



US Nuclear Regulatory Commission
ADAMS Directional Assessment Study
Report of Findings and
Recommendations



STRATEGY & TECHNOLOGY CONSULTING FOR GLOBAL E-BUSINESS

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Prepared by the Harvard Computing Group, Inc.

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1. Executive Summary

This document was prepared by The Harvard Computing Group, Inc. (HCG) as the Phase 5 deliverable, "Written Report of Findings and Recommendations", in the US Nuclear Regulatory Commission's (NRC) project entitled "ADAMS Directional Assessment Study". This deliverable was due on March 30, 2001.

The overall project is scheduled as a 9-week project with start and end dates as follows:

- Start Date - February 7, 2001
- End Date - April 9, 2001 (Last task is a briefing with Chairman Meserve)

Document Organization

This document has been organized to include the Business Case, Recommendations and Action Plan at the beginning of the document. The support information, such as the Alternative Technology and Methodology has been moved to the back. This will allow the reader to quickly get to the results of the assessment and still provide the background information.

Issues

HCG delivered a document to the NRC on February 28, 2001, entitled "US Regulatory Commission ADAMS Directional Assessment Study Outline of Issues to Study". In this document, HCG identified five main issues that will be included in the study.

1. Determine whether near-term upgrade plans are a cost effective way to improve ADAMS. This issue is represented by Scenario 1 – Status Quo in the *Business Case* chapter and is answered in the Near-Term section under *Recommendations*.
2. Determine whether the NRC is on the appropriate path towards a Document Management/Process Management system that meets long-term NRC needs. The long-term NRC needs are defined in the *Ideal* chapter and the issue is answered in the Long-Term section of the *Recommendations*.
3. Determine whether there are alternative technologies to ADAMS that would better meet the NRC's long-term goals. To address this issue HCG investigated other Document Management (DM) systems as well as technology outside of DM systems. The results for this issue are in the *Alternative Technology* chapter and are contained within the Business Cases and Recommendations.
4. Provide business case component estimates to support recommendations in Issue 5. The business cases developed are in the *Business Case Component* chapter.
5. Provide Recommendations for specific actions and focus for the NRC to

achieve their long-term Document Management/Process Management goals. This issue is covered in the *Recommendations* chapter and the *Action Plan* chapter.

One area within the NRC's Document Management goals that HCG was unable to address in the Recommendations was whether ADAMS meets NARA requirements. This area cannot be explored until NARA defines their requirements for electronic documents. At this point the NRC must proceed with the goal of trying to replicate documents in ADAMS with an accuracy of as close to 100% as possible.

2. Ideal – Long Term NRC DM Goals

The “Ideal” ADAMS environment supporting long-term, NRC, document management requirements was defined within the context of this project to be the set of functional requirements provided by:

1. Input from the ADAMS Steering Committee members during the Kick-off Workshop,
2. User Assessment Reports compiled by the OCIO to provide feedback on ADAMS 3.0, and
3. Input from the Assessment Interviews held with various members of the ADAMS user community.

Functional requirements were consistently captured in a standard “Verb-Noun” format (e.g. “Scan Documents”) to support compilation and analysis. Subsequent analyses established a means to quantitatively prioritize the requirements to reflect business criticality, technical complexity, and programmatic management issues.

A broad understanding of the “Ideal” ADAMS environment was developed through a series of analyses based on key parameters: issue type, programmatic impact, and phases. The percentages provided are not designed to add up to 100% between all analyses. They only reflect the degree of impact within each parameter assessment respectively. More information on the “Verb-Noun” format and the rest of HCG’s methodology can be found in Chapter 9 – *Methodology*.

Issue type analysis revealed the following significant characteristics:

- 1) **Six categories of issues** accounted for almost 75% of all functional requirements captured. These six were:

Workload Issues (23.5%) – these were problems or requirements related to the time and effort users were taking to use ADAMS. A significant number were specifically related to performance problems in the profiling process. Common complaints were “cumbersome” and “time-consuming”.

Performance Issues (15.6%) – these were problems or requirements related to system response times. Some of the more common complaints were directed toward the profiling and scanning processes. Other performance issues addressed printing and search functions.

Reliability Issues (10.1%) – these were problems or requirements at both the system and application function levels. System reliability primarily centered on outages, lock-ups and functional issues centered



on sending documents and searches.

Usability Issues (9.5%) – these were problems or requirements that dealt with the ergonomics of ADAMS. Comments like “non-intuitive” and “awkward” characterized these sets of issues.

Consistency Issues (7.8%) – these were problems or requirements related to profiling and data quality issues. However, other aspects addressed system response and processes. Comments covered a range of subjects from viewer rights to policy enforcement.

Functionality Issues (7.8%) – these were problems or requirements related to system capabilities. These were typically ‘bugs’ concerning features that should have already been a part of the system. However, other issues were full-blown complaints or requests for functions that were seen to make life easier if available. Examples included the need to support complex searches and the scrolling requirements of certain drop-down lists.

- 2) **Two categories of Programmatic Issues** accounted for nearly a third of all functional requirements captured.

Other-General (16.5%) – these are problems or requirements that deal with systems design, availability, compatibility, integration, and performance. Most issues deal with systems support at the component level. Examples include incompatibility with INFORMS and underpowered workstations.

Other-Program Administration (15.8%) – these are problems or requirements that address application support issues. Common concerns address inadequate documentation and training.

- 3) **One Life Cycle Phase** accounts for roughly 40% of all functional requirements captured.

Input / Development (41.5%) – these problems or requirements deal overwhelmingly with profiling process issues. The breakdown on the 45 issues captured include 17 workload-related, 8 usability-related, and 6 performance-related issues. The common thread seems to be that people feel too much time and effort is needed to use and support ADAMS.

3. Business Case

The following scenarios were considered in developing our recommendations presented in the next section. The assumptions for each scenario and cost details are represented in APPENDIX J.

Change management issues have not been addressed in the scenarios, because change management affects each scenario and it is not a differentiating factor. The exception is scenario 4, which requires the NRC to move to one of FileNET's competitors. This move would require more training for both the end-user and system administrators than migrating FileNET to a newer version.

Scenario 1 – Status Quo

The NRC will proceed with the current plan for ADAMS 4.0, 5.0 & PIP. This scenario has the NRC continuing on the current path as it stood on March 14th, which was the completion of the Assessment Interview Phase of this project.

This scenario includes:

- Moving forward with ADAMS 4.0, adapting the custom code and moving toward the most recent versions of FileNet.
- Continuing with the PIP project using Convera software to improve the public interface.
- Moving to ADAMS 5.0, where 5.0 is a reduction of custom code from 4.0 and the inclusion of the "Ideal" functionality.

Cost

(000's)	FY2001	FY2002	FY2003	FY2004	TOTAL
FileNET SW Maintenance	630.6	692	727	763	2,812.6
Application Maintenance	694	728	650	943	3,015
Moving to Release 4 & 5	650.2	331	510	510	2,001.2
New ADAMS Public Interface	196	195	316	17	724
TOTAL	\$2,170.8	\$1,946	\$2,203	\$2,283	\$8,552.8

Source: 03Adams2.wk4

Hard Benefits

Removing custom code will reduce the amount of money the NRC spends on software maintenance, which will reach \$900,000/year in FY 2003. \$900,000 is the combination of the NRC system integration contractor portion under Application Maintenance in FY 2003 (\$650,000) and the system integration contractor amount attributed to moving to release 5 (\$250,000).

Soft Benefits

- A more stable system will improve usability and the internal perception of the system.



- The PIP will improve the public interface and improve the public perception of the NRC.
- The closer the NRC can get to a 100% COTS product, the easier and less costly it will be to stay up-to-date with software upgrades; thereby, reducing the incidences of bugs in the system and allowing the organization to take advantage of new features and functions that are available.
- Using the browser-based interface in the newer versions of FileNET will require fewer resources on the desktop allowing other applications to work better.

Problems

- PIP using Convera only improves search functionality on the public site; it does not move ADAMS toward any of the other “Ideal” functionality.
- Assuming ADAMS 5.0 will meet the NRC’s long-term goals (Ideal), they will not get there until FY04.
- The reduction of custom code included in the migration to ADAMS 5.0 will not occur until FY04. Until then, the NRC will have to continue to support the current custom code.
- Custom code makes it difficult to continue to upgrade ADAMS and take advantage of new features and functions in FileNET and those that result from new technology.
- The NRC did not perform a business process review and re-engineering to optimize processes for ADAMS, therefore there is custom code supporting current processes that could not be removed without re-engineering.

Scenario 2 – Status Quo with a Portal

Proceed with current plan for ADAMS 4.0 and 5.0, with the addition of a Corporate Portal, which replaces the PIP project. There is information on Corporate Portals in the *Alternative Technology* section of this document. Also, this scenario requires the NRC to migrate from WordPerfect to the MS Office Standard Suite, which consists of Word, Excel, PowerPoint, and Outlook. However, HCG does not feel it is necessary to replace GroupWise by installing Outlook or any of the Microsoft back office products like Exchange.

Cost

(000's)	FY2001	FY2002	FY2003	FY2004	TOTAL
FileNET SW Maintenance	630.6	692	727	763	2,812.6
Application Maintenance	694	728	650	993	3,015
Moving to Release 4	650.2	331	510	510	2,001.2
Corporate Portal	196	500	316	100	1,050
Sub-TOTAL	2,170.8	2,251	2,162	2,291	8,878.8
MS Office	690	350	0	0	1,040
TOTAL	\$2,864.8	\$2,601	\$2,162	\$2,291	\$9,918.8

Hard Benefits

- Removing custom code will reduce the amount of money the NRC spends on software maintenance, which will reach \$900,000/year in FY 2003. \$900,000 is the combination of the NRC system integration contractor portion under Application Maintenance in FY 2003 (\$650,000) and the system integration contractor amount attributed to moving to release 5 (\$250,000).
- The implementation of Workflow and Collaboration software that was part of the "Ideal" functionality would cost less if the NRC already had a portal and/or MS-Office.

Soft Benefits

- The move to MS Office will give the NRC more flexibility implementing other IT systems, the majority of which are Microsoft centric.
- Since the MS Office products are more tightly integrated than WordPerfect, once users learn the products they may find working with the system to be more streamlined.
- A more stable system will improve usability and internal perception of the system.
- The portal will provide a more usable public interface covering more of the "Ideal" functionality than the PIP, improving the public perception of ADAMS and the NRC.
- The portal will improve the internal interface, improving the internal satisfaction with ADAMS.
- The portal will allow the NRC to achieve more of the "Ideal" functionality in a shorter period of time.
- The application integration capabilities of the portal will make it easier to tie other systems to ADAMS like GroupWise.
- Using a web browser to access ADAMS and potentially other systems through the portal will require fewer resources on the desktop allowing other applications to work better.
- The closer the NRC can get to a 100% COTS product, the easier and less costly it will be to stay up-to-date with software upgrades; thereby, reducing the incidences of bugs in the system and allowing the organization to take advantage of new features and functions that are available.

Problems

- Assuming ADAMS 5.0 will meet the NRC's long-term goals (Ideal), they will not get there until FY04, although the portal will allow the NRC to get closer to the "Ideal" in a shorter time frame.
- The reduction of custom code included in the migration to ADAMS 5.0 will not occur until FY04. Until then, the NRC will have to continue to support the current custom code.
- Custom code makes it difficult to continue to upgrade ADAMS and take advantage of new features and functions in FileNET and those that result



from new technology.

- The NRC did not perform a business process review and re-engineering to optimize processes for ADAMS, therefore there is custom code supporting current processes that could not be removed without re-engineering.

Scenario 3 – Fast Track to ADAMS 5.0

This scenario calls for stopping the current path of ADAMS at 3.3. Moving from WordPerfect to the Microsoft Office Suite and then migrating directly to a 100% COTS FileNet product with web interface.

Cost

(000's)	FY2001	FY2002	FY2003	FY2004	TOTAL
FileNET SW Maintenance	630.6	692	727	763	2,812.6
Application Maintenance	694	364	216.7	314.3	1,589
Moving to Release 5	750	1,000			1,750
Corporate Portal	200	500	275	75	1,050
Sub-TOTAL	2,274.6	2,556	1,218.7	1,152.3	7,201.6
MS Office	690	350	0	0	1,040
TOTAL	\$2,964.6	\$2,906	\$1,218.7	\$1,152.3	\$8,241.6

Hard Benefits

- NRC will only have to pay to maintain the current custom code of ADAMS for one year, and then the amount of custom code is reduced
- The amount of cash spent in the first two years is higher than scenario 1 & 2, however the amount spent on the on-going operation of ADAMS from FY 2003 on is considerably less (\$700,000+ vs. over \$1 million).
- The implementation of Workflow and Collaboration software that was part of the “Ideal” functionality would cost less if the NRC already had a portal and/or MS-Office.

Soft Benefits

- The move to MS Office will give the NRC more flexibility implementing other IT systems, the majority of which are Microsoft centric.
- Since the MS Office products are more tightly integrated than WordPerfect, once users learn the products they may find working with the system to be more streamlined.
- Users will get a more stable system with a user-friendly interface improving their opinion of ADAMS.
- The portal will provide a more usable public interface covering more of the “Ideal” functionality than the PIP, improving the public perception of ADAMS and the NRC.
- The portal will improve the internal interface, improving the internal satisfaction with ADAMS.
- The portal will allow the NRC to achieve more of the “Ideal” functionality in a shorter period of time.



- The application integration capabilities of the portal will make it easier to tie other systems to ADAMS like GroupWise.
- Using a web browser to access ADAMS and potentially other systems through the portal will require fewer resources on the desktop allowing other applications to work better.
- The closer the NRC can get to a 100% COTS product, the easier and less costly it will be to stay up-to-date with software upgrades; thereby, reducing the incidences of bugs in the system and allowing the organization to take advantage of new features and functions that are available.

Problems

- Requiring the organization to move from WordPerfect to Word will demand a well planned and executed change management plan. In addition to training new users on the system, plans must be laid to ensure the users are motivated to adopt the change.
- The NRC did not perform a business process review and re-engineering to optimize processes for ADAMS, therefore there is custom code supporting current processes that could not be removed without re-engineering. To move straight to ADAMS 5.0, the NRC would immediately need to start an aggressive project to capture, re-engineer and implement new processes.

Scenario 4 – Fast Track to New DM Product

This scenario is the same as scenario 3, but proposes instead of staying on FileNet the NRC would move to a 100% COTS product from another document management vendor.

For the purposes of this example, we have included pricing information for Documentum. In the vendor analysis portion of this document, Documentum distinguishes themselves from the others by providing more robust documenting review and editing controls. If the NRC determines these requirements have high-value to the organization that may be a reason to choose this scenario.

Cost

(000's)	FY2001	FY2002	FY2003	FY2004	TOTAL
SW Maintenance – FileNet	630.6	346			976.6
Application Maintenance	694	364			1,058
SW License – Documentum	751	1,000			1,751
SW Maint. – Documentum	415	315	315	315	1,360
Corporate Portal	200	500	275	75	1,050
Sub-Total	2,690.6	2,525	590	390	6,195.6
MS Office	690	350			1,040
TOTALS	\$3,380.6	\$2,875	\$590	\$390	\$7,235.6

Documentum, based upon 3000 users, provided the prices above. Specific prices



for the NRC would have to be determined once they clearly understand your requirements and the number of users. For more detail on the pricing refer to APPENDIX J. Also, refer to the Vendor Profile – Document Management section for more specifics about the Documentum pricing.

Hard Benefits

- It appears that over the long run the annual maintenance charges would be less for the software product. More specifically the application maintenance charges required to support all of the FileNet custom code would be eliminated.
- The amount of cash spent in the first two years is higher than scenario 1 & 2, however the amount spent on the ongoing operation of ADAMS from FY 2003 on is considerably less (\$590,000 vs. over \$1 million).
- The implementation of Workflow and Collaboration software that was part of the “Ideal” functionality would cost less if the NRC already had a portal and/or MS-Office.

Soft Benefits

- The move to MS Office will give the NRC more flexibility implementing other IT systems, the majority of which are Microsoft centric.
- Since the MS Office products are more tightly integrated than WordPerfect, once users learn the products they may find working with the system to be more streamlined.
- Documentum’s complete portfolio of integrated functions, including workflow will help to facilitate the document management process.
- A 100% COTS product will allow the NRC to stay up-to-date with software upgrades; thereby, reducing the incidences of bugs in the system and allow the organization to take advantage of new features and functions that are available.
- The portal will provide a more usable public interface covering more of the “Ideal” functionality than the PIP, improving the public perception of ADAMS and the NRC.
- The portal will improve the internal interface, improving the internal satisfaction with ADAMS.
- The portal will allow the NRC to achieve more of the “Ideal” functionality in a shorter period of time.
- The application integration capabilities of the portal will make it easier to tie other systems to ADAMS like GroupWise.
- Using a web browser to access ADAMS and potentially other systems through the portal will require fewer resources on the desktop allowing other applications to work better.
- After experiencing some of the problems and complications with ADAMS that were a result of things like new work processes or templates that may have been better planned and implemented, tackling the implementation of a new system allows people to implement more effective processes and



tools as a result of that learning experience.

Problems

HCG expects this scenario to be more challenging from a change management point-of-view than the other three scenarios. Not only does this scenario require users to learn MS Office, it will also require that they learn a new document management system. This is likely to disrupt operations for a period of time.

HCG estimated that the NRC would need to train four trainers (\$25,000/trainer) to educate users on Documentum. Beyond the \$100,000 spent to train the trainers, it is difficult for HCG to estimate the internal cost of training and the training of system administrators. But if the NRC utilized Documentum to train the system administrators and spent \$200,000 for internal training, the total number for training would easily approach \$1 million, which would be added to the \$7, 235,600 total from the chart above to give a total of \$8,235,600.

This solution also requires that the NRC abandon their investment in FileNet and reinvest resources into implementing a new solution.

4. Recommendations

Current plans to evolve towards ADAMS 4.0 and 5.0 are not the best course towards satisfying long-term, NRC requirements. The business case for this option was presented above as Scenario 1. Key problems stem from:

1. the 4 to 5 year period currently projected to achieve ADAMS 5.0 functionality,
2. the ability to quickly achieve ADAMS 5.0 functionality using alternate portal options, and
3. the limited functional gain provided by the development of PIP search capabilities.

One milestone addressed during our analysis was to gain a perspective on the degree of fit to expected requirements. We asked the participants of each Assessment Interview to assess the ability for ADAMS 3.0 to support the 'ideal' functional requirements set defined by the ADAMS Steering Committee. The resulting figures came in at just under 50% coverage, even when partially covered functionality was factored in. It should be noted that 'partial' coverage included work-arounds to address inadequate system functionality.

A subsequent review of the ADAM Systems Requirements Specification (SRS) as a reflection of ADAMS 3.3 seemed to indicate the suitability of fit at about the same 50% coverage. Clearly, a significant amount of effort should be factored in to account for the remaining 50% of the 'ideal' functionality required of ADAMS 5.0. Our view is that up to 75% of that remaining functionality could be addressed through properly specified portal design.

Overall, we would recommend options that drive towards commercial-off-the-shelf (COTS) product functionality as quickly as possible. One significant advantage would be to reduce code maintenance and migration costs as the core software (e.g. FileNET) evolved through subsequent revisions. With this in mind, we position Scenario 3 as the best of the four business cases presented. Recognizing the NRC's cultural preference for WordPerfect, we would still include the migration to MS Office (Word, Excel, PowerPoint) in the NRC's plans.

Proceeding directly towards fulfilling the targeted 'ideal' functionality of ADAMS 5.0 without the delays involved in staging at ADAMS 4.0 should satisfy user requirements sooner. That said, current efforts to achieve ADAMS 4.0 functionality by November 2001 might eliminate much of the difference between Scenarios 2 and 3, since extended costs associated with the current FY04-FY05 schedule disappear.

The transition to the Microsoft platform is also justified from a usage perspective. The ratios captured during our interviews indicated that 50-70% of all documents processed into ADAMS come from external sources. Of those external



documents, roughly 85% are said to be in a Microsoft format.

One final note, regarding any system solution or business option selected. It seemed very apparent that programmatic issues will have a significant impact on the success or failure of any implementation effort. Fully one third of all issues and requirements captured during this project were non-system factors. Change management issues regarding adoption, training, and documentation seemed noticeably un-addressed. There also seemed to be a genuine need to clearly establish productive, verified processes within the organization. Lack of adequate attention in these areas often leads to problematic symptoms in data integrity, workarounds, and system performance.

5. Action Plan

This action plan lays out a suggested sequence of tasks related to the initiation of Scenario 3. It was not designed to serve as a project plan, but it should provide enough direction to help guide a project manager towards the key milestones. The rough sequence of milestones should include:

- 1) Ensuring board-level sponsorship for the project
- 2) Complete the migration to ADAMS 3.3
 - a. Review processes to identify and troubleshoot newly created snags
 - b. Review user training requirements to plan and develop appropriate curriculum
 - c. Review the profiling process to look for improvements
- 3) Stop the current PIP effort and replace with a portal project
- 4) Stop additional ADAMS 4.0 development effort
- 5) Purchase MS Office Suite (Word, Excel, PowerPoint) and install
- 6) Prepare a System Specification for the new ADAMS platform based upon FileNet with a web interface
- 7) Develop a migration plan
 - a. Develop test scenarios
- 8) Purchase new system
- 9) Begin implementation
- 10) Train end-users

If the NRC could ensure that ADAMS 4.0 would be implemented by November 2001, thus making scenario 2 the best choice, the only change to the Action Plan would be to 4. This step would be change to "Complete the migration to ADAMS 4.0".

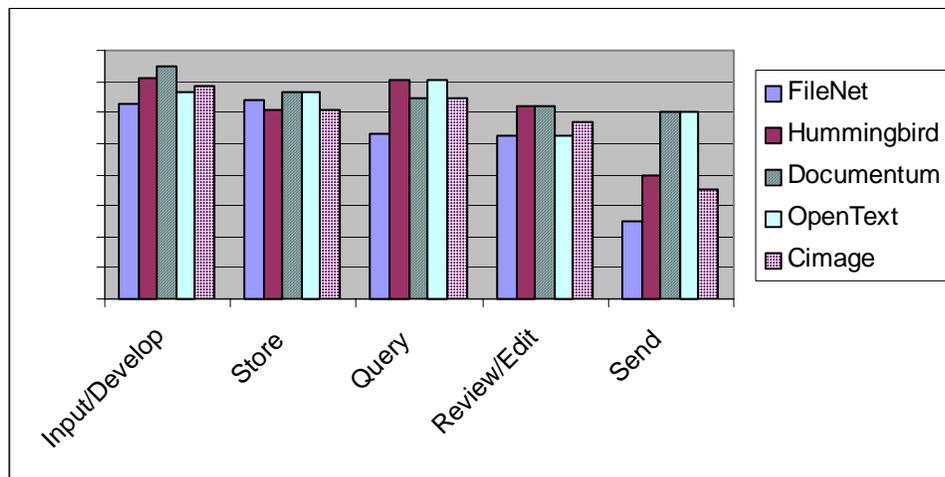
6. Alternative Technology

Document Management

To assist in the analysis of the various Document Management product vendors, the system’s ideal functional requirements were compared to the products’ capabilities. The five Document Management solution providers included in the analysis were: FileNet, Hummingbird, Documentum, Open Text and Cimage Novasoft.

To complete the requirements’ mapping we reviewed our own research materials, searched for new information, reviewed product documentation if possible, and talked to the product vendors. In most instances the product vendor did not know who our client was, although they did know that it was a federal agency in the Baltimore/DC area.

The following diagram provides a high-level summary of how the products compared when their capabilities where matched to the NRC Functional Requirements. The products were rated based upon their ability to satisfy the requirement. There was also a weighting applied if the requirement could be satisfied but required customization or third-party products.



Functional Requirement Comparison by Phase

As anticipated, the results of the mapping reflect how similar many of the products are in their document management capabilities. We expected that Documentum would be able to provide better support for your input/develop, review and editing requirements because they provide robust library services.

Hummingbird, stood out in the query category because they are able to manage binders for documents in addition to compound documents. As a result, they are



able to satisfy slightly more or your search requirements related to packaged documents. OpenText also rated high in this category. This is because many of the more advanced search capabilities come out-of-the box instead of requiring add-ons or customization.

The send category relates to distribution of documents through workflow or email. In this category, the products all rated very similarly for email, this is because all of the products have been tuned to support MS Outlook and in several instances require customization, or provide more limited functionality to GroupWise users. Documentum and OpenText stand-out because of their more integrated, built-in workflow capabilities to monitor the status of documents and ensure their receipt.

In the Vendor Profile/Document Management chapter you will find more specific information about each company and details on the advantages and disadvantages of their products that help to differentiate them in this competitive market.

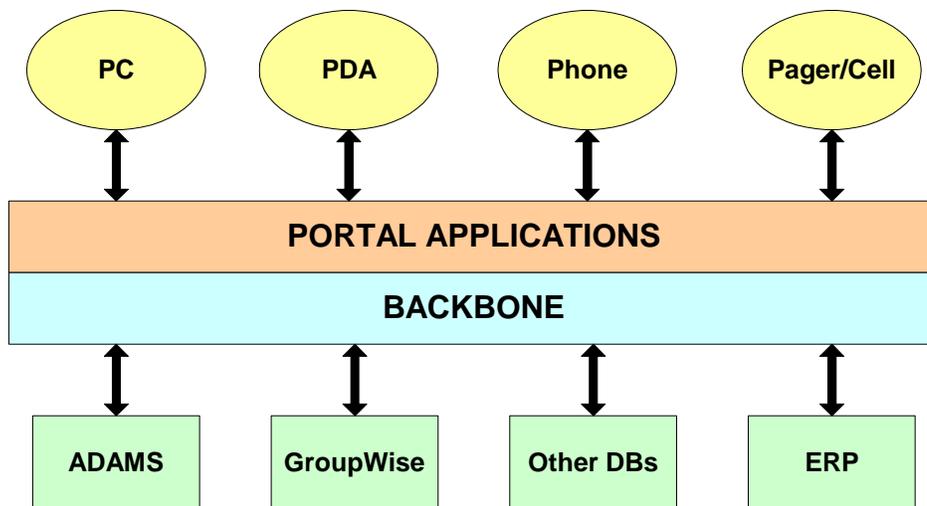
Corporate Portals

Corporate or Enterprise Portals allow firms to tie disparate systems into one user interface. Systems could include databases, legacy mainframe applications, or more modern Internet/intranet applications. The portal allows these systems to be accessed from a single user interface, usually a web browser. The result is a user-friendly interface that is easier to train to and easier to implement.

In “layman’s” terms, the portal allows someone to access company systems using a web browser. The user would access NRC systems the same way they use Yahoo to access information about their stocks or sports scores. The user would open up Netscape and have options like searching ADAMS and the Legacy Library, viewing their GroupWise email, or their GroupWise calendar.

Portal vendors often use the analogy of a “Digital Dashboard for Your Firm” to describe their products. This is a good way to describe the application integration of portals, but a true portal has other features for customizing the view and retrieving data. A true portal has a single search engine that can access all the systems integrated into the portal. The search engine usually has the option of doing a simple “Yahoo” type search or more advanced searches. The portal also allows personalization at the role and individual level and there is a built in Meta data dictionary. The Meta data dictionary stores such information as a user’s passwords to support a single login.





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High-Level Architectural View of a Portal

The above diagram shows the types of devices that can be used to access the portal, ranging from a PC to a Pager. These devices use a client application to access the Portal, for the PC this would be a web browser or for a Cell phone it would be a WAP browser or voice commands. The portal utilizes the backbone to communicate with a firm's systems. The backbone consists of a combination of plug-ins and/or custom code that allows the integration of systems with the backbone.

Referring back to the diagram above, one of the advantages of a portal is that all the systems are tied to a common backbone. If the NRC wanted to implement collaboration software, it would be added to the backbone and then it would be available on the portal. Once on the backbone, the collaboration software would be able to share information with other systems. So, instead of having to integrate the collaboration software with ADAMS and GroupWise separately, it can be done in one step, saving time and cost.

The NRC should select a portal application that can meet their functional needs and has plug-ins available for ADAMS/FileNET and GroupWise. This would eliminate the need to create custom code for these systems, but it may still be necessary to create code to access other NRC systems.

Developing a portal would allow the NRC to meet functional requirements in the Input/Develop, Query, Review/Edit, and Print/Publish phases of the Document Lifecycle as well as workflow. These areas represent 79.7% of the functional requirements that make up the 'Ideal' ADAMS. Using a portal to cover these functional requirements would improve ADAMS coverage of functional requirements by at least 75%.

A portal would improve the functionality of ADAMS in other areas including application integration and public access.

Application integration – internally the portal would give NRC employees access to ADAMS and other NRC systems like GroupWise, Foremost, and Informs.

Public access – the public, as well as other remote users of ADAMS, would no longer need to use Citrix to access ADAMS. The public would access the portal over the Internet and have access to public documents as well as the search capabilities of the portal. Affiliate states and sites would also be able to access ADAMS through the portal.

There are also soft benefits to implementing a portal, which are represented in the business cases that include the portal as a replacement to the PIP (scenarios 2, 3, & 4).

Portal software is priced on either per user or per server CPU basis. The average price is \$100/user or \$75,000/CPU. The license maintenance on the software is usually around 25% of cost.

In the Vendor Profile – Corporate Portal chapter, there is vendor specific information for Plumtree, Convera, and Sybase EP. This is a small sample of the 30 plus vendors that supply corporate portal products. They were selected based on the following:

- Plumtree has a partnership with FileNET
- Convera and Sybase are both current NRC suppliers

Workflow Management System

A Workflow Management System defines, creates, and manages the execution of workflows through the use of software. The software used for workflow is referred to as the workflow engine, which is able to interpret the process definition, interact with workflow participants, and invoke the appropriate IT applications when necessary.

Workflow was included in the original functional requirement set for ADAMS and the original implementation. The workflow functionality was used in the first few months after implementation; however, it was abandoned because it was too difficult to get people trained and there were functional issues that needed to be addressed.

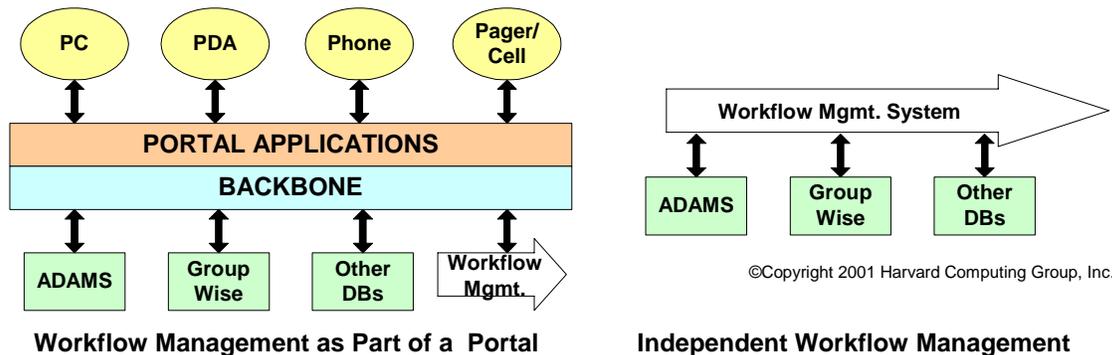
The need for workflow was reiterated by the ADAMS Steering Committee and in a few of the Assessment Interviews. HCG observed that there was a wide gap in how the workshop participants defined workflow. The input from the sessions



ranged from a tracking system, to a system that was able to replicate the concurrence process and push documents with changes from one step to another.

In general workflow has become very sought after functions in the most recent software releases. Many of the current releases of Portal Applications are now including workflow engines and other applications are touting more advanced workflow functionality.

The alternative to using the workflow engine within an application is to buy a standalone product. A standalone product is able to utilize API's to tie into the workflow engine included in existing systems or can be used independent of the other systems. If the NRC implemented a portal, the standalone workflow engine could utilize the portals backbone to communicate with other systems. The ability to tie workflow systems together has become easier as firms build to a standard established by the Workflow Management Coalition (WfMC).



Most workflow engines are now Internet enabled, which will allow the use of workflow to move outside of the office. This has two advantages to the NRC:

- The NRC expects remote users to increase over the next few years as people work from home. Internet functionality allows the remote users to still be included in the workflow.
- Workflow can be extended beyond the NRC to include key stakeholders (e.g. affiliated states, nuclear sites, other government agencies).

Before determining the direction that should be taken by the NRC with respect to workflow the NRC must capture the processes to support workflow – See Recommendations.

Collaboration Technology

One of the items mentioned by the ADAMS Steering Committee as a new functional requirement for ADAMS was to create documents collaboratively. The current limitation on this functionality is that more than one user cannot check a file out of ADAMS at the same time.

Overall, Collaborative Technology, which is often grouped with messaging, consists of more functionality than writing to documents at the same time. It also includes being able to:

- Communicating electronically through instant messaging or email
- Reviewing and submitting changes (redline) documents
- Collaborating on documents in an electronic virtual workspace

Collaborative technology has not advanced as quickly as workflow management systems. Collaboration is often implemented as part of an email platform like Domino/Notes or Exchange. There are not many systems like ERP or CRM that have embedded collaboration. This makes it difficult to develop a Collaborative Application that can communicate with other systems like the Workflow Management Systems described above.

Although there is probably not a single solution in this area that can meet the NRC's needs at this time, this is an area that both Lotus and Microsoft are concentrating on, which means there will be large technology jumps over the next couple years. Also portal vendors have been adding functionality in this area as they try to become a single access point into a company's IT systems.



7. Vendor Profiles - Document Management

FileNET

www.filenet.com

Vendor Overview

From KMWorld Buyers Guide – Winter 2001

“FileNET Corporation (NASDAQ: FILE) provides The Substance Behind eBusiness™ by delivering eProcess Management software solutions. FileNET enables organizations around the globe to increase productivity, customer satisfaction and revenue by linking customers, business partners and employees through efficient and flexible eBusiness processes.”

Product Overview

FileNet Corporation has evolved their product offerings over the years through acquisition and development. Their products began as primarily document library (repository) for electronic images. The product included capabilities to manage and retrieve the images and documents in the library. They have continued to develop their administration and user interface capabilities to improve these capabilities and make them more user friendly. Over time they have added workflow and integrated document management capabilities.

In the most recent version of their product offering, they are enhancing their sophisticated workflow capabilities to provide a powerful administration tool that is easier to use including the ability to administer the workflow over the Internet using a web browser. Workflow messages can appear in MS Outlook or Lotus Notes task lists; therefore, specific customization would be required to support GroupWise.

The FileNET product supports a browser interface that allows a user to access documents in the library. Their security model guarantees that users are strictly controlled in their ability to access documents in the repository.

The integrated document management capabilities allow users to work with the documents in the FileNet libraries directly through the Microsoft Office products (*Word, Excel, PowerPoint, Access*) that are on their desktops. In other words, instead of having a separate program on a user's desktop computer for finding, accessing, and storing documents, the user is able to work with the files in the library using commands that are added to the menu of their currently used products like Word. Custom coding is required to integrate the product with WordPerfect. With WordPerfect or Word, custom programming can be completed so that users have no other option but to add or retrieve documents from the FileNet library.



FileNet only handles documents at the file level. They do not provide additional capabilities that impact the data within a file. As a result, FileNET's tracking changes capabilities are what MS Word provides and they are not any more robust than that. Integration with a third party software product is required, for example, for more sophisticated comparing and combining of document edits from multiple editors.

Handling documents at the file level also impacts FileNET's ability to create complex documents that include data from multiple documents. A user is able to bind multiple, related documents together in the library, but they are not able to have complex documents updated automatically as the individual data elements are changed.

FileNet provides some search capabilities out-of-the-box including keyword, full text searches, thesaurus, and support for stop lists to exclude words from searches. If the organization requires additional search capabilities like relevancy ranking and searching multiple repositories, in and outside of FileNET then a third-party product like Excalibur, MS Site Server, or Verity must be used. The system's security structure allows the administrator to create separate document libraries, classes and index values. Putting documents in different libraries is the most secure way of controlling access to confidential information; however, a user is only permitted to search through a single library at a time. Customization of the search capabilities is required if a user needs the ability to securely search across multiple libraries.

Contact Information

Rick Kilborg and Randy Cunningham
FileNet
703-312-1500



Pricing

Note: This pricing information was furnished by the NRC.

ADAMS Estimated Cost (From 03Adams2.wk4)	FY 2001	FY 2002	FY 2003	FY 2004
FileNet SW Maintenance (From 03Adams2.wk4)	630.6	692	727	763
Application Maintenance	694	728	650	993
CISSCO	615	728	650	733
Additional Funding (R3.3)	79			
FileNet				210
Moving to Release 4 & 5	650.2	331	510	510
FileNet Prof. Svs.	428.2	135.5	200	
PCVS Manager	8			
CISSCO	214	75.5	250	
Computer Based Training	0	120	60	
New ADAMS Public Interface	196	195	316	17
TOTALS	2,170.8	1,946.0	2,203.0	2,283.0
TOTALS less PIP	1,974.8	1,751.0	1,887.0	2,266.0

Note: Numbers for "Moving to Release 4 & 5" for FY03 & FY04 were furnished by Linda Schneider @ NRC

Advantages/Disadvantages

Advantages	Disadvantages
FileNET's beginnings were primarily as a document library (repository) for electronic images. As a result, the product has strong store and retrieve capabilities for documents maintained in the repository.	Architecture is Microsoft focused. As a result the customization required to support WordPerfect and GroupWise makes on-going maintenance and upgrades to new releases, costly and time consuming.
The newer version of the product supports 100 fields at each level of the profile. Three levels are supported: Document/item, version, check-out.	Workflow is not an out-of-the-box function.
Publishing function allows a PDF rendered version of the document to be published. They also include a link to the original document in the even that the original is modified. When searches are done against the repository published documents are displayed with a star next to them.	Ability to search multiple repositories is not an out-of-the-box function.
The web client provides the full document management functionality. This interface is becoming the primary way users interact with the system, thus reducing the need to install and maintain software on individual desktops.	The product's content management capabilities still require better integration with the repository and lifecycle management.



Future Plans

FileNET plans to continue with the development of web applications that will help to improve the interaction between the company and their customers and constituents. Their plan is to compete by continuing to leverage their strategic partners like Plumtree for providing Portal solutions.

In addition FileNET plans to continue to enhance their core products.

Hardware/Software Requirements

Client	Server	Database
Windows NT, 2000 Internet Explorer Netscape Navigator	Windows NT Server HP-UX	Oracle Microsoft SQL Server



Hummingbird Communications Ltd. **Vendor Overview**

www.hummingbird.com

From KMWorld Buyers Guide – Winter 2001:

“Hummingbird develops enterprise software solutions that provide access to all business-critical information and resources, aggregated and categorized through a single user interface. Hummingbird offers these global enterprise solutions through the desktop and the Web using Hummingbird Enterprise Portal Suite; the cornerstone of the firm's e-Business solutions. Integrated within Hummingbird Enterprise Portal Suite are the firm's proven technologies for host access, data integration, reporting and analytics, and document and knowledge management.”

(Source: <http://www.hummingbird.com/press/2000/3tierdocsfusion.html>)

Hummingbird's customers include financial institutions, law firms, healthcare providers, manufacturing, consumer products, communications, pharmaceutical, utilities, government agencies, and other organizations in more than 50 countries throughout the world.

In 1999 when Hummingbird acquired PC Docs, Hummingbird owned over 70% of the world market share for enterprise connectivity software. PC DOCS Group and its subsidiaries, PC DOCS/Fulcrum, CMS/Data Corporation and ComplInfo, Inc., developed, marketed and supported object-oriented client/server and Internet Document Management systems, Knowledge Management systems and Financial and Case Management systems for professionals. Hummingbird's objective with the acquisition was to integrate the combined technologies of the two companies to produce an Enterprise Information Portal.

Product Overview

DOCS Open is the core client/server product from this company and provides capabilities across a wide range of hardware, software and network platforms. The company offers more than ten add-on products that extend DOCS Open capabilities to include, for example, document imaging, ad hoc routing (not true workflow), enhanced security, document binding, mobile access (DOCS Unplugged), records management (DOCS RM) and internet support through CyperDOCS.

Hummingbird is also introducing DOCSFusion server technology which is a three-tier design supporting the CyberDOCS web client and a second-generation Windows client.

CyperDOCS provides full library services over the web including searching,



viewing, check-in, check-out, version control and audit trails. The product works with CyberDOCS Routing for workflow-like routing of documents, and CyberDOCS Imaging for access, control and sharing of documents received in paper form.

Fulcrum KnowledgeServer and SearchServer add knowledge acquisition and management capabilities across multiple data sources, formats and architectures. These products are compatible with DOCS Open and Fusion.

Hummingbird offers many features and capabilities to profile documents in the database. Every document has a profile, and every profile is assigned to a library. Any organization may have multiple libraries. Default profiles are provided by Hummingbird for specific vertical markets, these can be used by the administrator to easily set up specific default profiles for your organization. Profiling of a document may be completed on the front or back end of document creation. Automatic Document Categorization (ADC) is integrated with the Fulcrum KnowledgeServer. ADC uses neural network technology to automatically create a document map based upon the document contents. Users can also have their own defaults for profiles, by application. Custom development may be completed to create macros that can populate data as the user is entering information into the profile.

Hummingbird also provides XML based document binders to hold groups of related documents, folders, or other binders. Binders have their own profile. Documents within a binder can be published as a single document and all the page numbers will automatically be sequential.

Documents may be located for by searching the full text of the document, by the information in the profile, or both. If binders are used the search results may return a binder and/or a document within the binder. In addition to document Binders, DOCS Open allows the user to create compound documents, links to are not supported; however, for documents in an unplugged library.

DOCS Routing provides an easy tool for users to route documents and folders to other users and groups for review, approval and editing tasks. Users may define serial or parallel routes. A window in the DOCS Open desktop is used to view the task in and outboxes and to see what needs action. In addition the user can create and save routes through this feature. While DOCS routing facilitates workflow it is not complex workflow system that allows the user to graphically display the design, or automatically route documents based upon automated decision points and actions.

Hummingbird's suite of products is good for users that are looking for a fully functional Document Management system. In addition, organizations that have their information spread across multiple locations, repositories, operating systems and platforms are able to maximize their return on investment from their



system by utilizing the profiling and searching capabilities to effectively manage their information.

Contact Information

Hummingbird Communications Ltd.
 Cathy Brideau
 Sales Account Manager
 703-319-3450
 Cathy.Brideau@hummingbird.com

Pricing

Note: The pricing information provided below is for informational purposes only and should not be considered to be a price quote. If the NRC was to pursue a solution from this company a formal price would be provided based upon the users specific requirements.

The initial pricing information was provided by the vendor was for 100 – 500 users. We have requested that the vendor provide us with 1000 – 3000 users. The document will be updated when that information is available.

Software

DOCS Open

\$3,814.91 Per Server
 \$266.18 Per User

	100 users	500 users
CyberDocs	\$35,018	\$170,507
Fulcrum Knowledge Server	\$29,325	\$131,045
Intelligent agents	\$5,880	\$29,400
	<u>112,744</u>	<u>372,137</u>

Maintenance 18% Annual fee

Training \$2000 Per class / per day / on-site

Customization \$185 Per hour

It is likely that for 1000 or more seats a 20% discount or more would be applied.



Advantages/Disadvantages

Advantages	Disadvantages
Searches can cross multiple repositories and databases and remote file servers to display a unified hit list.	The DOCS Routing product does not support work queues, alarms, event triggers associated with complex workflow decisions. It also does not provide a graphical view of the workflow.
Product supports integration with WordPerfect and GroupWise applications used by the NRC.	While the system supports fairly good integration with GroupWise, one limitation is that links to documents in the repository are not supported in the email messages. The document must be attached. This limitation does not exist for Notes or Outlook.
Web based interface shortens the time to deploy and reduces the total cost of ownership.	Prioritized result sets are only available with content searches not profile searches.
The product supports seven levels of security and is tied directly to the network operating system.	Many different 'DOCS' modules make up the system and create confusion.
The Document Binder allows documents of any format to be packaged together. The documents may be managed and published in a group. In addition the systems search capabilities will identify binders that match the search criteria as well as the documents within binders.	

Future Plans

In 2001, Hummingbird plans to continue their focus on creating the complete Enterprise Information Portal. Their major initiatives during the year include improved support for:

- LDAP
- Public key Infrastructure
- Records Management

Hardware/Software Requirements

Client	Server	Database
Netscape Navigator MS Internet Explorer Windows NT 4.0, 98 and 2000	Windows NT Server NetWare 5.0, IntraNetWare 4.11	MS SQL Server 6.5, 7 Oracle 8, 8i Sybase System 12 Sybase Adaptive Server 11.9



Open Text

Vendor Overview

www.opentext.com

From KMWorld Buyers Guide – Winter 2001:

“Open Text is a leading provider of collaborative commerce solutions. Our products and services content buyers and sellers, customers, partners and employees across global organizations and online trading communities, allowing organizations to streamline business processes and speed new products to market and improve customer satisfaction. LifeLink®, our flagship application, delivers a fully integrated set of powerful enterprise services directly to your desktop – including document and records management, team collaboration, workflow, search and group scheduling. LiveLink’s richly featured functionality can be access using any standard Web browser.”

(Source: <http://www.infotoday.com/KMWorld/BuyersGuide/00000368.htm>)

Product Overview

Open Text began as a popular web search engine and its back-end technology was used to drive the initial search capabilities of Yahoo!. That was all before the company decided to move out of that arena and toward document and knowledge management with a strong focus on collaboration functionality including e-mail, discussions, forums, chat rooms and more. Open Text views their primary competition in the web-based collaboration area as Lotus Notes.

Open Text gained its market recognition by offering a complete range of capabilities for document management, collaboration, and knowledge sharing. In addition, their use of the standard web browser to perform all document management functions was a clear differentiator when it was first introduced. The ability to run the product without needing to install and manage software on each client’s desktop had an appeal to many organizations.

LiveLink provides full library services over the web. All system services and documents are accessed from a web browser. Documents and folders within the repository are assigned attributes. There are no practical limits to the attributes that may be assigned to a document. Templates and versions of attributes may be maintained to default information in certain categories. Searching for documents may be done on the attributes and the full-text.

LiveLink also includes workflow functions, supporting collaborative and administrative workflows in addition to user defined ad hoc workflows. The workflow capabilities allow for parallel processing, conditional branching, looping and sub-flows. It also includes an audit trail and reports to monitor the workflow. The workflow system relies heavily on the organization’s messaging system for



event notifications.

Open Text offers iRIMs as a standalone product or integrated LiveLink module to handle records management. This solution has completed the Department of Defense (DoD) 5015.2-STD certification testing. It supports: record classification, retention and disposition rules, searching reporting and security access.

LiveLink is good for users that need to share documents on different platforms at various locations. An organization with many high-value requirements for collaboration functionality is a good match for Open Text.

Contact Information

Open Text
 Bill Forquer
 614-761-7323
 FORQUER@informationdimensions.com

LiveLink Pricing

Note: Some of the pricing information obtained below we found on the OpenText web site, other information was from past projects with the company. The information may not be current. We are in the process of getting up-to-date pricing information, for 1,000 – 3,000 users. The document will be updated when that information is obtained.

The pricing information provided below is for informational purposes only and should not be considered to be a price quote. If the NRC was to pursue a solution from this company a formal price would be provided based upon the users specific requirements.

Software

500 users	\$75,000 server
1000 users	\$100,000

Maintenance 17.5% Annual fee

Training \$800 per day

Customization \$1,000 per day



Advantages/Disadvantages

Advantages	Disadvantages
Unification of Document Management, Workflow and Collaboration on one system.	Desktop integration is strongest for the Office products; however, it does provide some support for WordPerfect. Including text stripping and HTML rendering. However, some professional services work may be required for complete integration.
Web based system shortens the time to deploy and reduces the total cost of ownership	Rely on third party viewers.
All functionality is available via a web browser, including administration.	Can integrate with any SMTP email system.???? Need to verify is GroupWise SMTP.
Product includes extensive and flexible search capabilities. Including: Automated Research Assistants that can monitor content added to any document or repository for a single user. Also, Spiders can be set up to search Internet sites for additional information. Third party tools may be added to help the user find even better search results.	User Interface has some limitations compared to client/server interfaces because it is HTML based. For example, the system is limited in how affectively drop down lists may be used. <i>(Note, however, we anticipate these limitations to diminish as more applications become web based, and tools are developed to support the client/server like UI styles.)</i>
Product includes collaborative tools to help groups of people work together on a project and the documents related to the project.	Open Text's business focus over the next year is on improving the collaborative functionality. While the NRC has collaborative requirements, they are not the primary drives for the system selection. An organization with a strong document management / information retrieval focus may be a better match.
Every type of object in the repository can be managed and searched using the Document Management library services. Objects may include, but is not limited to: folders, tasks, discussions, attributes, workflow, URLs, news, queries, and other media.	

Future Plans

In 2001, OpenText plans to continue their focus on collaboration. Their major initiatives during the year include:

- Wireless capabilities.
- Real-time collaboration interfaces.
- Managing real-time collaboration in the document repository including: moderator, attendee information, audit trail, agenda, notes, tasks, and more. Tasks will automatically trigger workflow messages.
- Additional applications on top of LiveLink, including: compliance management, product development, web-based training programs and content, and more.



Hardware/Software Requirements

Client	Server	Database
Netscape Navigator MS Internet Explorer Windows NT, 95, 98, 2000	Windows NT Server Sun Sparc/Solaris HP-UX	Oracle MS SQL Server Sybase

Documentum

www.documentum.com

Vendor Overview

From Documentum's web site:

"Documentum, the leading provider of Internet-scale content management solutions for powering eBusiness applications, offers solutions that integrate dynamic content, complex business processes and people everywhere - enabling seamless collaboration, communication and knowledge sharing between employees, suppliers and customers.

Documentum offers the only open, standards-based content management platform and applications suite for managing complex processes as well as any content type, in a truly collaborative environment - enabling trusted content to be delivered to the right person at the right time on any information device, regardless of its origin or location. Documentum's highly adaptable collaboration and content management solutions enable corporate developers and Internet System Integrators to quickly implement robust eBusiness applications with the reliability, scalability and interoperability required by today's 24x7 Internet economy. These eBusiness applications powered by Documentum help more than 700 global customers dramatically improve their top line by accelerating product lifecycles, re-architecting business processes, improving operational efficiency and turning knowledge into a corporate asset."

(Source:

http://www.documentum.com/news_events/news/pr1999/19991006a.html)

Product Overview

Documentum's 4i eBusiness Edition is positioned by Documentum as a development platform for building end-to-end content management applications. The product relies on its core integrated document management technology and then adds the web content management piece by including content:

- Lifecycle management
- Creation
- Personalization
- Management
- Delivery



The product continues to provide their library and document management services including check-in and out, revisions, searching, viewing, version control, annotations, renditions and more.

The combination of the document and web content management services results in a produce that can support all forms of information and allows for the distribution of targeted information to people whether they are employees, partners, suppliers, customers, constituents or consumers.

The ideal customers for Documentum are organizations looking for enterprise wide solutions. In addition, customers that are continually working with and revising the documents in their repositories are good candidates to fully utilize the system's capabilities. Finally, as they continue to improve their web content management functionality, customers that need to provide dynamic, personalized information will find Documentum's products attractive. Organizations that are storing static documents for search and retrieval, or organizations seeking departmental solutions may find that the Documentum products are more robust then they require.

In the past Documentum was tightly integrated with WordPerfect in much the same way as they were with Word; however, as WordPerfect has evolved over time it has been more difficult to continue to keep the products closely integrated. As a result, the web client is used to handle WordPerfect documents. A few clients with large repositories have been working with WordPerfect documents through the web client and have found it to be an effective solution.

The Out-of-the-Box Documentum product is not integrated with GroupWise; however, a very minimal amount of coding is required to make the integration seamless. The necessary coding may be as little as a half day of effort.

The system uses Docobject Resource Locators (DRLs), like a URL to allow the users to easily access frequently used documents.

Optional Software for Documentum includes, but is not limited to:

- Server to render documents in Adobe PDF format. (AutoRender Pro)
- Module for batch scanning of documents, OCR and image enhancement (DocInput).
- Viewer that supports access and viewing of TIFF and PDF images and renderings. Also allow web client to view, mark up, annotate, and route. (DocViewer)
- Product suite that supports the management of CAD drawings. (CADLink)

Contact Information

Documentum, Inc.



Blix Jones
 Federal Account Manager
 (703)-934-6150
 blix.jones@documentum.com

Pricing

Note: The pricing information provided below is for informational purposes only and should not be considered to be a price quote. If the NRC was to pursue a solution from this company a formal price would be provided based upon the users specific requirements.

1000 User System

Software Product Schedule						
Software	Quantity	License Type	Unit Software List Prices	Total Software List Prices	Annual Maint. Prices	Total Software and Maint. Prices
Administrator	2	License	\$ 2,500	\$ 5,000	\$ 900	\$ 5,900
Developer	2	License	\$ 5,000	\$ 10,000	\$ 1,800	\$ 11,800
Foundation	1000	License	\$ 450	\$ 450,000	\$ 81,000	\$ 531,000
DocViewer	1000	License	\$ 146	\$ 146,000	\$ 26,280	\$ 172,280
AutoRender Pro	1	License	\$ 12,500	\$ 12,500	\$ 2,250	\$ 14,750
DocInput 5	1	License	\$ 19,995	\$ 19,995	\$ 3,599	\$ 23,594
Software Price				643,495		
Maintenance Price					\$ 115,829	
Soft. and Maint. Total Amount						\$ 759,324

3000 User System

Software Product Schedule						
Software	Quantity	License Type	Unit Software List Prices	Total Software List Prices	Annual Maint. Prices	Total Software and Maint. Prices
Administrator	2	License	\$ 2,500	\$ 5,000	\$ 900	\$ 5,900
Developer	2	License	\$ 5,000	\$ 10,000	\$ 1,800	\$ 11,800
Foundation	3000	License	\$ 420	\$ 1,260,000	\$ 226,800	\$ 1,486,800
DocViewer	3000	License	\$ 137	\$ 411,000	\$ 73,980	\$ 484,980
AutoRender Pro	2	License	\$ 12,500	\$ 25,000	\$ 4,500	\$ 29,500
DocInput 5	2	License	\$ 19,995	\$ 39,990	\$ 7,198	\$ 47,188
Software Price				1,750,990		
Maintenance Price					\$ 315,178	
Soft. and Maint. Total Amount						\$ 2,066,168



Advantages/Disadvantages

Advantages	Disadvantages
Documentum has earned its reputation as a market leader by continually adding new capabilities and adapting to changes in technology and market conditions.	Partly because of its comprehensiveness and incorporation of business rules with documents, Documentum typically requires extensive customization.
Web based system shortens the time to deploy and reduces the total cost of ownership. In addition the web client interfaces support the remote users.	Both the RightSite and Microsoft Internet Information Servers must be installed to accommodate the administrator.
The product has reasonable out-of-the-box support for WordPerfect through the web interface, and minor customization is required to bring Groupware in line.	Solution is typically more expensive than other alternatives.
There are no limits to the attributes that can be applied to a document. In addition, there are unlimited repeating fields where multi-values can be entered all in one field instead of multiple fields.	
In addition to maintaining document versions, the system also maintains the related attribute versions, so a user is always aware of changes that have been made to a document's attributes over times.	
The product supports seven layers of security.	
Workflow is tightly integrated into the product.	
Documentum repositories may be set up at various locations; however, the user is able to indicate that they want to search through all repositories (known as a federation of repositories.)	
Product supports all types of document components from text to video and everything in between. Even individual paragraphs within documents may be managed by library services. The system's Virtual Document Manager manages all of the components and their relationships to one another in order to store and publish compound documents.	

Future Plans

In 2001, Documentum plans to continue their focus on web content management. From their point of view the "Content Management Companies" do not have the back-end library services to manage the content lifecycle from start to finish. This gives Documentum a strategic advantage over these



companies since it make take them years to develop the functionality that already exists within Documentum.

Documentum's commitment to the complete content lifecycle ensures that the integrated document management capabilities that were the foundation of the system will continue to be enhanced.

Hardware/Software Requirements

Client	Server	Database
Windows 95/98, NT 4.0, 2000 Internet Explorer Netscape Navigator MacOS 9.0 HP-UX 11.0 Solaris 2.6, 2.7	HP-UX 11.0 Sun Solaris 2.6 and 2.7 Windows NT Server 4.0 and SP5	Oracle 8.1.5, 8.1.6 Sybase System 11.9.2.3 MS SQL Server 7



Cimage Novasoft

www.cimagenovasoft.com

Vendor Overview

From the Cimage NovaSoft web site

“Cimage NovaSoft is a leading developer and supplier of information management and process control solutions that dramatically improve key business processes of Discrete & Process Manufacturing, Utilities, AEC, Petrochemical, and Pharmaceutical companies world-wide. With over 10 years experience and 650 installations in 30 countries, Cimage NovaSoft has a wealth of expertise within Industry.”

In 1999, Cimage Enterprise Systems headquartered in Bracknell, Berkshire, United Kingdom, acquired NovaSoft Systems, in Burlington, MA. The resulting Cimage Novasoft operates as an independent company reporting to the parent in the UK. The acquisition is an opportunity for Cimage to accelerate their presence in the US.

Product Overview

Cimage was founded in the US in 1989. The company's primary focus at that time was image processing. Since that time, Cimage has continued to enhance their product offering. In some cases they have completed the development themselves, in other instances, they have integrated the full feature capabilities of other product vendors. For example:

- Staffware tool set is used to provide integrated workflow capabilities.
- Fulcrum provides the search capabilities in the system.
- ERoom supports the Virtual Project Office in the e3-PM product.
- Cimmetry Systems Inc's viewing and markup products are the basis of the ImageMaster product.

As result of their experience in certain industries, they are able to provide data models and templates specifically designed for the nuclear industry. This helps to ease the adoption and implementation of the system.

With their latest e3 products, Cimage Novasoft continues to provide improved capabilities to support collaboration. By providing a Virtual Project Office, where an organization can collaboratively work on the development and management of documents, Cimage Novasoft wants to create an environment that:

- Enables project information to be collated faster and deliverables to be tracked throughout the project.
- Facilitates the review and approval process.
- Improves the distribution of information quickly and easily, via web-based



- portals.
- Ensures the right people have access to the right information, at the right time.

Like many products in this market, Cimage Novasoft is planning to continue enhancing their product to provide more collaborative capabilities.

It appears from the documentation that separate windows are required for the ImageMaster and Workflow Desktop. While there appears to be some integration of the products it appears to be limited. A sense that this is an issue was also seen during their phone interview where they indicated they wanted to continue to improve the integration of workflow. It also appears that the workflow desktop is responsible for providing the systems version control capabilities.

In addition to the standard client/server desktop, the system also supports a browser interface using their DM Net product. At the current time, the product has limited email and workflow integration. The DM-Net client does not offer revision history, audit history, email or the ability to retrieve out of the database, it does offer URL generation to a document or a group of documents.

In researching this company, HCG was unable to locate any third party reviews of the product capabilities. In addition, Harvard Computing has been aware of Novasoft in the past, but has no direct experience with their products. That said, in our opinion, it appears from the documentation that the strength of the product is in its ability to store, search and view many types of documents including the large-scale CAD drawings. If this solution was pursued further, HCG suggests that the NRC look at the basic library services and make sure that the security, version control, and check-in/out capabilities would all meet their needs. In addition, the NRC should verify the usability of the interface, how well the core products are integrated, and how well it is able to integrate with the other products on the desktop.

Contact Information

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Pricing

The pricing information provided on the following page is for informational purposes only and should not be considered to be a price quote. If the NRC was to pursue a solution from this company a formal price would be provided based upon the users specific requirements.

Software

DM-Net Server	\$16,500
E3 PM Server	\$20,500
E3 VPO Server	\$15,500
Cimage Server	\$24,500
Output Server	\$9,300
Total	\$86,300

	1000 users	3000 users
E3 User License (Desktop or Net)	\$682,000	\$1,890,000
Virtual Project Office	\$146,000	\$405,000
E3 project Management	\$162,000	\$450,000
Totals	\$990,000	\$2,745,000

Maintenance 18% Annual fee

Training \$1500 Per class / per day / on-site

Customization \$187 Per hour

Advantages/Disadvantages

Advantages	Disadvantages
Their product set specifically targets the nuclear industry. As a result, they use a similar vocabulary to the NRC. Furthermore, they may more clearer understand the NRC's requirements.	For records management, they provide a service to manage the lifecycle of a document, it is not a specific capability of the product suite.
The e3 PM, Virtual Project Office allows for collaborative writing on documents. It also provides other collaboration features like chat, discussion forums, and more. <i>(Note: This product is an add-on to the basic system.)</i>	They offer a specific product to provide the tight integration with MS Office products. The same capability does not exist for WordPerfect.
Can support large-scale drawings without require additional add-on products. The ImageMaster product can support over 200 formats.	The web client does not offer revision history, audit history, email or retrieve out of the database.
	Compared to the other vendors evaluated, this company has less of a presence in the US market.
	Remote/offline access to the database requires customization.
	They provide five layers of security, which is less than the seven layers provided by other vendors.



Future Plans

Cimage Novasoft has recently changed some of the branding to refer to Content Lifecycle Management.

They want to continue to expand their lifecycle management and virtual project management office capabilities.

They also plan to continue to expand their web capabilities and further integrate the workflow functions provided by the Staffware tool set.

Hardware/Software Requirements

Client	Server	Database
Windows 95, NT, 2000 Internet Explorer Netscape Navigator	Windows NT Server Unix	Oracle Microsoft SQL Server Sybase

8. Vendor Profiles - Corporate Portals

Plumtree

Vendor Overview

Plumtree Software is the founder and leader of the market for corporate portal software. Privately held with a laundry list of big investors ranging from VC's to integrators, to large corporations. Along with an impressive list of investors, Plumtree's partner network includes Microsoft, PricewaterhouseCoopers, Siebel Systems and Vignette. Plumtree's customer network includes Procter & Gamble, BP, Ford Motor Company, Kmart, UTC Aerospace, State Street and Motorola.

Product Overview

The Plumtree Corporate Portal is a Web portal for corporate information and applications. In one simple, personalized Web experience, management can project a complete view of your business, drawing resources from a wide range of existing applications and new Internet services. Employees are more productive and more focused as a result, and business-to-business partners and customers can work more closely with you than ever before.

Enterprise-wide Web Directory scans systems and provides a list of links to files. By developing Plumtree Portal Accessors, Plumtree and its partners can extend the platform to scan new types of repositories and to index documents in new formats. The Plumtree Portal Gadgets allow integration with information and services like ERP and CRM systems. (source: www.plumtree.com)

Advantages/Disadvantages

Plumtree is a privately held company; therefore, data on their financial stability is not publicly available. They do have a very extensive list of powerful investors, partners, and customers.

In February 2001, Plumtree formed a partnership with FileNet, which means that the gadget necessary to integrate Plumtree with FileNet will soon be available. Many firms offer the gadgets for free to promote their use.

Convera/Excalibur Technologies

Vendor Overview

In December 2000, Excalibur Technologies merged with Intel's Interactive Media Services to form Convera. The new firm trades on NASDAQ under the symbol CNVR. Although the firm recorded a loss of just under \$24 million for the past fiscal year, they have enough cash on hand to survive for 6 years at this burn rate.

Product Overview

Convera RetrievalWare is an intelligent search solution for corporate portals. RetrievalWare creates a complete map of all your enterprise assets and then lets your users search them quickly and accurately. The Internet based version of the product, called RetrievalWare WebExpress, is a high-powered search and retrieval tool for providers of online information and products. It is capable of searching HTML, XML, SGML, and PDF documents and returning the most relevant results based on the searchers criteria. Overall the product supports over 200 formats. The product incorporated Adaptive Pattern Recognition Processing (APRP™) to compensate for misspellings, dirty OCR, and other errors.

Advantages/Disadvantages

With the support of Intel, Convera's finances have become stable. Since RetrievalWare is not a complete portal product the NRC would still need to use one of the other portal products to complete the solution. Using RetrievalWare as a standalone would solve some of ADAMS usability and query problems, but would not meet the 41.6% that could be achieved by a complete portal solution.

Sybase EP

Vendor Overview

Sybase trades on the NASDAQ under the symbol SYBS. They are a 16-year-old company and are coming off their most profitable year where they enjoyed an income growth of 62%. Sybase's strategy is to be the leader in providing enterprise software and services that web-enable the diverse applications found in business environments. The Enterprise Portal is the cornerstone of this strategy. (source: www.sybase.com)

Product Overview

The three main selling points of Sybase EP are its open technology, comprehensive platform, and mobile and wireless technology.

Open technology – is open to data and applications from multiple sources allowing you to continue to use existing infrastructure. It integrates with systems running on various OS's (e.g., IBM mainframes, UNIX, NT) and handles various databases (e.g., IBM UDB and DB2, Microsoft, Oracle).

Comprehensive technology – allows you to integrate, manage, and distribute content. It supports vertical solutions and horizontal solutions and is designed for business-to-business collaboration, business-to-customer transactions, and business-to-employee communications.

Mobile and wireless technology – draws from the industry leading technology developed by iAnywhere Solutions, Inc., a wholly owned subsidiary of Sybase.

(source: Sybase EP Literature)

Advantages/Disadvantages

Although Sybase has been in the portal market for less time than both Convera and Plumtree, they have a strong background from other product lines developing and integrating global enterprise-class systems. Sybase EP has developed a government vertical solution, which is being used by the United States General Services Administration (GSA) for GSAAvantage.GOV.

9. Methodology

ADAMS Steering Committee Workshop

An ADAMS Steering Committee Workshop was held to gather strategic NRC perspectives on long-term, document management functional requirements. Session expectations were set at defining an ‘ideal’ version of ADAMS in which anything was possible. The members were asked to work at identifying requirements within the framework of representative document life-cycle phases. These phases were sequentially presented as:

- Input / Development
- Store
- Query
- Review / Edit
- Send
- Print / Publish
- Archive / Destroy
- Other – Workflow
- Other – Program Administration
- Other – General

Members were asked to identify and describe their functional requirements using a “Verb – Noun” syntax (e.g. Send Document). This syntax forced a disciplined, structured capture that reduced the degree of side-bar discussion and elaboration. As a result, the workshop participants were able to define and document 80 distinct functional requirements for an ‘ideal’ ADAMS implementation within the three hour session. These requirements are include as [Appendix A](#).

Before leaving the workshop, the Steering Committee members were also asked to evaluate each life-cycle phase in terms of perceived business criticality and difficulty in achieving requirements. Both parameters were evaluated on a “High-Medium-Low” scale. The survey form is included as [Appendix B](#).

User Assessment Analysis

HCG analyzed a set of User Assessments that were provided by NRC Office Directors or their designees and compiled by the OCIO. These assessments provided valuable perspectives on problems and issues associated with the current ADAMS 3.0 implementation. To some degree, problems, performance issues, and inadequate functionality provided a means to symptomatically assess relative difficulty in achieving requirements. HCG identified and compiled separate sets of User Assessment-related ‘ideal’ functional requirements and problem areas. They provided tactical and operational perspectives on desired requirements for future versions of ADAMS.

A sample subset of functional requirements (232) compiled from the User Assessments was then analyzed against the capture from the ADAMS Steering Committee Workshop. The first goal was to see whether there was any shift in perspective on the criticality of various life-cycle phases between ADAMS 3.0 and the future ADAMS 'Ideal'. Each functional requirement from the sample set was mapped by applicability against the life-cycle phases, along with any assessments of criticality provided from the NRC Offices. Using a formula that weighed both the relative number of functional requirements and subjective criticality evaluations provided, a 'Criticality Index' was derived for each phase. These were then converted into a simple High-Mid-Low "Criticality Rating".

A similar exercise was done with the survey capture from the ADAM Steering Committee Workshop. These two sets of ratings were then compared and slight shifts were indeed noted on the relative value placed on "Send" and "Print / Publish" functionality. These findings are provided within [Appendix C](#).

The second part of this analysis utilized the perceived difficulty ratings provided by the Steering Committee members. These scores were used in yet another calculation that weighed the number of problems identified within the User Assessment subset to derive a "Difficulty Rating". A final calculation was then made on both the "Criticality Rating" and "Difficulty Rating" scores to determine a "Prioritization Rating" for each phase. This provided an initial, quantified means to prioritize phase requirements and future development based upon perceived difficulty and impact on operations.

Assessment Interviews

A weeklong series of Assessment Interview was conducted with selected interviewees and volunteers from the various NRC Offices, including the regions. The interviews took two forms: 1) all day sessions with group that reviewed functional requirements identified from the Steering Committee Workshop, and 2) focus interviews held with domain experts in areas related to ADAMS.

The all day sessions pursued the following goals:

1. Identify requirements from the Steering Committee Workshop capture that were currently supported by features and functions within ADAMS 3.0
2. Identify requirements from the Steering Committee Workshop capture that were not currently supported by features and functions within ADAMS 3.0
3. Identify requirements from the Steering Committee Workshop capture that were partially supported by features and functions within ADAMS 3.0
4. Identify requirements from the Steering Committee Workshop capture that were currently supported by work-arounds
5. Identify problems associated with the functional requirements captured
6. Identify performance metrics associated with the functional requirements captured.



7. Identify additional functional requirements for an 'Ideal', future version of ADAMS.

Analyzing the compiled results from three separate, all day sessions, the consensus among interviewees was that only around 49% of the 'Ideal' functional requirements defined by the Steering Committee were currently supported by ADAMS 3.0. These findings can be found within [Appendix D](#).

System Requirement Specification Analysis (SRS)

The SRS document, defining ADAMS 3.3 due at the end of April 2001, was provided to HCG. Similar to the exercise conducted during the Assessment Interviews with NRC personnel, HCG conducted a similar comparison of SRS features and functionality against the 'Ideal' functional requirements identified by the Steering Committee.

The goal was to identify and quantify any shift between the abilities of ADAMS 3.0 and 3.3 to support the 'Ideal' requirements defined by the Steering Committee.

Compilation of Perspectives on the 'Ideal' set of Functional Requirements

Functional requirements identified during the Steering Committee Workshop, Assessment Interviews, and User Assessment analysis were compiled and grouped by life-cycle phase. This compiled 'Ideal' was then sorted and analyzed to determine the business criticality of each life-cycle phase with the full complement of identified requirements. The premise used was that the number of functional requirements compiled for a phase could serve as an indicator of relative business criticality, since criticality could be viewed as a function of greater need.

Each requirements source was evaluated separately, with a final compiled pass conducted at the end. The findings are included within [Appendix E](#)

One interesting finding from this analysis was the revelation that there was a significant difference in perception between various NRC communities on the nature of need. All interviews and analyses conducted all include a capture of additional programmatic issues broadly captured within the 'Other' categories. These issues were further sub-grouped into "Other-Workflow", "Other-Program Administration", and "Other-General". Programmatic issues are defined within our project as non-system, non-feature issues dealing with areas such as policy, training, design, etc.

When these categories were added to the business criticality analysis, the ratio of system vs. programmatic issues varied widely. The tactical Steering

Committee had a ratio of 86%, with a relatively even distribution of value placed across all life-cycle phases. Findings from the Assessment Interviews, which reflected a broad spectrum of the user community ended up with a ratio of 71%. Their findings had the higher weightings on “Input” and “Other-General” functional requirements. A subsequent, detailed analysis of these requirement sets found issues concentrated in profiling, performance, and workload issues. The final set of requirements derived from the User Assessment reflected the concerns and needs of the various NRC Offices. Their system/programmatic ratio came to around 52%, with heavy concentrations on “Input” and “Other-Program Administration”. Program administration requirements dealt extensively with training, support, documentation, and data integrity issues.

Problem Compilation and Analysis

As with the ‘Ideal’ functional requirements, problems and comments from Steering Committee Workshop, User Assessment, and Assessment Interviews were also compiled for analysis. The premise used was that the number of problems and performance issues compiled for a phase could serve as an indicator of relative complexity. Since problems affected system implementation efforts, they were vital in the assessment of requirement priorities.

After compilation, an analysis was done to clarify and define each problem within 22 distinct “issue types”. A matrix was then constructed to tally the number of issues types within each life-cycle phase. Using the tally as an indicator of relative complexity, a quick sort revealed the relative complexity of each phase. These findings are included within [Appendix F & G](#).

Finally, a further sort by ‘issue type’ revealed the most common types of problems encountered within each life-cycle phase. A significant finding was that 6 types accounted for roughly 74% of all problems and issues recorded. These types dealt with workload, performance, reliability, usability, consistency, and functionality. These findings are included within [Appendix H](#).

Functional Requirements Analysis

Combining the distribution analysis of both problems and criticality provided the means to finally prioritize the compiled set of ‘Ideal’ functional requirements. The goal was to quantifiably define the most important features and functions needed prior to any analysis of suitable system solutions. This analysis summary can be found within [Appendix I](#).

The results indicated that “Input” functional requirements consistently maintained the highest prioritization rankings, even when programmatic issues were included. However, when those non-system requirements were factored in, nearly 1/3 of the issues were programmatic overall.

10. Appendices

