDF) as an archiving format. Like TIFF, PDF is a standard format for scanned images that provides an exact rendition of the original image. PDF files can be retrieved, viewed and printed with a freeware software reader that is widely available through the Internet. This format is already in wide use by State Government and meets legal document requirements because the format was originally developed for the Federal Government to store its legacy files. PDF is also a publicly available specification making it a very attractive format to select for electronic archives (see Appendix B). An in-house software-database application is presently in use by the Appraisal Services Unit that is setup for searchable PDF attachments. This application presently meets the needs of the Appraisal Services Unit and does not require the purchase of additional database software to index and store imaged document files. This option requires the purchase of a software license for PDF document management software at a cost of \$449.00. In addition, a document capture application at a cost of \$4,000.00 is required to scan new documents and establish a back file of existing documents. The existing server software for storage of archived records is

presently sufficient to handle scanned documents on a transitional basis; therefore, no additional server software is necessary at this time.

A scanning device is a necessary hardware component for a document imaging system. The purchase of a duplex color scanner that can accommodate documents up to 11" x 17" in size and includes all the necessary accessories to connect to a computer workstation is available at a cost of \$7,000.00 to \$7,800.00. A dedicated computer workstation is also a necessary hardware component needed for document imaging. This workstation is available for approximately \$1,000.00, depending upon accessories chosen. Use of a current in-house server is available at present time; therefore no new server purchase is necessary.

The need for professional services to implement this option should be minimal. In-house IT staffers and some users are already familiar with the setup and use of PDF software and associated hardware equipment. Operator and user training is available online for as little as \$50.00 per person and offsite courses are available for \$400.00 or less. An allocated amount of \$2,000.00 should be sufficient to cover any professional services and training needed.

Annual maintenance includes the cost of new software releases and upgrades, telephone and on-site support as well as the cost of parts, labor and travel to maintain computers and scanner equipment. No initial cost for a software maintenance contract is required; instead it is included in the purchase of the software. Realizing that new software releases and upgrades, as well as the cost of parts, labor and travel to maintain computers and scanner equipment are likely to occur; an amount equal to our vendors estimate should be set-aside on an annual basis for this purpose. Therefore, the total cost

for software support and hardware maintenance should be \$2,651.00 and \$1,050.00 respectively.

Creation of a scanned back file of documents located in the vertical file system by in-house staffers is difficult to estimate but can be quantified with certain assumptions. Assuming 220,000 to 240,000 document images exist to be scanned within a one-year horizon, the total hours to complete the back file project would equal approximately 1,600 workstation operator hours based on an estimated 150 pages per hour rate. If a scanning workstation operator were employed at a rate of \$15.00 per hour, the total wages paid to a scanning workstation operator for the project would be \$24,000.00. Assuming an allowance of 10% of total operator wages for supervision and 5% of the total for contingency, the total cost of back file conversion by in-house scanning is \$27,720.00. (See Table #2)

**Table #2-**

**ELECTRONIC DOCUMENT IMAGING PROJECT**

*Start-up Costs- Back File Conversion by In-House Scanning*

1. Number of pages to be converted to electronic document images	240,000
2. Desired time, in working days, to complete back file conversion (1 Year Horizon)	240
3. Average number of pages scanned per workstation per hour (Estimated)	150
4. Amount on line 1 divided by amount on line 3 (Total Hours To Complete Back File Project)	1600
5. Hourly wage rate for scanning workstation operator (Estimated)	\$15.00
6. Amount on line 4 times amount on line 5 (Total Wages Paid To Scanning Workstation Operator)	\$24,000.00
7. Percentage of in-house scanning cost to be added for supervision	0.10
8. Amount on line 6 times decimal value on line 7 (Total Cost For Supervision Of Scanning Project)	\$2,400.00
9. Total of amounts on line 6 and line 8	\$26,400.00
10. Contingency percentage	0.05
11. Amount on line 9 times decimal value on line 10 (Total Amount For Contingency)	\$1,320.00
<b>12. Total of amounts on line 9 and line 11 (Total Cost of Back File Conversion By In-House Scanning)</b>	<b>\$27,720.00</b>

The total cost of Solution #2 in-house option ranges from \$18,150.00 to \$18,950.00, without a created back file. With a created back file, the estimate is \$45,870.00 to \$46,670.00 (see Table #3).

Table #3-

**ELECTRONIC DOCUMENT IMAGING PROJECT**

<i>Start-up Costs- Computer Hardware and Software- Solution #2</i>	<i>Cost</i>
1. Purchase price of hardware and software components to be used for document imaging implementation	\$13,249.00
2. System-related charges not included in line above (Maintenance)	3,701.00
3. Cost of professional services (Software installation, System Testing, Training etc.)	<u>2,000.00</u>
4. Total of amounts on lines 1,2 and 3, this amount is the total start-up cost for purchased hardware and software	\$18,950.00
<i>Start-up Costs- In-House Scanned Back File- Solution #2</i>	<i>Cost</i>
1. Estimated in-house cost to produce a digital imaged back file	\$27,720.00
<b>Total Cost of Solution #2 with a created back file</b>	<b>\$46,670.00</b>

**Comparison Of Solutions #1 and #2**

Only two digital formats were considered alternatives for the Appraisal Services Unit's proposed digital imaging system, the Tag Image File Format (TIFF) and the Portable Document Format (PDF). Both formats are recognized industry standards and are suggested for use in permanent digital archiving solutions. Both of the solution alternatives provide at least one or both of these recognized formats (see Appendix B).

Solution #1 and #2 both require the purchase of scanning software. Solution #1 offers database and report distribution software requiring setup and indexing in order to be compatible with an existing in-house database. Solution #1 also requires a change in server software by in-house staffers. Solution #2 makes use of the existing in-house database software application that was previously setup for PDF attachments. Additional report distribution software is not necessary for Solution #2.

Hardware for both solutions includes the purchase of a scanner. For purpose of this project comparison, a similar specked color scanner with duplex capabilities and the ability to handle document sizes to 11" x 17" was chosen. Two separate vendors were contacted to obtain pricing for the chosen scanner hardware. A very close price range from \$7,000.00 to \$7,800.00 was found in both solutions. Document imaging workstations for each solution were equal in price at approximately \$1,000.00.

The biggest difference in the two solutions was for professional services and training. Solution #1 estimates by the vendor totaled \$14,000.00 to \$15,000.00 for services such as software and hardware installation, application design, system testing and operator and user training. Solution #2 included an amount equal to \$2,000.00 to be set-aside for operator and user training. The use of in-house IT staff for software and hardware installation and system testing in Solution #2 alone provides a savings of approximately \$12,000.00 to \$13,000.00 over the vendors cost estimate.

An amount equal to \$3,701.00 was estimated for both solutions for annual maintenance. The vendor in Solution #1 estimated the cost of software maintenance to be \$2,651.00 and hardware maintenance at \$1,050.00. Solution #2 software purchase includes upgrades and telephone support for a limited time from the date of purchase. Realizing that new software releases and upgrades, as well as the cost of parts, labor and travel to maintain computers and scanner equipment are likely to occur; an amount equal to the vendors estimate was determined appropriate for software and hardware maintenance in Solution #2.

A scanned back file by both solutions proved to be very close in cost. Solution #1 outsourced option by the vendor was based on a price per image at \$0.14. This option produced a cost range from \$30,800.00 to \$33,600.00. Solution #2 was based on an hourly rate for a scanning operator plus a percentage for management and contingency. The estimated cost by Solution #2 was \$27,720.00. An estimated savings in the range of \$3,080.00 to \$5,880.00 could be realized by the selection of Solution #2 in-house scanning of the back file (see Appendix C).

### **Benefits To Be Derived**

Extensive cost savings can be achieved for the Appraisal Services Unit through the creation of an electronic digital archive. The cost associated with continuing to maintain a paper-based archive can be great. Establishing an electronic digital archive can significantly reduce this cost. It has been determined from an independent study that for every 12 filing cabinets in an organization one additional employee is required to maintain them. Further, professionals spend approximately 5% to 15% of their time reading information while 50% of their time is spent looking for it.

An additional benefit, the conversion of the Appraisal Services Unit's documents and supporting addenda to a digital format would allow appraisers to access records and documents in a disconnected environment away from the base office facility. The Appraisal Services Unit is based in downtown Columbia, South Carolina and appraisers travel from the base location to appraisal jobs located in all areas of the state. The ability to access digital document files in a field environment would be more practical and time efficient than the present practice of hand carrying large paper files which can be damaged or lost. Although this benefit cannot be measured quantitatively, timesavings, increased productivity, and preservation of documents would be accomplished.

The freeing-up of valuable rented office space now occupied by the vertical document files is a by-product of the scanning of the back file documents. Immediate savings at this time are not attainable due to lease contract obligations, but the space occupied by the vertical files could be freed up and used for additional office space until the expiration of the lease term. Based on the current rental cost of the space, a savings of approximately \$2,796.80 annually would be attainable at the expiration of the lease.

## **Conclusion and Recommendations**

The purpose of this report was to examine two different solutions available in establishing an electronic document imaging system for the Appraisal Services Unit and to recommend a solution for implementation. Both Solution #1 and #2, respectively, provide a workable solution to establishing an electronic document imaging system. The most obvious difference in the two solutions is related to implementation cost. By far the largest differences in cost are associated with the cost of software, professional services, and the creation of a scanned back file. The costs of implementation and maintenance of either system would be off set by savings related to increased time efficiency and productivity gained by the Appraisal Services Unit. Additional savings would be obtained by freeing up space occupied by the vertical document files. Based on the startup cost savings and the ease of implementation, my recommendation is Solution #2, the in-house solution. Implementation of the in-house solution should provide the Appraisal Services Unit with benefits long into the future.

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## Appendix A

November 26, 2003

### SC State Budget and Control Board Proposed Information Management System Option #1: Network Document Management System

#### Software:

Legato 2 User Application Xtender (concurrent)	\$7,000.00
Legato Report Distribution Software (unlimited CD creation)	\$3,900.00
*Note- The above includes one Legato Application Xtender License.	
Microsoft SQL Client Licenses and Server Software	supplied by customer

#### Hardware:

Canon 9080C (duplex, color up to 11 x 17")	\$7,800.00
Adaptec Card	included
SCSI Cable	included
Legato Scan Xtender Software to drive scanner	included
90 day warranty	included
Scan Workstation	supplied by customer
Server	supplied by customer
CD Distribution Workstation	supplied by customer

#### Professional Services:

\$14,000.00-\$15,000.00

- Software Installation
- Hardware Installation
- Application Design
- Integration with existing database
- System Testing
- Operator Training
- User Training
- Administrative Training
- Documentation

Custom Utility for Migration of Images (if required)	\$1,600.00
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**Annual Maintenance (required upon order):**

Software \$2,651.00

**\*Note-** The above includes new releases, upgrades, telephone support, on-site support. Installation and training on upgrades and new releases are charged on a time and materials basis of \$1,250.00 per man-day.

Hardware \$1,050.00

**\*Note-** The above includes parts, labor and travel.

**\*Note-** SC Sales Tax must be added to above pricing

**Options:**

Canon Duplex Flatbed Scanner (43ppm autofeed, duplex with flatbed capability of up to 11 x 17")

\$8,200.00

Adaptec Card

included

SCSI Cable

included

Legato Scan Xtender Software to drive scanner

included

90 day warranty

included

**Option #2: PMSI to Scan and Index Existing Project Files**

Estimated Number of Images to be scanned 220,000 to 240,000 images

Price per Image to Prepare, Scan and Index  
(Indexed by Job # and Improvement #, possibly date) \$.14 per image

Estimated total price \$30,800.00 to \$33,600.00

**\*Note-** The above images can be output as TIFF files or PDF Files.

### **TIFF versus PDF Formats**

- Both TIFF and PDF have free viewers. TIFF viewer comes automatically with Windows. The proposed Legato Software can manage both TIFF and PDF formats. Legato scans and stores images that are scanned into Legato as industry standard TIFF files.
- The proposed Legato solution offers a total database/image management system versus PDF which has no database structure and ability to search for individual images.
- PDF is a proprietary format which can not be converted into any other format. For example, a PDF file can't be converted to a TIFF file.
- The proposed Legato software versus Adobe Acrobat allows for the security of the images on the network to eliminate someone browsing to the image on the network and modifying or deleting the image.
- The proposed Legato Software has the ability to manage all formats of documents to include scanned images, digital photographs, ODMA compliant application such as word, digital formats such as CAD drawings, voice files, video files, and e-mails.
- When retrieving the PDF files across the network it requires the entire PDF document to be transferred to the client station versus with the proposed Legato system single pages may be retrieved as required in order to minimize network traffic.
- The proposed Legato solution offers an off-the-shelf web module for internet or intranet viewing.
- Legato offers the customer the ability to work from a remote location via the web and the interactive web client for future consideration.

## Appendix B

### PDF or TIF?

#### *Which is a better format for your images, PDF or TIF?*

Once documents have been scanned, a determination needs to be made as to how those images will be stored. In general, the two primary choices are to store the files in either PDF format or TIF format. While there are a few technical differences between the two, it is more of a preference choice than a technology choice.

PDF files are created using Adobe Acrobat software. The main advantage the Adobe claims for PDF is its portability. It doesn't matter what operating system you have or what type of hardware you have. You need to have Adobe's Acrobat Reader software, but that is a free download from Adobe's web page. PDF files are becoming more and more popular because of their ease of use across many different platforms.

TIF files have been the traditional format for scanned images. The TIF standard has been around for a long time and many of the more current operating systems include a TIF viewer as a standard part of the installation. This makes TIF format nearly as portable as PDF.

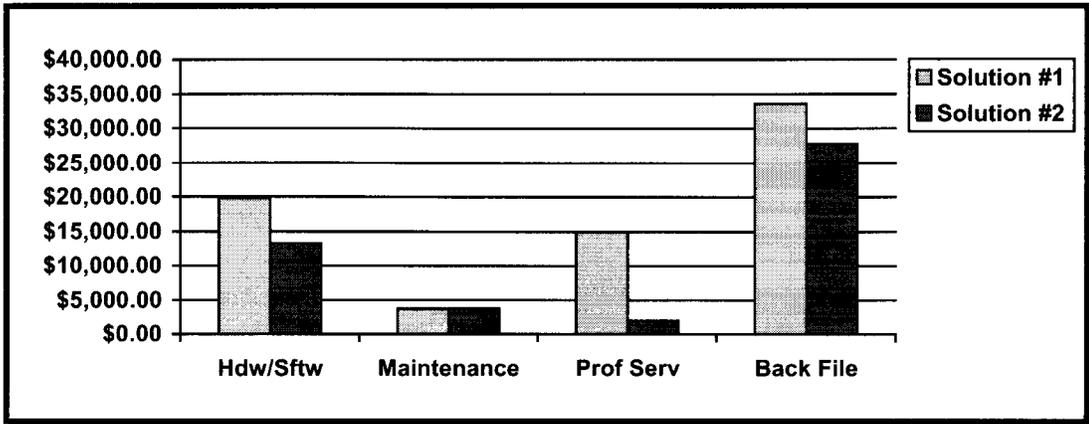
Both formats require roughly the same amount of storage space. In other words, a PDF file of a page and a TIF file of a page will be just about the same size. The decision on which to use is often based more on how the files will be used than on any technical issues.

The key issue is how will someone search for a particular image. If the files that have been scanned are "monolithic", PDF is usually a better choice. Monolithic means that the user will generally know which file they need and will search based upon the file name rather than on a more detailed index structure. For example, if there is a separate file for each client, and when you need some information, you want to pull the whole client file, PDF would be a good choice.

On the other hand, if you intend to have a great deal of indexing done to the images, the images will typically be stored as TIF format files. In this case, there is almost always some type of database associated with the images. The database allows for and keeps track of all of the index information. The index structure will either be in an external database, such as Access, Informix, or Oracle, or it will be internal and included as a part of the imaging software itself.

The bottom line is that, unless you are using a document imaging software program to scan, store, and index the images, you will probably want to store the images in a PDF format. If you are using a document-imaging package, you will probably end up storing the images in a TIF format. The good news is that either format will work.

### Appendix C



ELECTRONIC DOCUMENT IMAGING PROJECT		Solution #1	Solution #2
Computer Hardware and Software		\$19,700.00	\$13,249.00
Maintenance		\$3,701.00	\$3,701.00
Software Installation, System Testing, Training etc.		\$15,000.00	\$2,000.00
<b>Total Hardware and Software Start-up Cost</b>		<b>\$38,401.00</b>	<b>\$18,950.00</b>
Cost To Produce Digital Imaged Back File		\$33,600.00	\$27,720.00
<b>Total Cost With A Created Back File</b>		<b>\$72,001.00</b>	<b>\$46,670.00</b>