RESEARCH ARTICLE OPEN ACCESS

Automatic Barcode Scanner with Billing System Using Arduino

Dhamodharan.T[1], Prakash.S [2], Vasantha Kumar.R[3]
[1,2]*Department Of Electrical And Electronics Engineering, Sasurie College Of Engineering, Tirupur*
[3]*Assistant Professer, Department Of Electrical And Electronics Engineering, Sasurie College Of Engineering, Tirupur,*

ABSTRACT
The abstract should summarize the content of the paper. Try to keep the abstract below 200 words. Its uses are growing up day by day. There are different sectors which use hand held barcode scanning system. Instead of that we are going to implement automatic barcode scanner with billing system using Arduino. In our project we are performing multiple operations which are used for Scanning the barcodes, splitting the products one by one and it sending to the scanning sensor. We use the elevator for moving the Products from conveyor to the Scanning sensor block. For controlling the elevator function we are using the servomotor. The LCD Display is used to display the Total Number of Products that is Scanned or Billed.

Keywords **:** Arduino, Liquid Crystalline Display (LCD), Servo motor.

I. INTRODUCTION

Now a day's maximum operation is based on the automation but then for billing we have to stand in long queue where automation is not there in billing system. Based on automatic barcode scanning method we can reduce the waiting time for billing the products and reduce the man power .Day by day we try to reduce the man work but for scanning and billing process still us depending the man power.

In this method we are using the Arduino for controlling purpose. Now Arduino is a developing prototyping tool it performing multiple operation in our project, it is a heart of our project .based on arduino we controlling the motor function and more over we can display the product details in computer system. The products was move from one place to another place, this operation is control by the arduino.

Sensor was sense the product barcodes and send the product details to the computer system finally the products sending to billing system here after the products was packed automatically and deliver to the customer.

The project is used to carry out this research work. Following papers are deals with operation and application of barcode scanning and performances features of the arduino.

Barcode Enabled Event Management System for Logistics and Consumables Management in this paper Event management has a complex set of processes, which involve registration, secured venue access, real time stock taking of consumables and crowd-management. A system that integrates all these requirements is scarce. Hence, there is a dire need to build an automated system, which can cater to the needs of any event management. In this paper,

We propose the use of an integrated barcode system for event management to ensure smooth and quick

Registrations of participants, real time stocktaking of consumables and providing exclusive secured venue-access.

Barcode based Student Attendance System in this paper Student attendance play significant role in order to justify academic outcome of a student and college as overall. Unfortunately, there is no automated attendance record keeping application available in colleges. There is a need for a tool to systematically keep the students attendance record due to increasing number of college students the project that we are going to make is to help the teachers in our college to avoid maintaining the registry book. This project uses a barcode scanner. B.B.S.A.S uses Barcode scanner to take the attendance of students entering the lab. Each student's ID card will have a barcode at the backside of it. This barcode contains unique data of the student such as roll number, branch, and year.
Etc. Student will scan their barcode at the end so that the student cannot cheat. The display screen will show the attendance of the particular student after scanning his/her barcode. Teachers and administrator will only have access to the system with their respective login and passwords.

Camera-phone based barcode scanning this paper sets Mobile phones are always with us. Advertisers already use the mobile phone as a tool to interact with consumers. However, current options are either constrained or difficult to implement. Contrast, in 2D barcodes allow owners of camera-enabled wireless phones to conveniently interact with print and electronic media. For example, consumers could use 2D barcodes to gain

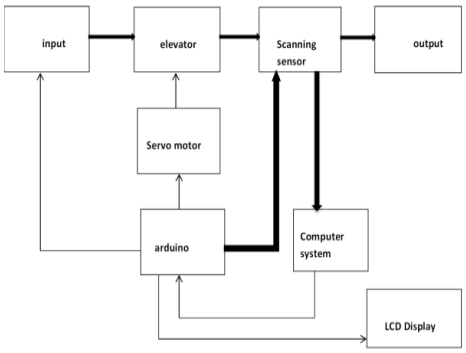
instant access to specific information, such as product and service prices, recipes, or bus arrival times. For Publishers, code scanning also provides rich targeted information and the ability to drive and collect responses, which will help them gain insight into scanning users. Overall, 2Dbarcodes will enable a higher level of mobile interaction and communication within the United States.

Barcode Recognition Systems in this Barcode became essential elements in sales and products services due to importance of keeping records of all items in one place. For this purpose, there are many methods implemented to make the barcode reading process became easier to users. This project is to develop a barcode recognition system by using image processing. The system will be able to read barcode through an image and the system capable to capture the image by using a webcam. This project will be using MATLAB software program to develop the system and it will integrate with webcam or digital camera. System will analyze the image and then display on the Graphical User Interface (GUI) the barcode type, data and size of the image. System is designed to recognize different types of barcode and display the data once the barcode image is captured. System also is to provide convenience way of observing data from the barcode with lower costing compared by using the electronic barcode scanners. The user who likes to observe the data represented by the barcode numbers without going any places providing the barcode scanner services can use this system anytime and anywhere. As the result, the project has been developed smoothly and perfectly. For the future system development, it is suggested that the system also should consist a slider so that the user would able to control the brightness of the image which captured by webcam.

II. AUTOMATIC BARCODE SCANNER WITH BILLING SYSTEM USING ARDUINO

In the Process System design the following steps are followed with proper way of the work,

2.1 Block diagram



2.2 Block diagram description

2.2.1 Scanning sensor

Barcode scanner is an electronic device that can read printed barcodes to a computer. Like a flatbed scanner, it consists of a light source, a lens, and light sensor translating optical impulses into electrical ones. Additionally nearly all barcode readers contain decoder circuit analyzing the barcode's image data provided by the sensor and sending the barcode's content to the scanner's output port.

2.2.1.2Methods of connection

2.2.1.3 Early serial interfaces

Early barcode scanners, of all formats, almost universally used the then-common RS-232 serial interface. This was an electrically simple means of connection and the software to access it is relatively simple, although needing to be written for specific computers and their serial ports.

2.2.1.4 USB

Later barcode readers began to use USB connectors rather than the keyboard port, as this became a more convenient hardware option. To retain the easy integration with existing programs, a device driver called a "software wedge" could be used, to emulate the keyboard-impersonating behavior of the old "keyboard wedge" hardware. In many cases, a choice of USB interface types (HID, CDC) are provided. Some have Powered USB.

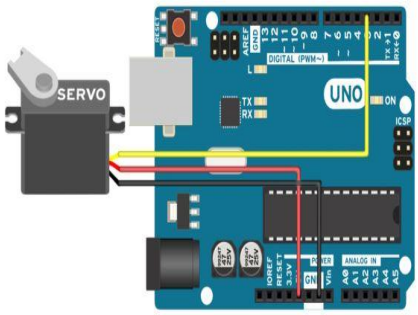
2.2.1.5 Wireless networking

Some modern handheld barcode readers can be operated in wireless networks according to IEEE 802.11g (WLAN) or IEEE 802.15.1 (Bluetooth). Some barcode readers also support radio frequencies viz. 433 MHz or 910 MHz Readers without external power sources require their batteries be recharged occasionally, which may make them unsuitable for some uses. Resolution The scanner resolution is measured by the size of the dot of light emitted by the reader. If this dot of light is wider than any bar or space in the bar code, then it will overlap two elements (two spaces or two bars) and it may produce wrong output On the other hand, if a too small dot of light is used, then it can misinterpret any spot on the bar code making the final output wrong. The most commonly used dimension is 13thou (0.013 in or 0.33 mm), although some scanners can read codes with dimensions as small as three thou (0.003 in or 0.075 mm). Most manufacturers advertise bar code resolution in mil, which is interchangeable with thou. Smaller bar codes must be printed at high resolution to be read accurately.

2.2.2 Arduino

For this project, we use a very easy to use microcontroller called Arduino. Arduino is an open source project based the programming language is a variant of C which is straight forward, and the system library is very rich. With little fuss you will be able to learn a great deal about how microcontrollers work and how to program them.(The actual microprocessor chip the Arduino uses is made by Atmel, which is based in San Jose, California.) Below is an enlarged photograph of the Arduino microcontroller module (technically the Uno R3 module) Arduino has 14 input/output pins on one side (labeled 0 through 13) and 6 input/output pins on the other (labeled A0 through A5).

It is these pins that allow external information flow in and out of the microcontroller. In this lab, you will primarily be concerned with these input/output pins. The six pins labeled A0 through A5 have the analog to digital conversion (ADC) capability. This means that you can measure an analog voltage (between 0 and 5V) on these pins to a certain degree of precision. In the case of the Arduino, the precision is 5/1023 or about 5 mV.



2.2.3 Servo motor

A servomotor is a rotary actuator or linear actuator that allows for precise control of angular or linear position, velocity, and acceleration. it consists of a suitable motor coupled to a sensor for position feedback. It also requires a relatively sophisticated controller, often a dedicated module designed specifically for use with servomotors. Servomotors are not a specific class of motor although the term servomotor is often used to refer to a motor suitable for use in a closed-loop control system. Servomotors are used in applications such as robotics, CNC machinery, or automated manufacturing.

Servomotors are great devices that can turn to a specified position. Usually, they have a servo arm that can turn 180 degrees. Using the Arduino, we can tell a servo to go to a specified position and it will go there. As simple as that! Servo motors were first used in the Remote Control (RC) world, usually to control the steering of RC cars or the flaps on a RC plane. With time, they found their uses in robotics, automation, and of course, the Arduino world. Here we will see how to connect a servomotor and then how to turn it to different positions. The first motor I ever connected to an Arduino, seven years ago, was a Servomotor. Nostalgic moment over, back to work! We will need the following things: An Arduino board connected to a computer via USB A servo motor, Jumper wires.

There are few big names in the servo motor world. Hi-tech and Futaba are the leading RC servo manufacturers. Good places to buy them are Servo city, Spark fun, and Hobby king. This instructs able and many more can be found in my Arduino Development Cookbook available here.

A servomotor is a rotary actuator or linear actuator that allows for precise control of angular or linear position, velocity, and acceleration. It consists of a suitable motor coupled to a sensor for position feedback. It also requires a relatively sophisticated controller, often a dedicated module designed specifically for use with servomotors. Servomotors are not a specific class of motor although the term servomotor is often used to refer to a motor suitable for use in a closed-loop control system. Servomotors are used in applications such as robotics, CNC machinery, or automated manufacturing.

2.2.4 Elevator

The main function of elevator was carrying the product from one place to another one place. In our project, the elevator was taking the product from input section and sends the product to scanning block for scanning the barcodes.

2.2.5 LCD Display

Each pixel of an LCD typically consists of a layer of molecules aligned between two transparent electrodes, and two polarizing filters (parallel and perpendicular), the axes of transmission of which are (in most of the cases) perpendicular to each other. Without the liquid crystal between the polarizing filters, the second (crossed) polarizer would block light passing through the first filter. Before an electric field is applied, the orientation of the liquid-crystal molecules is determined by the alignment at the surfaces of electrodes. In a twisted nematic (TN) device, the surface alignment directions at the two electrodes are perpendicular to each other, and so the molecules arrange themselves in a helical structure, or twist. This induces the rotation of the polarization of the incident light, and the device appears gray. If the applied voltage is large enough, the liquid crystal molecules in the center of the layer are almost completely untwisted

and the polarization of the incident light is not rotated as it passes through the liquid crystal layer.

III. CONCLUSION

Every field depending the automation for all work, based on our project we implemented the automation for automatic barcode scanning with billing system we avoided the waiting time for billing and more over we don't need to use more worker in billing section. Our system take less time for the scanning comparing to hand held method.

REFERENCES

[1]. Kuo-Lan Su, Sheng-VenShiau, Jr-Hung Guo, Chih-Wei Shiau ""Mobile Robot Based Online Chinese Chess Game" Innovative Computing, Information and Control (ICICIC), 2009 Fourth International Conference, IEEE (2014).

[2]. M.Kassim, H.Mazlan, N.Zaini and M.K. Salleh, "Web Based student attendance System using RFID Technology" 2012 IEEE Control Research Colloquim, no.Icsgrc, pp.213-218, July-2012.

[3]. H.Oktavianto "Intelligent Image Attendance Logging System,"-6, 2012pp.

[4]. Xiaochuan Zhang, Lianchang Chen, FeiTu, Zushu Li "Discussion on Chinese Chess decision-making system with emotion", Control and Decision Conference (CCDC), 2011 Chinese, IEEE.

[5]. I.A.Ujan and I.A.Ismaili system, "The 2011 IEEE/I Conference on Complex Medical Engineering, pp. 499-501, May 2011.

[6]. T.S. Lim, S.C. Sim, RFID based M.M Attendance System," 2009.

[7]. M.K.Y.Sabri, M.Z.A.Aziz, M.S.R.m. Shah and M.F.A.Kadir, Smart Attendance System by using RFID,"2007.

[8]. Z.Yongqiang and L.WirelessJi, "Fingerprint Attendance System Conference on Communication Technology," pp. 1–4, Nov. 2006.

[9]. Qaiser and S. A. Khan, "Au Attendance using RFID Systems 13–14, 2006.

[10]. A.S.Bedi and J.H.Marshall, attendance "P in Honduras," Journal of Deve 69, pp. 129–153, 2002.