Sri Lanka Institute of Information Technology

PROJECT REGISTRATION FORM

(This form should be completed and submitted on or before 3.00 PM, 2nd August 2019)

The purpose of this form is to allow final year students of the B.Sc. (Hons.) 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), 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	Document Reading System for Blind People ("Taking Books")

RESEARCH GROUP	• Assistive Technology • Artificial Intelligence and Machine Learning • Cloud Computing

PROJECT NUMBER	01	(will be assigned by the lecture in charge)

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

	STUDENT NAME	STUDENT NO.	CONTACT NO.	EMAIL ADDRESS
1	(GROUP LEADER) E.M.D.D. EKANAYAKE.	IT16102156	0777724874	it16102156@my.sliit.lk
2	I.N. KALANSOORIYA.	IT16176348	0771537237	it16176348@my.sliit.lk
3	P.S.N. KULARATHNE.	IT16165762	0772789541	it16165762@my.sliit.lk
4	W.R.P. FERNANDO.	IT16079328	0774577122	it16079328@my.sliit.lk

SUPERVISOR

Ms. Suranjini Silva.		
Name	Signature	Date

CO-SUPERVISOR (will be assigned by the Supervisor, if necessary)

Dr. Anuradha Jayakody.		
Name	Signature	Date

EXTERNAL SUPERVISOR (if any, may be from the industry)

Name	Affiliation	Contact Address	Contact Numbers	Signature/Date

ACCEPTANCE BY CDAP MEMBER

Name	Signature	Date

PROJECT DETAILS

Brief Description of your Research Problem:

How to read documents for vision impaired people as normal person and easier than Braille system?

Currently vision impaired people use Braille system to read and write that was introduced centuries ago. Though they have been benefitted from it immensely, with the modern technology it would be much better if we can find an alternative solution for reading without the use of Braille. Braille method is slower as the user must touch the raised dots in order to read the materials with his/her fingers. It is highly error prone and the speed of reading is also slower as the reader must touch and understand the letters one by one and he/she could easily lose the place they are reading. Obviously, they cannot read the materials with the same speed as a sighted reader.

However, with the modern technologies, this can be solved. Therefore, our research is going to be conducted to provide a suitable solution for this problem.

Description of the Solution:

We propose to develop a Mobile app called "TAKING BOOKS "to read documents which contains,
- Text
- Images
- Charts (ex: Bar, Pie)
- Tables
- Equations

Proposed system can read any type of books by recognizing the content of the books and visually impaired people can read the hard copies or e-books the by listening to the content of the books through using the sound. Moreover, proposed system will ensure to overcome the difficulties of reading non braille written books for visually impaired people and it will help them to read books as normal human beings.

Figure 01: Full System diagram

Figure 02: System diagram (Identify digital image)
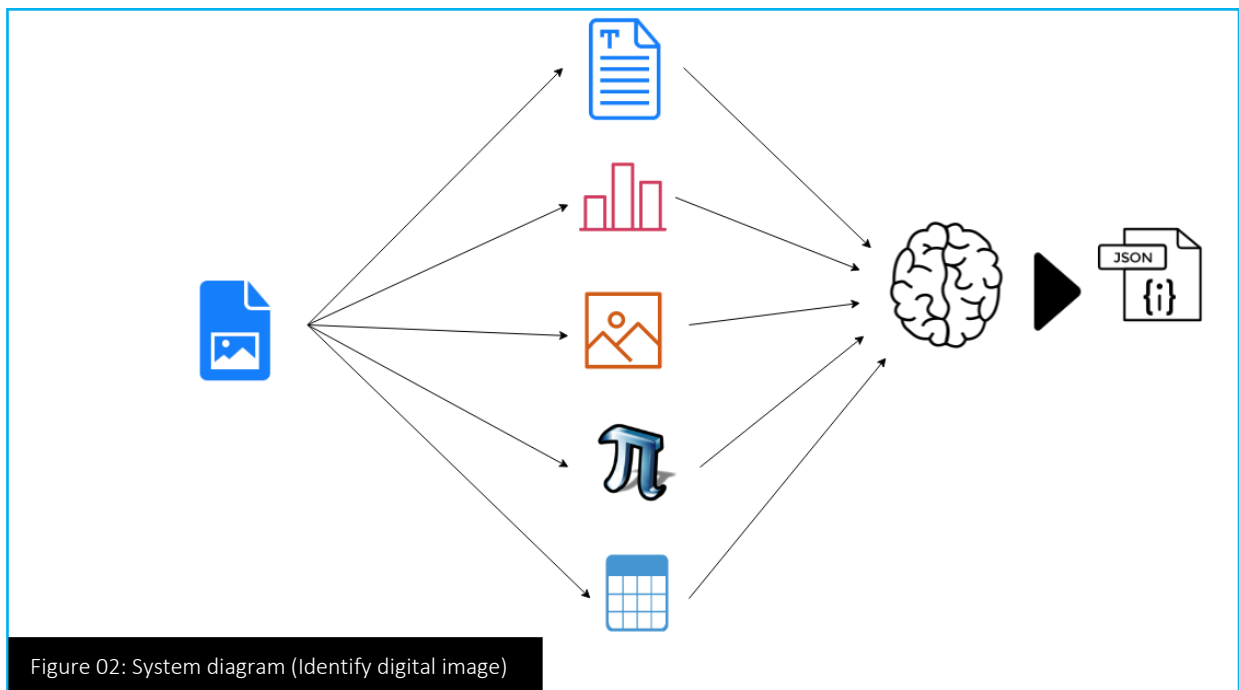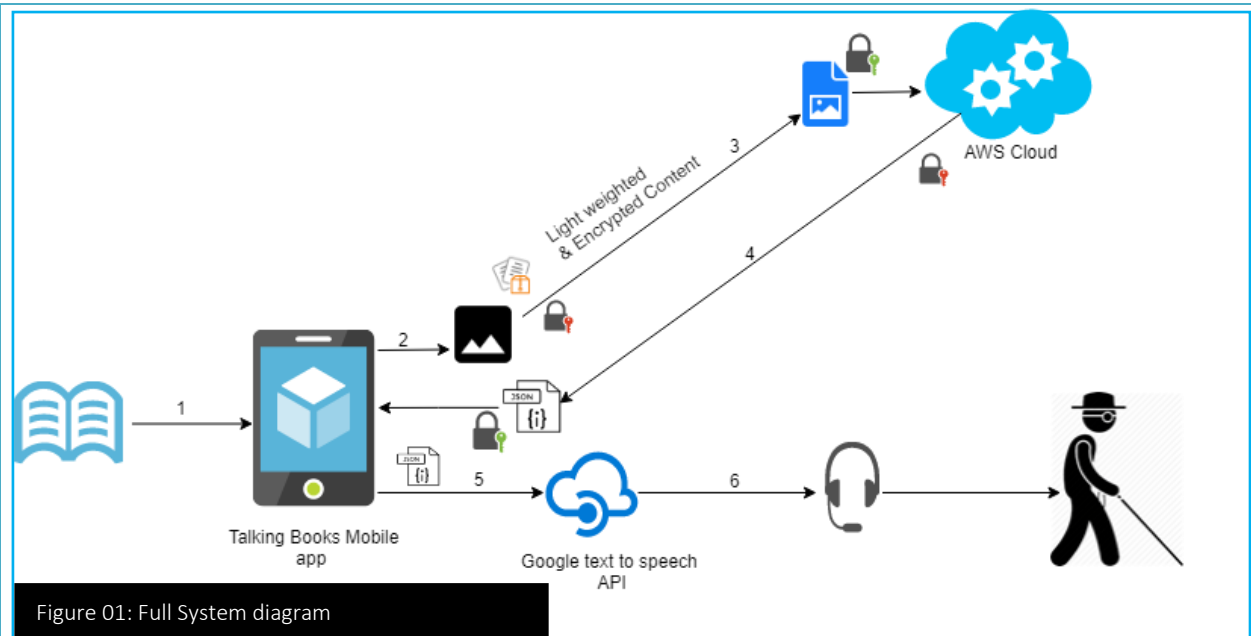
Main expected outcomes of the project:

According to the uploaded photos of the document (e.g.: books), app will generate an audio file describing the content of the uploaded photo. Hence user can listen to the content and understand the document.

System can identify text, images, charts, tables and equations in the uploaded photo and describe them in detail to make it easier for the user to understand.

Before sending photos to the cloud the system will decrease the size of the images without causing any alteration that makes it easier to transfer to the cloud. After decreasing the size then images will be encrypted this makes the connection from the app to the cloud much more secure. Encrypting images will protect Integrity, confidentiality, authenticity of the images.

WORKLOAD ALLOCATION (Please provide a brief description about the workload allocation)

MEMBER 1	E.M.D.D. EKANAYAKE (IT16102156)

Create mobile application, Identify the different categories, Analyzing and Describing text and generate describe audio clip.

- Develop a user-friendly cross platform mobile application for vision impaired people.
    - Analyze captured photo and auto rotate the image in actual direction where image should be.
    - Single command to start analyzing.
    - After analyzing the document auto play starts and user able to listen to the document.

- Identify text, images, charts, tables and equations uniquely and create another digital image for different identical matches.

- Text - Identify language patterns and create detailed description.

- Generate a json file of that detailed description for the user to listen.

- Concatenating all json files and generate a single audio clip using open source API service for the user to listen.

MEMBER 2	**I.N. KALANSOORIYA. (IT16176348)**

Create an algorithm to encryption and reduce the size of the images.

- Create an algorithm to reduce the size of the images, remove noises and preprocesses to get meaningful information.

- Create an encryption algorithm to make the assurance of the communication. encryption algorithm must include following properties.
    - High efficiency
    - Resistant to brute force attacks

- Use **Diffie-Hellman** algorithm for the secure key exchange to make key exchange much more secure and reliable.

- Use randomly generated 256-bit long secret key and embed it into the application to make key storage much more secure.

- Enforce cloud policies to safeguard and handle the process according to the standards and best practices.

MEMBER 3	**P.S.N. KULARATHNE. (IT16165762)**

Analyzing and Describing Charts and Equations in the Documents.

- Detect charts, equations in the uploaded digital photos of the document.

- Charts - Identify the type of the chart and the relevant data representation of the charts accordingly.
    - Line charts
    - Bar charts
    - Pie charts

- Equations - Identify numbers, variables and operators of complex equations accordingly.

- Create a detailed description about the identified content of charts and equations.

- Generate a json file of that detailed description for the user to listen.

MEMBER 4	**W.R.P. FERNANDO. (IT16079328)**

Analyzing and Describing Images and Tables in the Documents.

- Detect images, tables in the uploaded digital photos of the document.

- Images – Identify
        objects,
        people,
        places,
        actions and background regions
    in the image using deep learning techniques.

- Tables – Identify columns and row data in tables accordingly and analyze the content.

- Create a detailed description of the content that was identified for both images and tables. If the system identifies a white dog in an image, it will create a description of that like "This is an image of a white dog".

- In case of failure to identify, the system will respond to the user saying, "I cannot understand what that image is". This is because, there will be situations where the system cannot accurately identify the image.

- Generate a json file of that description for the user to listen.

DECLARATION

"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 for 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
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