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# AI Based Material Management System

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**ABSTRACT:** The project deals with the idea of empowering Industrial automation, Small scale industries, public distribution system using technology to enhance accuracy in the process regarding measurements. The user is authenticated using RFID card and prompted for his password which by entering step one of authentication is completed and the GSM module sends a randomly generated password as OTP. The concerned user has to enter the quantities of goods following the OTP. Hence the system takes care of the measurement and provide as per regulations. It gives fully automated and accurate weighting. There is no possible of error and unerring measurement. Hence by the introduction of our project fully automated tool is obtained that can extract predefined field that reduces manpower.

**KEYWORDS**: Industrial automation, RFID, GSM module, OTP, Unerring measurement**.**

## I. INTRODUCTION

India's Public Distribution System (PDS) with a network of 4.78 Lakh Fair Price Shops (FPS) is perhaps the largest retail system of its type in the world. One of the main problems with this system is the inefficiency in the targeting of beneficiaries and the resulting leakage of subsidies. One of the main problems with this system is the inefficiency in the targeting of beneficiaries and the resulting leakage of subsidies. many systemic challenges that plague the PDS system today are PDS Leakages, Scale and Quality of Issue, System Transparency and Accountability, Grievance Redressed Mechanisms. Keeping in mind the above-mentioned factors, it is thus crucial to strengthen the PDS to ensure Adequate supplies, reasonable subsidies and efficient delivery of subsidized food to the deserving people [1].

In an effort to make the public distribution system (PDS) more efficient, various state government in India has decided to introduce smart cards for the consumers to enhance security. A smart card has a computer chip and enables its holder to purchase goods or avail of services, or perform other operations using data stored on the chip. It can also maintain a log as to which family has been consuming how much. Once user select the quantity, his account balance is checked and if it is sufficient user will get the items and account will be automatically updated. But nowadays it is very difficult to measure quantities according to government standards in all fields. By manual practice measurements cannot be done effectively. Measurement of liquids may be done using timing basis. But it is impossible for solid particles and large quantities. Also, in industries authentication plays a vital role. It will be a major problem if any unauthorized user operates the system.

Hence the proposed system deals with authentication problems and measurement of both solid and liquid quantities using load cell and solenoid valve. Initially the user needs to place his card on the RFID card reader which senses the card and gets the information about the user. The details of the user are announced using Voice Announcer. Then an OTP number is sent to the registered mobile number of the card holder using GSM. The authentication for the user is granted when he enters the OTP.

After the user is verified, the items available are displayed in the LCD display along with available quantity. The user can select the required item and required quantity from the available list. The selected item is then measured using loadcell. The solenoid valve provide platform for measurement of both solid and liquid items. Both nozzle and liquid bay is present in this system.

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This system provides an option to measure quantities in timing basis also since in few cases timing is an effective way. For example, filling soft drinks in bottles.

Energia IDE provides platform for coding that provide instructions to controller and other parts.

## II. LITRATURE REVIEW

In this section, we briefly discuss the existing works about Smart Public Distribution System [2]. In this automated system conventional ration card is replaced by smartcard in which all the details about users are provided including their AADHAR (social security) number which is used for user authentication. This proposed to use smart card instead of manual ration card with UID for unique authentication.

K. BalaKarthik [6] presents an efficient method for the user to buy the products in the ration shop by just flashing the card at the RFID reader at the ration store and the user can check their purchase details in a dedicated website. The paper proposes web site functionality by accepting requests from the user's browser and responds by sending back HTML documents (Web pages) and files. Database creation and GUI design and provides the details of centralized management and updating of database through web.

Rahul J. Jadhav, Dr. Pralhad K. Mudalkar [9], The structure of e-PDS system, software requirements and implementation are mentioned in the paper and it proposed to create different database tables as well as GUI including different login pages. It also defines role of administrator as well as ration distributor.

S. Valarmathy, R. Ramani [11] proposed to use RFID and GSM technology based Ration cards by showing the RFID tag into the RFID reader. Then the controller checks the user codes and details of amounts in the card. After verification, these systems show the amount details. The user need to entered the required materials by using the keyboard, after receiving the materials controller send the information to government office and user through GSM technology.

Dhanojmohan, Rathikarani, Gopukumar [7]," Automation in ration shop using PLC'', proposed methodology for ration shop automation using embedded PLC. Further updating to the government database about the stock available and the user details were carried out.

A.N. Madur, Sham Nayse [8] "Automation in Rationing System using Arm 7", this system is based on radio frequency identification of user. First user is authenticated, then system shows the balance of person. User have to enter the amount of Kg he wants to withdraw. System checks his account. If the user will have sufficient balance to withdraw the current amount, system will open the valve. The updated account information is send to the user's mobile using GSM module.

## III. PROPOSED METHEDOLOGY

The main deal of technology required for the working of this concept are Embedded System, Artificial Intelligence (AI), GSM and RFID. all the concepts are just developed and are gaining much development in its features at a faster rate. This project stops depending on the basic factors such as hardware, software communication infrastructure.

- Hardware: Making physical objects responsive and giving them capability to retrieve data and respond to instructions. Voice Announcer is installed such that it aids the user by informing them about their details and the available items along with quantity. Here hardware components such as digital display are used.
- Software: Enabling the data collection about various users, storage of information, availability of materials, processing and manipulating are achieved by giving instructions to the controller and other parts in form of embedded programming in Energia IDE.
- Communication Infrastructure: Most important of all is the communication infrastructure which consists of protocols and technologies which enable two physical objects to exchange data. Communication infrastructure is the place where the interconnection of hardware and software are connected to each other.

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A. System Architecture

At industries, we are using RFID card rand fingerprint authentication for identification. After reading the RFID card the LCD will display message “Enter OTP no”. The user will enter OTP no through keypad then controller will send this data to server, server will check that the card is valid or not. If valid member then, the name and quantity of products allotted is displayed on the LCD. Using keypad customer has to enter the product’s corresponding serial number they want to buy along with quantity. After getting the input from the keypad controller will send this data to server. The transaction details are sent to the customers mobile.

B. Block Diagram

The Block Diagram for proposed system is shown in Fig.1

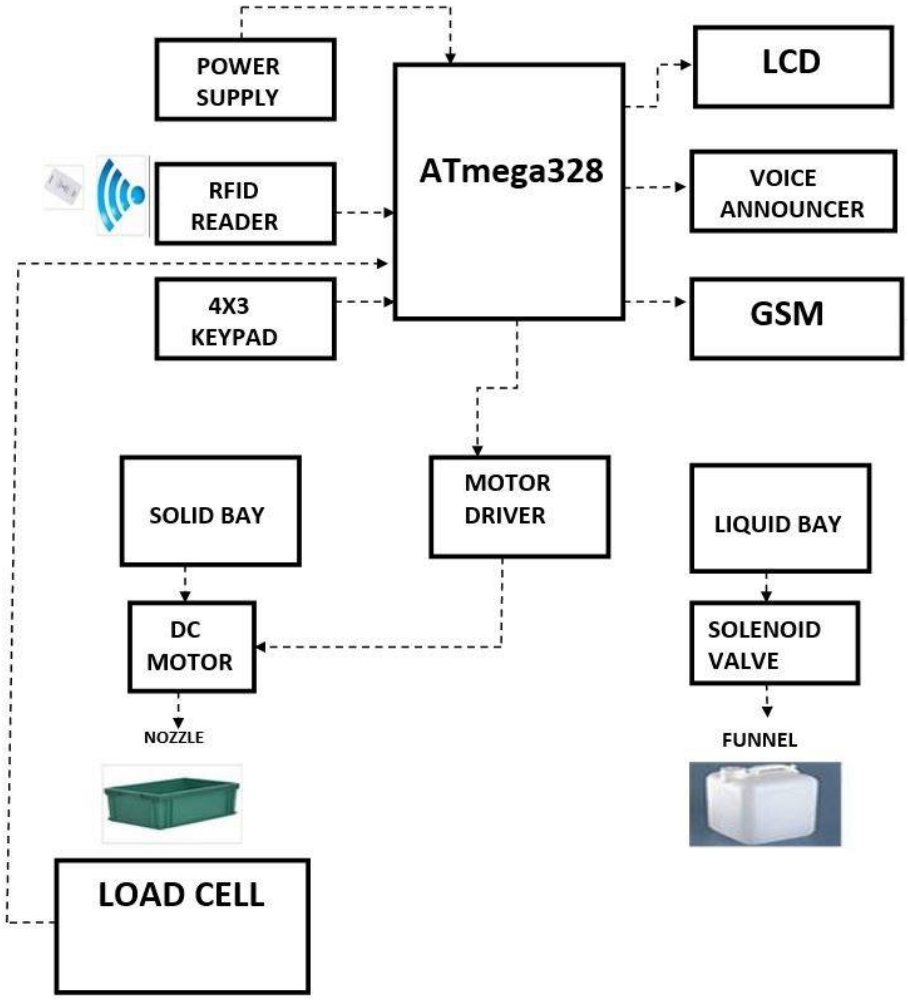


Fig. 1: Block Diagram

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C. Software Architecture

The software which acts as an interface between the hardware components is Energia IDE. The software is designed in a way that nothing is stored in the local computer. This concept removes the one of the worst phenomena of data hacking. In case of PC, there is a chance of Ransomware virus attack but embedded systems overcome these problems and ensures the process to be at most security of the data and tackles any sort of malpractices.

D. Database

A database is defined as an organized collection of data and tailored to our system, our database is employed to mainly store the user's personal and purchased information including tables namely Admin, RFID Card, Person, Item, Allocations, and Purchase.

Secondarily the database is also used to store data gathered from the online web-interface, such as updated personal information, password, email and mobile numbers by the users. In offering more features to the users, our online system can manipulate the user information by querying the database for complex data retrieval. This includes automated operation, such as summarizing an individual's purchase details.

## IV. APPLICATION

- Material Management in Industries
- Authentication based automations.
- Public distribution systems.
- Cooperative Societies
- Medical Bag Weighing
- Wire Tension measurement
- Bolt fastening
- Tank Dispensing
- Tube expansion measurement

## V. RESULTS & DISCUSSIONS

The main deal of technology required for the working of this concept are Embedded System, Artificial Intelligence (AI), GSM and RFID. All the concepts are just developed and are gaining much development in its features at a faster rate. This project stops depending on the basic factors such as hardware, software communication infrastructure.

The processing of our project is explained as

Step 1: RFID card reader senses the RFID card of the user.

Step 2: The details of the user are announced using Voice Announcer.

Step 3: An OTP number is sent to the registered mobile number using GSM.

Step 4: The authentication for the user is granted when he enters the OTP.

Step 5: Then the items available are displayed in the LCD display.

Step 6: The user can select his desired item of required quantity.

Step 7: The selected item is then measured using loadcell if it is a solid particle

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Step 8: Solenoid valve provide platform for measurement of liquid items.

The final outcome of our project is

- The system, authenticates twice and measures dynamically from the load cell and solenoid valve which can be used in terms of solid as well as liquid efficiently.
- Fully automatic and accurate weighing.
- Embedded system based control.
- Optimized for automation.
- Artificial intelligence based voice announcing response.

## VI. CONCLUSION

Over the course of human history, the emergence of certain new technologies has globally transformed life as we know it. Disruptive technologies like fire, the printing press, oil, and television have dramatically changed both the planet we live on and mankind itself, most often in extraordinary and unpredictable ways. In pre-history these disruptions took place over hundreds of years. We are currently at the edge of one such event. In ten years we will fly our planes, grow our food, explore space, discover lifesaving drugs, fight our wars, sweep our homes and deliver our babies using Artificial Intelligence(AI). In the process, this AI driven disruptive event will create a new 200-billion-dollar global industry and change life as you now know it, forever. Just as my children cannot imagine a world without electricity, your children will never know a world without AI. HENCE THIS NEW SYSTEM SURE GOING TO BE A BOON TO THE WORLD.

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