IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Vol. 8, Issue 7, July 2021

DOI: 10.17148/IARJSET.2021.8730

EMAIL VOICE ASSISTANT

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Abstract: According to the report given by 'Indian Vision Institute', it has been observed that nearly 40 million of people in India are visually disabled. Due to such population of people with disability, there is a demand for Assistive technology which can enable them to resume their daily tasks without reliance on their peers.

In pursuit of devising such a usable and reliable technology, we are designing and developing a Voice Assistant which can help the visually impaired/disabled access their Gmail services effectively as most of the internet applications and services rely on emails for effective communication of information. This architecture will reduce the cognitive load of remembering and typing characters on a keyboard by a visually disabled/impaired user. It uses features such as speech to text & text to speech engines which are used to cut down many mundane tasks while accessing/operating an email application. With a successful implementation of this system, it can be utilized by anyone and everyone at their convenience. Our voice assistant is addressed as "EVA"(email voice assistant) which takes user commands. It is designed as a web-based chrome extension which uses an Interactive voice response method to simplify the user experience. This will assist users in navigating mail accounts through their voice to perform operations like read, compose, and send a mail, further it can be scaled up to perform other useful tasks such as deleting a mail, marking as unread etc. provided by Gmail or any other emailing client.

Keywords: Voice Assistant, Chrome extension.

I. INTRODUCTION

The year 2020 proved that the internet is a crucial part of our lives. Every human being is widely accessing knowledge and information through the internet. The facilities availed through the internet was the only reliable means of communication and to also gain services. The current communications on the internet mainly rely on the email system for verification and information. However, visually impaired face difficulties in accessing these services provided through the internet. The advancement in computer based accessible systems has opened up many opportunities for the visually impaired across the globe in a wide way. Audio feedback based virtual environments like screen readers have helped visually impaired to access internet applications immensely.

EVA (Email Voice Assistant) is a chrome extension for the visually impaired using Interactive voice response, thus enabling everyone to control their mail accounts using their voice only and to be able to read, compose and send performing all the other useful tasks as well. The system will take user voice commands to perform certain action and the user will respond to the same. Extensions are software programs that customize the browsing experience built using HTML, CSS, JS, images. They enable users to enhance Chrome functionality and behaviour to individual needs or preference.

Email communication is an integral part of personal and professional communication. The visually impaired find it difficult to operate mailing service hence we came up with a solution to ease out the process. In this project, we built a voice-based mailing system for the visually impaired to access an E-mail service more specifically Gmail. This architecture will reduce the load taken by the visually challenged to remember and type characters using a keyboard. It can also be utilized by anyone and everyone at their convenience to work with Gmail by giving voice input.

Since the existing models are either stand-alone applications which require their users to install their application and create another account or users will have to pay for extra beneficial features which sometimes can be expensive, we propose a model which is a chrome extension built for Gmail thus requiring the users to only install once and does not require the user to create and manage a separate account.

The proposed model can be platform independent and hence it can be used on Mac, Windows and Linux users on their chrome browser. The user is guided throughout with help from a voice assistant. The model's core mechanism can be described through the following scenarios

II. METHODOLOGY

Extensions as a technology have existed for a larger period of time, Google Chrome started to support this technology from 2010. As of 2019, the chrome web store has been said to house over 190,00 extensions. With such an advancement over a decade, it has been proven to be a viable means of development of tools for easing out a user's daily web browsing

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activity. In our case, a user's inbox can be made more accessible through voice and do operations based on their commands. In terms of today's state of technology, Voice Recognition technology can be used to ease out the terms of accessibility for a user.

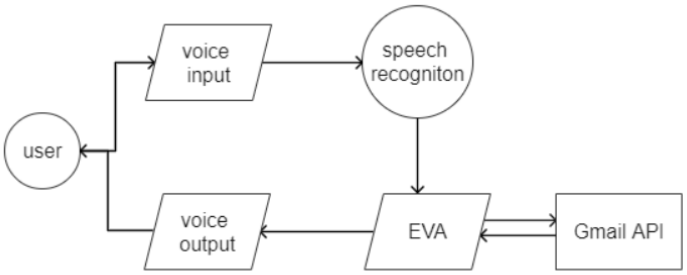

Fig 1: Architectural diagram

The architecture shown in Figure 1 has the following phases. They are:

- Voice input: User gives voice input such as commands given in table 1
- Speech recognition: Speech recognition module web speech API is used to process voice input given from the user
- EVA interface: Our extension responds to the commands and performs actions as per requirement
- Voice output: The performed action is given as a voice output with the help of web speech API.

For easier recognition of command input from the user we used simple keywords like "read one/next" as a way of navigating through the inbox list for audio output of the user's email. While composing an email or any other task, the user should not accidentally trigger a different operation, to do that a repetitive sentence like "compose compose" should do the trick for the most part. This command triggers the function responsible for handling all the composition of an email through voice operations.

Voice commands	**Action performed**
Read(one/next)	Reads first mail or next mail
Compose compose	Takes user voice input to compose a mail
Send mail	Sends a mail to the recipient after composing
Open inbox	Navigates to inbox of the user
Open sent	Navigates to sent box of the user
Open star	Navigates to starred mail of the user mail account
Open draft	Navigates to draft mails of the user mail account
Open bin	Navigates to bin mails of the user mail account
Yes/No	To confirm recipient mail address

Table 1

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The user can launch the extension by clicking on the icon in the toolbar and either compose a brief mail in the popup window and send a mail or navigate to our customized UI from which other operations can be performed such as composing a mail, reading mails in inbox, bin, sent, starred, and draft by using commands defined in the table

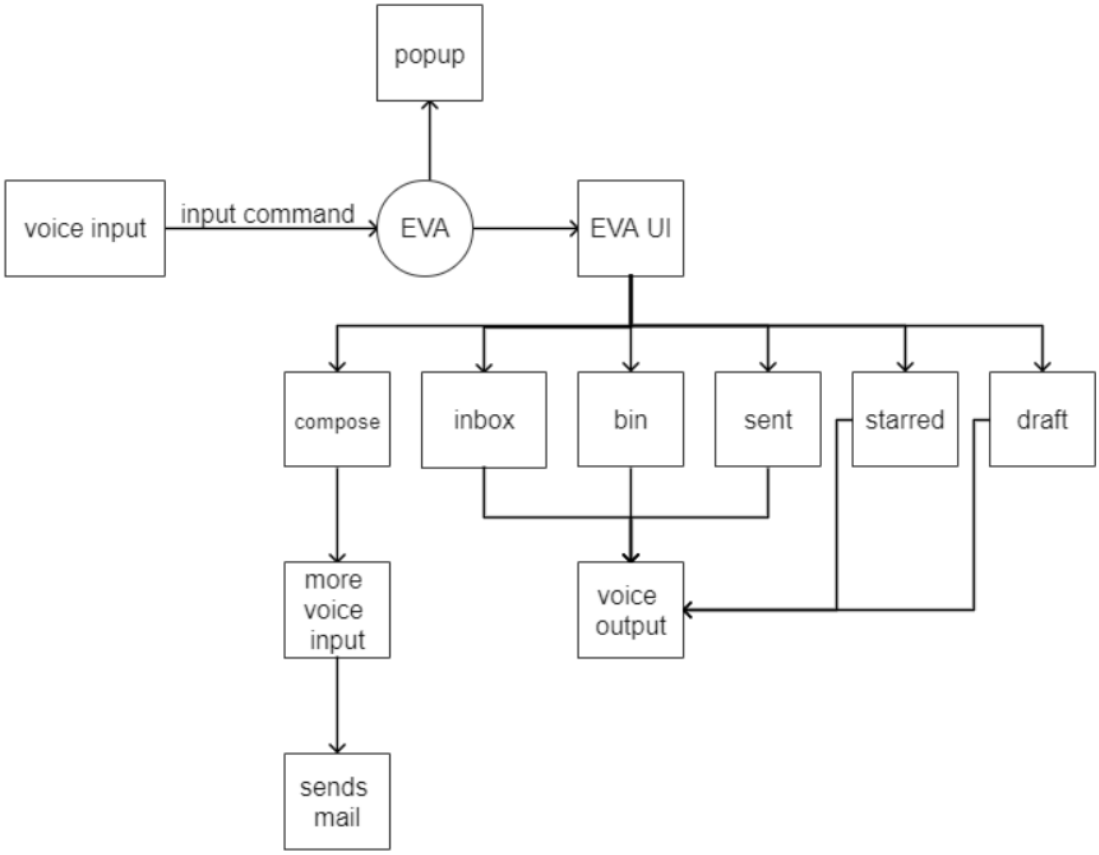

Fig 3: Dataflow diagram

While composing an email EVA takes a confirmation of the recipient mail address before composing the email.

III. RESULTS AND DISCUSSION

Emails are an important means of communication regarding exchanging information for services, opportunities and business enquiries. Despite being such a huge part of the internet, the accessibility aspect of it has been forbidden for users who are visually impaired. Screen readers and other assistive technology have been around for a while, but they rely on user inputs from their keyboard for few necessary actions, sometimes even requiring the users to go through a training to get a good hang of it. With the help of Web Speech API we can cut short these shortcomings as it has the ability to convert speech to text and vice versa, all handled on the chrome browser.

With the help of these technologies we can tailor and improvise the experience of users with visual disabilities by giving voice based commands to perform a function to do the necessary operation. The extension can help them with operations such as composing a quick email's subject and body through voice on the popup, the user could also open our web page which serves a unique UI that can be operated through voice based commands like "read one", "read next", "open inbox", "open sent", "compose compose" and so on. While reading the mail EVA also reads out the recipient address, subject and body of the mail. The assistant also enables users to switch between labels to get the textual speech output of each with the help of the above defined commands. To compose an email "Compose compose" command can enable the user to compose an email directly through the web page and send the email with the help of "send send" command. With these features the existing prototype can cut out a lot of friction to an extent faced by users with disability.

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3.1 Popup UI

The following screen is displayed once the user navigates from popup to our customized interface. User's inbox is displayed in the below snapshot

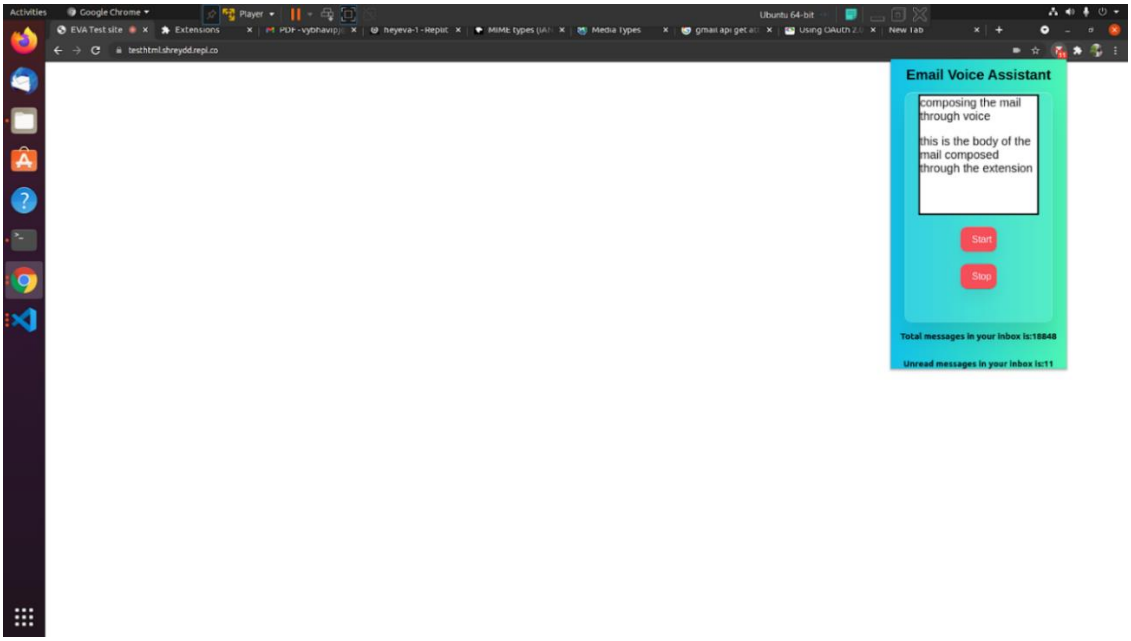

Fig 4: Popup UI

3.2 Custom EVA UI

The following screen is displayed once the user navigates from popup to our customized interface. User's inbox is displayed in the below snapshot

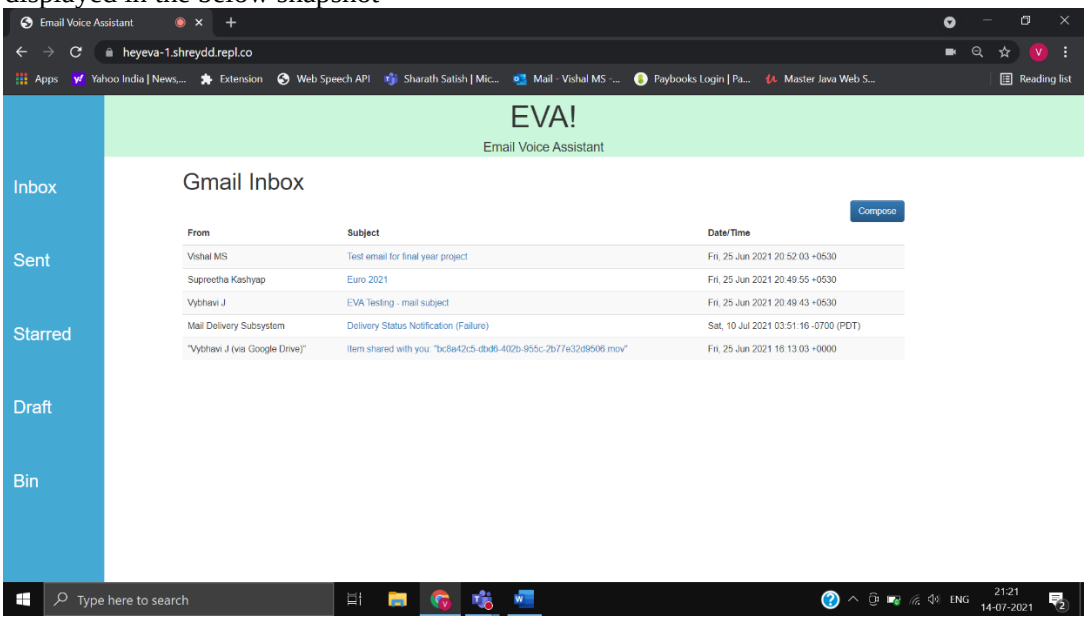

Fig 5: EVA UI

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3.3 Compose window

The following screen is displayed while a user is composing a mail.

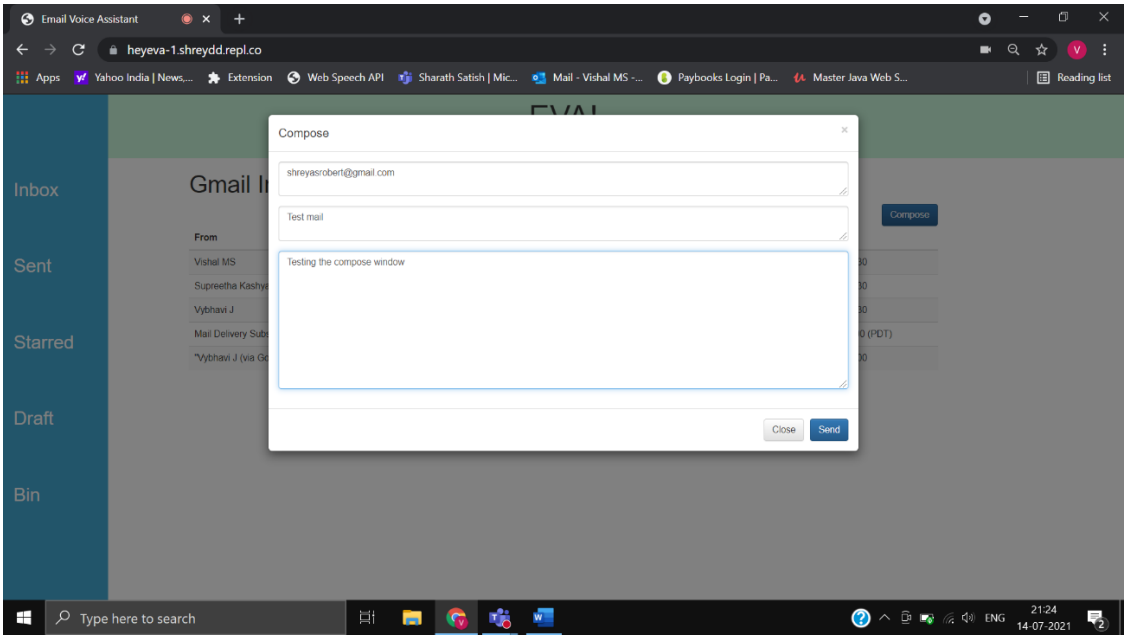

Fig 6: Compose window

3.4 Mail contents

On giving a voice command such as ‘read one’ or ‘read next’ the following screen shows up and EVA reads out the mail contents

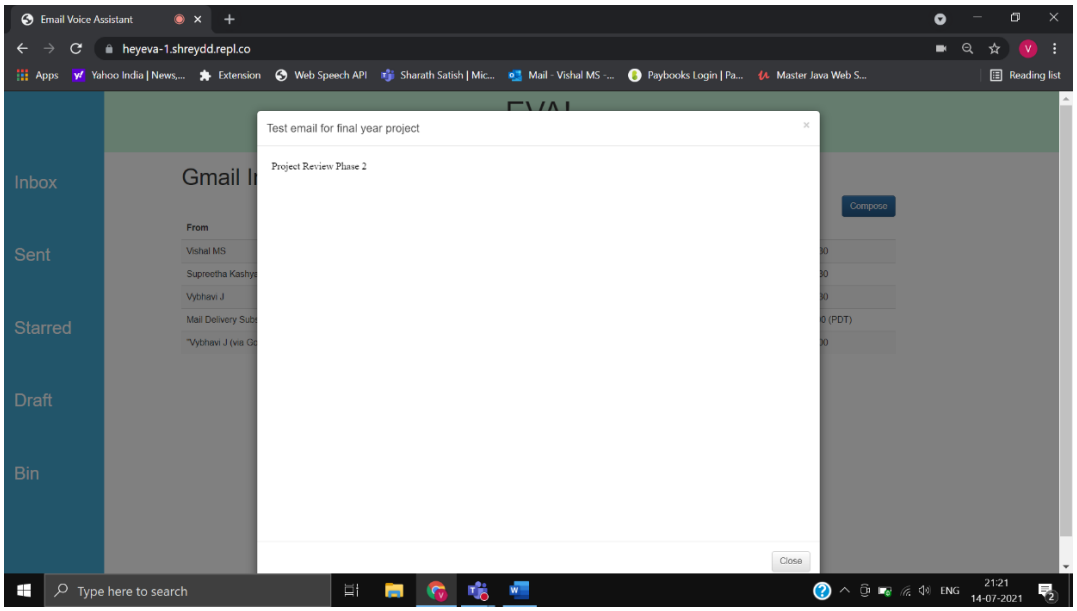

Fig 7: Mail contents

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