In-Time Billing Process for Canteen Management System

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ABSTRACT

In colleges, schools or Inside an University campus canteen facility is provided. Students, college staff or university staff uses this facility. Similarly food facilities provided in canteen in various companies. In these canteens students or employees pay their bills by cash. In existing system, cash payment is the only option for making the payment. This is the case for small canteens. In some big canteens credit card facility is provided but that's very rare. The main drawback of cash payment system is that user always needs to carry the cash with him/her. And he/she needs to pay the exact amount otherwise there is problems for the remaining amount e.g. the bill is Rs.82 and if customer pays 100 then the canteen owner has to give back Rs.18. this creates a problem and if there is shortage of coins then either the owner has to maintain some register or he needs to provide coupons to canteen users.

If the canteen owner gives coupon for the remaining amount then user has to carry that coupon. One more problem is that in colleges the students are going to have food in the same canteen throughout the month. In such cases an account of students is maintained in a notebook. Canteen owner writes order details of students on daily basis and at the end of the month total is calculated. This method has limitation and draw backs of maintaining paper based records. These paper based records can get spoiled or damaged and data of student account might get lost.

Key words: Real Time Clock, PIR sensor, Matrix Keypad, ARM, KEIL compiler.

1. INTRODUCTION

Now a day, cash payment is the only option for making the payment canteens or restaurants etc. This is the case for small canteens. In some big canteens credit card facility is provided but that's very rare. The main drawback of cash payment system is that user always needs to carry the cash with him/her. And he/she needs to pay the exact amount otherwise there is problems for the remaining amount.

The owner has to maintain some register or he needs to provide coupons to canteen users. If the canteen owner gives coupon for the remaining amount then user has to carry that coupon. One more problem is that in colleges the students are going to have food in the same canteen throughout the month. In such cases an

account of students is maintained in a notebook. Canteen owner writes order details of students on daily basis and at the end of the month total is calculated. This method has limitation and draw backs of maintaining paper based records. These paper based records can get spoiled or damaged and data of student account might get lost.

The restaurant menu, as we know it, has evolved from its humble beginnings on carte chalkboards and imageless print to today's detailed, colorful displays. With the emergence of digital tablets and user-friendly touch screen technology menus can move to a whole new surface. With this electronic menu, orders can be taken correctly the first time. There is no need to run back and forth to a distant terminal, because the terminal is always with the server. Every order is associated with an individual seat at the table, and orders are built one customer at a time, just like on paper, but with greater accuracy. Items can also easily be shared by the whole table, moved or modified, and noted and the cost can be calculated in real time.

The Recommendation algorithm suggests dishes to the patrons based on previous orders. It makes it easier for the customer to build his/her order and also view the most popular dishes. Moreover, various dimension filters can be used according to individual preferences e.g. Price, taste, quantity, etc.

In a study earlier, a preliminary experiment was conducted in a restaurant, and a questionnaire survey was administered to fifteen waiters and forty-five customers. The survey result was encouraging. In addition, extensive interviews with restaurant owners were conducted and the results indicated that the proposed system is useful in reducing running cost, enhancing service quality as well as customer relationship.

2. EXISTING SYSTEM

In existing system, cash payment is the only option for making the payment. This is the case for small canteens. In some big canteens credit card facility is provided but that's very rare. The

main drawback of cash payment system is that user always needs to carry the cash with him/her. And he/she needs to pay the exact amount otherwise there is problems for the remaining amount.

For example the bill is Rs.82 and if customer pays 100 then the canteen owner has to give back Rs.18. this creates a problem and if there is shortage of coins then either the owner has to maintain some register or he needs to provide coupons to canteen users. If the canteen owner gives coupon for the remaining amount then user has to carry that coupon.

Figure 1: The students waiting for ordering food.

One more problem is that in colleges the students are going to have food in the same canteen throughout the month. In such cases an account of students is maintained in a notebook. Canteen owner writes order details of students on daily basis and at the end of the month total is calculated. This method has limitation and draw backs of maintaining paper based records. These paper based records can get spoiled or damaged and data of student account might get lost.

3. PROPOSED METHOD

To give an effective solution for these problems we have implemented a project called "In-time billing process for canteen management system". In this project canteen owner or canteen administrative person will give a RFID card to the user. This user can be a student in case of collages and an employee in case of an organization or company. This system is very effective. Advantage of this system is that it is really help full and effective for those people who have to go to canteen on daily basis. They need not to carry cash. A card is allocated to each user and user can recharge this card with a certain amount.

We can avoid the staying of students in canteen while running of classes and also we can restrict the presence of students in restricted timings of canteen.

This project says canteen timings only bill should be produced and other times the bill should not produce. This is the main aim of this project.

4. TECHNOLOGY

The block representation of our project is shown below. It contains several blocks such as Microcontroller, power supply, Matrix keypad, RFID Reader, PIR sensor, Real Time Clock(RTC), 2*16 LCD Display.
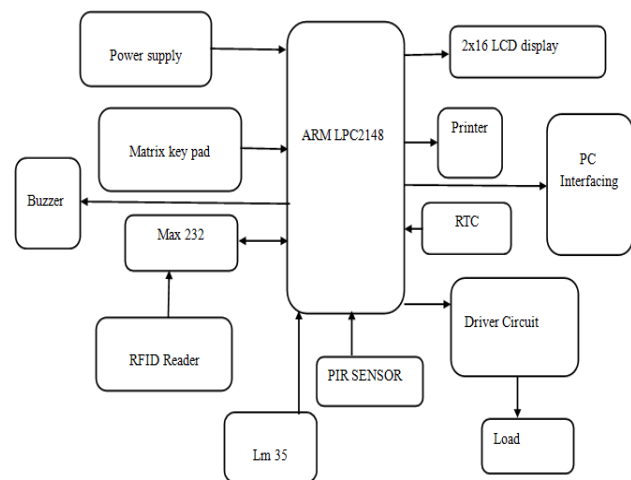

Figure 2: Block diagram of proposed system

Power supply unit is used to provide the power supply for the controller that organizes all the components in this project.

4.1 RTC (Real Time Clock)

4.1.1 Features

• Measures the passage of time to maintain a calendar and clock.
• Ultra Low Power design to support battery powered systems.
• Provides Seconds, Minutes, Hours, Day of Month, Month, Year, Day of Week, and Day of Year.
• Dedicated 32 kHz oscillator or programmable prescaler from APB clock.
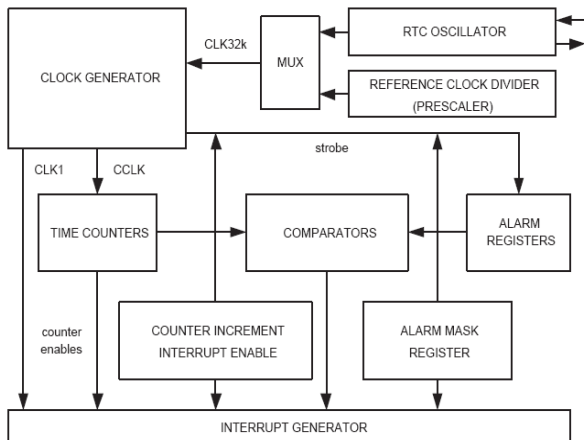• Dedicated power supply pin can be connected to a battery or to the main 3.3 V.

Figure 3: Architecture of RTC

Figure 4: Working of PIR sensor

4.1.2 Description

The Real Time Clock (RTC) is a set of counters for measuring time when system power is on, and optionally when it is off. It uses little power in Power-down mode. On the LPC214x, the RTC can be clocked by a separate 32.768 KHz oscillator or by a programmable pre-scale divider based on the APB clock. Also, the RTC is powered by its own power supply pin, VBAT, which can be connected to a battery or to the same 3.3 V supply used by the rest of the device.

4.2 PIR Sensor

The PIR (Passive Infra-Red) Sensor is a pyro electric device that detects motion by measuring changes in the infrared levels emitted by surrounding objects. This motion can be detected by checking for a high signal on a single I/O pin.
PIR sensor features include:

- Single bit output
- Small size makes it easy to conceal
- Compatible with all types of microcontrollers
- 5V till 20V operation with <100uA current draw

Pyro electric devices, such as the PIR sensor, have elements made of a crystalline material that generates an electric charge when exposed to infrared radiation.
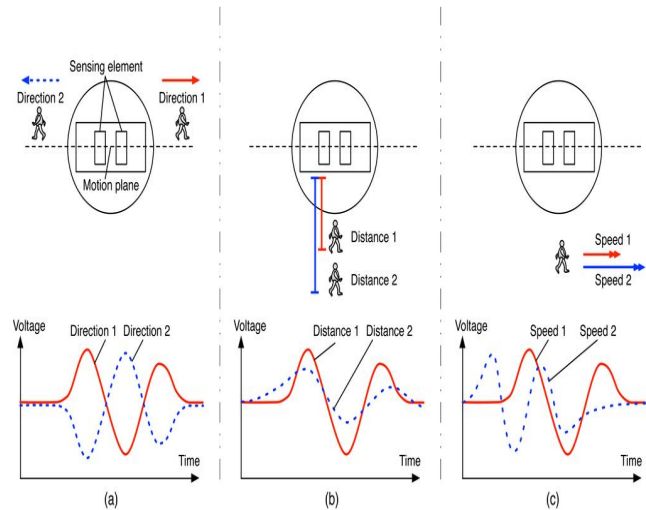
The changes in the amount of infrared striking the element change the voltages generated, which are measured by an on-board amplifier.
The device contains a special filter called a Fresnel lens, which focuses the infrared signals onto the element. As the ambient infrared signals change rapidly, the on-board amplifier trips the output to indicate motion.

5. WORKING PROCEDURE

At time of Student joining the college he/she has to take ID card and that ID has to be Recharged with some amount of money like 200-2000 Rs. The student can use that id every time when ever he/she wants to take food in the canteen.
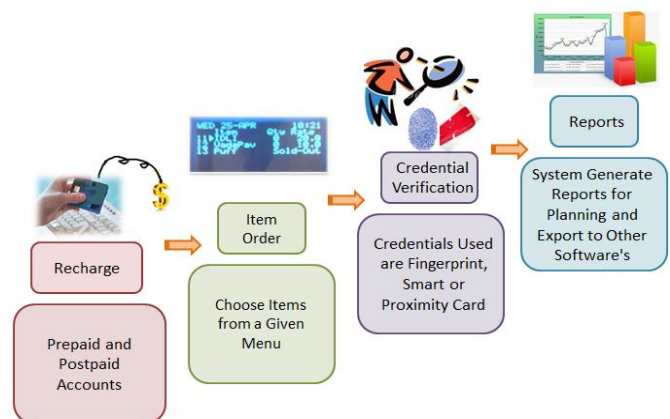

Figure 5: Working Procedure

The recharge may prepaid or postpaid. If the amount is completed, again the id has to be recharged. With this id the person can enter into the canteen by swiping this id.

Once after swiping, if the id valid we can continue to the item selection. If the id invalid or containing less amounts the system will displays error like the id is invalid or not sufficient funds.

After item selection the item list reached to the pc in the kitchen. Then the server may serve the items according to the list. The PIR sensor and Temperature sensor are used to save the powers that are consumed by fan and light.

6. CONCLUSION

By this we can change the entire canteen system. We can recharge card and used in after finishing of our college. Is there amount in that card the amount is refundable.

This project is very easy to operate and fast response. The user credential result should be shows every week or a month.

For this project to give effective solution and also In-Time only bill should be produced. For that the students are particular time only stay at canteen.

7. Feature Development

1. Voice feedback system can be included in RFID based prepaid card for canteen management system.

2. And additionally added printing machine.

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