



Information Technology
Fiscal Year 2014 Work Plan
July 31, 2013

The Information Technology (IT) staff at the Montana State Library provide support to all library programs to ensure they have access to needed technical resources. To be effective, it is essential that the IT staff work with library programs to provide solutions that balance their needs with the larger library need for integrated, secure, sustainable library systems designed to adapt to the constant, rapid pace of technology change.

This IT Staff includes the following employees:

- Digital Information Manager/Chief Information Officer – Responsible for overall IT planning and coordination.
- GIS Database Administrator – Manages the library database and GIS server environment.
- GIS Web Developer – Develops and manages MSL web applications.
- Network Administrator – Configures and supports the agency desktop, network, and server resources
- Web Manager – Manages the agency internet and intranet web environments.

This work plan is built around the core goals contained in the 2012 through 2022 MSL Long Range Plan. In terms of Information Technology we aspire to:

1. Provide file server and database platforms for the storage and management of library content.
2. Provide a web server environment and developer support resources to allow programs to provide cutting edge data access tools to patrons.
3. Provide training for library staff, partners, and patrons for effective application of library technology to meet information management and information access needs and provide library staff with technology resources to allow them to be more effective trainers.
4. Provide MSL staff with the IT resources needed to be effective in their leadership and consulting roles.
5. Use IT resources to promote partnerships and encourage collaboration both within and beyond the library, government, and natural resource information management communities.
6. Insure sustainable success through efficient and effective management of information technology resources.

By completing the tasks set forth within this work plan we intend to efficiently and effectively fulfill the mission of the Montana State Library.

Goal One – Content

1. MSL acquires and manages relevant quality content that meets the needs of Montana Library users.

IT Staff plan, implement, and support the file server and database environment where MSL digital content resides.

Over the past two years MSL file storage capacity has been migrated to a new Storage Area Network (SAN) which resides in the Montana State Library Data Center (MSLDC) and is mirrored on an identical SAN at the State of Montana Data Center (SMDC). In the coming year we will be expanding the SAN environment to add an additional 10TB of storage capacity to allow more content to be managed in system designed to be both secure and accessible.

- 6 drives were added to the MSL SAN which expanded the file server capacity from 30TB to 42TB. Prior to adding these drives we had sufficient capacity to handle day to day MSL needs, but any large data request would have pushed us up to limits of what our file servers could handle. With the expansion we have been able to attached the TBL recording studio machines to our SAN for more secure storage of recordings and we are currently in the process of migrating our file and print server data to the SAN to provide more secure storage for this data.
- Our SAN has capacity to hold an additional 12 drives which would provide up to 20TB of additional storage. We are currently exploring the possibility of purchasing half of those drives this year and the remaining drives next year.

We will be planning and implementing a more extensive overhaul of the MSL database environment this year. At present, though effective, our existing database environment was designed primarily to support NRIS GIS Databases. Tweaks have been made over time to allow additional programs to take advantage of the resource. A redesign of the database architecture, coupled with a move to virtual servers and an upgrade to current database server software should provide the library with a more robust platform designed to support all of the agency's needs in a manner that is much more efficient to manage.

- We have successfully stood up a virtual database environment that consists of a development, production, and publication server. We are in the process of migrating databases off of our older, physical server based architecture and into this new virtual environment so that several of our aging physical servers can be retired. We expect to complete this project by the end of the calendar year.

Along with the improvements to the hardware supporting our file servers and databases, the IT group will also be reviewing and updating our user identity management plan to ensure that employees can access these systems at a level that is appropriate for the work they need to perform.

- We have performed an audit of existing MSL security groups. As we migrate to the new file server environment we are cleaning out obsolete security groups and verifying that the existing users and groups have the appropriate permissions.
- IT staff have stopped using administrator logins except when required. We are researching systems for managing administrative accounts in an organizational setting and hope to begin applying new administrative login policies at the beginning of FY15.

The library will continue migrating existing physical servers to virtual servers whenever possible. This transition reduced the impact of hardware maintenance on system availability. With the increasing amount of web accessible content and patrons wishing to access our web based tools around the clock, reducing or eliminating maintenance outages is becoming more important.

- In early May we migrated many library programs to a new virtual file and print server. The remaining programs are scheduled to be moved on Memorial Day weekend.
- We are working with TBL to migrate the Keystone Library Automation System (KLAS) software to a virtual server. We expect to have this project completed before the end of FY14.
- A new virtual ArcGIS Server environment consisting of a development and production server were both brought up this year. We are working to migrate services from our existing physical ArcGIS server machines into this environment. This work is expected to be completed by the end of the current calendar year.

The transition to a virtual server environment will also require a review and update to our IT disaster recovery protocols. With proper planning we should be able to recover systems supported by virtual servers faster and from a broader range of potential service interruptions than we were able to provide for in a physical server environment.

- We have been testing different recovery procedures for our virtual servers, but have not documented specific virtual server disaster recovery protocols. This will be addressed early in the coming fiscal year if it is not completed by the end of FY14.

Goal Two – Access

2. MSL provides libraries, agencies, and its partners and patrons with convenient, high quality, and cost-effective access to library content and services.

With more and more library content being made available digitally, the primary point of access for this information is becoming the library web site and web based applications made available through the website.

Over the past year the library has been implementing a Content Management System (CMS) to allow program staff more direct access to program web pages. The idea behind this move is that with minimal support resources and a growing reliance on the web site, it would be extremely difficult for the IT staff to provide sufficient support to keep pages program pages current. The use of a CMS allows program staff with minimal training to have more direct access to their program pages, while still allowing the web manager to maintain the overall page style so that it remains consistent with an overall web site theme.

- The move to CMS based web sites occurred without any major issues. Program web leads have been identified and the web manager works with them and program managers to identify agency web needs. Regular meetings with web leads have not occurred recently because of the migration to a new CMS system (see below) but those are scheduled to resume next month.

From initial roll-out of this approach for just a couple of programs a few months ago, currently every program has an updated CMS based web page up or soon to be rolled out and the library just rolled out an updated home page to reflect the new design. In addition to providing a cleaner design, the new stylesheet that was chosen is also responsive which means that our pages are designed to look good in a variety of browsers from large desktop computer screens to table and even smartphones. Over the course of the coming year we plan to complete the full roll-out of CMS to all of the library program pages.

- After using WordPress as our CMS tool for a little more than a year, MSL is migrating to a new CMS tool, DNN. The state IT Services Division (SITSD) is making DNN available to users in their enterprise web environment. It has been a slow process to get our pages migrated to this environment in part because we have had to wait for SITSD staff to learn how to administer DNN. A lot of progress has been made recently and our plan is to have the first program pages moved to DNN before Memorial Day, with the remaining program pages migrated before the end of FY14. We are very happy to have a substantial portion of the MSL web environment hosted on the state enterprise systems. It provides an added level of security for those sites and is cost effective for MSL.
- With the migration process winding down, and now that we have a better understanding of the capabilities and limitations of the CMS environment, the MSL Web Oversight Committee has been exploring an overhaul to our agency home page and program pages. Any updates to the MSL web presence would be implemented in the coming months to ensure that we have a stable site through the coming legislative term.

Our GIS Web Developer has been busy updating library web applications that reside on outdated technology and that is a process that will take much of the coming year to complete. The Today's Air application (<http://todaysair.mt.gov>) that we host for the Department of Environmental Quality was just updated to take advantage of current ArcGIS Server technology and no longer relies on out of date ArcIMS tools to present users with a map of air quality monitoring sites. Similar updates are planned for the GIS Data Bundler, the Montana Digital Atlas, and the Topofinder. This work will be performed in collaboration with the Geographic Information program and in conjunction with an update of our GIS server environment being directed by our GIS Server Manager.

- In collaboration with the Geographic Information program we have been able to update two of the flagship GIS applications to current technology. The GIS portal has been replaced with a GIS Data list which has resolved issues with users contributing metadata that had plagued the portal for several years. The GIS Data List is an application developed in house which allows for better integration into the existing Geographic Information and Montana State Library web environment. The GIS Data Bundler was originally built more than 10 years ago and continued to operate on obsolete and unsupported software. This tool was updated to use the current ArcGIS Server javascript API and a tool from SafeSoftware called FME Server. The combination of these tools allowed for a new bundler with a much friendlier user interface and better performance and stability to be rapidly developed and moved into production. The new GIS Portal and GIS Data Bundler have significantly reduced the after-hours maintenance load that the older tools were putting on our Geographic Information and IT staff.
- The Geographic Information program has initiated the process for updating the Montana Digital Atlas. MSL IT staff are part of the project team and will work closely to help develop a new tool to provide our users with quick access to MSL's spatial data holdings.

Both the Web Manager and the GIS Web Developer will also take time in the coming year to evaluate new tools such as dotNet 4.5 and Visual Studio 2013 to determine when and how to best implement this new technology in a manner that balances the need to keep our systems current and provide with the need to provide users with stable, reliable data access tools.

- A review of dotNet 4.5 and Visual Studio 2013 revealed that a number of developers were dealing with problems trying to use these new tools. A decision was made to stay at dotNET 4.0 and Visual Studio until the issues with these tools are corrected by Microsoft or a more improved version is released.

Goal Three – Training

3. MSL provides appropriate trainings and training resources so that the best use can be made of the resources offered.

MSL IT Staff does not provide any direct training to patrons in the use of library resources but there are a few way that they do support this goal. First, one of the first sites developed in the new library web environment was the learning portal. This is an indication that the CMS model allows an appropriate level of content control at the program level to allow the program pages to support training material.

Another aspect of the new web site which we will be exploring in more depth this year is the ability to integrate staff and/or program blogs. Though not typically thought of as a traditional training resources, blogs can provide helpful training tools in the proper context.

- This project has been on hold as we work to implement a new CMS. Once the sites in the new CMS are in production we will revisit this need.

Beyond those specific examples, one of the guiding principles of the MSL website overhaul is a desire to make more current content readily available to patrons. While this content may come in many forms it is reasonable to believe that some of it will be training materials.

- Again, though it has been interrupted somewhat recently with the move to the new CMS, we do believe that the use of a CMS has allowed all programs to do a better job of keeping their pages current and relevant. We are also exploring options for better integration of social media tools into the new CMS pages to further assist with these goals.

Goal Four – Consultation and Leadership

4. MSL provides consultation and leadership to enable users to set and reach their goals.

IT Staff will participate in several state IT groups including the IT Managers Advisory Council (ITMC) the GIS Manager's Forum, the Network Manager's Group (NMG), and the Information Manager's Security Group (ISMG). Additionally, they will also collaborate more directly with other agency IT staff to identify the most efficient methods for providing access to databases and other types of data stored on agency networks.

- IT employees are regular participants in all of these groups except for the ISMG. The ISMG is currently undergoing a review to help provide agencies with a more clear understanding of what their goals are and who would be appropriate to

attend these group meetings from each agency. Once we have this guidance, we will be more active in this group as well.

Goal Five – Collaboration

5. MSL Promoted partnerships and encourages collaboration among its users.

IT Staff can and will work with program staff and partners to understand how and where technology solutions can be implemented to assist with collaborative efforts.

- IT staff have worked with all of the library programs on many projects over the last year including many that have been highlighted in this report. We are always exploring ways to improve our communication with the programs and hope to implement some better communication tools through our intranet site in the coming year.

Goal Six – Sustainable Success

6. MSL is efficient and effective (measured against partner and patron outcomes) and is engaged in fulfilling its mission.

A concerted effort is being made to approach IT support at the library as a resource for the agency as a whole, and to work with the IT staff as a team rather than independent staff supporting specific parts of a larger IT system. This is done in part to provide more effective and efficient services to all library employees. Another reason for taking this approach is to build a sense of partnership among IT staff with other employees that do work that might overlap or otherwise impact the work they do.

- MSL IT has held bi-weekly staff meeting throughout the last year. On the off weeks, the IT Manager has one on one meetings with IT Staff. This has generally increased the sharing of information about IT systems and projects across the IT employees.

We have already begun the process of cross-training IT staff to provide better service to the library users that rely on the IT services they provide. All IT Staff will learn basic skills needed to support MSL systems. Most of these remain the primary responsibility of the Network Administrator, but other IT employees will be able to handle basic requests if the Network Administrator is not available and understand if a request should be wait until the Network Administrator can handle it. These skills will include: The ability to create and manage users and groups to manage access to network resources, Familiarity with the tools used to manage the MSL virtual server

environment, the ability to perform basic database administration tasks such as checking the status of a database, the ability to set up and manage software monitors and alerts, and the ability to perform basic tasks on the MSL web server.

- At some level cross training has occurred and been an effective tool for the MSL IT group. There are still many areas (network support, database support and web support for example) where we are still heavily dependent on a single staff member for support and other problem solving needs. This has been an issue on more than one occasion when a key staff member was either out of the office or otherwise unavailable. We will continue to pursue cross training of staff as a solution for these bottle necks.

In addition to promoting the team aspect of the IT work environment, something else that is important to the retention of IT staff is the opportunity to get training in and work with current technology. Staff have already identified valuable training opportunities for the coming year and we are setting up an appropriate training budget to support that. Additionally, every IT staff member has new, updated software to either roll-out or evaluate during the course of this fiscal year. This includes:

- Evaluation of Internet Information System (IIS) 8
 - Complete. Decision was to not implement now, but re-evaluate in FY15.
- Implementation of SQLServer 2012
 - Partially complete. SQLServer 2012 is available on all new database servers and we are working to get data migrated to these machines from older versions of SQLServer.
- Implementation of ArcGIS Server 10.2
 - Partially complete. ArcGIS Server 10.2 is available on the new ArcGIS Servers and we are working to get web map services migrate to these machines from older versions of ArcGIS Server and ArcIMS.
- Evaluation of Windows 8 and Windows Server 2012
 - Complete. Decision was to not implement now, but re-evaluate in FY15.
 - We have recently begun testing Windows Server 2012 on some new virtual servers.
- Evaluation of Visual Studio 2013
 - Complete. Decision was to not implement now, but re-evaluate in FY15.