

OPPO FinTech Contest

Speech Automation of Loan Application

Team ID: FT-69888554
Problem 1: Zero Typing Data Entry

Made by
Aditya Mahajan
Mansi Wakodkar

Abstract

Document creation can be a tedious task so we are providing a solution for Zero Typing Data Entry solution which would help in automating the manual work done of typing or copying and pasting, we would be creating an Android app which would allow users to select a template based on the loan product type. Then the user will be able to fill application with their speech (by voice) with the help of *Dialogflow-Android-Client* and *Google Assistant SDK* and also provide an offline functionality for speech or simply by typing, which is to be populated in the template, this data will be stored in the *Firebase* database so that we can use it when needed either in real-time or when required. Then we select the type in which the file is to be exported. Now, this data will be utilized by automation tools of Google Docs with the help of python modules we would be using selenium for basic browsing and rest will be handled by Document studio or with Docs API and then according to the specified format, the document is exported.

Introduction

There are various works which go on repetitively from creating documents, reports the only thing that changes in those files is just some specific details, to do those things we need to keep on copying and pasting the whole text or at least part of it which is a frustrating task and also there can be human-made errors which can also create trouble.

So we would be providing a simple and clean solution which would help in automating most of the task which is taking input Speech(with voice recognition) from user and also with typing (as some things can't be pronounced correctly or due to other reasons) and saving them to the database which can then be accessed at any point of time for further use or as a document history and also by this method we would be saving a lot of disk space as if we save the complete documents which are created for all the users then there would be all the redundant data which would take lots of space which can be reduced with the database.

So while taking input from user we need to keep in mind all the fields which are to taken so for that first we would need to decide the template (as for a loan Document there may be different templates depending on the range of the loan taken by user)and when the template is decided we can move on to taking input from the user.

The Last part is selecting the output format for the document ie in which document we need to export the final application which may be the word file, powerpoint, pdf or any other standard formats.

Now the documents are created but should be organized properly and hence we also will provide a proper and organized document management system.

Background Research

The basic step for the finding the solution was to check for all the needs of user or the customer, which was basically feeding the data with speech and getting the output back as a format specified, the next step is to check for any existing solution that is available in the market which does the same thing and executes the tasks provided. We found some already existing solution present in the market which provide document creation from the template and they have different pros and cons.

Some of them are as follows:

Existing software

[WebMerge](#), [Woodpecker](#), etc. These softwares provide the creation of documents and also have a great interface to work with and also there are some softwares which converts speech to text but not designed for filling the applications, still these have various cons too which are as follows:

- a) The Pricing is very high and also it is monthly.
- b) It only allows users to create only a limited amount of documents.
- c) It also does not have a voice recognition input for fields which would be a lot helpful.
- d) No document management system is present.

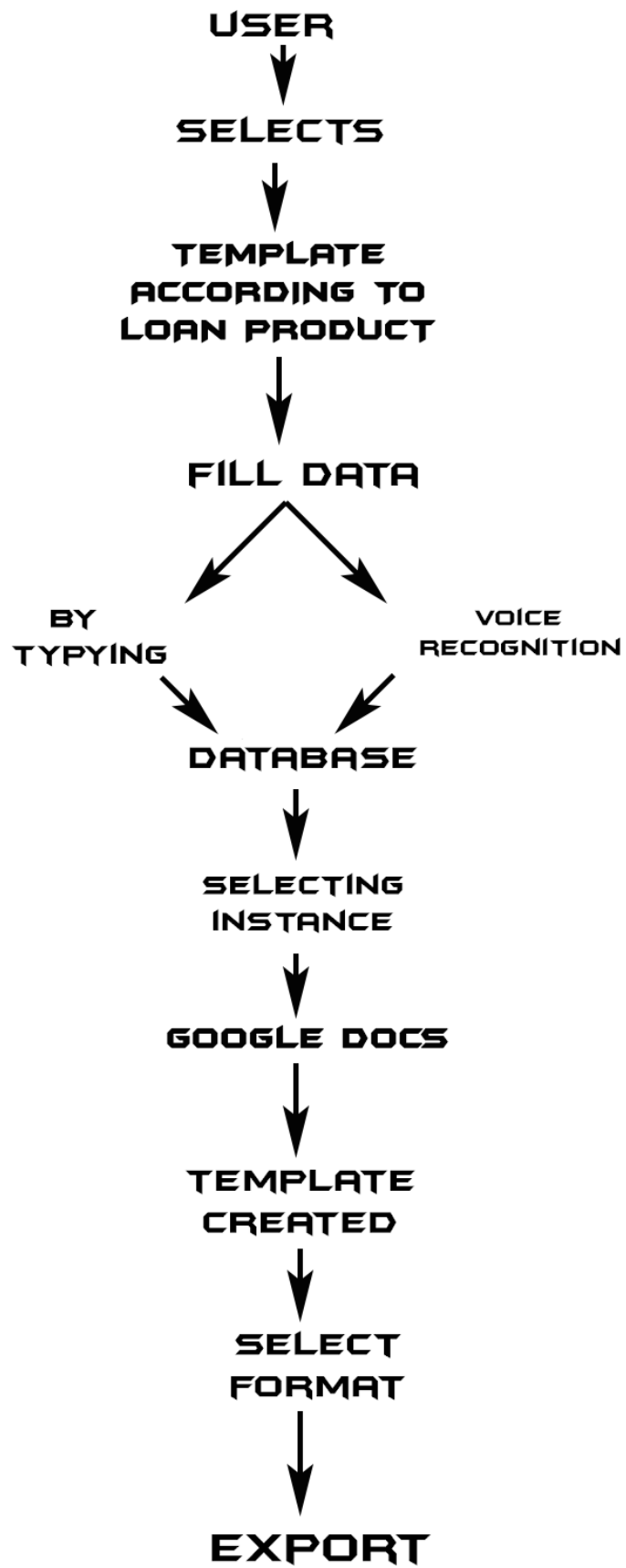
TECHNICAL SOLUTION

ANDROID APP

All the working of the solution is provided in the android app and we would be using [Android Studio](#) software to create the app. The Language that would be used will be JAVA. And the database would be created on [Firebase](#), as *firebase* provides a very simple UI with tons of functionalities and options to work with. We would be using a real-time database to work with our data.

TEMPLATE

The first thing in our solution is that the user would be selecting the type of the template according to the loan product type. So now we have the exact fields which need to be populated for that particular loan template.



TAKING INPUT

Then after selecting the template we would need to give the data input through the forms which would contain all the fields that would be present in the template selected and we will provide the way of filling the form with voice that is we would be using voice recognition or if the user wants (Due to some reasons) then he can also fill the data by conventional way of typing and when the user fills the form the entered data would be stored in the *Firebase* database. So if we need the document in real-time we can generate it then and there or if we need it later then we can schedule the document to be generated at the time specified and to be sent to someone via email or other platforms.

So for Achieving this in the app we actually need to think of all the scenarios that are, in some cases we do not have the access to the internet (due to some reasons) and the other is when we have internet connectivity this is a different situation.

With Internet connectivity, we have 2 solutions which would do the work for us, both are from google and they are

- 1) [Google Assistant SDK](#)
- 2) [Dialogflow Android Client](#)

The Dialogflow also has support for google assistant so typically we are doing the final thing the same that is integrating with google assistant but in two different ways.

[DialogFlow](#) - Give clients better approaches to associate with your item by building voice and content-based conversational interfaces, for example, voice applications and chatbots, fueled by AI. Interface with clients on your site, portable application, the Google Assistant, Amazon Alexa, Facebook Messenger, and other prevalent stages and gadgets. It provides a way of creating intents in our chatbot and extract the useful data required from the user response.

The Dialogflow Android Client help in achieving the same thing for android that is small devices, it uses machine learning with natural language processing toolkit to get the most out of the user responses.

Google Assistant SDK - helps in integrating the google assistant features in our app according to our need that is not using all the assistant features but only the required ones in our app. This will be modified to take input through the speech from the user and fill the required fields.

In case if we don't have internet connectivity then we can not use the above two techniques so we would be using the offline speech recognition of [Gotev/android-speech](#) on GitHub. We have used this repository because we found this was very easy to use still very powerful in speech recognition. It would be a lot helpful rather than not having anything at all and just typing all the fields.

All the implementation of this speech recognition system is given [here](#). This offline system would not be as great as the first two as there we would be using intent-based classification of the speech of user and this would be just simple speech recognition.

PROCESSING (Populating data)

So the next thing that came was automating the document creation process. And for that, we would be using Google Docs.

Automating the google docs this would be a much easier solution as this would mainly support all the platforms from Linux, windows to mac so platform won't be a problem & could be used anywhere, in addition to this, we also have the script editor provided in google docs which will be helpful for our solution.

Now in the implementation of Google docs, we will be automating the browser for which we would be using selenium whenever needed. So the next step is to populate the data which can be done in various ways

- a) Script Editor
- b) Document Studio
- c) Google Docs API

Google Apps Script is a quick application improvement tool that makes it quick and simple to make business applications that incorporate with G Suite. You compose code in JavaScript and approach worked in libraries for most loved G Suite applications like Gmail, Drive, etc. The script which in turn would do all our work of populating the document and this works in google docs, google slides, etc.

Document Studio is a plugin that helps in automating the documents and which internally uses Google Apps Script. This is a very powerful tool that also has various integrated APIs like Gmail API, drive API, etc.

A significant number of the highlights that make Google Docs so effective is accessing through the API. This API allows you to peruse and compose records automatically with the goal that you can coordinate information from different sources utilizing the intensity of Google Docs.

DOCUMENT MANAGEMENT SYSTEM

This is an additional feature we will be implementing in our solution of managing all the files in an organized way so that when we create a number of documents we can easily point out the file required or sort files according to the needed. This is a kind of implementation of collaboration kind software like [SamePage](#) which provides a sleek way of organizing things this would be done with Mayan which is an open-source [Document management system](#).

Future Scope: The industry of automation has a lot of potentials as this increases the efficiency of the work in all the domains from business to finance domain. And can be improved a lot.