Software Requirements Specification

for

BSM ReachAll

Version 1.0 approved

Prepared by Hayden Marshall, Justin Centilli,

Richard Olivarri, and Cole Trammell

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Table of Contents

Revision History

Name	Date	Reason For Changes	Version

1. Introduction

1.1 Purpose

The SHSU Baptist Student Ministry (BSM) is a non-profit organization on located on the campus of SHSU and aims to be a blessing and serve the campus community. One of the ways the BSM does this is by performing Spiritual Surveys, in which they spend time getting to know the students and faculty on campus and get to know them better. For years, this was done by hand on pen and paper. The BSM Director, however, was looking for a way to improve this process and streamline the effort. The goal of the app was to not only provide the BSM with necessary functions, such as performing and submitting a survey, but also offer other added benefits, such as statistical analysis and the ability to quickly view past surveys. This is the purpose of the mobile application BSM ReachAll.

1.2 Document Conventions

This document makes use of the Times New Roman font throughout the entirety of the document. Major chapters of the document are in bold 18 font. Subchapters are in bold 14 font. Every other part of the document is italicized 11-pt font. Page numbers in the header pertain to the table of contents at the beginning of the document.

Throughout the document, you will find some acronyms, which include BSM, which stands for Baptist Student Ministry, and TXBSM, which stands for Texas Baptist Student Ministry, and is the head organization over other Baptist Student Ministries. SHSU stands for Sam Houston State University. If there is any other terms or acronyms unknown to the reader, a glossary can be found at the end of this document.

1.3 Intended Audience and Reading Suggestions

This document is provided for the Baptist Student Ministry to understand the software and how to use it, as well as for any future software developers that would work with this software in the future. The rest of this document includes the scope of the project, a description of the software to be provided, and the features included with the software. It is recommended to read from beginning to end to get a full idea of the background, design, and implementation of the software.

1.4 Product Scope

The software is, first and foremost, a survey app. It allows the user to begin a new survey to fill in information while they ask the survey subject questions. Once the surveyor is done, they can submit the survey and the answers to the database. There is also an admin view available, where one can view the results from past surveys, sort based on demographics, and view statistics based on information stored in the database. The goal of the software is to create a convenient means for BSM staff and volunteers to store and view the results of survey and follow up data, as opposed to the inefficient usage of paper and manual data entry in excel spreadsheets.

1.5 References

- *TXBSM: https://www.txbsm.org/*
- *Dart: https://dart.dev/*
- *Flutter: https://flutter.dev/*
- *Firebase: https://firebase.google.com/*

2. Overall Description

2.1 Product Perspective

This project is brand-new software for the SHSU BSM. With this background, the project will be built from the ground up with the potential to be used by TXBSM statewide. The software was conceptualized because a couple members of the team attend the BSM on the SHSU campus, and after speaking with the team, they all wanted to provide a more efficient service to the director.

The Front-End for the end user will be implemented in the form of a mobile application that will be available via Android/IOS. This application will enable surveyors (users) to collect surveys on their own mobile device and enable the SHSU BSM to automate the population of survey data in a Firebase database.

The Front-End for the administrative user (director of BSM) will be implemented in the form of a web application. This application will enable the administrative user to analyze or manipulate data and make inferences based on data received.

The Front-End for both applications (Mobile and Web) will rely upon the backend which will take the form of a Firebase database. The Firebase server will be utilized to store survey data of end users and be analyzed by administrative users. Refer to Figure_1 down below for a diagram of development.

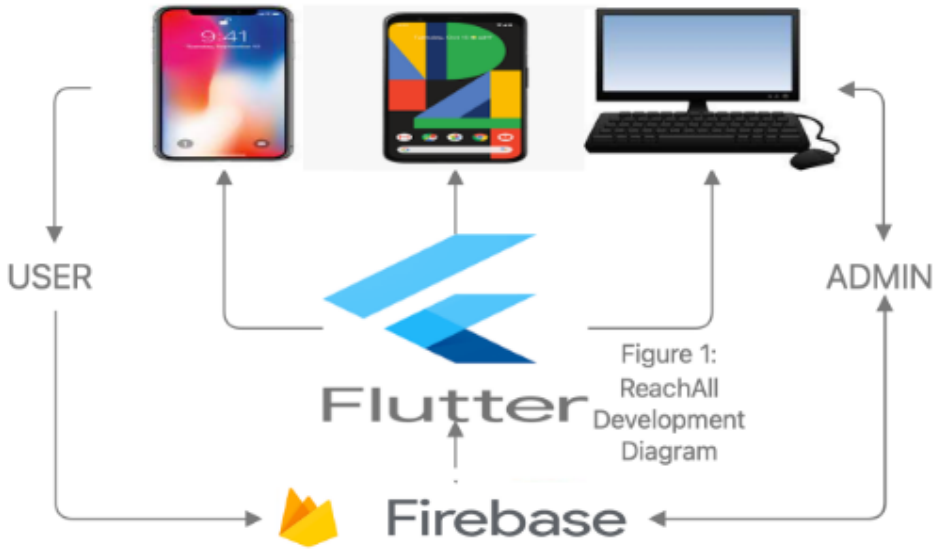


Figure 1: ReachAll Development Diagram

2.2 Product Functions

The software includes several key functions as stated down below:

- *Users will be able to input survey data for those who decide to take the survey.*
- *User must have a login created as a form of connectivity with the backend system.*
- *Users must be able to view their past surveys and follow ups completed.*
- *Admin must be able to analyze and examine data as seen fit.*
- *The product must be able to collect survey data and successfully store data in a Firebase database.*
- *The product must be able to display survey data in a presentable manner to the admin-user for data analysis and inference.*
- *Admin must be able to authorize users in a closed system to maintain security and integrity of the app and its data.*

2.3 User Classes and Characteristics

There are two main user classes, users and admins, that will utilize this software.

The user, the surveyor, will be making use of the front-end mobile application to conduct and submit surveys. They are college students without much experience of conducting surveys, although the front-end interface system should be rather straightforward in assisting the users with its functionality. The users will also be able to view their surveys after they are completed.

The admin, the BSM director, will be making use of a front-end web application to access the backend portion of BSM ReachAll. They are always educated with a degree of some kind, and lots of experience with surveys, but perhaps not much experience with statistics. Functionality may require a little knowledge regarding Firebase databases to provide statistics to the admin user.

2.4 Operating Environment

BSM ReachAll will be utilized on college campuses as both a mobile and web application depending upon the user class.

The mobile application will support IOS/Android systems, while the web application will support most popular web browsers such as Chrome, Safari, Firefox, etc.

Refer to Figure 2 down below for Operating Environment Diagram.

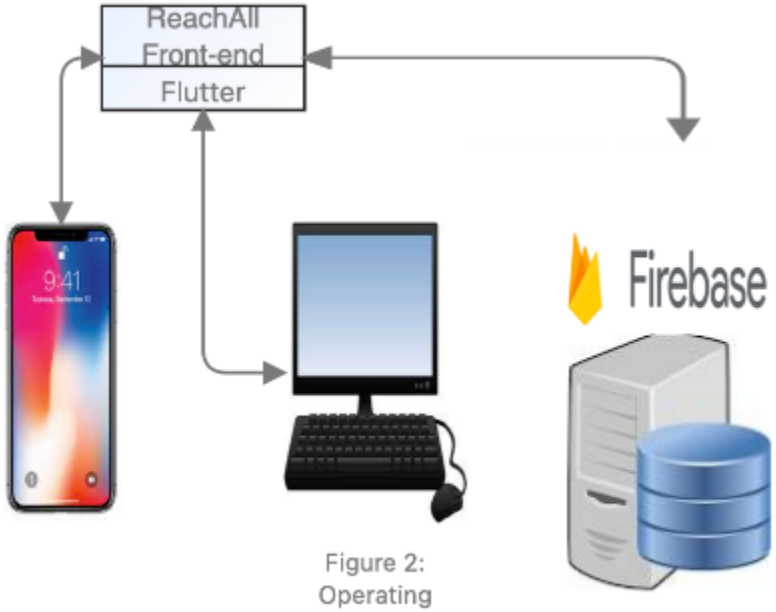


Figure 2: Operating Env. Diagram

2.5 Design and Implementation Constraints

Design Constraints:

- *Language: Dart (Mobile and Web Application Support)*
- *Database: Firebase*
- *IDE: Flutter*

Implementation Constraints:

- *Must be able to differentiate between user and admin classes*
- *Classes must be able to authenticate/login for access to Firebase functions*
- *Firebase must be used to integrate Flutter with Firebase databases and functions*
- *Must run on IOS/Android and most popular web browsers*
- *Must use Firebase API for accessing Firebase Database*

2.6 User Documentation

Objectively, documentation will explain all functionality regarding user classes and setup. There will be a step-by-step process regarding setup for user classes and usage of the application associated. Diagrams will be included to help explain application processes.

2.7 Assumptions and Dependencies

- *Assume knowledge regarding one's own user class and operations associated*
- *Assume user classes have access to an internet connection*
- *Assume surveyor has access to a mobile phone/tablet*
- *Assume admin has access to web browser that supports web applications*
- *Depend on proper integration between Flutter (Dart), and Firebase*
- *Depend on Firebase being always functional*

3. External Interface Requirements

3.1 User Interfaces

The home page will be in the form of a Login Page as shown below in Figure 3. All user classes will be assigned a Username and Password in association with their user class. Once a user logs in and their user class has been identified, the user will be redirected to their respective page for app functionality.

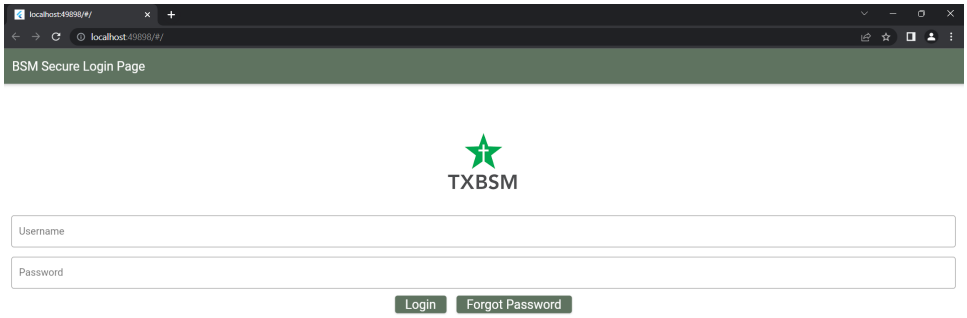


Figure 3

The user interface will be accessed upon a successful login. Functionality of the user class will include options as listed below in case of all possible outcomes when using the BSM ReachAll application:

- *Start a new survey*
- *View Past Surveys*
- *View Statistics on Surveys*
- *Logout (top right corner)*
- *Change password (under menu in top left corner)*

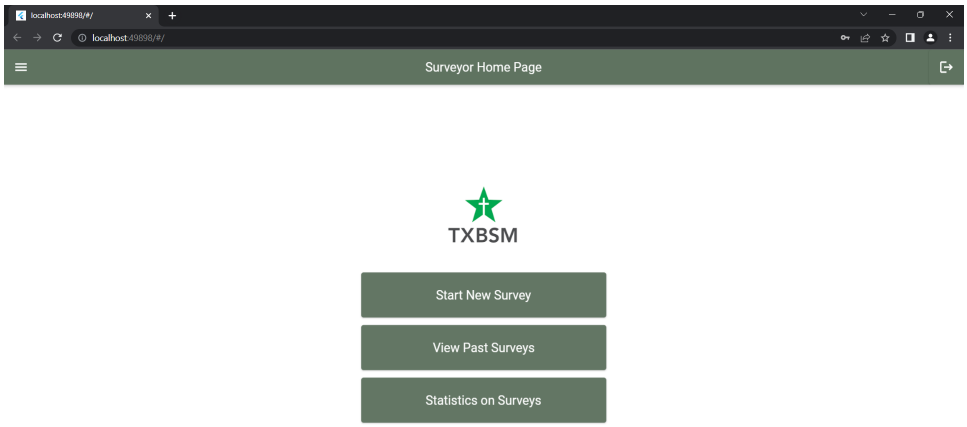


Figure 4

When the option is chosen to "Start New Survey", the user will be accommodated with a survey form that will be filled out in the format of Personal Information and Spiritual Information questions as shown below in Figure 5 and Figure 6. The Personal Information section will ask questions related to demographics, while the second portion of the survey will focus on open-response questions, titled "Spiritual Information." When the survey is completed, a "Submit Survey" button will be available to confirm a survey and populate the Firebase database. Questions may be left blank if the person surveyed decides not to answer.

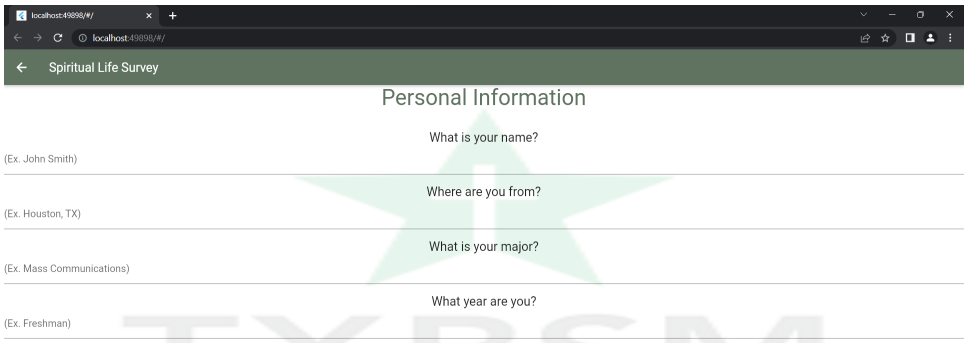


Figure 5

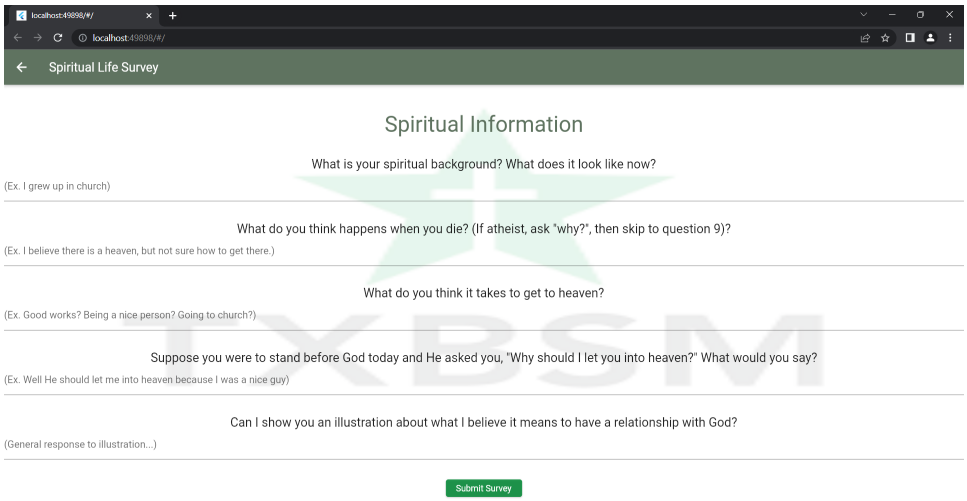


Figure 6

Once a survey has been submitted to the database, the user will be able to view this information in the app in the View Surveys section. There, the user can view personal information (under Fixed-Response) and Spiritual Information (under Open-Response), as well as access the ability to start a follow up and view past follow ups. See Figure 7 and Figure 8 below.

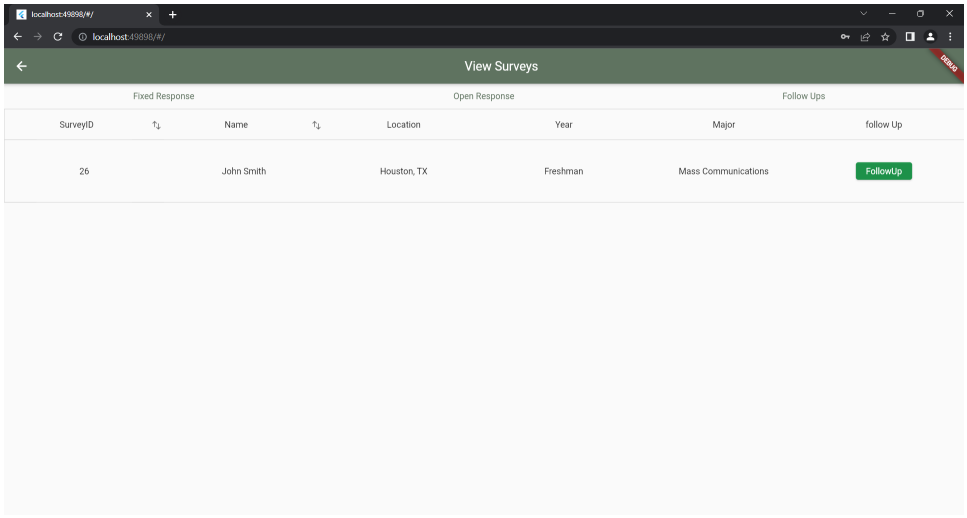


Figure 7

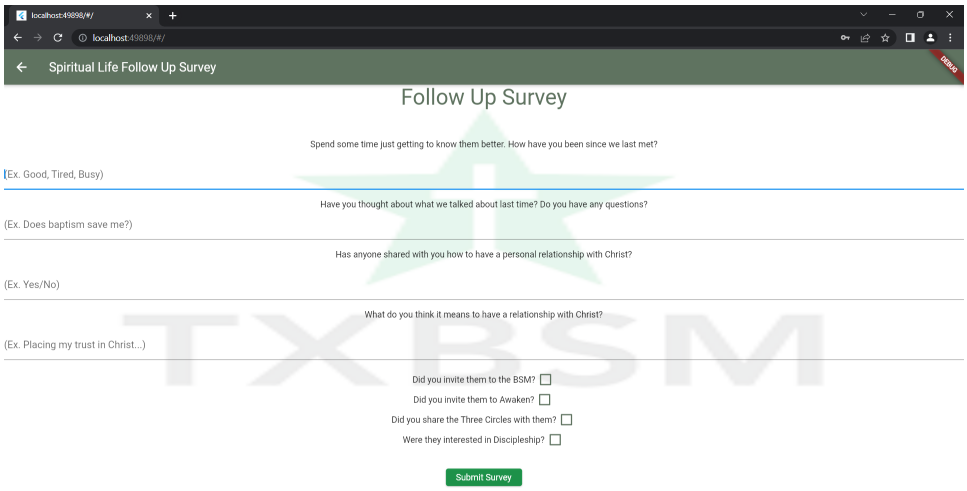


Figure 8

The user also has access to view statistics based on their surveys. This considers regular and follow ups surveys and is displayed in Figure 9.

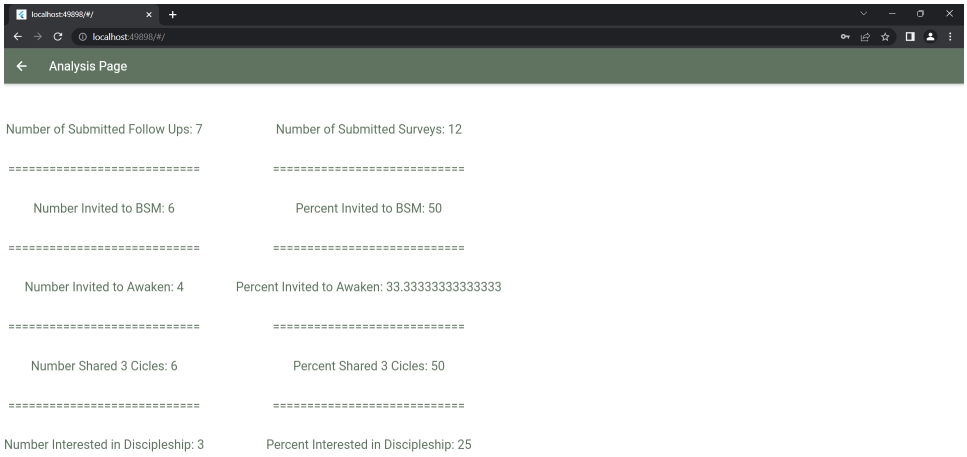


Figure 9

Finally, the user the access to change their password. In the event of needing to select "Forgot Password" on login, the user will receive a temporary password. When they login, they can select this option and reset their password to whatever it is they desire.

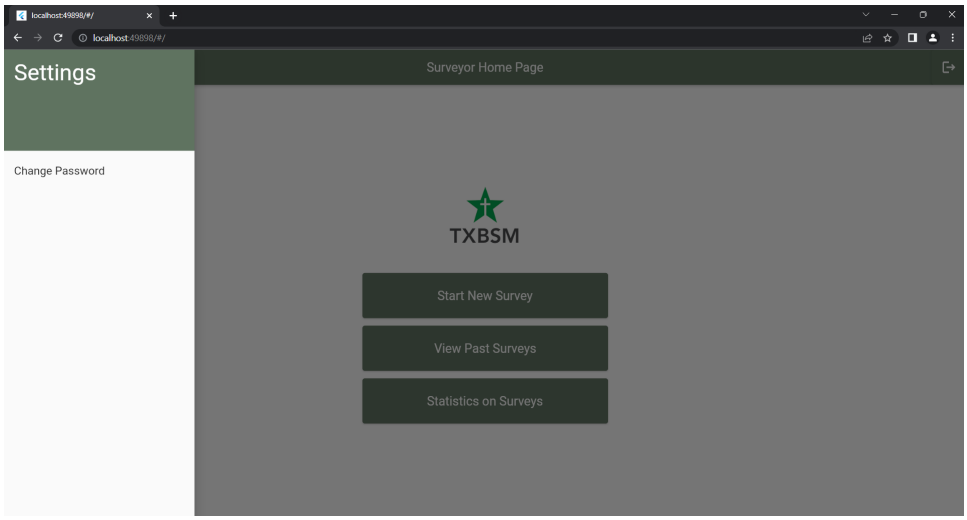


Figure 10

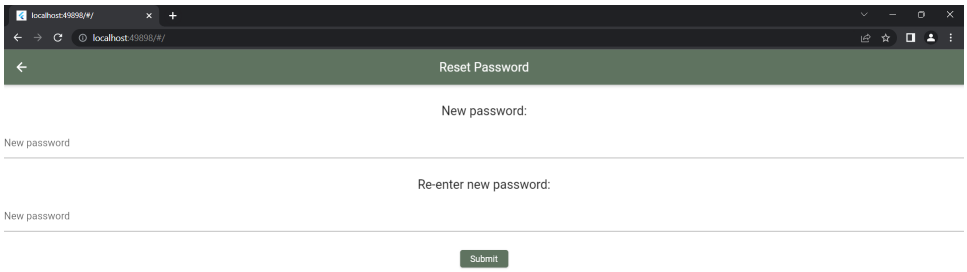


Figure 11

The admin class interface will be accessed upon a successful admin login. A visual example of the admin interface can be seen in Figure 12 down below. Functionality of the admin class will inherit all functionality of the user class, as well as functions listed below:

- *Access Fixed-Response Survey Data (See Figure 8)*
- *Access Open-Response Survey Data (See Figure 9)*
- *Add/Remove user class login credentials (See Figure 10)*

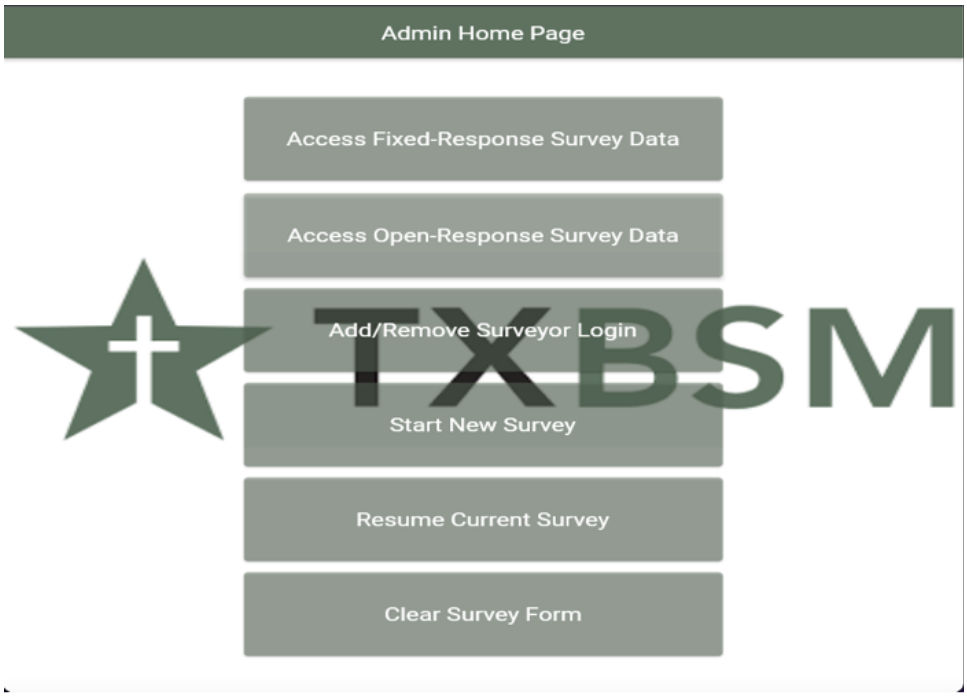


Figure 7

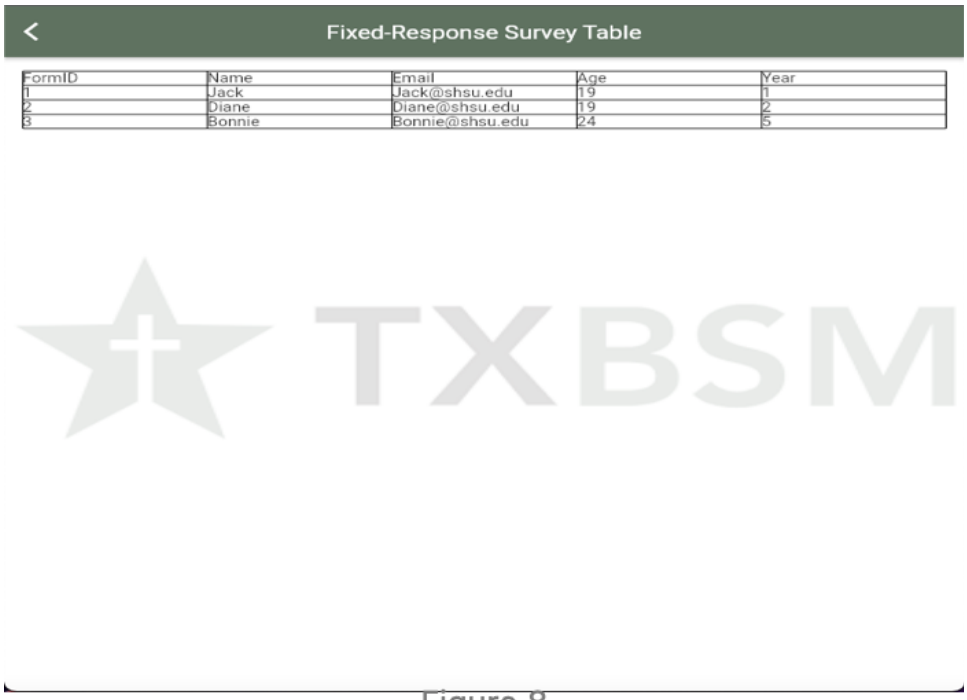
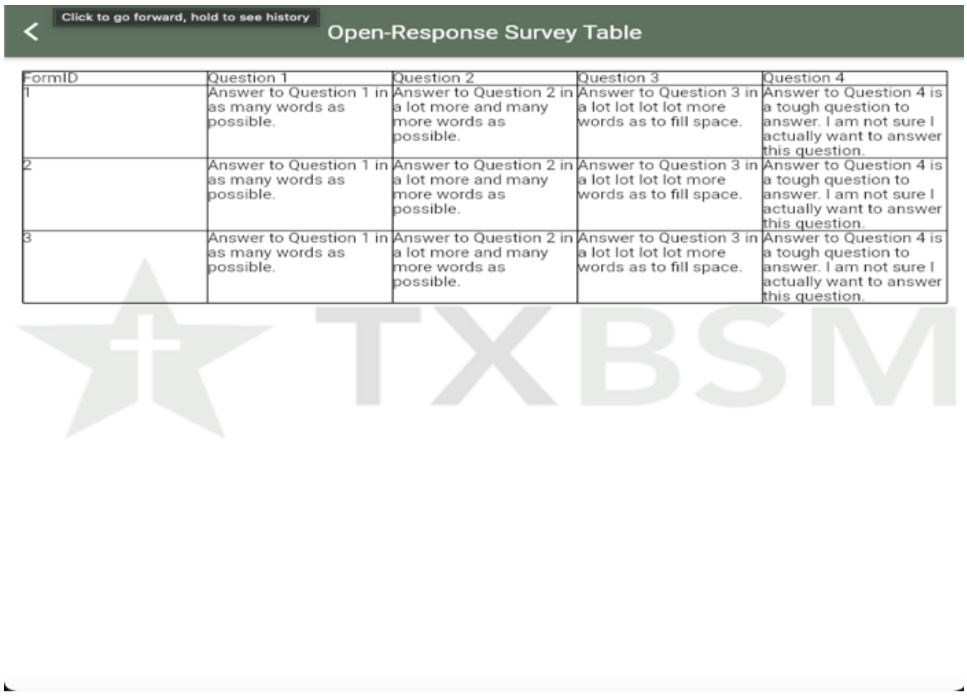


Figure 8



FormID	Question 1	Question 2	Question 3	Question 4
1	Answer to Question 1 in as many words as possible.	Answer to Question 2 in a lot more and many more words as possible.	Answer to Question 3 in a lot lot lot lot more words as to fill space.	Answer to Question 4 is a tough question to answer. I am not sure I actually want to answer this question.
2	Answer to Question 1 in as many words as possible.	Answer to Question 2 in a lot more and many more words as possible.	Answer to Question 3 in a lot lot lot lot more words as to fill space.	Answer to Question 4 is a tough question to answer. I am not sure I actually want to answer this question.
3	Answer to Question 1 in as many words as possible.	Answer to Question 2 in a lot more and many more words as possible.	Answer to Question 3 in a lot lot lot lot more words as to fill space.	Answer to Question 4 is a tough question to answer. I am not sure I actually want to answer this question.

Figure 9

3.2 Hardware Interfaces

The application will be compatible with most modern smartphones, both Android and iOS devices, and will be compatible with most web browsers. The only requirement that must be satisfied for a user to use our software is for them to have enough storage on their device to download the app. Data from the surveys will not be stored locally to the surveyor's smartphone, rather, it will be stored on separate dedicated servers.

3.3 Software Interfaces

- *Interface to interact with Firebase Database.*
  - *Requires Android/IOS/Windows/MacOS Device*
  - *Survey data will be impossible to collect without an intuitive UI for data entry.*
- *Firebase API*
  - *Without the Firebase API, there will be no cloud to receive survey data on the backend*
- *Windows/MacOs/Linux for access to a web browser*
  - *This is only required for admin users who wish to access the firebase database on the web*

3.4 Communications Interfaces

- *SMTP Server for Email Communication to those who wanted further communication via survey.*
- *HTTPS will be used to access the Web Application hosted on the Firebase Server*
  - *All communications with firebase are encrypted with the AES-256 cipher*
- *Communication will assume to only be hindered by users own internet connection to the Firebase Server*
  - *Assumes the Firebase server never goes down*

4. System Features

4.1 Login/Account Creation

4.1.1 Description and Priority

This feature is a secure login system that will have each user login with a username and password linked to their email. All the accounts will be stored in a Firebase database and account recovery features will exist for users if multiple failed login attempts occur. This feature has medium priority as account creation is an admin-side function.

4.1.2 Stimulus/Response Sequences

4.1.2a Login

Upon entering their username and password, our application computes a hash of the user-entered password with SHA-256. The search for a corresponding hashed password to the entered username is searched for within the database to authenticate a user. If there is a matching combination of username/password within the database, the user will be logged in with their user class functionality. If the username is not found or the passwords do not match the system, the system will reject the user's attempt to login, and prompt them to try again.

4.1.2b Account Recovery

Upon multiple login attempt failures, the system will prompt the user to see if they want to attempt to recover their account. This will happen by the user submitting the username associated with the account they would like to recover. Then an email will be sent to the user to reset the password on file with the associated account. This new password is written to the database to keep record of this occurrence.

4.1.2c Account Creation

Account creation is an admin class function that is done when a user wants to become a surveyor. This can be done when an admin requests a username/password combination from the user requesting to be a surveyor. The username/password combination will be added to the database at the discretion of the admin user.

4.1.3 Functional Requirements

REQ-1: UI with Web Functionality

REQ-2: Firebase database with functionality for query, search, and creation of possible User/Pass combinations, and surveys
REQ-3: SMTP server to support automated email system for account recovery

4.2 Survey Submission

4.2.1 Description and Priority

The primary feature of this software is the ability to fill out a survey and then store the results of the survey in a Firebase database to be stored/viewed later for data analysis.

4.2.2 Stimulus/Response Sequences

The primary feature of this software is the ability to fill out a survey. This will occur by the user selecting the option on the home page to create a new survey and then the new survey document will open with all the associated questions. Upon user entry of all the answers while conducting the survey and selecting the submit option the new survey will be uploaded to the database along with information related to the user who submitted the survey

4.2.3 Functional Requirements

REQ-1: UI with IOS/Android/Web functionality for survey completion and submission to the cloud
REQ-2: Firebase Database to submit and host the completed surveys

4.3 View existing surveys and data analysis

4.3.1 Description and Priority

This feature will allow admins to view and execute data analysis on the surveys stored in the Firebase database.

4.3.2 Stimulus/Response Sequences

4.3.2a Individual User view

An individual (non-admin user will be able to view the surveys they have submitted in the past and be able to edit or update the data of individual surveys or sort all their past surveys based on various factors

4.3.2b Admin user

An admin user will be able to view the surveys they have submitted in the past and the surveys of all the users who are under them. They will also be able to edit or update the data of individual surveys or sort all their past surveys based on various factors and print out the sorted data for data analysis.

4.3.3 Functional Requirements

REQ-1:UI for the user to view and sort the data
REQ-2: Database contain the data of the surveys

5. Other Nonfunctional Requirements

5.1 Performance Requirements

- *UI is very lightweight, should take less than a second to route between pages*

- *Sent Surveys will be "small" in size and take less than 3 seconds to submit to Firebase*
- *Login Services should take less than 5 seconds*
- *Retrieval of desired data from Firebase database to UI should take less than 10 seconds to load*
    - *Will depend upon the download speed of user-hardware's and internet connection*

5.2 Safety and Security Requirements

- *At a minimum, HTTPS must be used to secure a connection between the user and the database for login functions*
- *At a minimum, HTTPS must also be used to secure a connection between the user and the database for survey related functions*
- *Data will to be stored in at least 2 locations, one cloud and one local in case of data loss/corruption*

The primary security requirements are that the system have ample security to protect the usernames and passwords of various accounts through data encryption

5.3 Software Quality Attributes

5.3.1 - Supportability/Reliability

- *System will support functionality on multiple platforms. Including IOS/Android/Web*
- *Regardless of platform, application will support the main intended functions of the system*

5.3.2 – Useability/Reusability

- *Application is straightforward in functionality; documentation has been given supporting all possible outcomes of using this software*
- *Application was designed purely for the purpose given by the stakeholder*

5.3.3 – Modifiability/Testability

- *System was designed with the intention of scalability, and the potential to be used statewide for BSM*
- *UI was designed with a feature driven development in min*

5.4 Business Rules

User class: functionality to submit surveys to Firebase database

Admin class: user class functionality plus the ability to view/analyze surveys stored in Firebase database.

6. Other Requirements

Permission of those surveyed will be required to make use of their information for data analysis.

Appendix A: Glossary

SHSU : Sam Houston State Univeristy
BSM : Baptist Student Ministry
TXBSM : Texas Baptist Student Ministry
UI : User Interface
Database : A structured set of data held in a computer, especially one that is accessible in many ways
Flutter : Integrated Development Environment used for creation of application user interface
Firebase : Firebase is a hosting service for any sort of application