| ISSN: 2582-7219 | www.ijmrset.com | Impact Factor: 4.988

| Volume 4, Issue 4, April 2021 |

Smart Shopping System Using Arduino and Bluetooth Module

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ABSTRACT : The customers have to wait in long queues for products scanned using a barcode scanner and get them billed in the shopping mall. To get rid of this, we proposed a new method "Smart Shopping System using Arduino and Bluetooth Module". This implementation is used to assist a person while shopping and also it avoids standing in long queues and thus saving time. This method consists of an Arduino UNO board, Android Device, Bluetooth module, and a display device. The products in the shopping centres will be scanned by the barcode reader of our android application. It will read the Product ID and the information related to it will be stored in a database.Thus, communication will be established between the android device and billing system via Bluetooth module. Also, in many cases, we will be in a dilemma to buy a product. In such a case we can analyse the product using our android application. After analysis, if the customer is ready to purchase the product, he/she can place their order. It will beautomatically updated in the main billing system. Index Terms-Arduino UNO, Central BillingSystem, Bluetooth Android. Module.

KEYWORDS: ARDUINO, CENTRAL BILLING SYSTEM, BLUETOOTH MODULE, ANDROID, SHOPPING SYSTEM.

I.INTRODUCTION

The main aim of this project is to save time by avoiding the time we wait for paying our bills in the malls and supermarkets. At first, if the user is a regular customer for the store then he will possess an account in the mall through which he can log in to the account by providing the user id and password. If this matches with the one which is stored in the database of the mall the account will be logged in Once logged in, we can purchase products. If the user is a new customer. then he needs to sign up for a new account by giving his user's name, password, and other details. For purchasing, we make use of the barcode available in the product. The barcode is the unique identification code that varies from cash product to product. The barcode can wholly consist of numbers or groups of characters or a combination of both characters and numbers.

On scanning the barcode, the details of the product like product name and price stored in the database of the mall will be retrieved After that, if we wish to add it, we can add it to the cart. If there is a new brand available in the market and we are in a dilemma to buy a product. At this time, we can make use of the reviewoption which is available in the application. When we click this button our Android application will call the browser and the product details will be surfed in the browser. The review about this product and the price of the product can be surfed on the internet. We can also make use of the save my orders option to save our orders which are used in the case of future purchasing. The order details, user details, and product details everything will be stored in the database. After purchase, we can make the payment using three options:online, offline, wallet. We need to pay the amount in advance in the mall which will be credited into our account and after that, we can use that amount for purchasing. In the online mode of payment, our app will be integrated with the Paytm app so that it will be redirected to that page and then we can make the payment through our Paytm account. In the offline mode of payment, our net amount will be transferred to the central billing system via serial communication so that we can pay the amount directly in the mall itself.

There are also delivery options available in the application. If the products are to be delivered, then we need to click the delivery option and enter the address. The latitude and longitude values of the location will be calculated using a location sensor. For this, we need the help of the internet and GPS. The location of the mall will be calculated using GPS. The distance between the two locations will be calculated using a mathematical relation. Based on the distance, the delivery charges will be added to the net amount. For all this, we need only a smartphone which simplifies the tedious process of purchasing.

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II.RFID BASED SHOPPING SYSTEM

Human beings have always evolved technology to support their needs ever since the beginning of mankind. The basic purpose of development in technology has been in simplifying tasks and making everyday chores easier and faster. One quotidian task that citizenry spend a substantial amount of their time on is shopping.According to a survey conducted by the US Bureau of Labor, on average, human beings spend 14 hours everyday shopping. A large number of consumers will tend to walk out of a queue if the line is too long. The current Shopping environment can be simply be classified into two categories. They are Shopping in-person and Shopping in absentia. Shopping in absentia is supported in numerous ways includes online shopping, teleshopping, etc. wherein a shopkeeper does not have to be physically present in the shopping area.

Shopping includes an individual visit to the spot of shopping and choosing the item/s dependent on different variables including need, comfort, brand, and so on. Our Smart Shopping Cart framework plans to help shopping face to face that will limit the time spent in shopping just as find the ideal item effortlessly. It is likewise pointed toward supporting the store the board with ongoing reports on the stock. The framework depends on four significant innovations (I) Infrared sensors - utilized in a clever way for dynamic area recognition and following (ii) RFID labels for item recognizable proof (iii) ZigBee for accomplishing remote correspondence (with Server), and (iv) Integrating System with the show for charging and stock administration. The Smart Shopping Cart will make the shopping experience more pleasurable and time-proficient for the client and the stock control will be simpler for the store executives.

III.SYSTEM ARCHITECTURE

In the turn of events and conversation of the proposed keen shopping basket, we expect that the shopping field is coordinated in passageways/coves. We use IR transmitters set at the two closures of the path and on the truck to gather data on the passage/leave status of the truck and the straight ID. All the item data is put away in a data set at focal worker with the area data as a credit. We will record the walkway number for the item as the planned item area goal would be the passageway number. RFID labels are utilized to remarkably distinguish items. In this paper, microcontroller interfaced with RFID, IR, ZigBee, RFID Tags, EEPROM shaping the equipment unit and ZigBee interfaced to the worker making up the product unit. The IR transmitters are set on the section and exit of every passageway. The IR beneficiaries are set on the shopping baskets.

Assuming there should be a buy done, that item can be dropped in the truck where the RFID peruser peruses the tag. The data of the item is removed and shown on the LCD screen. Simultaneously charging data is additionally refreshed. Endless supply of the passageway, the path data is shipped off the worker alongside subtleties of procurement. Worker at that point stores them in the data set. When the "Total" button is squeezed there is an alternative furnished to end the shopping with similar items or to erase a portion of the items from the truck. This passes by the client decision. Toward the finish of shopping, the client can straight away cover the bill and leave. Stock status of the items is additionally refreshed toward the end of shopping.

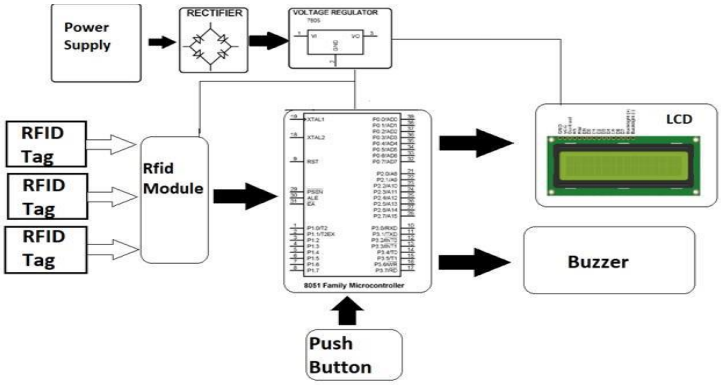

Figure 1 BLOCK DIAGRAM OF SYSTEM ARCHITECTURE

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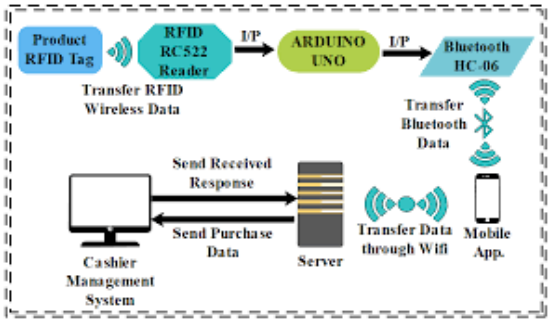

Figure 2 Model of Smart Shopping System

IV. EMBEDDED SYSTEMS

An EMBEDDED System/Framework is a PC System with a devoted capacity inside a bigger mechanical or electrical framework, regularly with continuous registering limitations. It is installed as a component of a total gadget regularly including equipment and mechanical parts. 98% of all chips are produced as segments of implanted frameworks. Instances of properties of commonly implanted PCs when contrasted and universally useful partners are low force utilization, little size, tough working reaches, and low per-unit cost. This comes at the cost of restricted preparing assets, which makes them essentially harder to program and to interface with. Nonetheless, by building insight systems on top of the equipment, exploiting conceivable existing sensors, and the presence of an organization of installed units, one can both ideally oversee accessible assets at the unit and organization levels just as give expanded capacities, well past those accessible. For instance, keen methods can be intended to oversee power utilization of the inserted systems.

V.HARDWARE USED - ATMEGA328 P

The elite Microchip Pico Power 8-bit AVR RISC-based microcontroller joins 32KB ISP streak memory with read-while-compose capacities, 1024B EEPROM, 2KB SRAM, 23 broadly useful I/O lines, 32 universally useful working registers, three adaptable clock/counters with look at modes, inward and outer intrudes on, sequential programmable USART, a byte-arranged 2-wire sequential interface, SPI sequential port, a 6-channel 10-bit A/D converter and five programming selectable force saving modes. The gadget works between 1.8-5.5 volts.

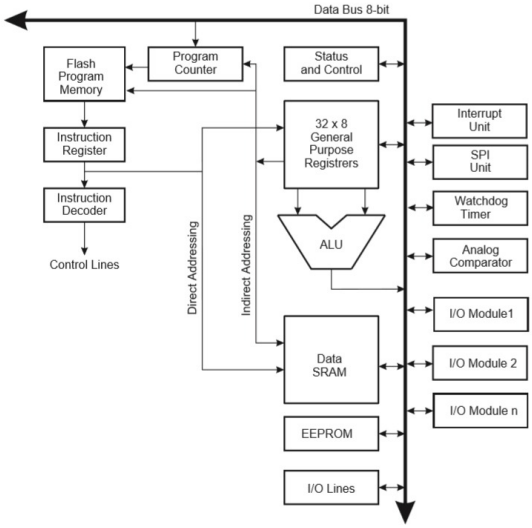

Figure 3 ATMEGA 328 P ARCHITECTURE

By executing incredible guidelines in a solitary clock cycle, the gadget accomplishes throughputs moving toward 1 MIPS for every MHz, adjusting power utilization and handling speed.

20 pins are working as I/O ports. This implies they can work as a contribution to the circuit or as a yield. Regardless of whether they are info or yield is set in the product. 14 of the pins are computerized pins, of which 6 can

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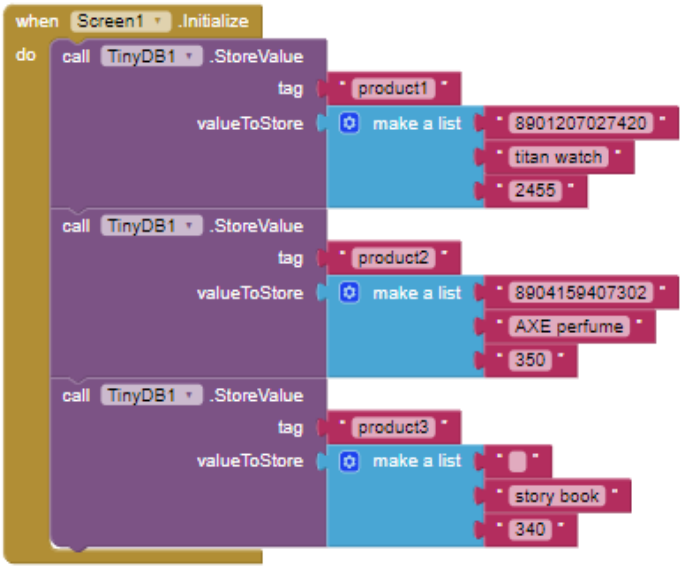
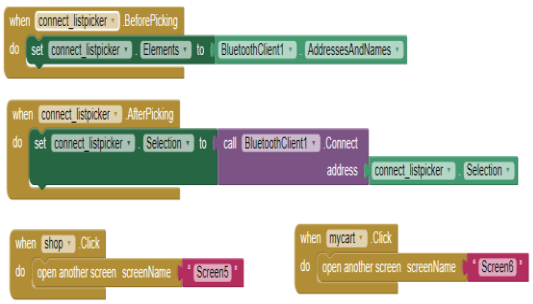
capacity to give PWM yield. 6 of the pins are for simple info/output.2 of the pins are for the precious stone oscillator. This is to give a clock heartbeat to the ATMEGA chip. A clock beat is required for synchronization with the goal that correspondence can happen in synchrony between the ATMEGA chip and a gadget. The chip needs power so 2 of the pins, Vcc and GND, give it power with the goal that it can work. The Atmega328 is a low-power chip, so it just requires between 1.8-5.5V of ability to work.

The Atmega328 chip has a simple to-advanced converter (ADC) within it. This should be or probably the Atmega328 wouldn't be equipped for deciphering simple signs. Since there is an ADC, the chip can decipher simple information, which is the reason the chip has 6 pins for simple info. The ADC has 3 pins put in a safe spot for it to work AVCC, AREF, and GND. AVCC is the force supply, positive voltage, that for the ADC. The ADC needs its own force supply to work. GND is the force supply ground. AREF is the reference voltage that the ADC uses to change a simple sign over to its comparing advanced worth. Simple voltages higher than the reference voltage will be relegated to a computerized estimation of I, while simple voltages beneath the reference voltage will be allotted to the advanced estimation of 0. Since the ADC for the Atmega328 is a 10-cycle ADC, which means it creates 10-bit computerized esteem, it changes a simple sign over to its advanced worth, with the AREF esteem being a reference for which advanced qualities are high or low. Subsequently, a picture of a simple sign is appeared by this computerized esteem; accordingly, it is its advanced journalist esteem. The last pin is the RESET pin. This permits a program to be rerun and begin once again Architecture.

LOGIN MODULE



WELCOME MODULE



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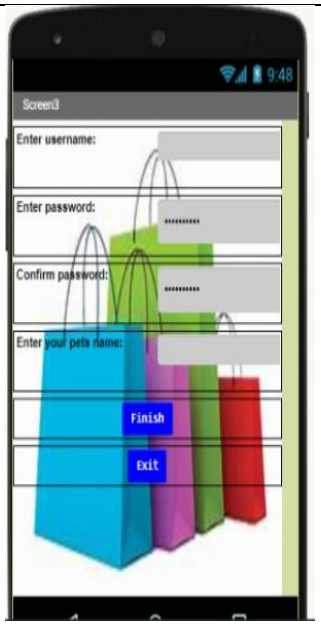
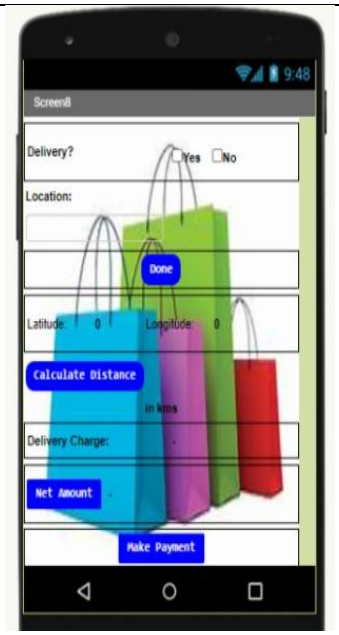
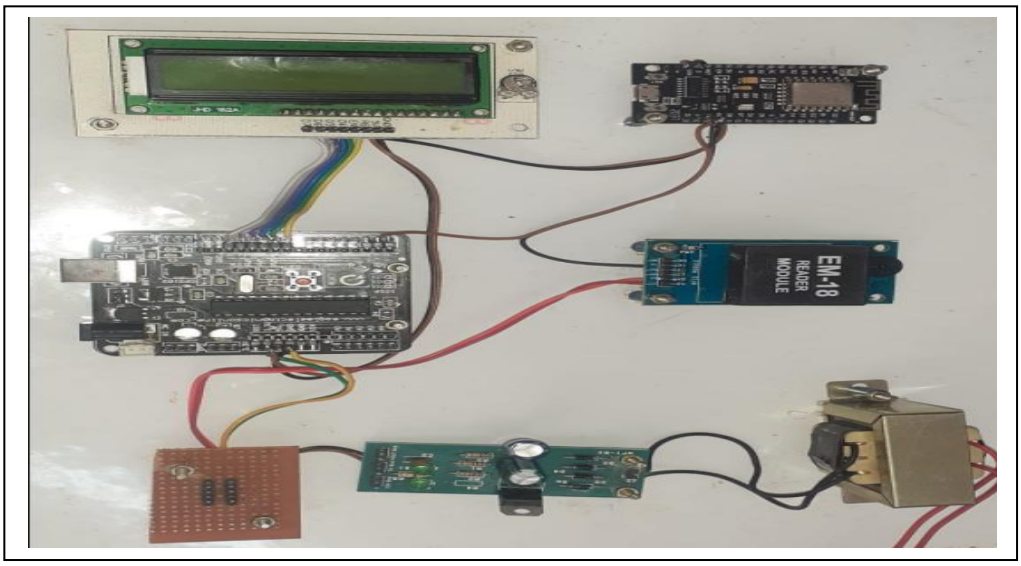
SIGN-UP SCREEN	PAYMENT SCREEN
	

HARDWARE ASSEMBLED KIT



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VI.CONCLUSION

The description of this paper is to save time in shopping. We don't have to wait in a long queue for checkouts. Providing user account for individuals, we ensure safety and security. It includes additional features like product analysis(getting reviews about the product in internet),delivery and payment modes(online, offline and wallet). Thus, it enhances our shopping experience.

VII.FUTURE EXTENSION

Theft is possible, therefore anti shop lifting methods has to be added with this project while implementing practically.

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