**Problem Statement: Intelligent Saline Monitoring System.**

**Requisrement Analysis:**

1. Provide cost effective and automatic saline level monitoring and controlling system which can be effortlessly implemented in any hospital.

2. Avoid harms cause to patient health due to negligence towards saline completion. 3. Overcome the drawbacks and provide greater accuracy in manually controlled saline flow rate system.

4. Inform the doctor/nurse spontaneously for patient safety.

5. Automatically stop the flow after emptying of saline bottle.

**Functional specification:**

After the saline finishes, blood rushes back to the saline bottle due to difference in blood pressure and pressure in the empty bottle.

The proposed system aims at trouble-shooting the above mentioned problem effectively. By means of this the nurse can monitor the amount of saline even in the control room.

**Roles:**

•IR SENSORS: An infrared sensor[IR Sensor] is an electronic device, that emits in order to sense some aspects of the surroundings.IR sensor will be positioned at the critical level of the saline on the saline bottle to sense the critical level of saline as well as saline completion status.

•ARDUINO MICROCONTROLLER: Arduino is an open source microcontroller kits for building digital devices and interactive objects that can sense and control objects in the physical world.Arduino Micro-controller will be used as processing and programming unit for sending instructions to the actuator,buzzer,database.

•BUZZER Buzzer: is an audio signaling device.Buzzer will alert the nurses, caretakers and doctors when saline reaches the critical level and for replacement of saline bottle.

•DATABASE :Database will store the information about the patient’s name, constituents and quantity of the saline fed to the patient, room no of the patient, phone numbers of at the most three caretakers of the patient, phone numbers of nurses and doctors responsible for monitoring concerned patient’s saline.

**SYSTEM WORKING**

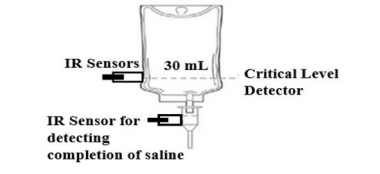
This proposed system will function for two different scenarios which are explained below as follows:

**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.

**FIGURE :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 actuator arrangement will be made. 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.

**System architecture:**

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**External Interface Specification:**

* User Interface-This application consist of an user friendly GUI for patient registration and an android app which will display the health condition of the patient.
* Communication Protocol-This web application uses apache tomat server.
* Hardware Interface-i3 processor.
* Apache tomcat server
* Android app.
* Database backend-MYSQL

**Technical Specification:**

* Hardware :

PC with i5 or higher processor

Pulserate Sensor

IR Sensor

Arduino Microcontroller

* Operating system : Windows 10 .
* Programming Language and Technologies :

JDK

Apache Server

IDE : Android Studio,Netbeans