

University of Ottawa

GNG 2101[C]: Group 2.3

# **Deliverable F – Prototype 2 and Project Plan**

Submitted by

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## **Abstract**

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In this deliverable, some improvements have been made based on client feedback and a Prototype 2 has been created accordingly. The most critical product assumption at this stage for the second prototype has been identified. Some sketches, pictures and diagrams have been presented to illustrate the second prototype and the purpose and function of the prototype have been explained. Prototype testing, analysis, and performance evaluation has been carried out in comparison to target specifications developed in Project Deliverable B. All testing results and prototype specifications have been documented. Finally, testing was presented in an organized, tabular format that shows expected versus actual results.

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# **1 Introduction**

This deliverable is based upon the client feedback that has been provided to us and the changes that need to be made to meet their requirements. That is, some adjustments need to be made so that a maximum level of satisfaction is achieved. In this respect, the feedback that was received was incorporated in a better version of prototype 1, which is prototype2. The latter is accompanied with product assumptions for which testing has been performed to validate them. To emphasize accuracy and for better guidance, a lot of sketches, diagrams and images have been developed. Furthermore, the purpose and function of the prototype has been explained to make sure that the concerns that were raised by the client were accurately and precisely identified. Some prototype testing, analysis and performance evaluation have been made in comparison to Deliverable B and the issues that were faced are also discussed. Finally, this deliverable will be a great milestone as it will allow to have a great starting point for building the Business Model and making an Economics Report in the next deliverable.

## **2 Client Feedback**

In the last client meeting, the client was satisfied with the presentation and the working image rendering feature to be incorporated in the 2<sup>nd</sup> prototype. The issues raised by the client in the 2<sup>nd</sup> client meeting were all addressed and will be incorporated in the second and third prototypes. The issues that were discussed in the meeting, and will be addressed in the next prototypes, were the use of solid colors for app presentation and the branching off settings in bigger font or in icons all of which were raised by the professor during our last class presentation.

### 3 Most Critical Product Assumption

The most critical product assumption made on the second prototype is the testability of the mobile application on iOS and Android platforms. Currently, we have developed the mobile application on Flutter which allows the application to be downloaded on both platforms making this a critical product assumption. However, we have successfully tested the application on an Android device, but not an iOS device since there were some issues as seen in the figures. Moving onto the next stages of the prototype we have a solid assumption that the developed application will work on an iOS device, but it still needs to be tested based on all the product functionality and usability. This will be attained by downloading Flutter successfully on a MacBook to test the developed code, then we will have the ability to apply the testing methods to our most critical product assumption.

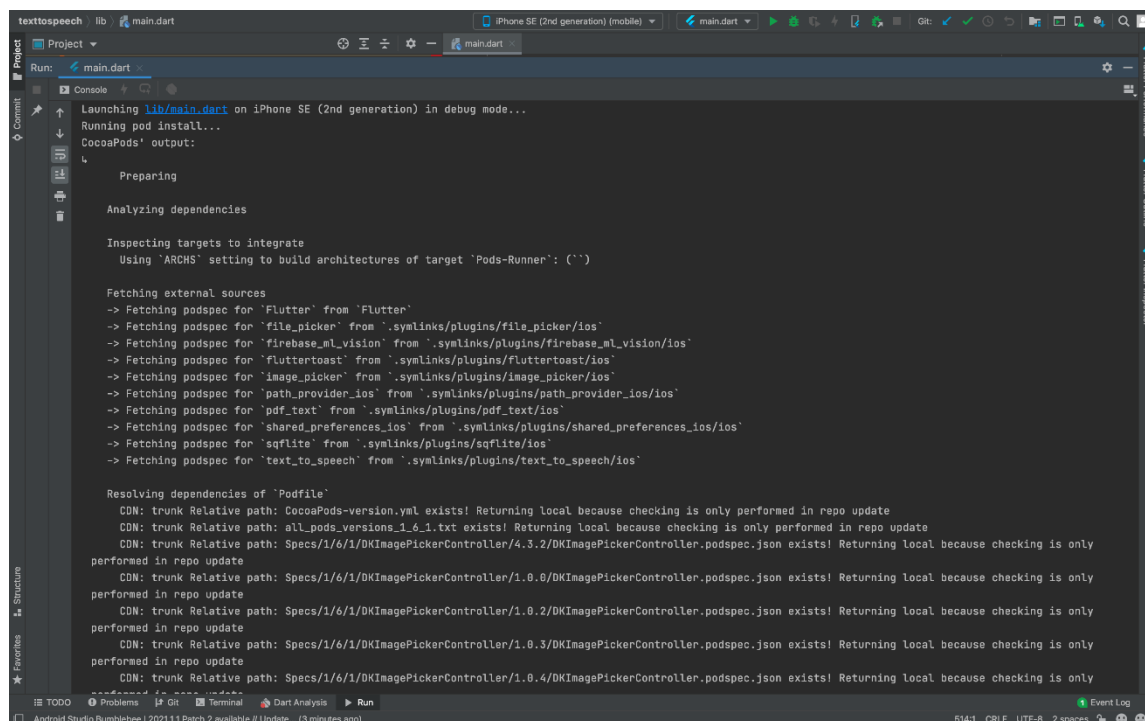


Figure 1: iOS error testing 1

```

CDN: trunk Relative path: Specs/0/3/5/Firebase/7.5.0/Firebase.podspec.json exists! Returning local because checking is only performed in repo update
CDN: trunk Relative path: Specs/0/3/5/Firebase/7.6.0/Firebase.podspec.json exists! Returning local because checking is only performed in repo update
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CDN: trunk Relative path: Specs/0/3/5/Firebase/7.9.0-k2/Firebase.podspec.json exists! Returning local because checking is only performed in repo update
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CDN: trunk Relative path: Specs/0/3/5/Firebase/8.3.0/Firebase.podspec.json exists! Returning local because checking is only performed in repo update
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CDN: trunk Relative path: Specs/0/3/5/Firebase/8.9.0/Firebase.podspec.json exists! Returning local because checking is only performed in repo update
CDN: trunk Relative path: Specs/0/3/5/Firebase/8.10.0/Firebase.podspec.json exists! Returning local because checking is only performed in repo update
CDN: trunk Relative path: Specs/0/3/5/Firebase/8.11.0/Firebase.podspec.json exists! Returning local because checking is only performed in repo update
CDN: trunk Relative path: Specs/0/3/5/Firebase/8.12.1/Firebase.podspec.json exists! Returning local because checking is only performed in repo update
CDN: trunk Relative path: all_pods_versions_5_1_0.txt exists! Returning local because checking is only performed in repo update
CDN: trunk Relative path: Specs/5/1/0/Toast/4.0.0/Toast.podspec.json exists! Returning local because checking is only performed in repo update

[!] CocoaPods could not find compatible versions for pod "pdf_text":
In Podfile:
  pdf_text (from `.symlinks/plugins/pdf_text/ios`)

Specs satisfying the 'pdf_text' (from `.symlinks/plugins/pdf_text/ios`) dependency were found, but they required a higher minimum deployment target.
Error running pod install
Error launching application on iPhone SE (2nd generation).

```

Figure 2: iOS error testing 2

```

Specs satisfying the 'pdf_text' (from `.symlinks/plugins/pdf_text/ios`) dependency were found, but they required a higher minimum deployment target.
Error running pod install
Error launching application on iPhone SE (2nd generation).

/usr/local/Cellar/cocoapods/1.11.2.1/libexec/gems/molinillo-0.8.0/lib/molinillo/resolution.rb:317:in 'raise_error_unless_state'
/usr/local/Cellar/cocoapods/1.11.2.1/libexec/gems/molinillo-0.8.0/lib/molinillo/resolution.rb:299:in 'block in unwind_for_conflict'
/usr/local/Cellar/cocoapods/1.11.2.1/libexec/gems/molinillo-0.8.0/lib/molinillo/resolution.rb:297:in 'tap'
/usr/local/Cellar/cocoapods/1.11.2.1/libexec/gems/molinillo-0.8.0/lib/molinillo/resolution.rb:297:in 'unwind_for_conflict'
/usr/local/Cellar/cocoapods/1.11.2.1/libexec/gems/molinillo-0.8.0/lib/molinillo/resolution.rb:682:in 'attempt_to_activate'
/usr/local/Cellar/cocoapods/1.11.2.1/libexec/gems/molinillo-0.8.0/lib/molinillo/resolution.rb:254:in 'process_topmost_state'
/usr/local/Cellar/cocoapods/1.11.2.1/libexec/gems/molinillo-0.8.0/lib/molinillo/resolution.rb:182:in 'resolve'
/usr/local/Cellar/cocoapods/1.11.2.1/libexec/gems/molinillo-0.8.0/lib/molinillo/resolver.rb:43:in 'resolve'
/usr/local/Cellar/cocoapods/1.11.2.1/libexec/gems/cocoapods-1.11.2/lib/cocoapods/resolver.rb:94:in 'resolve'
/usr/local/Cellar/cocoapods/1.11.2.1/libexec/gems/cocoapods-1.11.2/lib/cocoapods/installer/analyzer.rb:1078:in 'block in resolve_dependencies'
/usr/local/Cellar/cocoapods/1.11.2.1/libexec/gems/cocoapods-1.11.2/lib/cocoapods/installer/analyzer.rb:1076:in 'resolve_dependencies'
/usr/local/Cellar/cocoapods/1.11.2.1/libexec/gems/cocoapods-1.11.2/lib/cocoapods/installer/analyzer.rb:124:in 'analyze'
/usr/local/Cellar/cocoapods/1.11.2.1/libexec/gems/cocoapods-1.11.2/lib/cocoapods/installer.rb:416:in 'analyze'
/usr/local/Cellar/cocoapods/1.11.2.1/libexec/gems/cocoapods-1.11.2/lib/cocoapods/installer.rb:241:in 'block in resolve_dependencies'
/usr/local/Cellar/cocoapods/1.11.2.1/libexec/gems/cocoapods-1.11.2/lib/cocoapods/user_interface.rb:64:in 'section'
/usr/local/Cellar/cocoapods/1.11.2.1/libexec/gems/cocoapods-1.11.2/lib/cocoapods/installer.rb:240:in 'resolve_dependencies'
/usr/local/Cellar/cocoapods/1.11.2.1/libexec/gems/cocoapods-1.11.2/lib/cocoapods/installer.rb:161:in 'install!'
/usr/local/Cellar/cocoapods/1.11.2.1/libexec/gems/cocoapods-1.11.2/lib/cocoapods/command/install.rb:52:in 'run'
/usr/local/Cellar/cocoapods/1.11.2.1/libexec/gems/claide-1.0.3/lib/claide/command.rb:334:in 'run'
/usr/local/Cellar/cocoapods/1.11.2.1/libexec/gems/cocoapods-1.11.2/lib/cocoapods/command.rb:52:in 'run'
/usr/local/Cellar/cocoapods/1.11.2.1/libexec/gems/cocoapods-1.11.2/bin/pod:55:in 'ltop (required)>'
/usr/local/Cellar/cocoapods/1.11.2.1/libexec/bin/pod:23:in 'load'
/usr/local/Cellar/cocoapods/1.11.2.1/libexec/bin/pod:23:in '<main>'

Error output from CocoaPods:
↳

[!] Automatically assigning platform 'ios' with version '9.0' on target 'Runner' because no platform was specified. Please specify a platform for this target in your Podfile. See https://guides.cocoapods.org/syntax/podfile.html#platform.

```

Figure 3: iOS error testing 3

## 4 Prototype 2 Development

Prototype 2 has been developed using VS Code as a text editor and Android Studio to have a Pixel 3 android emulator. The latter allows to see a visual representation of our code and test that the intended output is obtained. In our third client meeting, we were short on time and were not able to build the application the way it was supposed to. For instance, the options only consisted of buttons with some text to prompt the user about what they wanted to do. Furthermore, the pdf option was not yet implemented, and the application was developed up to the point of image rendering:

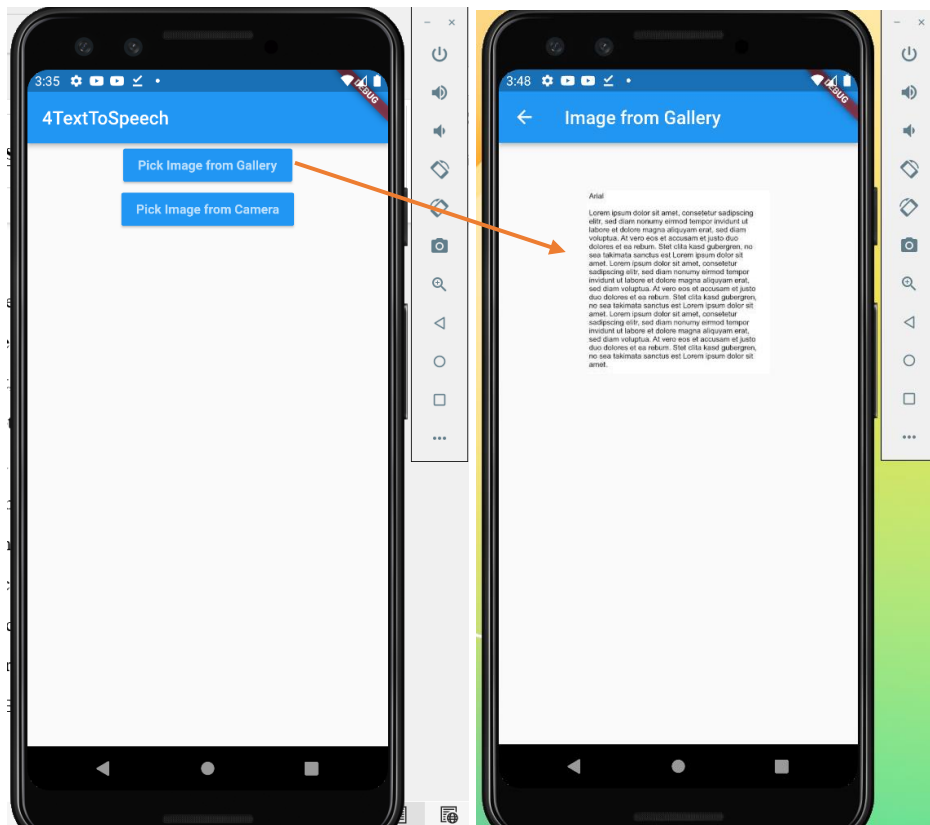
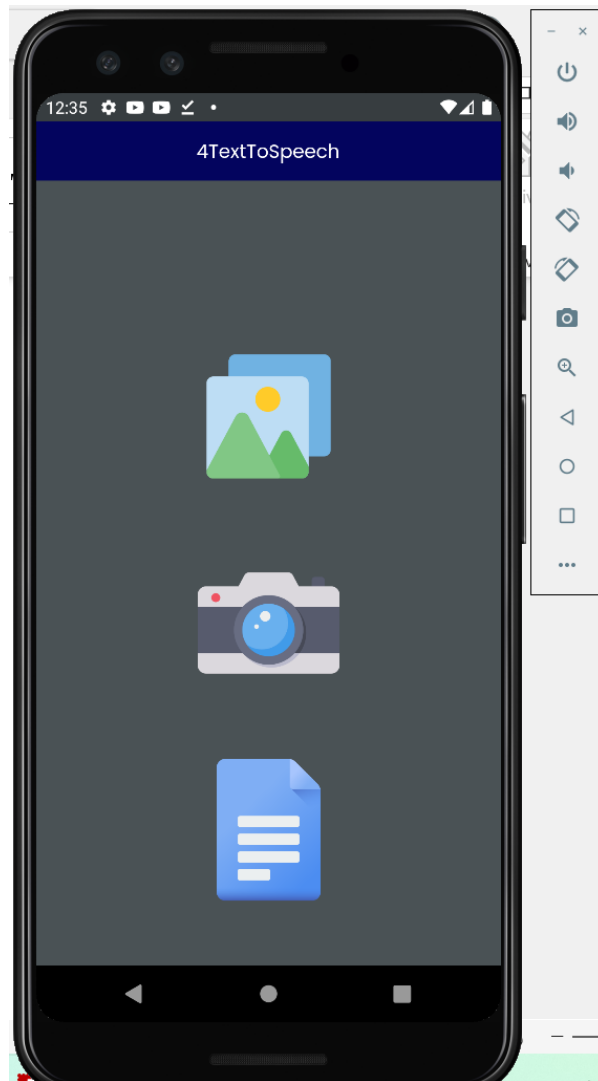


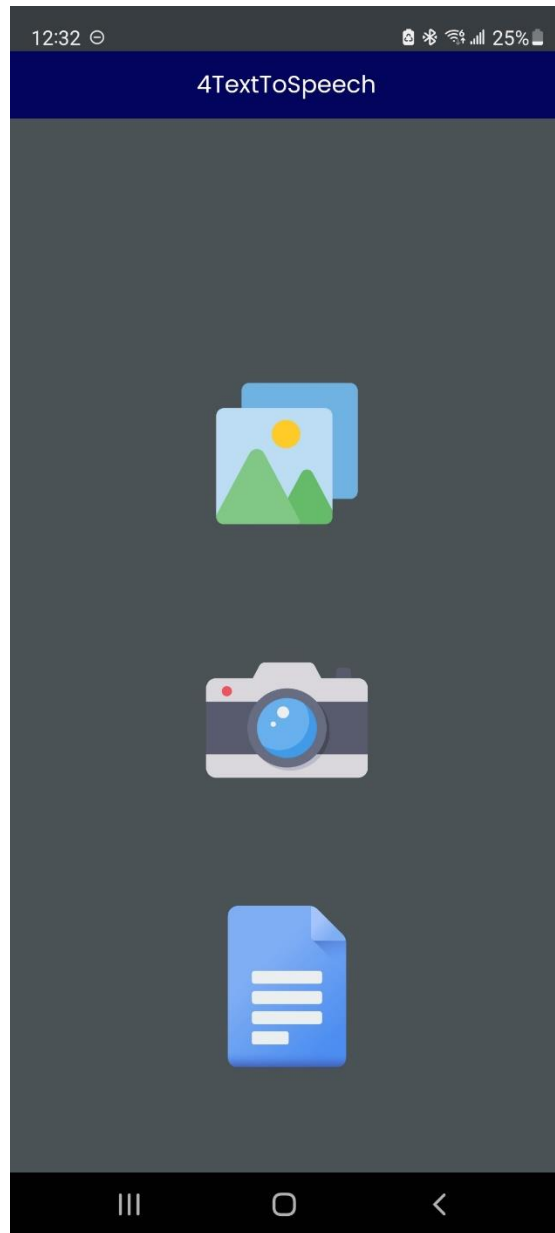
Figure 4: Initial stage of prototype 2: Main UI



Some improvements have been made to meet the client's requirements. Below are two images, one showing the output on the actual emulator and the other showing the output on a real android device upon generating the application as an apk file. A link has been provided below to view the working application.



*Figure 5: Prototype 2 on emulator*



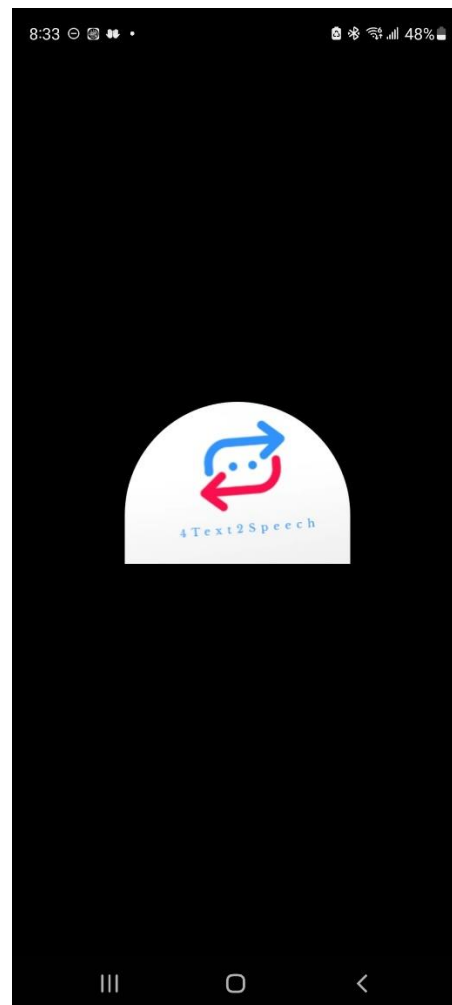
*Figure 6: Prototype 2 on phone*

**Link to the second prototype:** [https://drive.google.com/file/d/1ID5Qddii5BSHnYmGtz4k-S3bElzQo\\_lg/view?usp=sharing](https://drive.google.com/file/d/1ID5Qddii5BSHnYmGtz4k-S3bElzQo_lg/view?usp=sharing)

**Note:** Video might have to be downloaded to view it.

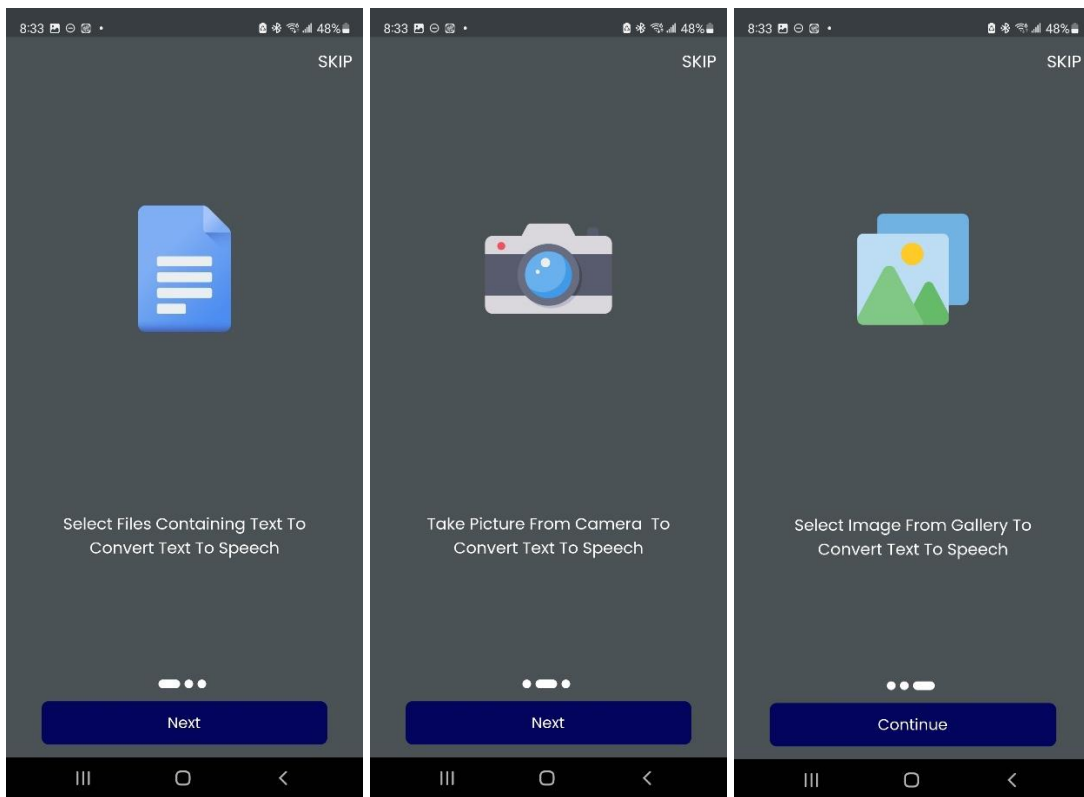
## 5 Sketches, diagrams, pictures, purpose, and functionality

The different screens of the application are shown below to showcase how it looks like, demonstrate the functionalities that has been implemented upon client feedback. The first screen aims to welcome the user every time they open the application. It contains a black background and the logo of the application.



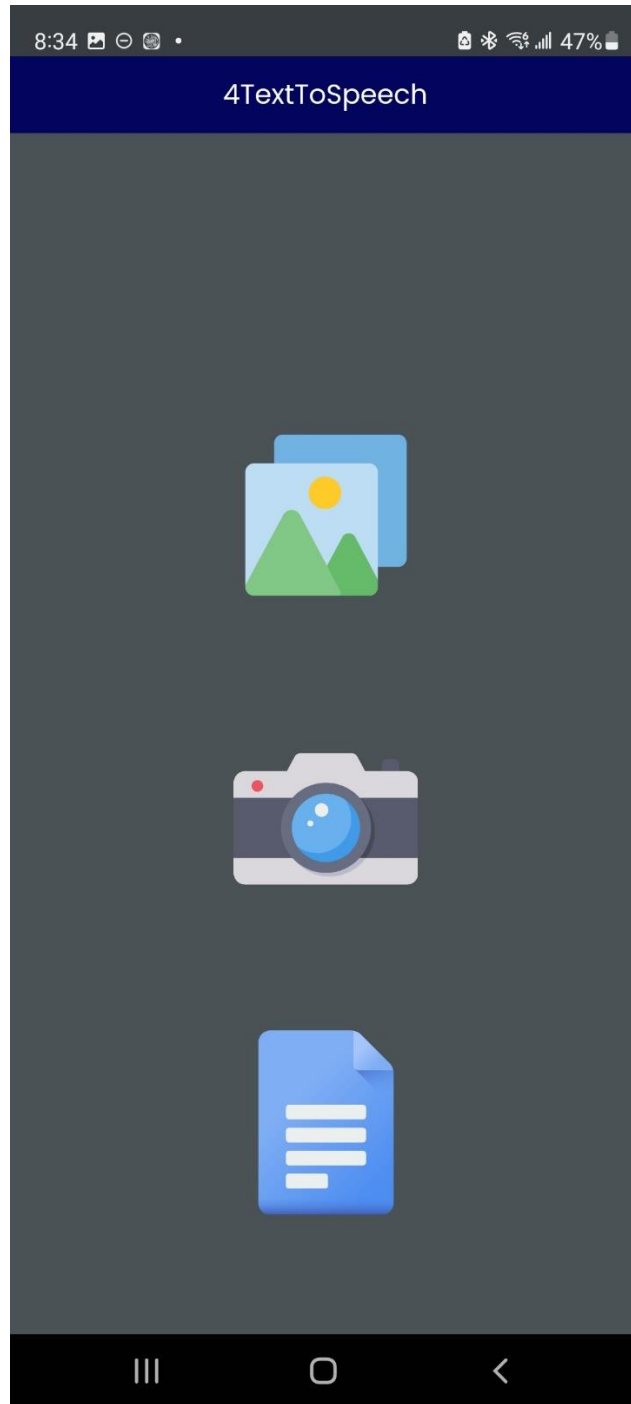
*Figure 7: Welcome screen*

The following 3 figures are screens that will show only the first time the application is opened. Its main purpose is to explain the user what each option is intended to do. As the user will be familiar with the application, it makes sense that it is shown only once. The first picture below shows the file icon and its associated function at the bottom. The second picture shows a camera icon with its associated function below. The last picture shows an image icon, again, with its associated function at the bottom.



*Figure 8: Onboarding - File Selection, Camera Access, Picture Selection*

Like explained on the “onboarding” screens, all the icons are displayed on the main UI and the user can select the one that they want depending on their needs.



*Figure 9: App main UI*

Upon selecting any of the options, the appropriate output will be shown on the screen. For an image that is selected in the gallery and a picture taken from the user's camera, the corresponding image is rendered. However, for a .pdf or .txt file, there might be multiple pages on the file. In this case, it is not possible to make a display. As a result, the text is instead extracted and output in a text box.

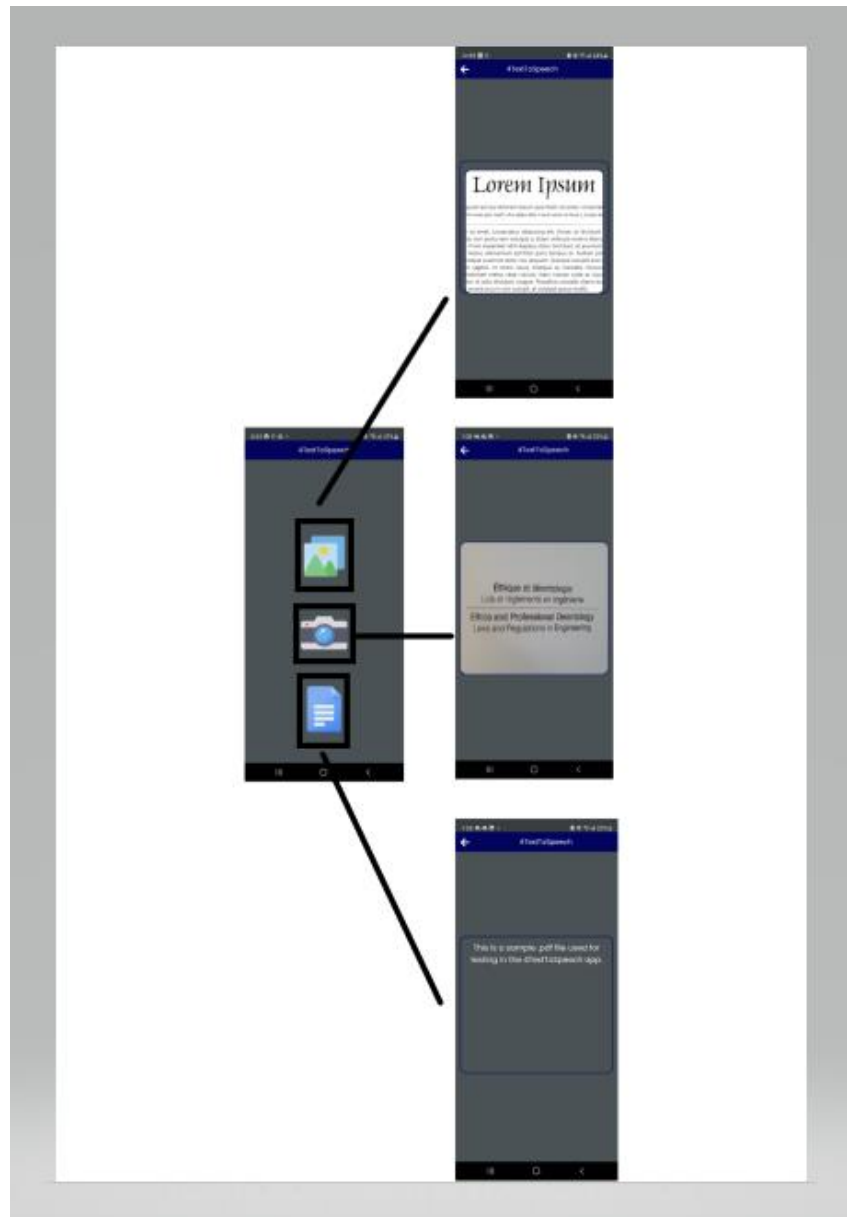


Figure 10: Image Rendering and Text Output

## **6 Prototype testing, analysis, and performance evaluation**

The testing stage is one of the fundamentals of prototyping. In Deliverable D, we had developed a prototype test plan that involved using an Android and iOS emulator to test the written code. The plan was executed in this Deliverable F, to test for functionality and usability of the application and features using Visual Studio Code and Android Studio. Tests were both performed on PC and Macbook.

### **6.1 Prototype testing and analysis**

#### **Testing on Android Platform**

- Splash user interface testing: The application logo is successfully displayed to the user upon opening the application for the first time. (Refer to Figure 3)
- User onboarding screen testing: The application successfully displays the three different options “Select Files Containing Text To Convert Text To Speech”, “Take Picture From Camera To Convert Text To Speech”, “Select Image From Gallery To Convert Text To Speech” to the user before they initiate to the main menu of the UI. The “skip” button works, and the user can skip the onboarding screen if they do not want to see the tutorial. (Refer to Figures 4-6)
- Selecting Image Files to Transcribe: We tested the functionality of this feature that is responsible for allowing the user to select PNG and JPEG files on their device that can be used to transcribe. While testing, the feature was successfully able to select PNG and JPEG files without any error. (Refer to Figure 8)
- Taking an image using the camera: In this feature, the rear camera was used to take a picture of a sample word document that contained some sentences which were successfully obtained by the application. (Refer to Figure 8)
- Selecting Text Files to Transcribe: We tested this feature by opening a TXT, PDF, and WORD file type that contained words. The application was successfully able to open all file types except DOCx type and display the content from those files. (Refer to Figure 8)

## Testing on iOS/Macbook

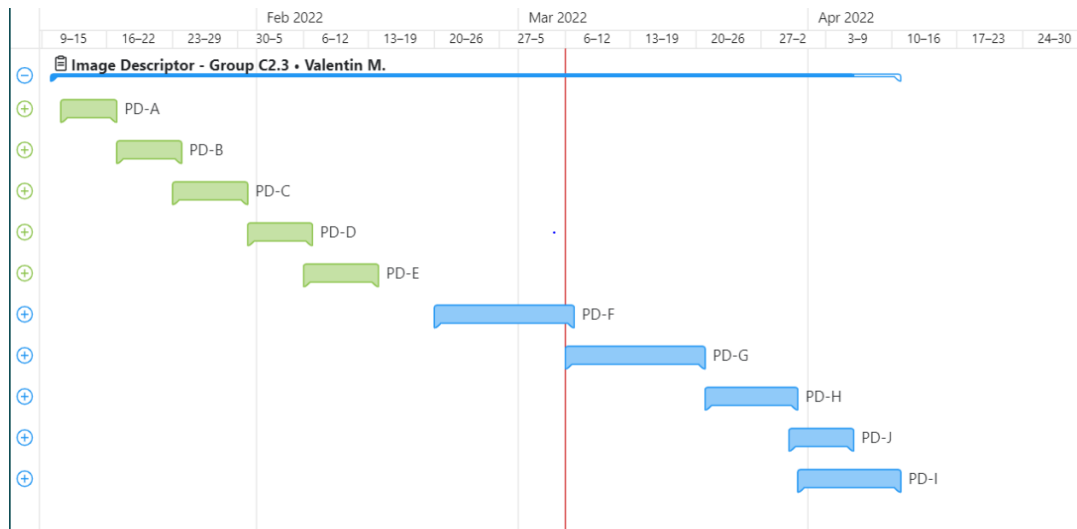
When testing on an iOS device, we faced some issues when running the code as seen in the critical product assumption. However, as assumed these issues will be fixed and the testability will successfully be carried out on an iOS device prior to deploying the application.

## 6.2 Performance Evaluation

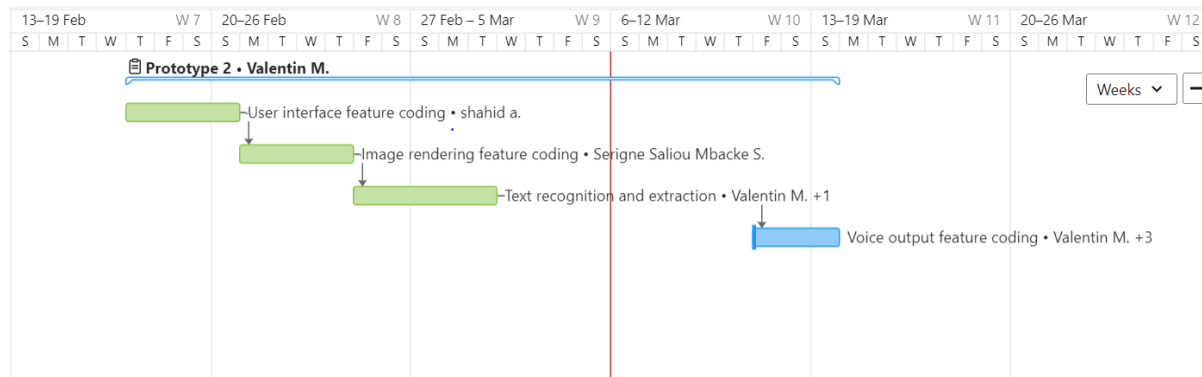
| METRIC # | Metric                    | UNIT | MARGINAL VALUES | IDEAL VALUES                            | ACTUAL VALUES       |
|----------|---------------------------|------|-----------------|---|---------------------|
| 1        | Response time             | s    | 5               | 3                                       | 3                   |
| 2        | Monthly Subscription Cost | \$   | 5               | 0                                       | 0                   |
| 3        | Types of files supported  | N/A  | JPEG, PNG, PDF  | All image file types, .pdf, .txt, .docx | JPEG, PNG, PDF, TXT |
| 4        | Speech Speed              | %    | < 300 WPM       | < 250 WPM                               | < 250 WPM           |
| 5        | Number of voices          | N/A  | 3               | 5                                       | 0                   |
| 6        | Number of languages       | N/A  | 5               | 20                                      | 0                   |
| 7        | App OS Compatibility      | N/A  | IOS and Android | IOS and Android                         | Android             |



## 7 Project plan update



### Prototype 2 sub-tasks:



## 8 Conclusions

In conclusion, the prototype 2 is missing some critical functionality which will have to be implemented as soon as possible to be able to deliver the final project on time. Furthermore, more debugging has to be done on MAC OS to solve the problem and run the application to check the functionality. This is crucial as it is a main requirement from the client and will therefore be the top priority. The dark mode also needs to be implemented although the colors chosen for the moment simulate a dark mode and therefore it will not be our main focus. The voice output which is the core functionality will have to be implemented as well along with the ability to make a pause, continue from where the user left off, and start over. Voice selection as either male or female needs to be implemented. The application should also allow you to select multiple files at a time to make it easier for the user. Finally, organization will be key to the success of the final delivery.

## 9 References

*Image\_picker: Flutter Package.* Dart packages. (2022, February 25). Retrieved March 6, 2022, from [https://pub.dev/packages/image\\_picker](https://pub.dev/packages/image_picker)

*Flutter documentation.* Flutter. (n.d.). Retrieved March 6, 2022, from <https://docs.flutter.dev/>

*File\_picker: Flutter Package.* Dart packages. (2022, February 28). Retrieved March 6, 2022, from [https://pub.dev/packages/file\\_picker](https://pub.dev/packages/file_picker)

*Flutter\_tts: Flutter Package.* Dart packages. (2021, December 24). Retrieved March 6, 2022, from [https://pub.dev/packages/flutter\\_tts](https://pub.dev/packages/flutter_tts)

*Flutter text to speech (TTS) | flutter ... - youtube.com.* (n.d.). Retrieved March 7, 2022, from <https://www.youtube.com/watch?v=IHAvWqp5chc>

*Flutter text to speech (TTS) | flutter ... - youtube.com.* (n.d.). Retrieved March 7, 2022, from <https://www.youtube.com/watch?v=IHAvWqp5chc>

*Text to speech (TTS) in flutter | flutter tutorial - youtube.* (n.d.). Retrieved March 7, 2022, from <https://www.youtube.com/watch?v=WnJZOi57oTY>