



CAMERA BASED AUTOMATIC SHOPPING AND BILLING IN TROLLEY FOR VISUALLY IMPAIRED PEOPLE

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ABSTRACT

This paper presents a camera –based product information reader to help blind person to read information of the product. Nowadays printed text appears everywhere like product names, restaurant menus, instruction on Bottles, signed boards etc.. Finally identifies the product names and identified product information is pronounced through the optical character recognition (OCR).The OCR is used to convert the text from text regions and then convert into voice output. In shopping mall the customers have to wait in long queues to get their products scanned using barcode scanner and get it billed. We have proposed a new ‘Smart Shopping Trolley Using RFID’. This implementation is used to avoid the long queues and thus saving time while persons shopping. When a customer places a product in a smart trolley the RFID reader will read the product ID and the information related to it will be stored in controller. The total amount of the product in the trolley will be calculated using android device and will be updated on server and central billing center

. **Keywords:** *Blind people, RFID reader, Central billing*

I. INTRODUCTION

Embedded system provides variety of application in human life. The recent advances in embedded system change our lifestyle in a smart way. In existing system is mainly used in image acquisition system and it used microprocessor .To overcome this difficulties we proposed a system it provides assistance for a blind people to purchase products in the supermarket. The proposed system uses ATMEGA (162) microcontroller and RFID technology. To identify the product and price of a product .It uses radio waves to identify the products and the OCR is uses to convert the product information into the voice output for blind people through the speaker. In this system we uses automatic billing in trolley. By using this trolley, customer can buy a large number of products in very short time with less effort. At the billing counter computer can be easily interfaced for verification and bill print out. One important requirement is ease deployment and usage, in other words the developed system and support application (software) must be able to be used with much ease and low cost hardware by visual impaired persons. Generally speaking, this study is intended to contribute for the enhancement and independence of visually impaired people in society, as well as their inclusion and participation. The next section brings up a brief overview over state of theart



of technologies designed for assist blind people on similar environments. The third and fourth sections explain in detail our proposed system and its various modules and functions.

II. RELATED WORK

Karen Duarte ,jose cecilio(1)The Blind people are not able to identify the product and product names. So we propose a RFID based assistive reading frame work to help a blind people to know the product through voice of the speaker. In this system the AWOCR [Optical Character recognition] is offer the function of scanning and recognition of text and some have integrated voice output.The customers have to wait in long queues to get the products scanned using barcode scanner and get it billed. The automatic billing in trolley implementation is used to assist a person while shopping and also to avoid standing in long queues and thus saving time . When a customer places a product in the smart trolley, the RFID reader will read the product ID and the information related to it stored in a microcontroller. It is communication between the server , android device and central billing system through the zigbee module.

Krutarth majithia,darshan sanghavi (2)BlindShopping offers infrastructural support for the whole purchasing process within a supermarket, understood as a four step cyclic process:broken when the user decides to go to the cash till to pay for her purchases. Consequently,BlindShopping offers a *navigation* component driving the user through voicemessages to the aisle where a product category previously dictated to her smartphoneis located. Once there, BlindShopping also offers support for *product recognition* by either shelf section identification or product own identification by means of QR orUPC code scanning, respectively.

X.Yang, Y.Tian, S.Yang (3)Camera based technology was used in the existing project. In this prototype a camera is attached to the pair of sunglasses. The frame work consist of three functional components: scene capture, data processing and audio output. Atmel 89c51 microcontroller was used. In this method camera based assistive text reading frame work to help the blind persons read text labels and product packaging from hand-held object in their daily lives. To isolate the object from cluttered backgrounds or other surrounding objects in the camera view, first provide an efficiency and effective motion based method to define a region of interest in the video by asking the users to shack the objects. This method extract moving object region by a mixture-of-Gaussians-based background sub-tracking method. In the extracted ROI, text localization and recognition are conducted to acquired text information. To automatically localize the text region from the object ROI, it improves the novel text algorithm by learning gradient features of strokes orientation and distributions of edge pixels in an ad boost model. Text characters in the localized text region are then binaries and recognition software. The recognized text codes are output to blind users in speech.

Le, M. H., Saragas, D., & Webb, N. (4)We propose a RFID based label reader to help the blind persons to read the name of the label on the product and also identify the product name and pronounced through voice. Blind people have the ear phones. AUDUINO UNO microcontroller is used in the data processing. Radio frequency identification or RFID is the fastest growing technology in the world today. RFID is an automatic identification method that can remotely retrieve data using devices called RFID tags or transponders. RFID in wireless communication was evolved to the grate advancement of wireless technology. This introduction of RFID into the mobile communication fields has made the world a smaller place to live in.

Kenny Ju Min Yeoh, Hwee Ling Wong, (5)Public locations, such as a crowded shopping malls, airports, train stations, and bus stations, can be difficult to navigate and can be become disorienting for those with visual impairments. Imagine having to navigate to a terminal at an airport without the ability to see. After checking in bags and getting through security, one would still need to walk to the terminal listed on their ticket. Without asking others for help, these tasks can be difficult. These public spaces contain various sensory distractions such as traffic noise and other people. For a visually impaired person, it can become difficult to determine what direction to travel without some form of guidance. Navigating through unfamiliar public locations has been modified.

III.METHODOLOG

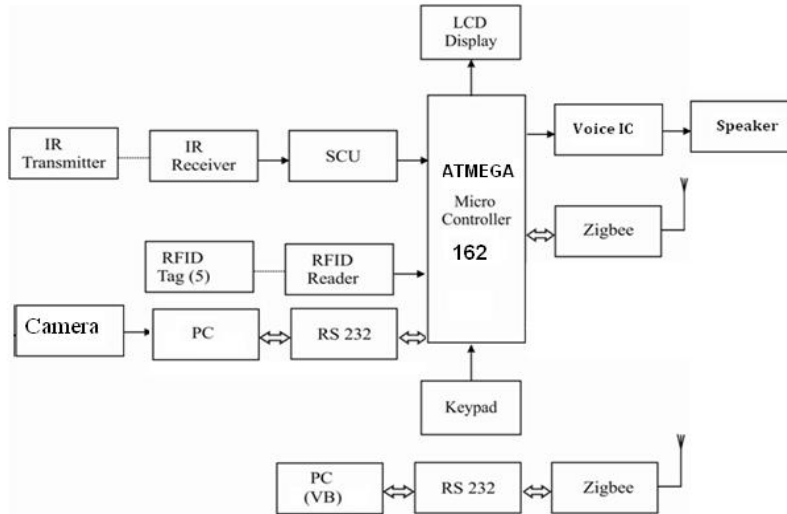


Fig:Block diagram of proposed system

IV.RFID TRANSPONDER

The Transponder or tag is fixed on to the baggage to be tracked in the airport. When this tag comes within the range of the reader or integrator, the tag is energized. Now, this tag transmits the data to the reader. This data is automatically sent to the micro-controller for further processing. The time at which the tag is sensed is sent to the micro-controller from the RTC (Real Time Clock).These details are displayed on LCD (Liquid Crystal Display) .The same is sent to the EEPROM (Electrically Erasable and Programmable Read Only Memory), which is used as a backup. It can be stored, and retrieved.

V.PASSIVE TAG AND READER:

Passive tags are those energized by the reader itself, they contain no power source, typically have very long lifetime a drawback over active tags is the read range. RFID Passive tag is composed of a integrated electronic chip and a antenna coil that includes basic modulation circuitry and non-volatile memory.



Fig2: Different types of tags

For most general applications passive tags are usually the most cost effective. These are made in a wide variety of sizes and materials: there are durable plastic tags for discouraging retail theft, wafer thin tags for use within "smart" paper labels, tiny tracking tags which are inserted beneath an animal's skin and credit card sized tags for access control. In most cases the amount of data storage on a passive tag is fairly limited - capacity often being measured in bits as opposed to bytes. However for most applications only a relatively small amount of data usually needs to be codified and stored on the tag, so the limited capacity does not normally pose a major limitation. Most tags also carry an unalterable electronic serial number, which makes RFID tags potentially very useful in applications where item tracking is needed or where security aspects are important.

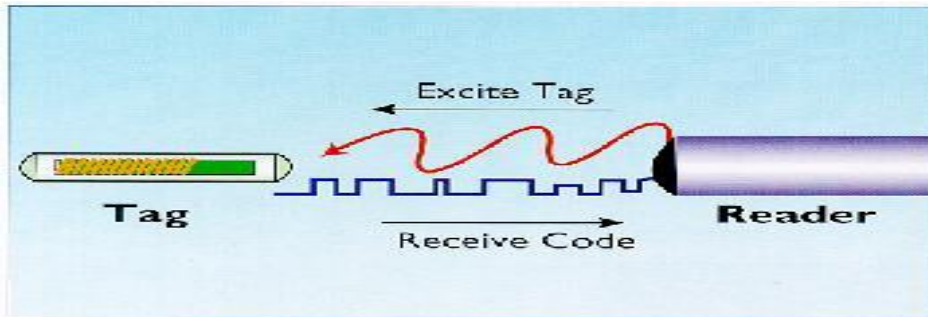


Fig3: Interaction between tag and reader

The reader powers the tag (transponder), by emitting a radio frequency wave. The tag then responds by modulating the energizing field. This modulation can be decoded to yield the tags unique code, inherent in the tag. The resultant data can be passed to a computer for processing. Tags have various salient features apart from their physical size: Other available features are: Read Only, Read Write,

VI. ADVANTAGE OF PASSIVE TAGS

- The tag is typically much less expensive to manufacture
- The tag is much smaller (some tags are the size of a grain of rice). These tags have almost unlimited applications in consumer goods and other areas.
- Tags can be read through a variety of substances such as snow, fog, ice, paint, crusted grime, another visually and environmentally challenging conditions



Fig 4: printed text from hand held objects in multiple colour

VII.SIGNAL CONDITIONING UNIT

The signal conditioning unit accepts input signals from the analog sensors and gives a conditioned output of 0-5V DC corresponding to the entire range of each parameter. The calibration voltages (0, 2.5 and 5V) and the health bits are also generated in this unit. Microcontrollers are widely used for control in power electronics. They provide real time control by processing analog signals obtained from the system. A suitable isolation interface needs to be designed for interaction between the control circuit and high voltage hardware. A signal conditioning unit which provides necessary interface between a high power grid inverter and a low voltage controller unit.

VIII.ATMEGA (162) MICROCONTROLLER

Atmel AVR 8- and 32-bit microcontrollers deliver a unique combination of performance, power efficiency, and design flexibility. Optimized to speed time to market, they are based on the industry's most code-efficient architecture for C and assembly programming. No other microcontrollers deliver more computing performance with better power efficiency. Industry-leading development tools and design support let you get to market faster. Atmel offers AVR software framework, a complete library of drivers and middleware needed to build an application. A common Application Protocol Interface (API) is provided making it easy to port your software between different AVR microcontrollers. In addition, a large collection of application notes explains how to use all on-chip peripherals in an application. Atmel QTouch Library makes it simple for developers to embed capacitive-touch button, slider, and wheel functionality into general-purpose AVR microcontroller applications. The royalty-free QTouch Library provides several library files for each device and supports different numbers of touch channels, enabling both flexibility and efficiency in touch applications. By selecting the library file supporting the exact number of channels needed, developers can achieve a more compact and efficient code using less RAM.

IX.ZIGBEE

The mission of the ZigBee Working Group is to bring about the existence of a broad range of interoperable consumer devices by establishing open industry specifications for unlicensed, un tethered peripheral, control and entertainment devices requiring the lowest cost and lowest power consumption communications between compliant devices anywhere in and around the home. The ZigBee specification is a combination of Home RF Lite and the 802.15.4 specification. The spec operates in the 2.4GHz (ISM) radio band - the same band as 802.11b standard, Bluetooth, microwaves and some other devices. It is capable of connecting 255 devices per network. The specification supports data transmission rates of up to 250 Kbps at a range of up to 30 meters. ZigBee's technology is slower than 802.11b (11 Mbps) and Bluetooth (1 Mbps) but it consumes significantly



Fig5: Automatic Billing in Trolley

X.PERSONAL COMPUTER

A **personal computer (PC)** is any general-purpose computer whose size, capabilities, and original sales price make it useful for individuals, and which is intended to be operated directly by an end user with no intervening computer operator. This is in contrast to the batch processing or time-sharing models which allowed large expensive mainframe systems to be used by many people, usually the same time, or large data processing systems which required a full-time staff to operate efficiently. A personal computer may be a desktop computer, a laptop, a tablet PC, or a handheld PC (also called a *palmtop*). The most common microprocessors in personal computers are x86-compatible CPUs. Software applications for personal computers include word processing, spreadsheets, databases, Web browsers and e-mail clients, games, and myriad personal productivity and special-purpose software applications. Modern personal computers often have connections to the Internet, allowing access to the World Wide Web and a wide range of other resources .A PC may be used at home or in an office. Personal computers may be connected to a local area network (LAN), either by a cable or a wireless connection.

XII.LCD DISPLAY

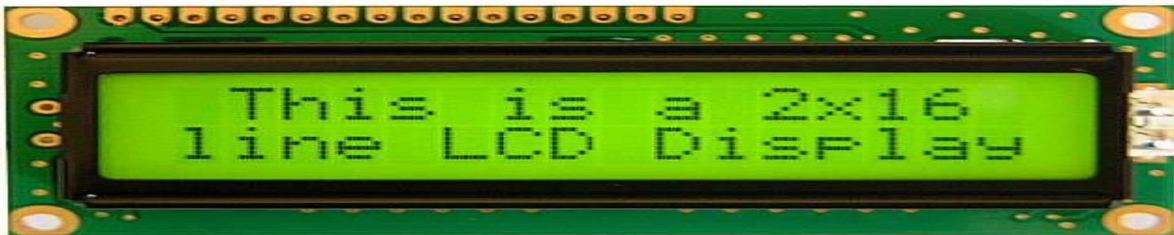


Fig 6: LCD display

A **liquid crystal display (LCD)** is a thin, flat electronic visual display that uses the light modulating properties of liquid crystals (LCs). LCs does not emit light directly. They are used in a wide range of applications including: computer monitors, television, instrument panels, aircraft cockpit displays, signage, etc. They are common in consumer devices such as video players, gaming devices, clocks, watches, calculators, and telephones. LCDs have displaced cathode ray tube (CRT) displays in most applications. They are usually more compact, lightweight, portable, less expensive, more reliable, and easier on the eyes. Its low electrical power consumption enables it to be used in battery-powered electronic equipment. It is an electronically-modulated optical device made up of any number of pixels filled with liquid crystals and arrayed in front of a light source (backlight) or reflector to produce images in color or monochrome.

XII.IR SENSOR

An **Infrared sensor (IR Sensor)** is an electronic device that measures infrared (IR) light radiating from objects in its field of view. All objects emit what is known as black body radiation. It is usually infrared radiation that is invisible to the human eye but can be detected by electronic device “Infra” meaning below our ability to detect it visually, and “Red” because this color represents the lowest energy level that our eyes can sense before it becomes invisible. Thus, infrared means below the energy level of the color red, and applies to many sources of invisible energy. Infrared transmitter is one type of LED which emits infrared rays generally called as IR Transmitter.

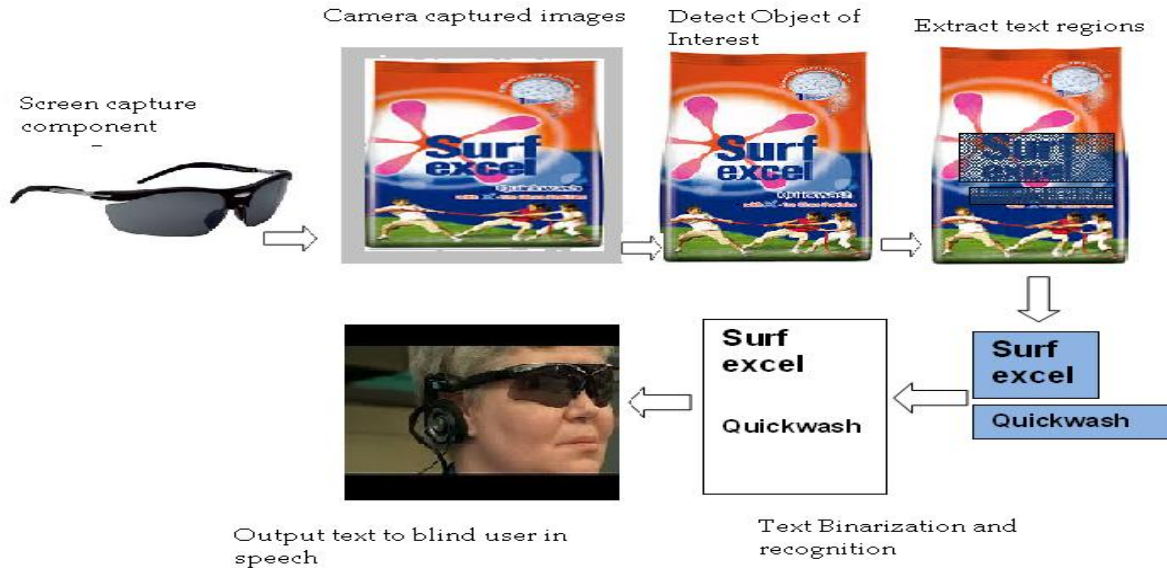
XIII.ADVANDAGE OF PROPOSED METHOD

- Low cost
- Reliability
- Easy to implementation

XIV.CONCLUSION

In this project, to solve the common aiming problem for blind users, we have proposed a camera-based automatic shopping and billing in trolley. The product reading framework to help blind persons to read product price also information from hand-held objects in their daily lives. In this project, we get the output in the form of audio and also use RFID technology for automatic billing in trolley.

XV.RESULTS



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