Faculty Record File Management System

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Abstract

Our team created a web base document management system for organizing the required documents stated in the ("Academic Affairs Handbook 2020 – 2021" 8-10) . After creating an outline for our database, we implemented it on Microsoft Azure, a cloud computing platform. We tested various methods of accepting client information and settled with the ASP. NET platform because of its ease in use and features. In using a cloud platform, we thought it would make everything easier and more accessible, but in the development process it was not. This led us to make an application that worked locally to each user which. Although cloud technology is powerful and used a lot today, it was not something that would help make this system function better.

Introduction

As the world around us advances it is difficult to stay on top of the latest tech. Creating a document management system is our idea of staying on top of the latest tech but most importantly changing the lives of our professors. The document management system we are creating will replace the current manual system used to organize hard-copy faculty records relating to promotion and tenure.

Due to the pandemic, not all faculty are on campus. Since the current system for the faculty record file is hard copy, it can be a mess getting all those files together if some are on campus and some are at home. The system we developed also makes it so that the files are reproducible. You can have both a hard copy and digital back up in case something happens to the physical. The most convenient feature of the system is that it organizes all the documents according to the latest Academic Affairs Handbook. The system is a helpful tool that will make the lives of faculty easier when handling these important documents.

Methods

Creating the document management system required more research than it did developing the application. First, the plan was to create a cloud-based database where all data would be accessible. This required the use of a cloud-based system. We had 2 options: Microsoft Azure and Amazon Web Services (AWS). The team lead suggested that Microsoft Azure because a perceived trouble using AWS. AWS was to be avoided because of an

experience the team lead had with using it. He found it difficult to navigate and did not understand how to use it. On the contrary, Azure offered a simple and straight forward layout with lots of support on how to use it through youtube and online forums. Both systems were new to the team, this alongside the team lead's suggestion, made it easier for everyone to decide. Both systems were new to the team so making the decision was clear and we chose Microsoft Azure.

Before we could make a database on Azure, we needed to create a plan as to what our database would entail. To get an idea we read the entire Academic Affairs handbook to grasp the structure.

Figure 1

Afterwards an outline of the handbook was created for all of the required documents and its structure. We spent a few meetings planning what other tables will be needed besides the tables for each section. Other tables included meta data like the time, date and version of the document added. With all this information gathered it was finally time to create an entity relationship diagram (ERD). An ERD is an outline of the database including all the tables, columns, datatypes and relationships amongst the databases. Research was not needed for the creation of the ERD or the database as because this was something learned from CST 204, Database Management. Navigating Azure was done with the help of this video: "How to create an Azure SQL Database | Azure Portal Series"
(https://www.youtube.com/watch?v=p7X8lH_XMtI&t=136s&ab_channel=MicrosoftAzure)

With the foundation of the system complete, next we built an application to accept user input into the database. This was the most difficult part and took the longest to complete. There were about three ways we had available to us for creating a form: Visual studio which uses c#, python which uses the flask library and Access, the user simplified database with built in forms. Access at first seemed like the best option because of its easy-to-use features and the team was experienced with it. Access also had hyperlinks also known as object link embedding (OLE). This is a concept that is made by Microsoft and used amongst all of Microsoft Office applications. OLE is a feature which allows users to connect files and applications within their documents. An example of this would be having a table with an embedded document in it. This

would allow for the convenient storage and access of faculty documents if Access was used to implement our project. The issue with Access is that it is not a cloud platform like Azure.

To create the visual interface for users to interact with the database we initially created a demo window on visual studio. This was being taught in CST 115, (Intro to Computer Programming) so research for this was not needed. In visual studio a window form is an application interface which has one screen to interact with on a window. The demo consisted of a registration form with a profile picture. After creating the form, we realized that there was no way to create a coherent form with multiple pages. In the process of trying to create the form we were unable to make multiple tabs. Window forms were limited because we could only create one form per application which would not satisfy the needs of this project.

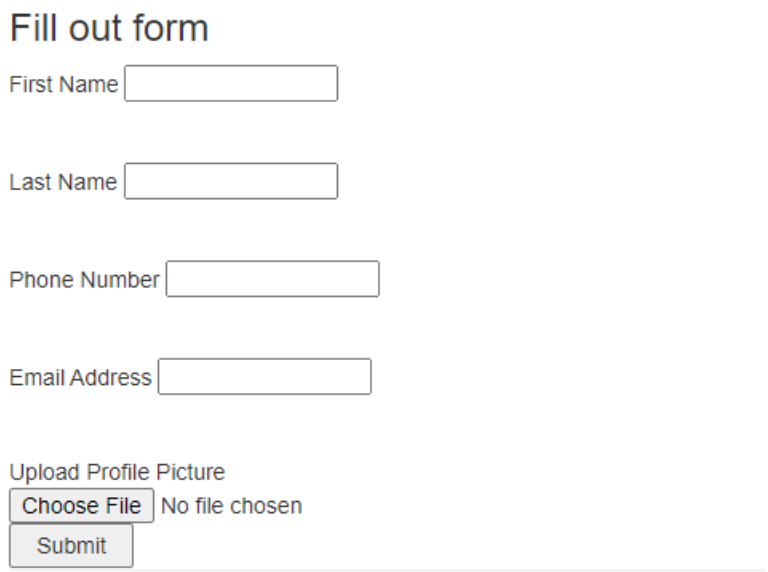

Figure 2

We need to be able to switch between pages so users can upload documents and edit their account. After searching online, we were able to find a video (Create an ASP.NET Web Form in Visual Studio, https://www.youtube.com/watch?v=Fo__AqRCMIg&ab_channel=SonyaZhang) which showed us how to create a web form which is a website made using the asp.net framework and c# for the back end.

With the creation of a webform, an html form on a webpage, we needed a way to put the site in a testing environment before we officially launched into the Union County College application cloud system. Dr. Wrice was able to get in contact with the head of the tech department so that the team could have an exchange with him about putting our application into the cloud system used at the school. Mr. Winch, JD, MBA, PMP | Union County College Chief Information Officer, asked for the specification of the cloud platform and after providing the information he replied explaining that he was unable to provide a cloud platform for us and suggested we use a free database tool.

The web forms that were created missed one important feature, the ability to accept pdfs. It could not be addressed because we did not know how to save pdfs to the database. The solution was addressed in a video on YouTube titled, “Image Upload in sql using asp.net with c#” (https://www.youtube.com/watch?v=2IT-V31l-ec&t=484s&ab_channel=AsraarAhmed). In this video, Asraar the narrator, shows how to save an image location to a database but it was

not the exact solution we were looking for. Image Upload uses a folder is created on the hosts local computer for saving the file. The file location is then saved into the database thus when the image is queried from the local computer it will retrieve the image. After reading a Stack Overflow, a site for asking and sharing answers to coding questions, article on saving images onto a cloud-based database we determined this was not an option. Cloud based databases do not allow for pdf storage. Our mentor suggested we have the document management system local to each user. This would mean that only they would have access to their documents, and it would be saved to their machine, they could then send, save, and print as many copies as they want. This was not something ever considered by the team, but it works well with the setup of the system. There was never a need for system to be cloud based when the faculty could just send it when they want.

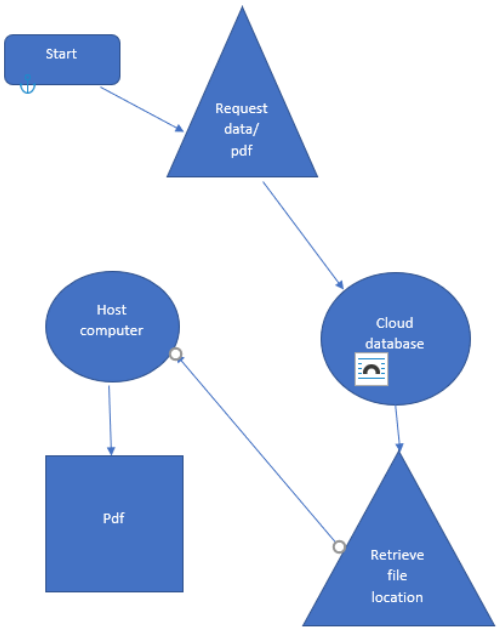

Figure 3

Azure cloud services is a free service for the first 2 months but afterwards they would charge for certain services. The way in which they charged for the service was not clear which made maintaining the database difficult. After developing the database for 4 months a team member who oversaw the database was charged over $200 for the azure service. Then 2 months after the first charge he was charged another $455. After the first charge the account was not used much to avoid charges but instead the price went up and thus the account was closed. There was not much of an issue with closing the account because the database could easily be recreated thanks to the ERD into a local database.

Results

Through the course of this research, we found that using a cloud service is very pricey and difficult to navigate. It should not be used unless someone is well trained on it and there is a good amount of fund going into it. There is a lot that goes into moving a system onto a computer system and this was something overlooked at the start but as we got into the mist of creating the layout things became very confusing. As we progressed, we realized that to effectively upload data to the proper tables in the database, the best thing to do would be to create a separate webpage for each section of the faculty record file. This would mean creating 10 different webpages that fits the needs of their respective section. We also ran into trouble trying to upload pdfs to the cloud storage system we were using. What also contributed to the confusion was the lack of proper training on the software we were working with. This made solving development problems difficult because, for instance, when trying to click on an tab

designated to a webpage we did not code we would get an error screen with: “Server Error in '/' Application”. we would get an error screen with: “Server Error in '/' Application”. The project ended up being unfinished because of our lack of understanding in the software.

What we have is a web form made with visual studio and C#, a local database with all the required entities and a within our notes we have a layout of what needs to be added to the website in order to make a completely functional website to replace the current faculty record file system.

Conclusions

The project was overwhelming because of the lack of knowledge and research required. The was a lot of trial and error to get to produce what we have and many questions we have about how to go about coding certain aspects of the web form. Through doing this research we learned a good practice for research such as detailed documenting, teamwork and communication. Throughout the course of this research, it has been difficult to get everyone to correctly document. It’s been a process of trial and error. Many times, the Mentor and team leader would have to correct the documenting process. For instance, there were times in a meeting where a member would discuss a problem or progress but never made note of it. Teamwork was very important because some members had strengths in areas others didn’t. This was very important when developing the webform because only one member was familiar with html, so they had to help the rest of the team get a foundation of the syntax. Communication was developed very early in the research; team members would get confused as to what to do next or couldn’t figure out a problem so first thing they would do is reach out to the team leader or to the other team member. When we all Since the team consisted of 3 people it was imperative to equally divide the work amongst each other and to be sure nothing overlapped. Having a plan and a backup plan is important for making sure that the project is always in motion.

Future work

For this project to be complete and ready for distribution the application must be completed with all the features needed in the faculty record file. This means there will be a total of 10 drop down tabs on the website leading to a page that will allow faculty to upload

their documents to the respective section. Then there must be a way to redistribute this application to the entire faculty of Union County College. Currently the only way we know how to distribute the application is through a zip file. The user would then open the .zip file and then open the .sln file which has a purple icon. Then they would run the code which will launch the site. Additional research must be done to find another way to make it easily accessible without the hassle of downloading visual studio and the other steps. Finally, to create a way to send all the 10 sections from one computer to another through the web form. When sending it, what also must be created is a pdf which is compiled of all the 10 sections with correct formatting and a header on each page describing the section and date created. This is the foundation to something that can be transformed into greater things.

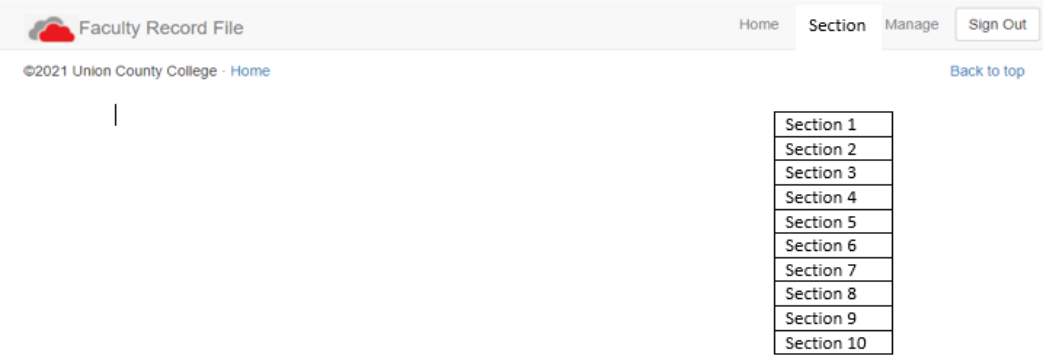

Figure 4

This could be something that eventually becomes a mobile application. In the application faculty could upload documents from their phone and manage their database too. The application will make the system more fluent as faculty will not be limited to just their computer at home or work. This application could eventually be sold and remodeled to fit the needs to other schools and companies.

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Figure Legend

Figure 1. Entity relationship diagram of database

Figure 2. Registration form made on window form

Figure 3. Flow diagram of image retrieval process

Figure 4. Example of how the sections could look on web form