

Florida International University
Knight Foundation School of Computing and Information Sciences

Software Engineering Focus

Project Title:

Sensor Data Visualization

Team Members: Tony Erazo, Luis A Gil, Jonathan Diaz-Arencia, Gentman Tan, Alejandro Ruiz

Product Owner(s): Enshi Zhang, Raphael Trujillo , John Michael Templeton, Christian Poellabauer

Mentor(s): Enshi Zhang, Raphael Trujillo , John Michael Templeton, Christian Poellabauer

Instructor: Masoud Sadjadi

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Abstract

This document aims to be a summarization of the details and topics covered in this project. The Koios project aims to mediate the collection and storage of survey information. Our team's goal is to 1. modernize the code base and 2. add visualization functionality to the Koios web application. This functionality is in the form of bar, pie, line charts and scatter plots, with the expressed goal of making the data analysis easier for researchers who use the platform.

Table of Contents

INTRODUCTION	6
CURRENT SYSTEM	6
PURPOSE OF NEW SYSTEM	6
USER STORIES	
IMPLEMENTED USER STORIES	7
PENDING USER STORIES	8
PROJECT PLAN	
HARDWARE AND SOFTWARE RESOURCES	9
SPRINTS PLAN	113
<i>Sprint 1</i>	13
<i>Sprint 2</i>	13
<i>Sprint 3</i>	14
<i>Sprint 4</i>	15
<i>Sprint 5</i>	16
<i>Sprint 6</i>	17
<i>Sprint 7</i>	18
SYSTEM DESIGN	
ARCHITECTURAL PATTERNS	20

SYSTEM AND SUBSYSTEM DECOMPOSITION	21
DEPLOYMENT DIAGRAM	22
DESIGN PATTERNS	22
...	22
SYSTEM VALIDATION	
.....	23
GLOSSARY	
.....	25
APPENDIX	
.....	27
APPENDIX A - UML DIAGRAMS	27
<i>Static UML Diagrams</i>	28
<i>Dynamic UML Diagrams</i>	29
APPENDIX B - USER INTERFACE DESIGN	30
APPENDIX C - SPRINT REVIEW REPORTS	33
APPENDIX D - USER MANUALS, INSTALLATION/MAINTENANCE DOCUMENT, SHORTCOMINGS/WISHLIST DOCUMENT AND OTHER DOCUMENTS	50
REFERENCES	
.....	63

INTRODUCTION

With the ever-present need for greater amounts of user metrics, systems need to be put into place that allow for effective collection of user data. This is due to the wealth of knowledge that can be provided by the collection and analysis of data by researchers, in order to be able to conclude on topical issues. The scientific method is the backbone of the technology of the past and present, and tools for observation are essential in providing for such a methodology.

Current System

The current Koios system utilizes an outdated web stack, and is therefore difficult to extend and add additional features to. For example, the frontend relies on Google Web Toolkit, which does include many conveniences in the form of UI abstraction; unfortunately, this fact of the monolithic nature of the software library lends it to be inflexible for the changing needs of surveyors and data researchers. The process to set up a testing environment for modifying the code is also challenging, as it requires a developer to pin certain versions of software library dependencies, some of which are stated by its maintainers to be unsupported.

Purpose of New System

The new Koios system aims to modernize the Koios system from the ground up, utilizing current, robust software frameworks that allow for extensibility and ease of use. The web application is responsive, allowing for the use of the web app on a variety of different device types of different screen sizes and shapes. The different components of the new Koios system are modular, allowing for a greater ease of reuse, modification and error checking.

The new Koios system also introduces graphing functionality through the use of the Recharts library, allowing researchers to quickly assess questionnaire data and come up with conclusions easier. This fact also highlights the extensibility of the new system, as it allows for modern web libraries to be quickly imported and used.

USER STORIES

The following section provides the detailed user stories that were implemented in this iteration of the Koios project. These user stories served as the basis for the implementation of the project's features. This section also shows the user stories that are to be considered for future development.

Implemented User Stories

- Refresh on Java programming methodologies
- Research ideas on how to better the Koios
- Setup project files to run the old Koios web application
- Research about topical web frameworks
- Research different tooling that can help with the creation of the new Koios system
- Implement an authentication/login page
- Implement bar graph showing response frequencies
- Implement the new Koios system with Tomcat web server compatibility
- Implement SQL connector and fetch data from an SQL server
- Customize default UI to match the Koios project style guidelines
- Create a webpage to show data for an entire study
- Use a hashing algorithm to store passwords privately
- Fetch question list using studyId and surveyId parameters
- Create a REST API endpoint to fetch a user's percentage of time awake
- Show a specific selected survey's question list
- Implement a webpage showing detailed information regarding a survey
- Implement drop-down menu to select various versions of a survey
- Show a specific selected survey and version number's question list
- Setup a responses table that gives responses related to a question
- Setup data visualization on the responses table
- Setup a version selector for questions in the question list
- Show how many people wore their fitbit over a given week on the mobile app
- Setup a connection between the Koios mobile app and the Koios server
- Setup a counter for the number of responses for each question in a question list
- Make an instructional video on how future developers access the code

Pending User Stories

- Implement a count of the number of surveys of a specific kind that have been performed in a given week
- Implement a count for the number of surveys that include multiple choice questions
- Show the number of surveys that a participant has completed on the Koios mobile app as well as the number of days that the fitbit has been worn

PROJECT PLAN

The project was planned in a holistic manner, listening first for the needs of the project owner as well as reviewing the current system. Then, a list of modern frameworks were compared and contrasted with one another in order to decide on the strongest option. Lastly, prototyping ensued and a candidate web stack was chosen.

Hardware and Software Resources

The following is a list of all hardware and software resources that were used in this project:

Component	Minimum Recommended Requirement
CPU	Pentium Dual-Core or newer
RAM	4 GB
Storage	20 GB
OS	Linux (preferred)/MacOS/Windows

Software Stack	● MySQL/MariaDB ● Spring Boot ○ Axios ● NodeJS ● ReactJS ○ Bootstrap ○ Recharts ● Flutter
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Sprints Plan

Sprint 1 **Sprint #1** **Planning Meeting**

Project: Sensor Data Visualization

Date: 01/20/2023

Start Time: 9:00 PM

End Time: 9:30 PM

Attendees:

Product Owners:

- Christian Poellabauer:
- Rafael Trujillo
- Enshi Zhang
- John Michael Templeton

Capstone II:

- Luis A Gil (LG)
- Gentman tan (GT)
- Tony Erazo (TE)
- Johnathan Diaz-Arencia (JDA)
- Alejandro Ruiz (AR)

After discussion, the velocity of the team was estimated to be:

- Velocity = 100 hours
 - Capstone 2 = 20 hrs x 5 = 100 hrs
- Sprint User Stories:
- User Story 01 -

- As a developer, I want to be able to learn Java to complete this project,
Assigned to: GT, LG, TE, JDA, AR
- User Story 02 -
 - As a developer, I want to learn about the various tools that help run the Koios project. Assigned to: GT, LG, TE, JDA, AR
- User Story 03 -
 - As a developer, I want to come up with ideas to better the Koios project.
Assigned to: GT, LG, TE, JDA, AR
- User Story 04 -
 - As a developer, I want to set up the project files and run the Koios program, Assigned to: GT, LG, TE, JDA, AR

Sprint 2

Sprint #2 Planning Meeting

Project: Sensor Data Visualization

Date: 01/30/2023

Start Time: 8:30 PM

End Time: 9:00 PM

Attendees:

Product Owners:

- Christian Poellabauer:
- Rafael Trujillo
- Enshi Zhang
- John Michael Templeton

Capstone II:

- Luis A Gil (LG)
- Gentman tan (GT)

- Tony Erazo (TE)
- Johnathan Diaz-Arencia (JDA)
- Alejandro Ruiz (AR)

After discussion, the velocity of the team was estimated to be:

- Velocity = 120 hours
 - Capstone 2 = 24 hrs x 5 = 120 hrs
- Sprint User Stories:
- User Story 06 -
 - As a developer, I want to learn about the various tools that help run the Koios project. Assigned to: GT, LG, TE, JDA, AR
- User Story 07 -
 - As a developer, I want to find a way to get how many surveys of a specific kind were completed last week for a study (insert fake data) Assigned to: GT, LG, TE, JDA, AR
- User Story 08 -
 - As a developer, I want to find a way for surveys that are of multiple choice/Number choosing. What are the answers people have been giving over the previous week, Ignore text inputs, audio and file uploads for now. GT, LG, TE, JDA, AR
- User Story 09 -
 - As a developer, I want to implement an authentication/login page., Assigned to: GT, LG, TE, JDA, AR
- User Story 10 -
 - As a developer, I want to implement on the web server: create an API endpoint that takes in the person's enrollment id and returns how many surveys they have completed in the study, and how many days they have worn the Fitbit. Flutter: Call the endpoint and then show those metrics on the main page. Assigned to: GT, LG, TE, JDA, AR

User Story 11 -

- As a developer, i want to find a way to show for an entire study, Bar Graph
How Many people wore the fitbit over last week, one bar per day
Assigned to: GT, LG, TE, JDA, AR

Sprint #3 Planning Meeting

Project: Sensor Data Visualization

Date: 02/13/2023

Start Time: 9:00 PM

End Time: 9:00 PM

Attendees:

Product Owners:

- Christian Poellabauer
- Rafael Trujillo
- Enshi Zhang
- John Michael Templeton

Capstone II:

- Luis A Gil (LG)
- Gentman tan (GT)
- Tony Erazo (TE)
- Johnathan Diaz-Arencia (JDA)
- Alejandro Ruiz (AR)

After discussion, the velocity of the team was estimated to be:

- Velocity = 120 hours
 - Capstone 2 = 24 hrs x 5 = 120 hrs

- Sprint User Stories:

User Story 11 -

- As a developer, i want to find a way to show for an entire study, Bar Graph
How Many people wore the fitbit over last week, one bar per day
Assigned to: GT, LG, TE, JDA, AR

User Story 13 -

- As a developer, I want to be able to fetch data from MySql database.
Assigned to: GT, LG, TE, JDA , AR

Sprint #4
Planning Meeting

Project: Sensor Data Visualization

Date: 03/06/2023

Start Time: 9:00 PM

End Time: 9:30 PM

Attendees:

Product Owners:

- Christian Poellabauer
- Rafael Trujillo
- Enshi Zhang
- John Michael Templeton

Capstone II:

- Luis A Gil (LG)
- Gentman tan (GT)

Date

Page 15 of 63

- Tony Erazo (TE)
- Johnathan Diaz-Arencia (JDA)
- Alejandro Ruiz (AR)

After discussion, the velocity of the team was estimated to be:

- Velocity = 120 hours
 - Capstone 2 = 24 hrs x 5 = 120 hrs
- Sprint User Stories:
- User Story 07 -
 - As a developer, I want to find a way to get how many surveys of a specific kind where completed last week for a study (insert fake data) Assigned to: GT, LG, TE, JDA, AR
- User Story 08 -
 - As a developer, I want to find a way for surveys that are of multiple choice/Number choosing. What are the answers people have been giving over the previous week, Ignore text inputs, audio and file uploads for now. GT, LG, TE, JDA, AR

User Story 10 -

- As a developer, I want to implement on the web server: create an API endpoint that takes in the person's enrollment id and returns how many surveys they have completed in the study, and how many days they have worn the Fitbit. Flutter: Call the endpoint and then show those metrics on the main page. Assigned to: GT, LG, TE, JDA, AR

User Story 11 -

- As a developer, i want to find a way to show for an entire study, Bar Graph
How Many people wore the fitbit over last week, one bar per day
Assigned to: GT, LG, TE, JDA, AR

User Story 15 -

- As a developer, I want to be able to work setting MD5 Hashing for our
login and authentication.
Assigned to: GT, LG, TE, JDA , AR

User Story 16 -

- As a developer, I want to connect both StudyId and Id from their respective tables
in the database in order to fetch surveilist.
Assigned to: GT, LG, TE, JDA , AR

Sprint #5
Planning Meeting

Project: Sensor Data Visualization

Date: 03/20/2023

Start Time: 9:00 PM

End Time: 9:30 PM

Attendees:

Product Owners:

- Christian Poellabauer
- Rafael Trujillo
- Enshi Zhang
- John Michael Templeton

Capstone II:

- Luis A Gil (LG)
- Gentman tan (GT)

Date

- Tony Erazo (TE)
- Johnathan Diaz-Arencia (JDA)
- Alejandro Ruiz (AR)

After discussion, the velocity of the team was estimated to be:

- Velocity = 120 hours
 - Capstone 2 = 24 hrs x 5 = 120 hrs
- Sprint User Stories:
- User Story 07 -
 - As a developer, I want to find a way to get how many surveys of a specific kind where completed last week for a study (insert fake data) Assigned to: GT, LG, TE, JDA, AR
- User Story 08 -
 - As a developer, I want to find a way for surveys that are of multiple choice/Number choosing. What are the answers people have been giving over the previous week, Ignore text inputs, audio and file uploads for now. GT, LG, TE, JDA, AR

User Story 10 -

- As a developer, I want to implement on the web server: create an API endpoint that takes in the person's enrollment id and returns how many surveys they have completed in the study, and how many days they have worn the Fitbit. Flutter: Call the endpoint and then show those metrics on the main page. Assigned to: GT, LG, TE, JDA, AR

User Story 11 -

- As a developer, i want to find a way to show for an entire study, Bar Graph
How Many people wore the fitbit over last week, one bar per day
Assigned to: GT, LG, TE, JDA, AR

User Story 20 -

- As a developer, I want to make a dropdown button that can select the
various versions of Surveys.
Assigned to: GT, LG, TE, JDA, AR

User Story 21 -

- As a developer, I want to be able to access all the questions related to a
survey and its selected version.
Assigned to: GT, LG, TE, JDA, AR

User Story 22 -

- As a developer, I want to set up a connection between the mobile and
web application.
Assigned to: GT, LG, TE, JDA, AR

User Story 23 -

- As a developer, I want to set up a responses table/section that will give all
the responses related to a question and their related versions.
Assigned to: GT, LG, TE, JDA, AR

User Story 24 -

- As a developer, I want to give data visualization to the responses table, via a button that gives me different graphs when selected.

Assigned to: GT, LG, TE, JDA, AR

Sprint #6
Planning Meeting

Project: Sensor Data Visualization

Date: 04/03/2023

Start Time: 9:00 PM

End Time: 9:30 PM

Attendees:

Product Owners:

- Christian Poellabauer
- Rafael Trujillo
- Enshi Zhang
- John Michael Templeton

Capstone II:

- Luis A Gil (LG)
- Gentman tan (GT)
- Tony Erazo (TE)
- Johnathan Diaz-Arencia (JDA)
- Alejandro Ruiz (AR)

After discussion, the velocity of the team was estimated to be:

- Velocity = 120 hours
 - Capstone 2 = 24 hrs x 5 = 120 hrs
- Sprint User Stories:

Date

Page 20 of 63

- User Story 07 -
 - As a developer, I want to find a way to get how many surveys of a specific kind where completed last week for a study (insert fake data) Assigned to: GT, LG, TE, JDA, AR
- User Story 08 -
 - As a developer, I want to find a way for surveys that are of multiple choice/Number choosing. What are the answers people have been giving over the previous week, Ignore text inputs, audio and file uploads for now. GT, LG, TE, JDA, AR

User Story 10 -

- As a developer, I want to implement on the web server: create an API endpoint that takes in the person's enrollment id and returns how many surveys they have completed in the study, and how many days they have worn the Fitbit. Flutter: Call the endpoint and then show those metrics on the main page. Assigned to: GT, LG, TE, JDA, AR

User Story 11 -

- As a developer, i want to find a way to show for an entire study, Bar Graph How Many people wore the fitbit over last week, one bar per day Assigned to: GT, LG, TE, JDA, AR

User Story 22 -

- As a developer, I want to set up a connection between the mobile and web application.
Assigned to: GT, LG, TE, JDA, AR

User Story 26 -

- As a developer, I want to set up a counter of responses for each question version.

Assigned to: GT, LG, TE, JDA, AR

User Story 27 -

- As a developer, I want to give data visualization to the responses table, via a button, and work on the different graph options associated with that button .

Assigned to: GT, LG, TE, JDA, AR

Sprint #7 Planning Meeting

Project: Sensor Data Visualization

Date: 04/17/2023

Start Time: 9:00 PM

End Time: 9:30 PM

Attendees:

Product Owners:

- Christian Poellabauer
- Rafael Trujillo
- Enshi Zhang
- John Michael Templeton

Capstone II:

- Luis A Gil (LG)
- Gentman tan (GT)
- Tony Erazo (TE)
- Johnathan Diaz-Arencia (JDA)
- Alejandro Ruiz (AR)

After discussion, the velocity of the team was estimated to be:

- Velocity = 120 hours
 - Capstone 2 = 24 hrs x 5 = 120 hrs
- Sprint User Stories:

User Story 29 -

- As a developer, I want to finish all my tasks this week for the end of sprint/semester.

Assigned to: GT, LG, TE, JDA, AR

SYSTEM DESIGN

This section contains information on the design decisions that went into this project. The architecture patterns are outlined and explained. The entire system is shown in a package diagram and the subsystems are explained. Finally, the design patterns used in the project are discussed.

SYSTEM VALIDATION

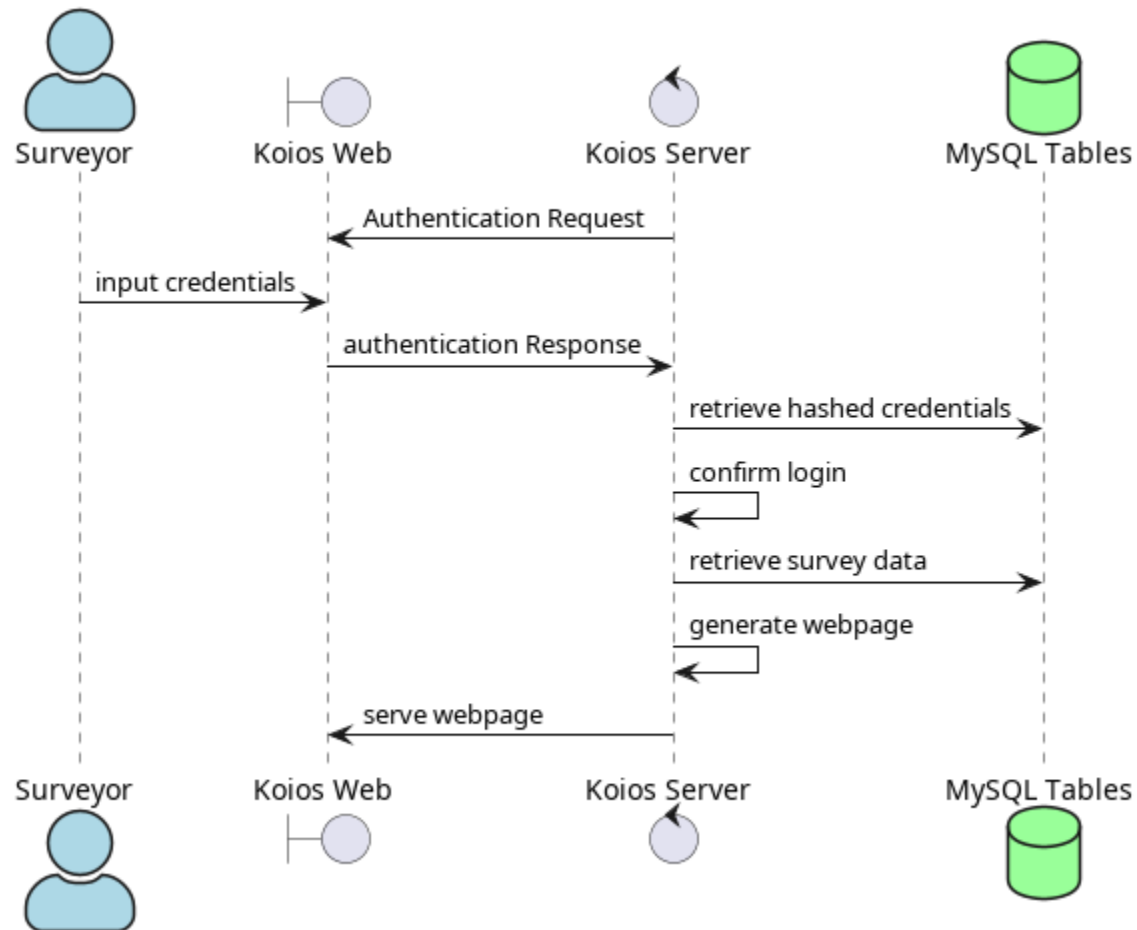
System Test Case #01	
System Test Case : User Authentication	
User Story: “Implement an authentication/login page”	
Purpose: Allow users to be authenticated	
Pre-Conditions:	• A user must remember their own correct credentials
Expected Results:	When the login button is clicked, it must check if the user is logged in.
Actual Results:	The user is brought to the profile page
Status:	Pass

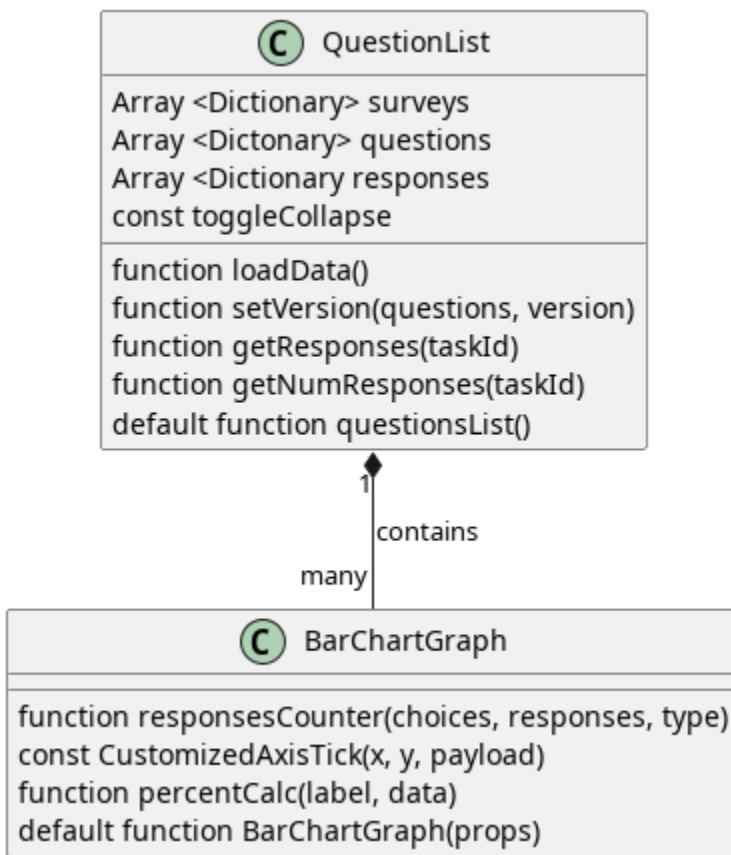
System Test Case #02	
System Test Case : Select a survey	
User Story: “Fetch question list using studyId and surveyId parameters”	
Purpose: Allow users to see a list of questions that a survey contains	
Pre-Conditions:	• A user must be logged in • A user must have selected a certain survey and version number

Expected Results:	A web page will populate with a list of questions associated with a particular survey and version id
Actual Results:	The correct webpage loads with the correct list of questions
Status:	Pass

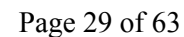
System Test Case #03	
System Test Case : Present graphs	
User Story: “Setup data visualization on the responses table”	
Purpose: Provide surveyors a bar graph to visualize answer response frequencies	
Pre-Conditions:	• A user must be logged in • A user must have selected a certain survey and version number • A user must have selected a certain question from the question list
Expected Results:	A bar chart will populate with the x-axis as answer labels and the y-axis as the frequency of an answer
Actual Results:	A bar chart is populated with the correct data
Status:	Pass

GLOSSARY

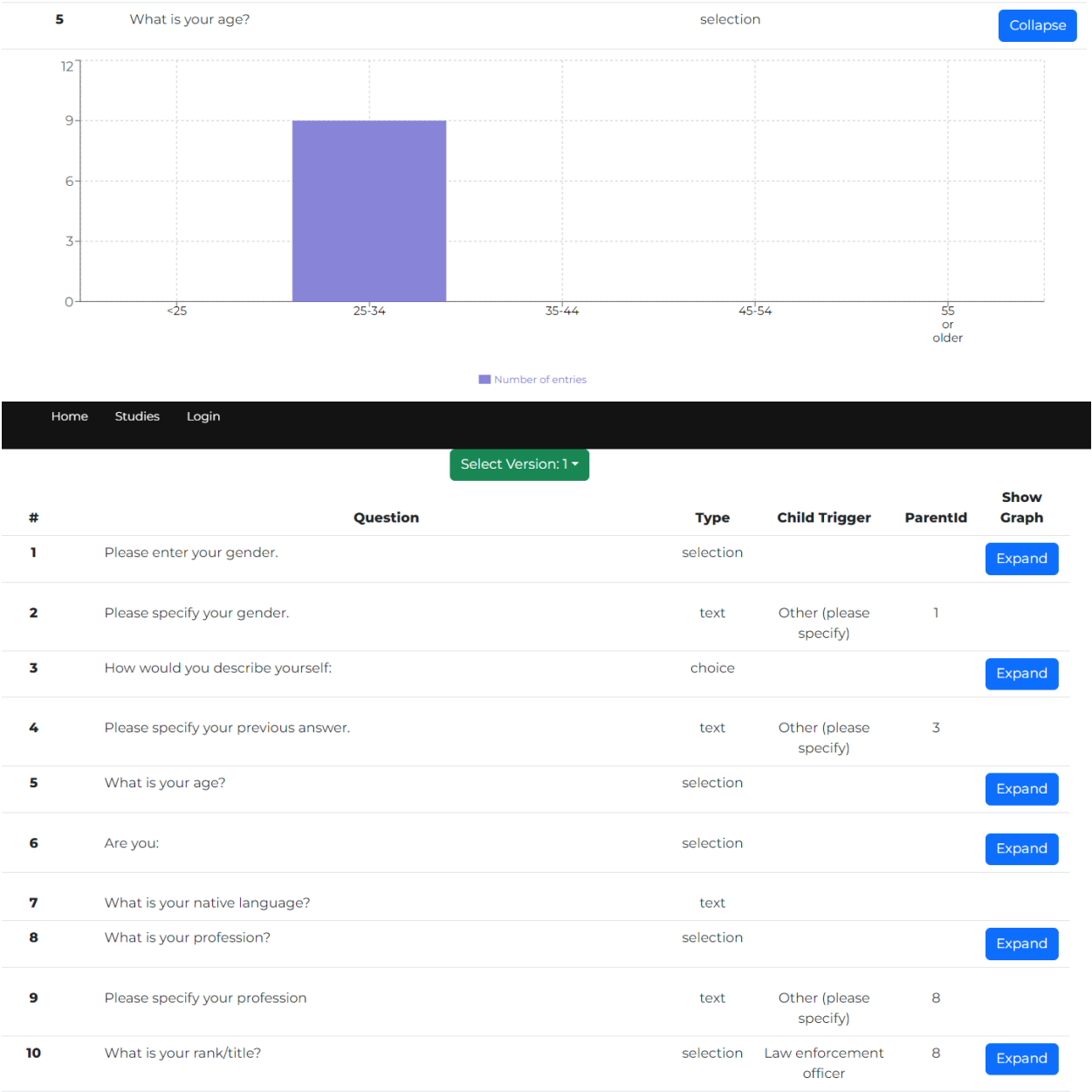
APPENDIX**Appendix A - UML Diagrams**



Date _____



Appendix B - User Interface Design



Home Studies Login		
Id	Name	
1	Initial Data Collection One-Time	Questions
2	Initial Data Collection Always	Questions
3	Event Questionnaire	Questions
4	Audio Test	Questions
5	Periodic Mental Health Questionnaire Every Two Days	Questions
6	Periodic Mental Health Questionnaire Always	Questions
Back		

[Home](#) [Studies](#) [Login](#)

View Study

Details of study id: 54

Study Name: FIU Test Study

Organization: Florida International University

Description: This is a test study to verify koiosweb is working correctly.

Created By: rtruj023@fiu.edu

Back

[Home](#) [Studies](#) [Login](#)

		Select Version: 1 ▾					
#	Question	1 - 2022-05-24 responses: 130	Type	Child Trigger	ParentId	Show Graph	
1	Please enter your gender.	2 - 2022-05-24 responses: 5	selection			Expand	
2	Please specify your gender.	3 - 2022-05-24 responses: 8	text	Other (please specify)	1		
3	How would you describe yourself:	4 - 2022-05-25 responses: 2	choice			Expand	
4	Please specify your previous answer.	5 - 2022-05-25 responses: 4	text	Other (please specify)	3		
5	What is your age?	6 - 2022-05-25 responses: 0	selection			Expand	
6	Are you:		selection			Expand	
7	What is your native language?		text				
8	What is your profession?		selection			Expand	
9	Please specify your profession		text	Other (please specify)	8		
10	What is your rank/title?		selection	Law enforcement officer	8	Expand	

Appendix C - Sprint Review Reports

Sprint #1 Review Meeting

Project: Sensor Data Visualization

Date: 01/27/2023

Start Time: 8:30 PM

End Time: 9:00 PM

Attendees:

Product Owners:

- Christian Poellabauer:
- Rafael Trujillo
- Enshi Zhang
- John Michael Templeton

Capstone II:

- Luis A Gil (LG)
- Gentman tan (GT)
- Tony Erazo (TE)
- Johnathan Diaz-Arencia (JDA)
- Alejandro Ruiz (AR)

After a show and tell presentation, the implementation of the following user stories were accepted by the product owners:

- Sprint User Stories:
- User Story 01 -
 - As a developer, I want to be able to learn Java to complete this project, Assigned to: GT, LG, TE, JDA, AR
- User Story 03 -
 - As a developer, I want to come up with ideas to better the Koios project. Assigned to: GT, LG, TE, JDA, AR
- User Story 04 -

- As a developer, I want to set up the project files and run the Koios program, Assigned to: GT, LG, TE, JDA, AR

The following ones were rejected and moved back to the product backlog to be assigned to a future sprint at a future Sprint Planning meeting.

- User Story 02
 - As a developer, I want to learn about the various tools that help run the Koios project. Assigned to: GT, LG, TE, JDA, AR
- User Story 05
 - As a developer, I want to implement the tasks given by the product owners. Assigned to: GT, LG, TE, JDA, AR

Sprint #2 Review Meeting

Project: Sensor Data Visualization

Date: 02/10/2023

Start Time: 8:30 PM

End Time: 9:00 PM

Attendees:

Product Owners:

- Christian Poellabauer:
- Rafael Trujillo
- Enshi Zhang

Date

Page 34 of 63

- John Michael Templeton
- Capstone II:
- Luis A Gil (LG)
 - Gentman tan (GT)
 - Tony Erazo (TE)
 - Johnathan Diaz-Arencia (JDA)
 - Alejandro Ruiz (AR)

After a show and tell presentation, the implementation of the following user stories were accepted by the product owners:

User Story 05 -

- As a developer, I want to implement the tasks given by the product owners.

Assigned to: GT, LG, TE, JDA, AR

User Story 06 -

- As a developer, I want to learn about the various tools that help run the Koios project.

Assigned to: GT, LG, TE, JDA, AR

User Story 09 -

- As a developer, i want to implement an authentication/login page.,

Assigned to: GT, LG, TE, JDA, AR

User Story 11 -

- As a developer, i want to find a way to show for an entire study, Bar Graph
How Many people wore the fitbit over last week, one bar per day

Assigned to: GT, LG, TE, JDA, AR

User Story 12 -

- As a Developer, I want to Implement Tomcat using spring. Assigned to: GT, LG, TE, JDA, AR

The following ones were rejected and moved back to the product backlog to be assigned to a future sprint at a future Sprint Planning meeting.

User Story 07 -

As a developer, I want to find a way to get how many surveys of a specific kind where completed last week for a study (insert fake data) Assigned to: GT, LG, TE, JDA, AR

User Story 08 -

- As a developer, I want to find a way for surveys that are of multiple choice/Number choosing. What are the answers people have been giving over

User Story 10 -

- As a developer, I want to implement on the web server: create an API endpoint that takes in the person's enrollment id and returns how many surveys they have completed in the study, and how many days they have worn the Fitbit. Flutter: Call the endpoint and then show those metrics on the main page. Assigned to: GT, LG, TE, JDA, AR

User Story 11 -

- As a developer, i want to find a way to show for an entire study, Bar Graph How Many people wore the fitbit over last week, one bar per day Assigned to: GT, LG, TE, JDA, AR

Sprint #3 Review Meeting

Project: Sensor Data Visualization

Date: 02/25/2023

Start Time: 8:30 PM

End Time: 9:00 PM

Attendees:

Product Owners:

- Christian Poellabauer:
- Rafael Trujillo
- Enshi Zhang
- John Michael Templeton

Capstone II:

- Luis A Gil (LG)
- Gentman tan (GT)
- Tony Erazo (TE)
- Johnathan Diaz-Arencia (JDA)
- Alejandro Ruiz (AR)

After a show and tell presentation, the implementation of the following user stories were accepted by the product owners:

User Story 13 -

- As a developer, I want to be able to fetch data from MySql database.
Assigned to: GT, LG, TE, JDA , AR

User Story 14 -

- As a developer, I want to show my progress on the tasks we have been assigned.
Assigned to: GT, LG, TE, JDA , AR

User Story 15 -

- As a developer, I wanted to change the UI to fit the koios project.

Assigned to: GT, LG, TE, JDA, AR

User Story 16 -

- As a developer, i want to find a way to show data for an entire study :

Assigned to: GT, LG, TE, JDA, AR

User Story 17 -

- As a developer, I want to show the progress of the Koios: flutter app

Assigned to: GT, LG, TE, JDA, AR

The following ones were rejected and moved back to the product backlog to be assigned to a future sprint at a future Sprint Planning meeting.

- User Story 07 -

- As a developer, I want to find a way to get how many surveys of a specific kind where completed last week for a study (insert fake data)

Assigned to: GT, LG, TE, JDA, AR

- User Story 08 -

- As a developer, I want to find a way for surveys that are of multiple choice/Number choosing. What are the answers people have been giving over the previous week, Ignore text inputs, audio and file uploads for now. GT, LG, TE, JDA, AR

User Story 10 -

- As a developer, I want to implement on the web server: create an API endpoint that takes in the person's enrollment id and returns how many surveys they have completed in the study, and how many days they have

worn the Fitbit. Flutter: Call the endpoint and then show those metrics on the main page. Assigned to: GT, LG, TE, JDA, AR

User Story 11 -

- As a developer, i want to find a way to show for an entire study, Bar Graph How Many people wore the fitbit over last week, one bar per day
Assigned to: GT, LG, TE, JDA, AR

Sprint #4
Review Meeting

Project: Sensor Data Visualization

Date: 03/17/2023

Start Time: 9:00 PM

End Time: 9:30 PM

Attendees:

Product Owners:

- Christian Poellabauer:
- Rafael Trujillo
- Enshi Zhang
- John Michael Templeton

Capstone II:

- Luis A Gil (LG)
- Gentman tan (GT)
- Tony Erazo (TE)
- Johnathan Diaz-Arencia (JDA)
- Alejandro Ruiz (AR)

After a show and tell presentation, the implementation of the following user stories were accepted by the product owners.

User Story 11 -

- As a developer, i want to find a way to show for an entire study, Bar Graph
How Many people wore the fitbit over last week, one bar per day
Assigned to: GT, LG, TE, JDA, AR

User Story 15 -

- As a developer, I want to be able to work setting MD5 Hashing for our
login and authentication.
Assigned to: GT, LG, TE, JDA , AR

User Story 16 -

As a developer, I want to connect both StudyId and Id from their respective tables
in the database in order to fetch surveylist.
Assigned to: GT, LG, TE, JDA , AR

User Story 17 -

As a developer, I want to create an endpoint in the REST api that has the
users percentage for your time awake and you need to know when you
were asleep do a combined both for now it will be a fraction of how much
time awake out of 24 hours have it available as a mobile end point.
Assigned to: GT, LG, TE, JDA , AR

User Story 18 -

As a developer, I want to Show a Selected surveys, Question_list.
Assigned to: GT, LG, TE, JDA , AR

User Story 19 -

As a developer i want to create a Survey Details page for each survey

Assigned to: GT, LG, TE, JDA , AR

The following ones were rejected and moved back to the product backlog to be assigned to a future sprint at a future Sprint Planning meeting.

- User Story 07 -

- As a developer, I want to find a way to get how many surveys of a specific kind where completed last week for a study (insert fake data)

- Assigned to: GT, LG, TE, JDA, AR

- User Story 08 -

- As a developer, I want to find a way for surveys that are of multiple choice/Number choosing. What are the answers people have been giving over the previous week, Ignore text inputs, audio and file uploads for now. GT, LG, TE, JDA, AR

User Story 10 -

- As a developer, I want to implement on the web server: create an API endpoint that takes in the person's enrollment id and returns how many surveys they have completed in the study, and how many days they have worn the Fitbit. Flutter: Call the endpoint and then show those metrics on the main page. Assigned to: GT, LG, TE, JDA, AR

Sprint #5
Review Meeting

Project: Sensor Data Visualization

Date: 04/01/2023

Start Time: 9:00 PM

End Time: 9:30 PM

Attendees:

Product Owners:

- Christian Poellabauer:
- Rafael Trujillo
- Enshi Zhang
- John Michael Templeton

Capstone II:

- Luis A Gil (LG)
- Gentman tan (GT)
- Tony Erazo (TE)
- Johnathan Diaz-Arencia (JDA)
- Alejandro Ruiz (AR)

After a show and tell presentation, the implementation of the following user stories were accepted by the product owners.

User Story 20 -

As a developer, I want to make a dropdown button that can select the various versions of Surveys.

Assigned to: GT, LG, TE, JDA, AR

User Story 21 -

As a developer, I want to be able to access all the questions related to a survey and its selected version.

Assigned to: GT, LG, TE, JDA, AR

User Story 23 -

As a developer, I want to set up a responses table/section that will give all the responses related to a question and their related versions.

Assigned to: GT, LG, TE, JDA, AR

User Story 24 -

As a developer, I want to give data visualization to the responses table, via a button that gives me different graphs when selected.

Assigned to: GT, LG, TE, JDA, AR

User Story 25 -

As a developer, I want to have a version selector for questions in the question table.

Assigned to: GT, LG, TE, JDA, AR

The following ones were rejected and moved back to the product backlog to be assigned to a future sprint at a future Sprint Planning meeting.

- User Story 07 -
 - As a developer, I want to find a way to get how many surveys of a specific kind where completed last week for a study (insert fake data)
Assigned to: GT, LG, TE, JDA, AR
- User Story 08 -
 - As a developer, I want to find a way for surveys that are of multiple choice/Number choosing. What are the answers people have been giving over

the previous week, Ignore text inputs, audio and file uploads for now. GT, LG, TE, JDA, AR

User Story 10 -

- As a developer, I want to implement on the web server: create an API endpoint that takes in the person's enrollment id and returns how many surveys they have completed in the study, and how many days they have worn the Fitbit. Flutter: Call the endpoint and then show those metrics on the main page. Assigned to: GT, LG, TE, JDA, AR

User Story 22 -

As a developer, I want to set up a connection between the mobile and web application.

Assigned to: GT, LG, TE, JDA, AR

User Story 26 -

As a developer, I want to set up a counter of responses for each question version.

Assigned to: GT, LG, TE, JDA, AR

Sprint #6
Review Meeting

Project: Sensor Data Visualization

Date: 04/14/2023

Date

Page 44 of 63

Start Time: 8:00 PM

End Time: 8:30 PM

Attendees:

Product Owners:

- Christian Poellabauer:
- Rafael Trujillo
- Enshi Zhang
- John Michael Templeton

Capstone II:

- Luis A Gil (LG)
- Gentman tan (GT)
- Tony Erazo (TE)
- Johnathan Diaz-Arencibia (JDA)
- Alejandro Ruiz (AR)

After a show and tell presentation, the implementation of the following user stories were accepted by the product owners.

User Story 11 -

- As a developer, i want to find a way to show for an entire study, Bar Graph How Many people wore the fitbit over last week, one bar per day

Assigned to: GT, LG, TE, JDA, AR

User Story 22 -

- As a developer, I want to set up a connection between the mobile and web application.

Assigned to: GT, LG, TE, JDA, AR

User Story 26 -

- As a developer, I want to set up a counter of responses for each question version.

Assigned to: GT, LG, TE, JDA, AR

User Story 27 -

- As a developer, I want to give data visualization to the responses table, via a button, and work on the different graph options associated with that button .

Assigned to: GT, LG, TE, JDA, AR

User Story 28 -

- As a developer, I want to make an instructional video in order for the next developers to access the code and know how to run it.

Assigned to: GT, LG, TE, JDA, AR

The following ones were rejected and moved back to the product backlog to be assigned to a future sprint at a future Sprint Planning meeting.

- User Story 07 -

- As a developer, I want to find a way to get how many surveys of a specific kind where completed last week for a study (insert fake data)

Assigned to: GT, LG, TE, JDA, AR

- User Story 08 -

- As a developer, I want to find a way for surveys that are of multiple choice/Number choosing. What are the answers people have been giving over the previous week, Ignore text inputs, audio and file uploads for now. GT, LG, TE, JDA, AR

- User Story 10 -

- As a developer, I want to implement on the web server: create an API endpoint that takes in the person's enrollment id and returns how many surveys they have completed in the study, and how many days they have

worn the Fitbit. Flutter: Call the endpoint and then show those metrics on the main page. Assigned to: GT, LG, TE, JDA, AR

Appendix D - User Manuals, Installation/Maintenance Document, Shortcomings/Wishlist Document and other documents

How to install KOIOS:

Requirements:

- Download crowdmaster-platform
- Java SDK 8 is required to run
- Install VS Code to run the front end for React
- MySQL Workbench Required to run their database
- Flutter is required to work on the mobile port

Backend

- Download Eclipse. Make sure to install the Spring Tools 4 plugin from the Eclipse Marketplace.
- Once the plugin is installed, import the existing gradle project from the gradle folder. Set the root to the koios-server folder in the Sensor Data Visualization section. Gradle will install the necessary plugins and dependencies needed for the project.
- Make sure the password in the applications.properties file matches the password on your MySQL workbench server.
- To run, select the run dropdown button -> Run As -> Spring Boot App. If it asks for a class file, select KoiosServer.Java.
- In the rare case that you receive an error that states “Port 8080 was already in use”, open the command prompt as an administrator.
 - Run this command: netstat -ano | findStr “8080”
 - Then take the task value and run this command to terminate it: taskkill /F /PID 4616 <- task #

Frontend

- Open Visual Code Studio. Select “Open File” -> Koios-Web. Then, go to Terminal -> New Terminal
- In the terminal run the “npm install” command. It only needs to be run once unless more dependencies are added in the future.
 - Make sure you have node package manager installed. It can be installed from the node.js website.
- Run the command “npm start” to run the React App. Use App.js to start React.
- In the rare case that you receive an error that states “Port 8080 was already in use”, open the command prompt as an administrator.
 - Run this command: netstat -ano | findStr “8080”
 - Then take the task value and run this command to terminate it: taskkill /F /PID 4616 <- task #

How to install Mobile:

iOS

- Open up your iOS simulator.
- Open Xcode.
- Go to Xcode -> Open Developer Tool -> Simulator
- In the root directory of the Koios project, type in "flutter run lib/src/main.dart" into the command line. Alternatively, you may also go to "Run -> Start Debugging" in VS Code.
- Note: If you get an error regarding cloud_firestore, you may have to do an extra configuration step. Go to the following link <https://firebase.google.com/docs/flutter/setup> and do Step 3 - Part 2 ("Using Xcode, move the file...")

Android

- Open up your Android Simulator.
- See <https://developer.android.com/studio/run/emulator>, go to "Launch the Android Emulator without first running an app"
- In the root directory of the Koios project, type in "flutter run lib/src/main.dart" into the command line. Alternatively, you may also go to "Run -> Start Debugging" in VS Code.
- Note: If you get an error regarding cloud_firestore, you may have to do an extra configuration step. Go to the following link <https://firebase.google.com/docs/flutter/setup?platform=android> and do Step 3 - Parts 2-3 (regarding the config file for Firebase)

Shortcomings and Wishlist:

- Filter over the answers people have been giving over the previous week.
- Create an API endpoint that takes in the user's enrollment id and returns how many surveys they have completed in the study, and how many days they have worn the Fitbit.
- In Flutter, call the endpoint and then show those metrics on the main page.

Users Manual:

Web Application:

Step 1 Login: Enter your email and password for testing purposes use testing@fiu.edu and password 123.

A sign-in form on a white background. At the top, it says "Sign in" in bold, followed by "or use your account" in smaller text. Below this are two input fields: the first contains "jnapo@hotmail.com" and the second contains six dots. Under the password field is a link that says "Forgot your password?". At the bottom is a blue rounded button with the text "SIGN IN" in white. The form is set against a large blue rectangular background.

Step 2 Study Select: Select the study you want to view.

Home Studies Login						
Id	Name	Organization	Date	Status	View Study	View Surveys
1	FIU Test Study	Florida International University	2022-05-24 18:42:14	Open	Study	Surveys
2	Test_1	FIU	2022-05-31 09:08:27	Open	Study	Surveys
3	Test_2	FIU	2022-06-29 14:50:24	Open	Study	Surveys
4	FIU Fitbit Test Study	Florida International University	2022-07-20 15:48:33	Open	Study	Surveys
5	Test_3		2022-07-24 00:27:27	Open	Study	Surveys
6	Test_4		2022-07-24 22:36:55	Open	Study	Surveys
7	Speech Emotion Sensing Study	Florida International University	2022-09-16 17:23:27	Open	Study	Surveys
8	Running study	FIU	2023-01-16 18:23:27	Closed	Study	Surveys

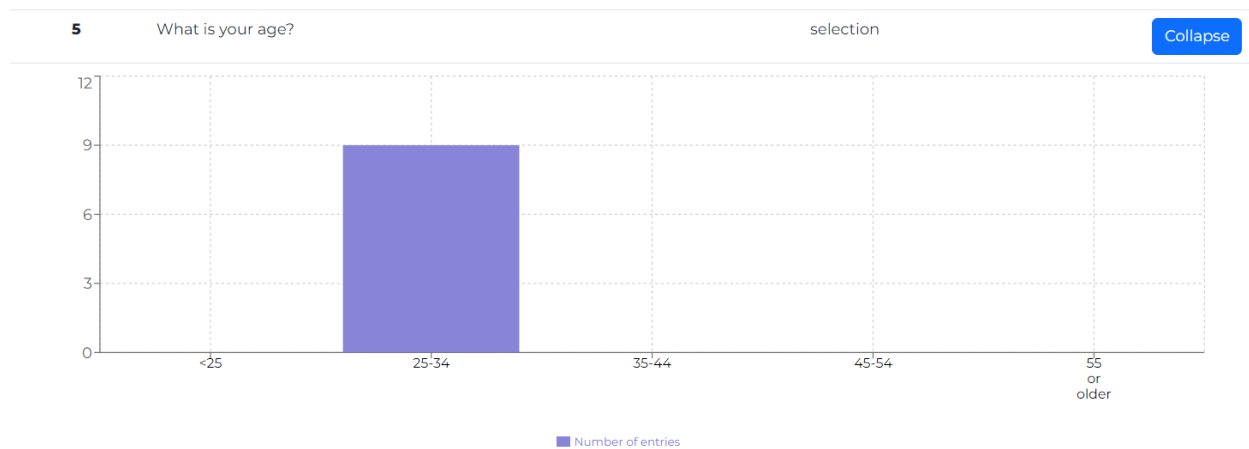
Step 3 Survey Select: Select the survey that you want to view.

Home Studies Login		
Id	Name	
1	Initial Data Collection One-Time	Questions
2	Initial Data Collection Always	Questions
3	Event Questionnaire	Questions
4	Audio Test	Questions
5	Periodic Mental Health Questionnaire Every Two Days	Questions
6	Periodic Mental Health Questionnaire Always	Questions
Back		

Step 4 Question Version Select: By clicking the drop down menu select a version of questions you want to view.

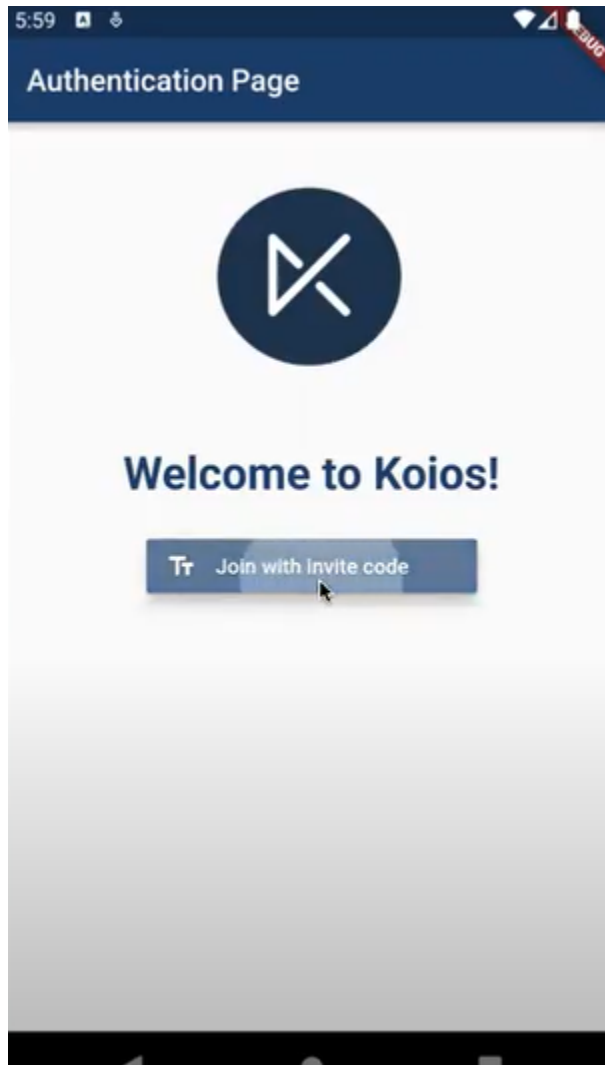
Home Studies Login						
		Select Version: 1 ▾				
#	Question	1 - 2022-05-24 responses: 130	Type	Child Trigger	ParentId	Show Graph
1	Please enter your gender.	2 - 2022-05-24 responses: 5	selection			Expand
2	Please specify your gender.	3 - 2022-05-24 responses: 8	text	Other (please specify)	1	
3	How would you describe yourself:	4 - 2022-05-25 responses: 2	choice			Expand
4	Please specify your previous answer.	5 - 2022-05-25 responses: 4	text	Other (please specify)	3	
5	What is your age?	6 - 2022-05-25 responses: 0	selection			Expand
6	Are you:		selection			Expand
7	What is your native language?		text			
8	What is your profession?		selection			Expand
9	Please specify your profession		text	Other (please specify)	8	
10	What is your rank/title?		selection	Law enforcement officer	8	Expand

Step 5 Visualize data: By clicking Expand you will be able to visualize the data of your selected question.

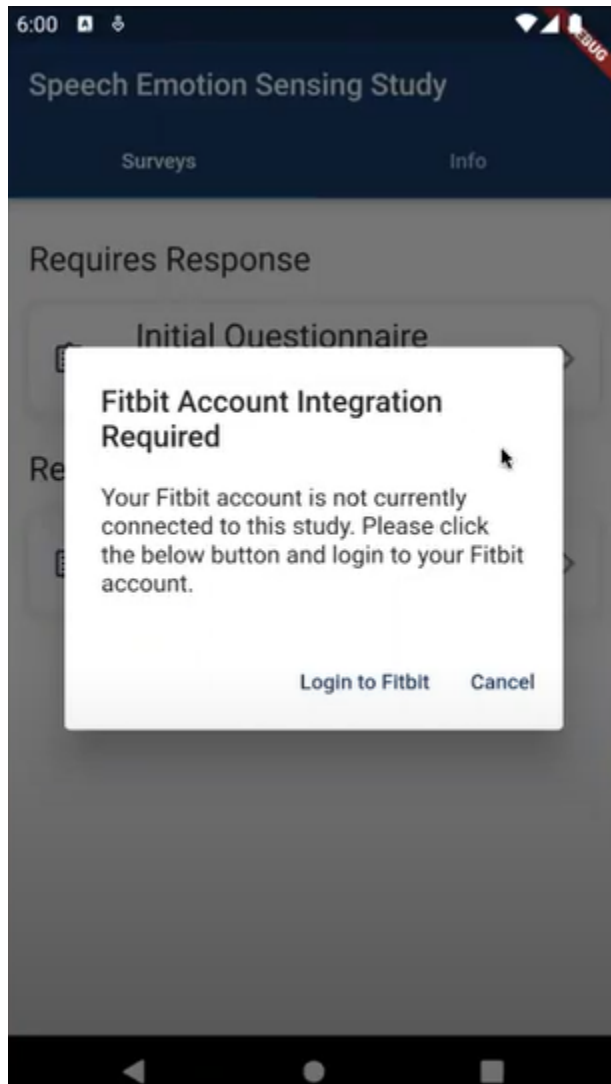


Mobile application:

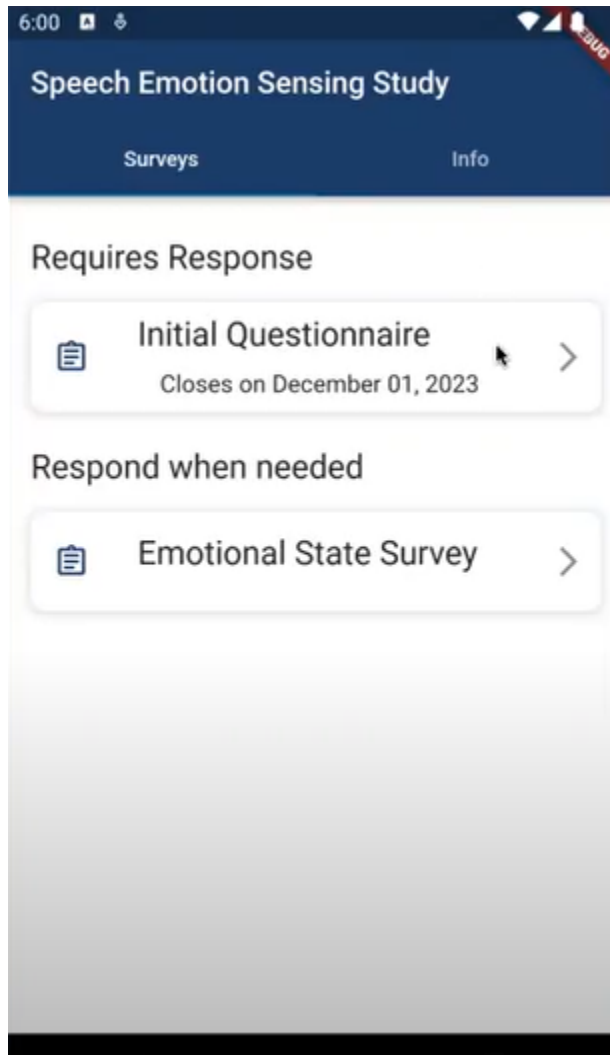
Step 1 Sign up with invitation code: invitation code SpeechEmotion2022



Step 2 Do not link to fitbit: as we are not provided with a fitbit device you cannot use a fitbit account. Please select cancel when prompted.



Step 3 Select Questionnaire: click on the bar under the required response header to select the questionnaire you want to work on.



Step 4 Answer Questionnaires: with multiple choice, text entry and likert scale questions.

6:00

← Initial Questionnaire Submit

1. What is your native language? *

Enter answer here

2. Do you speak with an accent? *

☐ Yes

☐ No

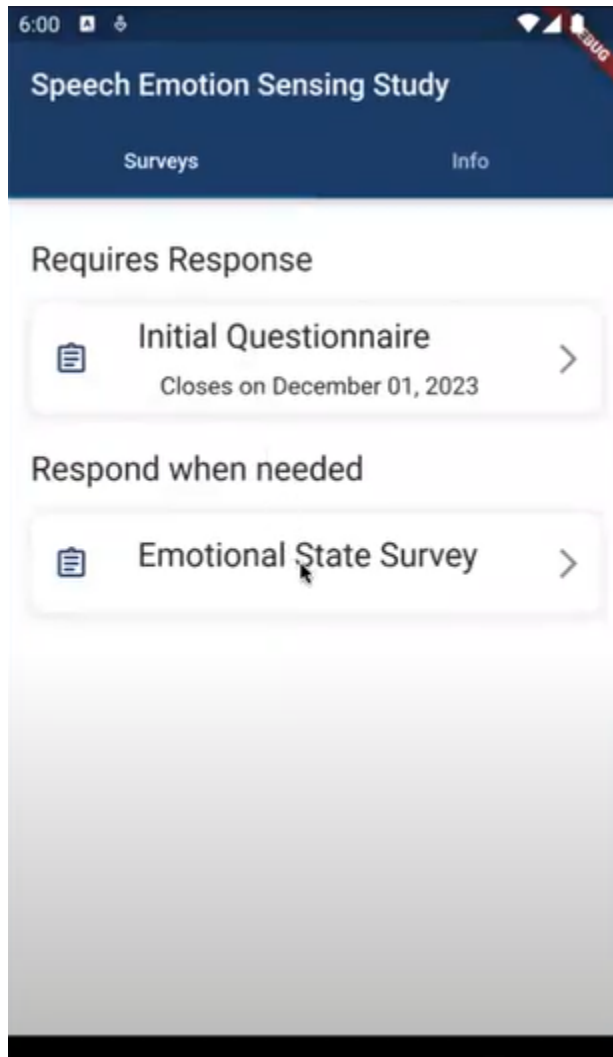
4. What is your education level? *

☐ Elementary School

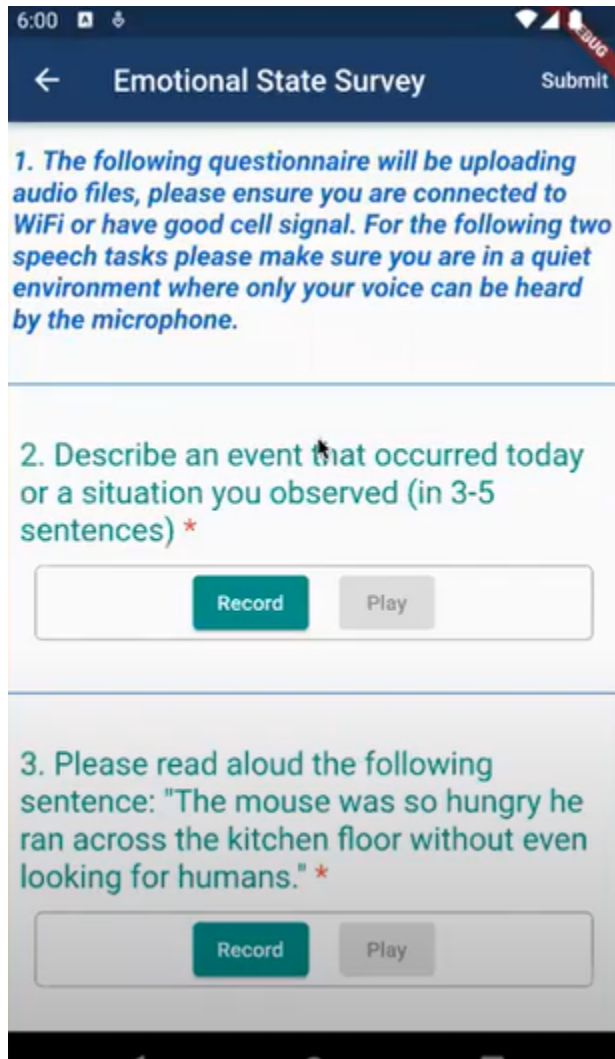
☐ Some High School

☐ High School Grad/Equivalentent

Step 5 Select Survey: Under the respond when needed you will see a emotional state survey. Click on it to view its contents.

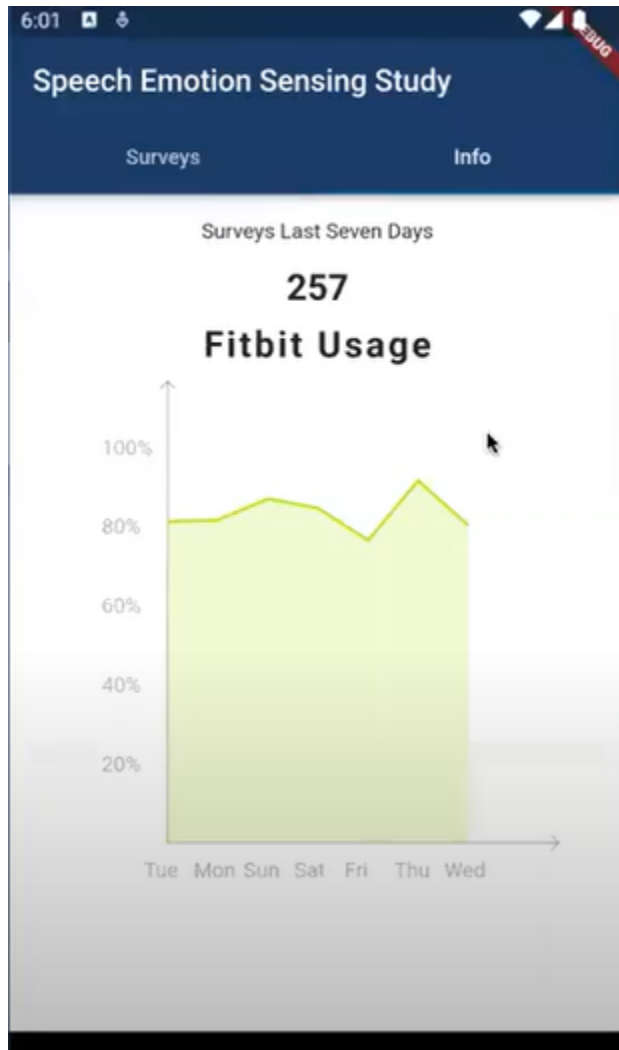


Step 6 Complete surveys, you can complete the surveys which at the moment are audio based. Just tap on the record button to record your answers.



The screenshot shows a mobile application interface for an "Emotional State Survey". At the top, there is a dark blue header bar with a back arrow on the left, the title "Emotional State Survey" in the center, and a "Submit" button on the right. Below the header, the first instruction is in blue text: "1. The following questionnaire will be uploading audio files, please ensure you are connected to WiFi or have good cell signal. For the following two speech tasks please make sure you are in a quiet environment where only your voice can be heard by the microphone." The second instruction is in green text: "2. Describe an event that occurred today or a situation you observed (in 3-5 sentences) *". Below this instruction is a white rectangular box containing two buttons: a green "Record" button and a grey "Play" button. The third instruction is also in green text: "3. Please read aloud the following sentence: 'The mouse was so hungry he ran across the kitchen floor without even looking for humans.' *". Below this instruction is another white rectangular box containing a green "Record" button and a grey "Play" button. The bottom of the screen shows the standard Android navigation bar.

Step 7 Visualizing user data: Tap on info and you will see all your data from your Fitbit in a graph, the info displayed will be the Fitbit usage during the week.



REFERENCES

- UML diagrams created using:
 - <https://plantuml.com/>
- Frontend libraries:
 - React: <https://react.dev/>
 - Bootstrap: <https://getbootstrap.com/>
 - Recharts: <https://recharts.org/>
- Backend libraries:
 - Spring Framework: <https://spring.io/>
 - Axios: <https://axios-http.com/>
- Mobile frameworks:
 - Flutter: <https://flutter.dev/>
- Integration testing
 - Postman: <https://www.postman.com/>