

Capstone Project 2021: The Complete Recorder

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Abstract

The Complete Recorder application is a sound recording app with organizational features for easy access and search. The app includes features which we have been looking for, however, these features do not exist on the apps currently in the market. Most sound recorders pile up recordings into a list, without basic search functionality and organization to help users find a specific recording. As some users have lots of recordings per week, sifting through a pile of recordings and playing each one of them just to find the one recording they're looking for can be a pain. The Complete Recorder application will help to solve these issues.

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1.0 Introduction

1.1 Background

As students who record multiple times a day, finding recordings can become really difficult. We also found that the current state of recording applications couldn't allow users to rename, search and organize their recordings altogether, as well as have different other great features. Whenever we find a good app that offers any one of these features, it would be lacking in others.

1.2 Purpose

The purpose of our project is to build an application that will achieve, or at least get close to solving the problem of not having all the features we need in a recording application in just *one* application. And given the time we have to complete the project, we wanted to build an application with features to achieve this goal.

Our vision when starting this project was to create an application we would love to use. As students, we found that we had a few different applications because each one did something the other could not. Our goal ultimately is to create an app that is a one-stop shop for users looking to record anything. Over time we hope to add useful and innovative features that would cater to both power and everyday users while still maintaining its simplicity and ease of use.

2.0 Requirements, Specifications and Design

2.1 Project Scope

The scope of this project is to create a cross-platform recording application which will include features we believe a good and complete recorder should have. This includes features such as:

- A fully functional, user friendly recording page
- Organizational features, to ensure that recordings are not just in a list, and can be organized, either through folders or tags
- Search functionality, for a user wants to quickly search for a specific recording, without going into all the folders they might have created.

2.2 Project Timeline

The table below shows the timeline of our project.

	September	October	November	December	January	February	March	April
Phase 1	Project Requirements							
Phase 2				Studying Dart and Flutter				
Phase 3					Code Development			
Phase 4							Testing	

Table 1.1 Project Timeline

For this project, we were given a timespan of about eight months to complete our work. We began the preparations for the project in September, and the project was set to conclude at the end of March/mid April. The total of eight months was split into two parts.

The first part began in September 2020 and lasted till December 2020. During this time, we worked on completing tasks linked to our project requirements, design and prototyping. As well, we focused on researching and learning the technologies we needed to begin working on our application.

The second part began in January 2021 and concluded in April 2021. In this time, we focused on development work and testing our application internally.

2.3 Design

We started sketching our design on paper. Some of the things we needed to consider during our design are our three fundamentals:

- Friendliness - the ease of use of our application. We needed to make sure our application is easy to use for both power users and casual users.
- Familiarity - making sure that it is similar to what people are already used to, to help cut down on the learning time for the users of the application.
- Functionality - making sure the application is fully functional, with all the features we wanted to include, and ensuring that everything works seamlessly together.

So, having our three fundamentals in mind, we began sketching our ideas, as shown in the figures below. We also sketched our user interactions, which were very critical for how we would build our application. And because we were able to have our design ideas finalized, we were able to follow them very closely during the development of our application.

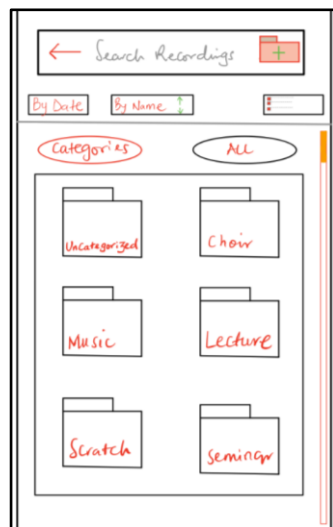


Figure 2.1

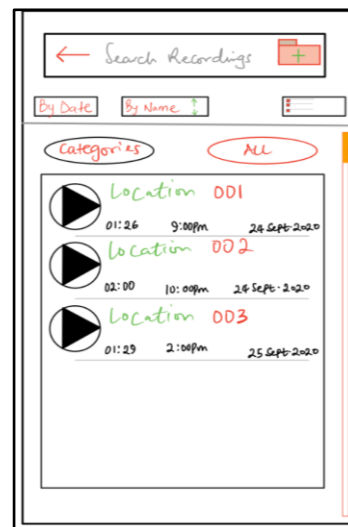


Figure 2.2

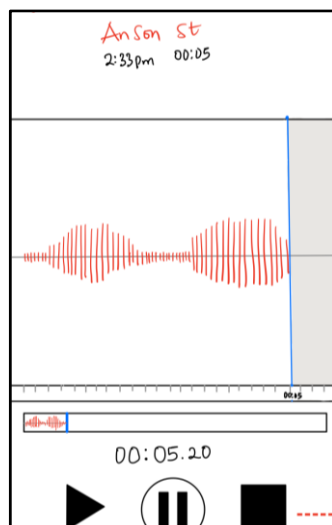


Figure 2.3

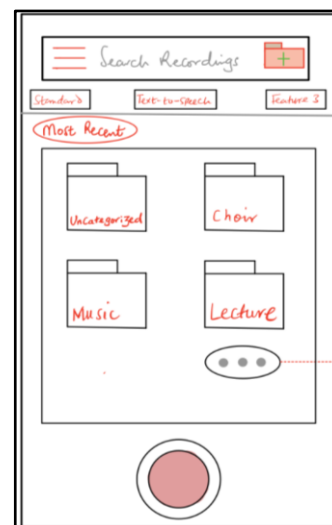


Figure 2.4

3.0 Used Tools and Technologies

We had initially planned to start out with an application for Android devices, but after much consideration, we decided to produce an application that would work for both iOS and Android devices. We utilized different tools and technologies to get our application to where it is now.

3.1 Android Studio

Android studio is used to develop applications specifically for Android devices, however, along with Flutter and Dart, it can be used to develop cross-platform applications.

3.2 Flutter

Flutter is an open-source UI software development kit created by Google. It is used to develop applications across all platforms. Everything in Flutter is a widget - that is, you basically build your UI out of widgets. Flutter uses different widgets to describe what a view would look like with the current configuration/state. Then when the state is updated, the widget is rebuilt to transition from one state to the next.

3.3 Dart

Our code using the Flutter platform is written in the Dart programming language.

3.4 iOS Specific Installations

3.4.1 Xcode

Xcode is Apple's Integrated Development Environment (IDE), which is used to develop software on Mac for iOS, iPadOS, MacOS, etc.

3.4.2 CocoaPods

CocoaPods is a library or framework used for Swift and Objective-C Cocoa projects. It allows for ease of using third-party code and their integration with Xcode projects.

3.4.3 iOS Simulator

Part of the Xcode software application, this tool helps during development and is used for prototyping for our mobile application.

3.5 Android Specific Installations

3.5.1 Android Emulator

The android emulator is a software application that opens an imitation of Android OS features into your PC. Our emulator was built into the Android Studio software.

3.6 Github

GitHub is a platform for version control and collaboration, and it lets you and other team members work together on the same projects. We utilized Github in the process of keeping up with our development cycle.

3.7 Microsoft Azure DevOps Services

Microsoft Azure DevOps Services offers different resources and we used the Azure Boards, which offers “agile planning tools for traceability and reporting” (Microsoft, 2020). This feature was used by our development team for organizing our sprints and keeping track of our work.

4.0 User Manual/How-To

As shown in Figure 3.1, the user can navigate to the *All recordings* folder, and the *Speech* folder for the speech-to-text feature directly from the homepage. Furthermore, any intention to begin recording, shown in Figure 3.2, or search for one, Figure 3.3, can be done with a single tap directly from the homepage as well.

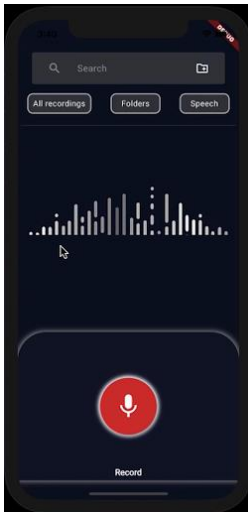


Figure 3.1

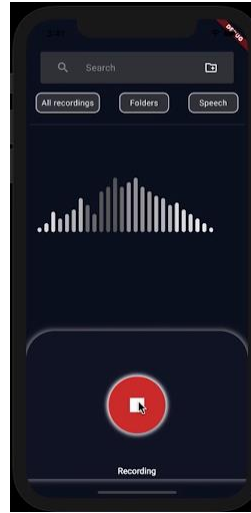


Figure 3.2

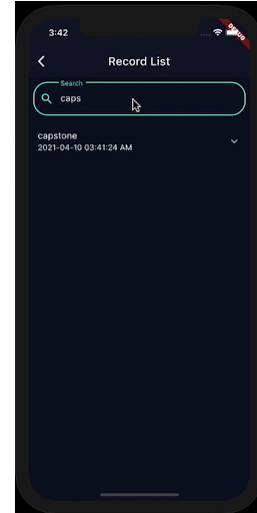


Figure 3.3

In the *All recordings* section, the user will be presented with the list of recordings which can be played, paused, and stopped, as shown in Figure 3.4, or renamed, Figure 3.5. The user also has the same ability to do a search directly from the *All recordings* section as well, as shown in Figure 3.3, and upon extending the searched recording, can also play, pause and stop the recording.

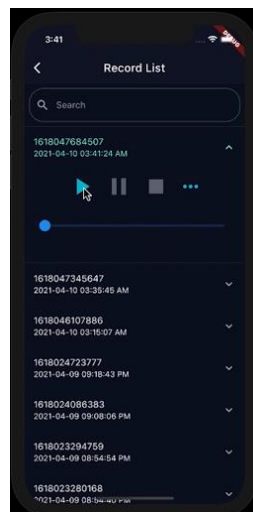


Figure 3.4

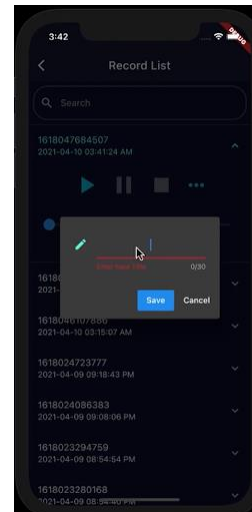


Figure 3.5

In the *Speech to Text* section, shown in Figure 3.6, the user can begin to record their voice, which will then be transcribed as a text, as displayed in Figure 3.7. The text then can either be copied to clipboard or be converted directly to PDF file, as shown in Figure 3.8.

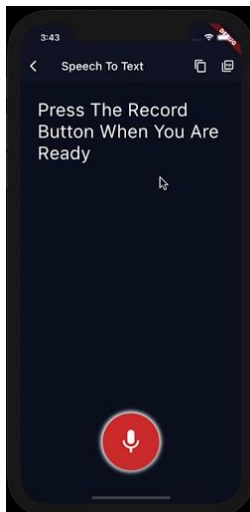


Figure 3.6



Figure 3.7

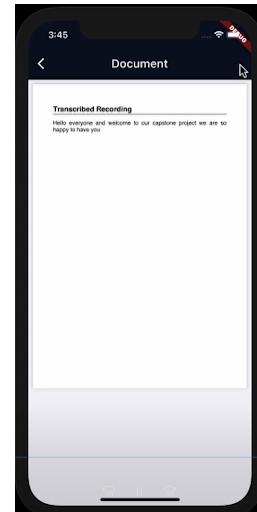


Figure 3.8

For future implementation, we were thinking of adding some kind of organizational functionality, where different folders can be created and recordings can be created and saved directly into the folders. That is what we put currently on the folders section, Figure 3.9.

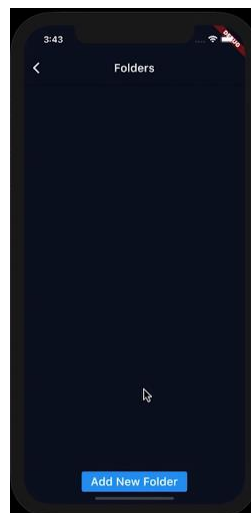


Figure 3.9

5.0 Reflections

5.1 Experiences - Lessons Learned

It has been an exciting and exhilarating eight-month journey. Together as a team, we have learned new and interesting things in our approach to completing our project. Here is a list of some of the great positive experiences we were able to acquire through the course of this project:

- We learned about flutter and how to use it to build cross-platform applications
- We were able to bring standard ways of working with revision control from working in industry into our project development
- We were also able to learn and add a new programming language (Dart) under our belt.

5.2 Changes

Like most journeys in life, there will always be ups and downs and ours was not any different. One of the biggest challenges we faced as a team was trying to meet deadlines after issues that occur, often due to circumstances beyond our control. If there is one thing we would change if we had to do this all over again, it would be to begin our timing and planning much earlier. By choosing to do this, we hope to help somewhat mitigate events or occurrences that could potentially delay us from meeting our deadlines.

5.3 Going Forward

“Give me six hours to chop down a tree and I will spend the first four hours sharpening the axe”
- Abraham Lincoln.

Having a good planning process is definitely the biggest takeaway from our capstone project. We found that having more detailed plans after getting our high-level implementation left us feeling more focused and more precise as to exact things that we need to do and get done.

Overall, it has been an amazing eight-months. We have left these past two semesters being more comfortable and conversant with front-end and app development. This journey is not done for us, and we are really looking forward to applying more of the skills we have acquired here in the future.

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