Software Design

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Team Success Starters

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Accepted as baseline software design for the project:

Client signature:_____ Date:___3/22/2021___

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Definitions

Administrator(s): A school administrator from VCA.

Client/Sponsor: In this document, the client or sponsor refers to Verde Christian Academy, which is whom the team is building the project for.

Editor(s): An editor is a user that is able to create and send out surveys and view results. They do not have access to change the site

MVP: Short for minimum viable product; the version of the software that meets the minimum requirements set out by the client.

Site Administrator: A site administrator is a user that has access to the entire website and can make edits to the content within the pages, manage users, etc..

Survey Respondent(s): Survey Respondents consist of people who are taking the surveys. For example: parents, current students or alumni.

Team: The team working on this project, team Success Starters.

User(s): A user is defined as any user of the site whether that be a site administrator or an editor. All users are school administrators from VCA.

VCASS: Short for Verde Christian Academy for Student Success; the software project that the team is working on.

VCA: Short for Verde Christian Academy, a private K-8 school located in Cottonwood, Arizona.

Section 1 - Introduction

Verde Christian Academy (VCA) is a private K-8 school located in Cottonwood, Arizona. VCA wants to gather information about their alumni to determine if their students are prepared 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 proposed system will allow VCA to stay connected with both current and former students. VCA is not only concerned with students' academic performance, but also with involving students in other activities such as sports, clubs, brands, student government, and study groups. In addition to activities inside the school, they also would like to encourage their students to participate in activities outside of school such as community events, support organizations, and be a part of faith related activities including youth groups service missions, music, bible study groups. VCA also wants to provide the students with the opportunity to communicate observations and insights to the VCA administration.

The team's solution is creating the Verde Christian Academy for Student Success (VCASS) system. The goal of this web system is for the administrators of the school to create and send out surveys to selected survey respondents to collect information on the status of their education. The users will then be able to pull the responses from the survey results and see if there are trends in the data that they can use to better help their students and evaluate VCA's own internal programs.

The system will collect and store the data obtained from surveys. This data will consist of emails, names, and other information collected from students or alumni for user accounts. There will also be feedback collected about how the school is functioning. All feedback-specific surveys will have the option to be confidential, which should facilitate more honest and useful feedback. The system will then use the data collected from surveys to generate graphs or charts, allowing for easy viewing and understanding of collected data.

The team believes that this solution is sufficient to solve the client's problem, as it both integrates with the sponsor's current website and implements a survey management system. The team have browsed other options for database hosting, but do not believe that there are any noticeable benefits to outweigh the costs it would incur. If the software is successful, it might become a template for other schools who want better ways to get and analyze student or alumni feedback. Overall, the system will make it easier for the sponsor to get feedback from students and alumni.

Section 2 - Implementation Overview

VCASS is a web portal that will enable the school administrators to create surveys, distribute surveys to students, and see survey results. The system will be implemented on a part of the school's website through Wordpress, which is what the existing school website is built on. The majority of the system will be implemented through WordPress pages and WPForms plugin to make up the application and the surveys. Additionally, the team will use PHP code snippets to retrieve and display data from the database to the results page. More plugins or languages could be used if the team discovers any that would further contribute to the project.

In implementation of the system, there will be a redirect on the school's main website that will take the users to VCASS where they are able to then sign in and register. The system access will be restricted to administrators only. There will be two types of users, editors and site administrators. An editor can create a custom survey, distribute an existing survey, or see results from previously answered surveys. In addition to all of the editor user privileges, the site administrator has the ability to add new users, approve new registrations for users, and remove users from the system.

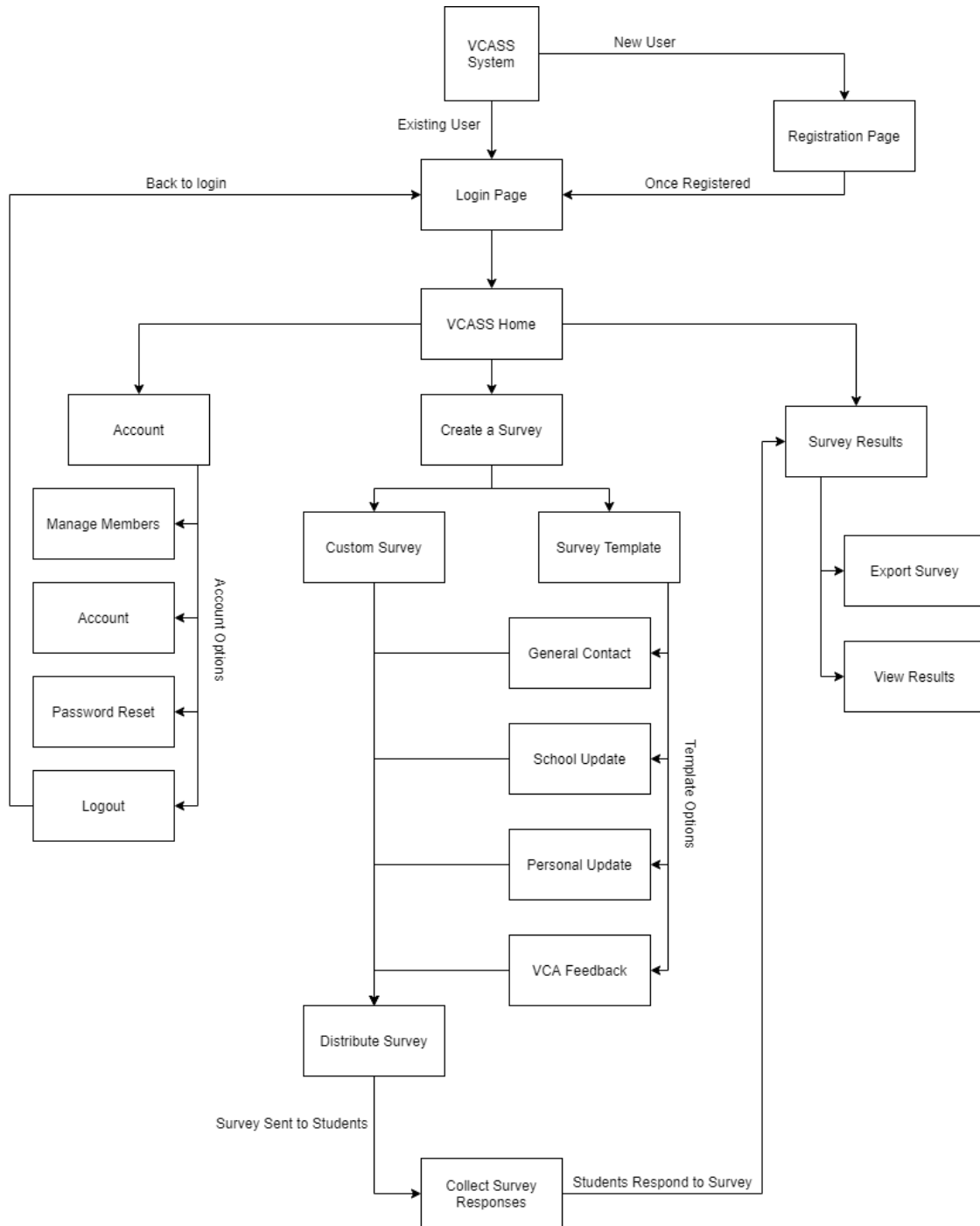# Section 3 - Architectural Overview

Figure 3.1: This figure above is the architectural overview for VCASS. The diagram gives a high level overview of each main component of the system-

In order to go about implementing the system, there needs to be an explicit overview of what needs to be implemented. The VCASS architecture diagram (Figure 3.1) shows the high level architecture of the proposed VCASS system. When first visiting VCASS the first two steps for a user are going to be either sign in (if they already have an account) or to register for an account. Once the user has an account created and has access to the system then they can proceed forward. There are three main areas within the VCASS system: account, create a survey, and survey results.

The first component is the "Account" tab. This area is where users can edit and change their account information. For example their name, email, password, etc. Part of this section is also where the main administrators can view the other members of the system to keep track of who has access, etc. The last piece of this component is the logout function where users can log out of VCASS, which will bring them back to the main landing page to sign in or register.

The next main component of the system is the "Create a Survey" tab. This is the part where users will be able to go in and create surveys for distribution. There are two main subcomponents of the create a survey section, the option to create a custom survey and the option to use a template for a previously created survey. The custom survey piece is where users can go in and create a new survey for distribution to survey respondents. The second piece, the survey templates, is where users can go and send out previous surveys that have been created instead of creating a new survey each individual time. Both of these sub components come back together with the distribution tool to send out a survey to the respondents, once the user is ready to do so.

The final main component of the system is the "Survey Results" tab. The section is where administrators will be able to go in and view the results of the surveys that have been sent out, export the results into a file as well as visualize the results from a specific survey. As a survey is sent out, the results from respondents are sent directly to the database of the system, which is then updated within this tab.

To get a better understanding of how these systems should be implemented, the modules will need to be expanded upon in greater detail. The following section will describe the major components of the system in terms of user interface and backend functionality.

Section 4 - Module and Interface Descriptions
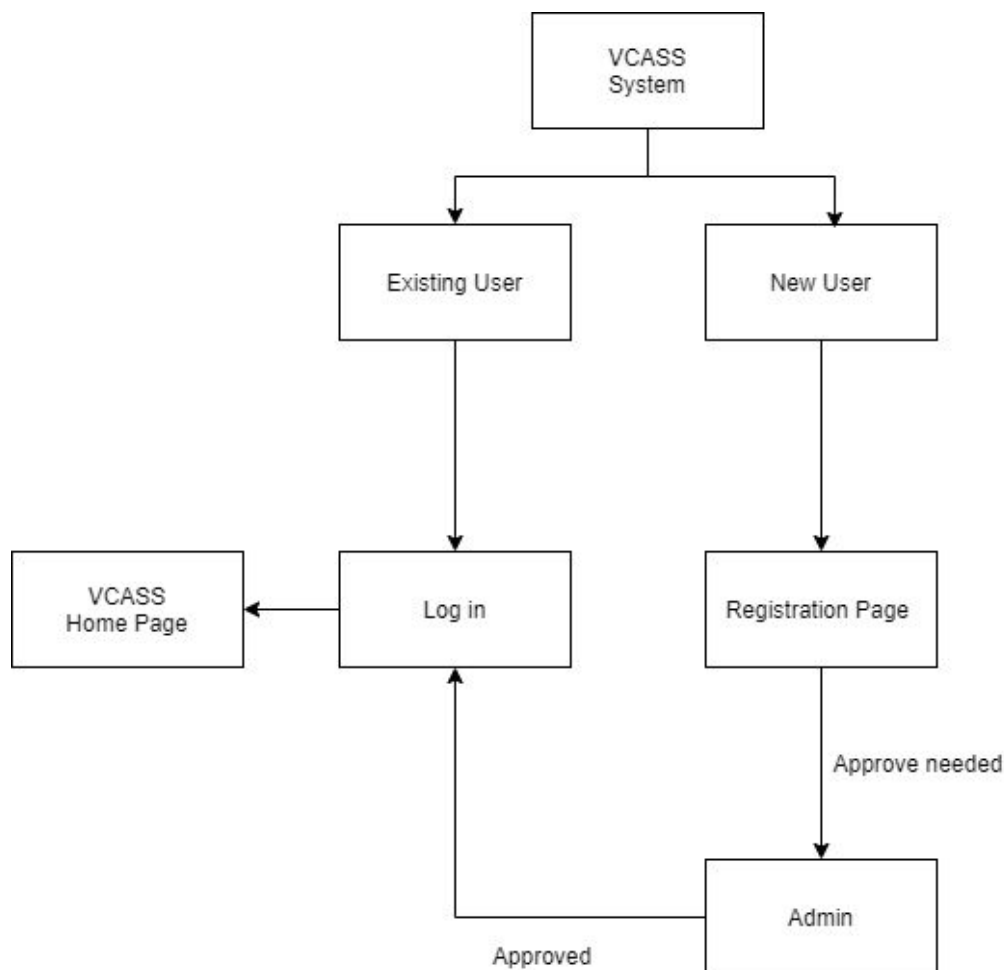
4.1 User Login Component

Figure 4.1: This figure above shows the architecture of the user login component. The login component is the first component of the system that a user interacts with.

a. This component is responsible for managing access to the system, to ensure security and privacy of respondents' information. The access to the system is restricted to school administrators, so each new user needs to be approved by the site administrator of VCASS, which ensures that no unauthorized access is allowed.

b. The system will have a site administrator that has the ability to add, approve, and remove user accounts. For other administrators to have access to the system, they need to register first, and then the site administrator will be able to approve or deny the access of the newly created account. The process for logging in and registering is shown in the architecture diagram above (Figure 4.1)

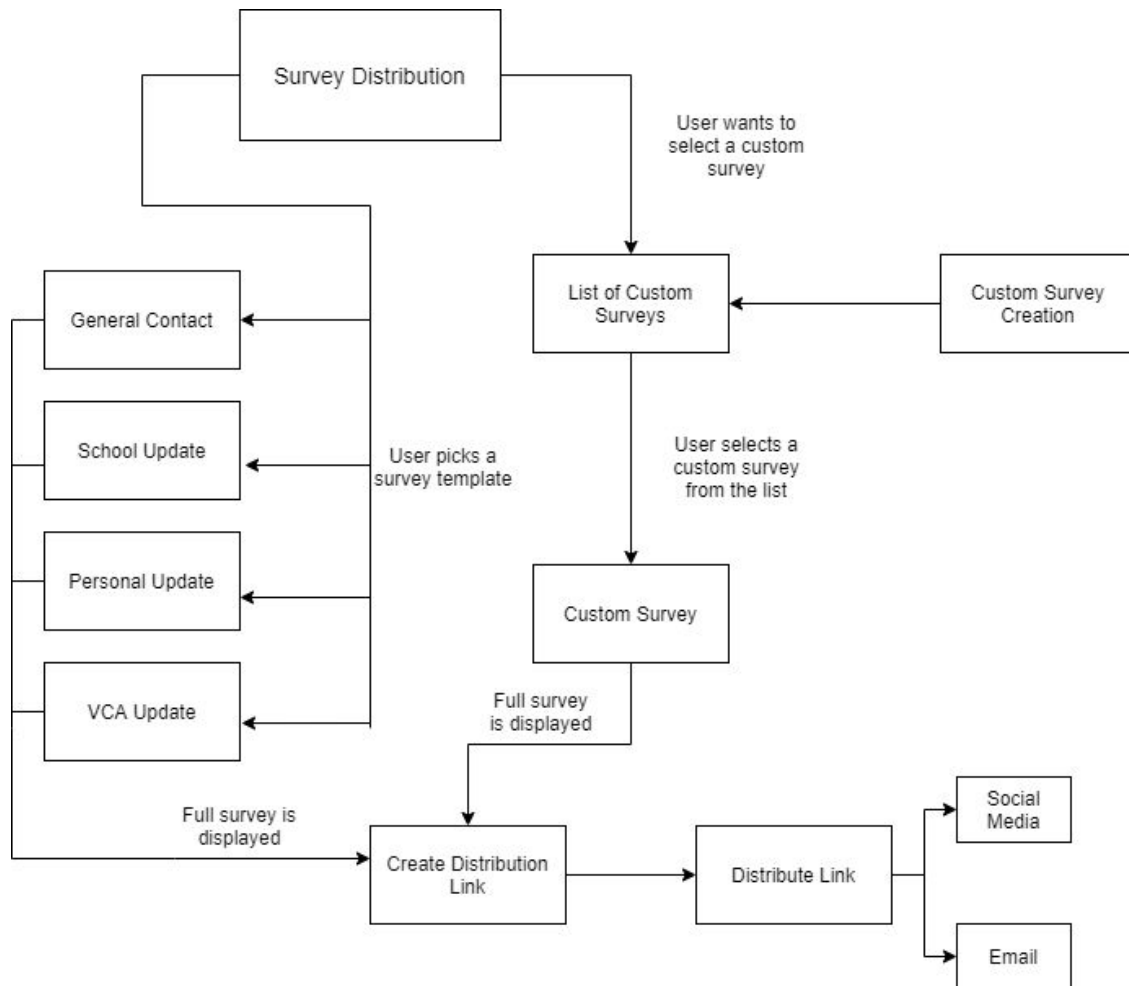## 4.2 Survey Creation and Distribution Component

Figure 4.2: This figure above shows the architecture of the survey component. The survey creation component is where a user will go to create and send out a survey.

a. This component is responsible for how the user interacts with and distributes surveys. As the surveys are the main component of the system, other components exist to facilitate interactions with the surveys. This component is chiefly responsible for allowing a user to create custom surveys, allowing the user to view previously created surveys, and for allowing the user to distribute surveys.

b. When a user wants to distribute a survey, they will be given the option between a survey template and a list of custom surveys. The list of custom surveys is gathered from surveys that users had previously created. Once a survey has been selected, the survey is displayed in full. The user is then given an option to distribute the survey, as well as the option to send out that link through a variety of means. The process for creation and distribution of a survey is shown in the architecture diagram above (Figure 4.2).
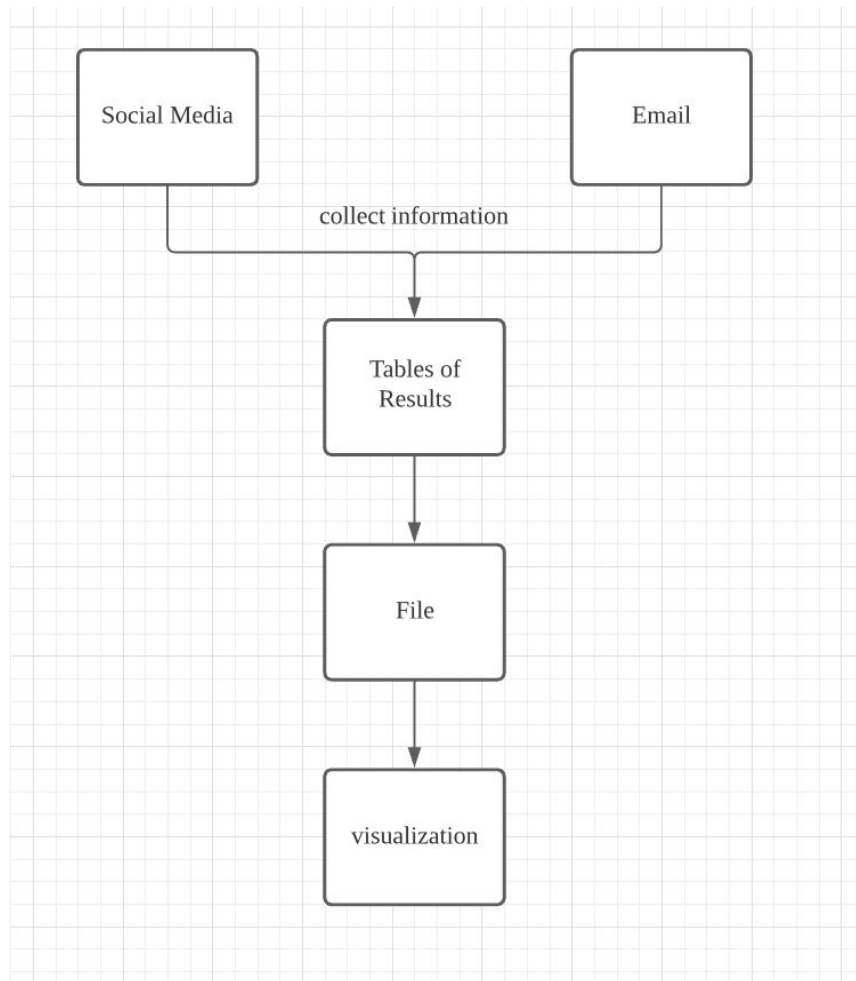
4.3 Survey Results Component

Figure 4.3: This figure above shows the architecture of the survey results component. The survey results component is where a user will go to see the responses from surveys.

a. This component is responsible for displaying the analysis of the data. The survey results are the main components of the system. This component is mainly responsible for analyzing survey data and presenting it with clear charts or graphs.

b. When the administrators distributes a large number of survey forms and obtains effective data, the system automatically displays tables containing the survey results, and generates an Excel form, and then the data is imported to form a visualization (such as a chart or graph) that the user can view. The process for viewing the survey results in is shown in the architecture diagram above (Figure 4.3)
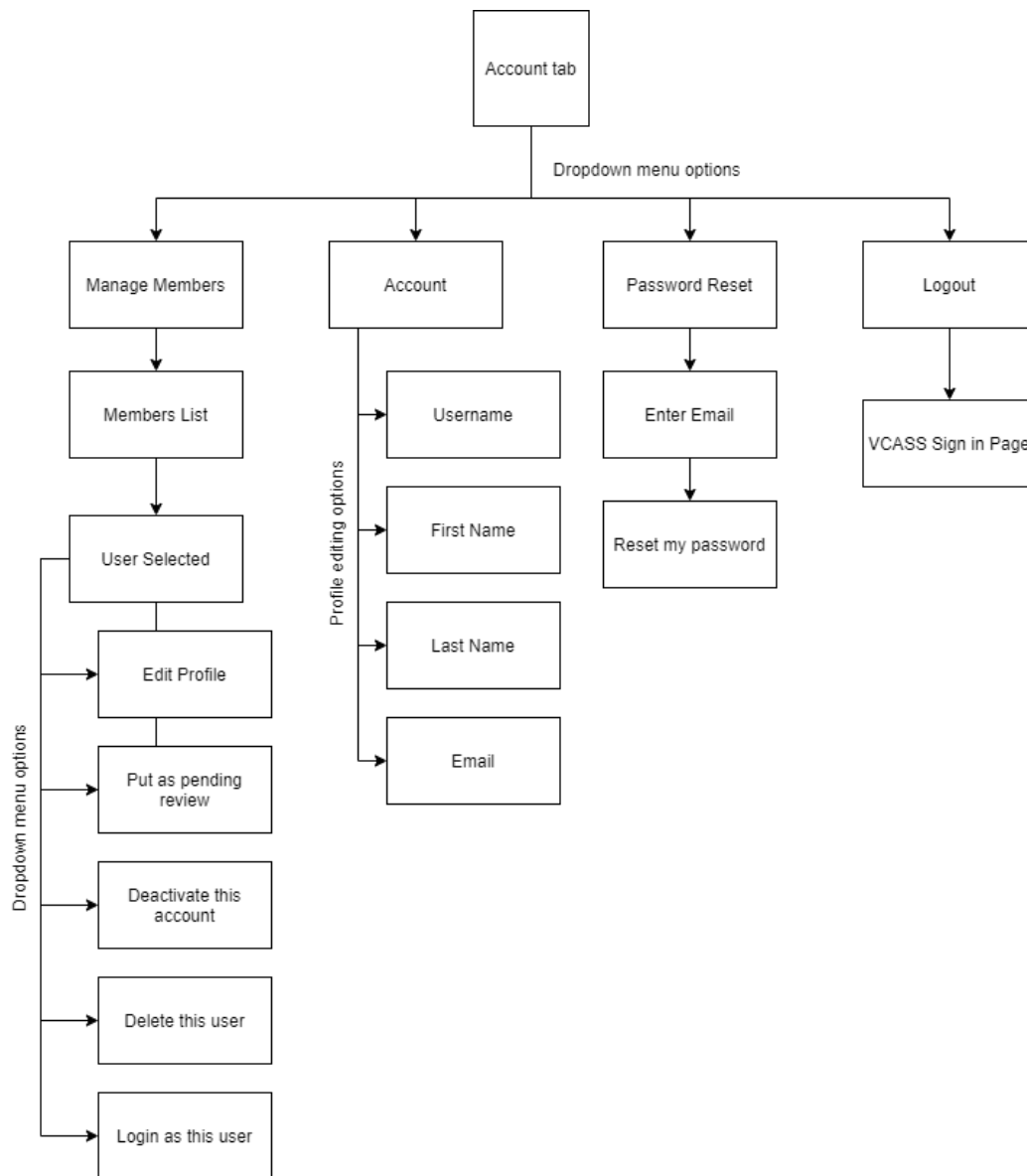
4.4 User Accounts Component

Figure 4.3: This figure above shows the architecture of the user account component. This is where a user will go to manage everything associated with their account.

a. This component is responsible for how the user interacts with their account. This is where the main administrators of the site (site administrator) will be able to manage the other users of the site as well. If a user is not an administrator for the site, they will not have access to that component. The main functionality of this component is to give the user the ability to change their email, reset their password, etc.

b. When a user decides that they want to manage their account they will be given a drop down menu with different options. The options are manage members, account, password reset and logout. The manage members option is there for the site administrator to view what accounts have access to the site and manage those accounts. The site administrator can edit, put as pending, deactivate, delete and login as that account. The second option is the account option. From here, the user can edit their username, first name, last name and email address for their account. The third option is the password reset page where the user can go and submit a request to reset their password through their email. The last option is to logout of the system and return back to the login page. The process for a user to manage their account in is shown in the architecture diagram above (Figure 4.4)

Section 5 - Implementation Plan

Figure 5.1: This figure above shows the Gantt chart that represents the project. The team divided the project into seven distinct sections, known as epics. Each epic has a time frame dedicated to working on it, shown with the purple bars.
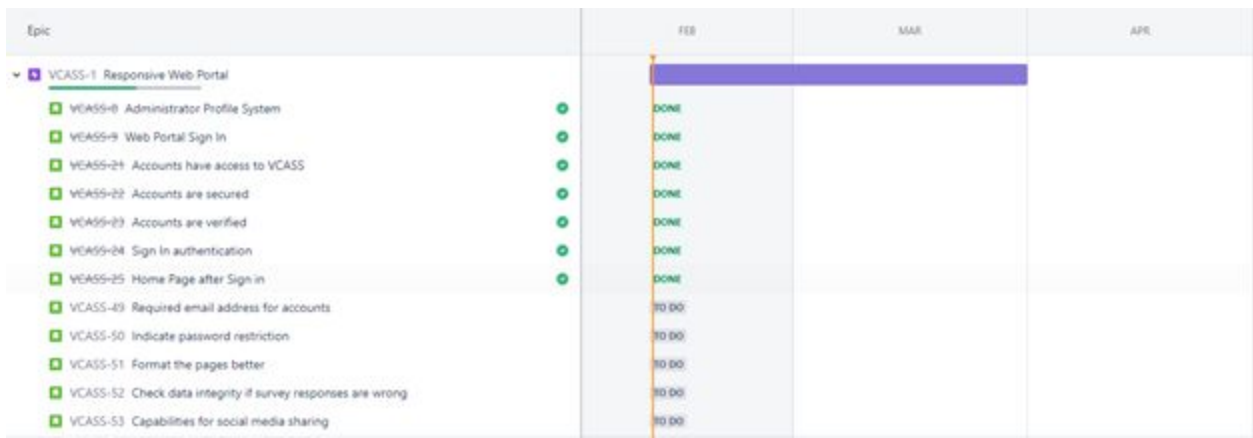

Figure 5.2: This figure above shows the first epic expanded, which concerns the web portal for the website application.
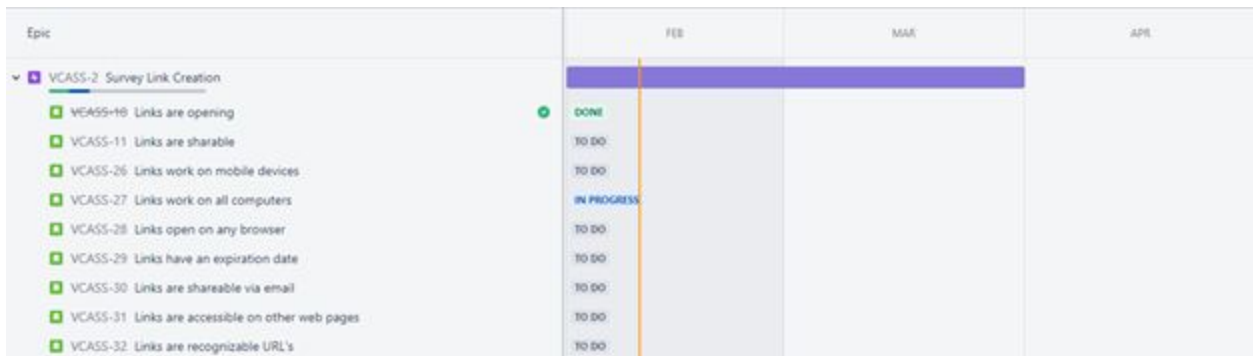
Figure 5.3: The figure above shows the second epic expanded, which concerns the creation of survey links.
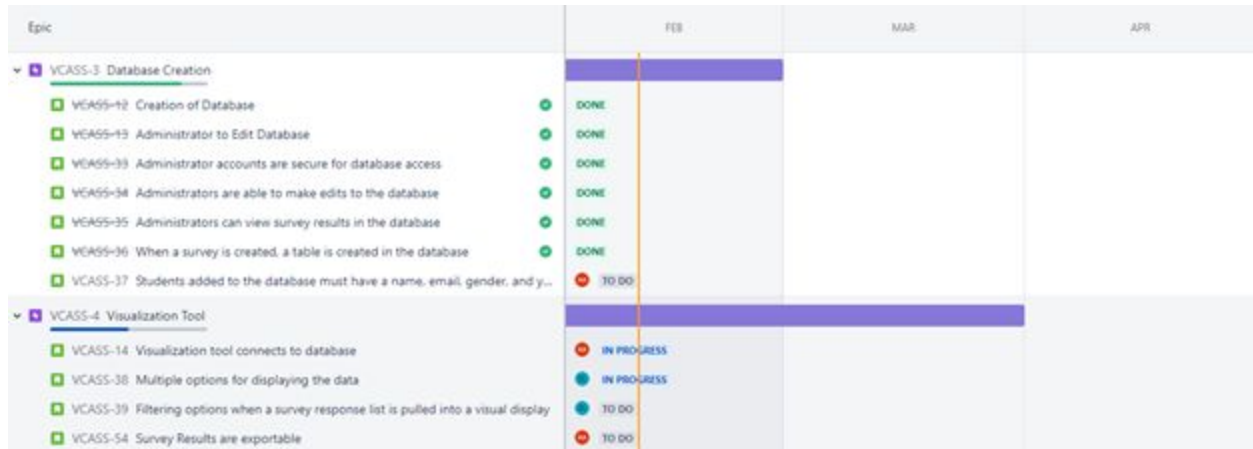

Figure 5.4: The figure above shows epics three and four. Epic three concerns database creation and accessibility, while epic four concerns the visualization of the collected data.
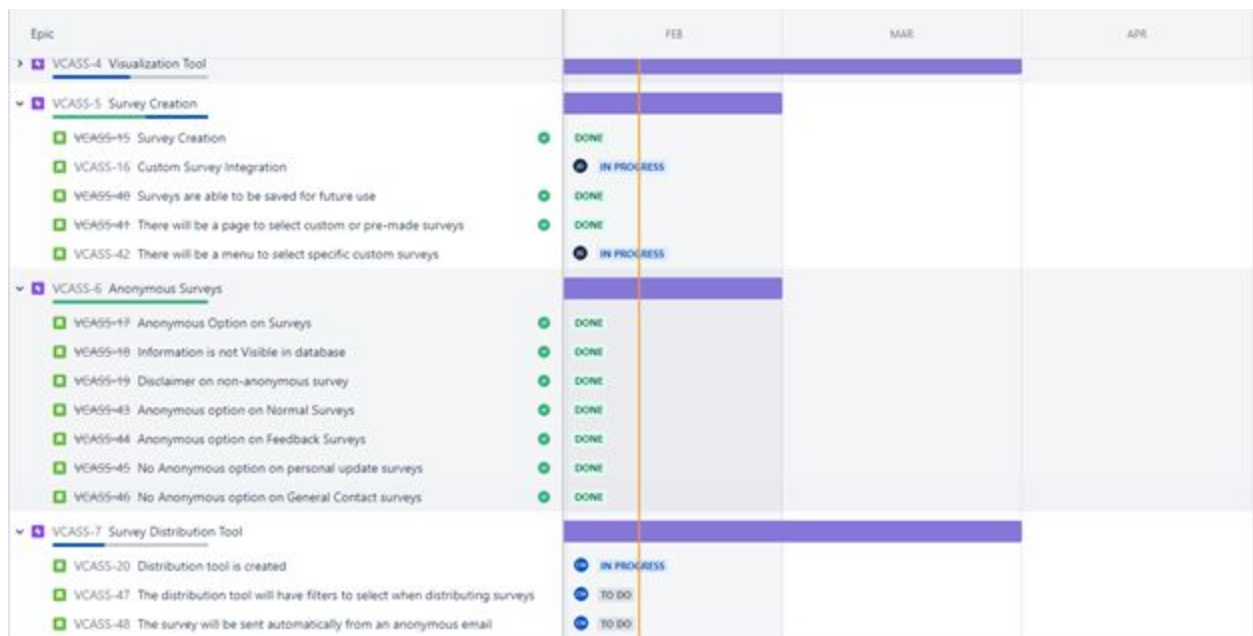

Figure 5.5: The figure above shows the expanded epics five, six, and seven. Epic five concerns the ability to create and access surveys. Epic six concerns aspects of surveys, mostly centered around the ability for survey respondents to remain anonymous. Epic seven concerns tools for distributing surveys.

Now that the systems have been described in detail, a plan for implementing these systems can be laid out. The Gantt chart (Figure 5.1) shows the key milestones that are left to complete for the project. The current plan for implementation involves first focusing on the elements that would make a minimum viable product, also known as an MVP. The team's work involves taking the framework created for the fall 2020 tech demo and refining it in order to make an MVP that is satisfactory to the client. After the MVP is achieved, the team will work on adding functionality and features beyond the scope of the MVP.

The Survey Visualization epic (Figure 5.4) is the first critical aspect of the MVP. The Survey Visualization concerns the ability for users to view the results from sent-out surveys. The team expects partial functionality by the end of February (in time for the design review presentation), with full functionality at the end of March. The implementation of this epic is being handled by two members: Abdulaziz Alfort and Zhicen Liu. Abdulaziz is focusing on connecting the visualization tools to the database (which will involve refining the database storage, seen in epic 3 in Figure 5.4), as well as the ability to export collected data as an excel file. Zhicen is focusing on the visualization tools that will be found within the VCASS website, which would include being able to view survey data as charts or graphs, as well as the ability to select filter options when pulling visual data from a survey.

The Survey Creation epic is yet another important aspect (Figure 5.5) of the MVP. The Survey Creation involves the ability for users to create custom surveys, and to view/interact with previously made surveys. The current plan is to have full functionality by the end of February, but the team should have time in March to work on it more if needed. The implementation of this epic is being handled by Joshua Geyer. Joshua is focusing on the aspects of this epic that are currently incomplete, which include the option for users to create custom surveys, and the option to select one of the custom-made surveys when a user wishes to view the surveys.

The last critical element of the MVP is the Survey Distribution Tool (Figure 5.5). The Survey Distribution involves the ability for users to send out surveys to a variety of people using a variety of platforms. The team hopes to have partial functionality by the end of February, with full functionality by the end of March. The implementation of this epic is being handled by Carter Wrobel. Carter is focusing on all aspects of the Survey Distribution tool, such as the ability for users to filter who the surveys are being distributed to, as well as automatically distributing links from an anonymous email.

Once work is done on these epics critical to the MVP, the team can turn their attention to completing non-functional requirements, such as the yet uncompleted parts from the Responsive Web Portal epic (Figure 5.2) or the Survey Link Creation epic (Figure 5.3). The team will delegate parts of the non-functional epics to the team members once work is finished on the currently-assigned epics.

Section 6 - Conclusion

The project the team is working on is called Verde Christian Academy Student Success system, or VCASS for short. It is an information collection and analysis system, which will be used to help Verde Christian Academy obtain alumni information and statistically analyze the recent situation of alumni. The system will help school administrators to provide questionnaires to survey respondents. Administrators will then use the system to analyze the information and generate intuitive results analysis charts.

The document gives the team a clear understanding of how to proceed with implementing the software. After careful study, the team has elaborated the implementation specifications of the software through this manuscript. First of all, there is a preliminary definition of the project, a detailed overview of the project, and a description of the implementation plan and technical preview of the whole project. In the module and interface description part, the document explains the four key components of the system. In the implementation plan, the team has made specific plans for the implementation of the system components. Under the guidance of these detailed specifications, the team believes in the success of this project.