Technological Feasibility Analysis

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Section 1 - Introduction

The Problem:

Staying connected with alumni has always been a challenge for schools. Currently there is no easy way to keep track of how their students are doing later on in their lives. Administrators from schools would love to have a system that is able to collect and manage that information. Competition between different schools over students is increasing, especially in Arizona due to educational freedom for families. Being able to stay connected with their alumni could help schools determine if they are properly preparing their students for the future.

Verde Christian Academy (VCA), located in Cottonwood, Arizona, is one such school. VCA wants to gather information about their alumni to see if they are properly preparing their students not only for middle and high school, but also for their adult lives. There should be tools in place to convert collected data into useful visuals, such as charts or graphs. VCA also wants to implement a system where students can reach out at any time about issues they are having, and VCA will be able to help those students.

The Current Solution:

As of right now there are a few solutions VCA is using to get feedback from former students and parents. Currently, VCA is using third party sites such as Wufoo and Survey Monkey. They have tried surveying parents to get their personal opinions, such as choosing between a 4 or 5 day school week. They also have sent out feedback surveys on how the school is performing. VCA would rather create their own survey system that they can personalize and fine-tune, rather than having to rely on a generic online survey generator. Overall, the school has no system in place right now to keep them connected with their alumni.

Our Solution:

Our solution to the problem is the Verde Christian Academy Student Success System, otherwise known as VCASS. The goal of this web system is for the administrators of the school to create and send out surveys to certain students to collect information on the status of their education. The administrators will then be able to pull the responses from the survey results and see if there are trends in the data to then use to improve student success.

This document is an analysis of the technical feasibility of the proposed web application. The purpose of this document is to explore the technological challenges of creating this system, to analyze those challenges, and to define how we are going to integrate the solutions to those challenges.

Section 2 - Technological Challenges

The first step in planning for this system is understanding the challenges we will face in creating it.

1. We will need a way to collect, filter, and store data.
2. We will need to ensure user security. We also will need to ensure the students can answer anonymously.
3. We will need a responsive front-end for when users submit their information, as well as a responsive back-end for when administrators access information.
4. We will need a way to visualize data as charts or graphs.

Section 3 - Technology Analysis

The next step is to take those challenges and determine the best possible way to overcome them.

1. **The issue:**

   We will need a way to filter and store useful information from the large amount of collected data. It will need to be accessible from our front-end.

   Alternatives:

   There are a lot of systems that we can use for this purpose. One alternative is MySQL, which is an open-source relational database management system, that allows us to create and manipulate data in tables. Another alternative is Microsoft SQL Server.

   Analysis:

   To solve our problem, we need to use a SQL database. At this stage, MySQL appears to be the best solution for a database. MySQL servers can be hosted locally, which allows for prototyping and testing before pushing the final product to a public-facing website. In addition, MySQL can easily be connected to a wide range of front-end website technologies, such as Wordpress. A Microsoft SQL server could be a potential back-up solution, although SQL servers hosted by large companies such as Microsoft would be expensive.

   Chosen approach:

   Our current approach is a MySQL database that will be implemented into WordPress. We believe that we can figure out a way to host a MySQL database on our website without occurring too much overhead. In addition, a MySQL database would better allow for testing, which will be important in the early stages of implementation.

Proving feasibility:

We will test the feasibility of this approach by testing out locally hosted MySQL databases, and seeing how easy they are to interact with, as well as seeing how easy it is to implement a MySQL database on a website. We will also look into our sponsor's current web hosting, and see if it would be possible to add the needed databases to their web hosting without incurring additional overhead costs.

2. **The issue:**

We will need to ensure user security. We also will need to implement the option of anonymous answers for the students. Administrators will need to have accounts on the website to create and send out surveys and there needs to be a way to keep the information in those accounts secure and safe. Keeping these accounts safe will ensure that the database containing the responses from the surveys are safe as well.

Alternatives:

Our current choice to solve this issue will be using the WordPress plugin, WPForms, to manage users. There will be a designated administrator for the site that can go in and create accounts for the administrators that need to have access. Another alternative will be to have a registration page for users to create accounts to access the system, but when creating an account the administrator has to approve it. This will be done using Google's Firebase Authentication service, which can be integrated with our backend.

Analysis:

Both options to solving this solution are viable. The administrator's will feel safe having their information in the accounts due to the main administrator creating them for them. Or going and making them on their own and being approved through Google's authentication service. This will also guarantee to the students taking the surveys that

only specific school administrators will have access to the survey results.

Chosen approach:

The chosen approach is to use the WordPress plugin. The school's existing website is built on wordpress and they would like to add this tool on. Given that, our goal is to use the existing tools and plugins that are available to us.

Proving feasibility:

We will begin testing the WordPress plugin, and seeing if it satisfies our requirements for security and privacy. The administrator must enter the account and password when logging in to the database. The user must also enter the account and password when logging in. To modify the password, the user's identity must be verified through the mailbox. If the given plugins do not solve the issue stated, we will go forward with our alternative option.

3. **The issue:**

We will need a responsive front-end for when users submit their information, as well as a responsive back-end for when administrators access information.

Alternatives:

The main solution we are considering is to use the WordPress page creation tool to create our pages for creating each page of the website. Using this tool will automatically link the pages together creating a smooth transition. When it comes to creating the surveys to be distributed to students, we plan on using the WPForms plugin for WordPress. Using this plugin will take that information from the form and plug it into the database directly. Another Alternative is that we create an html page that allows administrators to add survey

questions, and use javascript to create, and link tables for answers to the database before they send the survey out to the students.

Analysis:

Both options are viable solutions to the issue stated. Using the WordPress plugins makes it simple to connect the pages together and the management of the information is made easier. When creating our own pages and connecting them, we have the option to customize them deeper and make them specific to what we are trying to accomplish with each page.

Chosen approach:

The chosen approach for this issue is to use the WordPress plugins. As stated in previous issues. The goal is to use everything that is already available to us without going to outside resources. If we determine that the given plugins work for what we are attempting to do, then we will move forward with them. If they do not solve the problem, we will move forward with an alternative.

Proving feasibility:

When it comes time to test the plugins for WordPress we will need to see that the pages link together properly and that the pages are responsive. When it comes to the administrators creating new surveys, it should be easy for them to add a new section or question for the survey. If there is not an easy way to add sections on and the page does not format properly, we will have to move forward with the custom approach where we can directly add and remove sections.

4. **The issue:**

   One of the tools in the system will be a way to take the survey results and show them in a visual display. We will need a way to visualize data as charts or graphs.

Alternatives:

There are a few solutions to this issue. The first alternative is to use the Visualizer plugin for WordPress. This plugin comes with 12 responsive and interactive charts and graphs to display data. This plugin will directly connect with the database associated with the site. Another alternative to this issue is to use Chart.js, which is a simple HTML5 based javascript chart.

Analysis:

Both of the alternatives that we have are viable options. If we decide to create the display tools on our own, we can make it specific to what we are working with and what types of graphs we want to display. On the other hand, if we decide to use the Visualizer plugin for WordPress, we will not need to create any extra code and the charts will automatically be connected to the database with the survey information.

Chosen approach:

The chosen approach at this point in time is to use the Visualizer plugin for WordPress. Using this plugin will save us time on development giving us more time to focus on the more personalized areas, for example creating the surveys and the interface for the administrators to use.

Proving feasibility:

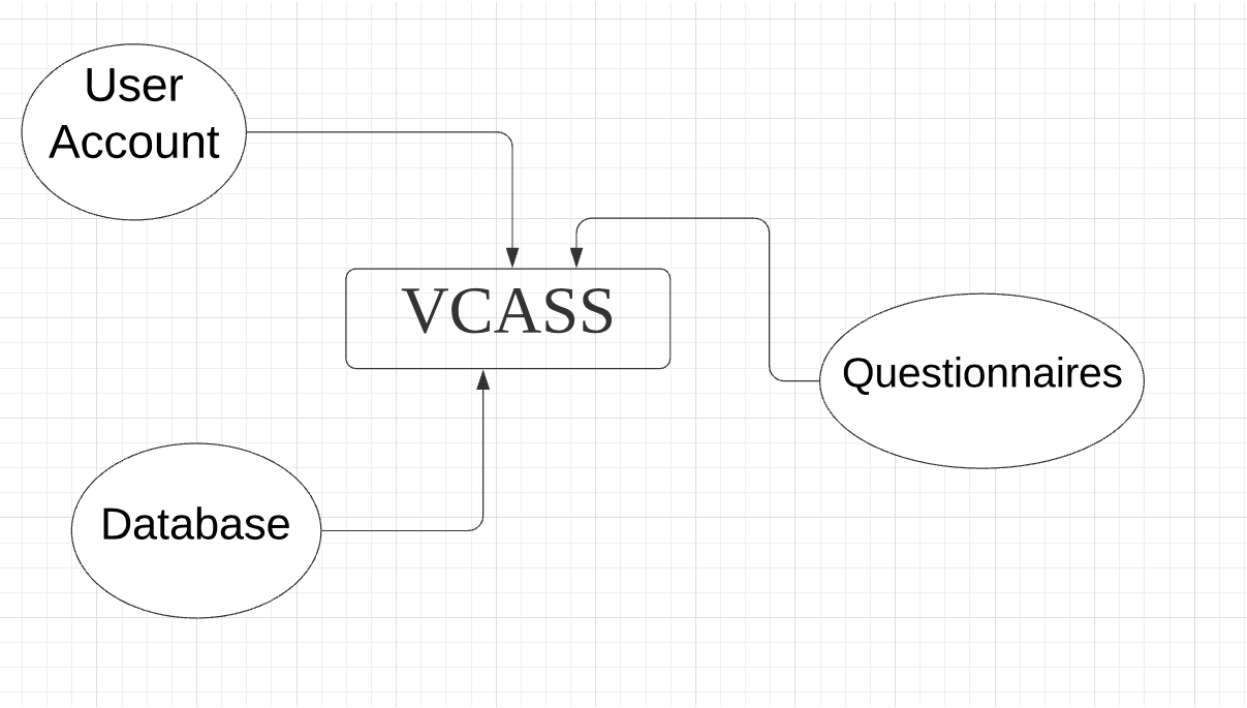
The way that we will test the built in Visualizer plugin is to create a mock list of data and make sure that the data is displayed properly and

correctly. Also, we can make sure that the visualizer is pulling the data from the proper location as well. If we come to realize that the given tool does not work the way it needs to be, we can move forward with creating our own visualization tools and make them specific for what we are trying to accomplish.

Section 4 - Technology Integration

Introduction of the technology integration

Our solution will need to filter and store the gathered information, display that information in various formats, and ensure user privacy when users submit their information. In addition, our solution should be easy to use, both by administrators wanting to analyze the collected data and by the surveyors.



Our system will consist of three main parts: the user accounts (including administrator and student accounts), the database itself, and the questionnaires. The accounts should be able to access information from the database (such as by using a database management system). Information from the questionnaires should be collected into the database, and that data should be converted into various visual aides.

Section 5 - Conclusion

Overall, our project is to create a tool that VCA will be able to use on a daily basis to stay connected with their alumni. Having this tool will help them understand if they are providing the best possible education for their students. We have gone through and analyzed the best possible options for creating this system from the front end development, the storage of data in the database, the security for the users, etc. We have analyzed the challenges we will face in implementing those options and have created plans to overcome them. The next steps moving forward will be to start looking into these challenges specifically and see if our proposed solution is feasible or not and make adjustments as needed. More challenges may arise along the way and we will have to take the same approach on them as we have for the known ones.