

Water A.T.M Based R.F.I.D and G.S.M

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Abstract: Now a day's water vending machines are available and operated on only one coin but our aim is to design water vending machine which operates on smartcards. In India there is problem of safe drinking water therefore we are going to provide mineral water. Water has become the most commercial products of the century. This may sound bizarre, but true. The stress on the multiple water resources is a result of a multitude of factors. On the one hand, the rapidly rising population and changing lifestyles have increased the need for fresh water. So is the panic over drinking water supply in the city as well as in villages. The reservoir has just 35.63 feet of water, which is not even half of the total water level. With the present arrangement of reduced frequency of water supply. Meanwhile, other sources of water such as tanks have dried up. As the problem of water shortage has been increasing by the day, slum-dwellers are being forced to fetch water from other sources located at a distance from their houses. There have been reports of quarrels between slum-dwellers over fetching water from public taps

Key Words: Radio Frequency Identification (RFID), Infrared Radiation (IR), Global subscriber Identity Module (G.S.M)

1. INTRODUCTION:

Water has become the most commercial products of the century. The stress on the multiple water resources is a result of a multitude of factors. On the one hand, the rapidly rising population and changing lifestyles have increased the need for fresh water. If opportunity costs were taken into account, it would be clear that in most rural areas, households are paying far more for water supply than the often-normal rates charged in urban areas. Also, if this cost of fetching water which is almost equivalent. To 150 million women days each year, is covered into a loss for the national exchequer, it translates into a whopping 10 billion rupees per year. In summer, we face the problem of drinking water. So is the panic over drinking water supply in the city as well as in villages. The reservoir has just 35.63 feet of water, which is not even half of the total water level. With the improvement in the technology there are many advanced devices and machines that are useful to the mankind. One of them is coin operated telephone. As we know the function of it and how it works. With the same technology used we are going to design a project which is based on liquid (water). Coin Operated Water Dispensing System as the name indicates it is based on COIN operation. It has been specially designed for use on Railway station, Bus deposes, public places etc. This system is based on microcontroller. The inputs to the microcontroller are coin and output in the form of water. Looking at the specifications required for Water Dispensing System and for simplicity of our application, microcontroller was found to be best suited. Now-a-days, automated vending machines are most in use as they make various activities not only easier but also more efficient. The machine has numerous input and outputs to provide service to the customer. This machine is similar to vending machine. It is coin operated machine. It accepts only coins as input like Rs.1 in any sequence and delivers drinking water. The main motto of this system is to avoid the environmental pollution and also to avoid the wastage of water with the help of water control valve. We know that the available water resources have initiated towards the end. This problem is quietly related to poor water allocation, inefficient use, and lack of adequate and integrated water management. Since last few decades, several monitoring systems integrated with water level detection have been accepted; therefore, water controlling system implementations have potential significance in the society. Vending machine is going to be developed in such a way that water will get served to the customers. As it is coin operated machine, the required quantity of water and respective amount of money is decided that are affordable for common people.

1.1. LITERATURE REVIEW:

In the nineteenth century, the first vending machine to be successfully commercialized by Thomas Adams was used for the sale of their chewing gum in underground stations of New York. Only in 1902 the first company of vending machines emerged, Horn & Hardart Baking Company in Philadelphia. In turn, the Committee Definitions of the American Marketing Association define vending machines as “retail sales of products or services by operating machines that are used by end consumers” (STEIN, 1964). Market developed via automatic vending machines has grown quickly since it is convenient, faster and cheaper (KIM, YOO, 2012). According to history, the coffee vending machines

emerged in the 50s since profits decreased and managers needed to reduce costs. They concluded that could save money by using coffee automatic machines (STEIN 1964). The vending machine also had an important role in the new economy of America, being a generator of Employment (WEEK, 1999; Apud LEE, 2003). Yet there is some vulnerability in this kind of business. When the economy is in recession, sales of this business also decreased (LEE, 2003). For example, the consumption of products from vending machines decreased by 5% in 2001 due to the economic downturn (National Automatic Merchandising Association, 2002; Apud LEE, 2003). Nowadays, vending services include a large number of products such as coffee, drinks, snacks, books, toys and other products located in stations, schools, universities, companies and hospitals (KIM, YOO 2012). However, STEIN (1964) pointed out a limitation, clearly stating that is not possible to serve a “full meal” in a vending machine. Regarding the evolution of the vending machine itself, in the ‘30s, there was the coin changers’ development. Also in the ‘30s, small refrigerator was placed inside the vending machine, which allowed the sale of chilled drinks and ice cream at competitive prices compared to sales in stores. In turn, in the 50s, the automatic coffee machines expanded to several small businesses. Its clean look and beautiful design would be appropriate in cafeterias or classrooms. In the ‘60s, two manufacturers have introduced machines with the hypothesis of automatic note changers (STEIN, 1964). In 1961, a million and a half of the U.S. population bought at least one product in the vending machines every day (STEWART, 1961; Apud STEIN, 1964). Vending machines were developed further, which led to a focus on installation, training and / or existence of effective instruction, maintenance and repair, being essential to achieve customer needs and satisfaction in different markets. In turn, the development of new machinery found a wide range of design requirements in project stage (GOFFIN, 2000). In an advanced perspective, operations strategy is a set of decisions on the strategic management of competence, skills, processes, technologies, resources and materials/stocks management in a supply chain in order to create and deliver products and services according to customers’ requests (BROWN et al., 2005).

1.2. Survey Data:

The Primary sources include Survey questionnaires were distributed among the participants, 75 were Filled and returned, and 50 fully filled questionnaires were taken for the final analysis. Thus, the Effective response rate of paper based survey is 67%. The secondary sources include journals, magazine, newspaper, and internet websites. The secondary Data are being utilized for review of literature on history of Market Analysis, growth and development of Vending machine for theoretical survey. A survey was undertaken using paper based techniques through questionnaire and personal interview. After collection of data of 80 respondents in different places of Mysore city were considered for final analysis. The respondents comprised of 62 males (77.5%) and 18 females (22.5%). Out of total sample size 36.3% are belongs from age group of 15-25 years. As well 51.3% are belongs from age group of 25-40 years. It shows that now a day ‘s youngsters are consuming more purified mineral water than Municipal water. Only 10% respondents are belonging from the age group of 40-55 years prefer municipal water. Out of total respondents 46.3% are service holder and 25.0% are business bodies. 25% respondents are students and 2.5% respondents are housewives. Out of that only 1.3 % respondents are engaged in other profession. From the above data, we found that more service holders are consume mineral water more than the others. Our survey shows that all respondents consume mineral water except 10% respondent in. 13 respondents are consuming mineral water less than 2 times per day which is 16.3% out of whole. Only 36(45.0%) respondents consume mineral water 2-3 times in a day. 24 respondents are consuming mineral water 3-4 times in a day which is quite less as compare to 2-3 times consumed respondents. Only 7 respondents are consuming more than 5 times as per our survey which is only 8.8% out of whole.

2. MATERIALS:

- Voltage Regulators
- LCD Display,
- IR LED,
- RFID,
- ULN Driver,
- Microcontroller (8051),
- Water Solenoid Valve,
- G.S.M

3. METHOD:

Initially an input of 230v ac is given as the supply to the board and this is connected to the Micro controller(8051). Here the 230v ac is converted to 5 v and 12v dc with the help of bridge rectifiers. This is shown in the below Pin diagram.

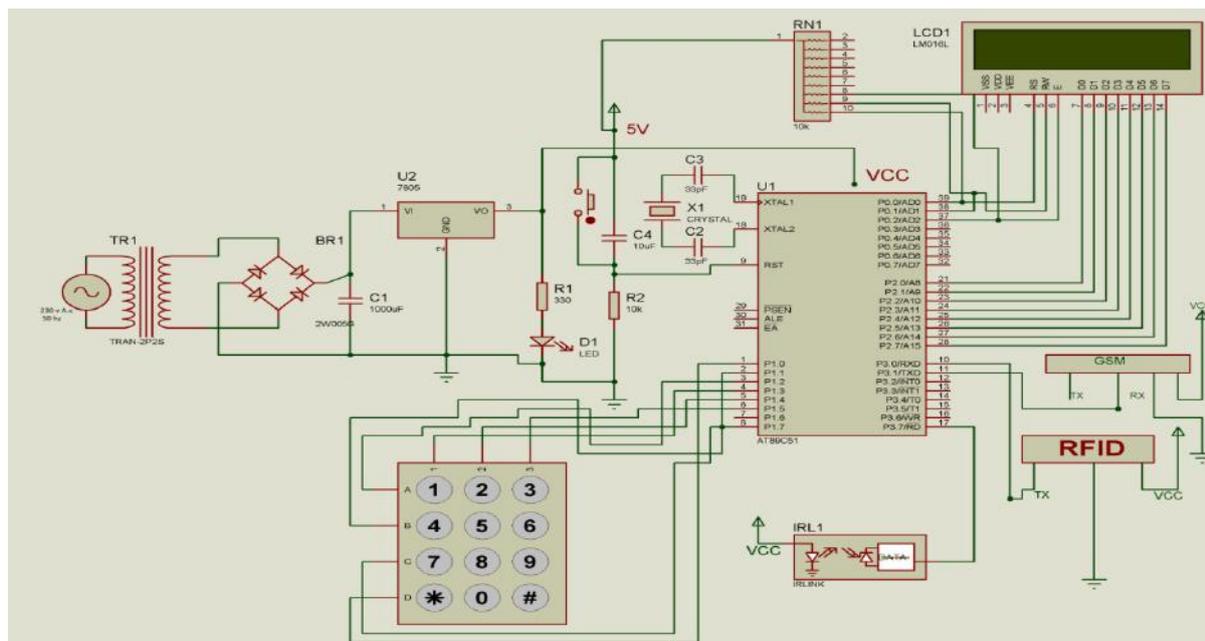


Figure 1. Pin Diagram

3.1. Client side:

As shown above when there is an object placed in the IR holder. It detects the presence of object in the holder if it is present in the holder, the IR sensor sends an digital pulse to the micro chip where the command is accepted and an message is shown and displayed as place a precise quantity in the L.C.D. We provide an R.F.I.D card to the user which is an prepaid one once the user recharges it he/she can attain the amount of quantity required. If there is an disturbance in the I.R place holder during the distribution of the quantity it stops distributing it and for that particular quantity the amount will be deducted.

3.2. Developer Side:

This type of machine requires less maintenance and there is no requirement of skilled person all we need is an proper installation and measure the readings of the system every day. For that we provide an owner id card at the end of the day this card is to be read by the reader module it comprises of an password once the password is entered it sends an particular message to that person and it shows the quantity used in a day and shows the remaining quantity present in it. Not only that if the quantity contained in the container is less than 20% it sends an alert to the machine holder as the quantity contained in the container is low.

4. ANALYSIS, DISCUSSION AND FINDINGS:

From a design perspective, the following question could be asked: what is the influence of the design in the vending machines? The design influences both the necessity of handling and the way of distribution (GARVIN, 1988; Apud GOFFIN, 2000). The decisions obtained in the phase of design / development machine, affect equipment reliability and consequently the requirements for maintenance of that machine (LELE, 1986; Apud GOFFIN, 2000). Some companies develop products / machines with a good assistance level. They reach this level because they get an excellent grasp and understanding of customer needs and to support the equipment evaluation. This will be carried out during the project development stage (GOFFIN, 2000). GOFFIN (2000), a Senior Operations Manager, argues that machine assistance is the key role of marketing either in technology practiced either in development of engineering machinery. Technical assistance was a significant change in many industries over the last ten years. GOFFIN (2000) considers not only the types of maintenance and repair but also includes other elements like support via phone or online and contact customers A research study focuses on a mathematical model of integration and planning of the technical department of the vending machines. Closely, related to preventive maintenance and failures. Planning determines levels of technical work (full-time and temporary), preventive maintenance and repairs to minimize the total cost (KIM, YOO, 2012). However, surprisingly, in practice, many companies maintain these services to a minimum number of human resources (technical) dedicated to fault repair and preventive maintenance. This strategy can even keep labor costs lower, but in terms of total costs, in the long run these are not minimal (KIM, YOO, 2012). The market success of vending machines depends on the customers' knowledge of their needs before offering products in the machines. It can even exist a disagreement according to the quality of the products but they should be part of the list of consumer preferences (STEIN, 1964). The stronger the exposure of products and / or vending machines, the larger image and recognition it

will be. This is an open path to marketing communications. This strategy is valid in the many countries because of reputable brands of products to dispose of this type of vending service (LEE, 2003). As people are adapted to use different types of vending machines, these will expand and represent increasingly different types of services. Interestingly, STEIN (1964, p.51) stresses that: “to be successful the desire should override the machine and not vice versa!”

Vending machine market in India is still at a nascent stage and is expected to witness dynamic growth in the near future. The market will be boosted by the increasing consumerism coupled with changing lifestyle, resulting in increased demand for vending machines. A market analysis studies the attractiveness and the dynamics of a special market within a special industry. It is part of the industry analysis and thus in turn of the global environmental analysis. Through all of these analyses the opportunities, strengths, weaknesses and threats of a company can be identified. Finally, with the help of a SWOT analysis, adequate business strategies of a company will be defined. The goal of a market analysis is to determine the attractiveness of a market, both now and in the future. Organizations evaluate the future attractiveness of a market by gaining an understanding of evolving opportunities and threats as they relate to that organization's own strengths and weaknesses. In most of the developed countries the vending machines are situated at public places. These machines dispense the snacks, cold drinks, coffee, tea, etc. to the people. Also in developing countries the vending machines are used to provide these things. (Hong Gu, and Shuang Qiao Jiang Tian, 2006; Bhuvaneswari et al., 2013 and Ana Monga Balwidar Singh, 2012) The invention of coin operated vending machine is done in London. Initially it was used to dispense the post cards. As time passes the vending machines become much popular because of its numerous advantages. Coin operated vending machines are most popular in all the vending machines. The customer is able to get required quantity of product by inserting coins in vending machine through coin discriminator. The basic idea of proposed system is originated from these existing systems. Majorly we are developing a system in water tank is set to provide water to customer. Now a day's water vending machines are available and operated on only one coin but our aim is to design water vending machine which is portable within limited amount. In India, there is problem of safe drinking water therefore we are going to provide hygienic mineral water. Water has become the most commercial products of the century. This may sound bizarre, but true. The stress on the multiple water resources is a result of a multitude of factors. On the one hand, the rapidly rising population and changing lifestyles have increased the need for fresh water. If opportunity costs were taken into account, it would be clear that in most rural areas, households are paying far more for water supply than the often - normal rates charged in urban areas. Also, if this cost of fetching water which is almost equivalent. To 150 million women days each year, is covered into a loss for the national exchequer, it translates into a whopping 10 billion rupees per year. In summer, we face the problem of drinking water. So is the panic over drinking water supply in the city as well as in villages. The reservoir has very low level of water, which is not even half of the total water level.

4. RESULTS:

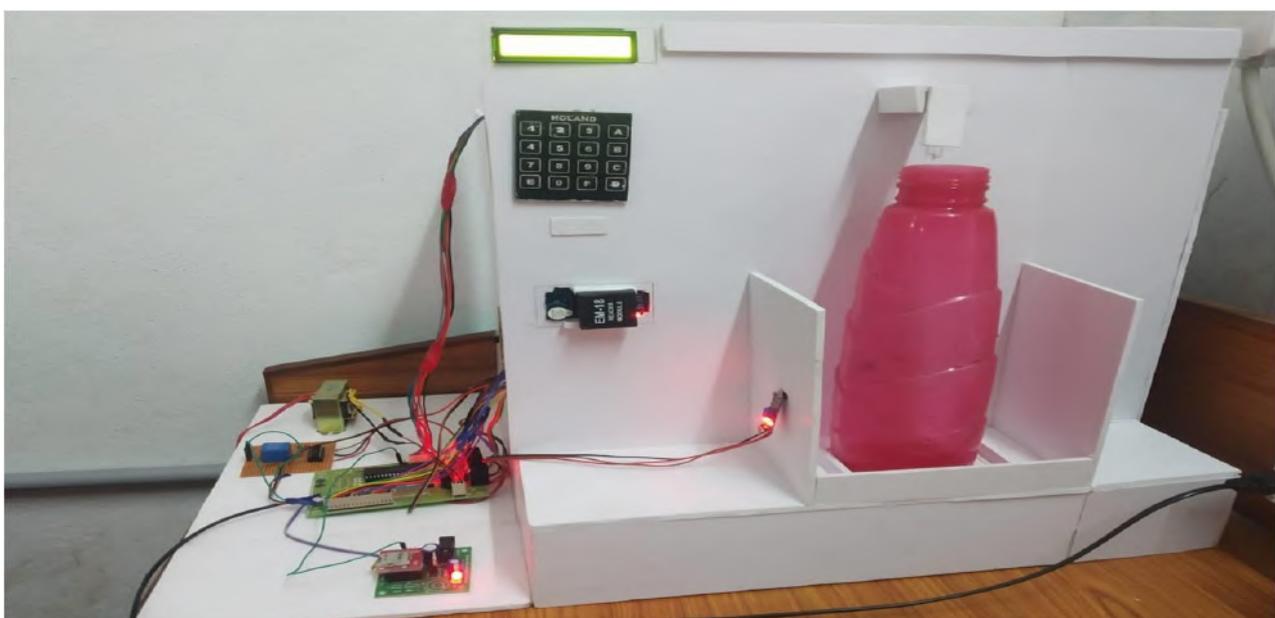


Figure 2. Prototype model of a water A.T.M machine

When RFID card is inserted near the R.F.I.D module it reads the particular card for further action. Once the card is accepted by the module then the L.C.D module displays as Place an obstacle (i.e. bottle, tumbler) or glass near the IR sensor as shown in the fig 3..



Figure 3. Quantity required in terms of ML:

When the IR sensor detects the object placed in the holder. The card holder can enter the amount of water required in terms of ml, When the object is removed from the holder it automatically stops delivering the quantity. The quantities that can be delivered from the machine be 250,500,750 and depending upon the requirement the quantity can be increased.



Figure 4. Owners Identity Card

Basically this type of A.T.M requires less man power and handling of the equipment is easy and simple. So it should be maintained under surveillance any equipment has its own identity card. Here we named it as **owner's card**. It can be accessed with a password when the handler enters the correct password through G.S.M a message will be sent in that it gives the details such as amount of quantity used in that day, And the amount of quantity remaining in the container. As mentioned earlier we will receive an alert message as shown it comprises of availability of water used and the quantity remaining. And not only that if status shown in the alert message is critical that means that quantity available in it is less than **2L**. When this problem occurs it automatically sends an alert message to the owner. So they need to refill there containers with the prescribed quantity which is greater than **10L**. The cards used here are the recharged ones. Depending upon the quantity they have taken the amount will be detected automatically when the amount is deducted In order to know the amount of quantity used in that particular area or that place we provide an **BUTTON** . So there is no requirement of sending messages at regular intervals of time.

5. RECOMMENDATIONS:

According to the author, The drinking water directive aims to establish strict standards regarding the quality of drinking water. The directive provides parameters and analysis methods, these standards must be met to ensure safe drinking water. The surface water for drinking water abstraction directive and measurement and sampling of surface

waters directive and information exchange decision are integrated to form a framework that deals with waste protection of all waters, not just those used by humans.

6. CONCLUSIONS:

The main aim of the project is to provide pure and safe drinking water for all at minimum cost. The water ATM allows for anyone to purchase as much or as little water as they want at anytime by selecting the water quantity with the help of keypad. In order to buy the quantity of water they desire, which a great advantage for low income villagers who don't need or can't afford large quantities of water in one buy. A card like ATM card will be provided by a Smart Card containing an amount which can be recharged at recharge booths. When a person enters with the smart card the person can draw water from the ATM and corresponding amount will be decremented from the smart card. LCD is used to indicate the card balance and if the water level in the ATM is low or not and the water level and in this it will intimate the water level if it is in low level through GSM and when the bottle placed then only the solenoid valve will ON otherwise the water will not come out. Finally pure drinking water will be dispersed to every citizen at minimal cost.

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