Solutioning the Design and Maintenance of the Federal Transit Administration's Systems to Keep Track of Archived Materials with FedWriters

A Professional Readiness Experiential Program (PREP) Project Effort

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Interested in being an Industry Participant and or PREP Sponsor? Please reach out to bngac@gmu.edu, Thanks!

---- Client Testimonial ----

"The tool that Nahom, Aqsa and Thomas provided gave us dual benefit, we ended with a client-centric approach, but the real solution recommendation came from the reusability in the form of the framework that was recommended and then delivered. This is the third project we have done with GMU and each time, my team and I see students that are not only interested in a grade, but a real approach to solve a real-world problem for businesses. I can't say enough for the professionalism and the dedication that the team brings."

- Marc Fain | Chief Revenue Officer | FedWriters

Introduction

The project that our team has taken on is a service for FedWriters, who have a contractual agreement with the Federal Transit Administration (FTA) to provide support services. The objective of this partnership and the following project focuses on preserving the FTA's historical artifacts. The majority of the artifacts that the FTA holds are text-based artifacts such as press releases, journals, and memorandums. Other artifacts include audio-based artifacts, videos, images, and tangible objects. We are tasked with aiding FedWriters in organizing, digitizing, cataloging, preserving, and displaying these artifacts. Our project aims to design and maintain organizational systems to keep track of archived materials. The FTA wants to store its artifacts on appropriate databases for easy usage and efficiency. This will lay the foundation that will permit the FTA to start showing off its artifacts for public consumption, whether they be physical or digital. Without the successful completion of this project, the FTA will not have the means to display the historic artifacts that are significant to American history. We must remove the wedge between the past and the people that it has impacted.

Business Challenge

The main objective of the project is to design and implement a data management system that can effectively and efficiently update, manage, and preserve historical artifacts that need to be registered or are already in the system. This involves creating an intuitive data entry form to take in new artifacts, developing a searchability component that allows for the easy retrieval of artifacts that have been registered, and establishing a visualization component that will allow the FTA to showcase the artifacts eligible for public viewing. This project will allow for more accessibility and engagement for both the consumers and the FTA staff members.

Taking on this project will involve some key considerations. For one, the system we design must be intuitive and user-friendly for the stakeholders involved. Those stakeholders would be the FTA staff members, administrative users, and website visitors who will interact with and navigate through the designed system for different reasons. As such, our team has to consider what abilities these different stakeholders should have within the system. Additionally, the team has to consider the integration of the newly developed system with already established systems, so that the transition is easier for FTA staff members. Lastly, the system should be scalable, meaning the system should be able to accommodate the different types of artifacts that the FTA has in its collection.

Activities Done to Address the Business Challenge

To address this problem, we first met with the team at FedWriters to go over the contract that they had with FTA, and then later on someone who currently works at the FTA joined us. In the meetings we discussed what was needed and, the FTA member emphasized three primary goals which include:

- ***Goal 1:*** Creating a data entry form, that will help to intake new artifacts
- ***Goal 2:*** Creating a searchability component that would make it more accessible to employees as well as the public to search up relevant artifacts
- ***Goal 3:*** The visual component which was discussed as the last priority, from the given three.

Furthermore, the FTA provided us with the Repository & Open Science Access Portal (ROSA P) database, which is a database that is already in place that we could use as a reference when creating an entry form, and for searchability.

Goal 1 was our main priority, to create a simple and easy-to-use intake form that employees at the FTA could easily use to process new artifacts. We researched the criteria best fit for an intake form through the ROSA P database and came up with a list of criteria that was then made into a sample intake form through the use of Google Forms. After discussing with FedWriters, what parts of the sample intake form needed to be removed and altered, we then decided on a program on which we will design our intake form. This program was decided to be Microsoft Power Apps as it is an easy low-code option that fits the team's qualifications.

After getting access to Power Apps, our team worked on creating an intake form app that utilized drag-and-drop options to create an easy and modern intake form. However, some members of our team struggled to access the app that was created. To solve this problem, we decided to continue working on the 3 deliverables in a parallel function to maximize our time. There were some other technical problems that we ran into such as creating a cascading dropdown and linking the two apps together for the searchability component.

After a continuous struggle with the initial Power app intake form, and consulting with FedWriters, we decided that it was best to use Microsoft Forms to create an intake form. We created the Microsoft Form, and after this connected the Microsoft Form to a SharePoint list, this was done through Microsoft Power Automate. Through this process, we created an intake form that satisfied the requirements made by FTA and FedWriters.

Then we moved on to goal 2, the searchability component, and created an app through Power Apps, that was named the Artifact Search App. This app gathered information from the SharePoint list, which was connected through Power Automate's free flow. The app contains different features such as a search bar, a vertical gallery, and a dropdown for specific artifact types.

While working on creating an intake form, we also provided FedWriters with the USE case Analysis for the intake form, searchability, and the visual component followed by creating a subsequent data flow diagram, this helped create a better understanding of the requirements of each deliverable as well as the course it would take to go through each deliverable.

Goal 3 was our final goal which includes the visual aspect; however, this goal was given the least priority by FedWriters and the FTA as having an organized database with an easy-to-use intake form. Because it was given the least priority, we focused our resources on goals 1 & 2, and when we had completed those two goals there was not enough time for the visual component. We discussed this with FedWriters once more and they advised that it was fine to not complete goal 3 as it was not the main priority of FTA.

With our three goals, we managed to solve the issues that were given to us by FTA and FedWriters. The main objective was to design and implement a data management system that can effectively and efficiently update, manage, and preserve historical artifacts that need to be registered or are already in the system, we solved this issue by creating an intake form through goal 1 that will help to systematically manage the intake of historical artifacts into the database. With goal 2 we created a search application that helps the retrieval of artifacts within the database efficiently.

Results & The Positive Impact

Despite the challenges associated with this project, our team overcame and delivered our final product - as much as we could accomplish given the time frame and our capabilities. The artifact intake form on Microsoft Forms resembles the format of Google Forms and other familiar types of survey inputs, reducing the need for extensive training for users. Users will not be burdened with the data entry process since the intake form requires about 12 entry fields that are easy to understand and quick to respond to, including a unique identifier automatically generated for each record and the ability to upload attachments in the form that will transfer it to the SharePoint list. We understand that time is the most valuable asset, so we intended to reduce the complexity for users so they can submit artifacts faster and take less time for usage training.

The bulk of the training should be reserved for the administrative users, who have access to the SharePoint List and Power Automate. MS Power Automate will especially require the most amount of training. It grants the ability to analyze data about the Artifact entry form process (i.e., how long does it take? Is the transfer successful? What do most of the artifact submissions consist of?) And, the SharePoint List can edit the transferred data. This role is ideally reserved for technologically sound users in managerial positions. These two apps hold the entire process together. Everything is done through Microsoft, creating a uniformity of app features, design, and seamless integration. This provides a clear pathway to debug any code or fix any issues with the data transfer.

If given enough time for research and construction, we (the GMU team) could have produced the visual component and finished the search function to meet the intended vision. The search feature can search for the artifact type, the artifact description, and the author's name. But the team needed more time to expand the search function so it could respond to any relevant keyword. Also, even though the file attachment feature works in MS Forms, we could not get the attached files to display when searched by viewers. Given these deficiencies, we see why the project needed a turnover document so that our succeeding team could finish off where we left off. Even if we had managed to finish every part of the project successfully, the turnover document could be used to expand on the previous project's scope to make a part two.

Conclusion

Our team addressed the key objectives of the FedWriters project by developing an efficient data management system for the FTA's historical artifacts. We utilized Microsoft Forms and Power Automate to create a user-friendly program, allowing for easy registration and retrieval of

artifacts. Although we were not able to fully implement the visual component, the foundation built permits future teams to further expand on our progress.

PREP Student Reflection

Nevertheless, the client can benefit well from our product, and we, the GMU team, have expanded our field of knowledge. For hard skills, we have familiarized ourselves with the not-so-basic Microsoft tools: Power Apps, Forms, SharePoint Lists, and Power Automate. These newly acquired skills set us apart from the majority of our peers, giving us a competitive advantage in the workforce. The soft skills we gained from this process were not brand new but heavily reinforced. Such skills include professionalism in communication (email and/or in-person) and flexibility in unpredictable circumstances. One feedback that we received from FedWriters, after presenting our final solution, was to have included a little bit of personal background information on us to get to know the project contributors before diving straight into the problem-solving aspect. This, we believe, is to break the ice and show that it was real people from unique backgrounds who came together to solve this problem. We were handling real-world problems instead of classroom assignments for grades, which proved to have a bigger impact on our learning.