

Fax Imaging System: *Efficient, Effective and Eco-Friendly*

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Abstract

The Disbursement Services department, located within the University of Florida's Finance and Accounting Division, is responsible for reviewing and approving payment vouchers submitted by approximately 600 departments. The University's payables process is decentralized; meaning 1,500 staff across 600 departments submits invoices and payment vouchers to Disbursement Services. The voucher review process requires staff to submit support documentation for the payment voucher via inter-department campus mail.

The University recognized the need for a more efficient and eco-friendly process for staff to provide this support documentation. The new Fax Imaging System (FIS) allows departments to fax the documents to Disbursement Services. The faxed image is systematically retrieved, indexed and imported into the University's existing imaging system, and a hyperlink to the image is created on the voucher pages of the University's ERP system.

90% of departments adopted the FIS during the first month after the system went live. The time required to approve payment vouchers dropped from five business days to two. Faxing support documentation allows departments to view the images in PeopleSoft within 15 minutes of sending the fax, instead of waiting up to two weeks to verify the documents arrived via campus mail. Disbursement Services is able to reallocate the 7 FTE previously required for scanning and imaging tasks, and departments no longer send 1.8 million paper documents to Disbursement Services each year. The FIS eliminates the dependency on campus mail and paper hard copies, saving valuable time, money and natural resources.

Introduction of the Organization

The University of Florida (UF) is the state's oldest, largest, comprehensive research university. It is among the nation's most academically diverse public universities and has a long history of established programs in international education, research and service. It is one of only 17 public, land-grant universities belonging to the Association of American Universities (AAU).

Enrolling approximately 50,000 students annually, UF is home to 16 colleges and more than 150 research centers and institutes. UF is a major Florida figure, with more than 35,000 employees, contributing nearly \$6 billion annually to Florida's economy and responsible for 75,000 Floridian jobs. UF is also one of the largest research universities in the nation.

In 1994, UF signed the Talloires Declaration, pledging support to reduce environmental degradation and natural resource depletion. The University of Florida joined 310 other universities in this world-wide commitment to environmental sustainability in higher education.

Statement of the Problem

The business process to review and approve payment vouchers is cumbersome and prone to error. Departments enter payment vouchers in PeopleSoft and submit support documentation via inter-department campus mail to Disbursement Services. Once Disbursement Services receives the documentation, it is sorted by department ID and distributed to the appropriate personnel for review and approval. It usually takes five business days to approve a voucher after it is entered in PeopleSoft.

To further complicate this process, departments do not have an efficient method to verify whether or not Disbursement Services received the support documentation from campus mail. Once a payment voucher is approved, support documentation is scanned by the imaging staff at Disbursement Services to satisfy record retention requirements. This scanning process lags by two weeks, creating a significant delay between the time a voucher is approved and the time scanned images are available to view. The original paper documents are boxed and sent to storage, and most departments maintain duplicate paper copies for their records.

During the fiscal year 2004-2005, Disbursement Services processed 407,000 payment vouchers, resulting in 1.8 million pages of support documentation – all of which were manually scanned to create the electronic images. Approximately 7 FTE are required to accomplish the scanning and imaging tasks associated with the voucher review process.

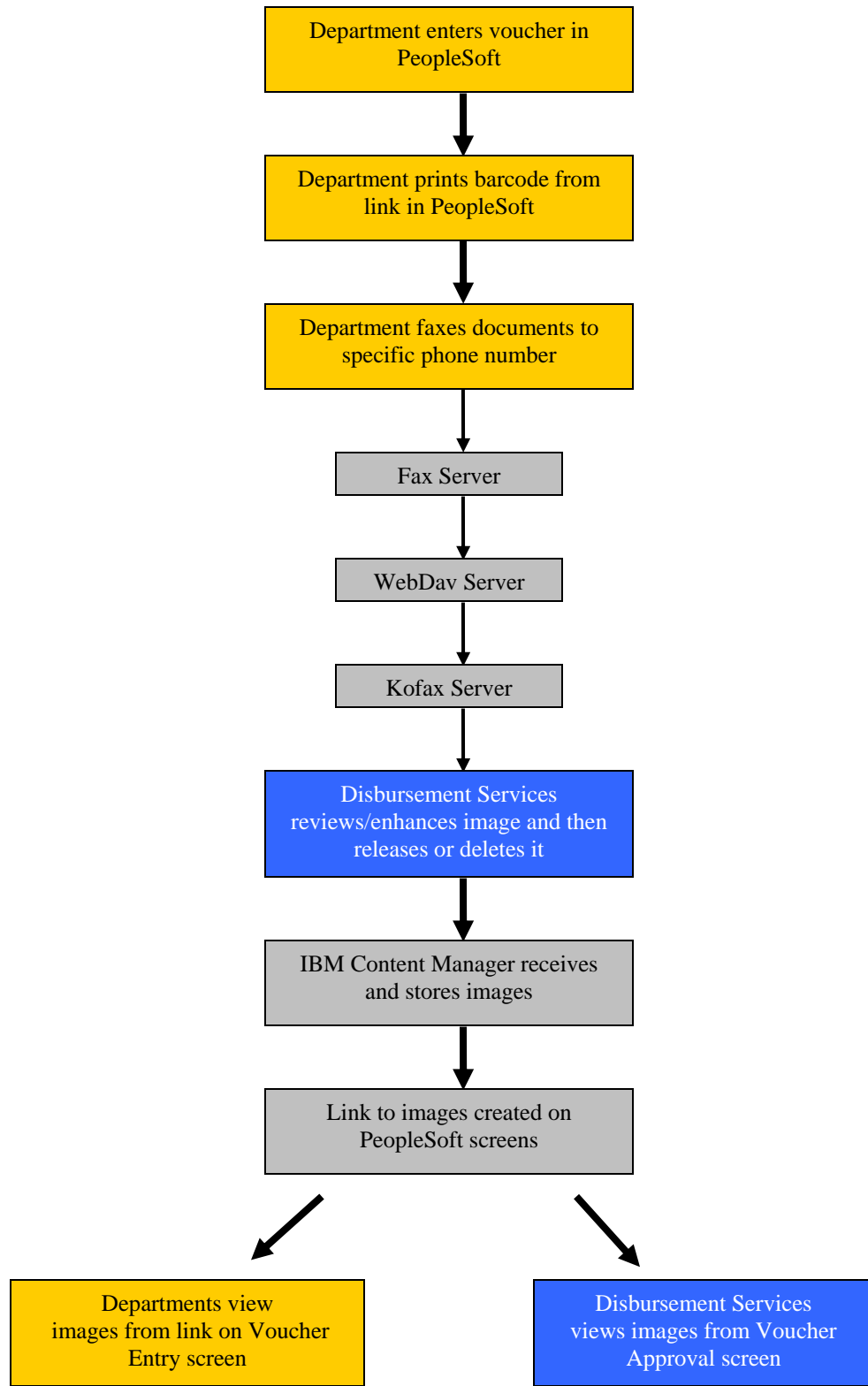
Design, Part I: Proof of Concept & Project Charter

Proof of Concept: The proof of concept for the Fax Imaging System (FIS) combines functionality from existing University technology: PeopleSoft, IBM Content Manager, fax software, various servers and department fax machines.

The University currently faxes purchase orders to vendors, but the fax software is also capable of receiving faxes. Using barcode software with PeopleSoft's Account Payable module, the PeopleSoft system generates barcodes associated with voucher IDs. The barcodes are included on a cover page, which is faxed to a server that creates electronic images. The barcode links the images to PeopleSoft – allowing departments to submit support documentation via fax and then view images of the faxed documents in PeopleSoft.

Project Charter: A Project Charter elaborated the proof of concept by adding image review and release, storage and retrieval from the University's existing document image system and support for existing manual processes. The Project Charter also addressed the project purpose, intended audience, scope, business organizations involved, assets impacted, assumptions, constraints, risks, major milestones and project deliverables. The Project Charter was approved by management teams in both UF's Finance and Accounting Division (F&A) and Bridges IT department. Diagram 1 illustrates this process on the next page (page 5).

Diagram 1: Voucher Image business process using the Fax Imaging System (FIS)



GOLD: 600 departments	GRAY: Hardware	BLUE: Disbursement Services
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Design, Part II: Functional Requirements & Features List

This analysis consisted of several fact finding meetings where the Project Team analyzed and documented exactly what the proposed solution must accomplish, including functional and behavioral needs and capabilities, operational requirements, prototypes and security. The following functional requirements and features were developed during the requirements analysis:

Departments: Departments need an efficient and expedient method to submit support documentation for the voucher review process to Disbursement Services. Instead of sending support documentation via inter-department campus mail, departments fax the documents to a central office on campus. Departments may include multiple sets of support documentation in one fax. With the right security role(s), departments need the ability to view all images associated with a voucher ID in IBM Content Manager from PeopleSoft's Voucher Entry and Voucher Approval pages. Options to enhance the image quality need to include zoom in/out, rotate images or select a specific image from a set of images.

Electronic Images: Once a department faxes the support documentation, the electronic image must be available from IBM Content Manager and PeopleSoft.

Disbursement Services: Disbursement Services needs to receive and review the faxed image before it is available for departments to view in PeopleSoft. Options to enhance the image quality include resizing, deleting, inserting notes or comments on the image or re-associating the image. Disbursement Services must be able to manage the images after they are sent to the file server for storage, including the ability to query the data.

Design, Part III: Technical Requirements & Design


In order to determine the most appropriate technical design for the Fax Imaging System (FIS), the Project Team started by analyzing the current scanning and imaging process used by Disbursement Services. The current process was implemented eight years ago and uses IBM Content Manager to store the scanned images. After evaluating IBM Content Manager, the Project Team determined that it met all imaging requirements for the FIS project in addition to providing an integrated solution to PeopleSoft. As a result, the Project Team decided to use a modified version of the existing voucher image process as part of the FIS design.

A diagram illustrating the departments that support the FIS is available at the end of this section (page 10). The Project Team incorporated the following technical requirements to the FIS design:

Requirement 1: Each department must own a fax machine or be able to access a fax machine.

Requirement 2: Install incoming telephone lines to meet the demand of fax loads during peak times of the year.

Requirement 3: The following servers are required in order to support the interface between the fax machines and IBM Content Manager:

 **Bridges Fax Server:** This server stores the fax image file received from the department's fax machine. A program runs on the server and polls the incoming directory and then processes any new files it finds. Images are written to a secure WebDav server.

✚ **WebDav Server:** This server is used for security purposes only. The Bridges fax server and the Kofax server are protected by separate firewalls, and the WebDav server links the two together.

✚ **Kofax Server:** This server retrieves the images from WebDav, allows users to enhance image quality and then sends the images to IBM Content Manager.

Requirement 4: Interface IBM Content Manager with PeopleSoft’s Account Payable module using a standard configuration in IBM Content Manager, barcode software and two simple customizations in PeopleSoft. PeopleSoft customizations and the barcode software are described below:

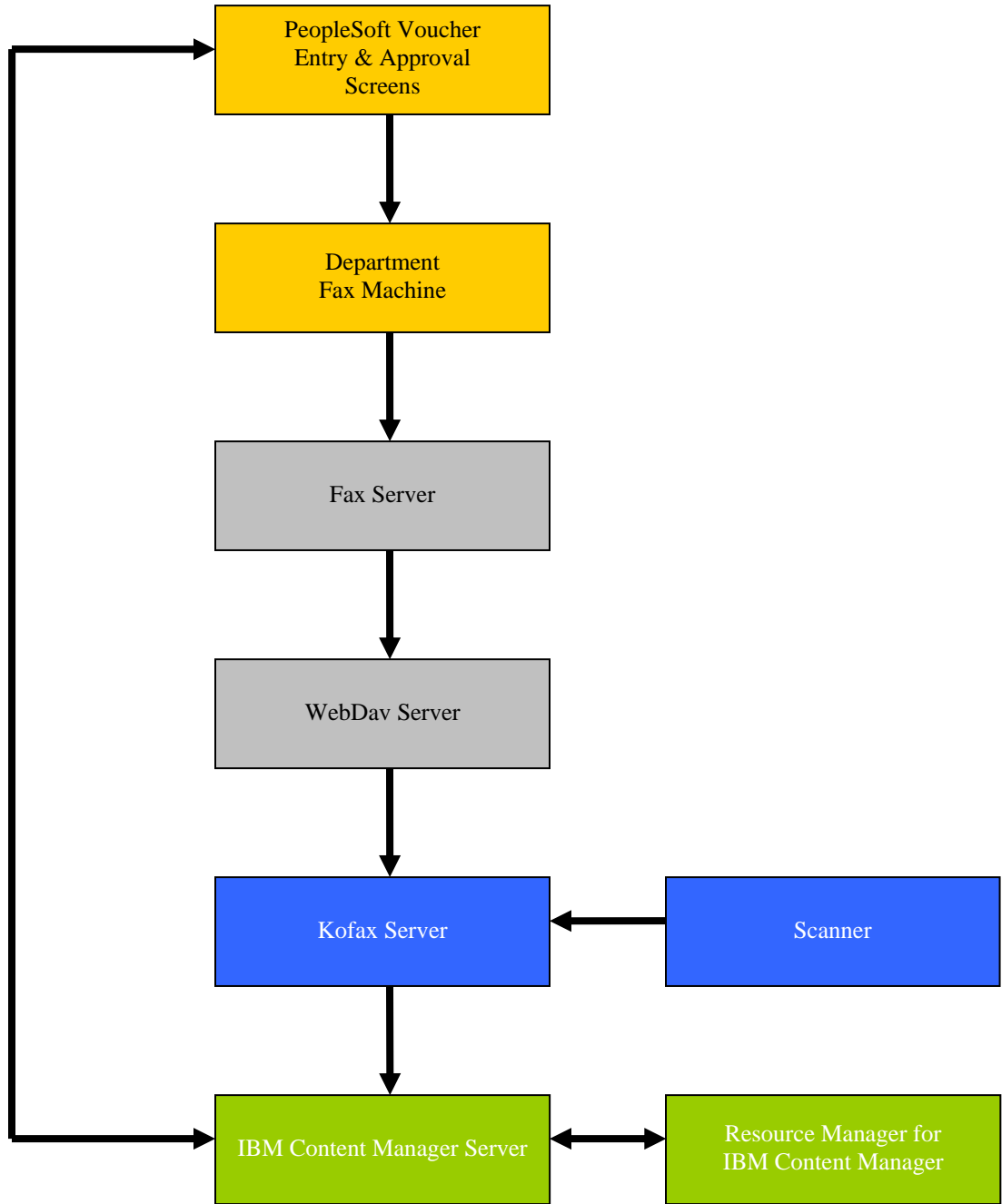
✚ **PeopleSoft Voucher Entry Screen:** The modification to this PeopleSoft screen allows departments to print a fax cover sheet with the barcode containing index information that associates the support documentation with the voucher in PeopleSoft. There was no mechanism in the current voucher entry process to pass the PeopleSoft Voucher ID to IBM Content Manager. IBM Content Manager must use the Voucher ID generated in PeopleSoft in order to create the index that links the vouchers in PeopleSoft to the images in IBM Content Manager.

✚ **PeopleSoft Voucher Approval Screen:** The modification to this PeopleSoft screen allows departments to view the support documentation in PeopleSoft with a “View Image” button. The “View Image” button in PeopleSoft retrieves the images in IBM Content Manager based on the index information in the barcode.

✚ **Barcode Software:** Use barcode software to create the mechanism that passes the Voucher ID generated in PeopleSoft to IBM Content Manager. Java4Less PHP Barcode

software generates the barcode images that contain the index information printed on the fax cover sheets. Once the barcode image is created, Tasman Barcode Reader API resides on the fax server, which reads and interprets the barcode on the fax cover sheet. This created a new step in the voucher entry process: a hyperlink was added to the Voucher Entry screen which allows departments to create the barcode image on a fax cover sheet. The departments are then instructed to print the image and to attach it to the hard copy before faxing. Departments fax multiple packets of support documentation in one fax session by inserting the barcode cover sheet between each packet. The barcode cover sheet allows the Bridges fax server to distinguish different packets of support documentation by voucher ID in order to store them in separate files.

Diagram 2: Voucher Image technical process shared by departments across campus



GOLD: 600 Departments	BLUE: Disbursement Services
GRAY: Bridges IT Department	GREEN: CNS IT Department

Design, Part IV: One-time & Recurring Costs

One-Time Costs: The following items are one-time costs to meet the needs of the Fax Imaging System.

Item	Amount
Fax Software License Base cost	\$5,985
Software, cost per channel \$1,095 x 32 fax lines	\$35,040
Tasman Barcode Reader API	\$875
Java4Less PHP Barcode generator	\$93
T1 Fax Card for Cisco router 2 x \$1,300	\$2,600
Fax Imaging Server	\$6,000
Total	\$50,593

Recurring Costs: The following items are recurring costs to support the Fax Imaging System.

Item	Amount
Fax Software Support Contract	\$5,577
2 T1-PRI x \$250 Month x 12 Months	\$6,000
80 GB storage approximate	\$1,000
Support of Fax Imaging Server	\$2,000
Total	\$14,577

Note: Costs for existing resources, such as Kofax server, department fax machines, IBM Content Manager and WebDav are supported separately.

Implementation

The implementation of the Fax Imaging System (FIS) included a variety of communication efforts, multiple testing phases and minimal training efforts. The Fax Imaging System went live on May 28, 2007. The initial Project Team consisted of three members who were tasked with defining the requirements of the project: Julian Christie – Project Manager (Bridges), Brennan Folmer – Infrastructure (Bridges) and Randy Staples – Associate Controller (Disbursement Services).

Once requirements were finalized and approved, the design began and Lee Stevens – Developer & Architect (Bridges) joined the Team. The following Team members joined during the later stages of the project: Barb Sedesse – Technical Lead (CNS), Willy Rechsteiner – Developer (CNS), Joe Gasper – IT Specialist (Disbursement Services), Glen Hordemann – Developer (Bridges) and Seth Wonder – Infrastructure (Bridges).

Communication: Communication to campus about the FIS started six months prior to go-live. The communication strategy was designed to spread the word about the FIS project across campus before go-live so that departments were “in the know” about progress and expected the FIS go-live in May. Information and project updates about the FIS were presented at the Finance & Accounting Roundtable, a quarterly meeting for business officers from all offices and units across campus in addition to other business meetings hosted by various departments and colleges on campus. Additional communication efforts were done after go-live to evaluate user-adoption rates and follow-up with departments who were continuing to submit support documentation via campus mail. Follow-up efforts were done using mass email to listservs, individual email and phone calls to drive user adoption, which hit 90% during the first month after go-live.

Testing: Testing phases were implemented simultaneously with the communications campaign, including system testing, user acceptance testing and load testing. A description of each follows:

✚ **System Testing:** Bridges conducted system testing to ensure the process was sound and all interface points and file transfer points were working correctly, end to end.

✚ **User Acceptance Testing:** A “soft rollout” to 25 departments was implemented during this testing phase. End-users in the departments started using the FIS one month prior to go-live by faxing support documentation to the Beta testing environment. Not only did this testing phase establish that the system worked well and was user-friendly, but it also generated the content needed for training materials. After the process was determined to be working as designed, tuning and timing were reviewed.

✚ **Load Testing:** It was critical to perform load testing on the Bridges Fax Server to determine the system response time during periods when high volumes of files are transmitted. Load testing determined that it takes 5 seconds per page during peak times. The following statistics were gathered from the Beta load tests: 1,342 total pages were faxed in 470 voucher submissions, resulting in 116 fax files. This load took 270 seconds (total time, includes a 5 second file settling time delay), resulting in 4.97 pages per second.

Training: Minimal training was required prior to go-live because most personnel already know how to use a fax machine. The key training element was redefining the steps in the voucher entry process, and was done via email to various listservs.

Benefits

Many communities on campus benefit from the Fax Imaging System (FIS). Not only does the FIS significantly improve the efficiency of information flow at the University, it also saves valuable time, money and natural resources associated with processing invoices and payment vouchers.

The time required to process voucher approvals dropped from five business days to two. Expediting the voucher approval increases the efficiency of Disbursement Services operating procedures, and departments are able to reconcile accounts more quickly. Disbursement Services is able to reallocate the 7 FTE previously required for scanning and imaging tasks, yielding \$189,280 in opportunity savings per year (7 FTE at \$10/hr with 30% fringe benefits). In addition, time is no longer wasted tracking down paper lost in campus mail. Departments have an efficient method to verify whether or not Disbursement Services received support documentation because the scanned images are available in PeopleSoft within 15 minutes of sending the fax.

By using IBM Content Manager as the image repository, departments view historical images collected in IBM Content Manager since PeopleSoft went live in June of 2004 as well images received via fax since the FIS went live in May of 2007. Departments no longer send 1.8 million paper documents to Disbursement Services each year. At three cents per copy, that translates to \$54,000. Now that the FIS is in place, the University can use this system to simplify other processes that require paper documentation, such as HR hiring documentation and support documentation from treasury management, cashiering, travel expense reports and p-cards.

Retrospect

Organizations interested in adopting a Fax Imaging System should start planning and design phases by exploring answers to the following questions:

- ✚ What documents are retained for voucher payment?
- ✚ What business processes maintain required documents for voucher payment?
- ✚ What technology currently exists for document imaging and retrieval?
- ✚ What capabilities are required for image improvement, voucher approval and access to previously stored documents and images?
- ✚ What offices will operate components of the proposed solution?
- ✚ Have they been involved in the design and development of the new solution?
- ✚ How much time and effort is saved by implementing a Fax Imaging System (FIS)? How does this translate into cost saving? What does it cost to implement and operate a FIS?
- ✚ What is the relationship between the business and the technologists?
- ✚ Are your requirements clear?
- ✚ Can technologists explain in clear language what they are doing, how much it costs, how it will be tested and when it will be finished?
- ✚ What is the expected volume of images for the FIS by day and by week?
- ✚ What is the busiest time of the year? Will the solution handle busy times?