Sri Lanka Institute of Information Technology

PROJECT REGISTRATION FORM

(This form should be completed and uploaded to the Cloud space on or before XXXXXXXXX)

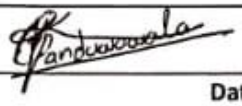
The purpose of this form is to allow final-year students of the B.Sc. (Hon) degree program to enlist in the final-year project group. Enlisting in a project entails specifying the project title and the details of four members in the group, the internal supervisor (compulsory), the external supervisor (may be from the industry), and indicating a brief description of the project. The description of the project entered on this form will not be considered as the formal project proposal. It should however indicate the scope of the project and provide the main potential outcome.

PROJECT TITLE (As per the accepted Topic Assessment Form)	Mobile Base Sinhala Book Reader for Visually Impaired Individuals
RESEARCH AREA (As per the Topic Assessment Form)	Natural Language Processing (NLP)
PROJECT NUMBER	TMP-23-198 (Will be assigned by the RP Team)

PROJECT GROUP MEMBER DETAILS: (Please start with the group leader's details)

	STUDENT NAME	STUDENT NO.	CONTACT NO.	EMAIL ADDRESS
1	Jayathunga T.M.	IT20146238	0775338747	it20146238@my.sliit.lk
2	Godakanda P.G.S.	IT20129712	0715394065	it20129712@my.sliit.lk
3	Semini J.P.D.L.	IT20241346	0752608871	it20241346@my.sliit.lk
4	Bhagya H.D.M.	IT20254520	0774405896	it20254520@my.sliit.lk

SUPERVISOR, CO_ SUPERVISOR Details

SUPERVISOR Name	CO-SUPERVISOR Name
Prof. Koliya Pulasinghe	Ms. Poorna Panduwawala
Signature	**Signature**
	
Date	**Date**
14/03/2023	14/03/2023

EXTERNAL SUPERVISOR Details (if any, may be from the industry)				
				Attach the email as Appendix 3
Name	Affiliation	Contact Address	Contact Numbers	Signature/Date

ACCEPTANCE BY CDAP MEMBER (This part will be filled by the RP team)		
Name	Signature	Date

PROJECT DETAILS

Brief Description of your Research Problem: (extract from the topic assessment form)

Blind people face several challenges when reading books, but the main problem is a lack of accessibility to printed materials. Despite advancements in assistive technology, such as text-to-speech software and Braille displays, most books are still not accessible to blind individuals in an easily readable format. This can limit the opportunities for blind people to gain knowledge, engage in literary experiences, and improve their education and employment prospects. [1]

One issue is the cost of specialized devices and software, which can be prohibitively expensive for many blind people. Even when these tools are available, they may not provide an experience that is comparable to reading a traditional printed book. For example, text-to-speech software can struggle with complex language and formatting, and Braille displays can be slow and clunky.

Another issue is the limited availability of audiobooks and Braille materials. While more audiobooks are being produced, the selection is still limited compared to the vast number of printed books. Braille books are even harder to come by, as the process of translating printed books into Braille is time-consuming and costly. This means that blind people may not have access to the latest best-selling books or popular educational materials.

In conclusion, the main problem that blind people face in reading books is a lack of accessibility to printed materials. Despite advances in assistive technology, there are still significant barriers to overcome, such as the cost of specialized devices and software, the limited availability of audiobooks and Braille materials, and the difficulty in providing a comparable reading experience to that of a traditional printed book. To address these challenges, there needs to be a concerted effort to make books more accessible to blind people and to ensure they have the same opportunities to engage with literature and gain knowledge as sighted individuals.

[1] I. Bamidele, “Information Needs of Blind and Visually Impaired People,” no. September, 2019, [Online]. Available: https://www.researchgate.net/publication/354601001_INFORMATION_NEEDS_OF_BLIND_AND_VISUALLY_IMPAIRED_PEOPLE

Main expected outcomes of the project: (extract from the topic assessment form)
A Sinhala book reader for the visually impaired is a software program designed to make reading accessible for individuals with visual impairments. It combines various technologies to provide a seamless reading experience. The device utilizes optical character recognition (OCR) technology to convert the text from a physical book into a digital format. Then, a Text-To-Speech (TTS) synthesizer reads the text out loud in the Sinhala language, making it easier for visually impaired users to follow along. Here, allows users to adjust the reading speed and volume of the audio to their liking. In addition to the voice direction and object identification, the device also includes audible guidance to help navigate the app and identify the distance to the book being read. This makes it easier for visually impaired users to find their place in the book and keep track of their progress. Another useful feature of this Sinhala book reader is the ability to record audio pitch, which is especially helpful for users who may have difficulty reading in a consistent tone. This feature helps users to improve their reading skills and become more confident in their abilities.

WORKLOAD ALLOCATION (**extract from the topic assessment form after correcting the suggestions given by the topic assessment panel.**)
(Please provide a brief description of the workload allocation)

MEMBER 1	Jayathunga T.M. IT20146238

Text To Speech (TTS) Synthesizer

- Here, the main purpose of using Text to speech (TTS) technology is to give a blind person the ability to access the written text of a Sinhala book. This allows them to easily listen to the valuable content of Sinhala books.

- TTS technology allows the written text in a Sinhala book to be read out loud in a natural-sounding voice, which makes it easier for visually impaired people to understand the content.

- The technology uses computer algorithms to analyze the Sinhala text and generate an appropriate pronunciation, intonation, and rhythm for each word and sentence.

Here are the steps for TTS,

- An audio notification should be sent to visually impaired person after the OCR process is complete.

- Here, Texts that have been extracted and identified in Sinhala characters should be transmitted to the TTS system.

- Finally, TTS should be used to read aloud and clearly audibly to visually impaired people the Sinhala text recognized in the camera picture.

- Overall, the main task of using TTS for visually impaired people in a Sinhala book reader is to provide them with a way to access written text and enjoy the content of books, regardless of their visual impairment.

MEMBER 2	Godakanda P.G.S. IT20129712

Voice Direction and Object Identification

- Audible guidance and help user to navigate app through the functions of the app and get a clear idea and guidance whenever user faces a difficulty perform a task.
- When user wants to find a book in the table, he opens the camera through the app and points its towards the table or desk and app identified user's hand and navigate to the book.
- Using real time Image processing technology identify the dangerous object near by the blind user and distance to the object will notify verbally to the user and identify the probability of occurring an accident to user. Users will navigate in a pristine environment evading dangers and harmful things.

MEMBER 3	Semini J.P.D.L. IT20241346

Optical Character Recognize (OCR)

- Sinhala Character Identification and word formation through engine and translate to the speech then send it to the TTS.
- When the app is not running, users can read the time using a background process. The program should also be able to start the camera when the user launches it using voice commands.

- The program should be able to quickly scan the document when the user launches it.
- On the paper in front of the camera, the app needs to be able to automatically focus.
- Until the document is within the capture frame, the system should alert the user audibly.
- When the user wants to capture an image on the book the app alerts and navigates the user to capture the image on to the frame of the phone.
- The device's storage should be used to store the image that was captured.
- Before submitting information to the OCR system, the system must detect and correct skew.

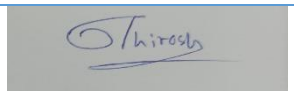
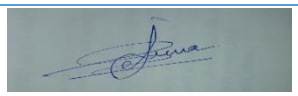
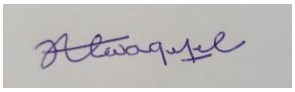
MEMBER 4	Bhagya H.D.M. IT20254520

- The method of identifying someone based on their speech features is called speaker recognition (voice biometrics). It focuses attention on the speaker.
- In this app blind users have an option to hear the sound from a different voice.
- The user can record any other person’s voice through a voice recorder.
- After that the system will measure the pitch variation of your voice when giving a speech to determine your vocal range.
- Texts that have been extracted and identified in Sinhala should be transmitted to the TTS system with the recorded voice.

DECLARATION (Students should add the Digital Signature)

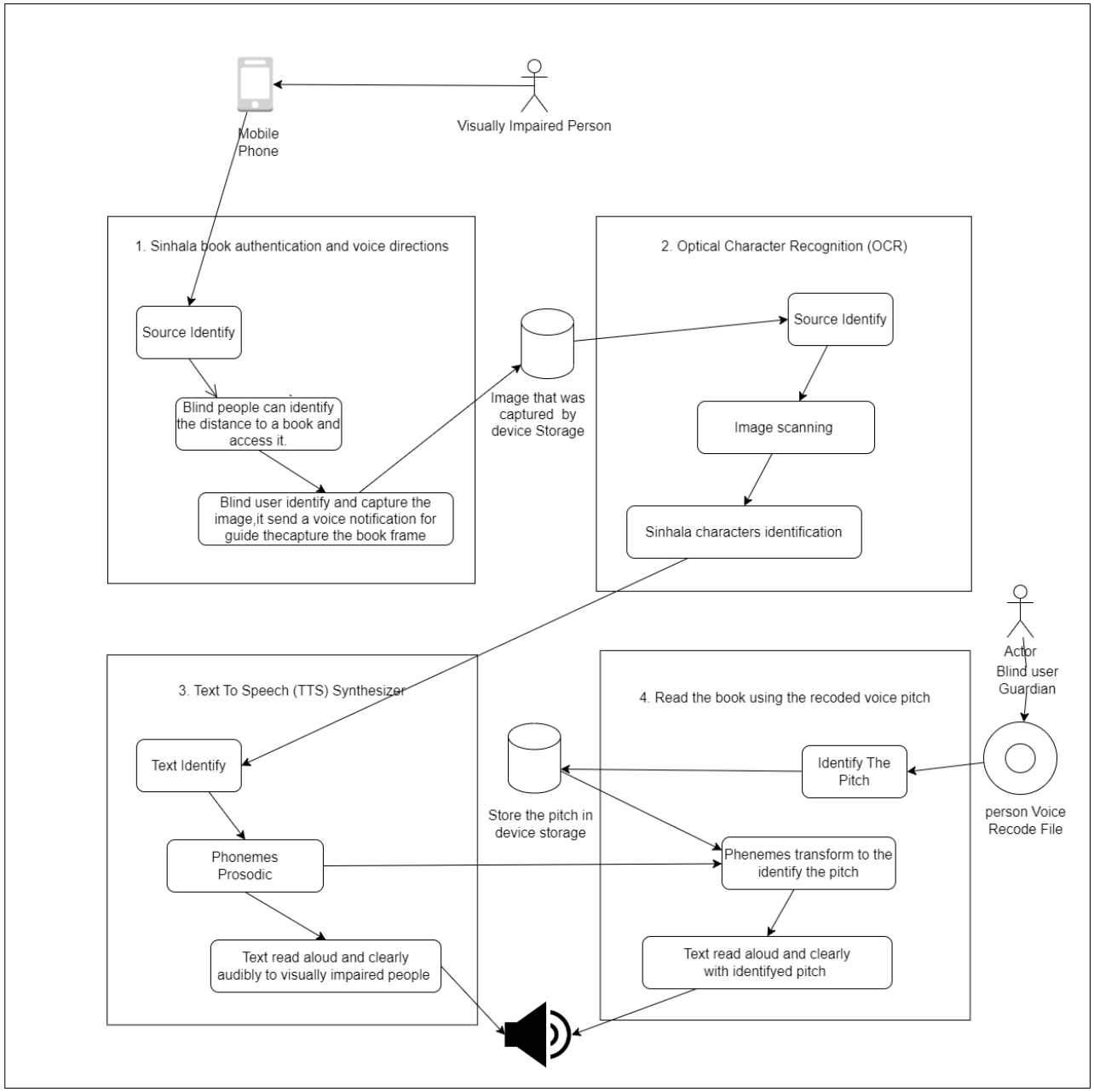
"We declare that the project would involve material prepared by the Group members and that it would not fully or partially incorporate any material prepared by other persons for a fee or free of charge or that it would include material previously submitted by a candidate for a Degree or Diploma in any other University or Institute of Higher Learning and that, to the best of our knowledge and belief, it would not incorporate any material previously published or written by another person in relation to another project except with prior written approval from the supervisor and/or the coordinator of such project and that such unauthorized reproductions will construe offences punishable under the SLIIT Regulations.

We are aware, that if we are found guilty of the above mentioned offences or any project related plagiarism, the SLIIT has right to suspend the project at any time and or to suspend us from the examination and or from the Institution for minimum period of one year".

	STUDENT NAME	**STUDENT NO.**	**Signature**
1	Jayathunga T.M.	IT20146238	
2	Godakanda P.G.S.	IT20129712	
3	Semini J.P.D.L.	IT20241346	
4	Bhagya H.D.M	IT20254520	

Appendix 1 :

solution including a conceptual diagram.



Appendix 2 :

The mobile-based Sinhala book reader for visually impaired individuals can provide a solution using the following technologies:

Sinhala book authentication and voice directions: The blind people can identify the distance from him/her to the book and easily access towards the book. Then after the user touches the book and try to capture the image the system will send a voice message and inform the user about the book frame and how to capture it.

Optical Character Recognition (OCR) Synthesis: Once the app is launched the user can use the app in real-time to scan the document. And the system auditory guides and helps the user to scan the document or the paper to adjust the frame. When the task is successfully completed system translates that to Sinhala and sends it to the system to perform TTS.
Text-to-Speech (TTS): The TTS software can be used to convert digitized text into speech, allowing visually impaired individuals to listen to the book through their mobile devices.
Read the book using the recoded voice pitch: The blind user can select any person's voice from the app. The user has to any preferred voice through the recorder and select that voice from the app. The app will read the rest of Sinhala voices using that pitch.