CA400 User Manual

Project Title: Handwriting to Text Converter
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Abstract:

Handwritten notes and essays are a key part of the academic environment. While the digital world is constantly growing, a lot of students, lecturers and professors still prefer writing notes by hand. My project is centered around converting a user's handwriting to a digital format.

I plan to create and train a neural network model that will be able to identify different characters and words in images uploaded by the user and convert this into a text document. The machine learning process will use convolutional and recurrent neural networks to process the training images. The model will be deployed and utilised by a simple web application. Any person can open up the application and upload images of their handwritten notes. They will be given the option to just download the generated documented, or they can save it to their Google Drive if they are signed into their Google account. It will also be possible to share the document via email. This application will help users keep track of any handwritten notes or essays they may want to keep safe for future use.

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1. Introduction

Handwriting to Text Converter is a web application aimed at students who write a lot of notes and essays by hand. It allows them to create a digital copy of their work with ease by creating documents on either their Google Drive or local machine. It also offers document sharing functionality.

This manual will guide users through all the different procedures in the application, as well as the meaning of different symbols and error messages. It also outlines all Google permissions required by the application for different features. Handwriting to Text Converter has a simple and intuitive user interface, and all possible queries are answered in this user manual. This document follows the IEEE guidelines for user manuals.

2. Information for the use of Documentation

This document will provides a guide through all of the features in Handwriting to Text Converter. For users reading this manual electronically, there is a "Search Capabilities" section which links to each heading and subheading, allowing for easier navigation. In the procedures section, each possible operation is outlined in detail, accompanied by screenshots to guide users through every individual step. If at any point you run into issues during this process, users can consult the "Error Messages and Problems Resolution" section to combat such issues.

The "Glossary" contains a list of descriptions of words which users may be unfamiliar with while reading the manual. This ensures no ambiguity when using Handwriting to Text Converter. If a user has any concerns regarding navigation throughout the web application, they will find clarification in the "Navigation Features" section towards the end of the document. All of these sections combine to provide a comprehensive description of the application and its core features.

3. Concept of Operations

This application has numerous procedures that allow users to reach their end goal. Some stages of the process are linked, while some have standalone functionality. The procedures in question are outlined in this manual, and are as follows:

- Login
- Logout
- Upload image(s) of handwritten text
- Use result to either create Google Doc or local document
- Select created document to share
- Enter email addresses and share the document
- Display the on screen tutorial for users

4. Procedures
4.1. Login
- When the user visits the application, the login screen will be displayed.
- The user clicks the "Login with Google" button in the top right corner of the screen.
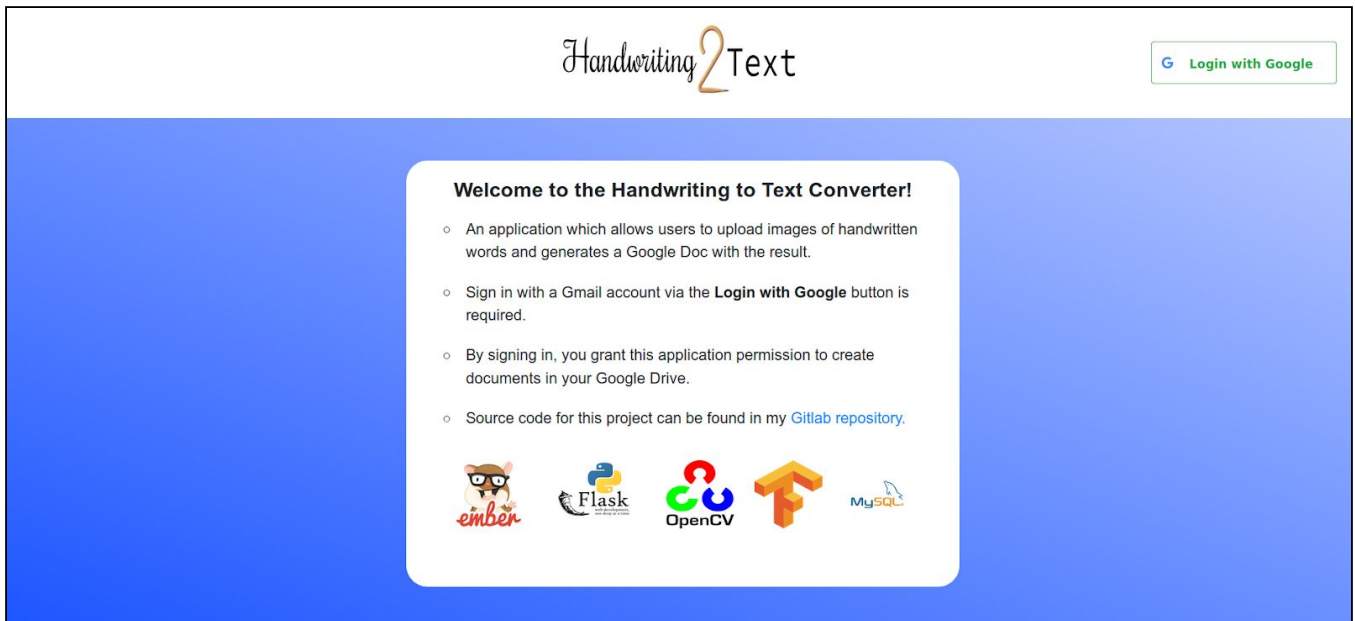
- From there, they will be redirected to a Google login prompt.
- The user will be asked to enter their email address, as well as their password. (The application never gets access to the password)
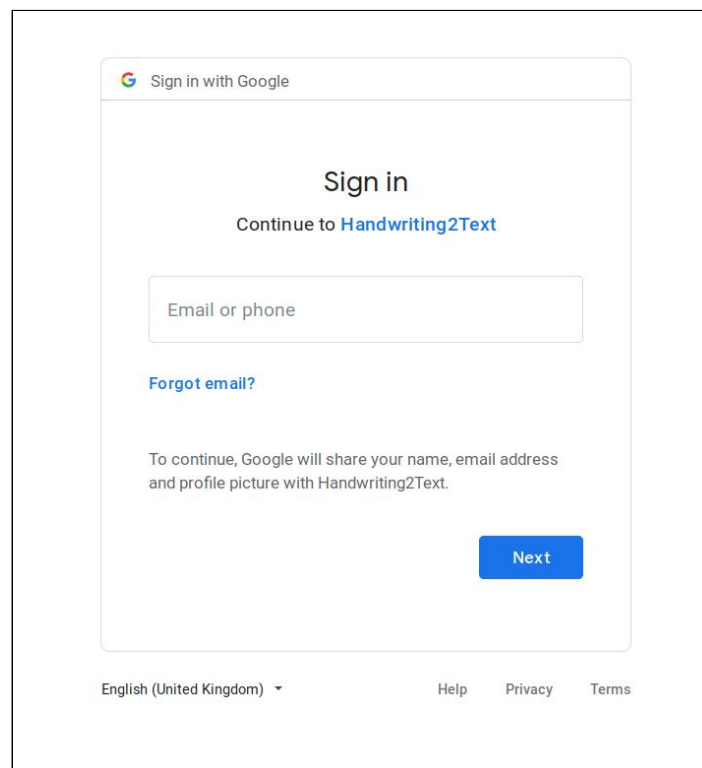

- Once their credentials have been verified, they will be asked to grant Handwriting to Text Converter permissions to view, edit and create Google documents. This is necessary for multiple features in the application.
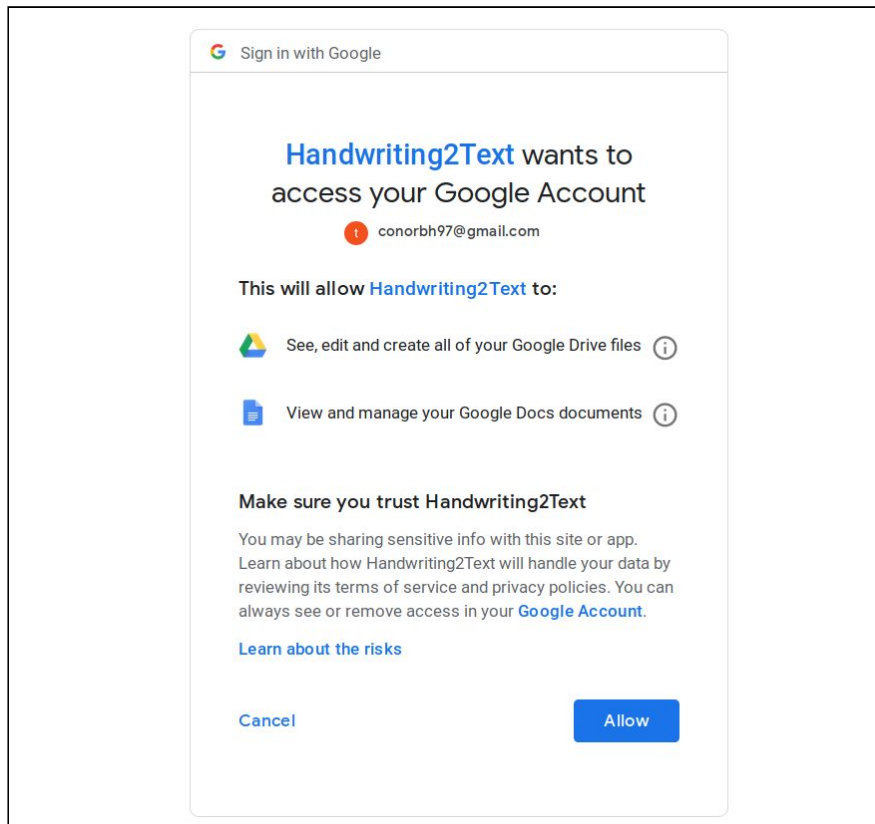
- After permissions have been granted, the login process is complete and the user redirected to the home page.

4.2. Logout

- This process can only be completed once the user is signed in and can access the home page, as shown below.
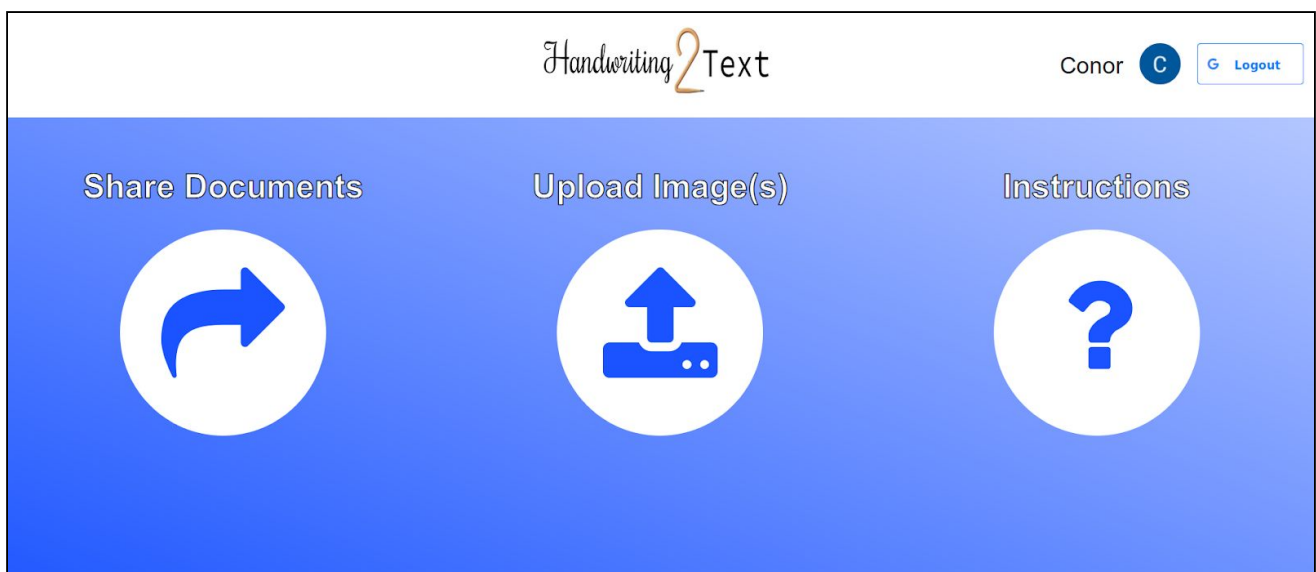
- The user clicks the "Logout" button in the top right corner of the page.
- This ends the session and redirects the user to the home page.

4.3. Upload Image(s)

- First the user clicks the "Upload Image(s)" button in the center of the page, displaying a popup box.
- The user clicks the blue target box in the middle of the popup. This will trigger the browser's file selector, where you can choose what files you want to upload.
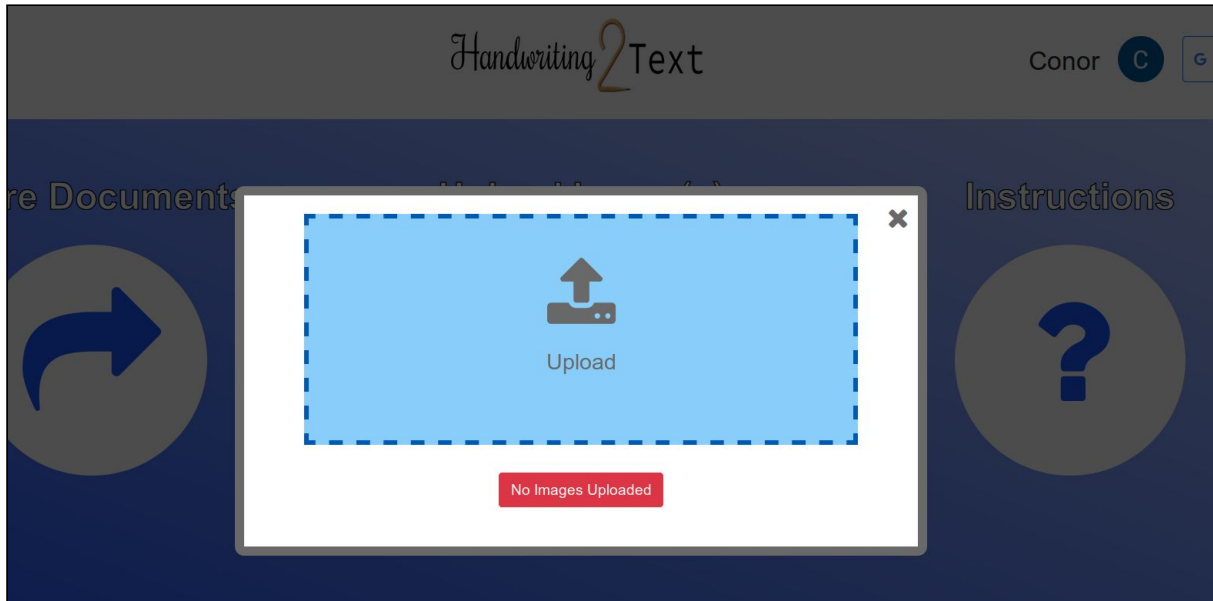

- Once they have uploaded at least one image, clicking the button will start the conversion process.
- Users can choose to upload more images before clicking the start button. Previously uploaded images will not be cleared.
- While the application is working, a loading spinner will be displayed in the middle of the page.
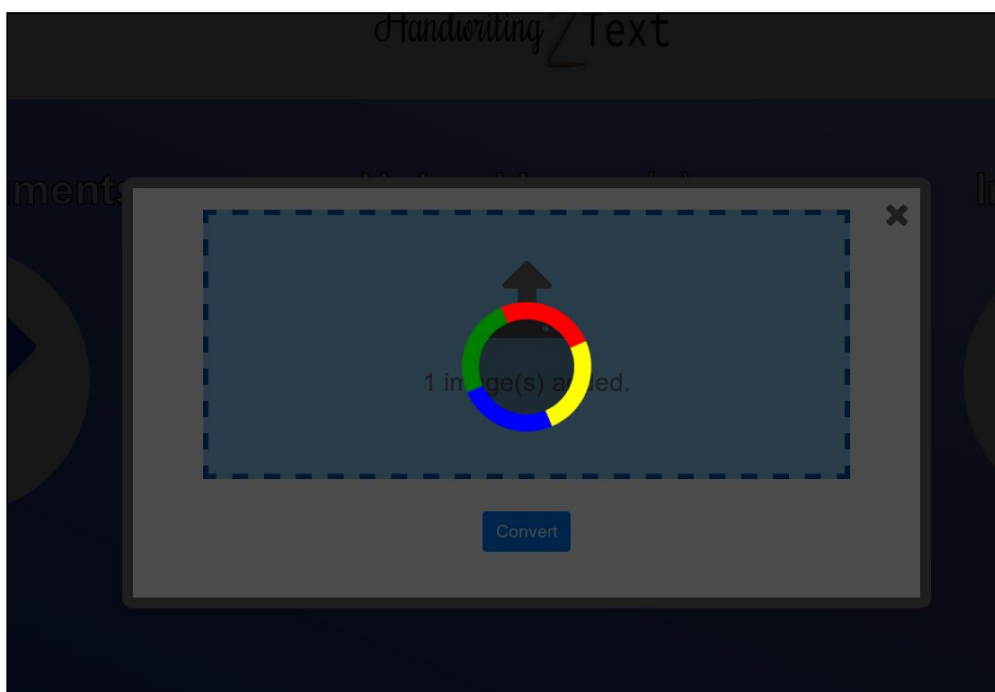
- Once the handwriting has been converted to text, the spinner disappears and a popup with the results is displayed.

4.4. Save Document
- The user has the option to make any modifications to the resulting text, which is displayed in the popup box.
- The user must enter a desired filename for their new document(s).
- If the user clicks the "Save to Google Drive" button, the application creates a Google Doc with the given filename and result text. A loading spinner is displayed during this process.
- If the user clicks the "Download Local File" button, a *.doc* file is created with the given filename and result text and saved to the user's device.
- Once the user has created their desired documents, they can click the close icon in the corner of the popup to return to the home screen.
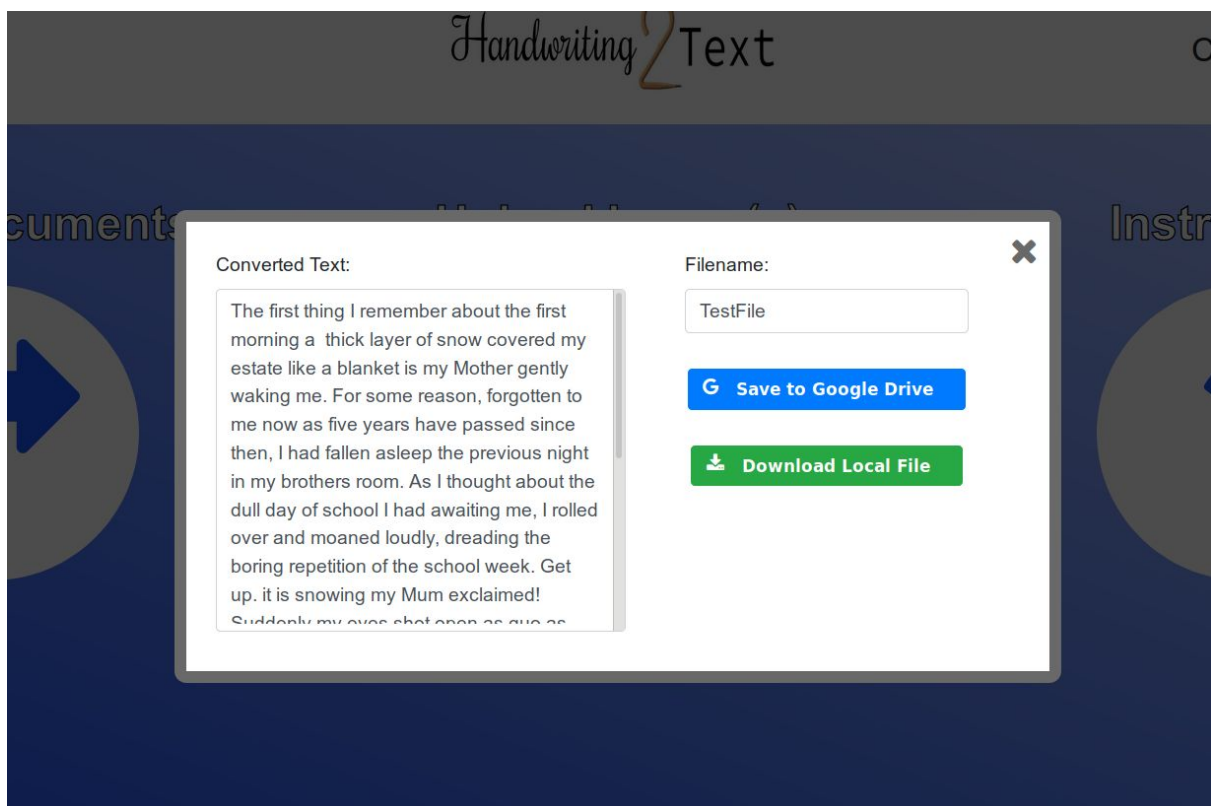

4.5. Select Document to Share
- From the home screen, the user clicks the "Share Documents" button.
- A popup box displaying all of the user's previously created Google Docs are displayed.
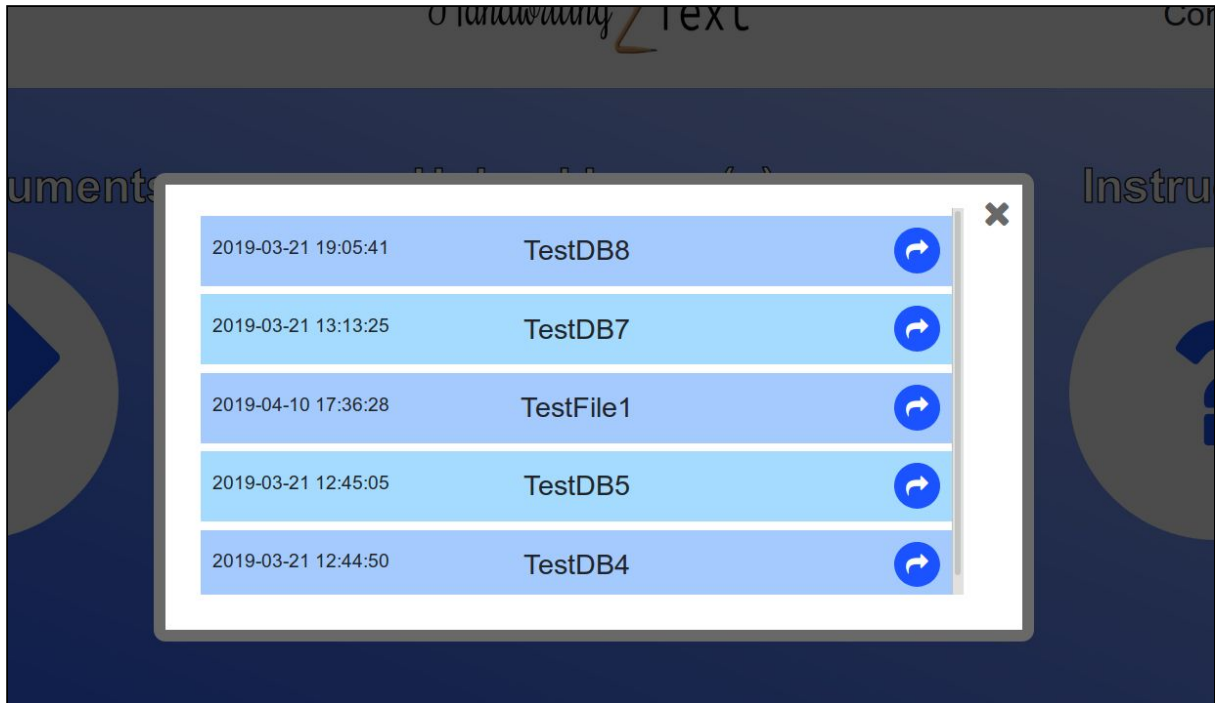
- The user clicks the white arrow of the document they would like to share, which forwards them to a popup box for the sharing information.

4.6. Share Document
- Once the user has selected their chosen document, they can see the below popup box.
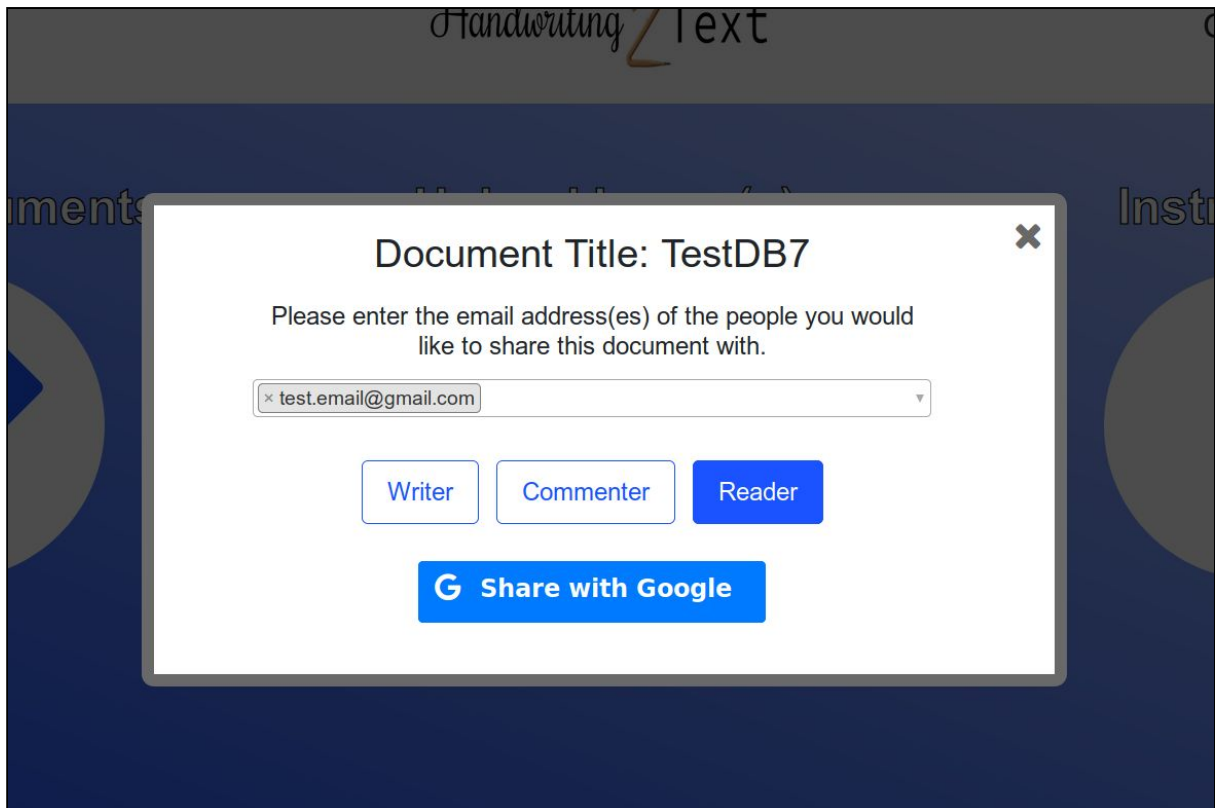
- The user can enter multiple email addresses to share the Google Doc with by inputting them into the given field.
- The user must then choose one of the three permission options to grant to their friends.
- Once the user is happy with their selections, they can click the "Share with Google" button to start the sharing process. A loading spinner is displayed until it is finished, when they are redirected to the home screen.
- Notification emails are sent to the entered addresses to notify them that they can now access the Google Doc.

4.7.   Follow Tutorial

- If it any point when using the application a user is unsure how to complete an action, they can click the "Instructions" button, which will display the below popup.
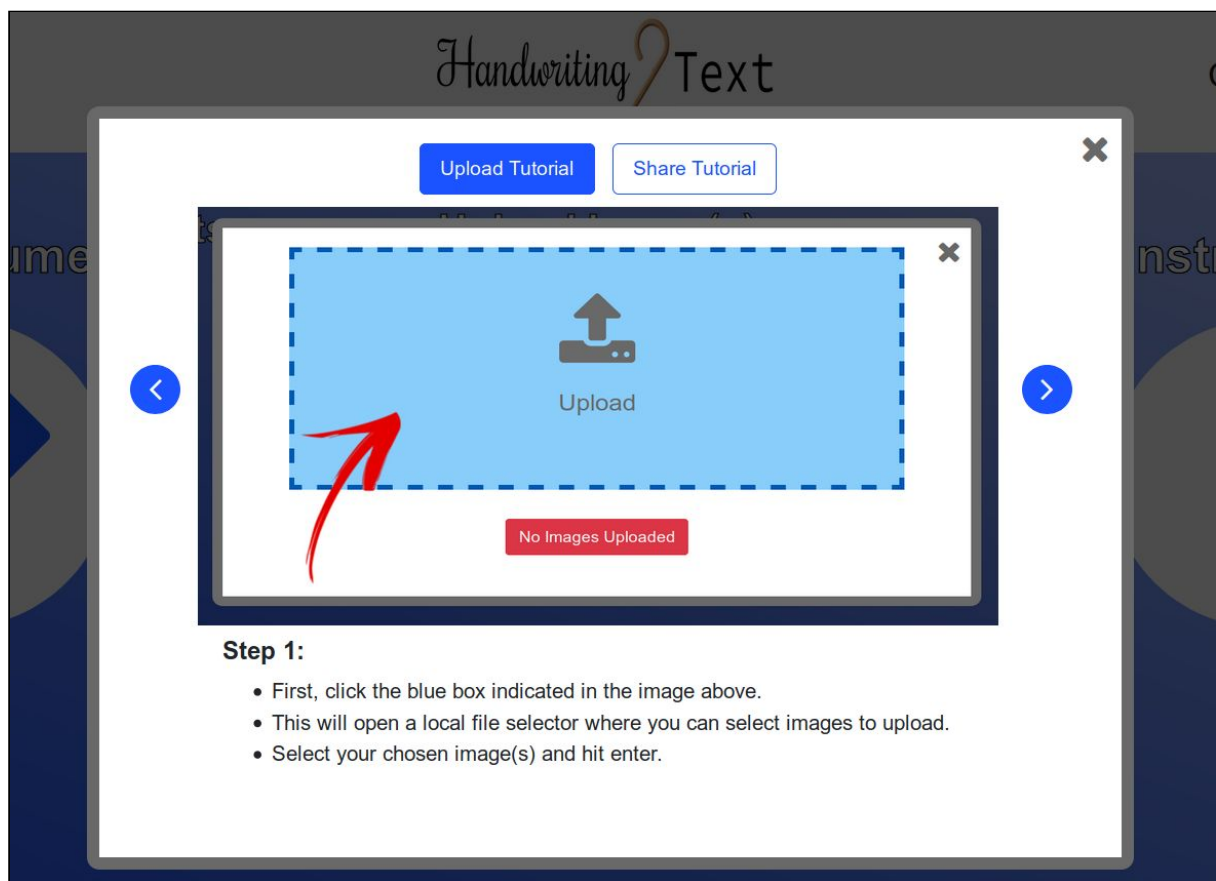
- The user can follow step by step guides which bring them through both the document creation and document sharing processes.

5. <u>Error Messages and Problem Resolution</u>

5.1. No Documents Created

- If a user has not yet created any documents, they do not have the option to share a document.
- The below message is displayed if they click the "Share Document" button.
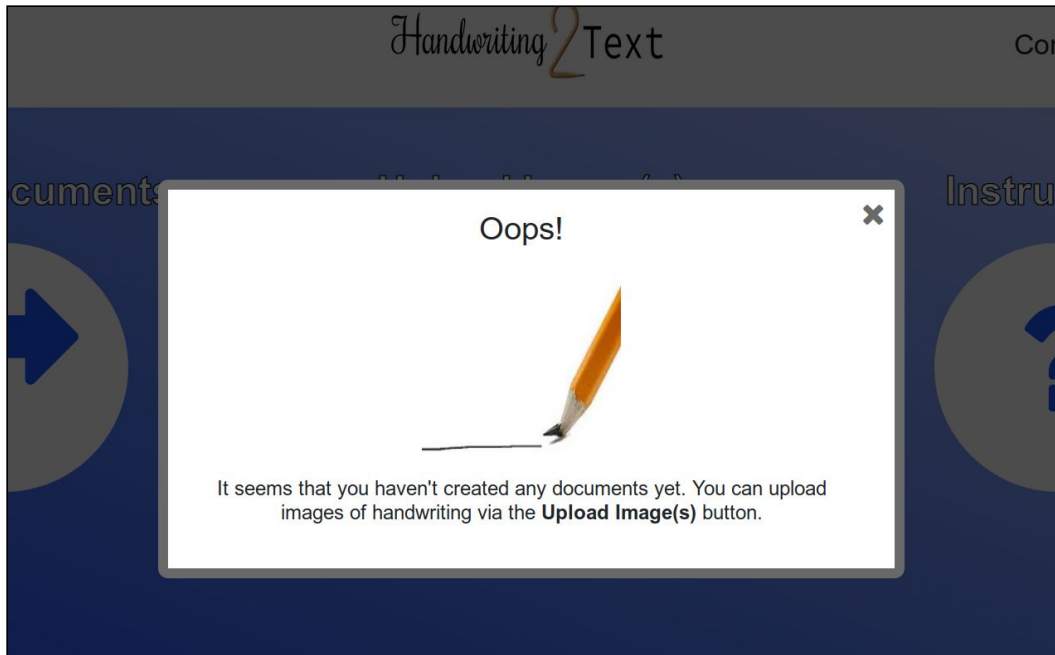
- The user must then create a Google Doc via the application to access the sharing feature.

5.2. No Filename Entered

- The application does not allow users to create documents without given filenames.
- If the user tries to carry out this action, an error message is displayed.
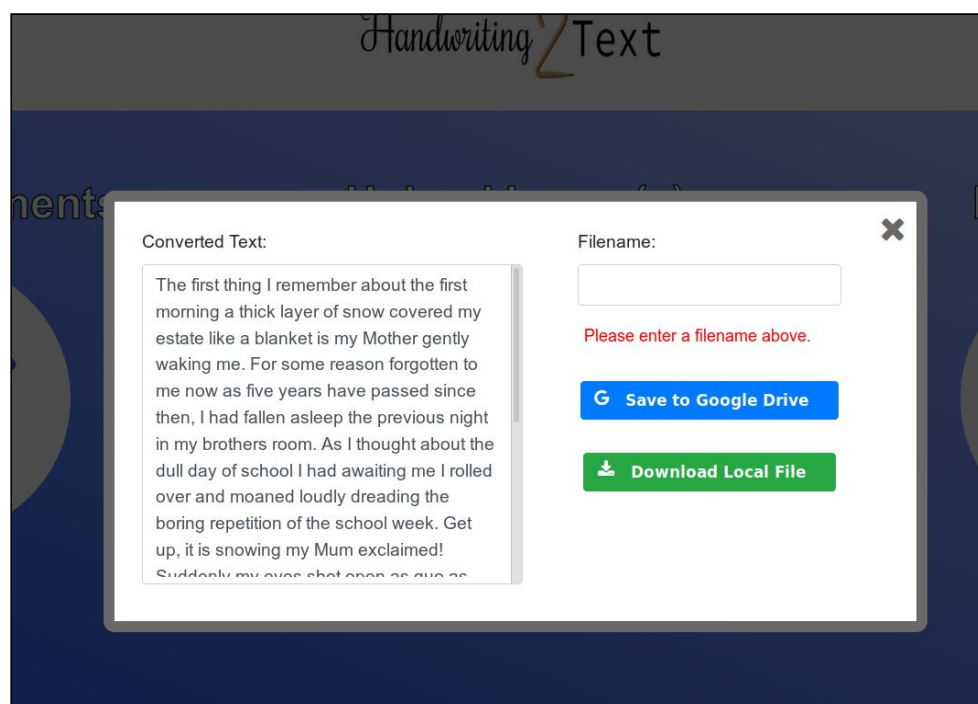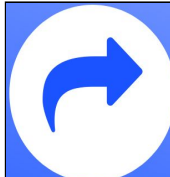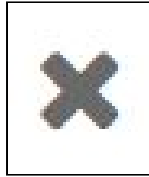
5.3. No Email Addresses / Permission Option

- The application requires that the user inputs an email address as well as selecting a permission option when trying to share a created Google Doc.
- If these conditions are not met, error messages are displayed, prompting the user to make corrective action.
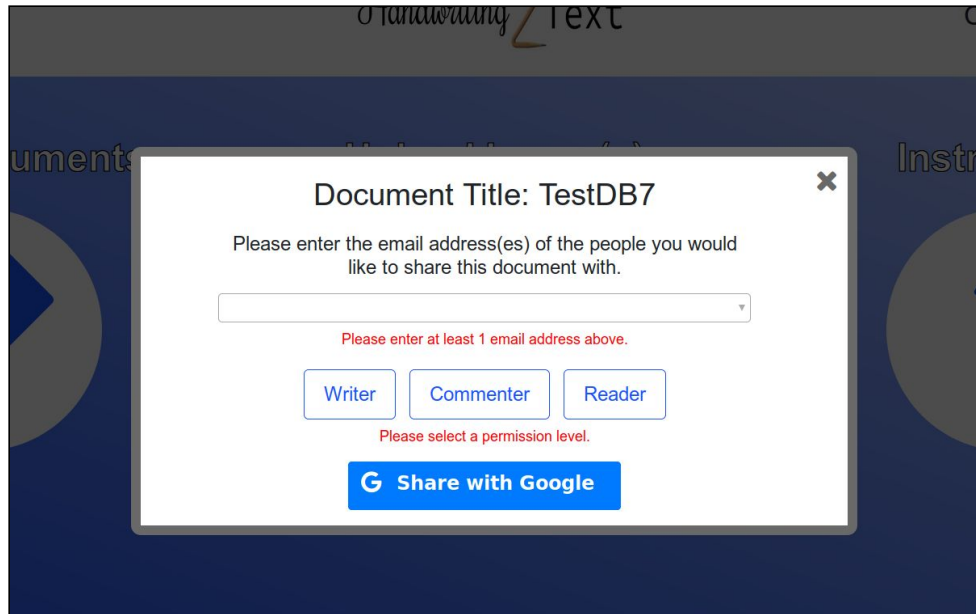
6. Glossary

- *User Interface:* The pages displayed to the end user in the browser.
- *Intuitive:* Easy to use and understand with little explanation.
- *Google Permissions*: Refers to the level of authority granted on a document to another Google user, e.g. a reader can not make any changes or suggestions.
- *Electronic Format:* Having your data accessible by a computer.

7. Navigational Features

"Upload Image(s)"	"Instructions"	"Share Document"	Close Popup	Next Slide	Previous Slide

8. **Search Capability**