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Automated Ration Distribution System

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Abstract

Ration Distribution System means distribution of essential commodities to a large number of people. It is done by the government. Public distribution system is one of the widely controversial officers that involves corruption and illegal smuggling of goods. All these happen because every job in the ration shop involves manual work and there are no specific high-tech technologies to automate the job. Our main objective here is to automate the process of the distribution. The classical method involves customer to tell the person handling the ration shop outlet, the amount of the commodity he/she needs and the type too. The person working then measures the commodity and gives it to the customer. In our version of the system, we will develop an embedded system project where we will have the customer to input the amount he requires and the system made will automatically collect that much amount in a container. It is a new concept which takes into account the various social, economic and general aspects relating to technical as well as day to day disciplines.

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1. Introduction

An embedded system is a computer system designed to do one or a few dedicated and/or specific functions often with real-time computing constraints. It is embedded as part of a complete device often including hardware and mechanical parts. By contrast, a general-purpose computer, such as a personal computer (PC), is designed to be flexible and to meet a wide range of end-user needs. Embedded systems control many devices in common use today. Embedded systems are controlled by one or more main processing cores that are typically either microcontrollers or digital signal processors (DSP). The key characteristic, however, is being dedicated to handle a particular task. Our proposed system, i.e. the Automated Ration Distribution System, is also an embedded system as it includes a perfect

share of hardware and appreciable share of software as well. It, like many other embedded applications, it consists of program source code, a microcontroller, a circuit with which the microcontroller is interfaced along with the computer, serial communication connection, a keypad, other peripheral circuits and power supply. Automated Ration Distribution System, the name itself suggests an important and new concept which will help resolve the various fallacies involved in the classical system.

2. Problem with Existing System.

The classical system of Public Distribution System (PDS) established by the Indian government for provides food security to the people. There are various ration shops in the entire nation where there are employees who give the people various commodities like food grains, oil, kerosene etc. The customer has to go the ration shop and ask the employee to give the commodity and the amount he needs. The employee then manually measures it and gives it to the customer. This transaction also needs to be added in to the ration card. This is the total interaction which takes place. This system faces with various problems. As there are many ration shops and the customers coming to buy from ration shops are normally believed to be below poverty line and illiterate, the customers are fooled to a large extent. There are complaints related to the quality of the product they receive, the quantity they receive is many a times less than the quantity demanded by them as the employees steal from it. Moreover, they end up paying more for the quantity they receive. Also the quantity which is added in the ration card is wrong. So they cannot buy more the next time they need. So there is a lot of cheating and fooling of the customers that takes place.

3. Proposed Solution.

Automating the existing system is our primary solution to the various problems existing. The various things that we can do to automate this system are explained below. The quantity of weight required by the customer can be asked by the employee to enter into the application running on the computer at the outlet by the customer itself. Once the quantity is entered, the employee can place a container on the weighing machine. Now instead of him manually taking the grains weight, the customer /employee can hit the start button that would be provided on the user interface of the application. Once the start button is clicked, a small door-like opening in a container placed at a height, above the place where the container is put for collecting the required amount of grains, will be opened by a solenoid valve. The grains start getting collected in the container. The weight will keep increasing continuously. It can be displayed on the weighing apparatus itself and also on the application running on the computer. Just when the weight reaches the quantity that was entered by the customer, the solenoid valve which opened the door-like opening in the container of grains; it will close that opening, as the required quantity has been reached. This detail can be entered into the database maintained at that shop through the application, by adding various details about the customer in the different fields provided. Thus the main fallacies involved in the fooling of customer where they receive fewer amounts than what they have asked for and end up paying more, false entries in the ration card like making false entries or double entries etc., are all dealt with in this implementation of the system.

4. Design and Implementation

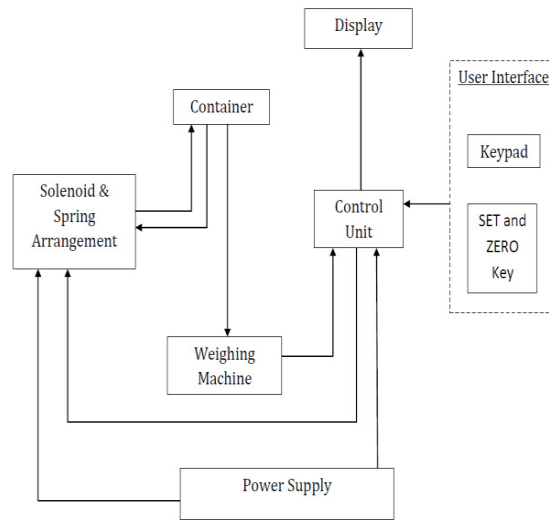


Fig. 1. System Design.

The above diagram represents the system architecture of the proposed system. It is a logical view of the all the components that are required and how they will be connected with each other.

It shows the connection between various blocks of the projects set-up. The power supply is connected to the solenoid coil to activate it and it is given to the control unit for its functions. The control unit is connected to the keypad so that the user can enter the required quantity of ration. The output of the control unit is given to the solenoid coil to activate and deactivate it and the output is also given to the display to display the weight of the ration. The container is also connected to the weighing scale. The ration that flows out of the container falls on the weighing scale and is measured on it. The output of the weighing machine is given to the control unit to check the weight of the ration already given out and compare it with the entered quantity. The container and the solenoid coil are connected together. When the solenoid coil is activated, it opens the flap of the container for the ration to flow out and when the coil is deactivated, the flap of the container is closed.

For implementing the above proposed automated solution, there are various hardware components that are required for making the setup. Also proper software is required for making the application which would work along with the hardware.

A) Hardware:

For the hardware part, the following components are required- A load cell which has the maximum weighing capacity according to the requirements and constraints, An ADC circuit, which can convert the analog signals that are received from the load cell and convert it to digital signals which can be used by microcontroller for further processing, A LCD display for displaying the weight which would be converted through the ADC by the microcontroller in digital format, A keypad which would be used for calibrating the load cell and the microcontroller so that the measurements are done properly, A power supply of +/- 5V and +12V and ground. The above components together make the entire one sub component, i.e. the weighing machine circuitry. Another sub component is one for controlling the solenoid valve which opens and closes the opening of the container storing the commodity. It involves the following components- A microcontroller AT89s52, a solenoid valve which pushes and pulls on giving a signal, a relay circuit. We will be using serial communication between the controller circuits and the computer. Thus RS232 serial port and IC MAX232 is required for connecting computer with weighing machine circuitry for receiving the weight that is calculated to be stored in the computer for comparison and computation purposes. The RS232 and IC MAX232 are also needed for communication between the microcontroller controlling

the solenoid actuator and the computer. A signal from the computer will be passed so as to when open the container and when to close it. These are the various hardware components required for implementing the proposed solution.

B) Software:

For making the software of this project, we need to implement serial communication. Hence we need to select such software which provides such a feature. We can use Visual Basic 6 for this purpose. It provides us with a communication object MSCOMM which can be used for serial communication. By setting the various parameters like baud rate and other threshold values, we can send and receive data to and from the various controller circuits. It also provides us with data control feature to connect with various types of databases like MS ACCESS, SQL, etc. Thus VB6 is a good software choice to make a desktop application for the project.

5. Results.

Below we have shown the final block diagram of resulting system. The system is shown in two views- the front view and the side view through which we can understand and visualize the entire system about how it will actually look.

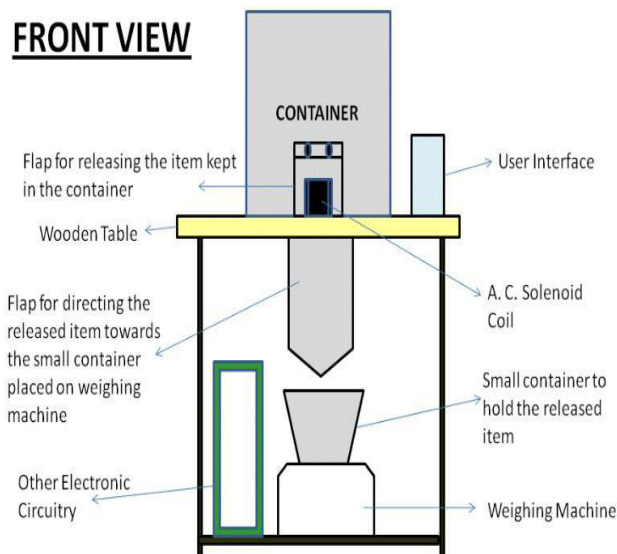


Fig. 2. Front View of the resulting system.

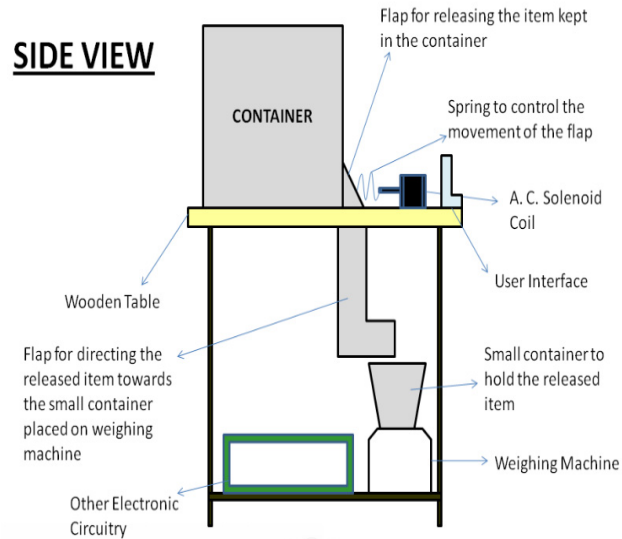


Fig. 3. Side view of the resulting system.

6. Future Scope.

The application of this particular improvement is the present working of the ration shops has a lot of scope in various other areas apart from being introduced only to this particular domain. This particular system can be scaled up to for a large number of items which can be selected from one controller itself. Also the technology introduced can be used in various places like malls, supermarkets, etc. As there is ease of access, it can remove the constraint on time for various types of applications. So the users have 24x7 availability. This can prove to be a profit to some organizations and they may opt for installing such a system.

7. Conclusion.

Through this paper, we have made intent to introduce a new technology which helps to remove the wrongs of the existing system and also has its own advantages which are useful for other applications. It acts as an anti-corruption tool as it reduces corruption to a great extent, which was one of the primary reasons we thought of while coming up with the idea.

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