CSCI221 – System Analysis & Design

Email System Transition

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# Executive Summary

This Systems Analysis project focuses on the enhancement of the email infrastructure at the Lewis & Clark Library with the goal of upgrading from the current GroupWise system to Microsoft Outlook. The organization has identified several technology challenges, including outdated software and legacy data management issues. In response to these concerns, the analyst team has tailored the scope of their investigation to prioritize crucial software updates, as well as the implementation of robust security policies and training protocols for the proposed Microsoft Outlook system.

Through comprehensive research, the analysts have outlined alternative solutions and recommendations in this report. The analysis indicates a substantial advantage in adopting the proposed alternatives, showcasing significant cost-savings. It is projected that the implementation of the upgraded email system will yield financial benefits, covering the incurred costs within the first-year post-project completion. This strategic initiative aligns with Lewis & Clark Library’s commitment to embracing modern technology solutions and ensuring a secure, efficient, and streamlined email communication environment.

# Introduction

Library History: The Lewis and Clark Library in Helena, MT, boasts a rich history as one of the state's pioneering libraries. Initially situated in the Whitlach Building on Last Chance Gulch, it predates Montana's territorial status, opening its doors before the region officially became a territory.

Established as a subscription library, visionaries such as Colonel Wilbur F. Sanders, J.W. Whitlach, and Ben Stickner Jr. orchestrated its creation four years after gold was discovered on Last Chance Gulch. Unfortunately, a fire razed the library and its contents in 1874, but determined efforts led to its prompt restoration.

Operating on a subscription basis, the Helena Library continued until 1886 when citizens decided to transform it into the Helena Public Library—a free public library and the first of its kind in Montana Territory.

Library Growth: The Helena Public Library quickly outgrew its space, prompting a move to a new building adjacent to the city auditorium on Seventh Avenue and Warren in 1892. Subsequent expansions led to another relocation in 1933 when the Unitarian Church generously donated their Park and Lawrence building for use as a free public library. This location, now housing the Grandstreet Theater, served the community until further growth demanded a move.

The library found its current home near the south end of the Walking Mall in 1976. The modern facility, constructed in 1975-1976, was designed with future technological advancements in mind. In the mid-1970s, it was renamed the Lewis & Clark Library, expanding to include branches in Lincoln and Augusta.

Continued Growth and Remodels: The library underwent significant changes in the 2000s. In 2000, voters approved a mill levy for expansion, leading to the addition of a third branch library in East Helena in 2001. A remodel in 2003-2004 addressed technological advancements, an expanding collection, and increased demand for services. The renovated facility on Last Chance Gulch now accommodates nearly 30,000 users monthly, offering a range of programming and an extensive collection.

Post-remodel enhancements included a public computer lab, a café-style lobby with a coffee kiosk, and a dedicated space for children's computers. The Lewis & Clark Library Foundation contributed to the Ambrose Reading Room on the second floor in 2005, providing Wi-Fi service and hosting public programs.

Branch libraries in Lincoln and Augusta received makeovers in 2005, and in 2009, services expanded to East Helena with the opening of a new branch. The introduction of the Bookmobile in 2012 marked the library's commitment to reaching community members without direct access.

As of September 2013, the Lewis and Clark Library proudly celebrated 145 years of continuous library services to the people of Lewis and Clark County.

Our System Analysis & Design group reached out to Martha Furman, the Library’s Operations Manager, to ask if we could work with the Library on our final project. Martha included Matt Beckstrom, the Library’s Systems Librarian, who agreed to work with us. Our group initially met with Matt and Martha to determine what systems the Library has, which ones they’d like us to consider analyzing, and to give us a tour of the Library and explain how all of their systems work.

Our group decided to focus our scope on the email system transition as that is something the Library knew they needed, but desired assistance with. Our group met a second time with Matt and Quinn Kurokawa, a Library Systems Technician, who was within his last two weeks of working at the Library. In this meeting, we discussed the current system the Library was using, the things that system did well and the things that system did not do well. We also discussed what they were looking for in a potential alternative system.

The following report will outline what system the Library is currently using, why that system is no longer working, multiple alternative new systems to transition to, the functional requirements of a new system, and more.

# Information Systems Background

The Lewis and Clark Library graciously agreed to allow our student group to conduct a systems analysis, which initially was a very broad scope. We met with several Library staff, including the Systems Librarian, Operations Manager, and Systems Technicians.

We quickly discovered how vast the Library’s Systems department actually was. Through pointed conversation, we learned that the Library is currently using an antiquated email client called GroupWise and were planning a transition to the modern Microsoft365 Outlook client.

The transition will affect all Library staff and their intercommunication. This includes the numerous librarians, front desk staff, and other support staff.

The main problem with the current GroupWise system is that it is outdated and has been since 1998. The Library also recently received 100 free basic Microsoft365 licenses due to their non-profit status, and there is no rhyme or reason to maintain two separate email systems. Transitioning to the MS365 client provides stronger cloud security, a familiar interface for new employees, and contemporary and future focused features. Some of the features missing from the current system that will be included or improved in the new system include threaded conversations, the ability to embed images and signatures, consistency in the ability to view attachments in emails, and syncing calendars.

There are several needs identified considering the transition from the old but long-tenured system to the new but sometimes uncooperating system. One of the main concerns with transitioning is the loss of historical data and emails. It was mentioned that some Librarians still reference old emails from 20 years ago and losing these in the transition would be a loss of organizational knowledge. Additionally, there are legal requirements for maintaining certain data and information in the case of Freedom Of Information Act requests. Another concern is the lack of consistency in the Libraries Wi-Fi strength and availability and by moving their entire email system to the cloud could be problematic during internet outages.

Some other objectives and benefits of the new system include the ability to sync calendars, quickly create and easily maintain automatic group email lists (active directories), improved reliability, a better user experience, threaded conversations rather than multiple separate emails regarding the same conversation, and third-party integrations and other add-ons including Teams integration.

GroupWise, the current email client, was referenced as unknown by the current and emerging work force as it is an outdated system that is no longer keeping up with the competition. The transition to MS365 and Outlook will undoubtedly increase user familiarity and knowledge and experience from previous employment. Outlook is widely used in business everywhere and is nearly synonymous with email itself. By switching to this widely used system, the Library will have access to many features enjoyed by other users of the system and likely greater compatibility with other organizations.

# Functional Requirements

# User Stories

Bob Dole is a member of the public. Bob wants to easily use library resources, so he can learn about and understand the world around him.

Geoff is a librarian, he wants to access his email and upload documents to a managed cloud server, so he can focus on his primary responsibilities in the library.

Bethany is a system administrator at the library, she wants to shift some of her menial work to a subscription cloud service, so she can spend her time solving more complex, niche issues.

Persephone is a facilities maintenance manager, she wants to access any high-traffic area of the building with a single electronic key, so she can access equipment that needs attention or service without carrying ten pounds of keys with her everywhere.

Bob enters the library and asks Geoff the librarian to help find a book about millipedes. Geoff quickly saves work on an email he was drafting, locks his computer, and gets up to help Bob with his request. Geoff teaches Bob to use a computer terminal to find the millipede book, and during the interaction Geoff notices a bug in the terminal’s functionality. Once he has finished helping Bob, Geoff reports this bug to Bethany, who is able to replicate the bug and start working on a solution quickly since some of her more mundane responsibilities are handled by Microsoft on a server somewhere now. Bob checks out the millipede book easily and takes it home while noting how easy the trip to the library was.

Geoff was helping a student with research for a class. Geoff remembered his colleague sent him an article that was relevant to the research. Geoff accessed his email account on the public computer to view the article and share it with the student, he then forgot to sign out of the email. A couple hours later, a different patron realized they had access to the employee email, and through it, the employee network. The patron, a devious individual, stole information from the employee network and emailed the entire library staff about their successful hijacking of data. The library’s system administrator Bethany instituted stronger multifactor authentication and automatic timeouts to prevent similar issues in the future.

# Alternatives

In the age of technology, there are many alternative solutions to an outdated email system. In order to determine the best possible alternative solution, one must consider which solutions can meet the functional requirements, and then compare the different pros and cons of each system. After considering the functional requirements documented in section D, we have identified three possible alternative solutions to meet the Library’s needs regarding email.

## Microsoft 365

Microsoft 365 is the premier business software solution, developed and maintained by one of the largest companies in the world. Microsoft Office apps that include their email client, Outlook, are synonymous with business software and solutions.

Some of the pros of using Microsoft 365 include, but are not limited to:

* Outsourced management,
* Numerous and vetted plugins,
* High reliability,
* Off campus access,
* Automatic redundancy,
* Guaranteed platform support,
* Widely used and well known by most business professionals, and
* Current ownership of free licenses due to non-profit status.

Outsources management can alleviate the I.T. department during times of turnover when they may not have enough staff to address all issues and needs in a timely manner.

The numerous and vetted plugins allow users a great range of options to personalize their digital workspace and ensure their work needs are met and resolved by reliable sources.

Microsoft has high reliability with their software and services. Users are able to access their inboxes from virtually anywhere as long as they have an internet connection. If they have internet access, users are guaranteed to be able to access their inboxes and files. Users can also enjoy peace of mind knowing their data is stored and backed up on the cloud by default so if their machine is lost or broken, they will not lose their information.

Microsoft also has 24/7 support for their users and their support can be utilized in multiple ways including via chat or phone call allowing everyone comfort in their contact with support services.

Microsoft Office is one of the most widely used software packages. New employees will be easier to onboard if they are familiar with the software used by the Library as odds are, these employees have used these programs either in school or previous employment. These business suite apps are included in Microsoft 365 and all of them including Word, Excel, and PowerPoint all integrate extremely well with Outlook.

With the Library being awarded free basic level Microsoft 365 licenses, the cost to switch is virtually free – minus payroll costs for set up and training.

With the good comes the bad. Some of the known cons include, but are not limited to:

* Subscription model,
* Centralized resources, and
* Cloud-based system.

A subscription model is not ideal for multiple reasons. Even though the Library has free basic level licenses, they would need to consider investing in at least one higher level license to have access to Microsoft’s administrative abilities including group policy creation, security features, and much more. Additionally, while the Library enjoys free basic level licenses right now, that could be rescinded at any point leaving the Library with a tough and costly decision of needing another system transition or having to accept the increased costs of having to purchase all users new licenses.

Centralized resources can create issues as there is no alternative if the solution were to fail or not meet the Library’s needs at a later point in time.

A cloud-based system is somewhat worrisome as it was noted that sometimes the Library is left without internet access as they don’t have the strongest connectivity. While no internet service would operate without internet access, a cloud-based system such as Microsoft 365 could leave users unable to access emails already in their inboxes if it wasn’t already loaded before the internet dropped. It was noted that some Library staff frequently refer to old emails to be able to do their job.

## IceWarp

IceWarp is a lesser-known software company that developed a mail server and an email messaging and collaboration service for small, medium, and enterprise level businesses.

Some of the pros of using IceWarp include:

* An all-in-one system,
* Cross-platform support, and
* Security.

IceWarp provides alternatives to everything provided in Exchange, SharePoint, Teams, and OneDrive for a small cost compared to Microsoft 365 paid licenses. It offers enterprise level collaboration out-of-the-box with no need to install additional components. Users get access to all components in a single window and get to choose where their data will be stored.

Some of the cons of using IceWarp include:

* Mutual exclusivity with other products,
* A lack of third-party support, and
* Cost.

IceWarp is not as widely known or used as Microsoft 365. IceWarp is cheaper than Microsoft 365 licenses; however, the Library already was awarded free basic-level licenses for 100 users. Using IceWarp instead would actually increase costs.

## Google Workspace

Google is another one of the largest companies in the world and does have a similar business software suite comparable to what Microsoft offers. Google is well known and widely used for many business solutions.

Some of the pros of using Google Workspace include:

* Easy to use interface,
* Strong collaboration features,
* Optional free version, and
* Reliability.

Google Workspace is the best alternative for business apps and systems for students as it offers free versions, therefore making it a well-known system that can be easily understood and used by potential new employees. It is easy to share Google documents for collaboration and provides a reliable user experience.

Some of the cons of using Google Workspace include:

* Cloud-based system,
* Additional costs with additional features, and
* Software features lag behind Microsoft software features.

Microsoft sets the standard for business software. While Google is one of the biggest competitors, it simply cannot keep up with Microsoft in terms of innovation.

# Recommended Alternative

Our recommendation is a two-part recommendation. Recommending a different email server or system also comes with recommendations around transitioning and implementing the new system.

There are several options for migrating from GroupWise to Microsoft 365. Each option has its own pros and cons. We have reviewed some of these options to determine what would work best to meet the Library’s needs.

## Quest On Demand

Quest On Demand is a secure, Azure-hosted SaaS management platform to help IT teams, partners, and MSPs move faster, tighten security and stay in control of hybrid Office 365 environments.

Some of the pros of using Quest On Deman include:

* Cloud-based,
* Comprehensive support,
* Robust reporting and monitoring, and
* Easy to use software interface.

As a cloud-based solution, Quest On Demand Migration eliminates the need for on-premises infrastructure, providing scalability and flexibility. The software’s user-friendly interface ensures that IT administrators, regardless of their level of expertise, can navigate and utilize its features effectively. The inclusion of robust security features, such as data encryption, underscores the commitment to maintaining the confidentiality and integrity of migrated data. The reporting and monitoring capabilities further empower administrators to track progress and troubleshoot any issues efficiently.

Some of the cons of using Quest On Demand include:

* Pricing is only available upon request (lack of transparency to potential clients),
* Limited customization, and
* Dependent on stable internet connection.

The cost associated with licensing fees could be a potential drawback. The dependence on a reliable internet connection is another factor to consider, as the performance of the cloud-based solution is contingent on network stability. While the software is comprehensive, it could lack features specific to this migration scenario, Matt will need to consider his requirements carefully.

## BitTitan MigrationWiz

BitTitan’s MigrationWiz is a fully automated SaaS migration solution. With MigrationWiz, partners can quickly help customers migrate to Office 365 and Google Workspace while keeping migration projects profitable and customers happy.

Some pros of using BitTitan MigrationWiz include:

* Per-user purchase, starting at $12,
* Good error handling, and
* Good user interface.

Ease of use was cited by reviewers as a clear benefit and users seemed to often successfully execute their migrations without issue.

Some of the cons of using BitTitan MigrationWiz include:

* New platform to learn,
* Relies on Deployment Pro, and
* Reviews citing poor support.

Reviewers often cited poor support by the company as a con. While most migrations appear to be successful, should anything go wrong, it seems there is limited support offered.

## Microsoft FastTrack

FastTrack is a service provided by Microsoft that helps customers onboard Microsoft Cloud solutions and drive user adoption. Customers with eligible subscriptions to Microsoft 365, Office 365, Azure, or Dynamics 365 and more can user FastTrack at no additional cost for the life of their subscription.

Some pros to using Microsoft FastTrack include:

* No additional cost,
* Expert, hands-on assistance,
* Consistent results, and
* Consistent and reliable support.

User reviews described consistent, professional performance and noted that the service is included in the cost of the licenses.

Some cons to using Microsoft FastTrack include:

* It can be a very lengthy process,
* More reliance on Microsoft,
* More of a process than a product,
* Strict adherence required, and
* Inflexible timeline.

User reviews described some common downsides to be Microsoft requiring stringent preparation before they provide assistance, and some projects reported very long processes.

## Recommendations

For the system to migrate to, we recommend Microsoft 365 to replace GroupWise. Microsoft is the longtime leader in office software. Most of the Microsoft supported file types are the accepted standards. Microsoft also takes the headache out of the backend management of the system and its payment model is more predictable and consistent compared to the other options. Another positive to using Microsoft 365 is that the Library already has the free licenses and uses the office suite regularly.

Regarding how to migrate to Microsoft 365, in the interest of meeting budgetary and data safety restrictions, Microsoft’s migration assistance seems to be a logical place to start. Some value is available without any additional investment, and even if the plan changes, the core assistance from Microsoft is relevant given that Microsoft 365 is the destination.

This project prioritizes data retention above timeliness, and as such, the possible delays inherent to Microsoft’s method are less important than their consistency and rigorous process. After the planning process, we think that Quest On Demand software is the best option for migrating. Quest On Demand is highly regarded as a go-to for this scenario, and they tailor their pricing depending on the project.

# Time and Cost Estimate

# Financial Analysis / Feasibility Study

# Appendices