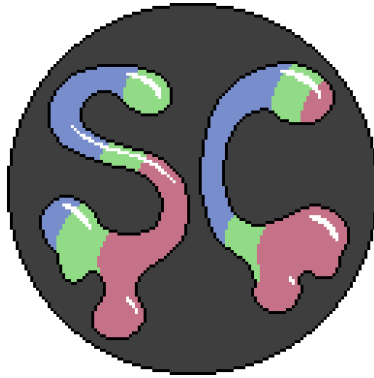


Sugar Coded



User Manual

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Project: Prediabetes Intervention Mobile Application

Sponsor: Dr. Natalia Dmitrieva

Mentor: Dr. Eck Doerry

Team Members:

Chantz Spears

John Bassler

Julian Shak

Alfonso Martinez

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1.0 Introduction

We are pleased you have chosen SCHEMA (Sugar Coded's Handheld Ecological Momentary Assessment) for your research needs. SCHEMA is a powerful product for any sized EMA research studies that you can customize to your will. Some key highlights of the product include:

- Offline functionality
- Time based notifications
- Questionnaire backlog
- Questionnaire logic branching

The purpose of this user manual is to help you, the client, successfully install, administer, and maintain SCHEMA in your actual research context going forward. Our aim is to make sure that you are able to benefit from our product for many years to come!

2.0 Installation

As part of SCHEMA's final delivery the .APK for the mobile application is installed on multiple devices and the web portal is hosted and live. In the future, perhaps after some development changes, you may want to rehost the web portal or create a new .APK. For hosting, many services are available all with different deployment methods, depending on what service you choose to use following the services documentation will be essential. Currently SCHEMA is hosted using Firebase, this will be the example we use for the purpose of this installation section. Ionic and Firebase will have to be installed on the computer wishing to rehost the portal. If the necessary packages are installed (use `npm install` to double check) hosting is as easy as:

1. Building the product with Ionic "`ionic build`" in the command line while in the projects directory.
2. If the current machine has not yet hosted the portal then "`firebase init`" will need to be called to initialize the website. It will ask for the projects firebase credentials.
3. "`firebase deploy`" which will then push the web portal to the corresponding URL set up through the firebase website's hosting tab

Figure 1: Firebase hosting tab

With those three steps the web portal will be deployed or re-deployed unless firebase or ionic update their commands used for these processes in the future, the ideas will remain the same though.

Building an .APK file is even simpler; once again Ionic needs to be installed on the computer and the code needs to be downloaded from the repository. Navigate to the mobile application directory in the command line and run “ionic cordova build --release android”. This will generate an .APK file for you to distribute how you wish. For a more detailed look on how to set up the development environments and installing ionic and Firebase, please refer to Sugar Coded’s Final Report Appendix. Section three of the manual will now detail SCHEMA’s configuration and daily use.

3.0 Configuration and Daily Operation

Now that everything necessary is installed, the web portal is live and there are .APKs or the iOS equivalent on each of the phones being used, this section will go into study configuration and operation.

Web Portal

Upon going to the URL where the web application is hosted you will be asked to login or create an account. If you have previously had an account but forgot your password there is a ‘forgot password function’. Once logged in, the menu button in the top left can be used to access all the applications’ different pages. The suggested steps for setting up a new study are as follows:

1. Go to the “studies” page and create a new study, filling out requested information.
2. Navigate to the “participants” page and create the number of participants you plan on having participate in your study.
3. Navigate to the “questions” page and create all the questions you will have in your study.
4. Navigate to the “modules” page and create the number and types of modules needed for your study. The current types of modules are ‘Baseline’, ‘Timed’, ‘User Initiated’, and ‘End Module’. Baseline modules are asked at the start of a study, but can be completed later should a participant choose. Timed base modules require you to enter how often they occur and these can be put into a participants module backlog or “TO DO” list. User initiated modules can be answered by a participant at any time and as many times as needed. An End module is asked at the study’s completion.
5. After modules are created you will click on them one at a time from the modules home page to add questions into the modules. There will be a list of questions at the bottom of the page, titled “Add Questions” every time one is clicked it will be added into that specific module’s repertoire of questions above.

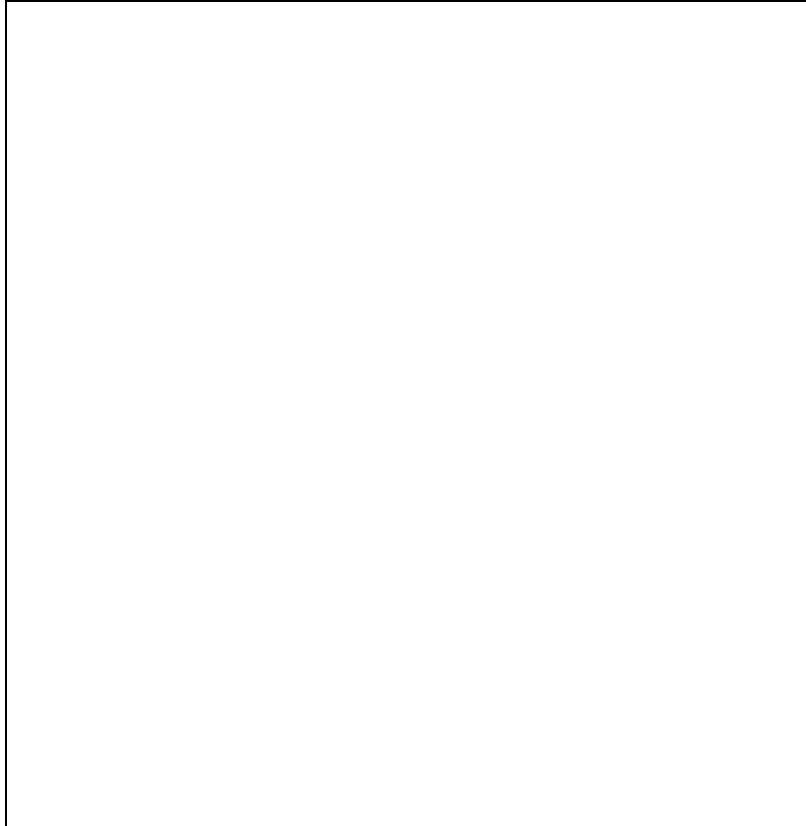


Figure 2: Adding questions to a module

6. After questions are added into the module they must be clicked on in the same screen now in the “Questions” list to add logic branching to the questions. As of now only questions of type ‘Radio’ can be branched to multiple different questions depending on the answer selected, but the rest of the questions still need to be branched to a next question independent of a user’s answer. *It is important to note, the first question added to the “Questions” list will be the first question that appears in the module or questionnaire to the participants.* On the branching page you simply select what question you would like to branch to from a drop down list of other questions in the Questions list. On this branching page, the large red button removes the selected question from the Questions list should the need arise. Every question in the module needs branching logic added and one question needs to lead to the end of the module, an option in the branching drop down.

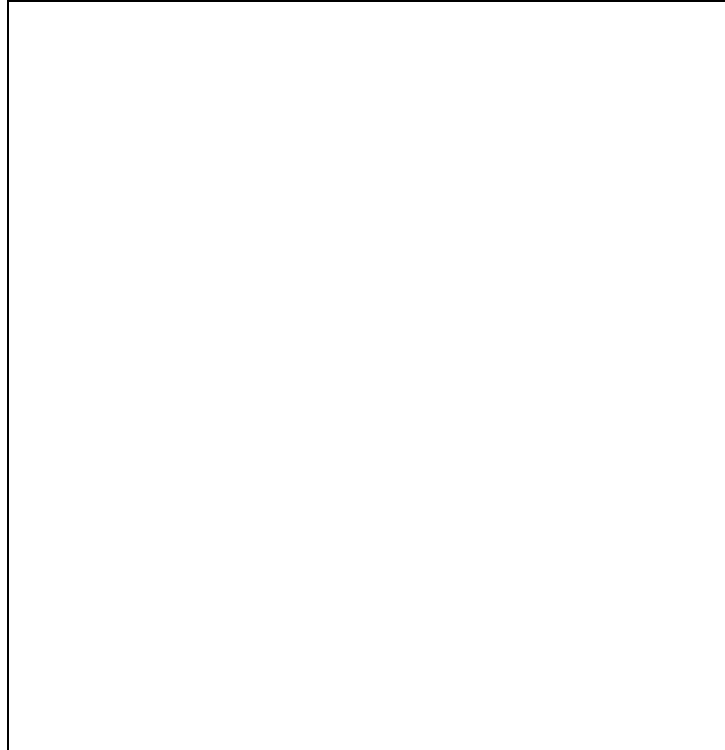


Figure 3: Adding branching logic to a question

7. After all of the modules are branched navigate back to the “Studies” page and click on your previously created study. Now you will add the modules to this study in the same way you added questions to the modules. Clicking on a added module will remove it from the study should the need arise.
8. After all of these steps have been completed, participants can connect to the study using the unique ID automatically generated for them in the participants page. There is a button on the participants page to generate a .csv with all of the participants unique IDs should you want to print it out for your records or to give them the IDs in person.

At any time during or after a study’s completion you can go to a specific module and download all of the participants’ answers into a .csv file. Anything created on the web portal can be edited or deleted at anytime using intuitively named and placed buttons. This covers most of the functionality and use of the web portal, next is a walkthrough of the mobile application usage.

Mobile Application

A participant starts up the application and is asked to enter their unique ID. Once entered they will get a confirmation screen showing them what study they registered for. They are then asked to enter sleep times which will prevent time based modules from going off in the set interval. If there is a baseline questionnaire participants will be asked if they wish to complete it now or later. Now the participant is on the homepage, on the bottom navigation bar they can navigate to their TODO tab where they can answer missed time

based questionnaires or the skipped baseline questionnaire. On the homepage they can also initiate and submit any user initiated questionnaires. In the top left of the home page the user can find a button to direct them to the applications about page. The mobile application's use is fairly straightforward and teaching a participant how to use the application should take little to no time. Section four of the manual will go into the minimal maintenance needed for SCHEMA's long term health.

4.0 Maintenance

Maintenance for SCHEMA should be very minimal and easy to perform. Currently the project is using Firestore, a Firebase product, for its database needs. Should you choose to go past the free tier of data storage, data reading and data writing offered by Firebase then you will use the Firebase website's billing tab to set up and manage a payment plan.

Figure 4: Firebase billing tab

Regardless of whether or not you are in the free, paid tier or even using firebase for your database and hosting needs, you may want to clean up your database storage periodically. If studies are constantly being created and completed for a year the database is likely getting quite a bit of data stored in it. If after a study ends and all the answers are collected and downloaded then that data may be sitting in the database no longer of use to anyone. Deleting old studies, questions or participants inside of the web portal is one way to clear up space but going into the Firebase website and deleting data in bulk can be a quicker and more efficient method.

<https://console.firebase.google.com/u/0/project/>

Aside from database management there is no maintenance necessary unless functionality is being expanded for SCHEMA. In this case the project code can be found at Sugar Coded's Github repository: <https://github.com/NauSugarCoded/capstone>

Figure 5: Firebase deleting data

Section five of the user manual will cover some common troubleshooting tips should problems ever arise.

5.0 Troubleshooting

Listed below will be some common issues that may come up when creating or deploying studies using SCHEMA. The team has tried to have detailed error handling for any problems that may occur, however with such a large application it would be ill conceived to think we have covered everything that could possibly happen.

A module isn't appearing on the mobile application - Make sure the module is indeed added to the study, that all of the questions have branching completed.

A questionnaire has a blank part way through and cannot be completed - Make sure branching was completed for the previous question. If branching was completed then check that the questions do not have any off special character patterns, like two spaces in between each word, or non english letters or numbers for instance.

The mobile application is not functioning correctly on an Android device - The device must be running at least the Android 5.0.1 OS.

A timing module is not firing at the correct times - Make sure the correct recurrence times are entered for that module, and the “Recurrence” option is set for either Once, Daily, or Weekly.

I have a brand new android device and the application does not work - The current developer may need to be contacted to see if the new device changes the way it deals with dependencies or plugins and adjust the code accordingly.

The web app is down - Make sure there is not a problem with the service you are hosting the app through, for example if your hosting has expired or terms and service have updated.

I can no longer add/download/edit/answer anything within either application - If Firebase is being used a data limit may have been reached and it either needs to be increased or upgraded to continue at that time.

6.0 Conclusion

We hope SCHEMA is a product that will benefit your research for years to come and fulfills any and every expectation you had when seeking its development. The Sugar Coded team has had a fantastic experience developing this product and have enjoyed every step of its creation. Best wishes from the Sugar Coded team: Chantz Spears, Julian Shak, Alfonso Martinez, and John Bassler. * While we are all moving on to professional careers, we would be happy to answer any questions in the coming months to help you get the product deployed and operating optimally for your needs.

Chantz Spears - css258@nau.edu

Julian Shak - jrs669@nau.edu

Alfonso Martinez - am3536@nau.edu

John Bassler - jeb427@nau.edu