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 The organization has identified several technological challenges, including outdated software and legacy data management issues.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, highlighting 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 of 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

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 would 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 an overly 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 one hundred 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 synchronizing 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 synchronize 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

The library already uses teams for meetings so being able to integrate that tool is essential. Most of the library email use is done with patrons, as such the library staff want a system that can be easily accessed and used by the public and that does not require specialized training. GroupWise setup was noted to be convoluted, as the following diagram of the correct setup for a GroupWise protocol flow shows. One does not need to understand the diagram; it is simply there to show its complexity.

A diagram of a network

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GroupWise is very outdated, and the Lewis and Clark library’s server has gone down multiple times, the library needs a client they can depend on​, even in the case of an internet interruption to the library itself, a cloud-based solution will have better reliability and security than an outdated, onsite server.

No matter what the library chooses, keeping their old emails is perhaps the most important aspect of this migration. ​

The existing mailboxes are valuable to the staff and library operations, and ideally there is no down time during the migration, this could involve configuring coexistence between the two server options. Beyond these points, there are also some secondary requirements. The ability to use plugins was cited as a desirable outcome. Simple access to the server from outside the library location is another requirement.

The following diagram shows the simplicity of a Software As A Service (SaaS) model due to the upkeep responsibilities being shifted from the administrative team, while also showing that it can accomplish the data retention required and the plugin integration desired.



# 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 of 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 viable 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 vast 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 they were not 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 one hundred 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 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 were able to 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 use 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 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

When speaking with the Lewis and Clark library team, much of the work will be done by Matt Beckstrom.​ System Technician Matt Backus will provide end user training and additional help post-migration​. All told the entire migration, barring any unforeseen issues, should only take about two weeks. Our recommendation of using Microsoft FastTrack may introduce a complication in terms of how to proceed. Since the service is provided at no cost beyond licensing, we recommend that Microsoft is contacted as soon as possible to begin the planning stage of the process.

We can now define a set of high-level steps to follow to complete the project efficiently.

1. Contact Microsoft FastTrack:

Begin the planning process and get Microsoft’s team started on the project.

1. Backup Mailboxes:

Export existing mailboxes to a secure backup, deleting mailboxes as appropriate.

1. Configure 365 Accounts:

In this Case the Accounts already exist, but some preparation is needed to have them ready for migration.

1. Configure Quest Software:

Become familiar with the software and its interface.

1. Configure Coexistence:

If possible, prepare the Outlook boxes and prepare the GroupWise server to co-manage services with Microsoft.

1. Migrate Data:

Begin the migration process, if coexistence is possible, it may be wise to migrate mailboxes in small batches to leave time for handling unexpected errors.

1. Update DNS Records:

As batches of mailboxes are migrated, they will need to have their pointers reset to ensure future mail is routed correctly.

1. Complete Migration:

After all the mailbox batches are migrated, review errors and compare migrated data to backups.

1. Microsoft final configuration:

Review the outcome of the migration, are there any mailboxes with smaller issues left to be resolved?

1. Employee Training:

Since training can be handled by other employees, it could technically start at the beginning of the process and will likely extend far beyond the scope of the project.

This Gantt chart represents a reasonable timeline for accomplishing the migration, the starting point is arbitrary, given we do not know how soon it is reasonable for the migration to begin.

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Duration** | **Start** | **Finish** |
| Contact Microsoft FastTrack | 7 days | 1/15/2024 | 1/23/2024 |
| Backup Mailboxes | 1 day | 1/15/2024 | 1/15/2024 |
| Create MS365 Accounts | 1 day | 1/16/2024 | 1/16/2024 |
| Choose Migration Method | 2 days | 1/15/2024 | 1/16/2024 |
| Configure Coexistence | 2 days | 1/17/2024 | 1/18/2024 |
| Migrate Data | 3 days | 1/19/2024 | 1/23/2024 |
| Update DNS Records | 2 days | 1/24/2024 | 1/25/2024 |
| Complete Migration | 2 days | 1/26/2024 | 1/29/2024 |
| Client Configuration | 3 days | 1/30/2024 | 2/1/2024 |
| Training | 3 days | 1/17/2024 | 1/19/2024 |

A diagram of a project

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The Gantt chart demonstrates the consequences of using a single person to perform most of the work. Many of the steps are contingent on the previous steps, meaning that there could be time lost in partial days depending on how closely the steps fit into our model.

With this timeline established we can address the cost estimates. We will outline the facts governing the estimate, then we can create a model that can be adjusted based on changing costs. We know that, because of its non-profit status, the library gets Microsoft licenses at no cost, and we also know that most of the staff are already using office resources for other things. We also know that Microsoft FastTrack services are provided at no cost to the organization, and that Matt’s estimate for the number of mailboxes to migrate is eighty-two accounts with approximately seventy-five being live accounts currently in use.

Our model for the project estimates that core steps of the process will take fourteen days, with the training portion of the project estimated at three days. The training can mostly take place simultaneously to the core project.

The pricing for Quest software is evaluated based on the project. Based on the pricing of comparable products, we can form a conservative estimate of $1,200.00. Now that we have outlined the facts of the estimate, we can create our formula. Matt Beckstrom’s work will span roughly 112 hours, and his hourly payrate will be represented by the variable x, with Matt Backus’ work spanning roughly 24 hours and his payrate represented by the variable y, and we will use the variable z as our total cost. This gives us the following formula. (112 \* x) + (24 \* y) + 1200 = z.

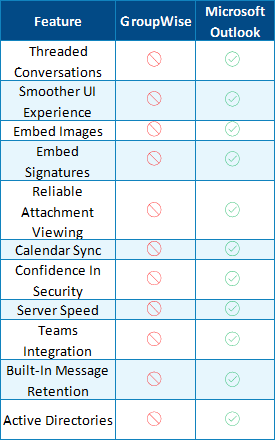
# Financial Analysis / Feasibility Study

## The Problems And How They are Solved

To determine the feasibility of our recommended solution and implementation plan, we first looked at what the problem is. There is an extensive list of problems with the current system; some of them being more problematic than others.

GroupWise, the current system, is long outdated and has been behind the curve since 1998. It is a Linux based system, and while that could potentially be viewed as a positive, the operating system it runs on is not widely used. Therefore, it can be more difficult to recruit a competent workforce without excessive training. This issue is compounded with GroupWise itself not being a widely used program in today’s business world.

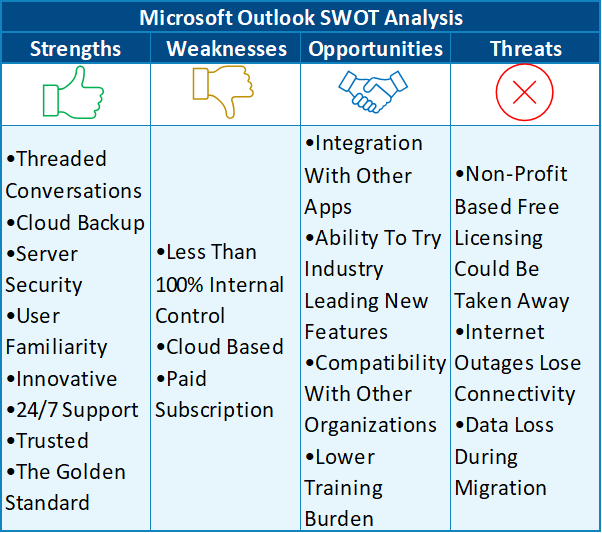
Additionally, in a one-to-one comparison between GroupWise and Microsoft Outlook, comparing the key features outlined by Library staff, GroupWise comes up short in every category, as shown in the table below.



Microsoft Outlook is the most efficient solution as it not only offers all of the features that GroupWise does not, but it also sets the standard and leads the industry for innovation in new features.

## SWOT (Strengths, Weaknesses, Opportunities, Threats) Analysis

We performed a SWOT Analysis on Microsoft Outlook to ensure it meets all of the Library’s needs without introducing too many new problems or risks.



### Building From The Strengths

Microsoft Outlook’s strengths will allow Library staff and patrons to have more efficient and organized discussions with threaded conversations. It also allows for more reliability in their technology as they can have confidence in their data retention and data security. It allows the Library more effective recruitment opportunities as any new prospective employees will likely have experience with their technology. They can also enjoy the leading-edge features instead of falling behind the ever-changing technical landscape.

### Shoring Up The Weaknesses

The basic tier free licenses the Library was awarded for their non-profit status are wonderful in many ways. However, they will not offer much for administrative staff to be able to administer their system. It would be advisable to upgrade at least one basic license to a higher tier allowing for more administrative control by the IT/IS Department. The cloud-based system has many benefits but can be frustrating in times of intermittent network connectivity. Microsoft 365 (the cloud-based system) usually allows users to have offline access to their data and information. While that data will not be updated in live-time, it would allow users to continue working without as much of an interruption during those less-than-reliable internet connections.

### Capitalizing On The Opportunities

Microsoft 365 and Outlook offer many opportunities that the Library can capitalize on. Of those opportunities, the integration with other apps such as Teams and calendar syncing will allow the Library seamless productivity with meetings and activities throughout their facilities. They will now be able to view attachments sent to them, embed their own attachments in their emails, and no longer have to worry about writing out their email signatures every time. Perhaps the biggest opportunity will be the lowered training burden as most current and new employees will be familiar with Outlook and other Microsoft products. There will likely still be an initial training burden, but that would be focused on the Library’s specific file structure, procedures, and processes instead of how to use their programs.

### Monitoring The Threats

There are three large threats that the Library will want to monitor. First, their basic free non-profit licenses are not guaranteed and could be taken by Microsoft at any point. It is unlikely, but not impossible and we would recommend the Library always stay up to date on the status of their licenses. Second, The internet outages could cause issues on Library productivity. There is not much the Library can do for this threat, nor much any service provider can do that is not the internet service provider. However, the Library can continue working with local internet providers to bolster their connection and speeds. Third, data loss during the migration process is a major threat to this process. Following our recommendations of using Microsoft’s FastTrack to plan the migration and prep the data to be transferred, then coupling it with Quest On Demand’s software to actually migrate the data should provide the lowest risk for any such project. We would also recommend performing a backup to GroupWise before initiating the migration process to ensure that there is no data loss in the event of a failed migration.

# Appendices

## Appendix A – Focused Questions

1. How many email accounts are you looking to migrate to the new system, and what is the total volume of email data to be transferred?
2. Are there any specific features or functionalities you require in the new email client that are essential for your operations?
3. Do you have a budget allocated for this migration, and are there any cost constraints or considerations we should be aware of?
4. Are there any compliance or data retention requirements that need to be considered during the migration process?
5. What is the level of technical expertise among your staff who will be involved in this migration?
6. Do you have an existing IT infrastructure that the new email client needs to integrate with, such as authentication systems or other software?
7. Have you identified potential challenges or concerns related to the migrations, such as data loss, downtime, or training needs for your staff?
8. Are there any critical third-party integration or plugins that your current email system uses, and do you need them to work seamlessly with the new email client?
9. What is your preferred method for data backup and disaste4r recovery, and how should this be incorporated into the migration plan?
10. What is the primary purpose of email usage within your organization, and are there any specific workflows or processes that heavily rely on email communication?
11. What is the desired outcome of the migration in terms of improving email system performance, reliability, or user experience?
12. Are there specific performance metrics or key performance indicators (KPIs) that you want to track after the migration to measure its success?
13. Do you have any technical documentation for the current GroupWise email system that could be used to help identify potential issues and risks during the migration?

## Appendix B – Bibliography

Works Cited

BitTitan. “GroupWise to Microsoft 365 Migration Guide.” *BitTitan Help Center*, 2023, https://help.bittitan.com/hc/en-us/articles/115008107627-GroupWise-to-Microsoft-365-Migration-Guide. Accessed 9 Nov. 2023.

Brame, Daniel. “IceWarp Cloud Review.” *PCMag*, 22 Oct. 2021, https://www.pcmag.com/reviews/icewarp-cloud. Accessed 9 Oct. 2023.

GroupWise. “What Is Enterprise Email and Why Is It Important?” *OpenText*, 2023, https://www.microfocus.com/en-us/products/groupwise/overview. Accessed 9 Nov. 2023.

Microsoft. “Microsoft FastTrack, Move to the Cloud with Confidence.” *Microsoft*, 2023, https://www.microsoft.com/en-us/fasttrack. Accessed 7 Nov. 2023.

MigrationWiz. “MigrationWiz vs. Exchange Cutover Method: Pros And Cons.” *Trusted Tech Team Blog*, 22 May 2020, https://blog.trustedtechteam.com/2020-05-22-migrationwiz-vs-exchange-cutover-method-pros-and-cons/. Accessed 1 Dec. 2023.

Oest, Caroline. “Knowledge Document: How to Convert a GroupWise Email into Outlook Readable Format - GW Mailbox Management Tips & Information.” *OpenText GroupWise Mailbox Management*, 30 May 2022, https://community.microfocus.com/img/gw/gwmm/w/gwmmtips/41978/knowledge-document-how-to-convert-a-groupwise-email-into-outlook-readable-format. Accessed 5 Nov. 2023.

Shoviv Software. “Shoviv.” *Automated Email Recovery and Migration Software*, 2023, https://www.shoviv.com/. Accessed 26 Oct. 2023.

Simson, Eric. “Best GroupWise to Office 365 Migration Solution - Free Methods.” *Stellar Data Recovery Blog*, 27 Dec. 2017, https://www.stellarinfo.com/blog/groupwise-office-365-migration-step-step-guide/. Accessed 31 Nov. 2023.

Wibowo, Inka. “Google Workspace Review: Will It Serve My Needs?” *Emailtooltester.Com*, 24 Apr. 2019, https://www.emailtooltester.com/en/blog/google-workspace-review/. Accessed 8 Nov. 2023.