1. Introduction

Student portfolios are a key part of project-based learning at Minnesota State University, Mankato. They help students collect and showcase their best work, prepare for interviews, reflect on their learning, and support program assessment. Despite their importance, the current system for managing portfolios is inconsistent and inefficient. Students and faculty struggle with organization, access, and usability.

This report is based on survey responses from students, which highlight the challenges they face with the current system and their desired improvements. Based on these insights, we recommend a hybrid solution: **buying a front-end platform (such as Wix, Google Sites, or WordPress) for students to effectively display and share their work, while building a backend data storage system for faculty to analyze portfolio evidence.** This approach balances usability for students with the analytical needs of faculty while ensuring long-term sustainability.

2. Current Challenges with Portfolios

Survey Findings

From 32 student responses, we identified several common challenges:

1. **Difficulty Organizing Evidence**
   a. Students struggle with structuring their portfolios, linking their evidence effectively, and maintaining formatting consistency.
   b. Some use Word or Google Docs, which are flexible but can become cluttered and hard to navigate.
2. **Limited Sharing and Usability**
   a. Many students do not revisit their portfolios after submission.
   b. Most do not share them with potential employers because the current system lacks good presentation and accessibility.
   c. Some students would use their portfolios more if sharing was easier and more professional.
3. **Technical Limitations**
   a. Many portfolios are under 500MB, but some exceed 1GB, making them harder to store and manage.
   b. Some students want a simple system like Google Docs, while others want multimedia features like videos and interactive elements.
   c. Accessibility and clarity are issues, especially for students new to portfolio building.

3. Importance of a Portfolio System

A well-designed portfolio system is critical for both students and faculty.

For Students:

- A portfolio is a **professional tool** that can help students stand out in job applications and internships.
- It allows students to **track their growth over time** and reflect on their learning journey.
- If designed well, it can become **a living document that students actively update and showcase** instead of something they submit once and forget.
- The ability to easily share portfolios with potential employers and graduate programs is **essential for career development.**

For Faculty:

- Faculty need **a structured and efficient way to review and grade portfolios** without dealing with inconsistent formats and scattered evidence.
- A centralized system would help faculty **analyze student progress** and identify areas where improvements are needed.
- Portfolios play a role in **accreditation and program assessment**, and a well-managed backend system would simplify this process.
- A good system would save time and allow faculty to focus on **providing meaningful feedback** instead of struggling with technical limitations.

Given these factors, it is clear that the university needs a **portfolio system that is simple for students to use, professional in appearance, and powerful enough for faculty to analyze submissions.**

4. Recommended Solution

Instead of choosing between a fully built or fully purchased system, we recommend a **hybrid approach** that takes advantage of existing tools while also addressing the need for better organization and analysis.

Front-End Solution (Buy Option: Wix, Google Sites, or WordPress)

Students need an easy and visually appealing way to display their portfolios. A **website-based system** like Wix, Google Sites, or WordPress is the best solution because:

- It allows students to create **professional and customizable pages** for their work.
- It makes sharing simple, with **custom URLs and responsive design** for mobile and desktop.
- Employers can **browse portfolios easily** without needing special permissions or downloads.
- These platforms are already widely used, reducing the **learning curve for students.**
- No need to reinvent the wheel, these platforms already have features that support images, videos, documents, and more.

Detailed Option Breakdown

1. Google Sites

Google Sites is our top choice for this project because it is completely free, easy to use, and allows students to create professional-looking portfolios with minimal effort. It integrates well with our backend solution. Students don't need any coding skills to build their portfolios, and everything is automatically formatted for desktop and mobile viewing.

Note: For students who do not wish to create or use a google account, there will be an option to use Microsoft SharePoint to create their visual portfolio instead. This will make no discernable difference for faculty grading; this will simply be secondary website builder option for students to use if needed.

Pros	Cons
Free to Use: There is no cost associated with Google Sites	Limited Customization: Compared to platforms like Wix or WordPress, Google Sites has fewer design and layout options.
Easy to use: Students don't need coding skills to work on their portfolio.	Not ideal for highly customized and interactive elements.
Backend integration: we can easily display files that are hosted on our backend. This helps us minimize storage costs.	Students will be required to have Google accounts.
No Hosting Fees: Google Sites is hosted on Google's servers	
Responsive Design: Automatically adjusts for desktop, tablet, and mobile viewing without extra work.	
Simple Sharing & Permissions: Students can control who has access to their site, making it easy to share with employers or keep it private.	

Cost: Google Sites is completely free. There are no subscription fees, hosting costs, or hidden charges. This makes it an excellent option for our project. After some research and reading through the Terms of Service, Google does reserve

the right to analyze the data and usage of all Google Sites which could be considered a cost.

Example Portfolio: https://sites.google.com/view/meron-woldesenbet/home

2. Wix

Wix is our second option for the front end because it is easy to use and allows you to build a portfolio within a short period of time. It also offers over 800 templates that can be used to create a portfolio without coding. Additionally, it is well formatted for both desktop and mobile views.

Pros	Cons
Fast and easy development: it doesn't required coding, and it offers over 800 templates	Performance Issues for Large-Scale Use: API limits could slow down requests when 100+ students are using the system simultaneously.
Responsive Design: you can access Wix portfolio both on computer and mobile	No full control over the front-end code: Wix does not allow direct access to HTML, CSS, or JavaScript
API and backend integration: Wix supports API integrations with Azure	Subscription Costs for API Access: Business Premium Plan ($36 per month)
Access Control & Sharing Options: Students can control who sees their portfolios and share custom links with faculty or employers	

Cost: The best option is to use one central Wix site for all students, requiring only one Wix Business Premium Plan ($36 per month).

Examples Portfolio: **https://yohannes30belachew.wixsite.com/yohannes**

3. WordPress

WordPress is the third option for the site students will make their visual portfolios on. While it might not be as easy as Wix or Google Sites for students to use, it is still a possible option that could be customized to work for this project. Create a detailed setup guide for students that would walk them through setting up their own WordPress website. These instructions would include step by step instructions for how to customize their websites, how to add their essays, how to embed or link their evidence, and more.

Pros	Cons
Customizable: Fairly customizable with just the free version, but becomes extremely customizable with the paid plans	Learning Curve: Slightly less intuitive than Google Sites or Wix
Community Support and Resources: It is a popular tool, which means there are many help resources that exist if students ever have issues with creating their portfolios	Paid Features: Certain plugins (i.e. PDF Embedder) can only be used with a paid plan. There are potential workarounds that would require additional guides/training.

Cost: This option would be completely free because each student would be using the free version of WordPress.com. There might also be a way to create a base

Example Portfolio: https://abiandersonmockportfolio.wordpress.com

Options Initially Considered but Not Pursued

During our research, we explored several potential platforms for portfolio creation. However, after evaluating factors such as storage limitations, user experience, and ease of sharing, we decided not to pursue these options. Below is a breakdown of the alternatives we considered and the reasons they were ultimately not selected.

Name	Pros	Cons
Mahara	• Supports collaborative learning and assessment tracking.	• Requires technical expertise to set up and maintain. • Interface is older and outdated. • No visuals.
Webnode	• Drag-and-drop website builder. • Free tier available with basic features.	• Limited storage and customization on free plans. • Not designed for academic portfolios. • Fewer integrations.
D2L e-portfolio System	• Students are familiar with D2L. • Grading and portfolios on the same platform.	• Employers need a D2L account. • It is harder for students to access after graduation. • Viewers must download linked evidence.

Backend Solution (Build Option: Custom Data Storage System)

While front-end platforms help students, faculty need **a structured way to collect and analyze portfolio submissions.** We recommend building a **backend data storage system** because:

- Programs need these portfolios **archived for accreditation purposes** with a minimum cold storage time for each semester of **6 years**.
- Faculty need to **track trends, analyze student progress, and assess program effectiveness.**
- A centralized database would allow **secure storage of portfolio evidence** (PDFs, code files, presentations) without relying on scattered student-managed platforms.
- The system can include **search, tagging, and filtering features** to make reviewing portfolios and the health of the various programs easier.
- It ensures that **data privacy and long-term accessibility** are maintained.
- Accreditation processes become **more efficient** when faculty can easily extract relevant data.

While researching potential solutions for hosting files on the proposed backend site, three options were identified by the team, and ordered by the clients in the below by preference:

1. **University Hosted Object Storage**

   The best option potentially for Object Storage from both a security and cost perspective would be the potential for the Object Storage that this site would require to be hosted on Minnesota State University, Mankato servers. This option would have the data hosted locally, or on an existing University cloud slice. Efforts are being made to contact IT and get exact details and costs of this solution.

2. **Azure Blob Storage**

   Azure Blob Storage is a solution for scalable and secure object storage offered by Microsoft. This option provides flexibility in the files that students would be able to put into their portfolio, and a high degree of data security. When looking at proposed costs, We estimate for 2.4 terabytes of storage (the amount of storage required for a full 12 semesters of student's portfolio data at each student's portfolio being 1gb across TCE and CS.) that this solution would cost around $12-24 a month (depending on the "temperature" level of storage we choose or how often we need to access the data).

3. **Amazon AWS Simple Storage Service (S3)**

   S3 is the secure object storage service offered by Amazon. It operates very similarly to Azure, allowing for the uploading and storage of files of a wide variety of types. For 2.4 terabytes, we estimate this solution to cost approximately $35 a month, and with no possibility for university hosting, we deem this solution to be cost prohibitive.

4. **OneDrive Account Script Option**

   This option is different than the other options in that it utilizes the OneDrive storage that we as students all get through the university. This option would utilize a python script to let a CS or TCE "bot" create a file structure in OneDrive each semester that would have a folder for each student shared to that student and every faculty for students to put their

portfolio contents in. This option comes with the limitations of not having a CDN to host the files outside of this system in, limiting its practical use with the front-end system, but comes with the upside of lower development costs, and potentially lower storage costs as well.

The development of this project has been greenlit, and work on an application utilizing Azure Blob Storage has begun. This application will primarily be written fully in Typescript using React; with a secondary database for managing user authentication and other data needs of the application (tracking semesters, etc.) in SQL.

This hybrid model ensures that **students get an easy-to-use, visually appealing system to showcase their work, while faculty get the structured data storage they need for grading and analysis.**

5. Justification for the Hybrid Approach

This solution provides the best of both worlds:

- **Ease of use for students** – They won't have to struggle with complex formatting or outdated systems. They can focus on presenting their work in a way that is meaningful and professional.
- **Flexibility and professionalism** – Students can customize their portfolios while ensuring they look polished for job applications.
- **Data-driven insights for faculty** – Instead of manually digging through disorganized files, faculty will have a **centralized database** to review student progress and support accreditation efforts.
- **Scalability and sustainability** – The hybrid model ensures that **as technology evolves, the front-end can be updated or replaced** without losing valuable portfolio data stored in the backend.
- **Cost-effectiveness** – Instead of investing heavily in a fully custom-built system, this approach leverages **existing tools where possible** while still addressing the program's unique needs.

6. Next Steps

1. **Pilot Testing** – Test a small group of students using the chosen portfolio frontend (Google Sites, Wix, or WordPress)

2. **Backend Development** – Design and implement a scalable database for portfolio storage and analysis with accompanying system for students and faculty to use.
3. **Faculty Training** – Provide guidance on how to use the new system for grading and accreditation purposes.
4. **Student Training**– Create tutorials and support to help students build high-quality portfolios with minimal frustration.

7. Conclusion

Portfolios are a crucial part of the learning experience for students and a key tool for faculty assessment. However, the current system is disorganized and difficult to use. Our recommended **hybrid solution—buying a front-end system for students and building a backend system for faculty—ensures that both groups get what they need. We recommend using Google Sites as the visual frontend for student portfolios and a web application for hosting the contents of student portfolios with either University-hosted object storage or Azure Blob Storage to accomplish this.** See other possible options above.

This approach provides students with an easy, professional way to present their work while giving faculty the tools they need for evaluation and accreditation. With the right implementation and support, this system can transform the portfolio process into a valuable asset for the university.

By moving forward with this hybrid approach, we can **create a portfolio system that is efficient, user-friendly, and built for long-term success.**

8. Client Approval

Client	**Signature**	**Date**

Client	**Signature**	**Date**