


Office of Inspector General
U.S. House of Representatives
Washington, DC 20515-9990

MEMORANDUM

TO: James M. Eagen III
Chief Administrative Officer

FROM: 
Robert B. Frey III
Deputy Inspector General

DATE: July 7, 1999

SUBJECT: Management Advisory Report - Optical Imagery Records Management System Evaluation (Report No. 99-CAO-05)

This is our final report on Optical Imagery Records Management System Evaluation. The objective of this evaluation was to analyze the system alternatives for replacing the Optical Imagery Records Management Systems (OIRMS) application in the Office of Human Resources with electronic filing, document imaging, and workflow technologies. In this report, we discussed areas where safeguards could be implemented to mitigate the risk to the current application. We also discussed a number of information technology solutions that could replace the current OIRMS application. Accordingly, we identified recommended actions with respect to the maintenance and replacement of this current application.

In your May 18, 1999 response to our draft report, your office agreed with our findings and recommended actions. This management response is incorporated in this final report and included in its entirety as an appendix. The corrective actions taken and planned by your office are appropriate and, when fully implemented, should adequately respond to the recommended actions.

We appreciate the courtesy and cooperation extended to us by your staff. If you have any questions or require additional information regarding this report, please call me or Christian Hendricks at (202) 226-1250.

cc: Speaker of the House
Majority Leader of the House
Minority Leader of the House
Chairman, Committee on House Administration
Ranking Minority Member, Committee on House Administration
Members, Committee on House Administration

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OPTICAL IMAGERY RECORDS MANAGEMENT SYSTEM EVALUATION

I. INTRODUCTION

This report presents the results of the evaluation of the system options for replacing the Optical Imagery Records Management Systems (OIRMS) application in the Office of Human Resources (OHR) with electronic filing, document imaging, and workflow technologies. The report includes the following: (1) a needs statement that presents the high-level business needs for a replacement system, (2) an assessment of the system risks associated with the OIRMS application, (3) a feasibility study of viable options for replacing the system, (4) a cost-benefit analysis of implementing viable options to replace the OIRMS application, and (5) a recommended course of action for utilizing the results of this evaluation.

This evaluation was conducted by the Office of the Inspector General (OIG) utilizing the services of PricewaterhouseCoopers (PwC). The OHR assisted the OIG by providing information to facilitate the completion and validate the results of this evaluation.

Background

This OHR provides overall Human Resource (HR) management services to House Members, House Officers, and House employees. The Office was established at the beginning of the 104th Congress in 1995 and is responsible for operating and maintaining the OIRMS application. The OHR consists of the following Offices: Employee Assistance, Member Services, Payroll, Personnel and Benefits, Policy and Administration, and Training. The OHR adheres to the regulations and policies of the Office of Personnel Management (OPM), but unlike other branches of the U.S. Government, records of House employees remain the property of the House, not the OPM.

The OHR uses the OIRMS to store and manage HR related records for employees of the House Officers and other House employees¹. All post-1984 House payroll and personnel information is maintained in the OIRMS and contains what is considered to be the employee's Official Personnel File². The application's primary component is FileNet, a commercially available imaging software application. The FileNet system was installed in 1987 and all associated software and hardware was upgraded or replaced in 1996. The FileNet software is used to scan hard copy forms, retain document images, and display document images based on query criteria submitted by system users. The OIRMS also has a custom interface with the House's

¹ For purposes of this evaluation, House employees refer to employees of the House Officers (i.e., Sergeant at Arms, Office of the Clerk, Chief Administrative Officer, and Office of the Inspector General) and employees of Members and Committees. The Office of Member Services, within OHR, handles HR management of the House Members. House Member information is maintained in a separate application than that of House Officers and other House employees.

² The Official Personnel File as defined by the Committee on House Administration includes information pertaining to payroll and financial actions, appointments and separation actions, employee benefit actions, and completed annual attendance and leave records.

Financial Management System (FMS) that is used to validate indexing information entered into OIRMS. The House Information Resources (HIR) department maintains the FMS system and the interface to the OIRMS. OHR Personnel and Benefits and Payroll staff are the only staff authorized to access the OIRMS.

The detailed overview of the OIRMS application can be found in Exhibit 1, *Application Overview*.

Objective, Scope, And Methodology

The objective of this evaluation was to analyze the system alternatives for replacing the OHR's OIRMS application. The system alternatives focused on the functional and technical feasibility, costs-benefits, and risks of utilizing electronic filing, document imaging and workflow technologies to meet the needs and deficiencies of the existing OIRMS application. The evaluation of the OIRMS application included the performance of the tasks listed below. These tasks were completed in accordance with the House's System Development Life Cycle (SDLC), dated June 28, 1996, which implements procedures detailed in the U.S. Department of Commerce, National Bureau of Standards, Special Publication 500-153, *Guide to Auditing for Controls and Security: A System Development Life Cycle Approach*. Our evaluation approach included the following steps:

- **Gain Understanding of the Application.** Data was collected to gain an understanding of the mission that the applications support, the functionality, business processes, and identify the organizations that use and support the applications. The detailed methodology and results of this task can be found in Exhibit 1, *Application Overview*.
- **Prepare a Needs Statement.** Data was collected to identify deficiencies in existing application capabilities, new or changed program needs, and overall high-level business needs of the application as they relate to the OHR's mission. The detailed methodology and results of this task can be found in Exhibit 2, *Needs Statement*.
- **Conduct a Risk Assessment.** Data was collected to identify the threats to data and assets, the potential impact of those threats, system vulnerabilities, and existing safeguards of the current internal control and security environment of the applications. The detailed methodology and results of this task can be found in Exhibit 3, *Risk Assessment*.
- **Prepare a Feasibility Study.** Based on the analysis of the data collected in the needs statement and risk assessment tasks, a feasibility study was performed. The feasibility study included analyzing the needs, defining evaluation criteria, identifying a range of potential alternatives, and selecting and developing system alternatives. The detailed methodology and results of this task can be found in Exhibit 4, *Feasibility Study*.
- **Conduct a Cost-Benefit Analysis.** The scope of this evaluation included a cost-benefit analysis of the system alternatives identified in the feasibility study. The detailed methodology and results of this task can be found in Exhibit 5, *Cost-Benefit Analysis*.

The work completed in this evaluation was based on the following overall assumptions and constraints:

- **Reliance on OHR staff for information.** Information was provided about the current OIRMS application and the associated business processes by OHR staff during this evaluation. It is assumed that all information provided by OHR staff was factual and accurate.
- **Implementation of HR/Payroll system.** The OHR will be replacing the existing payroll system with a new combined HR/Payroll solution. As part of the HR/Payroll solution, it is assumed that a HR database will be implemented in the OHR that will be the official source of all House employee data. It is also assumed that the new HR/Payroll system will meet the needs listed in *United States House of Representatives Payroll/Human Resource Information System Requirements*³. A number of those requirements relating to data management and document processing overlap with the needs of the OIRMS. Examples of the related requirements include:
 - Support the option of being able to roll out functionality to multiple offices using a world wide web (WWW) architecture.
 - Support electronic routing and workflow.
 - Effectively support multiple concurrent users.
- **Use of Commercial-off-the-Shelf Applications.** The House's Information Systems Program Plan, Management Policy for SDLC, states the desire to move towards use of Commercial-off-the-Shelf (COTS) applications. It is assumed that COTS applications are the desired solution rather than an internally developed system. For this analysis, COTS applications include solutions that may require significant customization using commercially available software and development tools in order to meet the House's needs.

³ The *United States House of Representatives Payroll/Human Resource Information System Requirements* document presents requirements for a new HR/Payroll solution. It contains 126 detailed requirements that any new solution must meet. Changes in the HR/Payroll schedule or requirements may impact the OIRMS solution.

- **Implementation time frame.** Any potential alternative to replace the OIRMS must be implemented in conjunction with the schedule for replacing the current HR/Payroll system. Due to the interdependence between the HR/Payroll and the OIRMS replacement system, the time frame for the implementation of the OIRMS replacement system is dependent on the selection and implementation of the HR/Payroll solution⁴. The HR/Payroll solution, combined with the OIRMS replacement system, will provide the comprehensive HR/Payroll solution for the OHR.
- **Adherence to Federal HR Initiatives.** The alternatives should comply with Federal mandates and requirements relating to HR. Recent initiatives that impact the OIRMS replacement system include: (1) the Joint Financial Management Improvement Program (JFMIP)⁵ draft Human Resources and Payroll Systems Requirements document which provides guidance to Federal agencies implementing HR/payroll systems, (2) an Interagency task force reviewing the Federal policy on electronic signature, and (3) the OPM task force review of Official Personnel File (OPF) standards throughout the Federal Government, which included standards for electronic OPFs.
- **Scalable.** The potential alternatives must be scalable to meet all needs. Any potential alternative must be able to accommodate increases in technology or increases in the size and scope of information retained in the system. For the purposes of this evaluation any proposed system alternative must be scalable to meet other business needs (i.e., introduction of new HR forms) within the OHR's domain.
- **Outsourcing.** Outsourcing is not a feasible option to consider when evaluating the potential system solutions to replace the current OIRMS application. All House employee records must stay within the physical and logical jurisdiction of the House. This constraint was provided by CAO management during the course of the evaluation.

This evaluation was conducted during the period October 1998 through April 1999.

II. RESULTS OF STUDY

In this section, the results of the OIRMS evaluation are presented. The summary includes: (1) a needs statement that presents the high-level business needs for a replacement system, (2) a risk assessment associated with the OIRMS application, (3) a feasibility study of viable options for replacing the application, and (4) a cost-benefit analysis for implementing viable options to replace the OIRMS application. Lastly, recommendations for utilizing the results of this evaluation are also presented.

⁴ The current projected completion date for the HR/Payroll solution is the fourth quarter of 2000. However, a HR/Payroll solution has not been selected. Therefore, the implementation date of the HR/Payroll system is subject to change based upon selection of the HR/Payroll solution.

⁵ JFMIP is a joint cooperative undertaking of several federal agencies to improve financial management practices throughout government. The JFMIP draft presents high-level requirements that are intended to assist agencies in implementing effective and efficient systems.

Needs Statement

The purpose of the needs statement was to identify the deficiencies in existing capabilities, new or changed program needs, and overall high-level business needs of the OIRMS application as they relate to the OHR's mission. The needs statement also identifies opportunities for increased economy and efficiency, and provides justification for exploring alternative solutions.

The needs statement was developed based on the analysis of data collected from staff of the OHR. The results of the needs statement included:

- **Deficiencies.** Deficiencies were identified with the OIRMS application and the associated processes. These deficiencies can be summarized as: reliance on an antiquated and unstable system (Financial Management System) for validation, inefficiencies and errors associated with the processing of House HR information, inefficient forms management procedures, lack of a centralized location for HR data, redundant retention of information in OIRMS, limited ability to generate reports and to perform advanced queries, inefficient OIRMS backup procedures, proprietary nature of OIRMS, and no integrated HR information system.
- **Program Needs.** The system should be able to interface with the new HR/Payroll solution. The system should be flexible enough to allow efficient response to changes in Federal HR mandates regarding system needs, without considerable rework of the system and associated business processes.
- **High-Level Business Needs.** The system should provide for the capabilities identified in Figure 1: High-Level Business Needs Summary on the following page. The functionality is divided into categories, with a corresponding description of each category.

Criterion Capability	Description
Input	<ul style="list-style-type: none"> • Ability to automate the entry of House HR information (e.g., HR data or related correspondence).
Processing	<ul style="list-style-type: none"> • Ability for system to validate entry of HR information. • Allow for modification of HR records through on-line access or other sources (e.g., Internet/Intranet). • Ability to provide a history of changes made to House employee HR data. • Ability to file HR information consistent with Federal regulations. • Ability to record receipt of relevant HR hard copy documents.
Output	<ul style="list-style-type: none"> • Ability to reproduce stored HR data in print and electronic formats. • Allow for high speed printing of HR data in a user defined sort order.
Query and Reports	<ul style="list-style-type: none"> • Ability to produce reports based on user defined queries. • Ability to simultaneously view multiple House employees' records.
Storage	<ul style="list-style-type: none"> • Ability to track House HR data from initial receipt to archival. • Ability to perform automated backup of all electronic records. • Ability to maintain images in a non-proprietary data format.
Technology	<ul style="list-style-type: none"> • Provide for interoperability with other technologies and systems that provide input/output of HR data. • Provide scalability to accommodate increases in size and uses of system. • Ability to accommodate advances in hardware and software technologies. • Provide ability for simultaneous access by large user population (e.g., 10,000 House employees).
Application Controls and Security	<ul style="list-style-type: none"> • Ability to prevent unauthorized access to data and system. • Ability to track usage information for system users. • Ability to protect HR data during electronic input, processing, and storage.

Figure 1: High-Level Business Needs Summary

The detailed methodology and results of this task can be found in Exhibit 2, *Needs Statement*.

Risk Assessment

The purpose of the risk assessment was to (1) identify threats to data and assets, and the potential impact of those threats; (2) identify system impacts and vulnerabilities to the OIRMS application; and (3) recommend safeguards to mitigate the potential threats. Using an internal control and security diagnostic tool, an understanding of the current vulnerabilities and related safeguards was achieved. Information for the diagnostic tool was gathered through observations made during walk throughs of the systems and facilities, and from interviews with staff of the OHR and HIR.

The results of the risk assessment indicated that seven high-level threats were pertinent to the OIRMS application where the associated data may be vulnerable. These threats originate from events or people internal or external to the House. Figure 2: Summary of Risk Assessment Results on the following page presents these nine threats, the potential impacts and vulnerabilities, and recommended safeguards to minimize or eliminate the threats.

The detailed methodology and results of this task can be found in Exhibit 3, *Risk Assessment*.

Threat	Vulnerabilities	Recommended Safeguards
Acts of nature	<ul style="list-style-type: none"> No business continuity plan (BCP) within the OHR. Data center environmental controls need improvement. Opportunities exist to improve procedures governing backup and off-site tape storage. 	<ul style="list-style-type: none"> Proceed with plan to participate with CAO disaster recovery workgroup; identify recovery thresholds and resource requirements necessary for system restoration; and develop, test, and implement a BCP. Relocate system to a facility environmentally conditioned for computer equipment. Obtain network-based disaster recovery services from HIR; establish automated scripts to perform routine system backups; and institute an industry-accepted tape backup and archiving rotation scheme.
Acts of terrorism	<ul style="list-style-type: none"> No BCP within the OHR. Data center environmental controls need improvement. 	<ul style="list-style-type: none"> Proceed with plan to participate with CAO disaster recovery workgroup; identify recovery thresholds and resource requirements necessary for system restoration; and develop, test, and implement a BCP. Relocate system to a facility environmentally conditioned for computer equipment. Obtain network-based disaster recovery services from HIR; establish automated scripts to perform routine system backups; and institute an industry-accepted tape backup and archiving rotation scheme.
Data center environmental compromise (facilities)	<ul style="list-style-type: none"> No BCP within the OHR. Data center environmental controls need improvement. 	<ul style="list-style-type: none"> Proceed with plan to participate with CAO disaster recovery workgroup; identify recovery thresholds and resource requirements necessary for system restoration; and develop, test, and implement a BCP. Relocate system to a facility environmentally conditioned for computer equipment. Obtain network-based disaster recovery services from HIR; establish automated scripts to perform routine system backups; and institute an industry-accepted tape backup and archiving rotation scheme. Adopt stronger environmental controls similar to those of HIR's data center.
Software/Hardware failure	<ul style="list-style-type: none"> No BCP within the OHR. Data center environmental controls need improvement. Current system "halts" when storage capacity reaches maximum capacity. Only one scanner to handle workflow of incoming forms. 	<ul style="list-style-type: none"> Proceed with plan to participate with CAO disaster recovery workgroup; identify recovery thresholds and resource requirements necessary for system restoration; and develop, test, and implement a BCP. Relocate system to a facility environmentally conditioned for computer equipment. Obtain network-based disaster recovery services from HIR; establish automated scripts to perform routine system backups; and institute an industry-accepted tape backup and archiving rotation scheme. Implement automated notification when storage nears capacity. Ensure that a secondary scanning device is readily available.
Intentional acts by House staff	<ul style="list-style-type: none"> No formal user access request and revocation processes are in place. 	<ul style="list-style-type: none"> Establish formal processes governing user access request and timely revocation of users accounts.
Human error by staff	<ul style="list-style-type: none"> Vendor-specific security standards, policies, and procedures do not exist. No formal user access request and revocation processes are in place. Current user community has not received formal security awareness training. Official user data ownership and classification designations are not formally in place. 	<ul style="list-style-type: none"> With HIR oversight and guidance, develop and implement security standards, policies and procedures specific to vendor product. Establish formal processes governing user access request and timely revocation of users accounts. Proceed with HIR Security Office plans to formalize an entity-wide security awareness program. Proceed with HIR Security Office plans to establish a House-wide data classification program.

Figure 2: Summary of Risk Assessment Results

Threat	Vulnerabilities	Recommended Safeguards
Logical/physical penetration to data center by unauthorized public users	<ul style="list-style-type: none"> • Modems facilitate remote access to FileNet server and user workstations. • Unauthorized “telnet” access via Internet is possible. • Lack of integrated security mechanisms (i.e., audit trail mechanisms and password syntax requirements). • No segregation of system access based on job responsibilities. • Weak security configuration for UNIX environment. No staff with requisite UNIX skills. • Means to detect network intrusions directed at current system do not exist. 	<ul style="list-style-type: none"> • Implement more secure HIR dial-in methods (e.g., secureID). • “Unplug” desktop modems. • Implement technical service-filtering tool. • Implement security mechanisms (i.e., audit trail facility, password syntax restrictions, and password history functionality, password change, automatic logoff, time of day/day of week restrictions). • Perform a user requirement analysis to identify the access needs of various users; establish group profiles based on this analysis. • Subject the UNIX environment to a comprehensive security review. Implement the following: disable the “guest” account, change the system administrator password on a periodic basis, and establish distinct system administrator accounts. Also, retain staff with requisite UNIX skills. • Proceed with the HIR Security Office effort to implement a network-wide intrusion detection capability.

Figure 2: Summary of Risk Assessment Results (continued)

Feasibility Study

The purpose of the feasibility study was to identify viable alternatives to the existing system. The feasibility study was intended to provide management with information to make decisions to analyze and evaluate alternative systems to satisfy the OHR mission.

The feasibility study presented three specific alternatives that would serve as implementation scenarios for further evaluation. The rationale used to group the viable alternatives was to provide the OHR with a range of viable alternatives to consider and an analysis of viable technologies. The three alternatives selected for further evaluation in Exhibit 4, *Feasibility Study* include the following:

- **New Imaging System/Workflow system.** This alternative would include the implementation of a new client-server based imaging system with advanced form processing functionality (i.e., OCR/ICR, workflow). A forms-based application would be implemented that would enable employees to complete House HR forms on-line and print the hard copy forms for submission to the OHR.
- **Electronic Filing via Web-Based Forms Application.** This alternative includes the implementation of a web-based forms application with functionality that allows for electronic submission of OPM and House HR information via the House Intranet. A workflow application, which would route submitted information directly to the database or to an appropriate official for processing, is also included in this alternative.
- **Electronic Filing and Enhanced Employee Self-Service Capabilities.** This alternative includes functionality that provides enhanced self-service capabilities for House employees. These capabilities give House employees the ability to view, update and submit OPM and House HR information via the House Intranet through use of a web-based forms application. A workflow application, which would route submitted forms directly to the database or to an appropriate official for processing, is also included in this alternative.

The detailed methodology and results of this task can be found in Exhibit 4, *Feasibility Study*.

Cost-Benefit Analysis

The purpose of the cost-benefit analysis was to analyze the viable system alternatives detailed in the feasibility study and examine the costs and benefits for implementing each alternative. The cost-benefit analysis included: (1) a cost analysis of the existing system and each alternative, (2) a cost sensitivity analysis to analyze the impact of changes in assumptions on the cost differences of the alternatives, (3) an analysis of qualitative (or non-quantitative) factors, and (4) an analysis of financial measures relevant to the costs for the alternatives.

Cost Analysis

Figure 3: Existing System and Alternative Cost Analysis presents a summary of the non-recurring and recurring cost estimates for the existing system and the three viable system alternatives. The figure presents 5-year total cost estimates discounted using a present value calculation to provide overall 5-year life cycle cost estimates for the existing system and each alternative.

Cost Factor	Existing System	Alternative 1 New Imaging/Workflow System	Alternative 2 Electronic Filing Via Web-Based Forms Application	Alternative 3 Electronic Filing and Enhanced Employee Self-Service Capabilities
I. Non-Recurring Costs				
Conversion Services	\$0	\$100,000	\$100,000	\$100,000
Software Integration/Testing	\$0	\$315,000	\$427,000	\$517,000
Software Customization	\$0	\$91,000	\$150,000	\$150,000
Hardware Purchase	\$0	\$214,000	\$161,000	\$161,000
Software Purchase	\$0	\$398,000	\$839,000	\$839,000
Training (OHR Users)	\$0	\$22,000	\$15,000	\$15,000
Training (House Employees)	\$0	\$46,000	\$46,000	\$46,000
Total Non-Recurring Costs	\$0	\$1,186,000	\$1,738,000	\$1,828,000
2. Recurring Costs (5-Year Net Present Value)				
Personnel Salaries and Fringe Benefits				
Office of Personnel and Benefits	\$3,427,000	\$3,218,000	\$2,608,000	\$1,804,000
Office of Payroll	\$1,711,000	\$1,711,000	\$1,711,000	\$1,711,000
House Information Resources	\$5,000	\$5,000	\$5,000	\$5,000
Hardware (Purchase and Maintenance)				
Optical Disc Jukebox Maintenance	\$117,000	\$0	\$0	\$0
Scanner Maintenance	\$2,000	\$0	\$0	\$0
New Scanner Maintenance	\$0	\$3,000	\$0	\$0
Server Maintenance	\$2,000	\$37,000	\$37,000	\$37,000
Optical Platter Purchase	\$9,000	\$2,000	\$0	\$0
Magnetic Disc Purchase	\$0	\$13,000	\$0	\$0
Optical Drive Maintenance	\$0	\$4,000	\$4,000	\$4,000
High-Speed Printer Maintenance	\$0	\$41,000	\$41,000	\$41,000
Software (License and Maintenance)				
Imaging System Software License/Maintenance	\$181,000	\$0	\$0	\$0
New Imaging System Software License/Maintenance	\$0	\$72,000	\$0	\$0
Online Forms Software License/Maintenance	\$0	\$220,000	\$291,000	\$291,000
Workflow Software License/Maintenance	\$0	\$0	\$327,000	\$327,000
OCR/ICR Software License/Maintenance	\$0	\$7,000	\$0	\$0
Backup Software License/Maintenance	\$0	\$4,000	\$4,000	\$4,000
Total Recurring Costs (5-Year Net Present Value)	\$5,454,000	\$5,337,000	\$5,028,000	\$4,224,000
Total Estimated Costs	\$5,454,000	\$6,523,000	\$6,766,000	\$6,052,000

Figure 3: Existing System and Alternative Cost Analysis

The results of the cost-analysis indicate that, despite lower recurring costs, the estimated net present value of each alternative system is more expensive than the existing system over the 5-year period. However, the alternatives do provide additional functionality over the existing system and better meet the evaluation criteria defined in this evaluation, as presented in Exhibit 4, *Feasibility Study*.

The following discussion presents the cost-analysis for the existing system and each of the three viable alternatives. The costs presented are preliminary estimates and can be considered minimum costs that could be incurred in implementing and maintaining each alternative. Additionally, actual implementation of the alternatives may result in varied functionality and different technical components than those presented in this evaluation and would therefore differ in cost.

The total estimated costs for **Alternative 1: New Imaging/Workflow System** are higher than the existing system over the 5-year period because of non-recurring implementation costs. Despite higher software maintenance costs for this alternative, estimated savings in hardware maintenance and labor efficiencies could result in net recurring costs that are lower than the existing system. Estimated labor efficiencies (in terms of salaries and benefits) are associated with a potential reduction in forms requiring subsequent follow up submitted by House employees. The use of on-line forms could also provide additional benefits not included in the evaluation⁶.

The total estimated costs for **Alternative 2: Electronic Filing Via Web-Based Forms Application** are higher than the existing system over the 5-year period because of the non-recurring implementation costs. Despite higher software maintenance costs for this alternative, estimated savings in hardware maintenance and labor efficiencies could result in net recurring costs that are lower than the existing system. Estimated labor efficiencies (in terms of salaries and benefits) are associated with a reduction in forms requiring subsequent follow up submitted by House employees, time saved processing forms, and the elimination of the scanning function. This alternative is more expensive than Alternative 1 primarily because of the purchase and maintenance of stand-alone workflow software.

Alternative 3: Electronic Filing and Enhanced Self-Service Capabilities provides the greatest functionality and most potential labor efficiencies, and thus is also the least expensive of the three alternatives over a 5-year period. The total estimated costs for this alternative are higher than the existing system over the 5-year period because of the non-recurring implementation costs. Despite higher software maintenance costs for this alternative, estimated savings in hardware maintenance and labor efficiencies could result in net recurring costs that are lower than the existing system. Estimated labor efficiencies (in terms of salaries and benefits) are associated with a reduction in forms requiring subsequent follow up submitted by House employees, time saved processing forms, the elimination of the scanning function, and the

⁶ For all three alternatives, the addition of on-line forms could reduce annual printing and mailing costs. Information typically mailed to House employees, such as blank forms and administrative booklets, could be placed on the House Intranet. The bulk of these savings could come with the elimination of the need for open-season mass mailings. These potential savings are not included in this analysis because House mailing and printing expenses are not all tracked in a method that could be used in this evaluation.

generation of less HR questions because employees would now have direct access to more information. Total non-recurring costs for this alternative are more than those in Alternative 2 due to higher software integration costs associated with the addition of full employee self-service functionality.

Cost Sensitivity Analysis

A sensitivity analysis was conducted on the estimated costs (non-recurring and recurring) for the three viable alternatives analyzed in this evaluation. The objective of the sensitivity analysis was to analyze changes to assumptions and to determine the impact on the overall cost of the alternatives. Two scenarios were developed for the sensitivity analysis: On-line Forms and Electronic Filing Efficiency Gains, and Increased Transition Costs. These scenarios are presented below.

On-line Forms, Electronic Filing, and Self-Service Efficiency Gains. With the introduction of an on-line forms application, electronic filing capabilities and employee self-service, efficiencies may be realized with regards to the House HR function and processes. It is estimated that efficiencies could potentially occur primarily as a result of the following:

- a reduction in time to follow up with House employees to correct errors in submitted HR forms,
- a reduction in the total time to process, scan, and index submitted HR forms, and
- a reduction in time to field House employee HR questions.

Each alternative includes higher estimates of these labor efficiencies, with Alternative 3 providing the highest of these efficiencies. All of these potential savings could provide annual labor efficiencies equal to or greater than one work year⁷.

In order to analyze the potential impact of efficiencies created by the increased capabilities of the alternatives, a range of potential efficiency gains were considered. For the purposes of this analysis, the estimated efficiency gains developed in this evaluation were increased by 80 percent⁸. The impact on each alternative, if there were no efficiency gains, is also analyzed.

⁷ One work year is equal to 1,720 hours.

⁸ In a project similar to that outlined in Alternative 3, Carolina Power & Light gained labor efficiencies of 76 percent due to the implementation of HR self-service functionality. This gain was 80 percent higher than the 42 percent efficiency gains estimated for Alternative 3. Therefore, for the purpose of the sensitivity analysis, labor efficiencies of all three alternatives were increased by 80 percent to analyze the effect that the greater than expected labor efficiencies would have upon each of the alternatives.

Figure 4: Sensitivity Analysis-Alternative Efficiency Gains presents the results of the sensitivity analysis for this scenario. The top section of the figure shows, for each alternative, the estimated efficiency gains as a percentage of total Personnel and Benefits administrator staff time saved⁹. The bottom section of the figure shows, for each alternative, the estimated 5-year net present value (NPV) of the Personnel and Benefits administrator staff salaries and benefits, taking into consideration the dollar value of time saved by increased labor efficiencies.

Estimated Efficiency Gains (as percentage of time saved)	Alternative 1	Alternative 2	Alternative 3
Estimated Efficiency Gains (shown in report)	7%	16%	42%
Increased Estimated Efficiency Gains (by 80%)	12%	28%	76%
Without Efficiency Gains	0%	0%	0%
Personnel & Benefits Administrator Personnel Costs (5-Year NPV)	Alternative 1	Alternative 2	Alternative 3
Estimated Efficiency Gains	\$2,812,000	\$2,551,000	\$1,747,000
Increased Estimated Efficiency Gains (by 80%)	\$2,644,000	\$2,174,000	\$725,000
Without Efficiency Gains	\$3,021,000	\$3,021,000	\$3,021,000

Figure 4: Sensitivity Analysis-Alternative Efficiency Gains

⁹ This refers to the Office of Personnel and Benefits staff whom actually process HR forms as they are received. This staff category does not include the scanning administrator staff. Based on interviews with Office of Personnel, there are currently 13 Office of Personnel staff responsible for processing HR forms.

Transition Cost Increases. Cost information was gathered from vendors based on the high-level business needs associated with the three viable alternatives noted in this evaluation. However, these estimated costs may differ from actual implementation costs due to the specific vendor chosen and the detailed requirements of the alternative. Therefore, a scenario was developed to examine the impacts of significantly higher implementation costs on each alternative.

The total transition costs associated with the three alternatives were increased by 50 percent to represent a scenario in which the up-front costs to implement the alternatives are significantly more expensive. Although software integration/testing, software customization and software purchase have the greatest likelihood for increase, to reflect the possible increases in all categories, the 50 percent factor was applied to the overall non-recurring charge for each alternative. Figure 5: Sensitivity Analysis - Transition Cost Increases demonstrates the impact of the cost increases on the alternatives.

Cost Factor	Existing System	Alternative 1 New Imaging/Workflow System	Alternative 2 Electronic Filing Via Web-Based Forms Application	Alternative 3 Electronic Filing and Enhanced Employee Self-Service Capabilities
1. Non-Recurring Costs				
Conversion Services	\$0	\$150,000	\$150,000	\$150,000
Software Integration/Testing	\$0	\$473,000	\$641,000	\$776,000
Software Customization	\$0	\$137,000	\$225,000	\$225,000
Hardware Purchase	\$0	\$321,000	\$242,000	\$242,000
Software Purchase	\$0	\$597,000	\$1,259,000	\$1,259,000
Training (OHR Users)	\$0	\$33,000	\$23,000	\$23,000
Training (House Employees)	\$0	\$69,000	\$69,000	\$69,000
Total Non-Recurring Costs	\$0	\$1,780,000	\$2,609,000	\$2,744,000
2. Recurring Costs (5-Year Net Present Value)				
Personnel Salaries and Fringe Benefits				
Office of Personnel and Benefits	\$3,427,000	\$3,218,000	\$2,608,000	\$1,804,000
Office of Payroll	\$1,711,000	\$1,711,000	\$1,711,000	\$1,711,000
House Information Resources	\$5,000	\$5,000	\$5,000	\$5,000
Hardware (Purchase and Maintenance)				
Optical Disc Jukebox Maintenance	\$117,000	\$0	\$0	\$0
Scanner Maintenance	\$2,000	\$0	\$0	\$0
New Scanner Maintenance	\$0	\$3,000	\$0	\$0
Server Maintenance	\$2,000	\$37,000	\$37,000	\$37,000
Optical Platter Purchase	\$9,000	\$2,000	\$0	\$0
Magnetic Disc Purchase	\$0	\$13,000	\$0	\$0
Optical Drive Maintenance	\$0	\$4,000	\$4,000	\$4,000
High-Speed Printer Maintenance	\$0	\$41,000	\$41,000	\$41,000
Software (License and Maintenance)				
Imaging System Software License/Maintenance	\$181,000	\$0	\$0	\$0
New Imaging System Software License/Maintenance	\$0	\$72,000	\$0	\$0
Online Forms Software License/Maintenance	\$0	\$220,000	\$291,000	\$291,000
Workflow Software License/Maintenance	\$0	\$0	\$327,000	\$327,000
OCR/ICR Software License/Maintenance	\$0	\$7,000	\$0	\$0
Backup Software License/Maintenance	\$0	\$4,000	\$4,000	\$4,000
Total Recurring Costs (5-Year Net Present Value)	\$5,454,000	\$5,337,000	\$5,028,000	\$4,224,000
Total Estimated Costs	\$5,454,000	\$7,117,000	\$7,637,000	\$6,968,000

Figure 5: Sensitivity Analysis - Transition Cost Increases

Qualitative Factor Analysis

In addition to the cost analysis and sensitivity analysis, we performed an assessment of qualitative, or non-quantifiable, factors for the system alternatives. The qualitative analysis was intended to provide additional evaluation criteria to analyze the alternatives. The qualitative factors analyzed were: (1) stakeholder needs and constraints, (2) level of customer service, (3) security risk, (4) commercial acceptance of technology, (5) Office of Personnel and Benefits impact, (6) House employee impact, and (7) flexibility of system in adhering to possible changes in Federal regulations. The primary results of the qualitative analysis are:

- **Stakeholder Needs and Constraints.** The New Imaging/Workflow alternative meets all needs and constraints with the exception of automated data input and employee self-service capabilities. The Electronic Filing via Web-Based Forms Application alternative achieves all of the identified stakeholders needs and constraints, with the exception of providing employee self-service functionality, and the Electronic Filing and Enhanced Employee Self-Service Capabilities alternative satisfies all user needs and constraints.
- **Level of Customer Service.** All of the alternatives will improve the level of service the OHR can provide to its customers. The Electronic Filing and Enhanced Employee Self-Service Capabilities alternative provides the greatest potential improvement of customer service.
- **Security Risk.** The Imaging/Workflow alternative does not introduce any new security risks. The Electronic Filing via Web-Based Forms Application and the Electronic Filing and Enhanced Employee Self-Service Capabilities alternatives introduce additional security risks including the risk of non-repudiation, the protection of new technology components, and the security of the information in the HR database.
- **Commercial Acceptance of Technology.** The functionality and technology components associated with all of the alternatives have a wide commercial acceptance.
- **Office of Personnel and Benefits Impact.** Each of the alternatives impacts the current processes in the Office of Personnel and Benefits. The Electronic Filing and Enhanced Employee Self-Service Capabilities alternative provides the greatest change in the current OHR business processes.
- **House Employee Impact.** Each of the alternatives impacts House employees and HR information. The Electronic Filing and Enhanced Employee Self-Service Capabilities alternative provides the greatest impact on the House employees' HR servicing.
- **Flexibility of System in Adhering to Possible Changes in Federal Regulations.** All of the alternatives would satisfy the requirement for an electronic OPF. The Electronic Filing via Web-Based Forms Application alternative and the Electronic Filing and Enhanced Employee Self-Service Capabilities alternative would be able to adhere to regulations regarding digital signature.

A more detailed analysis of the qualitative factors associated with the alternatives is presented in Exhibit 5: *Cost-Benefit Analysis*.

Financial Analysis

To provide additional evaluation criteria to analyze the alternatives, we summarized the results of the financial analysis performed in a decision matrix shown in Figure 6: Decision Matrix for All Alternatives. The Total Cost column represents the non-recurring costs to implement each of the alternatives. The Total Benefit column shows the net present value of the recurring cost savings of each of the alternatives over a 5-year period. The Net Present Value (NPV) column calculates the difference between the Total Cost column and the Total Benefit column to provide the net present value of the combination of the non-recurring costs and the recurring benefits for each alternative. The benefit cost ratio column shows how much money the House will get back in savings over a 5-year period for each dollar it spends to implement an alternative. For example, for every dollar spent to implement Alternative 3, the House will receive a total of \$0.67 in savings over a 5-year period. The Break-Even Point column shows how long it will take for each alternative to incur savings which total more than the alternative’s initial investment costs. Only Alternative 3 will break-even within the next 10 years.

Alternatives	Total Cost	Total Benefit	NPV	Benefit-Cost Ratio	Break-Even Point
Alternative 1	(\$1,186,000)	\$117,000	(\$1,069,000)	0.10	Year 30+
Alternative 2	(\$1,738,000)	\$426,000	(\$1,312,000)	0.24	Year 22
Alternative 3	(\$1,828,000)	\$1,230,000	(\$598,000)	0.67	Year 8

Figure 6: *Decision Matrix for All Alternatives*

The detailed methodology and results of this task can be found in Exhibit 5, *Cost-Benefit Analysis*.

III. RECOMMENDED ACTIONS

The results of this study indicate that each of the three alternatives examined in the evaluation are functionally and technically viable. This evaluation also has shown that the current OIRMS is not viable because of the deficiencies noted in Exhibit 2, *Needs Statement*, thus a project to replace the existing system is justified. Because each alternative is viable and the cost differentiation across the alternatives are minor in comparison to improved efficiencies and services to stakeholders, a recommendation to implement a specific alternative is not provided. However, recommended steps for utilizing the results of the evaluation are provided. The recommended steps are categorized as:

- **Immediate.** Recommended actions that should be implemented or commenced as soon as possible, prior to initiating actions to replace the existing system.
- **System Planning, Development, and Implementation.** Recommended actions that should be taken or considered during the system planning, development, and implementation process.

The following discussion presents the specific recommendations for each of the above categories.

Immediate

The following recommendations should be implemented immediately or commenced as soon as possible.

- **Implement Recommended Safeguards.** As indicated in Exhibit 3, *Risk Assessment*, there are potential threats to the OIRMS applications that could be resolved with the implementation of security safeguards. The OHR should examine the recommended safeguards presented in the risk assessment to identify ones that can be implemented immediately to mitigate potential threats to the data and related assets of the OIRMS applications.
- **Review Combining HR/Payroll solution and OIRMS system.** Because of the planned replacement of both the current FMS and the OIRMS applications, and because of the interdependence of the two systems, consideration should be given to combining the implementation of the two solutions. The new HR/Payroll system, in conjunction with the OIRMS replacement system, can provide a comprehensive HR/Payroll solution for the OHR. The following issues support the reasoning for combining the two projects:
 - 1) As described in Exhibit 4, *Feasibility Study*, many of the requirements of the HR/Payroll project overlap with the needs identified for the OIRMS system.
 - 2) The time frame for the implementation of the OIRMS replacement system is dependent on the selection and implementation of the HR/Payroll solution. Any potential alternative to replace the OIRMS must be implemented in conjunction with the schedule for replacing the current HR/Payroll system.
 - 3) In addition, the interdependence between the two projects and the limited resources of the House and the OHR, may require the same personnel to manage the implementation of both projects.

The House and OHR should determine the impact of the interdependence between the two projects and review combining the two projects to create a total HR solution. This analysis should be done prior to beginning system development.

- **Determine HR/Payroll Solution.** The viable system alternatives are interdependent with the new HR/Payroll system. Once a decision is made regarding the HR/Payroll system, the OHR should review the impact of the selected solution on the OIRMS replacement system. It is critical to determine if the HR/Payroll system meets any of the OIRMS needs prior to beginning systems development.
- **Organize a Project Team.** The success of implementing the new total HR/Payroll solution would greatly depend on the individuals identified and dedicated to this project. A project manager should be assigned who would be directly responsible and accountable for the success of the project.

- **Review Staffing Issue.** The staffing requirements for both the HR/Payroll system and the OIRMS replacement should be analyzed to determine if a comprehensive HR/Payroll solution requires additional staffing. The personnel requirements of the two systems should be closely reviewed to determine if they should be combined. This analysis should be done prior to beginning system development.
- **Develop a Work Plan.** The success of managing and executing large-scale projects greatly relies on a sound work plan. To assist the project manager in managing and executing the implementation of the application, we suggest that a comprehensive work plan be developed. The work plan should serve as a master plan that allows the project manager to monitor progress and facilitate the reporting to the OHR, CAO, and Committee on House Administration (CHA). The work plan should identify planning, implementation, and post-implementation tasks, including the phases of the SDLC. The time frames for the completion of the tasks should be based on the level of effort required to complete the tasks and the available resources.
- **Establish a Project Budget.** In order to ensure the system solution and implementation resources can be procured in a timely manner, the OHR should develop a project budget. The cost estimates in this evaluation can be used as a basis for budget planning with respect to the implementation of the system solution. However, the OHR should be prepared to include additional costs once the application hardware and software components have been chosen subsequent to developing the detailed requirements for the system. In addition, there may be a need to factor additional costs due to any requirements for contractor support in implementing the solution in the event OHR/CAO resources are not available to support the project.

System Planning, Development, and Implementation

The following recommendations should be considered during planning, development, and implementation of the replacement system for the OIRMS application:

- **Conduct a Detailed Business Process Analysis.** It is important to perform a detailed analysis of the business processes in the OHR before proceeding with the implementation of an alternative system to replace the current OIRMS. This detailed business process analysis will allow the OHR to take full advantage of the functionality included in any of the alternatives presented in this evaluation.
- **Assess Legal Implications and Acceptability of Electronic Filing.** The legal issues surrounding the use of electronic filing of HR information involve non-repudiation and the acceptability of digital information in a court of law. Research should be undertaken to derive conclusions of the appropriateness of using electronic filing prior to investment in this technology. The OPM has members currently participating in an interagency task force on the use of electronic filing and digital signature. The OHR, in conjunction with the Committee on House Administration, should assess the findings and recommendations of the OPM task force prior to investment in this technology.

- **Petition OPM and Other Agencies.** Currently, the OPM approves requests by agencies to accept electronic versions of most HR forms in lieu of hard copies only on an exception basis. The OHR, in conjunction with other House offices and the Committee on House Administration, would need to petition the OPM for the ability to implement the electronic forms functionality as noted in this alternative. Other agencies whose HR forms House employees submit may also need to be petitioned for electronic submission in lieu of hard copy (i.e., Federal Employee Group Life Insurance (FEGLI) and the Life Insurance Beneficiary Form).
- **Assess Preferences for Use and Acceptance of Electronic Filing by OHR Customers.** Although Internet technologies have gained wide acceptance within the U.S., it is unclear to what extent OHR customers would submit HR information using electronic methods. Based on a prior survey of House employees, it has been determined that a majority of House employees feel that electronic forms processing for completing administrative functions is either important or very important.¹⁰
- **Make Decisions Regarding Implementation of Alternatives.** Although the alternatives presented in this evaluation could be implemented in phases, the OHR should make decisions regarding which alternatives to implement prior to beginning systems development. It should be noted that although the use of imaging technologies is a viable solution to meet the needs of the OHR, best practices and other research have found that this technology is not the most efficient means for addressing the deficiencies of the current system. It is critical to determine the full range of functionality offered by the alternatives presented in this evaluation prior to investment.
- **Use the House's Systems Development Lifecycle Methodology.** The OHR should follow the House's SDLC policy during systems planning, development, and implementation. This step is critical to ensuring a successful implementation.

Management Response

On May 18, 1999, the CAO agreed that the Optical Imagery Records Management System Evaluation provides reasonable parameters for determining the information technology solutions for the high-level business needs associated with the OIRMS and recommends rational courses of action for using its results (see Appendix). The CAO concurred that the current system should be replaced as recommended in this evaluation and that the timing of the replacement is critical since the presented system alternatives are interdependent on the new Human Resources/Payroll system. Finally, the CAO stated that many of the suggested safeguards for the current OIRMS system identified in the evaluation's risk assessment have been implemented.

¹⁰ Based on the U.S. House of Representatives "Results of the Customer Satisfaction Survey", dated July 18, 1995, it was found that approximately 62 percent of House employees and 76 percent of House Members feel that it is either important or very important to have access to electronic forms processing functionality.

Office of Inspector General Comments

The CAO's completed and proposed actions are responsive to the courses of actions identified and the recommended actions addressed in the risk assessment.

Exhibit 1

Exhibit 1

Application Overview

Application Overview

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Application Overview

This exhibit presents an overview of the existing Optical Imagery Records Management System (OIRMS). The overview provides a brief description of the application's background and functionality. Specifically, the overview includes:

- A description of the Office of Human Resources (OHR), which is responsible for operating and maintaining the application and the primary users of the application.
- A description of the functionality and major processes of the application.
- A table listing details for the application including the:
 - Application metrics.
 - Users/Customers.
 - Key inputs.
 - Key interfaces.
 - Key outputs.

In compiling the application overview, a two step approach was followed to collect information. The two steps involved include:

- Interviewing House staff to collect information on the application.
- Reviewing House documentation.

1.1 Optical Imagery Records Management System (OIRMS)

The OHR provides overall Human Resource (HR) management support to House Members, House Officers, and House employees. The Office was established at the beginning of the 104th Congress in 1995 and is responsible for operating and maintaining the OIRMS application. The OHR consists of the following Offices: Employee Assistance, Member Services, Payroll, Personnel and Benefits, Policy and Administration, and Training. The OHR adheres to the regulations and policies of the Office of Personnel Management (OPM), but unlike the Executive Branch agencies of the U.S. Government, records of House employees remain the property of the House, not the OPM.

The OHR uses the OIRMS to store and manage HR related records for House employees¹¹. All post-1984 House payroll and personnel information is maintained in the OIRMS and contains

¹¹ For purposes of this evaluation, House employees refer to employees of the House Officers (i.e., Sergeant at Arms, Office of the Clerk, Chief Administrative Officer, and Office of the Inspector General) and employees of Members and Committees. The Office of Member Services within OHR handles HR management of the Members. Member information is maintained in a separate application than that of House Officers and other House employees.

what is considered to be the employee's Official Personnel File¹². The application's primary component is FileNet, a commercially available imaging software application. The FileNet system was installed in 1987 and all associated software and hardware was upgraded or replaced in 1996. The FileNet software is used to scan hard copy forms, retain document images, and display document images based on query criteria submitted by system users. The OIRMS also has a custom interface with the House's Financial Management System (FMS) that is used to validate indexing information entered into OIRMS. The House Information Resources (HIR) department maintains the FMS system and the interface to the OIRMS. OHR Personnel and Benefits and Payroll staff are the only staff authorized to access the OIRMS.

Figure 1.1: OIRMS Application Overview below presents an overview of the inputs, business processes, and outputs associated with the OIRMS application. This figure depicts the flow of information from the input of data on the left, to the application processing in the center, to outputs on the far right. A brief overview of the inputs, processes, and outputs are presented following the figure.

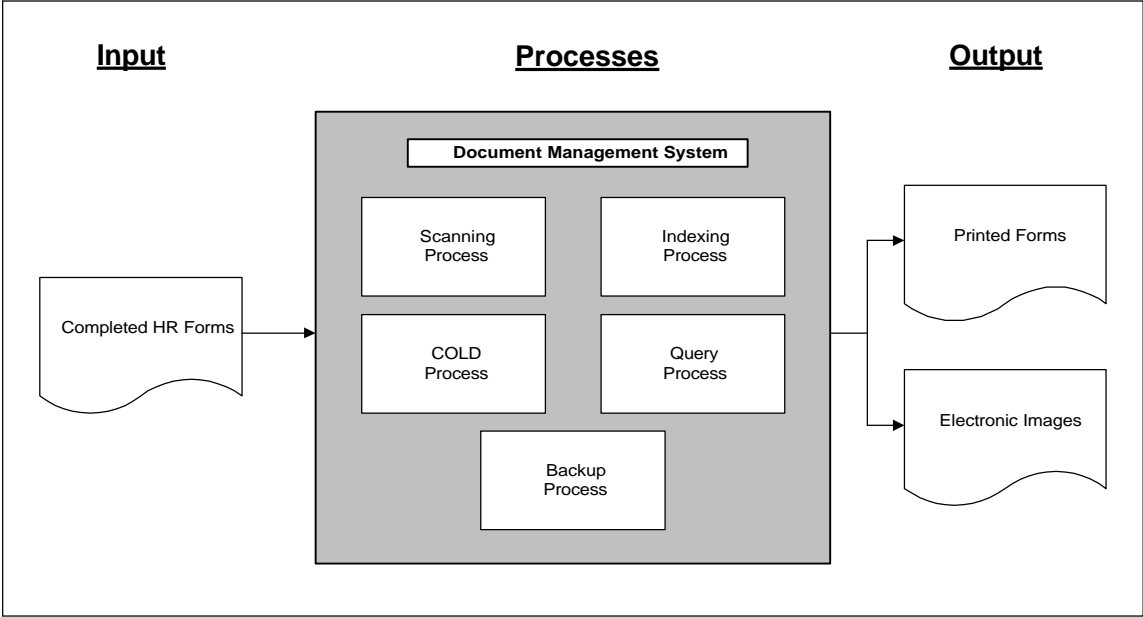


Figure 1.1: OIRMS Application Overview

¹² The Official Personnel File as defined by the Committee on House Administration includes information pertaining to payroll and financial actions, appointments and separation actions, employee benefit actions, and completed annual attendance and leave records.

1.1.1 Input

The inputs to the OIRMS application include the following:

- **Completed HR Forms.** Retirement, health benefits, life insurance, payroll, and other miscellaneous HR forms that have been completed by House employees are manually scanned into the OIRMS. These forms are the primary method used by the OHR to collect HR information. Before House employees can fill-out a form, they must first visit the OHR office to get the form to fill-out or call the OHR to request that a form be mailed or faxed to them. Some forms are available on the House Intranet and can be downloaded, printed, and then completed. The House stores over 130 different HR forms in the OIRMS. Approximately 90 percent are OPM forms, and the remaining 10 percent are House specific forms.

1.1.2 Processes

Listed below are the processes of the OIRMS application.

- **Scanning.** All forms that have been received and processed by the OHR are scanned into the OIRMS. Before the images are written to optical media, they are reviewed for quality and, if acceptable,¹³ are then committed to permanent storage on the optical platters.
- **Indexing.** Each image scanned into the system must be indexed to allow for subsequent access via query. For each form, employee Social Security Number (SSN), form effective date, and form type are manually keyed into the indexing database. Through an electronic interface with the FMS, the SSN is validated and its corresponding title suffix, first name, and last name are automatically transferred from the FMS into the OIRMS index fields.
- **Computer Output to Laser Disc (COLD).** Year-to-date information, Wage and Tax Statements (W-2), and cost of living adjustments are each transferred annually from the FMS to the OIRMS. Data from the FMS is electronically transferred to the OIRMS, written to laser disc, and stored in optical media.
- **Query.** To access the information stored in the OIRMS, users must query the system. Users can query records stored in the OIRMS by SSN and some combination of form type, name, and effective date.
- **Backup.** Indexing information is manually backed-up on magnetic tape daily. Backups of the images in the OIRMS are compressed and stored in transaction logs. When a transaction log reaches its capacity, the compressed images are exported from the OIRMS and stored in a fireproof cabinet located in the Rayburn Building.

1.1.3 Output

The outputs of the OIRMS application include the following:

- **Printed Forms.** Using printers connected to the House Backbone, OIRMS users can print the images that are stored in the system from their desktops.

¹³ Images that are unreadable or of poor quality are not saved to the optical platters. The document is rescanned to improve the quality.

- **Electronic Images.** The OIRMS creates electronic images of all forms that have been scanned into the system.

1.1.4 Technical Information

Figure 1.2: OIRMS Application Technical Information listed below presents additional technical and application metric information for the OIRMS application.

Application Metrics	
Element	Description
Technology Platform	<ul style="list-style-type: none"> • RS-6000 server Unix-AIX Version 4.1.5 operating system. • FileNet Imaging system. • Optical Storage And Retrieval (OSAR) storage system.
Processing Mode	On-line transaction processing.
Number of Lines of Code	Unavailable.
Data Storage	OSAR – Approximately 595 GB in use (75, 7GB platters), with 245 GB available (40, 7GB platters).
Number of records in database	Approximately 2,478,174.
Documents scanned per year	Approximately 116,000; the large majority of documents are handwritten.
Users/Customers	
Element	Description
Number of House Employees	Over 10,000 ¹⁴ .
Key application users	OHR- Office of Personnel and Benefits, Office of Payroll.
Key Inputs	
Input	Source
Completed HR forms	House employees.
Key Interfaces	
System	Description
FMS	A COLD process is used to transfer year-to-date information, W2s, and COLAs to the OIRMS. Customized software allows the OIRMS to validate indexing information based on information in the FMS.
Key Outputs	
Output	Description
Printed forms and form images	All forms scanned into the OIRMS can be printed or reproduced electronically.

Figure 1.2: OIRMS Application Technical Information

¹⁴ The House employee population is approximately 10,000 at any given time. Due to employee turnover and seasonal hiring, the total annual employee population is approximately 15,000 employees.

Exhibit 2

Needs Statement

Needs Statement

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Needs Statement

This exhibit presents the high-level needs of the Office of Human Resource's (OHR) Optical Imagery Records Management System (OIRMS) application.¹⁵ The purpose of the needs statement is to identify deficiencies in existing capabilities, new or changed program requirements, and overall needs of the application as they relate to the OHR mission. The needs statement also identifies opportunities for increased economy and efficiency and provides justification for exploring alternative solutions.

2.1 The Office of Human Resource (OHR) Mission

The OHR was created during the 104th Congress with the consolidation of numerous human resource (HR) functions that were dispersed throughout various House offices. As stated at its conception, the OHR's mission is: "The OHR is responsible for overall human resource management of the House."¹⁶ The OHR is comprised of the following Offices: Employee Assistance, Member Services, Payroll, Personnel and Benefits, Policy and Administration, and Training. The OHR mission and the responsibilities of each of the OHR offices was used as the framework for defining the high-level business needs for the purpose of identifying alternative system solutions to the current OIRMS application. As presented in Exhibit 1, *Application Overview*, the OIRMS application supports OHR's mission by maintaining HR related documents for all House Officers and House employees (House employees)¹⁷.

2.2 Deficiencies

Through discussion with the OHR users and work performed in developing Exhibit 3, *Risk Assessment*, deficiencies in the current OHR application were identified. These deficiencies were used later as a basis to define high-level needs for identifying alternative solutions. The deficiencies that affect the OHR application are listed below.

- **Reliance on the House's Financial Management System (FMS) payroll system for indexing and validation of data.** OIRMS reliance on the FMS system increases risk due the uncertainty of FMS's stability and lifespan. OIRMS relies on the FMS system for validation of data during the index process. The validation is performed through a custom interface between OIRMS and FMS. The upgrades and maintenance of FMS have been performed on an ad hoc basis and not in a controlled manner over the 22-year existence of the system. In addition to FMS's instability, the House is currently reviewing various viable system options for replacing FMS. The replacement of the FMS payroll system will render the OIRMS/FMS interface inoperable, and prevent reliable indexing and validation of data input

¹⁵ For the purposes of this evaluation, a high-level business need is an identified requirement asserted by the OHR staff and administrators and human resources best practices, which addresses the mission of the OHR. The high-level business needs presented in this evaluation are not intended to serve as functional requirements. The functional requirements are addressed in the analysis phase of the House's System Development Life Cycle Policy.

¹⁶ The quotation is an excerpt from the Human Resources section of the Chief Administrative Officer's June 30, 1995 Semi-Annual Report.

¹⁷ The OIRMS currently maintains information for all House employees. HR information for Members of the House is maintained in another application, which was not included in the scope of this evaluation.

into the OIRMS application. In order to continue indexing data in the current manner, a new custom interface would be necessary.

- **Inefficiencies and errors associated with the processing of House HR information.** The current processes relating to OIRMS are predominantly manual and paper-based, resulting in a number of processing inefficiencies. Inefficiencies are experienced when resolving errors and accessing information in OIRMS. It has been estimated that approximately 20 percent¹⁸ of all HR forms submitted to OHR contain errors that require significant follow-up with House employees. The current processing of employee information also requires a second administrator to audit and verify the accuracy of data entered into OIRMS and FMS.
- **Inefficient forms management procedures.** The current OHR forms management procedures are cumbersome and redundant. As a result of these procedures, documents are often not easily accessible to OHR staff and extraneous materials are retained in OIRMS. In addition, the current OIRMS does not allow for modification to document images, so the processing and data entry of the forms must be performed prior to scanning forms into the OIRMS application. Another area of inefficiency is related to processing during peak periods. An increase in the volume of processing sometimes can delay the entry of the form into the OIRMS application between one and six months¹⁹. This delay requires OHR staff to search multiple places to access previously submitted HR documents.
- **Lack of a centralized location for HR data.** HR data and documents are not centrally located or maintained in the OHR. Recent HR documents are kept in multiple locations due to delays associated with manual processes. HR records prior to 1982 are maintained in multiple formats; paper files, microfiche, and FileNet images.²⁰ The original hard copy document is retained and sent to the National Archives after scanning. Non-payroll or benefits information is not stored in the OHR, but maintained by the employing House offices.
- **Redundant retention of information in OIRMS.** The OHR has stated that all images in the OIRMS system are mission critical. As a result of this belief, there is a perceived need to maintain and sustain images in OIRMS that are also concurrently maintained by another means such as the FMS system, microfiche, or paper format. The perceived importance of the form image rather than the data on the form has led to inefficient or unnecessary retention of some of the records in the current OIRMS²¹. Examples of redundant information retained in OIRMS include images of prior year W-2 information. Prior year earnings information could be accessed from the current FMS system.

¹⁸ The number of forms submitted to OHR that contain errors that require significant follow-up was estimated to be 20 percent. This information was provided through interviews with OIRMS users.

¹⁹ Based on interviews with OHR OIRMS processing staff.

²⁰ If employees were active when OIRMS was implemented, all contents of the Official Personnel File (OPF) were scanned into the system. Employees hired after 1985 with prior House service have all historical OPF documents scanned into OIRMS.

²¹ Although Federal regulations mandate the retention of some employee information (i.e., service history information), sufficient documentation or explanation was not provided for many of the OHR practices regarding record retention.

- **Limited ability to generate reports and to perform advanced queries.** The OIRMS application has no reporting capability. The indexing database captures only social security number, form type, and effective dates. All other information stored in OIRMS is available only in image format, and thus options for accessing data are limited to queries by indexing fields.
- **Inefficient OIRMS backup procedures.** OIRMS data cannot be backed-up without rendering the application inaccessible, and requiring manual intervention to restore the system. This manual intervention required during the backup increases the risk of backup failure.
- **Proprietary nature of OIRMS.** The current OIRMS is a proprietary system. The proprietary nature of the system limits the OHR to the current vendor. There is a general dissatisfaction with the current vendor due to the inflexible nature associated with proprietary systems.
- **No integrated HR information system.** The combination of FMS and OIRMS does not provide the OHR the ability to offer comprehensive HR services through one centralized means. Significant HR functions, such as applicant tracking, position management, training monitoring, and benefits calculations, are performed using additional systems or manual procedures.

2.3 New or Changed Program Requirements

When evaluating alternative solutions to replace the current OIRMS, any new or changed program requirements need to be factored into the decision making process. Any changes to components with an interdependent relationship with OIRMS also need to be considered. For example, the OHR is currently in the process of replacing the FMS system with a new HR/Payroll solution. The replacement of the current payroll system will have an effect on the indexing and validation interface with the OIRMS application. The implementation of the new HR/Payroll system or solution may have significant effects on the business processes within OHR. New functionality inherent in the HR/payroll solution will offer greater automation of HR tasks and provide access to additional HR data.

Changes that may affect the OHR and the HR/Payroll solution are also detailed in a draft human resources and payroll systems requirements document developed by the Joint Financial Management Improvement Program (JFMIP). This draft presents high-level functional requirements that are intended to assist agencies in implementing effective and efficient systems. These new requirements could potentially have an impact on the functionality of the House's new HR/Payroll solution in relation to the alternative system solutions identified to replace the current OIRMS.

In addition, an Office of Personnel Management (OPM) task force is currently reviewing the issues associated with implementing electronic personnel files (OPFs) and electronic submission of personnel data within Federal agencies. The direction that OPM takes with regards to electronic functionality could also have an impact on the system solution to replace the current OIRMS.

2.4 High-Level Business Needs

This section details the high-level needs identified through interviews with OHR managers and staff members and House Information Resources (HIR) personnel. Additional high-level business needs were derived by reviewing public and private sector “Best Practices” research. Although many of the needs are expressed in terms of the current OIRMS application, consideration has been given to the future computing needs of OHR. The following list summarizes the primary high-level business needs and the context of their importance as noted by OHR management and administrators and best practices information:

Input

- Ability to automate the entry of House HR information (e.g., HR data or related correspondence).

Processing

- Ability for system to validate entry of HR information.
- Allow for modification of HR records through on-line access or other sources (e.g., Internet/Intranet).
- Ability to provide a history of changes made to House employee HR data.
- Ability to file HR information consistent with Federal regulations.
- Ability to record receipt of relevant HR hard copy documents.

Output

- Ability to reproduce stored HR data in print and electronic formats.
- Allow for high speed printing of HR data in a user defined sort order.

Query and Reports

- Ability to produce reports based on user defined queries.
- Ability to simultaneously view multiple House employees’ records.

Storage

- Ability to track House HR data from initial receipt to archival.
- Ability to perform automated backup of all electronic records.
- Ability to maintain images in a non-proprietary data format.

Technology

- Provide for interoperability with other technologies and systems that provide input/output of HR data.
- Provide scalability to accommodate increases in size and uses of system.
- Ability to accommodate advances in hardware and software technologies.
- Provide ability for simultaneous access by large user population (e.g., 10,000 House employees).

Application Controls and Security

- Ability to prevent unauthorized access to data and system.
- Ability to track usage information for system users.
- Ability to protect HR data during electronic input, processing, and storage.

2.5 Opportunities for Increased Economy and Efficiency

After a comparison of the high-level business needs and the current state of the OIRMS application, several areas were identified that could provide increased economy and efficiency to the OHR. The following have been identified as the key areas of improvement:

- **Improve level of customer service provided to the House employees.** The increased automation of the record keeping function, including data entry, data validation, and backup, would decrease the amount of time spent on manual and redundant tasks performed by the OHR staff and enable the OHR staff to focus on more strategic duties (i.e., perform more services for House employees).
- **Reduce number of paper based forms produced, processed, and archived.** Automated entry of information would greatly reduce the use of paper. The improved data validation capability would also decrease the number of follow-up or corrected forms required for HR submission.

- **Reduce time and labor expense through more efficient data input and verification.** The use of automation would provide enhanced processing efficiencies for the OHR administrators, thus reducing the cost and time spent performing the current processing tasks associated with the OIRMS.
- **Improve access to and integrity of HR data submitted by House employees.** Automating the entry and validation of HR records reduces the human error component inherent in manual submissions. The current time lag between submission, entry, and subsequent access to data input into the OIRMS application would also be improved.
- **Improve availability and response time from the system.** OHR administrators should experience increased system response time with the introduction of new technologies and automating the backup process would eliminate the period in which the OIRMS application is inaccessible to the users during the current backup process.
- **Improve the ability to adhere to laws governing HR data management.** A new record keeping system with the non-proprietary technology would provide the OHR with better flexibility when responding to changes to Federal mandates governing HR policies and procedures.

Exhibit 3

Exhibit 3

Risk Assessment

Risk Assessment

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Risk Assessment

This exhibit presents the risk assessment for the Optical Imagery Records Management System (OIRMS). The risk assessment identifies threats to data and assets, the potential impact of those threats, system vulnerabilities and existing safeguards, and the current internal control and security environment of the systems. Specifically, the risk assessment includes:

- A description of the methodology used to perform the risk assessment.
- The identification of the threats to data and assets, the vulnerabilities related to the threats, the risk impact of the threats, and recommended safeguards to mitigate the threats.
- A brief discussion of risk considerations for potential alternative system solutions for the application.

The results presented in this exhibit also served as input to Exhibit 2, *Needs Statement* in identifying the current deficiencies of the OIRMS application and new needs for potential replacement systems.

3.1 Methodology

The purpose of the risk assessment was to identify threats to data and assets, the potential impact of those threats, system vulnerabilities, and existing safeguards. Using an internal control and security diagnostic tool, we gained an understanding of the current vulnerabilities and related safeguards. Information for the diagnostic tool was gathered through observations made during walk throughs of the systems and facilities, and from interviews with the Office of Human Resources (OHR) and the House Information Resources (HIR) office. Due to the scope and purpose of the risk assessment, we have not conducted any detailed testing and validation typically completed during a detailed internal controls and security review or audit. The diagnostic tool used was comprised of questions covering the following areas:

- Information security policies and procedures.
- Security administration and management.
- Application level controls.
- System level controls.
- Network level controls.
- Internet security.
- Business continuity planning.

The data collected from the diagnostic tool was analyzed with respect to the following risk assessment components:

- Threats.
- Data and assets.
- Vulnerabilities.
- Risk impact.
- Potential safeguards.

The following sections describe each risk assessment component.

3.1.1 Threats

A threat is defined as a person, entity, or event that can potentially cause destruction or loss to something valuable. For example, an unauthorized user who attempts to access information they are not privy to is a threat. Threats may be categorized as follows:

- **Events.** Events, such as natural disaster, that can often have severe consequence on the data.
- **External threats.** People who may attempt to access data from outside the system.
- **Internal threats.** People who may attempt to access data from inside the system. These people are authorized to access the system and may even have access to valuable data.

3.1.2 Data and Assets

The following lists the critical data and assets related to the OIRMS application that were examined in the risk assessment. Included in the listing is a qualitative value of the data and assets²².

Data

- **Human Resources Forms**

The purpose of the OIRMS application is to support OHR customer service operations. Physical payroll and personnel and benefits forms are scanned and indexed. The hard copies are archived first at the Cannon Building, then moved to the National Archives for storage.

Value of data – Data from HR transactions is mission critical. Data is maintained in hard copy forms, form images, or a database application. OHR has stated that images are mission critical because they are the primary means for accessing the hard copy version stored in the National Archives.

²² Qualitative values are best used when attempting to identify where major problems exist. Since this risk assessment is being conducted as a first step towards justifying replacement alternatives, an in-depth detailed review was not required.

- **Human Resources Application Indices**

The OIRMS application maintains index data through which images of hard copy forms submitted to OHR are accessible. The index uniquely identifies each employee's record and contains location information that is used by FileNet to retrieve document images. Social Security Numbers are used as an index field for all employee data maintained in the OIRMS.

Value of data – Mission critical to locate images and archived physical documents. Furthermore, Social Security Numbers are extremely valuable to individual filers.

- **User Account Information**

ACF2²³ user account information, consisting of user ID and password combinations, allows users access to the mainframe component of OIRMS. The account information is the primary means used to authenticate OHR users and administrators. In addition to the mainframe accounts, there are accounts for the FileNet system, the NetWare and Windows NT networks, and the AIX operating system for the RS/6000 platform.

Value of data – Mission critical to protect the confidentiality, integrity, availability, and authentication of data.

Equipment

- **Mainframe (located in Ford 652)**

The OIRMS application interfaces with various applications on the mainframe.

- **The Enterprise Network**

The current processing environment is located in facilities in the Cannon, Rayburn, Longworth and Ford House office buildings. The House's enterprise network (BUDnet) is the communications medium for the OIRMS system.

- **Image Server (located in Cannon B-72)**

After the OHR forms are scanned into the workstation, they are transmitted to the FileNet Image Server for storage. Once digital images are on the FileNet Server, they must be indexed before they can be viewed. Subsets of the mainframe index are also duplicated on the FileNet Server.

- **Personal Computers, Printers, and Scanners (located in Cannon 263)**

OHR users utilize workstations to retrieve and view documents. The document scanning process also relies upon workstations to run the FileNet client.

²³ ACF2 is an access control software program that maintains and manages user ID and password combinations.

3.1.3 Vulnerabilities

A vulnerability is defined as a weakness that can be exploited by a threat. For example, a flaw or deficiency in the system design, weak administrative policies and procedures, or weak physical security may increase the likelihood of a threat by permitting easier access to data. The more secure a computer system, the less vulnerable its data is to threats, or the less likely the threats can penetrate the computer system. Therefore, the magnitude of the system risk is directly related to the vulnerabilities of the computer system.

3.1.4 Risk Impact

Four fundamental areas of risk related to data were examined in the risk assessment of the OIRMS system: confidentiality, integrity, availability, and authentication. The security fundamentals, consequences of compromises to the security fundamentals, and the related risk type of each are identified below:

- **Confidentiality.** Ensures that sensitive information is available only for the intended audience and that sensitive information is not disclosed to unauthorized individuals. The consequence of compromise includes financial loss, public embarrassment, or legal liability from unauthorized disclosure of sensitive and critical information.

RISK TYPE: Disclosure of confidential information.

- **Integrity.** Ensures that information is modified or changed only in a specified and authorized manner. The consequence of compromise includes loss of information or the creation of false information if critical data is accidentally or intentionally manipulated.

RISK TYPE: Modification of data.

- **Availability.** Ensures that systems operate promptly and service is not denied to authorized users. The consequence of compromise includes a disruption of operations due to inaccessible information.

RISK TYPE: Disruption of operations.

- **Authentication.** Ensures that only authorized users have access to the system. The consequence of compromise includes unauthorized access to sensitive information.

RISK TYPE: Impersonation of an individual's identity.

3.1.5 Recommended Safeguards

Recommended safeguards are actions that can be implemented to minimize or eliminate potential security threats. The safeguards can be categorized as technical, administrative, and physical. The technical safeguards are system related and can be used as criteria when evaluating system alternatives. Administrative and physical safeguards are independent of any system solution. Therefore, the administrative and physical safeguards are ones that can be implemented as soon as possible to minimize security risk.

3.2 Risk Assessment Results

Seven high-level threats were identified in the risk assessment to which OIRMS data may be vulnerable. These threats originate from events or people, internal or external to the House. Listed below is a description of the threats:

Events

- **Acts of Nature.** Includes acts of nature such as flood, hurricane, tornado, earthquake, or lightning strike that have the potential to physically destroy documents or the House data centers located in the Cannon, Rayburn, Longworth, or Ford buildings.
- **Acts of terrorism.** Includes various acts of violence against the House such as a bombing attack.
- **Data center environmental compromise.** Includes events affecting power supply, communications capabilities, or other environmental incidents, such as water leakage, within the building.
- **Software/hardware failure.** Includes the failure of system components.

People

- **Intentional acts by House staff.** Includes the threats posed by disgruntled or malicious House staff, including physical destruction of property, compromise of document integrity (to cause embarrassment to House employees) or the insertion of malicious object code (to cause processing disruption).
- **Unintentional internal acts.** Includes accidental acts by staff, including erroneous data entry, incorrect or incomplete index information, or improper system or security administration (causing third party compromise of data).
- **Logical/physical penetration.** Includes system access (physical or logical) by unauthorized public users.

Figure 3.1: Risk Assessment Results provides a summary of the risk assessment results. It presents:

- Potential threats.
- Level of risk associated with the threat occurring.
- Level of effort to mitigate or eliminate the risk.

- Vulnerabilities associated with the identified threat.
- Risk Impact of the threat occurring.
- Recommended safeguards to mitigate or eliminate the risk.

Threats	Risk H,M,L	Level of Effort H,M,L	Vulnerabilities	Risk Impact	Recommended Safeguards
<i>Network Level Controls</i>					
Logical Penetration	H	M	Modems facilitate remote access to the FileNet server and user workstations.	<p>This vulnerability presents risks of unauthorized dial-in access. Weak password controls established over FileNet magnifies the potential impact of this risk.</p> <p><i>Type of Compromise</i></p> <ul style="list-style-type: none"> • Confidentiality. • Integrity. • Authentication. • Availability. 	<ul style="list-style-type: none"> • Implement more secure HIR dial-in methods (e.g., SecureID). • “Unplug” desktop modems.

Figure 3.1: Risk Assessment Results

Threats	Risk H,M,L	Level of Effort H,M,L	Vulnerabilities	Risk Impact	Recommended Safeguards
<i>Internet Security</i>					
Logical Penetration	M	M	Discussions revealed FileNet’s vulnerability to unauthorized “telnet” access via the Internet.	FileNet resources are susceptible to unauthorized access and disclosure. <i>Type of Compromise</i> <ul style="list-style-type: none"> • Confidentiality. • Integrity. • Authentication. • Availability. 	Implement technical service-filtering tools.

Figure 3.1: Risk Assessment Results (continued)

Threats	Risk H,M,L	Level of Effort H,M,L	Vulnerabilities	Risk Impact	Recommended Safeguards
<i>Application Level Controls</i>					
Logical Penetration Unintentional & Intentional Internal Acts	M	H	Fundamental security features are not provided by FileNet. As an example, audit trail mechanisms, as well as control features to enforce password syntax requirements and history are lacking. Password history prevents passwords from being reused.	This vulnerability could potentially introduce risks of unauthorized access and disclosure, as well as masquerade. <i>Type of Compromise</i> <ul style="list-style-type: none"> Confidentiality. Integrity. Authentication. Availability. 	Establish FileNet security features: <ul style="list-style-type: none"> Audit trail facility. Password syntax restrictions. Password history.
Logical Penetration Unintentional & Intentional Internal Acts	M	M	All FileNet users maintain “blanket” access regardless of the access needs governed by their job responsibilities.	FileNet resources are susceptible to unauthorized disclosure or inadvertent acts. <i>Type of Compromise</i> <ul style="list-style-type: none"> Confidentiality. Integrity. Authentication. Availability. 	<ul style="list-style-type: none"> Perform a user requirements analysis to identify the access needs of various users. Establish group profiles based on the results of this analysis.

Figure 3.1: Risk Assessment Results (continued)

Threats	Risk H,M,L	Level of Effort H,M,L	Vulnerabilities	Risk Impact	Recommended Safeguards
<i>Application Level Controls continued</i>					
Logical Penetration Unintentional & Intentional Internal Acts	M	L	Fundamental security features provided by FileNet have not been implemented. <ul style="list-style-type: none"> • Password change. • Automatic logoff. • Time of day/day of week restrictions. 	FileNet resources are susceptible to unauthorized access and disclosure. <i>Type of Compromise</i> <ul style="list-style-type: none"> • Confidentiality. • Integrity. • Authentication. • Availability. 	Place FileNet security options in effect: <ul style="list-style-type: none"> • Password change. • Automatic logoff. • Time of day/day of week restrictions.

Figure 3.1: Risk Assessment Results (continued)

Threats	Risk H,M,L	Level of Effort H,M,L	Vulnerabilities	Risk Impact	Recommended Safeguards
<i>System Level Controls</i>					
Logical Penetration Unintentional & Intentional Internal Acts	M	M	<p>Areas for improvement in UNIX security configuration:</p> <ul style="list-style-type: none"> The UNIX “guest” account is enabled with weak password restrictions (e.g., zero password minimum length, no password expiration, etc.). The system administrator password has not been changed since the last transfer of FileNet System Administrator responsibilities. Individual accountability is not provided as the system administrator account is shared by two individuals. 	<p>UNIX security configuration does not adequately minimize risks associated with unauthorized access.</p> <p><i>Type of Compromise</i></p> <ul style="list-style-type: none"> Confidentiality. Integrity. Authentication. Availability. 	<p>Subject the UNIX environment to a comprehensive security review, and:</p> <ul style="list-style-type: none"> Disable the “guest” account. Change the System Administrator password on a periodic basis. Establish distinct System Administrator accounts (i.e., need two distinct passwords for two system admin accounts).

Figure 3.1: Risk Assessment Results (continued)

Threats	Risk H,M,L	Level of Effort H,M,L	Vulnerabilities	Risk Impact	Recommended Safeguards
<i>System Level Controls continued</i>					
Unintentional Internal Acts	M	M	UNIX System is not handled by an individual with requisite technical skills; it is currently performed by an OHR end-user.	<p>Security misconfigurations could potentially be exploited resulting in the compromise of system integrity.</p> <p><i>Type of Compromise</i></p> <ul style="list-style-type: none"> • Confidentiality. • Integrity. • Authentication. • Availability. 	Retain the requisite technical skills base to ensure adequate coverage of UNIX security. Potential exists for tapping of HIR technical resources.

Figure 3.1: Risk Assessment Results (continued)

Threats	Risk H,M,L	Level of Effort H,M,L	Vulnerabilities	Risk Impact	Recommended Safeguards
<i>Business Continuity Planning</i>					
<p>Acts of Nature</p> <p>Acts of Terrorism</p> <p>Data Center Environmental Compromise</p> <p>Software/Hardware Failure</p>	L	H	A formal approach facilitating the timely and structured restoration of FileNet is not in place.	<p>An informal business continuity plan adversely impacts the ability to restore business processes in a timely fashion in the event of an extended computer outage.</p> <p><i>Type of Compromise</i></p> <ul style="list-style-type: none"> Availability. 	<p>Implement proactive measures to establish a formal business continuity strategy and minimize system downtime:</p> <ul style="list-style-type: none"> Proceed with OHR plans to participate in the CAO disaster recovery workgroup tasked to identify core processes and alternative fallback plans. Identify recovery threshold(s), as well as resource requirements (hardware and software) necessary for system restoration. Develop, implement and maintain a formal business continuity program.

Figure 3.1: Risk Assessment Results (continued)

Threats	Risk H,M,L	Level of Effort H,M,L	Vulnerabilities	Risk Impact	Recommended Safeguards
Business Continuity Planning					
<p>Acts of Nature</p> <p>Acts of Terrorism</p> <p>Data Center Environmental Compromise</p> <p>Software/Hardware Failure</p>	L	H	<p>We noted the following observations:</p> <ul style="list-style-type: none"> • An electronic access device does not exist to restrict physical access. • An uninterruptible power supply (UPS) device does not support the FileNet server and the jukebox. • A surge suppressor does not protect the jukebox from electrical fluctuations. • Lack of raised flooring increases risks of flood damage. Also, risks are magnified by locating computer equipment on the basement floor. • A camera surveillance system is lacking. • Co-locating paper documents with the system images poses a fire hazard, as well as a disaster recovery concern. • Paper stackings above file cabinets do not provide adequate sprinkler clearance. • Portable fire extinguishers are not located in the room. • An emergency/auxiliary lighting system is not in place. • A temperature/humidity control system is lacking. • Exposed wiring increases the likelihood of inadvertent disruptions. 	<p>Computer equipment is susceptible to environmental and physical security threats.</p> <p><i>Type of Compromise</i></p> <ul style="list-style-type: none"> • Confidentiality. • Integrity. • Authentication. • Availability. 	<p>Re-locate FileNet hardware to a facility environmentally conditioned for computer equipment (e.g., HIR data center).</p>

Figure 3.1: Risk Assessment Results (continued)

Threats	Risk H,M,L	Level of Effort H,M,L	Vulnerabilities	Risk Impact	Recommended Safeguards
Business Continuity Planning (continued)					
<p>Acts of Nature</p> <p>Acts of Terrorism</p> <p>Data Center Environmental Compromise</p> <p>Software/Hardware Failure</p>	L	M	<p>Opportunities exist to improve the procedures governing backup and off-site tape storage:</p> <ul style="list-style-type: none"> • A systematic tape backup and archiving methodology does not exist, and thus hampers file restoration. • Backups are performed manually, thereby making the process more susceptible to errors. • Backup tapes are stored in non-secured off-site environments, and between three various locations. This complicates file retrieval during a disaster. • Backups of document images in compressed format (“trans” logs) are not timely rotated to an off-site secured environment. The “trans” logs are retained in the jukebox with the primary images until four platters reach capacity. Risks are increased since the original documents are maintained in the same location. Therefore, current files (manual and computerized) are susceptible to being simultaneously damaged by a single event. 	<p>Computer restoration may not be feasible if backups are not available.</p> <p><i>Type of Compromise</i></p> <ul style="list-style-type: none"> • Availability. 	<p>Regarding the backup process:</p> <ul style="list-style-type: none"> • Obtain network-based disaster recovery services from HIR. • Establish automated scripts to perform routine system backups. • Institute an industry-accepted tape backup, archiving, and rotation scheme (e.g., grandfather-father-son, daily incremental, and full weekly backups).

Figure 3.1: Risk Assessment Results (continued)

Threats	Risk H,M,L	Level of Effort H,M,L	Vulnerabilities	Risk Impact	Recommended Safeguards
<i>Business Continuity Planning (continued)</i>					
Software/ Hardware Failure	M	H	<ul style="list-style-type: none"> The FileNet system queries Financial Management System (FMS) for information validation during the indexing process. If index information is incorrect or incomplete, the image will not be indexed and stored. A COLD transfer sends information from FMS to FileNet for COLAs, W-2s, and Year-end salary. 	<p>The loss of FMS through system failure or replacement could cause customer service disruptions or loss of data.</p> <p><i>Type of Compromise</i></p> <ul style="list-style-type: none"> Availability. Integrity. 	A centralized location for all HR data would alleviate the need for the OIRMS and FMS interface.
Software/ Hardware Failure	L	M	The FileNet system “halts” when the platters containing compressed document images (“tran” log) reaches maximum capacity.	<p>This could potentially cause customer service disruptions.</p> <p><i>Type of Compromise</i></p> <ul style="list-style-type: none"> Availability. 	Implement automated notification when secondary image files near maximum capacity or establish procedure to remove “tran” logs on a more frequent basis.

Figure 3.1: Risk Assessment Results (continued)

Threats	Risk H,M,L	Level of Effort H,M,L	Vulnerabilities	Risk Impact	Recommended Safeguards
<i>Business Continuity Planning (continued)</i>					
Software/ Hardware Failure	L	L	Only one scanner available to handle workflow of incoming forms.	This could potentially impact customer service operations. <i>Type of Compromise</i> • Availability.	Ensure that a secondary device is readily available and integrated as part of the system.

Figure 3.1: Risk Assessment Results (continued)

Threats	Risk H,M,L	Level of Effort H,M,L	Vulnerabilities	Risk Impact	Recommended Safeguards
<i>Information Security Standards, Policies & Procedures</i>					
Unintentional Internal Acts	L	M	FileNet specific security standards, policies and procedures do not exist.	Users may not employ sound security practices to adequately protect information resources. <i>Type of Compromise</i> <ul style="list-style-type: none"> • Confidentiality. • Integrity. • Authentication. • Availability. 	With HIR Security oversight and guidance, develop and implement security standards, policies and procedures specific to FileNet.

Figure 3.1: Risk Assessment Results (continued)

Threats	Risk H,M,L	Level of Effort H,M,L	Vulnerabilities	Risk Impact	Recommended Safeguards
<i>Security Administration & Management</i>					
Unintentional & Intentional Internal Acts	L	M	No formal user access request and revocation processes are in place over OIRMS.	Computer resources are susceptible to disgruntled employee acts. <i>Type of Compromise</i> <ul style="list-style-type: none"> • Confidentiality. • Integrity. • Authentication. • Availability. 	Establish formal processes governing user access request and timely revocation of user accounts.

Figure 3.1: Risk Assessment Results (continued)

Threats	Risk H,M,L	Level of Effort H,M,L	Vulnerabilities	Risk Impact	Recommended Safeguards
Network Level Controls					
Logical Penetration	M	H	Means to detect network intrusions directed at the FileNet server do not exist.	<p>Lack of an intrusion detection system limits the ability to detect and respond to unwarranted acts of intrusion.</p> <p><i>Type of Compromise</i></p> <ul style="list-style-type: none"> • Confidentiality. • Integrity. • Authentication. • Availability. 	The HIR Security Office effort to implement a network-wide intrusion detection capability attempts to address this security concern; effort is in early stages.
Information Security Standards, Policies & Procedures					
Unintentional Internal Acts	M	H	The FileNet user community has not received formal security awareness and training.	<p>Users may not employ sound security practices to adequately protect information resources.</p> <p><i>Type of Compromise</i></p> <ul style="list-style-type: none"> • Confidentiality. • Integrity. • Authentication. • Availability. 	HIR Security Office plans to formalize an entity-wide security awareness and training program that addresses this concern; effort is in early stages.

Figure 3.1: Risk Assessment Results (continued)

Threats	Risk H,M,L	Level of Effort H,M,L	Vulnerabilities	Risk Impact	Recommended Safeguards
<i>Information Security Standards, Policies & Procedures</i>					
Unintentional Internal Acts	L	H	Official user data ownership and access designations are not formally in place.	<p>Computer resources may not receive commensurate security protection.</p> <p><i>Type of Compromise</i></p> <ul style="list-style-type: none"> • Confidentiality. • Integrity. • Authentication. • Availability. 	The HIR Security Office plans to establish a House-wide data classification program that addresses this concern.

Figure 3.1: Risk Assessment Results (continued)

3.3 Risk Considerations for Alternate Solutions

Using the recommended safeguards contained in Figure 3.1: Risk Assessment Results, future needs were identified and included in Exhibit 2, *Needs Statement*. These future needs may have significant impact on the internal controls and security environment of any new system. These needs are:

- Ability to automate the entry of House employee HR information (e.g., HR data or related correspondence) from various sources (e.g., imaging, on-line data entry).
- Allow for modification of HR records through on-line access or other sources (e.g., Internet/Intranet).

The impact of these needs on the internal controls and security environment is described below.

Electronic Filing and Signature

Implementing electronic filing and signature verification adds complexity to the management of the internal controls and security environment. Enabling electronic filing capabilities, with the need to verify signature, introduces new needs to protect the confidentiality, integrity, availability, and authentication of the data for filers. However, these security needs are addressed through specific technologies that are discussed below.

- **Confidentiality and Integrity.** Data encryption may be used to protect data during transmission of forms from either a Web site or e-mail source.
- **Authentication.** Electronic signature provides assurance that the file is truly from the sender. This provides non-repudiation (e.g., the filer cannot deny sending the file).
- **Availability.** Postal mail is continuously available. Electronic filing must be consistently available, particularly during the filing time window (i.e., benefit election periods). Denial of service is a risk of electronic filing, and additional controls to address this risk will be needed.

Exhibit 4
Feasibility Study

Feasibility Study

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Feasibility Study

This exhibit presents the Feasibility Study of the Office of Human Resources (OHR) Optical Imagery Records Management System (OIRMS) evaluation. The purpose of the Feasibility Study is to identify and analyze alternative system approaches to the current OIRMS application that meet the needs described in Exhibit 2, *Needs Statement* and Exhibit 3, *Risk Assessment*. This exhibit, in conjunction with the cost-benefit analysis document, will provide the OHR with information to analyze and evaluate alternative systems that satisfy the OHR's mission.

4.1 Methodology

The Feasibility Study was developed using the following steps:

- Analyze Needs and Define Evaluation Criteria.
- Identify and Assess Range of Potential Alternatives.
- Select and Develop Feasible Alternatives.

The following is a description of the steps followed in completing each task.

4.1.1 Analyze Needs and Define Evaluation Criteria

The needs and risks associated with the OHR's OIRMS application were analyzed using the findings detailed in Exhibit 2, *Needs Statement* and Exhibit 3, *Risk Assessment*. These needs and risks formed the basis of the evaluation criteria that viable alternatives must meet in order to be considered for implementation. External circumstances, which would potentially constrain the evaluation, selection, and implementation of the system alternatives, were also identified. Based on the external factors, assumptions were made regarding the future environment of the OHR. These assumptions and constraints were also considered when evaluating the viable system alternatives.

4.1.1.1 Alternative Evaluation Criteria

The seven areas of functionality detailed in Figure 4.1: Alternative Evaluation Criteria Summary are based on the needs derived in Exhibit 2, *Needs Statement*. These criterion capability areas will serve as the main basis by which potential system alternatives to replace the current OIRMS will be evaluated.

Criterion Capability	Description
Input	<ul style="list-style-type: none"> • Ability to automate the entry of U.S. House of Representatives (House) Human Resources (HR) information (e.g., HR data or related correspondence).
Processing	<ul style="list-style-type: none"> • Ability for system to validate entry of HR information. • Allow for modification of HR records through on-line access or other means (e.g., Internet/Intranet). • Ability to provide a history of changes made to House employee HR data. • Ability to file HR information consistent with Federal regulations. • Ability to record receipt of relevant HR hard copy documents.
Output	<ul style="list-style-type: none"> • Ability to reproduce stored HR data in print and electronic formats. • Allow for high-speed printing of HR data in a user defined sort order.
Query and Reports	<ul style="list-style-type: none"> • Ability to produce reports based on user defined queries. • Ability to simultaneously view multiple House employees' records.
Storage	<ul style="list-style-type: none"> • Ability to track House HR data from initial receipt to archival. • Ability to perform automated backup of all electronic records. • Ability to maintain images in a non-proprietary data format.
Technology	<ul style="list-style-type: none"> • Provide for interoperability with other technologies and systems that provide input/output of HR data. • Provide scalability to accommodate increases in size and uses of system. • Ability to accommodate advances in hardware and software technologies. • Provide ability for simultaneous access by large user population (e.g., 10,000 House employees).
Application Controls and Security	<ul style="list-style-type: none"> • Ability to prevent unauthorized access to data and system. • Ability to track usage information for system users. • Ability to protect HR data during electronic input, processing, and storage.

Figure 4.1: Alternative Evaluation Criteria Summary

(Note: Refer to Exhibit 2, *Needs Statement* for detailed information.)

4.1.1.2 Assumptions and Constraints

In addition to the alternative evaluation criteria, external circumstances which would potentially constrain the evaluation, selection, and implementation of the system alternatives, were also identified. Assumptions were made that address these constraints. The assumptions and constraints are described as followed:

- **Implementation of HR/Payroll system.** The OHR will be replacing the existing payroll system with a new combined HR/Payroll solution. As part of the HR/Payroll solution, it is assumed that a HR database will be implemented in the OHR that will be the official source of all House employee data. It is also assumed that the new HR/Payroll system will meet the needs listed in *United States House of Representatives Payroll/Human Resource Information System Requirements*²⁴. A number of those requirements relating to data management and document processing overlap with the needs of the OIRMS. Examples of the related requirements include:
 - Support the option of being able to roll out functionality to multiple offices using a world wide web (WWW) architecture.
 - Support electronic routing and workflow.
 - Effectively support multiple concurrent users.
- **Use of Commercial-off-the-Shelf Applications.** The House's Information Systems Program Plan, Management Policy for System Development Life Cycle (SDLC), dated June 28, 1996, states the desire to move towards use of Commercial-off-the-Shelf (COTS) applications. It is assumed that COTS applications are the desired solution rather than an internally developed system. For this analysis, COTS applications include solutions that may require significant customization using commercially available software and development tools in order to meet the House's needs.
- **Implementation time frame.** Any potential alternative to replace the OIRMS must be implemented in conjunction with the schedule for replacing the current HR/Payroll system. Due to the interdependence between the HR/Payroll and the OIRMS replacement system, the time frame for the implementation of the OIRMS replacement system is dependent on the selection and implementation of the HR/Payroll solution.²⁵ The HR/Payroll solution, combined with the OIRMS replacement system, will provide the comprehensive HR/Payroll solution for the OHR.

²⁴ The *United States House of Representatives Payroll/Human Resource Information System Requirements* document presents requirements for a new HR/Payroll solution. It contains 126 detailed requirements that any new solution must meet. Changes in the HR/Payroll requirements may impact the OIRMS solution.

²⁵ The current projected completion date for the HR/Payroll solution is the fourth quarter of 2000. However, a HR/Payroll solution has not been selected. Therefore, the implementation date of the HR/Payroll system is subject to change based upon the date of selection of the HR/Payroll solution.

- **Adherence to Federal HR Initiatives.** The alternatives should comply with Federal mandates and requirements relating to HR. Recent initiatives that impact the OIRMS replacement system include: (1) the Joint Financial Management Improvement Program (JFMIP)²⁶ draft Human Resources and Payroll Systems Requirements document which provides guidance to Federal agencies implementing financial systems, (2) an Interagency task force reviewing the Federal policy on electronic signature, and (3) the OPM task force review of Official Personnel File (OPF) standards throughout the Federal government, which included standards for electronic OPFs.
- **Scalable.** The potential alternatives must be scalable to meet all needs. Any potential alternative must be able to accommodate increases in technology or increases in the size and scope of information retained in the system. For the purposes of this evaluation any proposed system alternative must be scalable to meet other business needs (i.e., introduction of new HR forms) within the OHR's domain.
- **Outsourcing.** Outsourcing is not a feasible option to consider when evaluating the potential system solutions to replace the current OIRMS application. All House employee records must stay within the physical and logical jurisdiction of the House. This constraint was provided by CAO management during the course of the evaluation.

4.1.2 Identify and Assess Range of Potential Alternatives

To determine the various system alternatives for replacing the current OIRMS application, a number of sources were used to aid in the selection and evaluation. The approach used to research, identify, and analyze potential system alternatives is listed below.

4.1.2.1 Identification of Alternatives

Our approach to researching alternatives included:

- **Interviewed Subject Matter Experts.** Subject matter experts in the areas of human resources, imaging systems, and Internet/Intranet-based applications were interviewed. Areas of emphasis included human resources best practices, Federal human resources regulations, imaging system technologies (e.g., Optical Character Recognition (OCR)/ Intelligent Character Recognition (ICR) and workflow) and electronic filing functionality.

²⁶ JFMIP is a joint cooperative undertaking of several Federal agencies to improve financial management practices throughout government. The JFMIP draft presents high-level requirements that are intended to assist agencies in implementing effective and efficient systems.

- **Reviewed Technology Literature.** A variety of sources were used to research potential COTS software, such as industry trade journals, the Internet, and vendor and product databases. Faulkner, Gartner Group, and Forrester proprietary information databases were used for reviewing human resources, imaging, and electronic filing information. Various Internet searches were also performed to gather vendor information on technology components of the alternatives.
- **Reviewed Federal Regulation Literature.** Many publications were used to identify the legislative regulations associated with human resource record keeping. Areas of focus included record keeping and HR data management, Federal HR policies and procedures, House-specific HR policies and procedures, and Federal HR and financial systems information. Documents from the following sources were used: the Office of Personnel Management, the JFMIP, the U.S. House of Representatives, and the U.S. Department of Commerce.²⁷
- **Contacted Vendors to Identify Feasible Technologies.** Potential vendors of software and technologies that could meet the high-level business needs of the OIRMS application were interviewed. Data collected included information about product performance and functionality metrics, as well as business case metrics and reference information. The identity of the House or the OHR was not disclosed in order to preserve vendor integrity for any future possible procurement.
- **Interviewed Stakeholders.** Opinions and preferences were gathered through interviews with key stakeholders of the OIRMS application. Key stakeholders (i.e., Office of Personnel and Benefits, Office of Payroll, OHR OIRMS system administrator, and scanning operators) were interviewed for technology and functionality preferences, limitations of the current technical environment, and information relating to the current OIRMS application.

²⁷ Examples of HR related Federal documents used included: the Office of Personnel Management, Personnel Records Guidelines (1998 CFR Title 10, Volume 1), the JFMIP Human Resource and Payroll Systems Requirements Exposure Draft (JFMIP-SR-98-5), and Personnel Policies and Procedures for the Officers and Inspector General of the U.S. House of Representatives (March 12, 1996).

- Analyzed Private and Public Sector Agencies.** A number of private and public sector agencies were examined to determine current models used for HR record keeping practices. A visit to the Department of Defense Education Activities Agency (DoDEA) was conducted for a demonstration of the DoDEA's OPF system. Additional research and interviews with other Federal groups and private sector corporations were conducted to gather information about current and projected record keeping practices, the use of imaging, and the use of employee self-service functionality. Findings from the site visits, research, and interviews were analyzed to provide a better understanding of the current trends in HR practices. Figure 4.2: Public and Private Sector Record Keeping Practices below presents a summary of the results of the research and interviews.

Company/ Agency	Imaging	Electronic Filing/ Self-Service Capabilities	Comments
DoD, Education Activities Agency	Yes	Yes	Administering the electronic OPF by imaging all HR documents and providing employees with the ability to view the electronic OPF via the Internet.
Dept. of Veterans Affairs	No	Yes	Implementing a call center and HR self-servicing. Expects to reduce HR headcount by at least 40%. ²⁸ Employees can perform the following using self-service functionality: name and address changes; check leave balances; and managers can create position description and post job openings.
NASA	No	Yes	Providing administrative (i.e., vendor procurement) forms through the Internet. Maintaining HR forms on an Intranet for employees to submit electronically.
Ford Motor Corp.	Yes	Yes	Implementing a call center and use of interactive voice response (IVR) and kiosks. Image employee documents such as employment history or transcripts. Expect to reduce HR staff by 250 people. Functions performed include: e-mail forms, change of address, changing dependent information, and conducting 360° evaluation process.
Merck & Co., Inc.	No	Yes	Allowing employees to interactive access and make changes to benefits information via kiosks.
Carolina Power & Light Co.	No	Yes	Implementing HR self-service for accessing personal information and job posting. Enabled 12 employees to handle the processing of 4,600 employees, which was formerly handled by 50 HR staff.

Figure 4.2: Public and Private-Sector Record Keeping Practices

In addition, the Department of Labor, Department of Justice, and Department of Treasury were interviewed. These agencies are currently considering enabling electronic submission functionality for HR transactions. However, these agencies are waiting for the OPM to provide guidance with regards to implementing electronic filing/electronic OPF functionality before proceeding with their implementation plans.

²⁸ Information regarding the Department of Veteran Affairs headcount reduction was received at a PayVA demonstration given to the House on December 8, 1998.

4.1.2.2 Analysis of Potential Alternatives

Using the high-level business needs as evaluation criteria and considering the various assumptions and constraints, a range of alternatives for replacing the current OIRMS application were analyzed. The analysis included reviewing the potential alternatives for replacing the current OIRMS application and assessing the potential alternatives' ability to meet the evaluation criteria. As a result of the feasibility assessment, some alternatives were found to be not viable because their functionality was inconsistent with the needs and constraints of the OHR.

Figure 4.3: Summary Assessment of Potential Alternatives presents a description of each of the potential alternatives and an assessment of the viability of each alternative. The primary ways the alternative meets or does not meet the criteria is also highlighted.

Alternative	Description	Assessment
Retain the existing FileNet application	Continue to use the current FileNet imaging system.	Not Viable primarily because the alternative does not meet the needs criteria as noted in Figure 4.1: Alternative Evaluation Criteria Summary in the following areas: (1) the application is proprietary, (2) the alternative does not allow for automated entry or update of information by House employees, and (3) the application is not able to perform an automated backup of all electronic records.
Install new imaging system with advanced form functionality and workflow	Implementation of a new COTS, non-proprietary imaging system with advanced functionality that provides improved controls and processing techniques. OPM and House HR forms would reside on the House Intranet for employees to access, complete on-line, and print.	Viable because it partially meets the evaluation criteria. Although this alternative does not provide employee self-service capability or allow for automated data entry, the alternative could be expanded to allow for a future electronic/on-line interface and therefore is considered viable.
Electronic filing via web-based forms application	Implementation of a COTS, web-based form application with the capability for employees to submit HR information through the House Intranet. HR information would be routed through a workflow application directly to the database or to the appropriate processor, where applicable. ²⁹	Viable because it partially meets the evaluation criteria. The alternative does not meet the high-level need of allowing employees to review their records on-line. However, the application is scalable to allow for enhanced employee self-service in the future.

Figure 4.3: Summary Assessment of Potential Alternatives

²⁹ The database is the HR database identified in *Section 4.1.1.3 Assumptions and Constraints*.

Alternative	Description	Assessment
Electronic filing and enhanced employee self-service capabilities	Implementation of a COTS, web-based forms application that enables employees to view, update, and submit HR information over the House Intranet. HR changes and forms would be submitted using electronic filing. Workflow would be used to route HR information directly to the database or to the appropriate processor, where applicable.	Viable because it meets all of the evaluation criteria noted in Figure 4.1: Alternative Evaluation Criteria Summary.
Outsource record keeping administration to public or private sector agency/firm.	Outsource the OIRMS application to a vendor outside of the OHR.	Not Viable because it would remove the employee records from the administration of the House, thus violating the outsourcing constraint as noted in section 4.1.1.2: Assumptions and Constraints of this evaluation.

Figure 4.3: Summary Assessment of Potential Alternatives (continued)

4.1.3 Select and Develop Feasible Alternatives

Three alternatives were identified that will serve as implementation scenarios for further evaluation. The three alternatives for further evaluation are:

- **New Imaging/Workflow system.** This alternative would include the implementation of a new client-server based imaging system with advanced forms processing functionality (i.e., OCR/ICR, workflow). A forms-based application would be implemented that would enable employees to complete House HR forms on-line and print the hard copy forms for manual submission to the OHR.
- **Electronic Filing via Web-Based Forms Application.** This alternative includes the implementation of a web-based forms application with functionality that allows for submission of OPM and House HR forms via the House Intranet. A workflow application, which would route submitted forms directly to the database or to an appropriate official for processing, is also included in this alternative.
- **Electronic Filing and Enhanced Employee Self-Service Capabilities.** This alternative includes the implementation of a web-based forms application and gives the employee the ability to view, update, and submit HR information via the House Intranet. A workflow application, which would route submitted forms directly to the database or to an appropriate official for processing, is also included in this alternative.

4.2 Overview of Existing System

This section presents an overview of the existing OIRMS application used by OHR. The overview provides a profile of the primary stakeholders and a description of the technology components. As discussed in Figure 4.3: Summary Assessment of Potential Alternatives, the existing system is not considered a viable alternative because it does not meet the identified needs of the OHR.

4.2.1 Stakeholder Relationships

Figure 4.4: Overview of Stakeholders for Existing System presents a description of the stakeholders of the current OIRMS application. In the discussion, each of the stakeholders and their primary relationship to the OIRMS application is detailed.

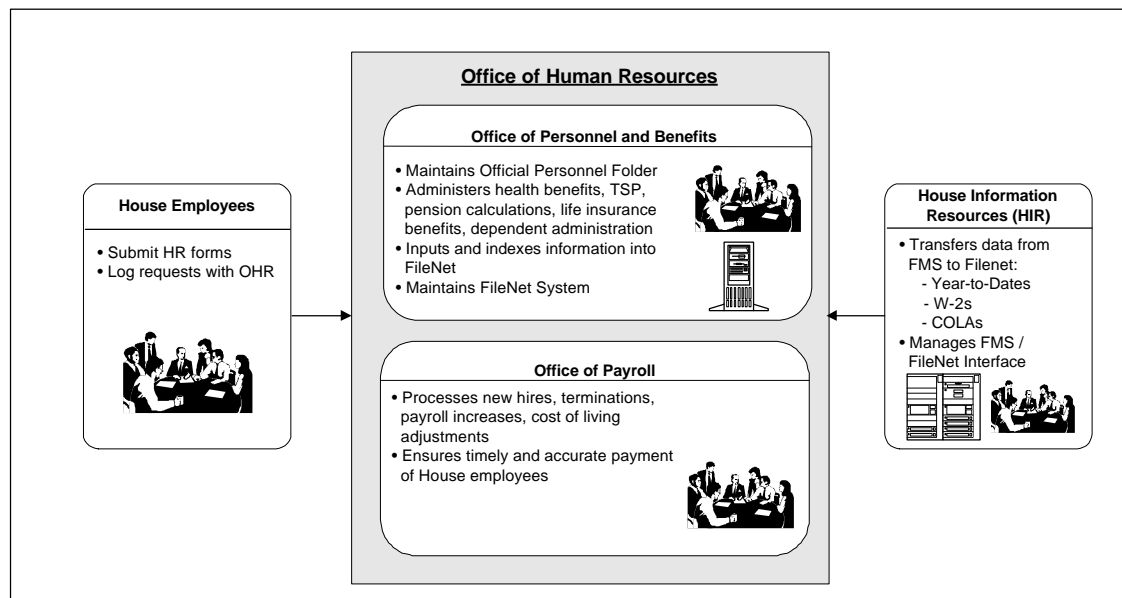


Figure 4.4: Overview of Stakeholders for Existing System

Office of Personnel & Benefits

- **Personnel & Benefits Administrators.** Personnel and Benefits staff administers the Federal employee benefits programs for the House. Thirteen Personnel and Benefits administrators process employee health and life insurance, new hire enrollments, and changes in benefit selections by inputting information into the FMS. They are also responsible for reviewing forms as they are received to ensure they are completed correctly, following up on submission errors, and processing the HR changes. These users, who are the primary contact for House employee HR questions, use OIRMS to access the HR information they need to process benefits and answer House employee questions.

- **Scanning Administrators.** Two imaging administrators are responsible for the scanning, indexing, and quality control of all materials entered into the OIRMS system. They are also responsible for labeling and organizing hard copy forms after they are scanned so that they are accessible if needed. The two imaging administrators archive the hard copies in the basement of the Cannon Building for up to one year after which they are sent to the National Archives for permanent storage.
- **OIRMS System Administrator.** There is currently one individual responsible for the administration of the OIRMS system. The duties include system maintenance, hardware and software procurement, OIRMS security, and the OIRMS custom interface with the FMS. The OIRMS administrator is also the OHR liaison with HIR.³⁰

Office of Payroll

Six payroll administrators access OIRMS on a daily basis to process payroll data for House employees. Payroll forms, such as the payroll authorization form, are kept in OIRMS and are used to track employee service history.

House Employees

The House has approximately 10,000 employees who submit HR information, such as dependent changes, address changes, or benefit elections, through submission of OPM and House forms to the OHR³¹. Forms are obtained and submitted in hard copy format. To access personal HR information, House employees log requests with OHR and receive the copies of the form images printed from OIRMS. The employees' OPF is maintained in OIRMS.

House Information Resources (HIR)

HIR maintains the FMS system and its interface to OIRMS. OIRMS interfaces with FMS to verify indexing information. A HIR technician maintains the customized software that provides the interface. This technician also executes the annual data transfer of year-to-dates, W-2s, and cost of living adjustments from FMS to OIRMS.

³⁰ A member of the OHR is currently filling the OIRMS system administrator position on a temporary basis.

³¹ The House employee population is approximately 10,000 at any given time; due to employee turnover and seasonal hiring the total annual employee population is approximately 15,000 employees.

4.2.2 Technology Description

Figure 4.5: Overview of Existing System Technology Infrastructure presents an overview of the technology infrastructure associated with the existing system. The discussion provides a high-level overview of the information technology components of the existing OIRMS system.

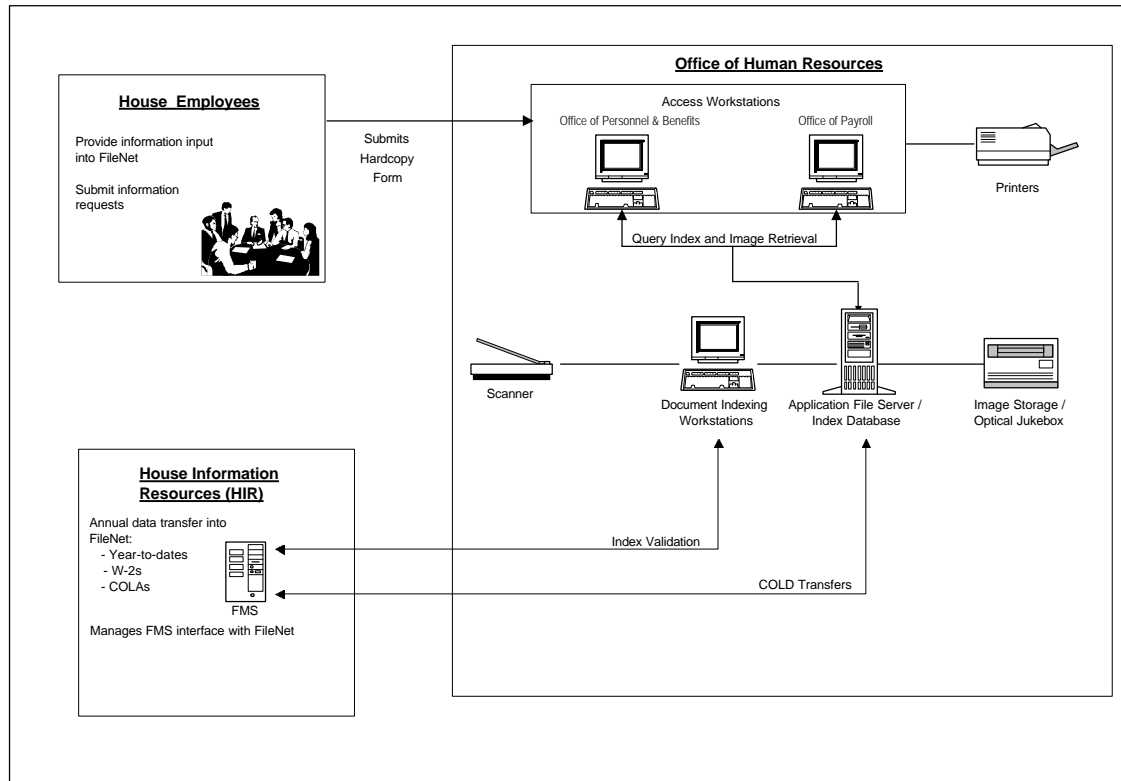


Figure 4.5: Overview of Existing System Technology Infrastructure

The primary components of the existing systems technology infrastructure are:

- **Application File Server.** The OIRMS application resides on an RS/6000 file server with a Unix-AIX Version 4.1.5 operating system. The server houses the indexing database and performs print and security functions. The custom software developed to allow OIRMS to interface with FMS also resides on the server. The server is located in the basement of the Cannon Building.
- **Mirror Drive.** A redundant RS/6000 file server is used to mirror the application file server and backup the indexing database.

- **Optical Image Storage.** Documents scanned and processed by OIRMS are stored on seven-gigabyte Write-One-Read-Many (WORM) optical platters. Images are stored in a proprietary TIFF format and cannot be altered once they are written to disk. The disks are stored in an optical disc jukebox system that currently contains 75 platters and has a 115-platter capacity.

- **Scanner Workstations.** One scanner and associated workstation and two indexing workstations are used by the scanner administrators for document scanning, indexing and routine data entry. The scanner is a Bell & Howell, Copiscan 11 with Ace Plus model.

- **Workstations.** The Office of Personnel/Benefits and the Office of Payroll staff access OIRMS through PC workstations located at their desks. The workstations are used to query the system and view documents.

- **Custom Interface.** OIRMS interfaces with the FMS system, which resides on the HIR mainframe. Through this customized interface, FMS is used to verify information during the indexing of scanned documents in OIRMS. Index information is entered into OIRMS and the custom interface validates this information with the relevant data residing in FMS.

- **Printers.** OIRMS's users have the ability to print OIRMS images by using one of seven Hewlett Packard laser printers connected to the House's network.

4.3 Alternative Systems

This section presents the evaluation of the viable alternatives for replacing the current OIRMS application, as described in Figure D.3: Summary Assessment of Potential Alternatives. The viable alternatives include:

- New Imaging/Workflow System.
- Electronic Filing via Web-Based Forms Application.
- Electronic Filing and Enhanced Employee Self-Service Capabilities.

The discussion of each alternative includes the presentation of the following information:

- **Stakeholder Analysis** describes how the alternative will affect the primary OIRMS stakeholders.

- **Technology Description** presents a high-level overview of the technology components associated with the alternative.
- **Alternative Criteria Evaluation** presents a summary of the evaluation of the alternatives' ability to meet the criterion capability.
- **Implementation Issues** identifies any issues that need to be considered when evaluating the alternative.

4.3.1 Alternative 1: New Imaging/Workflow System

This section includes the stakeholder analysis, the technology description, the alternative criteria evaluation, and the implementation issues for the New Imaging/Workflow System alternative. This alternative includes the following functionality:

- **Imaging/Workflow application** that would provide the functionality to maintain House and OPM human resource forms in a non-proprietary format. The images retained in the application would be available to Personnel and Benefits and Payroll staff. The workflow component of the imaging application would be able to provide automated routing of the HR forms for processing and allow for segregating of access to system data, where applicable.
- **Optical Character Recognition/Intelligent Character Recognition** functionality that would provide the ability to optically recognize designated key indexing fields as the documents are scanned, automatically entering the information into an indexing database, and reducing the amount of manual data entry.
- **Forms-based application** that would reside on the House Intranet.³² The application would provide the ability for employees to access, complete, and print OPM and House HR forms from their desktop. Rules and validation intelligence will be programmed into the forms application that would reduce form errors by recognizing incorrect fields or not allowing completion of form until all required fields are filled out.
- **Interface with HR/Payroll system** that would provide indexing validation capability. As the index information is input into the new system, the index application would access the HR database to verify key fields (e.g., social security number). This validation should increase the accuracy of information entered into the new system.

³² It is assumed all House employees will have access to the House Intranet.

4.3.1.1 Stakeholder Analysis

Figure 4.6: Alternative 1: Stakeholder Overview presents an overview of this alternative's key stakeholders. In the discussion, each of the stakeholders and their role in this alternative is detailed.

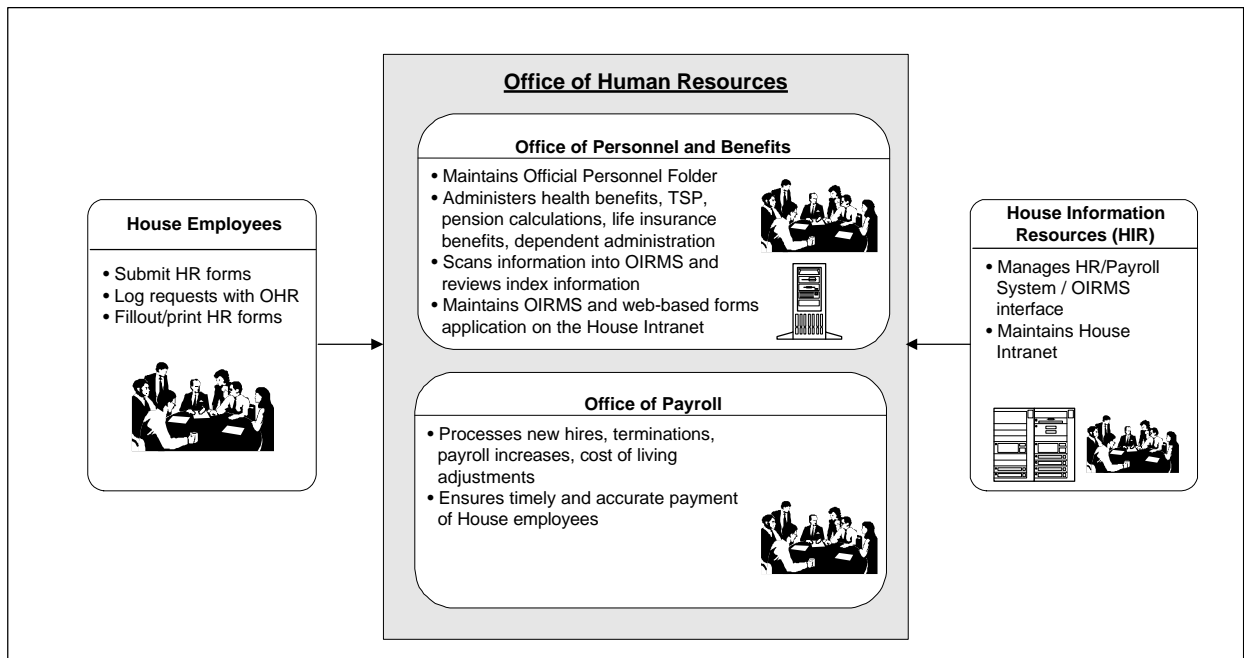


Figure 4.6: Alternative 1: Stakeholder Overview

Office of Personnel & Benefits

- **Personnel and Benefits Administrators.** Personnel and Benefits staff administer the Federal employee benefits programs for House employees. The functionality of the web-based forms application could potentially decrease the errors on forms submitted by employees, and thus reduce the time spent on the review and follow-up procedures performed by Personnel and Benefits administrators. The decrease in manual processes could enable administrators to spend more time counseling and providing strategic HR services such as long range HR planning, recruiting, and training.
- **Scanning Administrators.** The use of OCR/ICR functionality eliminates the need to manually enter the image index information. The imaging administrators would now be responsible for reviewing and correcting the image index information as it is recognized by the OCR/ICR engine. The elimination of the manual entry of indexing fields could potentially reduce the time spent on each form and allow the indexing of additional fields, if desired. The use of the web-based forms application would provide forms with standard machine print information in the OCR/ICR fields. Use

of machine print forms could potentially increase the accuracy of the OCR/ICR function and further reduce the time and labor spent on each scanned form. The OCR/ICR functionality could potentially decrease manual errors in the indexing process and increase user confidence in the information in the system.³³

- **OIRMS System Administrator.** The responsibilities of the system administrator would be similar to those of the person's current role. The automated backup process would reduce the time and labor spent on that aspect of system maintenance. The responsibility for maintaining the OHR web site currently belongs to HIR. However, the OHR system administrator is responsible for maintaining the content of the OHR website. The implementation of a forms-based application on the House Intranet would provide the need for additional interaction with HIR. The recurring responsibility for maintaining additional OHR information (i.e., HR forms) would continue to belong to the OHR system administrator.

Office of Payroll

The addition of OCR/ICR and the forms-based application functionality could potentially decrease the errors on the submitted forms and the indexing errors, and thus could potentially reduce the processing time and effort of the payroll administrators.³⁴

House Employees

The implementation of the forms-based application on the House Intranet could improve employees' ability to access forms. Providing the forms via the Intranet could also improve the forms completion process by decreasing errors through the "intelligent" rules in the forms application. Improved access to the forms, fewer submitted errors, and faster submission time should potentially decrease the time to process a HR change, which would benefit the employee.

House Information Resources (HIR)

HIR is responsible for the maintenance of the House Intranet. Implementation of the forms-based application on the House Intranet would increase the interaction between HIR and OHR. HIR would continue to play a role in maintaining the interface between this alternative and whatever HR/Payroll solution is implemented.

³³ Currently, OHR Personnel and Benefits administrators sometimes print all documents in an employee file in order to complete a process that requires only a specific form type. This is done because the form type information used in the indexing process is not consistently accurate.

³⁴ Efficiencies gained by the payroll administrators through the implementation of the OIRMS replacement system are unclear due to the unknown functionality of the new HR/Payroll solution.

4.3.1.2 Technology Description

Figure 4.7: Alternative 1: Technology Description presents an overview of the technology infrastructure associated with this alternative. The technology components discussion will provide a high-level overview of the information technology components for this alternative.

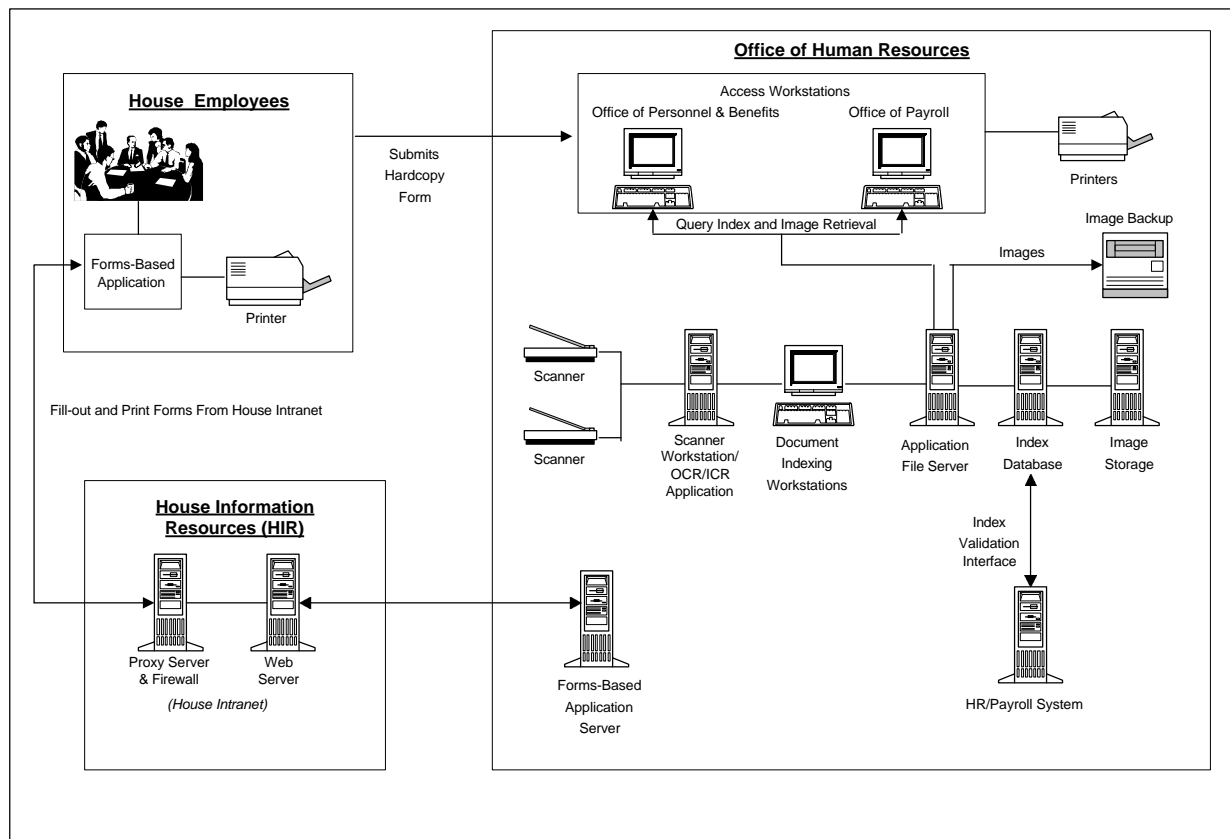


Figure 4.7: Alternative 1: Technology Description

The primary components of this alternative's technology infrastructure are:

- **Imaging/Workflow Application.** The imaging application allows for scanning, indexing, and query processes. Possible improvements to the core document imaging functionality include the addition of workflow management and OCR/ICR features. A workflow application manages a controlled flow of documents among administrators to ensure both accountability and quality assurance in the processing of information. The imaging/workflow application and the associated database engine would reside on separate servers.
- **Storage Media and Backup.** Given the age and expense of OHR's existing image storage, an upgrade to newer media or technology could be beneficial. The storage media included in this alternative would be magnetic disks rather than optical disks.

Magnetic media provides greater access speed and a more scalable storage capacity than optical media.³⁵ In addition, market research has shown that the future availability of optical WORM vendors may be in question³⁶. This potential lack of availability should be considered when making decisions regarding storage media.

- **Scanning and Printing Peripherals.** To accommodate current and future processing workloads, it may be necessary to upgrade the scanner and printing peripherals. A high-speed printer and a high-speed scanner could address the need for advanced scanning and printing capabilities.
- **Forms-Based Application.** A forms-based application would be used to allow House employees to access OPM and House HR forms from the House Intranet. The application would allow employees to fill out the form on-line and print the completed form. The employee would then sign the form and submit it to the OHR. The forms-based application would employ pre-programmed rules that require users to complete certain fields or reject information that is obviously incorrect (e.g., May 32, 1998). If one of the pre-programmed rules were violated, the forms application would notify the user of the error and not allow the user to save or print the form until the mistakes were corrected.
- **Interface with HR/Payroll System.** The interface with the HR/Payroll system would provide indexing validation capability. As the index information is input, the new system would access the central HR database to verify key fields (e.g., social security number). This validation increases the accuracy of information entered into the new system.
- **House Intranet.** The forms-based application detailed above would be accessed through the House Intranet. The House Intranet currently consists of four servers handling various functions. The House Intranet employs standard security mechanisms, such as account IDs and passwords.
- **Employee Workstations (desktops).** House employees would access the forms-based application and the House Intranet from their desktop computers. Employees could print or save information from their desktop computer as well.

³⁵ The DoDEA indicated that the Department of Defense Logistics Agency originally implemented an imaging system with optical disk storage, but migrated to magnetic media due to the slow system speed associated with optical media.

³⁶ “Hitachi, Sony, and Eastman Kodak have all decided to exit the large format WORM market, and ATG has experienced product delays and severe financial difficulties.” “The WORM Turns: Optical-Disk Replacements”. M. Casey. **Gartner Group**, Research Note. May 22, 1998.

4.3.1.3 Alternative Criteria Evaluation

As presented in Figure 4.3: Summary Assessment of Potential Alternatives, this alternative is viable because it partially meets the needs of the OHR. Figure 4.8: Alternative 1: Alternative Criteria Evaluation identifies which needs this alternative meets. As presented in the figure, this alternative meets most key needs except for providing the employee self-service capability and allowing for automated data entry. However, this alternative could be expanded to allow for a future electronic/on-line interface and therefore is considered a viable option.

Criterion Capability	Business Needs	Meets Criteria
Input Capabilities	<ul style="list-style-type: none"> • Ability to automate the entry of House HR information (e.g., HR data or related correspondence). 	No
Processing Capabilities	<ul style="list-style-type: none"> • Ability for system to validate entry of HR information. 	Yes
	<ul style="list-style-type: none"> • Allow for modification of HR records through on-line access or other sources (e.g., Internet/Intranet). 	No
	<ul style="list-style-type: none"> • Ability to provide a history of changes made to House employee HR data. 	Yes
	<ul style="list-style-type: none"> • Ability to file HR information consistent with Federal regulations. 	Yes
	<ul style="list-style-type: none"> • Ability to record receipt of relevant HR hard copy documents. 	Yes
Output Capabilities	<ul style="list-style-type: none"> • Ability to reproduce stored HR data in print and electronic formats. 	Yes
	<ul style="list-style-type: none"> • Allow for high-speed printing of HR data in a user defined sort order. 	Yes
Query and Reporting Capabilities	<ul style="list-style-type: none"> • Ability to produce reports based on user defined queries. 	No
	<ul style="list-style-type: none"> • Ability to simultaneously view multiple House employees' records. 	Yes
Storage Capabilities	<ul style="list-style-type: none"> • Ability to track House HR data from initial receipt to archival. 	Yes
	<ul style="list-style-type: none"> • Ability to perform automated backup of all electronic records. 	Yes
	<ul style="list-style-type: none"> • Ability to maintain images in a non-proprietary data format. 	Yes

Figure 4.8: Alternative 1: Alternative Criteria Evaluation

Criterion Capability	Business Needs	Meets Criteria
Technology Capabilities	<ul style="list-style-type: none"> • Provide for interoperability with other technologies and systems that provide input/output of HR data. 	Yes
	<ul style="list-style-type: none"> • Provide scalability to accommodate increases in size and uses of system. 	Yes
	<ul style="list-style-type: none"> • Ability to accommodate advances in hardware and software technologies. 	Yes
	<ul style="list-style-type: none"> • Provide ability for simultaneous access by large user population (e.g., 10,000 House employees). 	No
Application Controls and Security Capabilities	<ul style="list-style-type: none"> • Ability to prevent unauthorized access to data and system. 	Yes
	<ul style="list-style-type: none"> • Ability to track usage information for system users. 	Yes
	<ul style="list-style-type: none"> • Ability to protect HR data during electronic input, processing, and storage. 	No

Figure 4.8: Alternative 1: Alternative Criteria Evaluation (continued)

4.3.1.4 Implementation Issues

The following implementation issues should be considered for this alternative:

- **Data Conversion Solution.** This alternative must be able to incorporate OHR's current images and indexing information stored in OIRMS. In the current process, the box number is manually stamped on the form prior to scanning the form into OIRMS. After scanning, the original source documents of the images are placed in that box, and shipped and stored in the National Archives. To access a form after it has been shipped to the National Archives, the image is retrieved from OIRMS and the box number is read off of the image of the form. Thus, without the image, it is difficult to locate the corresponding hard copy form in the National Archives. Additionally, the first one thousand boxes of documents scanned into OIRMS have no box number or notation identifying the location of the hard copy in the National Archives. To retain the link between the images in the current OIRMS and the hard copy location in the National Archives, the current images would need to be converted and maintained in an accessible format. It may be possible to review the contents of the existing image storage for information not needed by the OHR staff. OHR may determine that some of the information may not need to be converted.
- **Employee Training.** Member, Committee, and House Officer staff members will need to receive training on the features and capability of the forms-based application on the House Intranet. A means of extending training to all House employees needs to be identified. A possible solution is to train a representative from each office, who in turn, would train the other employees in that office.
- **Coordination Needed for Interface Development.** The new OIRMS would need an automated interface with the new HR/Payroll system to validate information used to index scanned documents. The interface would be required to ensure that accurate index information is input into the new OIRMS. The interdependence between the new HR/Payroll system and the OIRMS replacement requires that the projects be coordinated throughout implementation.
- **Employees Access to House Intranet.** House employees would need to have access to the House Intranet in order to access the forms-based application. Employees located in the Washington, D.C. area have access to the House Intranet. Currently, one district office for each Member has a free designated direct relay connection to the House Intranet and connections for additional offices are charged to the Member.
- **Use of OCR/ICR Technology.** Careful consideration would need to be given to the reengineering of the OHR's scanning processes to accommodate the OCR/ICR features of the new system. Thought should also be given to the type and number of fields to be captured using OCR/ICR.

4.3.2 Alternative 2: Electronic Filing Via Web-Based Forms Application

This section includes the stakeholder analysis, the technology description, the alternative criteria evaluation, and the implementation issues for the Electronic Filing via Web-Based Forms Application alternative. This alternative includes the following functionality:

- **Web-based forms application** that would be used to allow House employees to fill out and submit OPM and House HR forms electronically via the House Intranet. As noted in Alternative 1, the forms application would also allow employees to save and/or print the completed forms for hard copy submission. The web-based forms application could also perform routine edit checks while the employee enters information.
- **Interface with HR/Payroll system** that would allow for automated data input as HR information is submitted by employees. The interface would enable baseline data, such as name or employee number, to be automatically applied to the form the employee sees on the desktop. Through the interface, information submitted on the web-based forms application could be applied to the database.
- **Workflow application** that would route submitted information to the appropriate area for processing. Information could be sent to the applicable administrator for review and processing or, through the database interface, be directly applied to the database.

4.3.2.1 Stakeholder Analysis

Figure 4.10: Alternative 2: Stakeholder Overview presents an overview of this alternative's key stakeholders. In the discussion, each of the stakeholders and their role in this alternative is detailed.

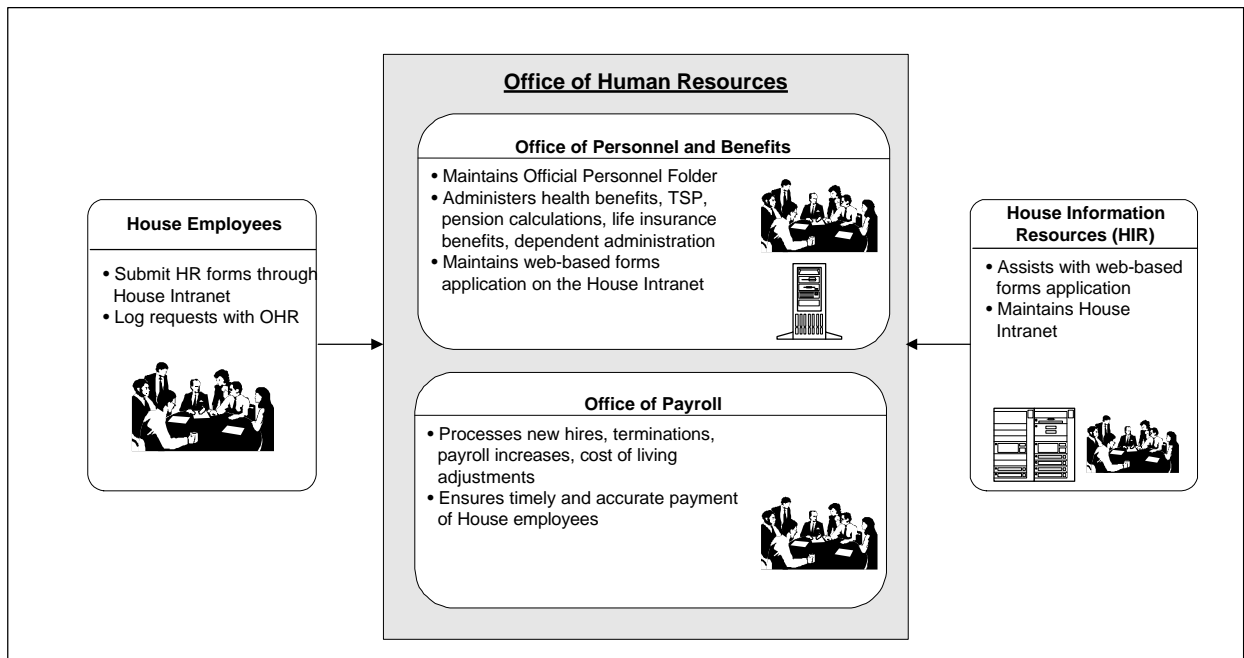


Figure 4.10: Alternative 2: Stakeholder Overview

Office of Personnel and Benefits

- **Personnel and Benefits Administrators.** Personnel and Benefits staff administers the Federal employee benefits programs for the House. Through electronic filing functionality, OHR staff would receive the employee data rather than the hard-copy form that contains the data. By reducing the number of hard copy forms and the need to manually enter HR data, the implementation of electronic filing functionality could potentially reduce the processing time for each HR transaction. Administrators would now review and approve the HR information and changes rather than manually enter the information into the HR/Payroll database. The use of workflow would enable appropriate officials to approve the transaction and forward it to another person on-line instead of manually transferring the document. The workflow application would also allow basic changes, such as address and phone number changes, to automatically update the HR database, eliminating the time and labor associated with that process. The reduction of manual processing could allow OHR staff to reallocate resources to other activities such as employee counseling and strategic planning and analysis activities, if desired.

- **Scanning Administrators.** This alternative does not include imaging functionality, thus there is no need for the scanning administrator positions.

- **OIRMS System Administrator.** The responsibility for the information on the OHR website currently belongs to OHR. The implementation of web-based forms on the House Intranet could require additional interaction with HIR. Maintaining the web-based forms would presumably be the responsibility of the OHR system administrator. Electronic filing security issues and database maintenance would also be responsibilities of the OHR system administrator.³⁷

Office of Payroll

The addition of electronic filing and the web-based forms application functionality could potentially decrease the processing time and effort of the payroll administrators by decreasing the number of errors submitted by employees.

House Employees

Placing the House and OPM HR forms on the House Intranet would provide faster access to the forms necessary to conduct HR transactions. Electronic filing could increase the employees' sense of ownership and responsibility for their own HR information and changes³⁸. While employee response to electronic filing of HR information has been positive in other organizations, some individuals may be uncomfortable with the shift away from current practices. A gradual transition to electronic filing all HR information may increase the comfort level of the House employees and their acceptance of the new environment.

House Information Resources (HIR)

The OHR website resides on the House Intranet. HIR maintains the House Intranet and could also assist with the implementation of the web-based forms application. In addition, HIR would have some responsibility for maintaining the interface of this alternative with the HR/Payroll system.

³⁷ Due to the interdependence between the OIRMS solution and the HR/Payroll solution, the system administrator responsibilities may be impacted by the implementation of the HR/Payroll solution. Thus, the extent of the impact of the OIRMS replacement on the system administrator position cannot be truly assessed.

³⁸ As noted in the September 1998 issue of *CIO.com: Personnel Best*.

4.3.2.2 Technology Description

Figure 4.11: Alternative 2: Technology Description presents an overview of the technology infrastructure associated with this alternative. The technology components discussion will provide a high-level overview of the information technology components for this alternative.

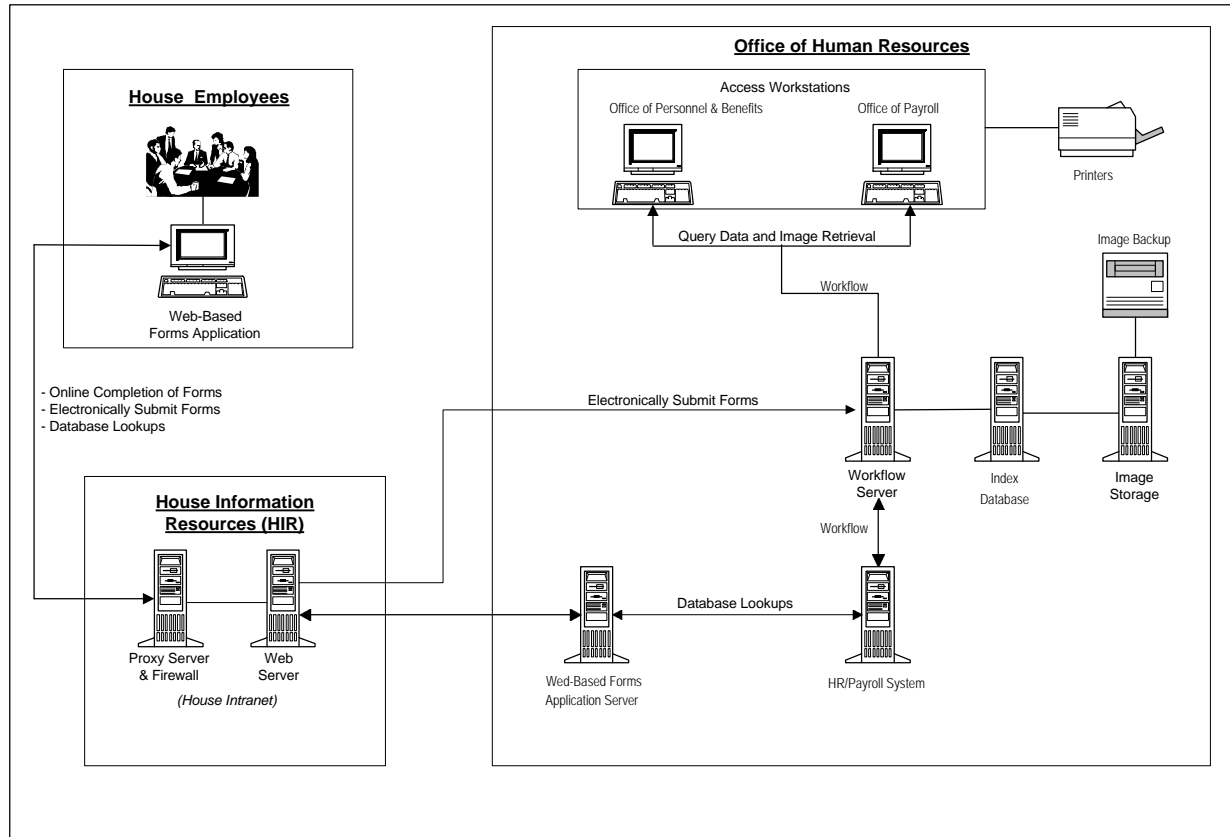


Figure 4.11: Alternative 2: Technology Description

- Web-Based Forms Application.** The key aspect of the electronic filing alternative is the web-based forms application. A web-based forms application could be deployed that would be used to allow House employees to fill out OPM and House HR forms via the House Intranet. The application would capture all of the information currently submitted on the hard copy HR documents, and allow employees to submit form data electronically. The web-based forms application would also allow employees to save and/or print the completed forms for hard copy submission. The web-based forms application could perform routine edit checks while the employee enters information.
- Interface with HR/Payroll system.** The web-based forms application would interface with the HR/Payroll system to supply basic information to the forms application, as well as receive information submitted by employees. The interface

would supply information to the form application dependent on the form type accessed by the employee (e.g., name, employee number, address). This interface will also allow data submitted by House employees to be automatically applied to the HR database, after review by a member of OHR.

- **House Intranet.** The web-based forms application detailed above would be accessed through the House Intranet. The House Intranet currently consists of four servers handling different areas of the Intranet. The House Intranet employs standard security mechanisms, such as account IDs and passwords.
- **Workflow Application.** Workflow functions automate the routing of documents/information among appropriate officials to ensure accountability and quality assurance in the processing of information. Workflow applications also enable organizations to monitor processes, evaluate performance, and automatically distribute and level workload. The workflow would enable HR changes to be applied directly to the database or routed to the appropriate official for processing and verification depending on the information or form type.
- **Employee Workstations (desktops).** House employees would access the web-based forms application and the House Intranet from their desktop computers. Employees could print, save, or submit HR information from their desktop computer as well.

4.3.2.3 Alternative Criteria Evaluation

As presented in Figure 4.2: Summary Assessment of Potential Alternatives, this alternative is viable because it partially meets the needs of the OHR. Figure 4.12: Alternative 2: Alternative Criteria Evaluation identifies which of the needs this alternative meets. As presented in the figure, this alternative meets most key needs except for providing employee self-service access to their HR records. However, the functionality of this alternative could be expanded to allow for future employee self-service functionality and therefore is considered a viable option.

Criterion Capability	Business Needs	Meets Criteria
Input	<ul style="list-style-type: none"> • Ability to automate the entry of House HR information (e.g., HR data or related correspondence). 	Yes
Processing	<ul style="list-style-type: none"> • Ability for system to validate entry of HR information. 	Yes
	<ul style="list-style-type: none"> • Allow for modification of HR records through on-line access or other sources (e.g., Internet/Intranet). 	No
	<ul style="list-style-type: none"> • Ability to provide a history of changes made to House employee HR data. 	Yes
	<ul style="list-style-type: none"> • Ability to file HR information consistent with Federal regulations. 	Yes
	<ul style="list-style-type: none"> • Ability to record receipt of relevant HR hard copy documents. 	Yes
Output	<ul style="list-style-type: none"> • Ability to reproduce stored HR data in print and electronic formats. 	Yes
	<ul style="list-style-type: none"> • Allow for high speed printing of HR data in a user defined sort order. 	Yes
Query and Reporting	<ul style="list-style-type: none"> • Ability to produce reports based on user defined queries . 	No
	<ul style="list-style-type: none"> • Ability to simultaneously view multiple House employees' records. 	Yes
Storage	<ul style="list-style-type: none"> • Ability to track House HR data from initial receipt to archival. 	Yes
	<ul style="list-style-type: none"> • Ability to perform automated backup of all electronic records. 	Yes
	<ul style="list-style-type: none"> • Ability to maintain images in a non-proprietary data format. 	Yes

Figure 4.12: Alternative 2: Alternative Criteria Evaluation

Criterion Capability	Business Needs	Meets Criteria
Technology	<ul style="list-style-type: none"> • Provide for interoperability with other technologies and systems that provide input/output of HR data. 	Yes
	<ul style="list-style-type: none"> • Provide scalability to accommodate increases in size and uses of system. 	Yes
	<ul style="list-style-type: none"> • Ability to accommodate advances in hardware and software technologies. 	Yes
	<ul style="list-style-type: none"> • Provide ability for simultaneous access by large user population (e.g., 10,000 House employees). 	Yes
Application Controls and Security	<ul style="list-style-type: none"> • Ability to prevent unauthorized access to data and system. 	Yes
	<ul style="list-style-type: none"> • Ability to track usage information for system users. 	Yes
	<ul style="list-style-type: none"> • Ability to protect HR data during electronic input, processing, and storage. 	Yes

Figure 4.12: Alternative 2: Alternative Criteria Evaluation (continued)

4.3.2.4 Implementation Issues

The following implementation issues should be considered for this alternative:

- **Data Conversion Solution.** This alternative must be able to incorporate OHR's current images and indexing information stored in OIRMS. In the current process, the box number is manually stamped on the form prior to scanning the form into OIRMS. After scanning, the original source documents of the images are placed in that box, and shipped and stored in the National Archives. To access a form after it has been shipped to the National Archives, the image is retrieved from OIRMS and the box number is read off of the image of the form. Thus, without the image, it is difficult to locate the corresponding hard copy form in the National Archives. Additionally, the first one thousand boxes of documents scanned into OIRMS have no box number or notation identifying the location of the hard copy in the National Archives. To retain the link between the images in the current OIRMS and the hard copy location in the National Archives, the current images would need to be converted and maintained in an accessible format. It may be possible to review the contents of the existing image storage for information not needed by the OHR staff. OHR may determine that some of the information may not need to be converted.
- **Maintenance of Hard copy Forms.** Currently, there are eight HR forms that require an actual signature (i.e., W-4 forms, beneficiary designation forms), and thus a hard copy submission. The forms can be designed such that they can only be filled out and printed using the web-based forms application. The data contained in these forms would then be entered through manual keypunch. A process for maintaining these hard copy submissions would need to be established. A recently completed OPM taskforce recommended that the forms requiring a signature be retained by the agency responsible for the forms³⁹ (i.e., FEGLI maintains the hard copy version of the Life Insurance Beneficiary form), however the recommendation has not been implemented.
- **Employee Training.** Member, Committee, and House Officer staff members may need to receive training on the features and capability of the web-based forms application on the House Intranet. A means of extending training to all employees needs to be identified. A possible solution is to train a representative from each office, who in turn, could train the other employees in the office.
- **Employees Access to House Intranet.** House employees would need to have access to the House Intranet in order to access the web-based forms. Currently, one district office for each Member has a free designated direct relay connection to the House Intranet and connections for additional offices are charged to the Member.

³⁹ Information about the OPM task force was received through conversations with an OPM task force member.

- **OPM Mandates.** Currently, OPM approves requests by agencies to accept electronic versions of most HR forms in lieu of hard copies only on an exception basis. The OHR would need to petition OPM for the ability to implement the electronic forms functionality as noted in this alternative. Other agencies whose HR forms House employees submit may also need to be petitioned for electronic submission in lieu of hard copy (i.e., FEGLI and the Life Insurance Beneficiary form).
- **Electronic Filing and Non-Repudiation.** The legal issues surrounding the use of electronic filing and authentication involve the acceptability of digital information and forms in a court of law. These issues are particularly important due to the sensitivity of HR information. The House will need to select a technology to meet those issues, based on mandates provided by OPM.

4.3.3 Alternative 3: Electronic Filing and Enhanced Employee Self-Service Capabilities

This section presents the stakeholder analysis, the technology description, the alternative criteria evaluation, and the implementation issues for the Electronic Filing and Enhanced Employee Self-Service Capabilities alternative. The functionality of this alternative includes:

- **Enhanced Employee Self-Service Capabilities** that would provide House employees with the ability to view, update and submit HR information via the House Intranet. A web-based forms application would be included that would also allow employees to save and/or print the completed forms.
- **HR/Payroll System Interface** that would enable employees to view their previously submitted information and to make changes to designated fields in the database. The HR/Payroll system would interface with the forms application, automatically supplying information for key fields such as name and social security number, and applying information submitted through the forms application directly to the database.
- **Workflow application** that would provide the ability to route the HR information submitted by House employees to the applicable administrator or directly to the HR/Payroll system, depending on form type.

4.3.3.1 Stakeholder Analysis

Figure 4.13: Alternative 3: Stakeholder Overview presents an overview of this alternative's key stakeholders. In the discussion, each of the stakeholders and their role in this alternative is detailed.

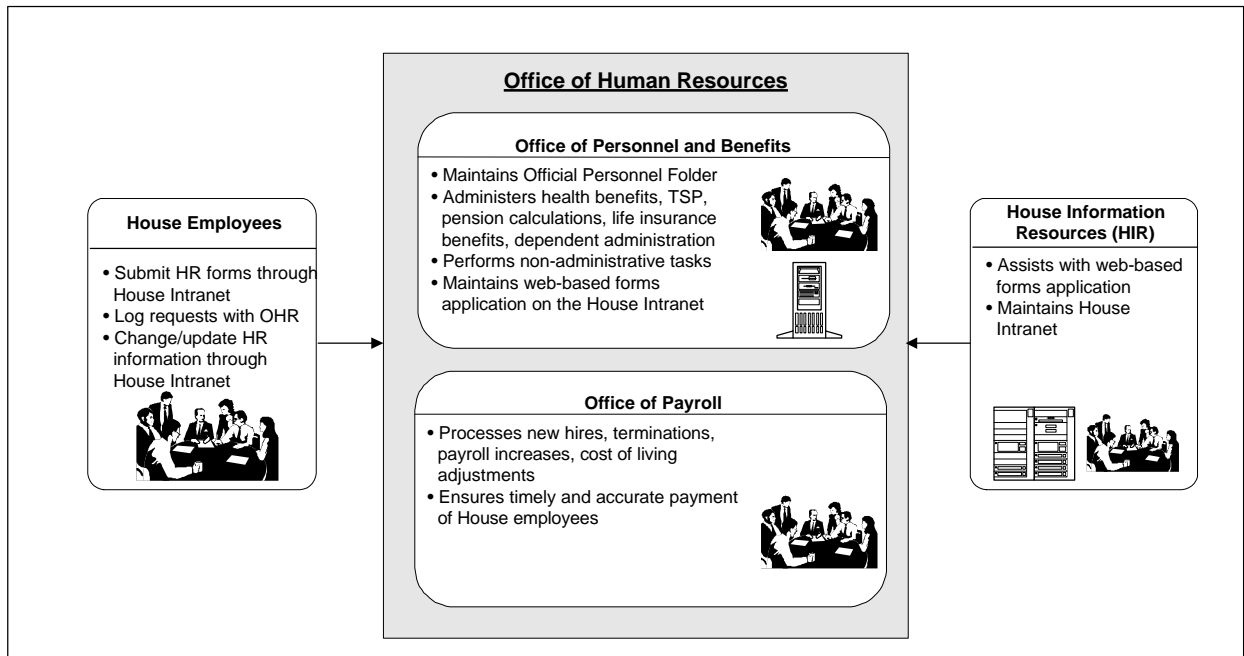


Figure 4.13: Alternative 3: Stakeholder Overview

Office of Personnel and Benefits

- **Personnel and Benefits Administrators.** Personnel and Benefits staff administers the Federal employee benefits programs for the House. Employee self-service capabilities in conjunction with the electronic forms functionality described in this alternative would lead to a significant change in the OHR business processes. A reduction in administrative and manual processes could potentially be achieved.
- **Scanning Administrators.** This alternative does not include imaging functionality, thus the implementation of electronic filing and workflow routing to the HR database would eliminate the need for the two imaging administrator positions.
- **OIRMS System Administrator.** The responsibility for the information on the OHR website currently belongs to OHR. The implementation of web-based forms on the House Intranet could require additional interaction with HIR. Maintaining the web-based forms would presumably be the responsibility of the OHR system administrator. Electronic filing security issues and database maintenance would also be responsibilities of the OHR system administrator.

Office of Payroll

Use of electronic forms and employee self-service functionality could decrease processing time. Electronic filing could speed the submission of payroll related changes, and allowing employees to update tax deductions through self-service could eliminate the manual entry of a significant amount of changes.

House Employees

With electronic filing and employee self-service functionality, House employees would have a greater role in the administration of their own benefits and information (e.g., benefits needs, address changes, etc.). The employees could view current and historical information from the database. This would be a significant change from the current environment at the House. House employees would still have the ability to fill out hard copy versions of the OHR forms, as well as contacting the OHR for assistance or HR information. While employee response to electronic filing of HR information and employee self-service functionality has been positive in other organizations, some individuals may be uncomfortable with the shift away from current practices. A gradual transition to the electronic filing of all HR information may increase the comfort level of the House employees and their acceptance of the new environment.

House Information Resources (HIR)

Employees would use the House Intranet to access the OHR Intranet site, the OHR forms and the self-service functionality. HIR maintains the House Intranet and could assist in the implementation of the web-based forms application and the self-service functionality. HIR would maintain the House Intranet and could assist the OHR staff with the web-based forms application on an on-going basis where applicable.

4.3.3.2 Technology Description

Figure 4.14: Alternative 3: Technology Description presents an overview of the technology infrastructure associated with this alternative. The technology components discussion will provide a high-level overview of the information technology components for this alternative.

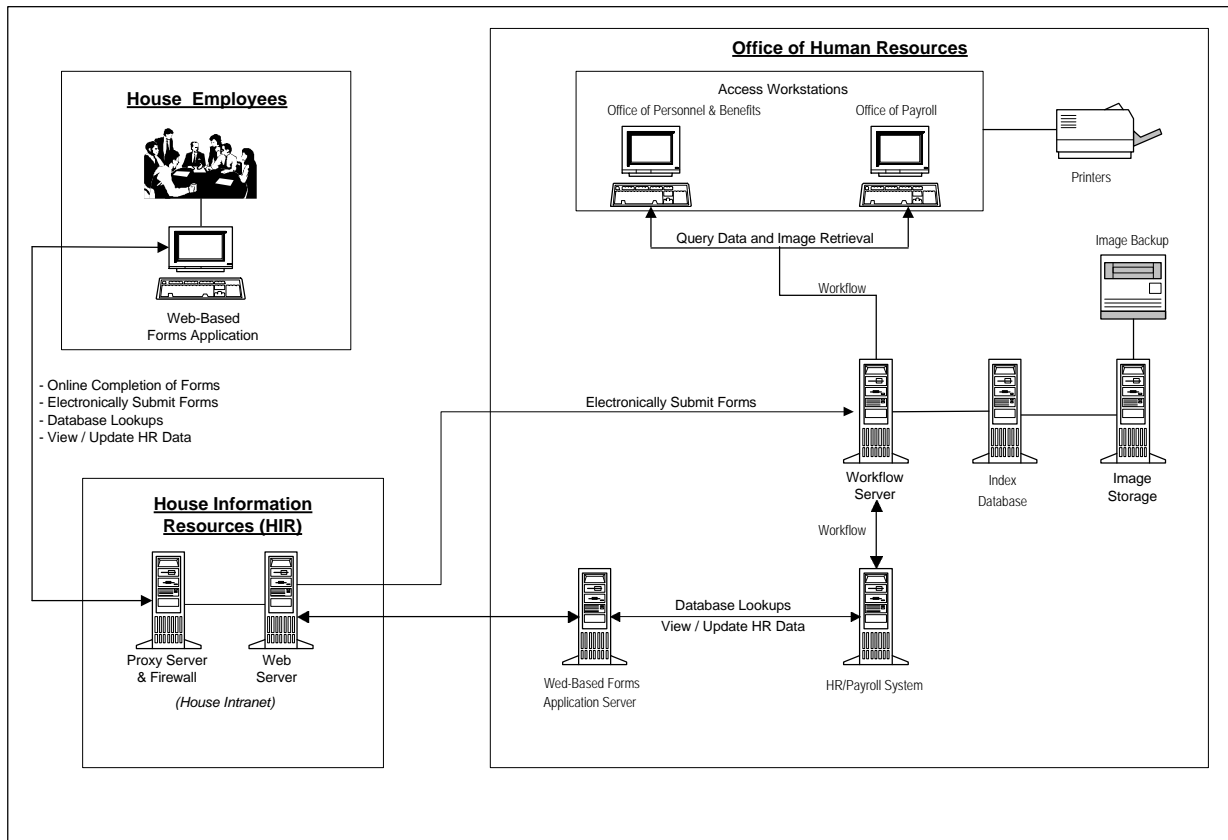


Figure 4.14: Alternative 3: Technology Description

- Web-Based Forms Application.** A web-based forms application will be developed that would allow House employees to fill out their HR and payroll related forms. The web pages would reside on the OHR website on the House Intranet. The web-based forms would capture all of the information submitted on the hard copy forms. The web-based forms would employ inherent intelligence that performs routine edit checks while the employee inputs data.
- HR Database Interface.** Through an interface with the HR database, employees would use the House Intranet to view their own information in the database. The interface would enable the employees to make basic information updates, such as address changes or tax deductions, without requiring processing by the OHR staff. The web-based forms application would interface with the HR database to supply information to the forms application, as well as receive information submitted by

employees. The interface would supply information to the forms application dependent on the form type accessed by the employee (e.g., name, employee number, address).

- **House Intranet.** The web-based forms application would be accessed through the House Intranet. The House Intranet currently consists of four servers handling different areas of the Intranet. The House Intranet employs the standard security mechanisms, such as account IDs and passwords.
- **Workflow Application.** Workflow functions automate the routing of documents/information among appropriate officials to ensure accountability and quality assurance in the processing of information. Workflow applications also enable organizations to monitor processes, evaluate performance, and automatically distribute and equalize workload among employees. The workflow would enable HR changes to be applied directly to the database or routed to the appropriate official for processing and verification depending on the information or form type.
- **Employee Workstations (desktops).** House employees would access the web-based forms application and the House Intranet from their desktop computers. Employees could print, save, submit, and view HR information from their desktop computer as well.

4.3.3.3 Alternative Criteria Evaluation

As presented in Figure 4.2: Summary Assessment of Potential Alternatives, this alternative is viable because it meets the high-level needs of the OHR. Figure 4.15: Alternative 3: Evaluation of High-Level Needs identifies which needs this alternative meets. As presented in the figure, this alternative meets all of the key needs and therefore is considered a viable option.

Criterion Capability	Business Needs	Meets Criteria
Input	<ul style="list-style-type: none"> • Ability to automate the entry of House HR information (e.g., HR data or related correspondence) from various sources (e.g., imaging, on-line data entry). 	Yes
Processing	<ul style="list-style-type: none"> • Ability for system to validate entry of HR information. 	Yes
	<ul style="list-style-type: none"> • Allow for modification of HR records through on-line access or other sources (e.g., Internet/Intranet). 	Yes
	<ul style="list-style-type: none"> • Ability to provide a history of changes made to House employee HR data. 	Yes
	<ul style="list-style-type: none"> • Ability to file HR information consistent with Federal regulations. 	Yes
	<ul style="list-style-type: none"> • Ability to record receipt of relevant HR hard copy documents. 	Yes
Output	<ul style="list-style-type: none"> • Ability to reproduce stored HR data in print and electronic formats. 	Yes
	<ul style="list-style-type: none"> • Allow for high speed printing of HR data in a user defined sort order. 	Yes
Query and Reporting	<ul style="list-style-type: none"> • Ability to produce reports based on user defined queries. 	Yes
	<ul style="list-style-type: none"> • Ability to simultaneously view multiple House employees' records. 	Yes
Storage	<ul style="list-style-type: none"> • Ability to track House HR data from initial receipt to archival. 	Yes
	<ul style="list-style-type: none"> • Ability to perform automated backup of all electronic records. 	Yes
	<ul style="list-style-type: none"> • Ability to maintain images in a non-proprietary data format. 	Yes

Figure 4.15: Alternative 3: Alternative Criteria Evaluation

Criterion Capability	Business Needs	Meets Criteria
Technology	<ul style="list-style-type: none"> • Provide for interoperability with other technologies and systems that provide input/output of HR data. 	Yes
	<ul style="list-style-type: none"> • Provide scalability to accommodate increases in size and uses of system. 	Yes
	<ul style="list-style-type: none"> • Ability to accommodate advances in hardware and software technologies. 	Yes
	<ul style="list-style-type: none"> • Provide ability for simultaneous access by large user population (e.g., 10,000 House employees). 	Yes
Application Controls and Security	<ul style="list-style-type: none"> • Ability to prevent unauthorized access to data and system. 	Yes
	<ul style="list-style-type: none"> • Ability to track usage information for system users. 	Yes
	<ul style="list-style-type: none"> • Ability to protect HR data during electronic input, processing, and storage. 	Yes

Figure 4.15: Alternative 3: Alternative Criteria Evaluation (continued)

4.3.3.4 Implementation Issues

The following implementation issues should be considered for this alternative:

- **Data Conversion Solution.** This alternative must be able to incorporate OHR's current images and indexing information stored in OIRMS. In the current process, the box number is manually stamped on the form prior to scanning the form into the OIRMS. After scanning, the original source documents of the images are placed in that box, and shipped and stored in the National Archives. To access a form after it has been shipped to the National Archives, the image is retrieved from OIRMS and the box number is read off of the image of the form. Thus, without the image, it is difficult to locate the corresponding hard copy form in the National Archives. Additionally, the first one thousand boxes of documents scanned into OIRMS have no box number or notation identifying the location of the hard copy in the National Archives. To retain the link between the images in the current OIRMS and the hard copy location in the National Archives, the current images would need to be converted and maintained in an accessible format. It may be possible to review the contents of the existing image storage for information not needed by the OHR staff. OHR may determine that some of the information may not need to be converted.
- **Maintenance of Hard copy Forms.** Currently, there are five HR forms that require an actual signature (i.e., W-4 forms, beneficiary designation forms), and thus a hard copy submission. The forms can be designed such that they can only be filled out and printed using the web-based forms application. The data contained in these forms would then be entered through manual keypunch. A process for maintaining these hard copy submissions would need to be established. A recently completed OPM task force recommended that the forms requiring a signature be retained by the agency responsible for the forms⁴⁰ (i.e., FEGLI maintains the hard copy version of the Life Insurance Beneficiary form), however, the recommendation has not been implemented.
- **Employee Training.** Member, Committee, and House Officer staff members may need to receive training on the features and capability of the web-based forms application on the House Intranet. A means of extending training to all employees needs to be identified. A possible solution is to train a representative from each office, who in turn, could train the other employees in the office.
- **Employees Access to House Intranet.** House employees would need to have access to the House Intranet in order to access the web-based forms. Currently, one district office for each Member has a free designated direct relay connection to the House Intranet and connections for additional offices are charged to the Member.

⁴⁰ Information about the OPM task force was received through conversations with an OPM task force member.

- **OPM Mandates.** Currently, OPM approves requests by agencies to accept electronic versions of most HR forms in lieu of hard copies only on an exception basis. The OHR would need to petition OPM for the ability to implement the electronic forms functionality as noted in this alternative. Other agencies whose HR forms House employees submit may also need to be petitioned for electronic submission in lieu of hard copy (i.e., FEGLI and the Life Insurance Beneficiary form).
- **Electronic Filing and Non-Repudiation.** The legal issues surrounding the use of electronic filing and authentication involve the acceptability of digital information and forms in a court of law. These issues are particularly important due to the sensitivity of HR information. The House will need to address these issues, based on mandates affecting this alternative provided by OPM.
- **Employee Access to Personnel Information.** The OHR would need to determine how much information House employees should be able to view and update over the House Intranet. Certain HR transactions could require approval before completion. An analysis should be done of the HR processes to determine the extent of the access employees are allowed.

Exhibit 5

Cost-Benefit Analysis

Cost-Benefit Analysis

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Cost-Benefit Analysis

This exhibit presents the cost-benefit analysis of the three system alternatives that were identified as viable solutions for replacing the current Optical Image Records Management System (OIRMS) application. This cost-benefit analysis includes a methodology section that identifies the resources used to collect information to identify cost factors, and the steps followed to analyze the costs and benefits of the viable system alternatives. The results presented include a cost comparison of the existing system and the three system alternatives. A cost sensitivity analysis, qualitative analysis, and financial analysis are also included.

5.1 Methodology

The objective of the cost-benefit analysis was to analyze the viable system alternatives detailed in Exhibit 4, *Feasibility Study*, and to examine the costs and benefits for implementing each alternative. The cost-benefit analysis presents cost estimates for the existing system and the three viable system alternatives.

The cost-benefit analysis was based on a multi-step process that began with the development of assumptions and identification of cost factors, and resulted in a cost summary for the existing system and the three viable system alternatives. The multi-step process was composed of four steps listed below, followed by a description of each step:

- System Alternative Cost-Benefit Analysis.
- Cost Sensitivity Analysis.
- Qualitative Analysis.
- Financial Analysis.

5.1.1 System Alternative Cost-Benefit Analysis

In Exhibit 4, *Feasibility Study*, information was presented on the viable system options for replacing the current OIRMS. For the cost-benefit analysis presented in this exhibit, preliminary cost data was collected and cost estimates were developed for inclusion in a cost model.

The cost model was used to analyze the costs of the existing system and the viable system alternatives. The cost data was collected from a variety of sources, including interviews with House personnel, software and hardware vendors, subject matter experts, and other Federal

government agencies. The cost analysis for the existing system and the three system alternatives comprised the following steps:

- Development of Assumptions.
- Identification of Cost Factors.
- Cost-Benefit Estimation of Alternatives.

Each of the cost analysis steps is described below.

5.1.1.1 Development of Assumptions

The system alternatives cost analysis used the following general assumptions:

- **Salary and Benefits.** Actual salaries and an average benefit rate of 29.55 percent for the personnel costs were used for salary and benefit calculations for the existing system⁴¹. For staff efficiencies, a percentage of total personnel costs, based on the estimated percentage of efficiency gains, was used for each alternative. For example, an estimated efficiency gain of 50 percent in forms processing, would result in a 50 percent reduction in the personnel costs (salary and benefits) associated with the forms processing staff.
- **Cost Factor Escalation.** Personnel costs (salary and benefits) were escalated by four percent per year to represent cost-of-living increases.
- **Time Period of Analysis.** A 5-year time period was used in this evaluation⁴².
- **Net Present Value and Discount Factor.** The net present value calculation was used to discount future costs using a discount rate of seven percent⁴³.

⁴¹ The benefit rate was obtained from OMB Circular A-76, entitled *Performance of Commercial Activities for Executive Branch Cost-Benefit Calculations*.

⁴² OMB Circular A-11, entitled *Preparation and Submission of Budget Estimates and The GSA Information Technology Planning and Investment Guide*, prescribes a 6-year planning horizon for IT investments. The time period was reduced to 5 years to be more conservative in our analysis with regard to the lifecycle of technology components.

⁴³ OMB Circular A-94, entitled *Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs*, indicates that a seven percent discount factor should be used and that net present value is the standard criterion for deciding whether a Government program can be justified on economic principles.

5.1.1.2 Identification of Cost Factors

Applicable cost factors listed below were identified by using the House's System Development Life Cycle (SDLC) procedures for performing a cost-benefit analysis and by using guidelines from the General Services Administration (GSA) Information Technology Planning and Investment Guide.

- **Non-recurring costs** are costs that occur in the first year of the analysis and consists primarily of the costs for conversion, hardware purchases, training, and the purchase, customization, and integration of software. It is assumed that non-recurring costs are incurred during the first year of the analysis time period and are not discounted.
- **Recurring costs** are costs that are incurred on an annual basis throughout the time period of the analysis, including the first year. The recurring costs include personnel salaries and benefits, computer hardware maintenance, and computer software licenses and maintenance. The recurring costs for each year are constant across all years and are discounted using a net present value calculation.

5.1.1.3 Cost-Benefit Estimation of Alternatives

The cost estimates presented in this analysis are based on the following:

- **Vendor Quotes.** Vendors were contacted to discuss the high-level requirements of the alternative systems and obtain software, hardware, and implementation costs. At least two vendor quotes were obtained for all estimates.
- **Independent Research Organizations.** Information about vendors, product specifications and costs, and industry trends was collected from on-line databases provided by Gartner Group, Forrester Research, and Faulkner Information Services. Similar information was accessed from the web sites of organizations such as the Association for Information and Image Management (AIIM).
- **Technology and HR Specialists.** Specialists in imaging, electronic filing, and Human Resources (HR) systems were interviewed to aid in the development and refinement of the costs estimates for the alternatives.

The cost factors included in this evaluation represent the high-level "primary" costs to support the system alternatives. Cost factors not included in the evaluation include facilities and utility costs, personnel overhead, supplies, costs to manage the procurement process, and costs for new workstations to access the House Intranet.⁴⁴ The actual cost to implement the alternatives could

⁴⁴ Interviews with members of House Information Resources revealed that all House employees in Washington, D.C., and at least one office in every district is already equipped with adequate workstations and House

vary significantly from these cost estimates due to the specific applications and requirements chosen by the Office of Human Resources (OHR). Due to the alternatives' interaction with the House's future HR/Payroll system, future decisions made with regard to the HR/Payroll system could also effect the cost estimates in this report. All cost estimates presented in this evaluation are rounded to the nearest thousand.

For this evaluation, benefits are defined as cost savings resulting from implementing the alternatives instead of continuing operation of the existing system. These benefits primarily come from labor cost savings and reduced hardware costs. Benefits are included, where applicable, in the cost analysis of the alternatives and are represented as costs that are lower than the existing system.

5.1.2 Cost Sensitivity Analysis

The next step after performing the cost analysis was to perform a sensitivity analysis. This sensitivity analysis was performed to determine the impact of changes to the cost factors and assumptions used in this evaluation. The cost sensitivity analysis will provide management with additional information to analyze the alternatives discussed in this evaluation.

5.1.3 Qualitative Analysis

A qualitative, or non-quantifiable, factor analysis was performed for each alternative. Qualitative factors were identified and assessed for each system alternative. The purpose of this analysis was to identify additional criteria factors to analyze the alternatives. The qualitative analysis methodology was comprised of the following steps:

- **Identification of Qualitative Factors.** Seven qualitative categories were identified and defined to assess the system alternatives. These categories represent qualitative, or non-quantifiable, attributes of the system alternatives. The factors include the following: stakeholder needs and constraints, level of customer service, security risk, commercial acceptance of technology, Office of Personnel and Benefits impact, House employee impact, and ability to adhere to possible changes in Federal regulations.
- **Analysis of Qualitative Factors.** The seven qualitative factors were analyzed for each alternative and an assessment was developed that presented the issues associated with each factor.

5.1.4 Financial Analysis

A financial analysis was conducted for each of the alternatives. The analysis will provide management with additional information when analyzing the alternatives discussed in this evaluation. The review included:

- A break-even analysis to identify how many years it would take for each alternative to pay for its transition costs with recurring annual savings.
- A benefit/cost ratio (BCR) analysis to determine how much of every dollar invested in each alternative could be returned in the form of recurring savings.

5.2 System Alternative Cost Analysis

The system alternative cost analysis section presents the results of the cost analysis for the existing system and each system alternative. The cost analysis presentation is organized as follows:

- Cost Analysis Summary.
- Existing System.
- Alternative 1: New Imaging/Workflow System.
- Alternative 2: Electronic Filing Via Web-Based Forms Application.
- Alternative 3: Electronic Filing and Enhanced Employee Self-Service Capabilities.

In each section, non-recurring and recurring cost factors are discussed.

5.2.1 Cost Analysis Summary

Figure 5.1: Existing System and Alternative Costs Analysis presents a summary of the non-recurring and recurring cost estimates for the existing system and the three viable system alternatives. The figure presents 5-year total cost estimates discounted using a net present value calculation. This was done to provide an overall 5-year lifecycle cost estimate of the existing system and each alternative.

As described in Exhibit 4, *Feasibility Study*, Alternative 1 provides a new and enhanced solution that is similar to the current system. Alternatives 2 and 3 provide increasing levels of employee self-service and build upon each other in terms of functionality.

Existing System	Alternative 1 New Imaging/Workflow System	Alternative 2 Electronic Filing Via Web-Based Forms Application	Alternative 3 Electronic Filing and Enhanced Employee Self-Service Capabilities
Cost Factor			
1. Non-Recurring Costs			
Conversion Services	\$0	\$100,000	\$100,000
Software Integration/Testing	\$0	\$315,000	\$427,000
Software Customization	\$0	\$91,000	\$150,000
Hardware Purchase	\$0	\$214,000	\$161,000
Software Purchase	\$0	\$398,000	\$839,000
Training (OHR Users)	\$0	\$22,000	\$15,000
Training (House Employees)	\$0	\$46,000	\$46,000
Total Non-Recurring Costs	\$0	\$1,186,000	\$1,828,000
2. Recurring Costs (5-Year Net Present Value)			
Personnel Salaries and Fringe Benefits			
Office of Personnel and Benefits	\$3,427,000	\$3,218,000	\$2,608,000
Office of Payroll	\$1,711,000	\$1,711,000	\$1,711,000
House Information Resources	\$5,000	\$5,000	\$5,000
Hardware (Purchase and Maintenance)			
Optical Disc Jukebox Maintenance	\$117,000	\$0	\$0
Scanner Maintenance	\$2,000	\$0	\$0
New Scanner Maintenance	\$0	\$3,000	\$0
Server Maintenance	\$2,000	\$37,000	\$37,000
Optical Platter Purchase	\$9,000	\$2,000	\$0
Magnetic Disc Purchase	\$0	\$13,000	\$0
Optical Drive Maintenance	\$0	\$4,000	\$4,000
High-Speed Printer Maintenance	\$0	\$41,000	\$41,000
Software (License and Maintenance)			
Imaging System Software License/Maintenance	\$181,000	\$0	\$0
New Imaging System Software License/Maintenance	\$0	\$72,000	\$0
Online Forms Software License/Maintenance	\$0	\$220,000	\$291,000
Workflow Software License/Maintenance	\$0	\$0	\$327,000
OCR/ICR Software License/Maintenance	\$0	\$7,000	\$0
Backup Software License/Maintenance	\$0	\$4,000	\$4,000
Total Recurring Costs (5-Year Net Present Value)	\$5,454,000	\$5,337,000	\$5,028,000
Total Estimated Costs	\$5,454,000	\$6,523,000	\$6,052,000

Figure 5.1: Existing System and Alternative Cost Analysis

The results of the cost analysis indicate that, despite lower recurring costs, the estimated net present value of each alternative system is more expensive than the existing system over the 5-year period. However, the alternatives do provide additional functionality over the existing system and better meet the evaluation criteria defined in this evaluation, as presented in Exhibit 4, *Feasibility Study*.

The following discussion presents the cost analysis for the existing system and each of the three viable alternatives. The costs presented are preliminary estimates and can be considered minimum costs that could be incurred in implementing and maintaining each alternative. Additionally, actual implementation of the alternatives may result in varied functionality and different technical components than those presented in this evaluation and would therefore differ in cost.

The total estimated costs for **Alternative 1: New Imaging/Workflow System** are higher than the existing system over the 5-year period because of non-recurring implementation costs. Despite higher software maintenance costs for this alternative, estimated savings in hardware maintenance and labor efficiencies could result in net recurring costs that are lower than the existing system. Estimated labor efficiencies (in terms of salaries and benefits) are associated with a potential reduction in forms requiring subsequent follow up submitted by House employees. The use of on-line forms could also provide additional benefits not included in the evaluation⁴⁵.

The total estimated costs for **Alternative 2: Electronic Filing Via Web-Based Forms Application** are higher than the existing system over the 5-year period because of the non-recurring implementation costs. Despite higher software maintenance costs for this alternative, estimated savings in hardware maintenance and labor efficiencies could result in net recurring costs that are lower than the existing system. Estimated labor efficiencies (in terms of salaries and benefits) are associated with a reduction in forms requiring subsequent follow up submitted by House employees, time saved processing forms, and the elimination of the scanning function. This alternative is more expensive than Alternative 1 primarily because of the purchase and maintenance of stand-alone workflow software.

Alternative 3: Electronic Filing and Enhanced Self-Service Capabilities provides the greatest functionality and most potential labor efficiencies, and thus is also the least expensive of the three alternatives over a 5-year period. The total estimated costs for this alternative are higher than the existing system over the 5-year period because of the non-recurring implementation costs. Despite higher software maintenance costs for this alternative, estimated savings in hardware maintenance and labor efficiencies could result in net recurring costs that are lower than the existing system. Estimated labor efficiencies (in terms of salaries and benefits) are associated with a reduction in forms requiring subsequent follow up submitted by House employees, time saved processing forms, the elimination of the scanning function, and the generation of less HR questions because employees would now have direct access to more information. Total non-recurring costs for this alternative are more than those in Alternative 2 due to higher software integration costs associated with the addition of full employee self-service functionality.

⁴⁵ For all three alternatives, the addition of on-line forms applications could reduce annual printing and mailing costs. Information typically mailed to House employees, such as blank forms and administrative booklets, could be placed on the House Intranet. The bulk of these savings would come with the elimination of the need for open-season mass mailings. These potential savings are not included in this analysis because not all House mailing and printing expenses are tracked in a method that could be used in this evaluation.

5.2.2 Existing System

In the discussion below, non-recurring and recurring cost estimates for this existing system are presented. Figure 5.2: Summary of Current OIRMS Costs summarizes the non-recurring and recurring cost estimates.

Category	Estimated Costs
Non-Recurring Costs	\$0
Recurring Costs	\$5,454,000
Total Estimated Costs	\$5,454,000

Figure 5.2: Summary of Current OIRMS Costs

5.2.2.1 Non-Recurring Costs

There are no non-recurring costs for the existing system. Costs associated with conversion, hardware purchases, training, and the purchase, customization, and integration of software had been previously incurred when the existing system was originally developed. Thus, the non-recurring costs to develop the existing system are considered sunk costs and not included in the analysis of this existing system.

5.2.2.2 Recurring Costs

Figure 5.3: Existing System - Recurring Cost Estimates on the following page presents the recurring cost estimates for the existing system. The recurring costs for the existing system were determined by reviewing current vendor invoices and through interviews with OHR staff. The figure presents the annual recurring cost estimates and a 5-year total of recurring costs discounted using a net present value calculation. The recurring costs are incurred on an annual and consistent basis throughout the 5-year period of the analysis.

Cost Factor	Annual Recurring Costs	5 Year Net Present Value Total
Personnel Salaries and Fringe Benefits		
Office of Personnel and Benefits	\$776,000	\$3,427,000
Office of Payroll	\$387,000	\$1,711,000
House Information Resources	\$1,000	\$5,000
Hardware (Purchase and Maintenance)		
Optical Disc Jukebox Maintenance	\$29,000	\$117,000
Scanner Maintenance	\$1,000	\$2,000
New Scanner Maintenance	\$0	\$0
Server Maintenance	\$1,000	\$2,000
Optical Platter Purchase	\$2,000	\$9,000
Magnetic Disk Purchase	\$0	\$0
Optical Drive Maintenance	\$0	\$0
High-Speed Printer Maintenance	\$0	\$0
Software (License and Maintenance)		
Imaging System Software License/Maintenance	\$44,000	\$181,000
New Imaging System Software License/Maintenance	\$0	\$0
Online Forms Software License/Maintenance	\$0	\$0
Workflow Software License/Maintenance	\$0	\$0
OCR/ICR Software License/Maintenance	\$0	\$0
Backup Software License/Maintenance	\$0	\$0
Total Recurring Costs	\$1,239,000	\$5,454,000

Figure 5.3: Existing System – Recurring Cost Estimates

Personnel Salaries and Benefits

The recurring personnel salaries and benefits for the existing system include the users and staff to support the current OIRMS application. Users of the system work in the Office of Personnel and Benefits and Office of Payroll, while members of House Information Resources (HIR) and the Office of Personnel and Benefits support the existing system. Listed below is a description of the staff resources that use and support the OIRMS application and their associated House office.

- **Office of Personnel and Benefits** staff dedicated to processing the House's HR information include thirteen full-time employees. In addition, two full-time staff are responsible for scanning and indexing documents into OIRMS. Also, one staff member devotes approximately 25 percent of his time to administering the OIRMS⁴⁶.
- **Office of Payroll** includes six fulltime staff responsible for processing the House's payroll information.
- **House Information Resources** provides one technician who devotes a small amount of his time to overseeing the House mainframe's interaction with the OIRMS⁴⁷.

Hardware (Maintenance and Purchase)

The recurring hardware maintenance costs for the existing system include the costs associated with maintaining the optical disc jukebox, scanner, servers, and purchasing optical platters. The specific cost factors for the existing system and the three alternatives include:

- **Optical Disc Jukebox Maintenance** includes the maintenance costs for the optical disc storage system.
- **Scanner Maintenance** includes the maintenance fees associated with the current scanner.
- **New Scanner Maintenance** includes the maintenance fees associated with new scanners.
- **Server Maintenance** includes the maintenance costs for all servers.
- **Optical Platter Purchase** includes the cost for new optical platters.
- **Magnetic Disc Purchase** includes the cost for additional magnetic disc storage.
- **Optical Drive Maintenance** includes the cost to maintain an optical drive used to backup images on optical platters.
- **High Speed Printer Maintenance** includes the cost to maintain a high speed printer.

⁴⁶ Estimate of 10 percent is based on interviews with the OHR system administrator.

⁴⁷ Based on an interview with the technician, it is assumed that one percent of his time is currently spent supporting the interface between the House's Financial Management System and the current FileNet application.

Software (License and Maintenance)

The recurring software license and maintenance costs for the existing system include the costs associated with the current imaging system software licenses and maintenance fees. This cost category also includes maintenance and license fees for other software associated with the existing system (i.e., database management and workflow software, and printer servers). The specific cost factors for the existing system and the three alternatives include:

- **Imaging System Software License and Maintenance** includes the license and maintenance costs associated with the imaging system software.
- **New Imaging System Software License and Maintenance** includes the license and maintenance costs associated with a new imaging system software.
- **On-line Forms Software License and Maintenance** includes the license and maintenance costs associated with the web-based forms application.
- **Workflow Software License and Maintenance** includes the license and maintenance fees of stand-alone workflow software.
- **Optical Character Recognition/Intelligent Character Recognition (OCR/ICR) Software License and Maintenance** includes the license and maintenance fees of the OCR/ICR software.
- **Backup Software License and Maintenance** includes the cost to maintain software used to backup images.

5.2.3 Alternative 1: New Imaging/Workflow System

In the discussion below, the non-recurring and recurring cost estimates for the New Imaging/Workflow System are presented. Figure 5.4: Summary of New Imaging/Workflow System Costs summarizes the non-recurring and recurring cost estimates.

Category	Estimated Costs
Non-Recurring Costs	\$1,186,000
Recurring Costs	\$5,337,000
Total Estimated Costs	\$6,523,000

Figure 5.4: Summary of New Imaging/Workflow System Costs

5.2.3.1 Non-Recurring Costs

Figure 5.5: New Imaging/Workflow System - Non-Recurring Cost Estimates presents the non-recurring cost estimates for the New Imaging/Workflow System alternative. The figure presents cost estimates to support new imaging and workflow applications. These non-recurring costs are incurred during the first year of the alternative. Each of the cost factors is discussed below.

Cost Factor	Estimated Costs
Conversion Services	\$100,000
Software Integration/Testing	\$315,000
Software Customization	\$91,000
Hardware Purchase	\$214,000
Software Purchase	\$398,000
Training (OHR Users)	\$22,000
Training (House Employees)	\$46,000
Total	\$1,186,000

Figure 5.5: New Imaging/Workflow System – Non-Recurring Cost Estimates

Conversion Services

This cost category includes the estimated costs to convert the index database and approximately 500 gigabytes of images stored on 12” Write-One-Read-Many (WORM) optical storage platters to non-proprietary formats on magnetic disk. This cost factor was estimated based on vendor quotes for data conversion services and estimates previously prepared by the House.

Software Integration/Testing

This cost category includes the estimated costs to integrate and write the workflow scripts and document capture processes associated with the imaging application workflow module, and to develop and integrate programs for supporting the OCR/ICR processing module. Estimated costs to develop the automated interface with the future HR/Payroll System are also included. Costs for software integration/testing for this alternative were based on estimates provided by an integration calculation software tool and vendor estimates based on similar projects.

Software Customization

This cost category includes the estimated costs to create and customize the on-line forms and write the scripts responsible for the forms' intelligent functionality. Estimated costs to customize the OCR/ICR software to recognize the House's HR forms are also included in this cost category. Estimates for software customization for this alternative were based on quotes provided by vendors.

Hardware Purchase

This cost category includes the estimated costs associated with purchasing the magnetic disk storage system and optical drive for backup, a high-speed printer, two scanners, a database server, two additional servers, and other related hardware. Costs for the database server are based on estimates obtained from vendors. An industry average was used to estimate the price of all additional servers⁴⁸. All other estimated hardware costs for this alternative were obtained from vendor quotes.

Software Purchase

This cost category includes the estimated cost to purchase the software utilities required for the imaging/workflow system, on-line forms application, and backup software. This includes software used for the imaging system, the scanners, and the OCR/ICR processing engine. The cost estimates were based on vendor quotes.

⁴⁸ A standard estimate of \$12,000, based on industry averages, was used for all servers in this evaluation except estimates associated with database servers, which are based on vendor quotes.

Training (OHR Users)

This cost category includes the estimated training costs for 25 users of the imaging system, two administrators of the on-line forms application, and two OCR/ICR software administrators. The need for training was based on vendor recommendations and costs were obtained from vendor quotes.

Training (House Employees)

This cost category includes the estimated costs to provide training to one thousand House employees to use the on-line forms located on the House Intranet. Costs are estimated for the House to train one person in each Member's Washington, D.C. office, one person in each Member's district offices, and one person in each House Officer and Committee office. The need for training was based on prior House experience and costs were obtained from vendor quotes⁴⁹.

5.2.3.2 Recurring Costs

Figure 5.6: New Imaging/Workflow System - Recurring Cost Estimates presents the recurring cost estimates for this alternative. The figure presents the annual recurring cost estimates and a 5-year total of recurring costs discounted using the net present value calculation. These recurring costs are constant across all years and are incurred on an annual basis throughout the 5-year period of the analysis.

⁴⁹ The need to provide training to House employees was identified in interviews with House administrators who cited previous similar House projects that required the training of House employees.

Cost Factor	Annual Recurring Costs	5 Year Net Present Value Total
Personnel Salaries and Fringe Benefits		
Office of Personnel and Benefits	\$728,000	\$3,218,000
Office of Payroll	\$387,000	\$1,711,000
House Information Resources	\$1,000	\$5,000
Hardware (Purchase and Maintenance)		
Optical Disc Jukebox Maintenance	\$0	\$0
Scanner Maintenance	\$0	\$0
New Scanner Maintenance	\$1,000	\$3,000
Server Maintenance	\$9,000	\$37,000
Optical Platter Purchase	\$1,000	\$2,000
Magnetic Disc Purchase	\$3,000	\$13,000
Optical Drive Maintenance	\$1,000	\$4,000
High-Speed Printer Maintenance	\$10,000	\$41,000
Software (License and Maintenance)		
Imaging System Software License/Maintenance	\$0	\$0
New Imaging System Software License/Maintenance	\$18,000	\$72,000
Online Forms Software License/Maintenance	\$54,000	\$220,000
Workflow Software License/Maintenance	\$0	\$0
OCR/ICR Software License/Maintenance	\$2,000	\$7,000
Backup Software License/Maintenance	\$1,000	\$4,000
Total Recurring Costs	\$1,216,000	\$5,337,000

Figure 5.6: New Imaging/Workflow System – Recurring Cost Estimates

Personnel Salaries and Benefits

The recurring personnel salaries and benefits for this alternative include staff from the Office of Personnel and Benefits, Office of Payroll, and House Information Resources. Listed below is a description of the staff resources that would use and support this alternative.

- **Office of Personnel and Benefits** staff dedicated to processing the House’s HR information for this alternative were reduced seven percent from the existing system due to estimated efficiencies gained by the on-line forms technology⁵⁰. It is estimated that two full-time

⁵⁰ Based on interviews with the Office of Personnel and Benefits staff, it was estimated that 20 percent of the forms received include errors requiring an average of five minutes per form to correct. Based on the average

employees would continue to scan and index documents, and one staff member would spend 25 percent of his/her time administering the new imaging system⁵¹.

- **Office of Payroll** would include six full-time staff responsible for processing the House's payroll⁵².
- **House Information Resources** would provide one technician to devote a small amount of his/her time overseeing the on-line forms' interaction with the House Intranet⁵³.

Hardware (Purchase and Maintenance)

This alternative includes the maintenance of a magnetic disk storage system with an optical drive backup. Magnetic disks and optical platters would also be purchased to accommodate additional images scanned into the system. Maintenance costs for other hardware components, such as servers, scanners, and a high-speed printer, are also included in this cost category. Cost estimates for servers are based on industry averages, and all other cost estimates for this category are based on vendor quotes.⁵⁴

Software (License and Maintenance)

The recurring software costs for this alternative include costs associated with the licenses and maintenance of a new imaging/workflow system. Software license and maintenance fees for an on-line forms application and magnetic tape backup software are also included in this cost category.

number of images scanned into FileNet each year, it was assumed that the Office of Personnel and Benefits receives approximately 116,000 HR forms each year. According to information from OHR interviews, approximately 3,800 hours, or 17 percent of the forms processing staff's time (based on a standard 1,720 hour work year) is spent correcting forms. To be conservative, it was assumed that the correction of forms would be reduced by only 80 percent to account for the small number of forms that may still require correction in this alternative.

⁵¹ It is estimated that the OHR system administrator will spend the same amount of time administering the New Imaging Workflow System as he currently spends overseeing OIRMS.

⁵² Due to uncertainties related to the House's future payroll system, it is assumed that the payroll staff would not benefit from any efficiency gains provided by this alternative.

⁵³ Although the HIR technician's job will change from supporting the interface between the House's Financial Management System and the current FileNet application to supporting the placement of forms on the House Intranet, it is assumed that the amount of time spent will not change. Based on an interview with the technician, it is assumed that one percent of his time is currently spent supporting the interface between the House's Financial Management System and the current FileNet application.

⁵⁴ Server maintenance estimate of 15 percent is based on industry averages.

5.2.4 Alternative 2: Electronic Filing Via Web-Based Forms Application

In the discussion below, non-recurring and recurring cost estimates for the Electronic Filing Via Web-Based Forms Application are presented. These estimates include higher non-recurring costs and lower recurring costs than described in Section 5.2.3, New Imaging/Workflow System of this evaluation. Figure 5.7: Summary of Electronic Filing Via Web-Based Forms Application Costs summarizes these estimated costs.

Category	Estimated Costs
Non-Recurring Costs	\$1,738,000
Recurring Costs	\$5,028,000
Total Estimated Costs	\$6,766,000

Figure 5.7: Summary of Electronic Filing Via Web-Based Forms Application Costs

5.2.4.1 Non-Recurring Costs

Figure 5.8: Electronic Filing Via Web-Based Forms Application – Non-Recurring Costs Estimates presents the non-recurring cost estimates for this alternative. The figure presents estimated costs to support the electronic filing of House HR information. These non-recurring costs are incurred during the first year of the alternative.

Cost Factor	Estimated Costs
Conversion Services	\$100,000
Software Integration/Testing	\$427,000
Software Customization	\$150,000
Hardware Purchase	\$161,000
Software Purchase	\$839,000
Training (OHR Users)	\$15,000
Training (House Employees)	\$46,000
Total	\$1,738,000

Figure 5.8: Electronic Filing Via Web-Based Forms Application – Non-Recurring Cost Estimates

Conversion Services

This cost category does not introduce any new conversion costs, but does include those conversion costs noted in the previous alternative for conversion of image data from optical storage platters to magnetic disks.

Software Integration/Testing

This cost category includes the estimated costs to integrate and write the workflow scripts and information capture processes associated with the stand-alone workflow application. Costs to develop the interface between the on-line forms application and the future HR/Payroll System are also included. Costs for software integration/testing for this alternative were based on estimates provided by vendors.

Software Customization

This cost category includes the estimated costs to create and customize the on-line forms and write the scripts that provide the forms' intelligent functionality⁵⁵. Costs for software customization for this alternative are based on estimates provided by vendors.

Hardware Purchase

This alternative includes purchases of a magnetic disk storage system with an optical drive backup, dedicated servers for the workflow and on-line forms applications, indexing database, and a high-speed printer. Estimated costs are based on vendor quotes.

Software Purchase

This cost category includes estimates for an on-line forms application, stand-alone workflow software, and software to backup stored images. The estimates for these applications were obtained from vendor quotes.

Training (OHR Users)

This cost category includes the estimated training costs for two administrators of the on-line forms application and two administrators of the stand-alone workflow application. The need for training was based on vendor recommendations and costs were obtained from vendor quotes.

Training (House Employees)

This cost category includes the estimated costs to provide training to one thousand House employees to use the on-line forms located on the House Intranet. Costs are estimated for the House to train one person in each Member's Washington, D.C. office, one person in each Member's district offices, and one person in each House Officer and Committee office. The

⁵⁵ Software customization costs for Alternatives 2 and 3 would be more expensive than Alternative 1 due to the added database look-up functionality associated with these alternatives. The database look-up capability will allow information entered into form fields to be checked against information residing in the HR Information System, increasing the integrity of information electronically submitted.

need for training was based on prior House experience and costs were obtained from vendor quotes.

5.2.4.2 Recurring Costs

Figure 5.9: Electronic Filing Via Web-Based Forms Application - Recurring Cost Estimates presents the recurring cost estimates for this alternative. The figure presents the annual recurring cost estimates, and a 5-year total of recurring costs discounted using the net present value calculation. These recurring costs are incurred on an annual basis throughout the 5-year period of the analysis. Discussion of the recurring cost components associated with this alternative is included on the following page.

Cost Factor	Annual Recurring Costs	5 Year Net Present Value Total
Personnel Salaries and Fringe Benefits		
Office of Personnel and Benefits	\$590,000	\$2,608,000
Office of Payroll	\$387,000	\$1,711,000
House Information Resources	\$1,000	\$5,000
Hardware (Purchase and Maintenance)		
Optical Disc Jukebox Maintenance	\$0	\$0
Scanner Maintenance	\$0	\$0
New Scanner Maintenance	\$0	\$0
Server Maintenance	\$9,000	\$37,000
Optical Platter Purchase	\$0	\$0
Magnetic Disc Purchase	\$0	\$0
Optical Drive Maintenance	\$1,000	\$4,000
High-Speed Printer Maintenance	\$10,000	\$41,000
Software (License and Maintenance)		
Imaging System Software License/Maintenance	\$0	\$0
New Imaging System Software License/Maintenance	\$0	\$0
Online Forms Software License/Maintenance	\$71,000	\$291,000
Workflow Software License/Maintenance	\$80,000	\$327,000
OCR/ICR Software License/Maintenance	\$0	\$0
Backup Software License/Maintenance	\$1,000	\$4,000
Total Recurring Costs	\$1,150,000	\$5,028,000

Figure 5.9: Electronic Filing Via Web-Based Forms Application – Recurring Cost Estimates

Personnel Salaries and Benefits

The recurring personnel salaries and benefits for this alternative include staff from the Office of Personnel and Benefits, Office of Payroll, and House Information Resources. Listed below is a description of the staff resources dedicated to supporting this alternative.

- **Office of Personnel and Benefits** resources dedicated to processing the House's HR information for this alternative were reduced 16 percent due to estimated efficiencies gained by the on-line forms and electronic filing technology⁵⁶. Efficiencies associated with the elimination of the scanning function are also included. It is estimated that one staff member would continue to spend 25 percent of his/her time administering the on-line forms application⁵⁷.
- **Office of Payroll** would include six full-time staff responsible for processing the House's payroll.
- **House Information Resources** would provide one technician to devote a small portion of his/her time to overseeing the web-based forms application on the House Intranet.

Hardware (Purchase and Maintenance)

This alternative includes costs for server and high-speed printer maintenance, and maintenance of the magnetic disk storage system with optical drive backup. Maintenance for the magnetic disk storage system with optical drive backup and high-speed printer is based on vendor quotes.

Software (License and Maintenance)

The recurring software costs for this alternative would include license and maintenance fees for an on-line forms application, a stand-alone workflow application, and the backup software. The estimates for these annual software expenses are based on vendor quotes.

⁵⁶ As with Alternative 1, Alternative 2 will include an efficiency gain of seven percent due to the reduction of the number of forms needing correction. The additional nine percent is derived from time savings associated with electronic filing. Based on interviews with Office of Personnel staff, it was assumed that they spend an average of one minute per form manually keying information into the House's Financial Management System. Using the assumption that the Office of Personnel and Benefits receives 116,000 forms each year, it was calculated that approximately 2,300 hours, or nine percent of the forms processing staff's time (based on a 1,720 hour work year) would be saved using electronic submission functionality.

⁵⁷ It is estimated that the OHR system administrator will spend a similar amount of time administering the on-line forms application, as currently required to support OIRMS.

5.2.5 Alternative 3: Electronic Filing and Enhanced Employee Self-Service Capabilities

In the discussion below, the non-recurring and recurring cost estimates for Electronic Filing and Enhanced Employee Self-Service Capabilities are presented. Figure 5.10: Summary of Electronic Filing and Enhanced Employee Self-Service Capabilities Costs summarizes these estimated costs for this alternative. These estimated costs include additional functionality, but, with the exception of the recurring personnel and the up-front (non-recurring) software integration/testing costs, are identical to the costs described in Section 5.2.4, Electronic Filing Via Web-Based Forms Application of this evaluation.

Category	Estimated Costs
Non-Recurring Costs	\$1,828,000
Recurring Costs	\$4,224,000
Total Estimated Costs	\$6,052,000

Figure 5.10: Summary of Electronic Filing and Enhanced Employee Self-Service Capabilities Costs

5.2.5.1 Non-Recurring Costs

Figure 5.11: Electronic Filing and Enhanced Employee Self-Service Capabilities – Non-Recurring Cost Estimates presents the non-recurring cost estimates for this alternative. The figure below presents the estimated costs to implement this alternative. These non-recurring costs are incurred during the first year of the alternative.

Cost Factor	Estimated Costs
Conversion Services	\$100,000
Software Integration/Testing	\$517,000
Software Customization	\$150,000
Hardware Purchase	\$161,000
Software Purchase	\$839,000
Training (OHR Users)	\$15,000
Training (House Users)	\$46,000
Total	\$1,828,000

Figure 5.11: Electronic Filing and Enhanced Employee Self-Service Capabilities – Non-Recurring Cost Estimates

Conversion Services

This cost category does not introduce any new conversion costs, but does include those noted in Alternative 1 for conversion of image data from optical storage platters to magnetic disks.

Software Integration/Testing

This cost category includes estimated costs to integrate and write the workflow scripts and information capture processes associated with the stand-alone workflow application. Costs to develop the interface between the on-line forms application and the future HR/Payroll System, and to integrate a magnetic disk storage system with a magnetic tape backup are also included⁵⁸. Costs for software integration/testing for this alternative were based on estimates provided by vendors.

Software Customization

This cost category includes the estimated costs to create and customize the on-line forms and write the scripts responsible for the forms' intelligent functionality. Costs for software customization for this alternative are based on quotes provided by vendors.

Hardware Purchase

This alternative includes purchases of a magnetic disk storage system with an optical drive for backup, dedicated servers for the workflow and on-line forms applications, an indexing database, and a high-speed printer. Storage, database, and printer estimates are based on vendor quotes.

Software Purchase

This cost category includes estimates for an on-line forms application, stand-alone workflow software, and software used to backup images. The estimates for these applications were obtained from vendor quotes. No other purchases of software are required for this alternative.

Training (OHR Users)

This cost category includes the estimated training costs for two administrators of the on-line forms application and two administrators of the workflow application. The need for training was based on vendor recommendations and costs were obtained from vendor quotes.

⁵⁸ Software integration/testing costs for Alternative 3 would be more than Alternative 2 due to costs associated with the additional self-service functionality.

Training (House Employees)

This cost category includes the estimated costs to provide training to one thousand House employees to use the on-line forms located on the House Intranet. Costs are estimated for the House to train one person in each Member's Washington, D.C. office, one person in each Member's district offices, and one person in each House Officer and Committee office. The need for training was based on prior House experience and costs were obtained from vendor quotes.

5.2.5.2 Recurring Costs

Figure 5.12: Electronic Filing and Enhanced Employee Self-Service Capabilities - Recurring Cost Estimates presents the recurring cost estimates for this alternative. The figure presents the annual recurring cost estimates, and a 5-year total of recurring costs discounted using the net present value calculation. These recurring costs are incurred on an annual and consistent basis throughout the 5-year period of the analysis. Discussion of the recurring cost components associated with this alternative is included on the following page.

Cost Factor	Annual Recurring Costs	5 Year Net Present Value Total
Personnel Salaries and Fringe Benefits		
Office of Personnel and Benefits	\$408,000	\$1,804,000
Office of Payroll	\$387,000	\$1,711,000
House Information Resources	\$1,000	\$5,000
Hardware (Purchase and Maintenance)		
Optical Disc Jukebox Maintenance	\$0	\$0
Scanner Maintenance	\$0	\$0
New Scanner Maintenance	\$0	\$0
Server Maintenance	\$9,000	\$37,000
Optical Platter Purchase	\$0	\$0
Magnetic Disc Maintenance	\$0	\$0
Optical Drive Maintenance	\$1,000	\$4,000
High-Speed Printer Maintenance	\$10,000	\$41,000
Software (License and Maintenance)		
Imaging System Software License/Maintenance	\$0	\$0
New Imaging System Software License/Maintenance	\$0	\$0
Online Forms Software License/Maintenance	\$71,000	\$291,000
Workflow Software License/Maintenance	\$80,000	\$327,000
OCR/ICR Software License/Maintenance	\$0	\$0
Backup Software License/Maintenance	\$1,000	\$4,000
Total Recurring Costs	\$968,000	\$4,224,000

Figure 5.12: Electronic Filing and Enhanced Employee Self-Service Capabilities – Recurring Cost Estimates

Personnel Salaries and Benefits

The recurring personnel salaries and benefits for this alternative include staff from the Office of Personnel and Benefits, Office of Payroll, and House Information Resources. Listed below is a description of the staff resources dedicated to supporting this alternative.

- **Office of Personnel and Benefits** resources dedicated to processing the House's HR information for this alternative were reduced 42 percent due to estimated efficiencies gained by the on-line forms and self-service functionality⁵⁹. Efficiencies associated with the elimination of the scanning function are also included. It is estimated that one staff member would continue to spend 25 percent of his/her time administering the on-line forms application.
- **Office of Payroll** would still include six full-time staff responsible for processing the House's payroll.
- **House Information Resources** would provide one technician to devote one percent of his/her time to overseeing the on-line forms' placement on the House Intranet.

Hardware (Purchase and Maintenance)

This alternative includes costs for server and high-speed printer maintenance, and maintenance of the magnetic disk storage system with optical drive backup. Maintenance for the magnetic disk storage system with optical drive backup and high-speed printer is based on vendor quotes.

Software (License and Maintenance)

The recurring software costs for this alternative would include license and maintenance fees for an on-line forms application, a stand-alone workflow application, and the image backup software. The estimates for these annual software expenses are based on vendor quotes.

⁵⁹ Alternative 3 includes the 16 percent efficiency gains included in Alternative 2. The additional 26 percent in efficiency gains are from time saved responding to employee questions that can be answered by the House employees themselves with this alternative's self-service capabilities. Using the assumption that Office of Personnel and Benefits employees spend 35 percent of their time answering employee questions, and that employee self-service can reduce this time by 76 percent, it was calculated that approximately 7,800 hours, or 26 percent of the forms processing staff's time (based on a 1,720 hour work year) would be saved with the addition of self-service capabilities.

5.3 Cost Sensitivity Analysis

A sensitivity analysis was conducted on the estimated costs (non-recurring and recurring) for the three viable alternatives analyzed in this evaluation. The objective of the sensitivity analysis was to analyze changes to assumptions and to determine the impact on the overall cost of the alternatives. Two scenarios were developed for the sensitivity analysis: On-line Forms, Electronic Filing, and Self-Service Efficiency Gains, and Transition Costs Increases. These scenarios are presented below.

5.3.1 On-line Forms, Electronic Filing, and Self-Service Efficiency Gains

With the introduction of an on-line forms application, electronic filing capabilities, and employee self-service functionality, efficiencies may be realized with regards to the House HR function. It is estimated that efficiencies would occur primarily as a result of the following:

- a reduction in time spent following up with House employees to correct errors in submitted HR forms,
- a reduction in the total time spent to process submitted HR forms, and
- a reduction in time spent to field House employee HR questions.

Each alternative includes higher estimates of these labor efficiencies, with Alternative 3 providing the highest of these efficiencies. All of these potential savings could provide annual labor efficiencies equal to or greater than one work year⁶⁰.

In order to analyze the potential impact of efficiencies created by the increased capabilities of the alternatives, a range of potential efficiency gains were considered. For the purposes of this analysis, the estimated efficiency gains presented in this evaluation were increased by 55 percent⁶¹. The impact on each alternative, if there were no efficiency gains, is also analyzed.

⁶⁰ One work year is equal to 1,720 hours.

⁶¹ In a project similar to that outlined in Alternative 3, Carolina Power & Light gained labor efficiencies of 76 percent due to the implementation of HR self-service functionality. This gain was 80 percent higher than the 42 percent efficiency gains estimated for Alternative 3. Therefore, for the purpose of the sensitivity analysis, labor efficiencies of all three alternatives were increased by 80 percent to analyze the effect that the greater than expected labor efficiencies would have upon each of the alternatives.

Figure 5.13: Sensitivity Analysis - Alternative Efficiency Gains presents the results of the sensitivity analysis for this scenario. The top section of the figure shows, for each alternative, the estimated efficiency gains as a percentage of total Personnel and Benefits administrator staff time saved⁶². The bottom section of the figure shows, for each alternative, the estimated 5-year net present value (NPV) of the Personnel and Benefits administrator staff salaries and benefits, taking into consideration the dollar value of time saved by increased labor efficiencies.

Estimated Efficiency Gains (as percentage of time saved)	Alternative 1	Alternative 2	Alternative 3
Estimated Efficiency Gains (shown in report)	7%	16%	42%
Increased Estimated Efficiency Gains (by 80%)	12%	28%	76%
Without Efficiency Gains	0%	0%	0%
Personnel & Benefits Administrator Personnel Costs (5-Year NPV)	Alternative 1	Alternative 2	Alternative 3
Estimated Efficiency Gains	\$2,812,000	\$2,551,000	\$1,747,000
Increased Estimated Efficiency Gains (by 80%)	\$2,644,000	\$2,174,000	\$725,000
Without Efficiency Gains	\$3,021,000	\$3,021,000	\$3,021,000

Figure 5.13: Sensitivity Analysis of Alternative Efficiency Gains

5.3.2 Transition Cost Increases

Cost information in effect as of the date of this report was gathered from vendors based on the high-level business needs associated with the three viable alternatives noted in this evaluation. However, these estimated costs may differ from actual implementation costs due to the specific vendor chosen and the detailed requirements of the alternative. Therefore, a scenario was developed to examine the impact of significantly higher implementation costs on each alternative.

⁶² This refers to the Office of Personnel and Benefits staff whom actually process HR forms as they are received. This staff category does not include the scanning administrator staff. Based on interviews with Office of Personnel staff, there are currently thirteen HR administrator personnel.

The total transition costs associated with the three alternatives was increased by 50 percent to represent a scenario in which the up-front costs to implement the alternatives are significantly more expensive. Although software integration/testing, software customization, and software purchase have the greatest likelihood for increase, to reflect the possible increases in all categories, the 50 percent factor was applied to the overall non-recurring charge for each alternative. Figure 5.14: Sensitivity Analysis - Transition Cost Increases details the impact of the cost increases on the alternatives.

Cost Factor	Existing System	Alternative 1 New Imaging/Workflow System	Alternative 2 Electronic Filing Via Web-Based Forms Application	Alternative 3 Electronic Filing and Enhanced Employee Self-Service Capabilities
1. Non-Recurring Costs				
Conversion Services	\$0	\$150,000	\$150,000	\$150,000
Software Integration/Testing	\$0	\$473,000	\$641,000	\$776,000
Software Customization	\$0	\$137,000	\$225,000	\$225,000
Hardware Purchase	\$0	\$321,000	\$242,000	\$242,000
Software Purchase	\$0	\$597,000	\$1,259,000	\$1,259,000
Training (OHR Users)	\$0	\$33,000	\$23,000	\$23,000
Training (House Employees)	\$0	\$69,000	\$69,000	\$69,000
Total Non-Recurring Costs	\$0	\$1,780,000	\$2,609,000	\$2,744,000
2. Recurring Costs (5-Year Net Present Value)				
Personnel Salaries and Fringe Benefits				
Office of Personnel and Benefits	\$3,427,000	\$3,218,000	\$2,608,000	\$1,804,000
Office of Payroll	\$1,711,000	\$1,711,000	\$1,711,000	\$1,711,000
House Information Resources	\$5,000	\$5,000	\$5,000	\$5,000
Hardware (Purchase and Maintenance)				
Optical Disc Jukebox Maintenance	\$117,000	\$0	\$0	\$0
Scanner Maintenance	\$2,000	\$0	\$0	\$0
New Scanner Maintenance	\$0	\$3,000	\$0	\$0
Server Maintenance	\$2,000	\$37,000	\$37,000	\$37,000
Optical Platter Purchase	\$9,000	\$2,000	\$0	\$0
Magnetic Disc Purchase	\$0	\$13,000	\$0	\$0
Optical Drive Maintenance	\$0	\$4,000	\$4,000	\$4,000
High-Speed Printer Maintenance	\$0	\$41,000	\$41,000	\$41,000
Software (License and Maintenance)				
Imaging System Software License/Maintenance	\$181,000	\$0	\$0	\$0
New Imaging System Software License/Maintenance	\$0	\$72,000	\$0	\$0
Online Forms Software License/Maintenance	\$0	\$220,000	\$291,000	\$291,000
Workflow Software License/Maintenance	\$0	\$0	\$327,000	\$327,000
OCR/ICR Software License/Maintenance	\$0	\$7,000	\$0	\$0
Backup Software License/Maintenance	\$0	\$4,000	\$4,000	\$4,000
Total Recurring Costs (5-Year Net Present Value)	\$5,454,000	\$5,337,000	\$5,028,000	\$4,224,000
Total Estimated Costs	\$5,454,000	\$7,117,000	\$7,637,000	\$6,968,000

Figure 5.14: Sensitivity Analysis - Transition Cost Increases

5.4 Qualitative Analysis

In addition to the cost analysis and sensitivity analysis, an assessment of qualitative, or non-quantifiable, factors was performed for all system alternatives. The qualitative analysis was intended to provide additional evaluation criteria to analyze the alternatives.

Seven qualitative factors were identified for use in analyzing the alternatives. A description of each of these factors is listed below.

- **Stakeholder Needs and Constraints** represent the extent to which each alternative satisfies the stakeholder needs and other constraints of the evaluation.
- **Level of Customer Service** represents the extent to which each alternative enables the OHR to improve its level of service to its customers, House employees.
- **Security Risk** represents the risks associated with application, network, and physical security for the implementation of an alternative.
- **Commercial Acceptance of Technology** represents the availability of knowledgeable customer support, upgrades, documentation, and proven success in the marketplace of an alternative.
- **Office of Personnel and Benefits Impact** represents the extent to which each alternative will impact the Office of Personnel and Benefits' business processes associated with processing House HR information.
- **House Employee Impact** represents the extent to which the House employees are impacted by the alternatives.
- **Ability to Adhere to Possible Changes in Federal Regulations** represents the extent to which the alternatives adhere to possible changes in Federal regulations, such as the use of a fully electronic OPF or digital signatures.

Figure 5.15: Overall Results of Qualitative Analysis on the following page presents an assessment of the qualitative factors for each alternative.

Qualitative Factor	Alternative 1 New Imaging/Workflow System	Alternative 2 Electronic Filing Via Web- Based Forms Application	Alternative 3 Electronic Filing and Enhanced Employee Self- Service Capabilities
Stakeholder Needs and Constraints	This alternative meets all of the needs and constraints used for the evaluation, except the need for automated entry of information and the capability for House employees to view their own records on-line.	This alternative meets all of the needs and constraints used for the evaluation, except the capability for House employees to view their own records on-line. This application could be developed to allow full employee self-service in the future.	This alternative addresses all the high-level business needs and constraints identified for the evaluation.
Level of Customer Service	The addition of on-line forms in this alternative introduces functionality that presents a modestly improved level of customer service provided. Access of HR forms via the House Intranet will now be available.	Access to HR forms and electronic filing functionality that provides the ability to submit HR forms via the House Intranet introduces moderately improved levels of customer service.	The ability to view, update, and submit HR data via the House Intranet provides House employees with advanced levels of customer service.
Security Risk	This alternative should not introduce any new security risks.	With the introduction of electronic filing capabilities and technology components, some additional risks are introduced. There are commonly used safeguards available in the marketplace that will alleviate these risks.	Security risks associated with this alternative are similar to Alternative 2. There may be added security risks associated with the added capability for employees to view HR files on-line. However, there are commonly used safeguards available in the marketplace that will alleviate these risks.
Commercial Acceptance of Technology	The functionality and technology components associated with this alternative have a wide commercial acceptance.	The functionality and technology components associated with this alternative have a wide commercial acceptance.	The functionality and technology components associated with this alternative have a wide commercial acceptance.

Figure 5.15: Overall Results of Qualitative Analysis

Qualitative Factor	Alternative 1 New Imaging/Workflow System	Alternative 2 Electronic Filing Via Web- Based Forms Application	Alternative 3 Electronic Filing and Enhanced Employee Self-Service Capabilities
Office of Personnel and Benefits Impact	The current processing method used for the House HR information would be impacted by this alternative due to changes to a portion of the current business processes (i.e., scanning, indexing methods).	The functionality introduced by this alternative would have a far reaching impact on the Office of Personnel and Benefits due to the introduction of a new method for House employees to submit HR information.	The functionality introduced by this alternative would have a greater impact on the Office of Personnel and Benefits than Alternative 2 due to the introduction of enhanced employee self-service. House employees would be able to both electronically submit HR information and view their own HR information.
House Employees Impact	The addition of on-line forms in this alternative would require House employees to find and complete HR forms on-line.	The addition of electronic filing in this alternative would provide functionality to allow House employees to fill out and submit HR forms electronically.	The use of electronic filing and employee self-service capabilities in this alternative would increase House employees' responsibility for their own HR records. House employees would electronically submit HR information and find answers to their HR questions on the House Intranet.
Ability to Adhere to Possible Changes in Federal Regulations	A new imaging system would satisfy requirements for an electronic OPF. Since information would be submitted in hard copy, a requirement to use digital signature would not apply to this alternative.	This alternative would satisfy an electronic OPF requirement. If digital signatures were required, a public key infrastructure (PKI) could be easily integrated with this alternative at an additional cost.	This alternative would satisfy an electronic OPF requirement. If digital signatures were required, a public key infrastructure (PKI) could be easily integrated with this alternative at an additional cost.

Figure 5.15: Overall Results of Qualitative Analysis (continued)

5.5 Financial Analysis

In addition to the cost, sensitivity, and qualitative analysis, a financial analysis of each alternative was conducted. The estimated financial benefits calculated for each alternative represent the savings associated with maintaining each alternative compared to maintaining the current system. This calculation does not take into consideration the fact that each of the alternatives provides greater functionality than the existing system. For example, the alternatives include costs, such as those for high-speed printing, advanced workflow, and faster access to HR information, which are not incurred in the current system and for which there are no associated financial benefits reflected in each alternative's financial analysis. Therefore, the information provided in this section should not be used in any decision making without taking into consideration the qualitative factors of each alternative. The purpose of this review is to provide management with additional information and an understanding of the magnitude of difference between the benefits associated with each of the alternatives.

Two types of financial analysis were performed, break-even analysis and benefit/cost ratio analysis. These analyses are presented below.

5.5.1 Break-Even Analysis

A break-even analysis was performed to identify how many years it would take for each alternative to pay for its estimated up-front (non-recurring) costs with recurring annual savings. Figure 5.16: Number of Years for Each Alternative to Break-Even reflects the estimated number of years it would take for each alternative to recover all of its transition costs with recurring savings.

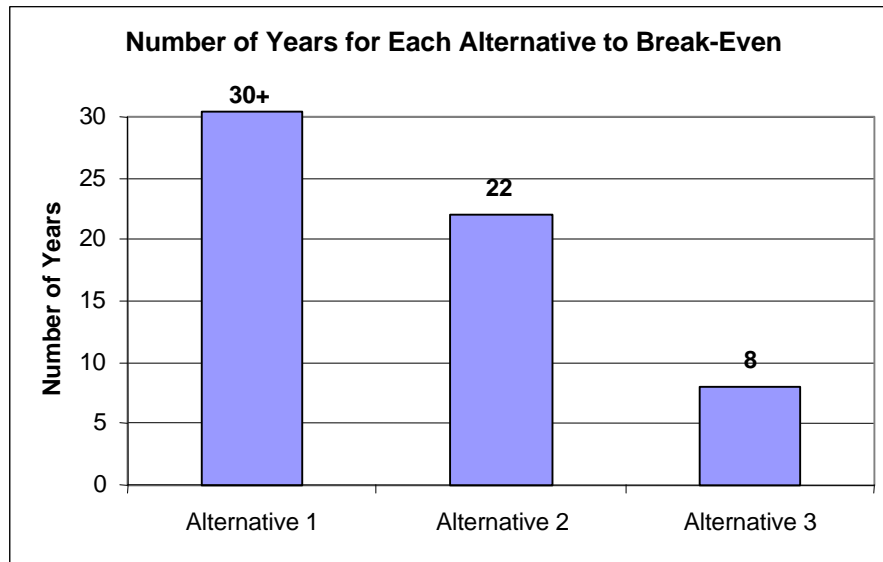


Figure 5.16: Number of Years for Each Alternative to Break-Even

In calculating the break-even point, benefits were calculated using a net present value calculation, while costs, which occur in the first year of each alternative, were not discounted.

The figure shows that Alternative 3 will break-even much more quickly than Alternative 1 and Alternative 2.

5.5.2 Benefit/Cost Ratio Analysis

A benefit/cost ratio (BCR) analysis was performed for each of the alternatives. The ratios are estimates of how much of every dollar invested in an alternative could be recovered in recurring savings over a period of time. For example, over the 5-year period Alternative 3 will gain back approximately \$.67 in recurring savings for every \$1.00 in non-recurring costs incurred. Figure 5.17: Five and Ten Year Benefit/Cost Ratio for All Alternatives below reflects the benefit/cost ratios associated with each of the alternatives. Benefit/cost ratios for both five and ten-year time periods are provided.

	5-Year BCR	10-Year BCR
Alternative 1	0.10	0.19
Alternative 2	0.24	0.49
Alternative 3	0.67	1.29

Figure 5.17: Five and Ten Year Benefit/Cost Ratio for All Alternatives

The analysis for a 5-year period shows that Alternative 3 has a BCR almost three times that of Alternative 2, and almost seven times that of Alternative 1. The same is true over a 10-year period. Again, this analysis only accounts for the quantitative benefits. It should be noted that both quantitative as well as qualitative benefits need to be considered when evaluating the alternatives.

James M. Eagen III
Chief Administrative Officer

Office of the
Chief Administrative Officer
U.S. House of Representatives
Washington, DC 20515-6860

MEMORANDUM

To: Robert B. Frey III
Deputy Inspector General

From: Jay Eagen
Chief Administrative Officer

Subject: CAO Response to Management Advisory Report "Optical Imagery
Records Management System Evaluation"

Date: **MAY 18 1999**

Thank you for the opportunity to comment on the draft management advisory report for the "Optical Imagery Records Management System Evaluation." We have carefully reviewed the draft evaluation regarding the system options for replacing the Optical Imagery Records Management Systems (OIRMS) application in the Office of Human Resources (HR). The draft advisory report provides reasonable parameters for determining the information technology solutions for the high-level business needs associated with the OIRMS and recommends rational courses of action for using its results.

We concur that the current system should be replaced as recommended in this evaluation. As stated in your draft advisory report, timing of the replacement is critical since the presented system alternatives are interdependent on the new Human Resources/Payroll system. Once a decision is made regarding the Human Resources/Payroll system, HR will review its impact as to the best solution for the OIRMS replacement.

Finally, we have also implemented many of the suggested safeguards for the current OIRMS system identified in the evaluation's risk assessment. We appreciate the continued opportunity to solicit your staff's advice on implementing the balance of the suggested safeguards and look forward to working with you on the replacement efforts in the future.