Review 3 Smart Saline

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Abstract: Almost in the whole of the clinical facility, an specialist or manager is subject for watching the saline level tirelessly without any impedances. On account of the thoughtlessness what's more, carelessness towards saline finish by authorities, clinical orderlies or administrator of the patients and nonappearance of orderlies with sufficient aptitudes in crisis centers and their over the top extraordinary job needing to be done, a monstrous number of patients are failing horrendously and are being harmed in the clinical centers. We proposed structure is fabricated using Internet of Things(IoT) stage. The proposed structure includes sensors which will go about as a level sensor for checking the essential level of the saline in the saline container.

*Key Words***:** Saline, IOT, Medical System, Level Monitoring.

Introduction: In light of the progress in development, the headway in therapeutic field is quick. A reason for this is just the mix of therapeutic and planning orders. Right when the Ordinary Saline (NS) is to be put intravenously then it is called as sterile. Normal saline is generally suggested as sterile course of action of sodium chloride (Nacl) in water. By what's more, huge, in clinical facilities saline level is checked by chaperons and patients relatives. There is continually a need to check the saline level after certain time. In order to make the human administrations structure splendid, it is required to motorize the limit of examination, treatment, the board, and decision, so the organizations are open both for nation and urban people. One of the huge incites related to the organization of restorative administrations is to watch the saline level. Almost in all clinical centers, a watchman/sustain is careful to look out for the saline level and if they disregard to screen this, the patient perseveres. Saline container when released and on the remote possibility that the needle isn't removed from the patient's vein, by then due to the weight differentiate, the blood streams outward into the container which may incite veritable misfortune. Along these lines, it is the need to modernize the perception in order to prevent such disaster. In view of the progress in development, the headway in helpful field is quick. A clarification for this is just the blend of helpful and structuring controls. Right when the Normal Saline (NS) is to be set intravenously then it is called as sterile. Regular saline is generally suggested as sterile game plan of sodium chloride (Nacl) in water. For the most part, in facilities saline level is checked by specialists what's more, patients relatives. There is continually a need to check the saline level after certain time. The current system for saline level checking is extremely repetitive and gravely intended for clinical chaperons. The essential objective of proposed system is to give strong, invaluable, simple and down to earth system for saline level watching. As the saline goes underneath the fundamental level, it is imperative to change the saline container. A customized saline level watching structure includes IR sensors which are used to choose the status of liquid in the container whether it is commonplace or alerted status. Bluetooth module and CC2500 far off module go about as transreciever, due to which the notification can be sent to the clinical guardian on her convenient similarly as PC. The speaker starts ringing when the liquid goes underneath the essential level and normally clinical overseer will get the notification of alert. Composing PC programs is done in microcontroller ATMEGA 328 which is best suitable for making the system monetarily adroit.

Literature Survey:

1. Mansi G. Chidgopkar , Aruna P. Phatale "Automatic And Low Cost Saline Level Monitoring System Using Wireless Bluetooth Module And Cc2500 Transreceiver " International Journal of Research in Engineering and Technology ; Volume:04 Issue: 09 |September-2015

    Traditional methods used for health care are becoming obsolete due to increase in population. Current health care system requires manual care takers and their heavy duties which is very time consuming job. Innovative health monitoring systems are required with less human intervention which will be available at low cost in rural as well as urban areas. Engineering technologies are getting coupled with medical field to solve this problem. So phisticated health monitoring systems are getting developed with the help of electronic components such as sensors, PLC, microcontrollers etc. with easy interfacing. This paper mainly focuses on providing advanced saline level monitoring system. [1]

2. C.C. Gavimath , Krishnamurthy Bhat , C.L. Chayalakshmi , R. S. Hooli and B.E.Ravishankera "Design And Development Of Versatile Saline Flow Rate Measuring System And Gsm Based Remote Monitoring Device " International Journal of harmaceutical

Applications Vol 3, Issue 1, 2012. As the world population grows, the need for health care increases. In recent years, progress in medical care has been rapid due to the advancements in the field of sensors, microcontrollers and computers. A major reason for this is the combination of the two important disciplines namely medicine and engineering. This paper describes the development of an automatic saline monitoring system using a low cost indigenous sly developed sensor and GSM (Global system for mobile communication) modem. This enables the doctor or nurse on duty to monitor the saline flow rate from a distance. The 8051 microcontroller is used for providing coordination action. An IR sensor is used at the neck of the saline bottle to know the flow rate of the liquid. The detection of saline drop rate is quite faithful. The output obtained from the sensor is processed to check whether the flow rate is slow, medium or fast and the same is transmitted through GSM technology to a distant mobile cell for future actions.[2]

3. Pattarakamon Rangsee, Paweena Suebsombut,

Phakphoom Boonyanant "Low-Cost Saline Droplet Measurement System using for Common Patient oom in Rural Public Hospital " The 4th Joint International Conference on Information and Communication Technology, Electronic and Electrical Engineering (JICTEE) 978-1-4799-3855-1/14 2014 The system can be used to check saline droplet of patients in each patient's bed in rural public hospital. By installing the measuring modules in all patients' beds, the system will show saline droplet status of each patient. So, nurses can accurately check saline droplet status of their patients on a computer including saline droplet statuses, saline droplet rate (drops per minute), and remaining time. The saline droplet statuses include four statuses that are Normal status (the system is working, the green light is shown on monitor), Warning status (sensor at critical point cannot detect saline, the yellow light is shown on monitor), Error status (droplet sensor cannot detect saline droplet, the red light is shown on monitor), and Chang New Bag (the blue light is shown on monitor). So, nurses do not need to go to patient's bed every time because they can check saline drop let status of each patient via this system. This system is a low-cost system and comfortable for a nurses. Therefore, in rural public hospital can use this system in common patient's room.[3]

4. P.Kalaivani, T.Thamaraiselvi, P.Sindhuja and G.Vegha "Saline Level Monitoring System Using Arduino UNO Processor" Asian Journal of Applied Science and Technology (AJAST) Volume 1,March 2017 . The epidemic growth of wireless technology and mobile services in this epoch is creating a great impact on our life style. Some early efforts have been taken to utilize these technologies in medical industry. In this field, ECG sensor based advanced wireless patient monitoring system concept is a new innovative idea. This system aims to provide health care to the patient. We have sensed the patient's ECG through 3 lead electrode system via AD8232 which amplifies minor and small bio-signals to the arduino which processes them, along with saline level. Saline level is detected through IR sensors. The output of the electrical pulse is shown with the serial monitor. The saline level is indicated by LCD. The major output ECG analog signal is displayed on serial plotter. The outputs are displayed through mobile application.[4]

5. Priyadharshini.R, Mithuna.S, Vasanth Kumar.U, Kalpana Devi.S, Dr. SuthanthiraVanitha.N. "Automatic Intravenous Fluid Level Indication System for Hospitals" International Journal for Research in Applied Science & Engineering Technology; Volume 3 Issue VIII, August 2015. During recent years due to the technological advancements many sophisticated techniques has been evolved for assuring fast recovery of the patients in hospitals .For good patient care in hospitals, assessment and management of patient's fluid and electrolyte need is the most fundamental thing required. All most in all hospital, an assist/nurse is responsible for monitoring the fluid level continuously. But unfortunately during most of the time, the observer may forget to change the saline bottle at correct time due to their busy schedule. This may leads to several problems to the patients such as backflow of blood, blood loss etc. To overcome this critical situation, a low cost RF based automatic alerting and indicating device is proposed .Where IR sensor is used as a level sensor. It is based on the principle that the IR sensor output voltage level changes when intravenous fluid level is below certain limit. [5]

System Architecture:
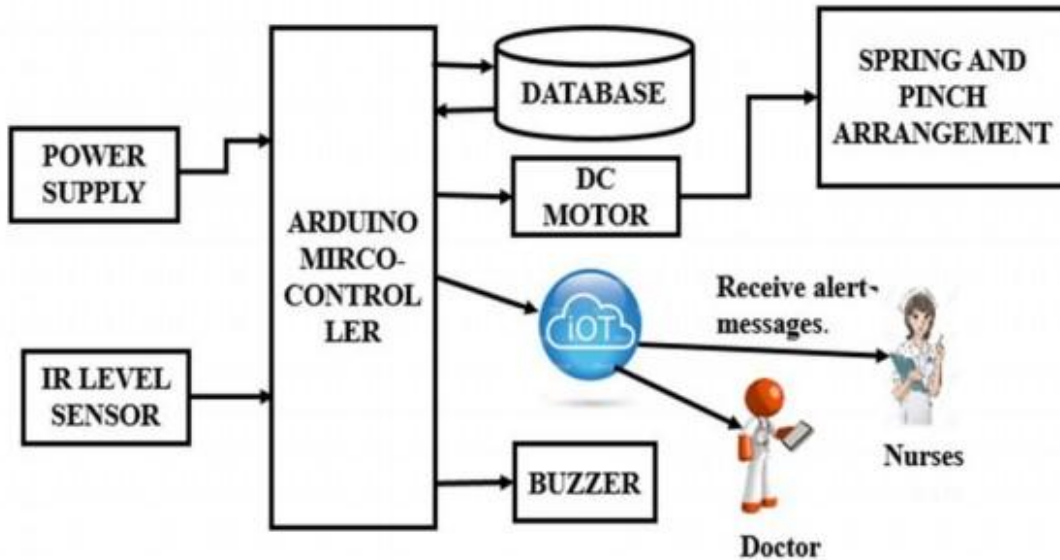
At first, this may be derived as an easygoing marvel. Be that as it may, the outcomes are regularly deadly. Soon after the saline completions, blood surges back to the saline container because of contrast in circulatory strain and weight in the vacant jug. Along these lines, Innovative wellbeing observing frameworks have being created with less human mediation which will be accessible effortlessly in rustic just as urban regions. The proposed framework focuses on investigating the previously mentioned issue adequately .By methods for this the medical attendant can screen the measure of saline even n the control room. A programmed saline level checking comprises of Level sensors which are utilized to decide the status of fluid in the container whether it is typical or cautioning status. The location of saline drop rate is very dependable. The yield got from the sensor is handled to check whether the saline container is unfilled. At the point when the degree of saline plunges under a specific level, the caution sound will be delivered.

Step 1: In our project the IR sensor can be used to measure the saline level. The content of saline in normal saline bag is 1000 ml. The saline bag is replaced by another when the saline falls below 50 to 100 ml. The critical level of saline is set to 70 ml which in between 50 to 100 ml so the nurse can change the saline bag when the liquid reaches to critical point.

This proposed system will function for two different scenarios which are explained below as follows: 1)Saline reaches at critical level. 2)Nurse fails to attend the patient to replace the saline bottle. In the 1st scenario, after getting consumed by the patient, saline reaches the critical level which is sensed by the IR sensors. This sensed output is sent to the micro-controller which scans the database for retrieving the contented information and buzzer starts ringing for alerting the nurses and doctors in the hospitals. A time limit will be set for ringing of the buzzer. An alert message is sent to the concerned nurses and doctors associated with the patient through the use of internet. If the nurse attends the patient, then she should stop the buzzer and reset the whole system. If she fails to do so, then 2 nd scenario takes place.

Step 2: POSITION OF IR SENSOR
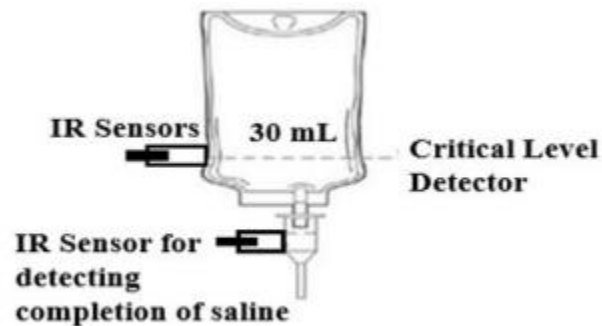
In the 2ndscenario, if the nurse fails to attend the patient within the set time limit, the reverse flow of the blood into the saline bottle is stopped. For this a spring-dc motor arrangement will be made. The clamp will be attached to spring, along with the compression and stretching of spring, the clamp will also move in forward and backward directions. Again the IR sensor, at the neck of the saline bottle will sense that the saline is totally consumed and buzzer will again start ringing louder to notify the nurse that the saline is totally consumed and there is a requirement for replacement of saline bottle. The instructions for System will be sent to generate alerts to nurse and other hospital staff.

Class Diagrams

Class diagrams are the most popular UML diagrams used for construction of software applications. So it is very important to learn the drawing procedure of class diagram. Class diagrams have lot of properties to consider while drawing but here the diagram will be considered from a top level view. Class diagram is basically a graphical representation of the static view of the system and represents different aspects of the application. So a collection of class diagrams represent the whole system.

The following points should be remembered while drawing a class diagram:

• The name of the class diagram should be meaningful to describe the aspect of the system.

• Each element and their relationships should be identified in advance.

• Responsibility (attributes and methods) of each class should be clearly identified.

• For each class minimum number of properties should be specified. Because unnecessary properties will make the diagram complicated.

• Use notes when ever required to describe some aspect of the diagram. Because at the end of the drawing it should be understandable to the developer/coder.

• Finally, before making the final version, the diagram should be drawn on plain paper and rework as many times as possible to make it correct.
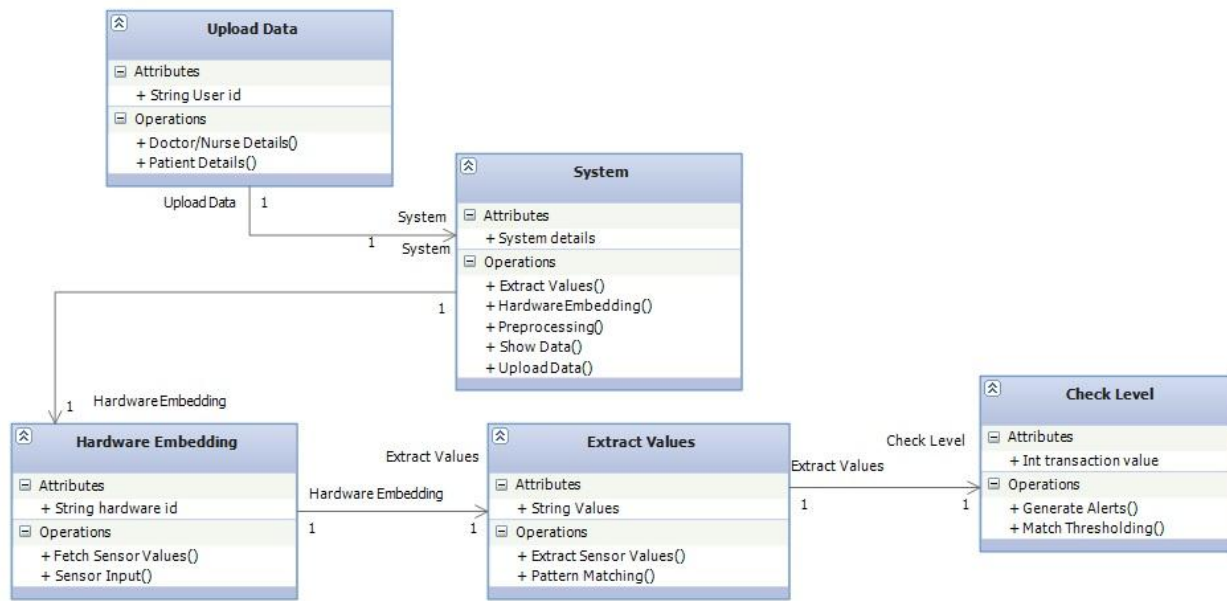
Fig. Class Diagram

Conclusion:

In this proposes system which can automatically monitor the saline flow rate by using microcontroller. It can wirelessly send the data to nurses or doctors computer and display the results in the form of saline droplet rate, number of droplets coming from saline bottle, saline solution given to the patient in ml and remaining time to empty the saline bottle with the help of serial port test software. The system is reliable, cost effective and convenient for nurses. It can be reused for the next saline bottle. It is beneficial for nurses as well as doctors at rural hospitals. Nurses can easily monitor the saline level from distance. It is mainly advantageous at night

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