PORTABLE BOOK READER FOR BLIND PEOPLE

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BORANG PENGESAHAN STATUS TESIS

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PORTABLE BOOK READER FOR BLIND PEOPLE

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This report is submitted in partial fulfillment of the requirement for the
Bachelor of Computer Science (Computer Networking)

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UNIVERSITI TEKNIKAL MALAYSIA MELAKA
2016

DECLARATION

I hereby declare that this project report entitled

PORTABLE BOOK READER FOR BLIND PEOPLE

is written by me and is my own effort and that no part has been plagiarized without citations.

STUDENT : _____ DATE: 24th August 2016

(WAN AFIFIE ALIFF BIN WAN ABDULLAH)

I hereby declare that I have read this project report and found this project report is sufficient in term of the scope and quality for the award of Bachelor of Computer Science (Computer Networking) With Honor.

SUPERVISOR : _____ DATE: 24th August 2016

(DR.NORHARYATI BINTI HARUM)

DEDICATION

I dedicated this project to all those humble beings who have aided me in any way to become what I am today. Whose scarifies seeded my success; especially our parents who have felt my pain beyond me and showered me win never ending prayers and support. I deem them as a divine source of inspiration.

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ABSTRACT

This project will help the blind people or who have low vision to read the book without using braille. Book reader will capture the picture of book pages using camera and book reader will process the images using OCR software. When the image is recognized, book reader will read it aloud. So, the blind people or who have low vision will hear it without need to touch using their fingertips. This project is using Raspberry Pi 2. The device is very energy efficient because it is only use 5V of power to run. It is also a high mobility device because raspberry pi only credit card size and can be carry out anywhere u want. This product is built because braille is difficult to learn and blind people cannot enjoy books as much as ordinary people.

ABSTRAK

Projek ini adalah untuk menolong orang buta atau orang yang kurang penglihatan membaca buku tanpa menggunakan braille. Pembaca buku akan menangkap gambar halaman buku menggunakan kamera dan memproses imej tersebut menggunakan perisian OCR. Apabila imej dikenalpasti, pembaca buku akan membacanya dengan kuat. Jadi, orang buta atau kurang penglihatan akan mendengar tanpa perlu menyentuh menggunakan hujung jari mereka. Projek ini menggunakan Raspberry Pi 2. Alat ini jimat tenaga kerana ianya hanya menggunakan 5V kuasa untuk dihidupkan. Ianya juga senang dibawa kemana sahaja kerana raspberry pi hanya sebesar kad kredit. Produk ini dibina kerana braille susah untuk dipelajari dan orang buta tidak dapat membaca banyak buku seperti orang biasa.

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INTRODUCTION

1.1 Project Background

There are approximately 285 million blind and visually problem people around the world. The term visual impairment covers a wide range and variety of vision, from lack of usable sight and blind, to low vision. Visually impairment cannot be corrected with eyeglasses or contact lenses to moderate visual impairment and an ability to read book, newspaper or any written notes. Visually impairment usually only can read using Braille system. Braille system contain 63 codes of character. Each of them made of 1 to 6 raised dot in different position matrix or cell. Braille character are embossed in lines on paper and read by passing the fingers lightly over the manuscript. These Braille systems are invented by Louis Braille in 1824. Braille can be difficult to learn, not all people's finger tips are sensitive enough to use it. Furthermore, there are limitations to get book using braille in market. [9]

This project is built to overcome Braille problem. Book reader will help the blind people or who have low vision to read the book without using braille. Book reader will capture the picture of book pages using camera and book reader will process the images using OCR software. When the image is recognized, book reader will read it aloud. So, the blind people or who have low vision will hear it without need to touch

using their fingertips. This project will take 4 months to complete. This Project is built using Raspberry Pi 2, monitor, keyboard, mouse and speaker.

1.2 Problem Statement

They are many problems in braille that being used today for blind and visually impairment. Below is the project problem that can be described. The Project Problem (PP) is summarized in Table 1.1.

Table 1.1 Summary of problem statement

No	Problem Statement
PS1	Braille can be difficult to learn and not many publishers publish their book using braille character.

1.3 Project Question

Three Project Questions (PQ) is constructed to identify the problem statement as discussed in previous section is depicted in Table 1.2.

Table 1.2 Summary of problem question

PS	PQ	Project Question
PS1	PQ1	What is the problem faced by visually impairment people?
	PQ2	How to solve their problem?

1.4 Objective

Based on the project statement formulated in previous section, appropriate project objectives (PO) are developed as follows in table 1.3.

Table 1.3 Summary of project objectives

PS	PO	PQ	Project Objective
PS1	PO1	PQ1	To study about blind's people problems.
	PO2	PQ2	To develop a tool that can read aloud a real book.
	PO3	PQ2	To validate the developed tool working properly.

1.5 Scope

The project will be focused on:

a) Develop a portable book reader

b) Recognize the text from the image

c) Read aloud the text from the image

d) Develop python script code for better recognize

1.6 Project Significance

Book Reader will help blind and visually impairment people in reading. This reader will help to reduce the weakness of the braille. Braille is a system of raised dots that can be read with the fingers by people who are blind or who have low vision. Braille can be difficult to learn, not all people's finger tips are sensitive enough to use it. Furthermore, there are limitations to get book using braille in market. By using this book reader, most of blind and visually impairment people can enjoy various books as

much as ordinary people, without concerning braille system. Book Reader will read aloud a book without need to touch like braille.

1.7 Expected Output

The result from this project consist of a product. The product can perform when a user put a book front of camera and raspberry pi will process the image captured and convert it into sound. The benefit of this project is the blind people or who have low vision can read the book without using braille.

1.8 Conclusion

At the end of this project, the book reader will help visually impairment people to read book. The book reader will read aloud a book. The next chapter will be focusing about literature review. Which will be covering about model approach and related work about book reader.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

In this chapter, we do some reviews on a few topics need to be done about visually impairment people and raspberry pi. Hence, this chapter will expose the related work, critical review of current project and justification, proposed solution and conclusion. After reviewing them, we will analyse the current problem regarding visually impairment people. Lastly, we find solution for the problem will be proposed.

2.2 Related Topic

2.2.1 Keywords

Visually impairment people

Based on “Visual impairment and blindness” by World Health organization (WHO), Visual impairment people is a people who have decrease ability to see [1]. There are four type of visual function such as normal vision, moderate visual impairment, severe impairment and blindness. Some of visual impairment can be fixed using glasses or treatment. Blindness is used for people that have complete or nearly complete of vision loss. They can see nothing and there is no treatment for them. Blindness are most common causes by uncorrected cataracts. It also may cause by age related macular degeneration, diabetic retinopathy, childhood blindness, cornea clouding and others infections. Problems in brain due to stroke or trauma also may cause blindness. Kay Ireland stated in “Daily Living Activities for a Blind Person” article [2], blindness people needs different ways to doing things such as travel, communication, written, read and daily activities. For example, in personal care, a blind people will shower or doing others grooming in their private bathroom. It is because they will be positioning the right tools to use in same place. By using this way, it is can help them to pick the tools easily. Blind people also needs a cane to walk. The white cane is the symbol of blind people. White cane can warn them if obstacles in their way, tell them if there are a stair or drain. There are school have been established for blindness people to do things such as play musical instrument, repair furniture and many others thing. It is a good thing to blind people to attend to this institution than stay at home because they can learn to contribute their own happiness. They also will be taught to write and read using raised dot letter or also known as Braille system.

Figure 2.1: White Cane Use by Blind People

Braille System

Braille system are invented in Paris, France by Louis Braille. Louis Braille are blindness person that loss his sight at three cause by eye injury. He became frustrated and used to learn raised dot to read and write at school. Louis Braille publish his first Braille book in 1829 and in 1837, he added symbol for math and music. Braille system is a system using raised dots to represent the letters of the alphabet. Braille are used by blind people to read and write by touch it using their fingertip. Braille also contain punctuation marks and provide symbol to show letter grouping. Braille system are contain 63 code of character. Each of them made of 1 to 6 raised dot in different position matrix or cell. Braille can be read by moving the fingertip from left to right along each of line [3].

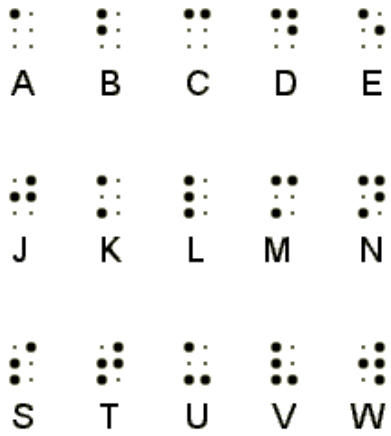

Figure 2.2: Braille alphabet

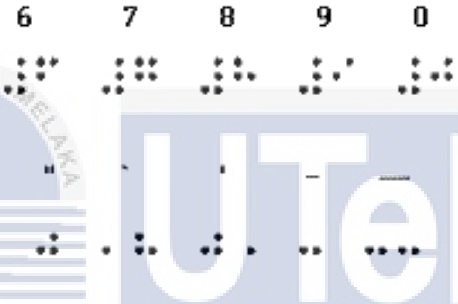

Figure 2.3: Braille Number and Symbol

Raspberry Pi

In pursuing modernization, information technology and communication is very important in our society nowadays. There are many advances in information and communications technology, from a large computer to a mobile phone that is very thin and many uses, from finding information on the library to get information from the internet. Information is now all in the fingertips. Accordingly, it is clear shows that there are a lot of importance of information technology to humans. Nowadays people used to carry their laptop everywhere they go. Hence, people prefer getting small size of computer to ease them to carry it everywhere they go. Because of that, Raspberry pi were invented. Raspberry pi is a low cost microcomputer. Its sized about credit card. It is a capable little device that people of all age can explore computing and learn how

to program in scratch and python language. Raspberry pi has all function that desktop computer has, for example word processing, watch movie, play games and many more [4].

Figure 2.4: Raspberry Pi

Pi Camera

Pi Camera module is designed for Raspberry Pi to take video or still images. Its need to attach the ribbon cable to the camera slot in Raspberry Pi board. Pi Camera has a 5MP fixed focus camera. The Pi Camera supports 1080p30, 720p60 and VGA90 video modes, as well as stills capture. This Camera module can work with all model of Raspberry Pi. There are some third-party libraries built for it and it also can be access through Multi-Media Abstraction Layer (MMAL) and Video4Linux APIs (V4L) [5].

Figure 2.5: Pi Camera Module

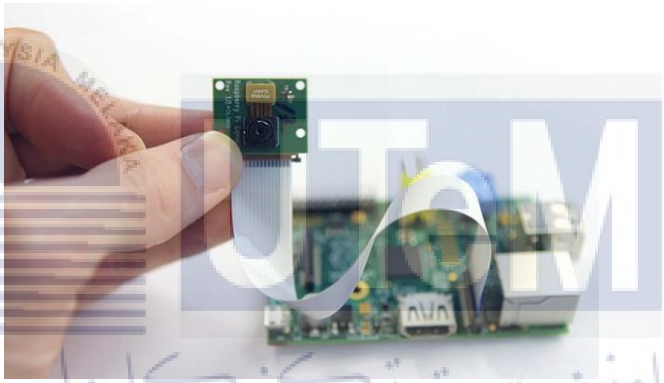

Figure 2.6: Pi Camera Module attached to Raspberry Pi Board