

# Barcode Based Product Label Reading

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**Abstract**— In this generation printed text appears everywhere. So because of this the blind people always take the help of others to buy some product. Thus blind people need some assistance to read text information of the product. Assistive technologies are being developed for visually impaired people in order to live confidently. This system proposes a barcode reader-based assistive text reading framework which processes the captured barcode and obtains its details to help blind persons read text labels and product packaging from hand-held objects in their daily lives. This system is framed into three stages. Firstly, the barcode reader scans the barcode from the product. Secondly the barcode number and the name of the product is displayed in the LCD. Finally, Speech output – the product name is pronounced through the headphones. This system can be used to assist the blind people in their daily life. The entire application is based on Raspberry Pi.

**Key words:** Barcode, Label Reading

## I. INTRODUCTION

According to estimates from the World Health Organization (WHO) Prevention of Blindness and Deafness Programme, About 285 million people are visually impaired worldwide: 39 million are blind and 246 million have low vision (severe or moderate visual impairment). About 90 per cent of the world's visually impaired people live in developing countries. Globally, uncorrected refractive errors are the main cause of visual impairment. Usually visually challenged people have a lack of confidence to move around the environment. After that with the help of guide dog and white cane they walked safely and confidently in this environment. In this generation printed text appears everywhere. So because of this the visually challenged people always take a help of other to buy some product. Thus blind people need some assistance to read text information of the product. Assistive technologies are being developed for visually impaired people in order to live confidently.

## II. LITERATURE SURVEY

- 1) Monisha M (January 2016) proposed an idea “OCR based automatic book reader for the visually impaired using Raspberry PI”. Optical Character Recognition (OCR) is the identification of printed characters using photoelectric devices and computer software. It converts images of typed, handwritten or printed text into machine encoded text from scanned document or from subtitle text superimposed on an image.
- 2) AnushGoel (June 2018), proposed an “Raspberry Pi Based Reader for Blind People”. This paper presents the automatic document reader for visually impaired people, developed on Raspberry Pi. It uses the Optical character recognition technology for the identification of the printed characters using image sensing devices and

computer programming. It converts images of typed, handwritten, or printed text into machine-encoded text.

## III. PROPOSED SYSTEM

The proposed system deals with the development of barcode reader based product label reading for visually challenged people in portable manner. Here raspberry pi acts as a mini computer which makes the system portable for use. Raspberry pi is interfaced with barcode reader, LCD and speaker in order to produce the output effectively. This proposed system mainly used for assistive purpose by the visually challenged people which helps them in shopping acting as a shopping tool to read the texts.

## IV. METHODOLOGY

The label reading process can be achieved by interfacing the barcode reader and raspberry pi model. Barcode readers usually used in the departmental stores for billing purposes is used here for helping the visually challenged. The raspberry pi acts as a mini computer and it makes this system portable. The output response is also fast when compared with others. An adapter is used for giving power supply to the raspberry pi unit. The proposed system in the block diagram is explained below.

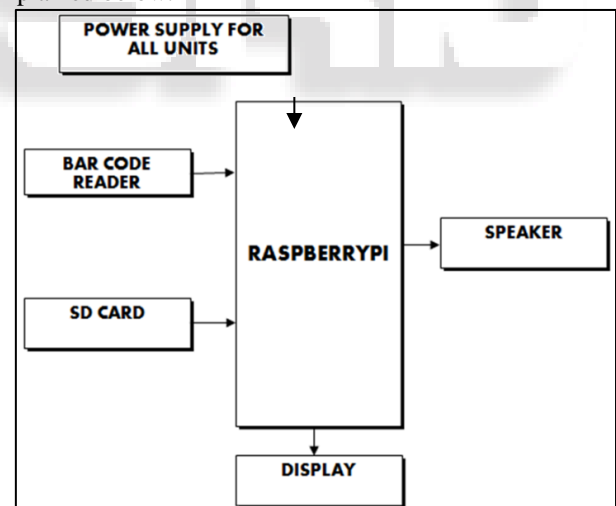


Fig. 1: Block Diagram for Proposed System

Barcode readers usually used in the departmental stores for billing purposes is used here for helping the visually challenged. Barcode reader interfaced with the raspberry pi 3 model B+. A barcode reader (or bar code scanner) is an electronic device that can read and output printed barcodes to a computer. Like a flatbed scanner, it consists of a light source, a lens and a light sensor translating optical impulses into electrical ones. Additionally, nearly all barcode readers contain decoder circuitry analysing the bar code's image data provided by the sensor and sending the barcode's content to the scanner's output port.

An AC adapter, AC/DC adapter, or AC/DC converter is a type of external power supply, often enclosed in a case similar to an AC plug. Other common names include plug pack, plug-in adapter, adapter block, domestic mains adapter, line power adapter, wall wart, power brick, and power adapter. Adapters for battery-powered equipment may be described as chargers or rechargers (see also battery charger).

External AC adapters are widely used to power small or portable electronic devices. The advantages include are safety, Electrical noise reduction, heat reduction, weight and size reduction, Ease of replacement etc...

A liquid crystal display (LCD) is a flat panel display or electronically modulated optical device that uses the light-modulating properties of liquid crystals. Liquid crystals do not emit light directly, instead using a backlight or reflector to produce images in colour or monochrome.

The Raspberry Pi 3 Model B+ is the latest product in the Raspberry Pi 3 range, boasting a 64-bit quad core processor running at 1.4GHz, dual-band 2.4GHz and 5GHz wireless LAN, Bluetooth 4.2/BLE, faster Ethernet, and PoE capability via a separate PoE HAT The dual-band wireless LAN comes with modular compliance certification, allowing the board to be designed into end products with significantly reduced wireless LAN compliance testing, improving both cost and time to market. The Raspberry Pi 3 Model B+ maintains the same mechanical footprint as both the Raspberry Pi 3 Model B and the Raspberry Pi 3 Model B.

Headphones (or head-phones in the early days of telephony and radio) are a pair of small loudspeaker drivers that are designed to wear on or around the head over a user's ears. They are electroacoustic transducers, which convert an electrical signal to a corresponding sound.

A database is created for the products. After displaying the barcode number in the LCD, it compares the barcode number with the barcode number in the database. If the number is matched then it displays the product name, product cost and both the product cost and product name will be pronounced in noise through the earphones. If the number is not matched then the words product does not exists is displayed and this will be pronounced in the earphones.

The B+ is an improvement over the Raspberry Pi 3 Model B, increasing the speed of the processor to 1.4GHz, adding support for wireless ac Wi-Fi, for Bluetooth 4.2, for faster Ethernet, and Power over Ethernet [POE] capability via a separate POE add-on. The steps involved are

- 1) The microSD card, is inserted into the SD card reader. Then the card reader is inserted into the computer to install the os.
- 2) For the raspberry pi, usually rasbian or noobs software is installed. For the proposed project Raspbian os is installed. To install the Raspbian os, the raspbian stretch zip file will be downloaded from the link raspberrypi.org/downloads/.
- 3) After the completion of raspbian stretch zip file download, Win32 Disk Imager will be downloaded to run the image file from the os.
- 4) The raspbian stretch zip file is extracted and after this all the files are copied into the SD card and the next step is to copy the image file into the sd card.

- 5) Then the image is opened in WinDisk32 imager, a dialogue box is opened. Nextly we need to select the folder and click the write option so that the operating system is copied in the sd card
- 6) After all this process got over, these card is removed from the card reader and is inserted into the raspberry pi until it sits firmly. Thus the softwares are installed successfully.
- 7) If the memory card need to be formatted we should format the sd card only by using the application "sdc card formatter".

## V. EXPERIMENTAL RESULTS

In the proposed system barcode reader based product label reading system was developed. After the installation of the software the memory card should be inserted into the raspberry pi model. The LCD is interfaced with the model. LCD operate in two modes namely, 4 bit mode and 8 bit mode. In the proposed project 4 bit mode of operation in LCD is used. The data pins D4, D5, D6 and D7 are only used in the four bit mode operation of LCD. The data are send in nibble by nibble in this process.

Data bits D0, D1, D2 and D3 are not used in four bit operation. In four bit mode splitting of data in nibbles. Data is send out as nibbles instead of bytes.

The supply pin and the ground pin of LCD is connected with the raspberry pi supply and ground pin. The data pins of the LCD are connected to the GPIO pins. The supply given is +5V. After the LCD and raspberry pi connected properly, the barcode reader is also connected. The barcode scanner used in the system is a USB type which is directed connected to the USB port of the raspberry pi module. The barcode reader scans the barcode in the packet of the product and displays the barcode number in the LCD. If the barcode number matches with the number in the database then it displays the product name and cost of the product and the voice is pronounced through the headphones.



Fig. 2: Existing Product Scanned

If the number is not matched then it displays that the "product doesnot exists" in the LCD and the same is pronounced in headphones.



Fig. 3: Product Doesn't Exist Scanned

## VI. CONCLUSION & FUTURE SCOPE

This proposed project gives better output when compared to the other existing system. Implementation of a product label reading system that reads printed text on hand held objects for assisting blind person. This method can be effectively used by visually challenged people for shopping. The proposed barcode to text as well as speech conversion system provides the solution to the problems faced by blind people. In proposed system it applies a simple and fast method. The future scope may include some innovations like, preventing accidents and avoiding obstacles when moving they are alone. By using ultrasonic technology alarm can be implemented for avoiding accidents. In future these implementations may be very useful for the visually impaired persons to live independently.

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