Automatic Ration Materialdistribution

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ABSTRACT-Ration card is a document issued by the State Government which serves as a proof of Nationality. It indicates individual economic status as well. It is also used as an address proof and also for family member details. In the present days, many immortal activities are taking place in ration shops, which are meant to distribute the commodities to the people who are in below poverty line, as the distribution process is manually operated and due to which it consumes a lots of time. To overcome this problem, we use RFIDtechnology.

I. INTRODUCTION

In India, the foremost functional system run by the government is the Public Distribution System with a total of almost 5 Lakh government run Fair price shops (FPS). According to survey this system is solely responsible for providing food grain and oil supply to over 45 crore Indians below poverty live (BPL) at discount prices as well as remaining above poverty line (APL) people at a concise and fixed rate. The Fair Price Shops (FPS) employ more than4.5 lakh people in Karnataka alone according to 2016 survey. Thus, the BPL population is designed to get the rationed food grains a highly subsidised prices while the APL population gets the ration at open market or wholesale rates without retail. The survey also states that 57% of the PDS food grains never reaches the entitled people, as in, in concise arithmetic, for every Rs 4 spent on PDS, only Re 1 reaches the BPL and needy people. This means that the entire budget accounts for only 25 % worth of stock yearly reaching the intended target citizens. Since the statistics paint a near crisis picture of public funds going to waste, our proposed system involves a good solution to this problem in this age of booming smart systems, IOT and automation.

II. EXISTING SYSTEM

The Planning Commission Annual report has estimated how much of the TPDS (Targeted Public Distribution System) rice and wheat are leaked.

Hence, more than 57% of the grain disappears before it reaches consumer. The leakage of grains happens in the PDS in two ways.one is, the leakage due to the ration drawn through ineligible cards. The other happens during the distribution.

According to the Planning Commission state report, it is found that total number of the genuine BPL families in Karnataka is 44 lakhs as opposed to the Government's, claim that there are 96 lakhs families. This means 52 lakh families who actually belongs to the APL category and are included under BPL list prepared by the government. Also, materials to be rationed is manipulated in quantity via inaccurate weigh bridges and placing magnets or extra weigh plates, misguiding the consumer during the process.

Fig 1: Traditional Public Distribution System

III. PROPOSED SYSTEM

Theproposed system mainly stipulates the eradication of the shortcomings of current system, regarding commodity leakage and monitoring. This system uses automatic weight monitor using a load cell and any discrepancy regarding the bulk food grains can be monitored.
Using a GSM module-based automation results in instant feedback to both consumer and shopkeeper, the amount transacted and remaining along with direct entry in the log as a proof serves the basis of proposed system.

The identity theft using any remaining loopholes is removed by using a fingerprint sensor which is biometric proof that a person exists and government has already classified him/her as

BPL/APL consumer. As there are vast amount of consumer list per capita per state, the micro management of improving the time ratio is reducing time of the transaction of the one consumer, hence, improving the total time scale.Automation using DC motors and conveyor mechanisms provides the solution, it is time saving and efficiently controllable with any microcontroller for grain and oil dispensation.

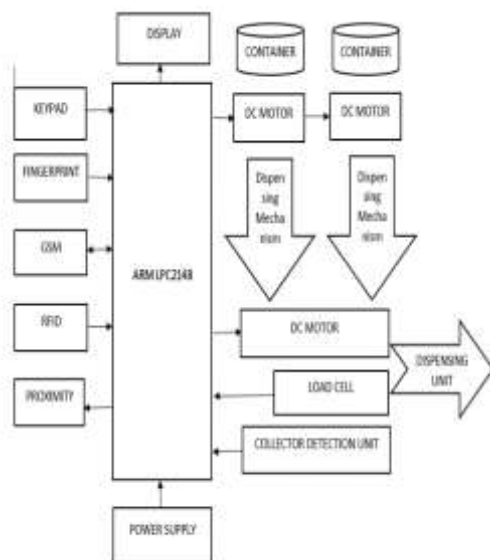**Fig2**: Automated Public Distribution System

IV. METHODOLOGY

Fig3: Block diagram of Automatic Ration material distribution

1.ARM LPC2148:

The ARM 7 LPC2148 Microcontroller is the heart of the system being implemented which controls all the three HMI components i.e. LCD, Keypad and Fingerprint module as well as the automated components such as motors, load cell and GSM module. Due to its low power consumption and fast processing timings it is preferably for proposed system. The ARM 7 LPC2148 is a general purpose 32-

bit microprocessor which offers high output and very low power consumption. It operates on asupplyvoltageof12VAC/DCsupply. TheARMarchitectureisbasedonReduced Instruction Set Computer (RISC) values, this simplicity results in a high instruction data and impressive real-time interrupt response from a small and profitable processor core. Pipeline techniques are employed so that all parts of the processing and memory systems can operate continuously. Serial communications interfaces ranging from a USB 2.0 Full-speed device, multiple UARTs, SPI, SSP to I2C-bus and on-chip SRAM of 8 kB up to 40 kB, make these devices very well suited for communication gateways and protocol converters, soft modems, voice recognition and low-end imaging, providing both large buffer size and high processing power.

2.RS 232:

The RS-232 is a standard for serial communication transmission of data. It defines the signals connecting between a DTE (data terminalequipment) i.e. a computer terminal, and a DCE (data circuit-terminating equipment or datacommunication equipment) i.e. a modem. Max 232 acts as a buffer driver for the processor. It accepts the standard digital logic values of 0 & 5 volts and converts them to the RS232 standard of +10 & -10 volts. some synchronous devices provide a clock signal to synchronize data transmission, especially at higher data rates.

FEATURES:
- Signal rate selection – the DTE or DCE can specify use of "high" of "high" or "low" signaling rate
- RS-232 driver chip has inbuilt circuitry to produce the required voltages from a 3- or 5-volt supply.
- Some synchronous devices provide a clock signal to synchronize data transmission especially at higher rates.

Pin diagram

A 14-pin access is provided having 8 data lines, 3 control lines and 3 power lines. The connections are laid out in one of two common configurations, either two rows of seven pins, or a single row of 14 pins. The two layout alternatives are displayed in fig
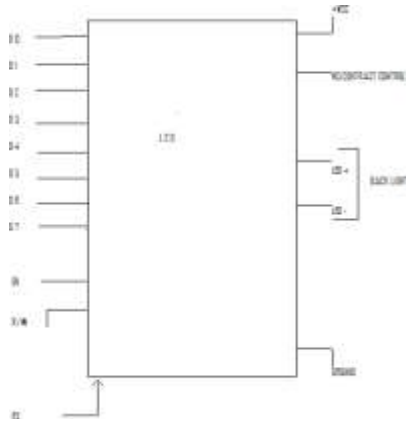
Pin 1 and 2 are the power supply lines, Vss and Vdd. The Vdd pin should be connected to positive supply and Vss to 0V supply or ground. The LCD module in our system specify a 5VDC supply, supplies of 6V and 4-5V both work well, and even 3V is sufficient for some modules

3.LIQUID CRYSTAL DISPLAY:

Liquid crystal display is a very important device in embedded system. A 14-pin access is provided having 8 data lines, 3 control lines and 3 power lines. The connections are laid out in one of two common configurations, either two rows of seven pins, or a single row of 14 pins. Pin 1 and 2 are the power supply lines, Vss and Vdd. The Vdd pin should be connected to positive supply and Vss to 0V supply or ground. The LCD module in our system specify a 5V DC supply, supplies of 6V and 4-5V both work well, and even 3V is sufficient for some modules. Pin 3 is a control pin, Vee, which is used to alter the contrast of the display. Ideally, this pin should be connected to a variable voltage supply. Pin 4 is the (RS) register select line. When this line is low, data bytes transferred to the display are treated as commands and data bytes read from the display indicate its status. By setting the RS line high, character data can be transferred to and from themodule. Pin 5 is read/write line. This line is pulled low in order to write commands or character data to the module or pulled high to read character data or status information from its registers. Pin 6 is the enable line. This input is used to initiate the actual transfer of commands or character data between the standard AT commands, GSM modems support an extended set of AT commands. One use of the extended AT commands is tocontrol the sending and receiving of SMSmessages.

module and the data lines. When writing to the display, data is transferred only on high to low transition of thissignal. Pin 7 to 14 are data bus lines (D0 to D7).data can be transferred to and from the display either as a single 8-bit byte or two 4-bit nibbles. The other two pins LED+ and LED- is used for back light of the LCD.

PIN	NAME	FUNCTIONS
1	Vss	Gnd
2	Vdd	+ve supply
3	Vee	Contrast
4	RS	Register Select
5	R/W	Read/Write
6	E	Enable
7	D0	Data bit0
8	D1	Data bit1
9	D2	Data bit2
10	D3	Data bit3
11	D4	Data bit4
12	D5	Data bit5
13	D6	Data bit6
14	D7	Data bit7

Table 1: PIN FUNCTION OF LCD

4.GSM MODEM:

To send SMS Messagesfrom a microcontroller using a GSM Modem:

A GSM modem is a wireless modem that works with GSM wireless networks. A wireless modem is similar to a dial-up modem. The main difference is that a wirelessmodem transmits data through a wireless network whereas a dial-up modem transmits data through a copper telephone line. Most mobile phones can be used as a wireless modem.

TheATcommandsthatarerelatedtothewritinga ndsendingofzSMSmessages to send SMS messages, first place a valid SIM card into a GSM modem, which is then connected to microcontroller by RS232 cable. After connecting a GSM modem to a microcontroller, you can control the GSM modem by sending instructions to it. The instructions used for controlling the GSM most of standard AT commands. In addition to this common set of TheATcommandsthatarerelatedtothewritingandsendin gofzSMSmessages to send SMS messages, first place a valid SIM card into a GSM modem, which is then connected to microcontroller by RS232 cable.

AT command	Meaning
+CMGS	Send message
+CMSS	Send message from storage
+CMGW	Write message to memory
+CMGD	Delete message
+CMGC	Send command
+CMMS	More messages to send

Table 2: GSM AT commands

5.FINGER PRINT:

Fingerprint processing includes two parts: fingerprint enrolment and fingerprint matching (the matching can be 1:1 or 1: N). When enrolling, user needs to enter the finger two times. The system will process the two-time finger images, generate a template of the finger based on processing results and store the template. When matching, user enters the finger through optical sensor and system will generate a template of the finger and compare it with templates of the finger library. For 1:1 matching, system will compare the live finger with specific template designated in the Module; for 1: N matching, or searching, system will search the whole finger library for the matching finger. In both circumstances, system will return the matching result, success or failure.

6.VOLTAGE REGULATOR:

As the name itself implies, it regulates the input applied to it. A voltage regulator is an electrical regulator designed to automatically maintain a constant voltage level. In our project, power supply of 5V and 12V are required. In order to obtain these voltage levels, 7805 and 7812 voltage regulators are to be used. The first number 78 represents positive supply and the numbers 05, 12 represent the required output voltage levels. This type of regulation is ideal for having a simple variable bench power supply. While a dedicated supply is quite handy e.g. 5V or 12V, it's much handier to have a variable supply on hand, especially for testing. Most digital logic circuits and processors need a 5-volt power supply. To use these parts, we need to build a regulated 5-volt source. Usually we start with an unregulated power supply ranging from 9 volts to 24 volts DC. To make a 5/12-volt power supply, we use a LM7805/12 voltage regulator IC (Integrated Circuit).

7.DC MOTOR:

A DC motor which is any of a class of rotary electrical machines that converts direct current electrical energy into mechanical energy. The most common types rely on the forces produced by magnetic fields. Nearly all types of DC motors have some internal

8.RELAY:

A relay is an electrically operated switch which uses an electromagnet to mechanically operateaswitch.Relaysareusedwhereitisnecessarytocontrolacircuitbyaseparatelow- power signal, or where several circuits must be controlled by one signal. The advantage of relays is that it takes a relatively small amount of power to operate the relay coil, but the relay itself can be used to control motors, heaters, lamps or AC circuits which themselves can draw a lot more electrical power. Thedesign and types of relay switching circuits is huge, but many small electronic projects use transistors andMOSFETs as their main switching device as the transistor can provide fast DC switching (ON-OFF) control oftherelay coil from a variety of input sources so here is a small collectionof some of the more common ways of switching relays.

9.LOAD CELL:

A Load cell is a transducer that is used to create an electrical signal whose magnitude is directly proportional to the force beingmeasured.This straight bar load cell (also called a strain gauge) can translate up to 5kg of pressure (force) into an electrical signal. Each load cell is able to measure the electrical signal. Each load cell is able to measure the electricalresistance that changes in response to and proportional of, the strain (e.g. pressure or force)applied to the bar. With this gauge you will be able to tell just how heavy an object is, if an object's weight changes over time, or if you simply need to sense the presence of an object by measuring strain or load applied to a surface.

V.   KEILSOFTWARE:

The µVision3 IDE is a Windows-based software development platform that combinesa robust editor, project manager, and makes facility. µVision3 integrates all tools including theC compiler, macro assembler, linker/locator, and HEX file generator. The µVision3 IDE offers numerous features and advantages that help you quickly and successfully developembedded applications and also help you achieve your designgoals.

WORKING OF KEILSOFTWARE:

The µVision3 screen provides you with a menu bar for command entry, a tool bar where you can rapidly select command buttons, and windows for source files, dialog boxes, andinformation displaysµVision3 lets you simultaneously open and view multiple source files. µVision3 has two operating

modes:
- **Build Mode:**Allows you to translate all the application files and to generateexecutable programs. The features of the Build Mode are described under CreatingApplications.
- **Debug Mode:**Provides you with a powerful debugger for testing your application. The Debug Mode is described in TestingPrograms.

In both operating modes you may use the source editor ofµVision3 to modify your source code. The Debug mode adds additional windows and stores an own screen layout.

VI. RESULTS:

In this way, our project works. A RFID Card read by RFID Reader. If the data is valid, customer information related to that particular data appear on the LCD. Here the customer is under authority to select the type and the quantity of the grains.The price of the material will also be displayed on the screen. The signal is sent to the microcontroller and accordingly the materials are dispensed to the customer. Then the SMS will be sent to the customer through the GSM Module.

The GSM Module sends SMS to the customer on its registered mobile number, it indicated that the ration is delivered to the customer. This provides security as message is sent to the authorized customer.

Below we have shown the final diagram of the resulting system through which we can understand and visualize the entire system about how it will actually look and work.
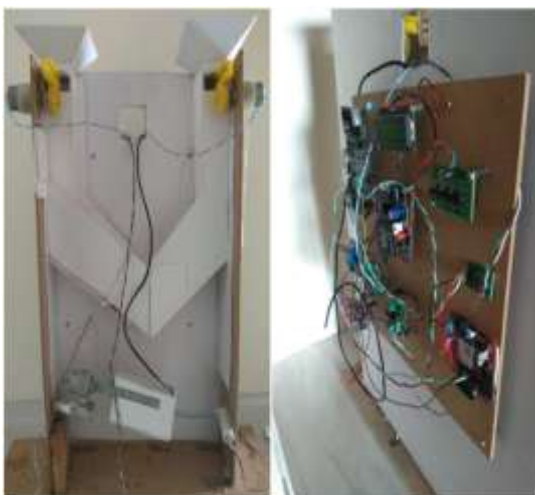

Fig4: Model of Automatic Ration Distribution

VII.   CONCLUSION

The module is basically made up of three units working together,firstly the fingerprint module, the LCD unit and the GSM module are all controlled by the ARM microcontroller.

The proposed system is expected to be of medium size and the prototype is upright with the control ARM board attached to the back of the board.

The proposed system is mainly designed to be affordable with costnot exceeding Rs 13000 and serves as an example of automationproposal for ration material discharge for the government.The prototype is aimed to reduce corruption and wastage of foodgrains in the existing PDS environment which causesunnecessary problem to government as well as the customer thereby saving taxpayer's money and providing abundant foodfor the poor and needy.

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