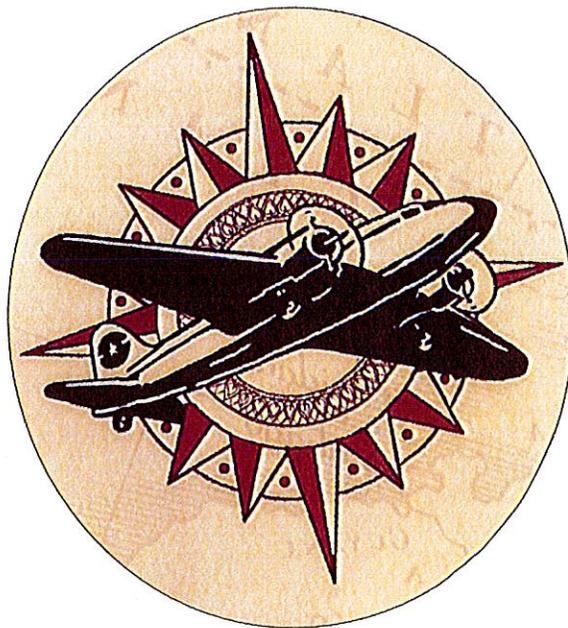


DLI/SITSD Content Management Pilot

Final Evaluation

April 24th, 2015



PREPARED BY: DEPARTMENT OF ADMINISTRATION
INFORMATION TECHNOLOGY SERVICES DIVISION
ACQUISITION MANAGEMENT SERVICES BUREAU

Executive Summary

The goal of the pilot was to determine if the vendor's solution could replace the manual and labor-intensive processes used by the Department of Labor and Industry's (DLI) workforce assistance programs. Along the way our team also evaluated the solution's ability to work with the State Information Technology Services Department's (SITSD) multi-tenant environment. Finally, we examined the solution's ability to meet the needs expressed by the many agencies who participated in the 2014 request for proposal (RFP) for electronic content management.

Over the course of five sprints, four months, three cities, and with two different agencies our team has determined that this solution is capable of meeting the needs of DLI. The solution has also demonstrated its ability to meet the core ECM needs of other enterprise customers as expressed in the multi-agency RFP. As a platform it gives SITSD the ability to offer our customers fully managed or completely autonomous ECM services.

The pilot was structured into five agile sprints. Evaluation goals, test criteria and team objectives were set at the beginning of each sprint, and the team was given a window of time (typically 12 business days) in which to accomplish these goals. At the end of each sprint the pilot team evaluated the solution against the criteria set forth and prepared a report for Montana Chief Information Officer (CIO) Ron Baldwin. Taking this evaluation into account the CIO could terminate the pilot if the vendor failed to demonstrate the solution's ability to meet the needs outlined at the start of the sprint. The sprints began on December 1, 2014, and the final sprint was completed on March 30, 2015.

Virtual servers from the State of Montana Data Center were commissioned and the core software was installed during the month of December 2014. The solution was designed and implemented in early January and rolled out to production at pilot sites in Missoula, Havre, and Helena starting on January 14th. Over the next several months the pilot team evaluated the vendor's ability in 130 different areas of content management specific to the pilot and over 300 requirements were gathered as part of the lengthy multi-agency RFP process.

During the final sprint we invited agencies to participate in labs where each agency could sit down with SITSD and vendor engineers to discuss agency content management needs and explore the solution's ability to meet those needs. Fourteen agencies were able to participate over the two week lab period.

In the pages that follow you will find an evaluation of the solution against the criteria set forth in the project charter, along with a discussion surrounding the recommendations of the Department of Labor and Industry. The report will also outline the possible paths forward for content and records management within the IT enterprise.

The appendices attached to this document include the multi-agency requirements traceability matrix, reference information, and additional details on each sprint that can be used to gain operational-level information about the progress of the team throughout the pilot.

The answers provided in this evaluation must be tempered with the knowledge that building any complex system is going to involve making tradeoffs between competing objectives. Each of these decisions comes with its own benefits and costs. None of the architecture choices the vendor made when designing this solution represent absolute barriers to adopting this system, but some of them merit stricter scrutiny and further consideration of potential downstream impacts.

A note on terms

Throughout this evaluation the terms ‘content’ and ‘document’ are used interchangeably. In the context of this evaluation both words refer to any sort of content that we have now or may have in the future. This includes items classically considered to be documents such as signed papers, policy documents, even this very report. It also includes video, audio, photographs, spreadsheets, presentations, and any type of electronic file or collection of electronic files.

Enterprise content management and electronic content management will also be used interchangeably as “ECM.”

A note on records

When we handle official records in paper form it is a distinct discipline referred to as records or archive management. When official records are electronic they are handled by the Enterprise Content Management platform. The platform evaluated in this pilot is certified by the U.S. Department of Defense (DOD) to be compliant with the DOD 5015.2 standard for records management. This is the same standard that Montana used as the basis for its records management laws and policies.

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Introduction

What is Enterprise Content Management?¹

The Association for Information and Image Management (AIIM) uses the following definition for Enterprise Content Management:

Enterprise Content Management (ECM) is the strategies, technologies, tools and methods used to capture, manage, store, preserve, and deliver content across an enterprise. It is important to emphasize that this content is related to and used by organizational processes, rather than simply content for its own sake.

Gartner, a leading IT research organization, states that ECM refers to both a strategy to deal with all types of enterprise content and a set of software products for managing the entire life cycle of that content. At the most basic level, ECM strategies, processes, workflows, and tools allow for the management of an organization's information, regardless of the source or type of that information.

ECM solutions typically operate on unstructured (media) or semi-structured (e.g., emails, spreadsheets) information, although they can also allow management of structured content (such as data in relational databases or XML documents).

A complete ECM implementation typically involves many processes, tools and technologies with the common purpose of managing the lifecycle of digital content in support of the organizational process. The areas covered by an ECM solution include the following:

- Capture or ingestion of digital content (via scanning, faxing, or direct file capture).
- Workflow and content focused Business Process Management (BPM).
- Forms Management (FM).
- Common records management tools and techniques.
- Management of content, including version control, reuse of content, retention policies, and security/access control.
- Content indexing and search.
- Content focused collaboration including review, revision, and approval.

Across an organization as diverse as state government not all types of content will be relevant to all agencies, and the capabilities of any specific solution may or may not be needed by all stakeholders.

There are a number of ways of grouping the aspects and disciplines that are part of an ECM solution. The top level grouping provided by AIIM is shown in the following poster figure:

¹ The state of California entered into a yearlong study of ECM as a discipline in 2013. Considering the high quality of work and suitability to purpose the introduction of this document uses several sections of an internal California Department of Technology memo.

According to AIIM, there are five key processes within ECM:

Capture: primarily the ingestion of content into the system. This can be done at creation or via scanner, fax, or any other digital or physical source.

Manage: enforcing compliance with policy across lifecycle of the content and the movement in the enterprise.

Store: persisting and accessing the content.

Preserve: long-term storage and archival of relevant content in compliance with records management policies and laws.

Deliver: delivery of the right content to the right recipients using right system, method or device.

What are the benefits of ECM?

Case studies devoted to ECM² identified the following positive business impacts of adoption of ECM:

- Direct cost savings in information processing operations and facilities.
- Improved internal and external collaboration.
- Improving our ability to share knowledge and create common practices among agencies with similar practices.
- Increased efficiency, effectiveness, and flexibility of knowledge work and business processes, including reuse of previously created content, metadata, templates, and navigation aids.
- Improved reliability and quality of information resulting in fewer errors in products and services.
- Improved organizational memory recording the practices, history, and transactions of the enterprise.
- Providing value-added or new customer services and products involving digital content.
- More modern and professional image of the enterprise in the eyes of its stakeholders.
- Improved compliance with external regulations and standards that are directly or indirectly governing the enterprise.
- Increased capability to quickly develop targeted content management applications for emerging purposes.
- Opportunity to create a standards platform for adherence to Montana records laws.

Any of these alone is worth pursuing, but together they represent an unparalleled opportunity for our enterprise to take a positive and constructive step forward.

² McNay, H.E., "Enterprise content management: an overview," Professional Communication Conference, 2002. IPCC 2002. Proceedings. IEEE International , vol., no., pp.396,402, 2002, doi: 10.1109/IPCC.2002.1049123

Pilot

In December of 2014 a multidisciplinary team of IT professionals from the Department of Labor and Industry (DLI) and the State Information Technology Services Division (SITSD) set out on a pilot project to evaluate the ImageNow platform (the solution) for electronic content management made by Perceptive Software (the vendor).

A core team was built and is comprised of the following personnel:

- Barry Fox, section supervisor for SITSD's current content management platform.
- Matthew Hosking, team leader for SITSD's acquisitions planning office.
- Judy Kelly, DLI's senior IT architect.
- Jim Pierce, section supervisor for DLI's web programming group.

These leaders were chosen for their expertise in their field, and were responsible for managing resources and personnel to accomplish the goals of the pilot. Each core team member was integral to the authoring of the sprint evaluations and this final report.

Purpose

The project charter provided the team with a set of objectives that needed to be achieved over the course of the pilot. The purpose of this document is to report on the findings of the pilot team as they relate to the following specific objectives outlined in the pilot charter:

- Evaluate the ability of the vendor to operate within the State's virtualized environment.
- Evaluate the ability of the solution to integrate with existing SITSD and DLI legacy systems such as MWorks, FileNet and others.
- Evaluate the vendor's ability to successfully execute their vision on budget and on time.
- Evaluate the features of the vendor's solution relative to the cost of the solution.
- Evaluate the solution's ability to create consistent processes across the DLI service locations.
- Evaluate the vendor's and solution's abilities to lower costs of creating, handling, transferring, storing, and retrieving records.
- Evaluate the ability of the vendor to acquire the necessary knowledge about our current system and process to integrate their software into our environment.

Evaluate Perceptive’s ability to work within the multi-tenant, enterprise environment.

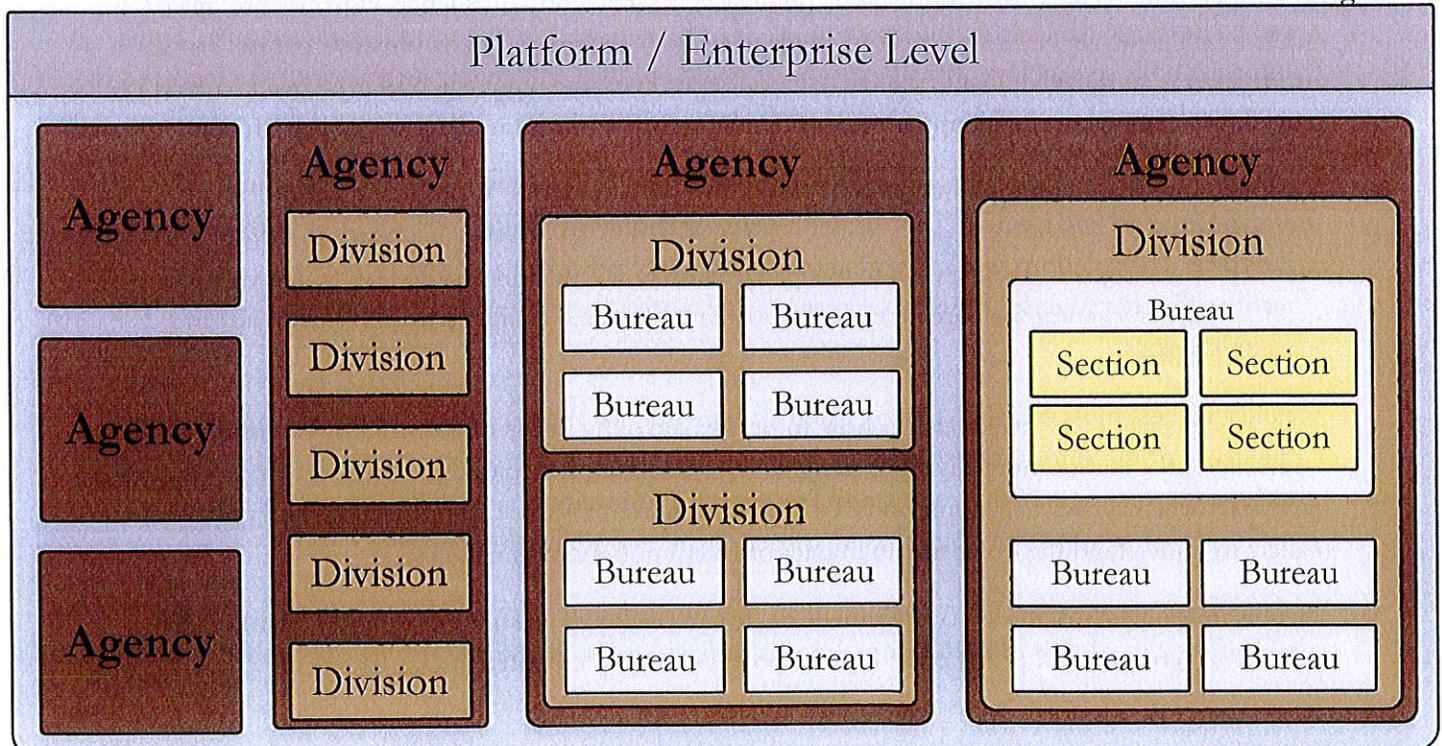
Enterprise Solution Needs

To meet the needs of the Montana IT enterprise the solution must have a top-level organizational unit responsible for the administration of an environment containing multiple lower level organizational units. Each of these lower level organizational units must have the ability to administer the features and functions of the solution, customize the integration of the solution to suit their needs, and control how the solution interacts with their own systems and processes. The solution should support several different organizational models, including those with multiple layers of abstraction. This organizational structure is summarized in **Figure 1** below.

The solution must be able to accommodate agencies that wish to administrate these aspects entirely on their own as well as agencies that want an independent top level administrator to provide implementation, configuration, or operation of the platform as a service. Agencies should have absolute control over the situations under which their content and other items such as workflows and tasks are able to cross organizational boundaries. Implementing a multi-tenant platform brings with it a host of complex policy challenges, and any solution must be flexible enough to allow for multiple concurrent configurations in order to assist platform managers in this difficult balancing act.

It is critical that the solution incorporates the concept of precision control into as many of its aspects and features as is possible. Agencies must have the flexibility to configure how the system will perform its basic and advanced functions at a very granular level. Storage locations, different organizational schema, different workflow policies, and different integration options should be able

Figure 1



to have different implementations or configurations based on the needs of the content in question.

The solution must also insulate organizational units from any deleterious changes made by other platform tenants to the greatest extent possible. The solution should provide controls that mitigate or eliminate an individual unit's ability to threaten the stability of the platform, the integrity of the content, or any other agency or unit's implementation.

The Vendor's Solution: Departmental Security

The solution is able to meet our needs in this area due to its departmental security model. This provides a system for creating independent and autonomous departments that operate as tenants within the overall enterprise platform. Under this model permissions are entirely driven by Active Directory users and groups, integrating with our existing enterprise environment. Top-level administrators do not necessarily have access to these departments' internal content or processes, giving agencies as much or as little autonomy as they require.

Sharing of content is completely granular – the organization that owns the content can choose which documents are never shared outside their organization, which documents are only available in special circumstances, and which documents are automatically available. This can be controlled by general document type, document metadata, or even the content within the document.

While the database portions of the solution are centralized, the content can be stored at any network accessible storage location. This allows agencies to store their content on whatever platform or system that they believe is most capable of meeting their operational or security needs. This feature is very granular, giving agencies the ability to look at their particular document and *then* decide how and where they wish it to be stored. The information security needs of different agencies are on a broad spectrum: some information will be publicly accessible content, such as video recordings of public hearings, while other information needs to be kept secure due to its sensitive nature. Some information is so sensitive that, if exposed, it could put lives in danger, such as evidence involved in active investigations or the identities of confidential informants and undercover police officers.

Workflows are built with the same level of flexibility and granularity. Workflow creation is a straightforward and intuitive process, with core functionality accessible via a “drag and drop” interface. The solutions workflow system is particularly powerful and easy to use, with a very low technical barrier to entry for core tasks, with substantial features available for those with advanced technical skills.

Policy makers must carefully consider how to best balance the needs of a centralized authority with the needs of the autonomous divisions or agencies operating on a shared platform. There is a natural tension between agency autonomy and IT centralization that requires administrators and policy makers to understand the downstream impact of their configuration choices.

There is no single correct way to implement this functionality. The solution is highly customizable and offers a great deal of precision in how its policies are implemented, giving platform

administrators the ability to build a balanced system that meets present needs and can reasonably be expected to meet the complex and evolving challenges we will face in the future.

Any enterprise solution is going to be a series of trade-offs, and this solution is no exception. The solution does not have its own encryption standard built in for stored content; it relies on the operating system or storage hardware to provide this. Encryption of the content in storage is one part of a layered security approach, and while it is reasonable that a vendor specializing in ECM might not provide their own encryption we would like to see more options integrated into the solution and supported by the vendor.

An example of an architecture choice that may present the enterprise with challenges down the road can be seen in the database structure; this solution uses a single database to store metadata for all content. While there is no distinctly articulated need for a multi-database solution, there may be some situations where it would be beneficial to have multiple databases that store the metadata surrounding the content.

With those caveats aside, the vendor's solution is well suited to work in the state's multi-tenant, enterprise environment.

Evaluate the ability of the vendor to operate within a virtualized server environment.

Virtualization Drives Savings

Server virtualization technology forms the cornerstone of modern IT environments and is a powerful driver of cost savings. Montana's shared data center and virtual server platforms deliver cost savings in excess of \$6.5 million per year, and additional capital savings will be realized as we move to wider adoption of virtual computing resources. We achieve these savings by decreasing power usage, increasing the utilization of resources, and dramatically lowering server overhead and support costs.

Enterprise solutions are hosted on enterprise hardware, and virtual platforms give SITSD the ability to architect high availability enterprise solutions that are resilient and secure.

Architecture Considerations

The solution was installed, configured, and moved into production without any negative impact on our virtual platform. Over the course of the pilot, the system's interactions with the virtual environment were as expected across the board.

The vendor fully supports their product when installed on virtual servers, and the solution is architected in such a way as to allow platform administrators to make full use of virtualization. This allows us to build high availability systems and to selectively scale the solution to meet spikes in users, such as legislative sessions, or data such as elections.

Unfortunately the ability to rapidly scale the solution is held back by the vendor's license enforcement system. Any changes to the server (such as adding memory or CPUs) can trigger the solution to "dump" all of its licenses and cease operations. This method of implementing digital rights management (DRM) presents several potential hazards in our virtual environment. The vendor mitigates this risk by providing a priority route through which the licenses can be re-provisioned. While not insurmountable, this is a challenging architecture choice to work around that warrants careful consideration should we decide to broadly implement the solution.

Evaluate the ability of the solution to integrate with current and legacy systems within SITSD and DLI

Montana's Complex IT Ecosystem

There are dozens, if not hundreds of existing or legacy systems within the State of Montana IT enterprise. Within our enterprise an IBM mainframe coexists with the Internet of Things; COBOL and SQL are both in demand; and our network connections run the gamut from gigabit fiber-optic to 256k twisted-pair copper. Any system that hopes to solve our enterprise needs must work, and indeed thrive, in this complex and quickly-evolving ecosystem.

It would be difficult, if not impossible, to overstate the complexity and variety of systems currently in use across our IT enterprise. While IT administrators across the state remain steadfast in their resolve to simplify, streamline, and standardize our processes it is reasonable to assume that this situation will continue to progress along its current course for some time. With new systems being added faster than old systems are retired, it is imperative that any potential ECM system work alongside as many systems as possible.

On the front end, this manifests as a need for the solution to work alongside whatever line-of-business application the agency uses. An example of a front end system would be an existing case/grant/claim management system, a licensing or permitting application, or an existing HR system. Most commonly these are ingestion points, where forms, documents, or other items are placed within the solutions content store.

On the back end the integration needs are reversed. The information ingested on the front end must be made available to operational staff through a variety of interfaces or applications. An example would be game wardens pulling images of hunting permits, a workforce center pulling up résumés submitted online, or a case worker pulling up incident photos in the field. This access can be through the vendor's native applications, but is most often achieved through common application programming interfaces (APIs). These APIs need to be intuitive enough to be used by agencies with varying levels of integration expertise, and powerful enough to meet our immediate and future needs.

Universal Tools: LearnMode and Integration Server

The manner in which the vendor delivers their solution for integration is comprehensive, well thought out, and substantially forward-looking. Not only does it meet or exceed our current needs, but it can be reasonably expected to continue to do so for the foreseeable future. The vendor achieves this with two components: LearnMode on the front end and Integration Server on the back end.

LearnMode is how the vendor integrates with existing line-of-business applications. LearnMode automates the process of attaching metadata to content at the point of ingestion. It takes the relevant data from whatever line-of-business application it is paired with and attaches it to the content automatically, in many cases completely removing the data entry from the end users. LearnMode is not one tool as much as it is a collection of tools that all accomplish the same thing via different mechanisms. The end result can best be described as screen scraping, although that is a vast oversimplification.

The vendors claim that this integration can often be done in less than a day. These claims were tested during a lab for the Department of Corrections (COR). Department personnel, somewhat skeptical of what they may have perceived to be an idle boast, asked the vendor to demonstrate a simple integration live for the group. Nobody from the pilot team or the vendor was given advance warning of the request, and the vendor's on site personnel were given no time to prepare ahead of the lab. The vendor was able to complete the core integration with the Department of Correction's OMIS system (without having ever seen it before) start to finish and to the satisfaction of COR in less than 30 minutes.

LearnMode is the vendor's clear differentiator; the ease and simplicity of integrating ECM alongside line-of-business systems is a stand-out feature that is unique and innovative.

On the back end is the vendors aptly named product "Integration Server." This platform uses a REST based API to allow authorized apps to access the content stored within the system. While the server itself runs on Windows, it is a platform agnostic interface that will work regardless of OS (Windows, Android, Unix, MacOS, iOS, etc.) or type of device (PC, laptop, tablet, phone, watch, etc.)

In order to evaluate what it would be like for agencies newly adopting this system we asked the Department of Environmental Quality (DEQ) to assist in our evaluation. Their web developer came into the situation blind, with no knowledge of DLI's data structure or the vendor's integration system. In less than a day he had learned the API and was not only able to retrieve content but build and demonstrate a proof of concept web integration.

Integration Server is clearly well architected, with a standards-based implementation that is simple, straightforward, and intuitive. Creating new applications or changing their existing applications to use this system was deemed to be "straightforward," "intuitive," and "trivial."

The presence of this API is not unique to this specific solution; it can be reasonably assumed that other vendors within the marketplace have similar functionality. However the ease and simplicity that the vendor has engineered into their solution's integration component was clearly demonstrated over the course of the pilot and has substantial value in an environment such as ours.

While not a vendor-specific issue, it also bears mentioning that while the simplicity and strength of modern integration tools satisfy our technical needs; these same features can create new and challenging security concerns. We must be extremely diligent in considering the security architecture of this or any other content management system we may choose to implement.

As it stands today the DLI workforce program retains its documents in paper files, which are stored in locking cabinets located in the private area of public buildings. The security is fairly low, but risk is spread over a very large geographic area and any individual breach creates only narrow exposure. Moving to a centralized system puts all of the documents in one place. The security is substantially better, but a single breach risks exposure of a much larger set of data.

As we move away from many dispersed paper processes towards a centralized electronic content management system we must carefully consider the security implications and take the steps required to mitigate them.

Evaluate the solutions ability to lower cost of storing, handling, transferring, and retrieving records

The Paper Tax

Many agencies are drowning in a sea of paper, and every time we use a paper process we pay a tax on our efficiency that is both immediate and ongoing. These paper records cannot be easily searched or indexed, substantially limiting their usefulness. Every interaction with paper records causes us to risk damage, loss, or theft of our data with no clear path of recovery.

Personnel at the agency that owns the documents cannot quickly or easily access information tied up in a paper process. There is no way to know if the key piece of information required to write a law, win a lawsuit, or solve an investigation is locked away in a filing cabinet nobody has accessed in years. Presupposing that another agency is aware that this information exists, they have limited (if any) methods to access the information, and agencies will incur the cost of moving the files to their staff or moving their staff to the files to search through them.

Gaining a complete understanding of the costs associated with a purely paper process is complex, and must take into account many aspects of an agency or enterprise.

At a minimum one must consider the primary and directly attributable costs of these processes:

- Employee time for document intake, search, and organization.
- Training and onboarding costs incurred when new users must learn another user's particular organizational system or distinct business process.

- Storage costs for both active paper records and archival paper documents.
- Office overhead such as equipment, office supplies, and consumables.
- Travel costs of training, auditing, and oversight.
- Transfer cost for routing documents between locations.

In addition to these direct costs there are many indirect costs that are more difficult to quantify. Examples of such items include:

- Cost of compliance with court-ordered discovery or Freedom of Information Act (FOIA) requests.
- Costs of office/storage relocation.
- Workers compensation costs related to staff being required to move large collections of paper files.
- Reconstruction of lost, misplaced, or physically damaged files.
- The costs of duplicated effort involved when documents are collected multiple times.

Another unfortunate reality is that regulations are increasing in both quantity and complexity. The cost of compliance associated with federally funded programs is climbing, as is the number of programs that draw some or all of their funding from federal sources. Agencies must pass increasingly complex compliance audits or face the potential of fines and the loss of mission critical funding.

Agencies also face an increasingly litigious environment, where the cost of discovery involving paper records can be substantial.

Another cost worth considering is the cost of consistent business process management. With multiple office locations there are substantial costs involved in ensuring that remote agencies are adhering to proper business process. Many agencies end up sending personnel across the state to train employees and audit processes. Even the most well-documented of paper processes can fall short in small, remote offices without diligent and consistent auditing.

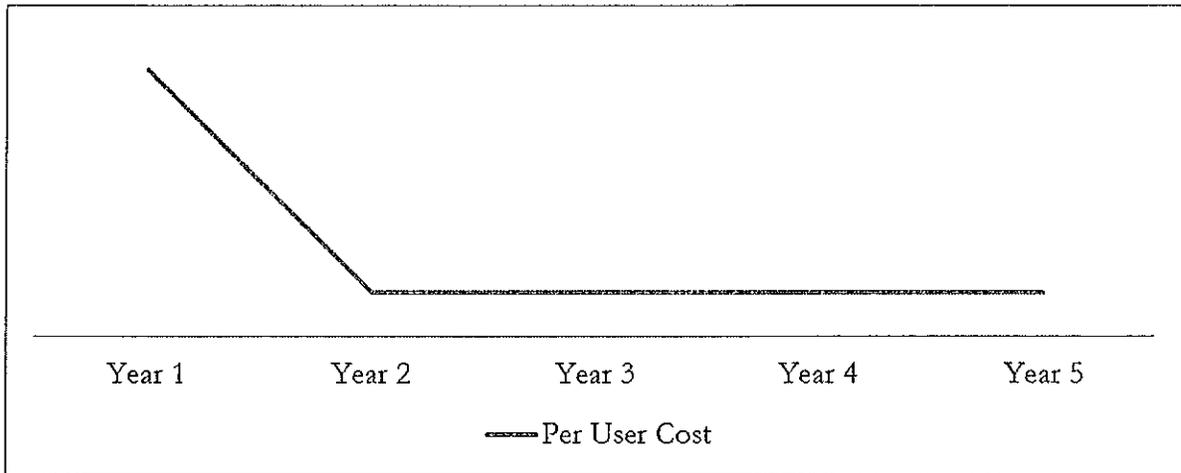
The Savings Opportunity

It is the unanimous opinion of the pilot team that Montana can realize cost savings and efficiency gains by adopting a standard content management platform across the IT enterprise.

The vendor's pricing model is not unique in its construction or implementation. User licensing is handled on a per concurrent connection basis, with core functionality included in this license. The base server component is licensed based on the number of these individual user licenses in a tier structure of small, medium, and large. Basic features and functions are included in the server product and additional server features are available as add-ons. Both user licenses and server licenses have an upfront cost and an annually recurring charge for software maintenance.

These are customary terms within the software industry and are well suited to meeting our current and future needs. This model lends itself to a cost distribution model (Figure 2) that is nearly universal in the software industry:

Figure 2



As is the case with many technology solutions these savings are not going to be realized in the first or second year. It takes time for agencies to adjust their processes, realign their resources, and reap the benefits of any new technology.

Policy decisions will be one of the many vendor-agnostic factors that will influence how quickly we realize the cost savings potential of an enterprise standard content management platform.

Evaluate the vendor's ability to successfully execute their vision on budget and on time.

A Simple Problem, A Simple Answer

The pilot was delivered on time and on budget.

Evaluate the features of the vendor's solution relative to the cost of the solution

A Complex Question

The task of evaluating the solution's features relative to its cost is inevitably going to vary depending on how much an individual agency values each feature.

Any organization as diverse as state government is going to accumulate a diverse and growing body of content in the course of business. This content could be images, audio, video, CAD drawings, topographical maps, permits, geographic information, forms, licenses, and many other types of content we don't even know about yet.

State governments are being asked to deliver this content back to our citizens in new ways. The days when agencies could ask citizens or journalists to come down to the office to view public records are being swept away by a wave of legislative action and executive mandate requiring that information be available online and in machine-readable formats. We are tasked with turning this information around more quickly than ever before, and must have a solution that has built-in tools for facilitating this access.

Among the enterprise's traditional offices with traditional needs you will also find an eclectic and unconventional array of specialized facilities with equally specialized needs. These facilities include state-owned hospitals, correctional institutions, fish hatcheries, educational institutions, retail outlets, a group home for orphaned wild animals, and many others. Each one of these locations is going to have its own unique content management and business process needs.

All of these factors combine to paint a very complex picture of the features a solution has to deliver in order to meet our needs. The solution must have the flexibility and adaptability to meet the needs we face today and in the future.

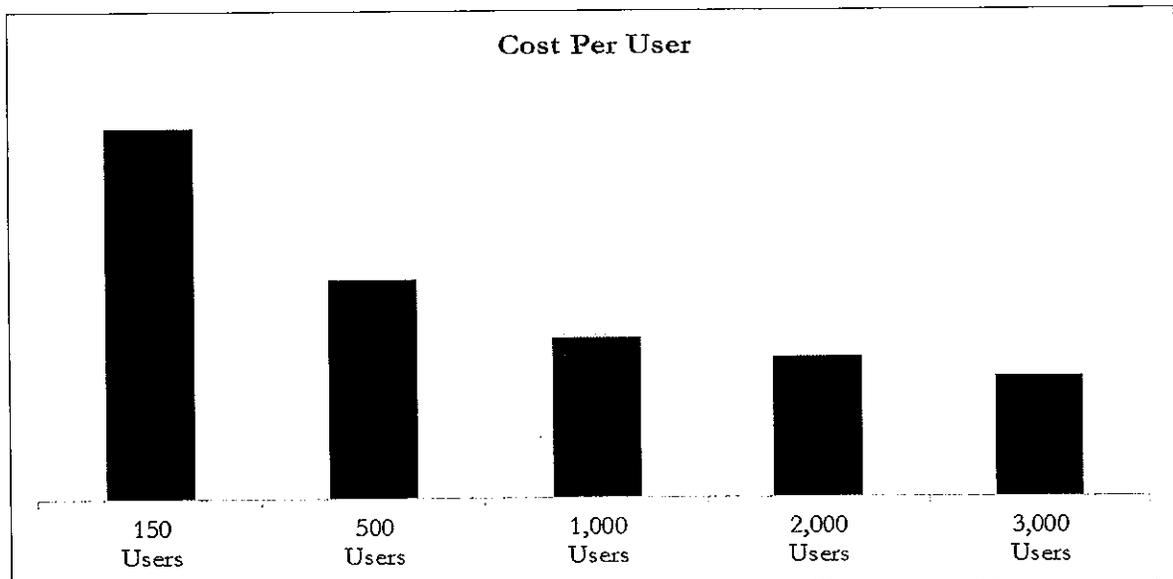
We must also consider new legislation, such as house bill 123, which sets the stage for an enterprise approach to our records management needs.

An Enterprise Answer

From an engineering and design perspective the vendor's platform is well positioned to meet the incredibly diverse needs of our IT enterprise.

The vendor's solution is primarily licensed on a per user basis. As you can see in **Figure 3** the per-

Figure 3



user costs decline dramatically as we scale up the number of users. This standard industry practice is not unique to this vendor and can be reasonably expected to apply to any platform we may choose.

The vendor's suite of products also includes many capabilities that were out of scope for this pilot. Independent research firm Gartner notes "Perceptive focuses on industries such as healthcare, higher education and government." This could be a substantial benefit for a state government which runs its own healthcare facilities and universities.

It is self-evident that managing the millions of records we have, as well as the tens of millions we can be expected to have as our digital age progresses, can best be accomplished with ECM. With the demonstrated ability to meet the common needs of our enterprise, as well as niche abilities tailored to medical and education institutions, the vendor's solution is well positioned to give us the tools needed to capture these records in whatever form they may take.

Evaluate the ability of the vendor to acquire the knowledge necessary about our current systems and processes, and to integrate their software into our environment.

Unique Challenges

The official state website lists over 36 distinct agencies with 13,000 employees working at over 4,000 distinct facilities across the state. These agencies, workers, and facilities interact with each other by way of processes that are governed by a complex combination of laws, policies, and administrative rules. Understanding agency-to-agency interactions requires a vendor that can understand the laws, policies and rules that drive them. While it seems tautological to state that "a vendor doing business with the state must be able to do to business with the state" there are solutions whose architecture or capabilities are ill-suited to operating in this environment.

When considering a vendor or solution's ability to understand our current systems we must consider that even a conservative view of what constitutes a "system" would yield dozens, if not hundreds, of major systems hidden behind an array of acronyms such as CHIMES, MISTICS, and STAARS.

Many systems in the state are essential systems for the day to day lives of our citizens; outages could cause irreparable damage to the property, prosperity, or safety of the people who live here. Companies unused to working in such an environment may be unprepared or unable to rise to the challenge, or unwilling to accept the moral and financial consequences that could follow a catastrophic system failure.

This poses a unique challenge to vendors and solutions alike.

Standard Solutions

Rather than offer us a unique solution the vendor deployed and demonstrated a **standard** solution to meet the needs of the pilot. The suite of tools the vendor demonstrated is the same suite that they have deployed to meet the needs of many states, including Georgia, Pennsylvania, Alaska, Florida,

Louisiana, Nevada, Arizona, California, New Mexico, Colorado, Kansas, Rhode Island, Virginia, Tennessee, New York, Texas, Minnesota, and Illinois.

The vendor also demonstrated the ability to be proactive in acquiring an understanding of DLI systems and processes. The vendor's staff actively reached out to DLI personnel to ensure the vendor understood both the spirit and the letter of our requirements and took steps to aid us in employing their technology in the most efficient or effective manner.

Most noteworthy was the vendor's ability to add value beyond that which was expected by virtue of their experience working with other state governments and their respective agencies. The vendor actively reached out to pilot personnel, demonstrating a willingness to go beyond the minimum required of them.

Over the course of the pilot the vendor ably demonstrated their ability to gather the knowledge necessary to excel within the DLI's environment. The vendor's team was courteous, professional, and generally met or exceeded the standards that one would reasonably expect of a company offering professional services.

Evaluate the solution's ability to create consistent processes across the DLI service locations

A Value Proposition

In an environment where satellite offices can be over 500 miles from centralized oversight we must have systems that enforce standard processes.

Standardization of processes across a single entity has been a core part of realizing efficiencies of scale since the industrial revolution. Henry Ford did not invent the first car, but he did build the first standard process to mass produce cars and in doing so he changed the world. The internet brought the world closer together using standards such as HTTP and DNS. Standard processes are the foundation of success for nearly any long-term undertaking or endeavor.

Workers also span multiple generations, and manual processes now require training and knowledge transfer to function over an ever-widening cultural gap. Montana is becoming increasingly diverse, welcoming viewpoints and cultural backgrounds that can also contribute to challenges in communication.

Standardization has also become more important as we face the challenge of ensuring compliance with a growing body of regulation, policy, and law. State employees acting in their official capacities have a tremendous responsibility to ensure that their actions are in line with an ever-growing list of requirements.

We need a solution that can help us enforce consistent processes across our entire enterprise.

An Integrated Approach

The vendor clearly demonstrated that their solution provides the tools necessary to create consistent processes across DLI's service locations.

Missoula and Havre were chosen as service locations for the pilot because they represent different deployment scenarios in many different ways. Missoula is the 2nd largest city in Montana, while Havre has fewer than 10,000 residents. Missoula's economy is powered by over 4,000,000 tourists per year and its local workforce is dominated by civil engineering, technical services and a growing specialized healthcare industry. Havre is a railroad town, caught up in the boom and bust cycle of oil and gas extraction industries.

Layered on top of these very different locations is the Helena-based oversight team, whose responsibilities include compliance and process auditing.

This pilot clearly demonstrated the benefits of unified processes, especially when those processes are being carried out at geographically disparate locations.

If there was one factor that is decisive in the success or failure of process unification it is the will of the agency to tackle the complex and challenging task of process unification. While the vendor provided the technical tools which were used to accomplish this task, and these tools performed ably and well, the lion's share of the credit must be laid at the feet of the DLI personnel who stepped up to the challenge when given the opportunity.

DLI Recommendations

DLI Recommendation: The enterprise should make a long-term plan for Enterprise Content Management (ECM) and records management

Pilot Leader Response: Any platform is going to take time to work into existing product lifecycles, and over the course of the pilot many agencies expressed the sentiment that uncertainty about the future ECM had impacted their decision making processes. SITSD should work with agencies to determine what the appropriate scope is for a long-term plan of this nature, and create a multi-agency team to author such a report for ECM.

ECM and records management are very closely related disciplines. The US Department of Defense (DOD) standard for records management is codified in DOD standard 5015.2; this standard reflects DOD's unparalleled experience and knowledge in the field of securing, archiving, and preserving official records. This standard sets out over 170 requirements designed to manage the information lifecycle. DOD 5015.2 has become the accepted standard for many state governments, including Montana, which draws most of its records management policies from this standard. As a result of this widespread adoption many ECM vendors, including the pilot vendor, have engineered their solution to be compliant to this standard.

The law governing how we must deal with public records and archival storage (HB 123) was actively debated in the 2015 legislature. The outcome of this legislative process is a heavily revised and standardized approach to records management. As it stands today we will have to build this compliance into at least a dozen individual technology platforms, and possibly more.

A single, unified platform for content management is going to be critical to meeting this clear legislative mandate. Attempting to bring hundreds (or thousands!) of processes across dozens of technology platforms into compliance with a new law would require applying our expertise and skills to many different areas. This process would have to be duplicated on every platform, resulting in substantial amounts of time and money simply wasted in unnecessary duplication of effort.

A unified platform affords us the opportunity to build compliance with HB123 from the start. We can also pool our resources by bringing in a multi-agency team to tackle the problem across the enterprise. By working with a unified platform the team would get very proficient with the solution, and once the project was complete they would take that knowledge back to their agency where its benefits can be evergreen. This is a rare opportunity and we would be well advised to take full advantage of it.

DLI Recommendation: SITSD should set an enterprise standard for ECM similar to the active directory standard, and in the absence of very compelling or legal requirements preventing it, SITSD should require agencies to use this standard.

Pilot Leader Response: The Montana Information Technology Act (MITA) mandates that certain principles guide our actions. Realizing the efficiencies of electronic content management is explicitly

stated one of those principles. Throughout the course of this pilot the benefits of a consolidated and uniform platform for content management have been demonstrated clearly and convincingly to the pilot team.

Right now we have no less than nine distinct content management systems: FileNet, SharePoint, Perceptive, Alfresco, Laserfiche, C-Track, Docuware, Microsoft CRM, Tyler-Eagle and many more homegrown or purpose-built systems are in use across the state.

Each one of these systems must be hosted, updated, and maintained. Each one of those tasks requires specialized knowledge and training that we are duplicating many times over. When critical documents must be found we must search each of these systems separately, which also requires specialized training and skills. With so many systems in place we are unable to use the true power of our enterprise to obtain the best pricing.

Every new platform or system we add must also be secured, and in doing so we run the very real risk of spreading our knowledge and expertise too thin and exposing critical data to opportunistic cyber criminals, organized criminal groups, or hostile nations. MITA is also clear that mitigating these risks should be a priority. While centralizing this content into a single location creates larger individual risk, we are able to focus the available security resources on securing a single system. Our personnel will be able to acquire a much deeper level of subject matter expertise, and maintain a more rigorous monitoring regimen over a single system than is possible for many disparate systems.

The pilot team unanimously recommends that the Montana adopt a single standard for ECM across the IT enterprise.

DLI Recommendation: Based on the success of this pilot, the enterprise standard ECM platform should be Perceptive Software's suite of ECM products

Pilot Leader Response: Enterprise platform standards require careful consideration and should reflect the diverse needs of the entire Montana IT enterprise. The Information Technology Managers Council (ITMC) is a diverse and responsive group of stakeholders from across all branches of state government and would be a logical forum to gather feedback on this recommendation.

DLI Recommendation: SITSD must find ways to address the financial barrier to entry that agencies face when adopting and migrating onto platforms and systems. DLI specifically requests that HB 10 funds be used to ease their transition from the current platform to Perceptive's ImageNow platform for ECM.

Pilot Leader Response: This is an area where an "enterprise first" strategy could yield tremendous dividends for all agencies, and we should aggressively pursue new and innovative ways to address the funding challenges associated with adopting enterprise platforms. Any way that we can find to improve this process and increase agencies' abilities to adopt enterprise platforms is worth our consideration.

However we must take care not to create financial incentives for agencies to move away from platforms in such a manner that might leave the other users of that platform at risk of financial harm.

With regard to the specific request for House Bill 10 funding, DLI is correct that in 2013 there was money set aside for “Electronic Records Management/Electronic Content Management Matching Grants.” However, in order for DLI to use these funds they must submit a plan for the CIO and Budget Director approval. The pilot process cannot, and should not, be a substitute for this.

DLI Recommendation: Enterprise standards need to be based on enterprise needs, and enterprise needs should most often originate from agencies. Specifically:

- SITSD needs to take the initiative to proactively understand agency needs.
- SITSD should actively work with agencies to identify opportunities for enterprise savings, and take charge of championing those initiatives in the enterprise.
- SITSD should be rallying agencies around converting single-agency solutions to multi-agency platforms.

Pilot Leader Response: The ideas DLI has laid out are all worth pursuing, and in many cases SITSD is already moving in that direction. This pilot is a reflection of SITSD’s commitment the principles of customer-focused information governance.

SITSD will continue to reach out to individual agencies (including DLI) as well as multi-agency governance groups such as ITMC for the input and guidance on issues that impact our enterprise.

DLI Recommendation: SITSD should adopt common information architecture standards across the enterprise, and break down the silos that separate us.

Pilot Leader Response: Private industry has been moving in this direction for a generation, and state governments are rapidly moving there as well.

Right now we collect the same data many times, often capturing and storing documents that another state agency printed out in the first place. We could reduce the cost of collection and storage of data by collecting data once, and reusing it many times. We also send staff across the state to audit process and documents and not only do we incur the costs of their travel but we put them at no small amount of personal risk in doing so.

Common information architecture would allow us to store our data/content much more efficiently and achieve a complete information picture more rapidly.

Achieving an enterprise standard for ECM will move us a long way towards this goal.

Next Steps

Policy makers must now make a determination as to whether or not we are going to have an enterprise standard platform for ECM.

If we are moving towards a unified IT infrastructure then this represents an unparalleled opportunity to realize that vision. Content, workflow, and process management are deeply intertwined systems that bring tremendous value to organizations who adopt them in a unified and purposeful manner. North Carolina identified ECM and workflow automation as a “key enabling technology” for their IT consolidation strategy³. Iowa is in the process of consolidating their IT departments and their CIO listed consolidated ECM alongside security and project management among of the items that can have an impact on costs⁴. Louisiana lists consolidation of ECM as their #2 goal for realigning enterprise IT applications⁵. These are only a few examples of how states are recognizing that ECM is a logical and natural enterprise platform and, when implemented as a standard, can help to drive substantial improvement in the efficacy and efficiency of government IT.

If we choose to adopt an enterprise standard, these are our options:

Make IBM FileNet / Content Foundation the enterprise standard

If we decide to adopt an enterprise standard IBM’s Content Foundation platform is the natural first choice. We use it already for many applications, which may reduce our migration cost, and we already possess subject matter expertise in this platform. Gartner lists IBM as the market leader in ECM, surpassing all others in completeness of vision and ability to execute. Content Foundation is a full featured, mature, and strong platform that is well suited to the Montana IT enterprise.

However a critical requirement of an enterprise platform is the ability to achieve enterprise adoption. Thus far this solution has struggled to gain broad acceptance within the enterprise, especially among our largest agencies. There are 12 agencies using this system now but DOJ and DLI represent approximately 63% of the billing for the first half of the 2015 fiscal year and both of these agencies have expressed a desire to migrate off this platform in the near future. We would have to find a way to address this issue, or risk the failure of the enterprise platform.

Such a failure could be a millstone around the neck of future enterprise platform initiatives, severely limiting our ability to develop IT resources in an organized, deliberative, and cost-effective manner. As it is currently configured this system is not suitable for use as platform with autonomous tenants and we may need to build a migration path for users from the centralized system to the new multi-tenant platform. With the current platform such a migration is likely possible with an “upgrade in place”, an option that is made largely transparent to end users due to our experience and expertise with the current platform. While we have a substantial

³ https://www.scio.nc.gov/library/pdf/IT_Consolidation_Report_March_2012.pdf

⁴ <https://www.legis.iowa.gov/docs/publications/SD/24706.pdf>

⁵ <http://www.doa.louisiana.gov/oit/pdf/2010%20Strategic%20Plan%20-%20For%20Website.pdf>

investment in both software and training for our current platform we must keep in mind that these are all sunk costs, and should not be a substantial factor in our decision making process^{6,7}.

Our current system is a capable and proven technology platform, but it has struggled to gain a voice among our agency customers. Any attempt to adopt it as an enterprise platform is going to have to overcome resistance from some of the largest enterprise platform users.

Make Perceptive's suite of ECM tools the enterprise standard

Perceptive has demonstrated their ability to work in our environment, win over our agencies, and deliver a powerful federated option with a pricing model well suited to our needs. They have tremendous momentum, having advanced from #8 to #2 in the Gartner rankings in just three years. They have also demonstrated an ability to actively engage agencies in marketing their products – a factor that will be critical in the long-term success of this or any enterprise platform.

We would also have to fund a migration path to help bridge agencies from the old platform to the new. This would likely entail running two systems in parallel during this migration, and this period of time is not easily estimated and may be considerable.

It should be noted that DOJ has been very supportive throughout the pilot, freely offering their time and expertise. DOJ uses this solution currently and has made a sizeable investment in the vendor's platform. Should we make Perceptive our enterprise standard we would be well advised to start by opening a dialog with DOJ about how we could use their current licensing to “bootstrap” an enterprise system with DOJ as its first autonomous tenant. There are policy issues and many implementations questions surrounding this, but it is a possibility that DOJ is willing to explore further.

This would be an excellent start to building a true enterprise standard ECM system, and a success here would go a long way towards signaling a new beginning to agencies as a whole.

DOJ and DLI have both articulated their desire to use this solution for their ECM needs and together they represent the majority of current platform revenue. This is a great situation for a service provider to have: we have identified a service that our largest customers clearly want. If our strategy is to build platforms that agencies will buy, this is the logical platform to build.

Issue an RFP to find an enterprise standard

With the knowledge gained from the pilot we could produce an improved RFP that we could leverage into an enterprise standard.

⁶ Knox, RE; Inkster, JA (1968). "Postdecision dissonance at post time"

⁷ Arkes, Hal; Hutzler, Laura (2000). "The Role of Probability of Success Estimates in the Sunk Cost Effect".

If we choose not to set an enterprise standard ECM platform these are our options:

SITSD offers Perceptive as a service alongside current offerings

This is the most straightforward option and, under normal circumstances, this may well be considered the “easiest” path to pursue. But we should not underestimate the downstream impact should we choose this option.

For the six months starting in July of 2014 DLI made up approximately 40% of total revenue for the existing ECM offering. If we begin offering two platforms with DLI anchoring the Perceptive platform there will be implications for the other eleven agencies currently using the other shared service.

The other agencies on this platform have made long-term plans based on the pricing published in our catalog. Agencies have already set budgets through 2017, and a change of rates could have a substantial deleterious impact on them. If we did not alter our rates then SITSD would have to absorb these costs.

When agency costs for SITSD services go up, their budget requests must likewise increase. Adding a second platform will be a net increase in IT spending with no corresponding increase in our IT efficiency or clear improvement in our ability to execute.

Helping decision makers to understand the complexities of the SITSD funding model presents challenge enough without muddying waters that are already cloudy. This choice will lend legitimacy to a spurious line of thinking, fueling a narrative of spiraling IT costs that SITSD and our partner agencies are already fighting on several fronts.

SITSD allows DLI to purchase and run Perceptive in DLI’s standalone environment

This option carries all of the downsides of SITSD creating a competing platform on the enterprise and offers no identifiable advantages to DLI or the enterprise. Given the cost of the solution at lower user numbers and the inability of an individual agency to tap enterprise funding sources this option is also very likely to be cost prohibitive.

SITSD brokers an arrangement with DOJ to offer Perceptive as a service to DLI and other interested agencies

There are many unknowns associated with this choice and investigating them was outside the scope of the pilot. Its inclusion in this list represents the desire of the author to present the most comprehensive list of options possible.

Over the course of the pilot we worked with a wide variety of experts across the state, gathered feedback from other state governments, consulted with independent industry experts, and read hundreds of pages of studies, white-papers, bids, proposals, and responses from across the nation. None of these consultations produced in any identifiable or foreseeable benefit to multiple systems or platforms in an enterprise environment.

Conclusion

There are six potential paths forward, but they all start with one choice: **is Montana going to have an enterprise standard platform for content management?**

Our current environment is one defined by its lack of definition. There are no fewer than nine different types of content management in use today within the enterprise. At a minimum we use FileNet, SharePoint, Perceptive, Alfresco, Laserfiche, C-Track, Docuware, Microsoft CRM, Tyler-Eagle and many more homegrown or purpose-built systems across the state.

The Montana Information Technology Act (MITA) mandates a set of principles that must guide the development of state information technology resources. Some of these policy statements speak directly to the topic at hand. MITA tasks us to:

- Ensure that common data is entered once and shared among government entities at any level or political subdivision;
- Conduct official business in an open and transparent manner, using technology to enable citizens to access our records simply and quickly;
- Build information technology systems that accommodate low-cost, system-to-system transfer of data and information between the state and its citizens, businesses, and other government entities;
- Embrace the economics of digitized records to avoid duplication and transport costs; and
- Adopt electronic record creation, management, storage, and retrieval processes, and implement procedures to create and deliver professional records management experiences for the citizens of Montana.

We cannot fulfil the mandate of MITA in our current environment.

This pilot clearly demonstrated that the vendor's solution is capable of delivering a platform that can host multiple tenants with varying levels of autonomy, and the value of an enterprise standard platform for content management platform are well known. This delivers the "one-two punch" for our enterprise; agencies retain their autonomy and control of the information that is critical to their business operations while simultaneously operating on a shared platform and leveraging fundamental aspects of our enterprise to realize cost savings, efficiency gains, and vastly better data security.

We have technology platforms that are demonstrably effective. We have a mandate from MITA that is compelling. We have requests from our current customers that are reasonable. We even have the potential to win over a large new customer, altering the course of our enterprise.

Having carefully observed the demonstrated success of this pilot, taking into account the advice of both internal and independent experts, and with guidance from our customers and mandate from our legislative bodies I believe our path forward is self-evident.

It is the unanimous recommendation of the pilot team that CIO Baldwin approve DLI's recommendation and create the policy framework necessary for the adoption and implementation of a standard platform for ECM across the Montana IT enterprise.

There will be times when individual projects or initiatives might be less expensive on an off-standard platform. Vendors, eager to get their foot in the door, will be ever-present and offering advantageous pricing to try and erode any platform or standard we choose.

However, by adopting an enterprise platform we will make things possible that were not possible before. Across the enterprise we reap the benefits of a shared login system, a shared telephone platform, a shared calendar, and universal email address book. We exchange documents, spreadsheets, and presentations seamlessly across the agencies, and we are able to take our tablets and laptops to nearly any office on the state campus and work as if we were in our office. We take these tremendous benefits for granted, but there was a time when we did not have any of them. The process for migrating to a unified email platform was contentious, and the road to a single active directory or phone system was equally challenging.

A shared ECM platform has the potential to bring the same dramatic impact to our enterprise, if not more. Sharing documents, processes and workflows across the state enterprise will change the way we do business across the state, and the road to getting there will be no easier than it was for any of the previous enterprise deployments.

But along with this challenge comes great opportunity. We will have the opportunity to tackle complex deployment, integration, and operational challenges in new ways by creating a community of shared knowledge and expertise.

Adopting an enterprise standard is going to be difficult; there will be challenges that no one agency can solve and obstacles that no one agency can overcome. But we will not meet this challenge as individual agencies, we will move forward as a unified enterprise. We will build bridges that cross the traditional boundaries between agencies, rising not only to the individual challenge of building a unified ECM platform but also facing the fundamental trial of enterprise. We will meet this challenge head on, as we will meet future challenges head on; with resources, experience, and technical acumen far greater than any individual agency can muster because we will bring the full weight of our enterprise to bear.

The pilot team recommends the adoption of a single, enterprise-wide standard for content management.