**PROJECT TITLE**

**Monitoring and Management of Home Electronic Appliances through IoT**

**FYP Project Proposal**

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**Monitoring and Management of Home Electronic Appliances through IoT**

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# **INTRODUCTION**

Home automation is a network of home appliances. It is a way of accessing your electrical home appliances at your fingertips. With home automation, we can now access our lights and fans and every other electrical appliance prevailing in our home with one click. Do you want to switch off your lights? Just click the button within the application and the blub goes off, you don’t manually need to turn the switch off. With Home Automation now all your electrical appliances are in your pocket. Home automation can include controlling aspects of your home remotely through a phone, programming electronic devices to respond automatically to certain conditions or scenarios, or centralizing the control of a variety of items in your home into a single control center.

# **PROBLEM STATEMENT**

One of the major problems prevailing in society is the problem of water. As we are aware that every fourth house in Pakistan faces a problem that water in their home tanks runs low and the people of the house are unaware of the situation. Which deliberately results in the shortage of water within the household. On the other hand, wasting of water is another issue arising due to the negligence of the same people who forget to turn off their motors in due time which causes water overflowing, extra consumption of electricity and even damaging the motor itself. Energy is another resource which we use in every phase of our lives and some people do not give it a second thought as to how much they are wasting. This results in high electricity bills upon which a decent portion of a household’s monthly budget is spent.

# **PROPOSED SOLUTION**

We will develop a digital assistance app, which will monitor, through various sensors, the level of water both in the underground tank as well as the main supply tank of the house. The digital assistant will keep track of the water levels and will ping alerts and warnings to the application user who can automate the water supplying task or the application will provide the contact details of the water suppliers so they can be contacted as per the need. The application will also monitor electricity usage and will automatically turn on/off various electronic appliances i.e. bulbs, lights, fans etc. of the house by detecting human presence through various sensors or cameras. This will result in required consumption of electricity and wastage would be reduced.

# PROJECT SCOPE

* + Automated monitoring of the water levels of the house water tanks.
  + Prevention of wastage of water by generation of alerts on near-overflow of tank.
  + Generation of pings to the user on low-level of water in tanks.
  + User-choice system to auto-contact water supplier of choice or do it manually.
  + Alarm sound on near-overflow of tank, alerting the household to cut-off power to the motor.
  + Monitor over electrical devices of the house such as lights and fans to keep track of what is on and what is off at the moment.
  + Auto detection of human/animal presence for electronic to turn off/on
  + Effortless control over lights/fans etc. through the application, eliminating manual labor of walking over to the buttons closing them manually.
  + Real-time infographics for power consumption on the application, showing how many watts an appliance is consuming

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# WORKING

The whole system is divided into two parts the hardware and the software. In order to solve the problem of water monitoring we will integrate our sensors in the house water tanks. The sensors will be responsible for the mapping of the water level with in the tank. If the water level of the tank gets lower than alert water level set by the user then the sensors will generate and interrupt which will be received on the application with in the user’s smart phone.

On the other hand, through our application the user will be able to set an alarm percentage for the water levels at which an automated generated message will be send to the water suppliers.

We will also be targeting the water pumping motors integrated with in the homes and societies prevailing in Pakistan. For the solution we will integrate a switch with the water pumping motor’s switch. The sensors integrated in the water tanks will measure water levels and if the water tank is near to overflow the sensors will ping the application which will send a ping to the switch integrated with the switch of the water pumping motor and the motor will automatically be turned off and the water inlet supply will be cut off.

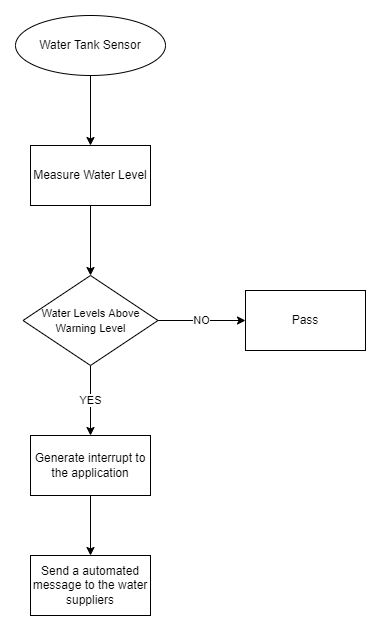
Same scenario is applied to switch on the water pumping motor. The sensors will measure the water levels and generate an interrupt to the application if the water levels in the tank is low, which in return will generate and interrupt to the switch integrated with the switch of the water pumping motor and thus the motor will be started automatically.

On the software side the user will be able to set the schedule for the motor to be automatically turned off or on. The user will also be able to permanently turn off the switch of the water pumping motor.

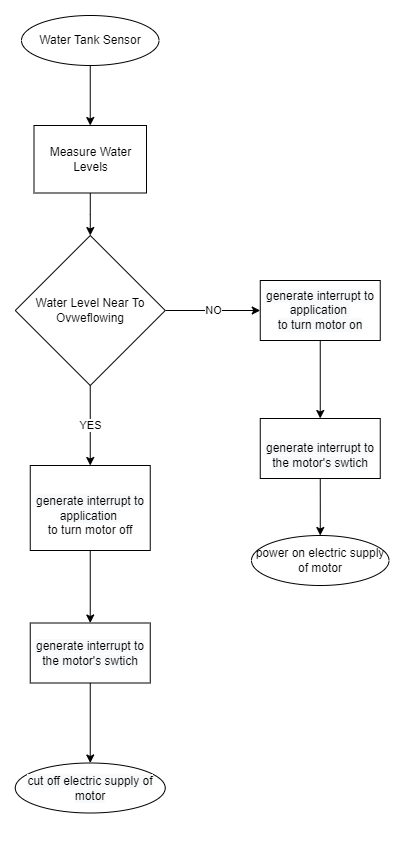
Lights and Fans will be automated via application i.e. the user will be able to switch the lights and fans on or off through application. On the toggle of the button the application will generate an interrupt to the switch attached to the fan or the light to switch on or off.

# FLOWCHART DIAGRAM

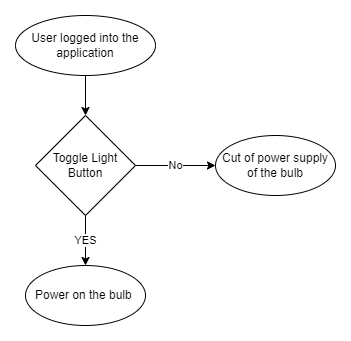
**Flow Diagram 1:**



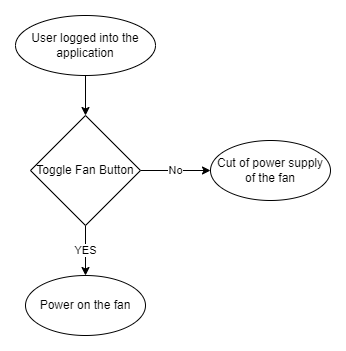
**Flow Diagram 2:**



**Flow Diagram 3:**



**Flow Diagram 4:**



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# SOFTWARE MODULES:

* Arduino Editor
* Database
  + - PostgreSQL
* Technologies to be used to build frontend of the application
  + - Ionic Framework
    - Vue.js
* Technology to be used to build backend of the application
  + - Django
* Languages
  + - Python
    - JavaScript

# HARDWARE MODULES:

* Raspberry Pi
* Arduino
* Ultrasonic Distance Measuring Sensor
* Control Relays
* Buzzer
* Jumper Wires
* Resistors
* Smartphone

# COMMERCIAL BENEFITS OF THE PROPOSED TECHNIQUE:

IOT home automation is the ability to control domestic appliances by electronically controlled, internet connected systems. It may include setting complex heating and lighting systems in advance and setting alarms and home security controls, all connected by a mobile app. home automation has made life much easier over the period. It provides you access to your electrical devices over the internet. We provide you with a lot of benefits through our project.

* After installation of the devices, you won't need to worry about your water supplies anymore. With our automation, we have provided an automatic alert system for your water tanks.
* Energy and water costs contribute a large portion of home running expenses. Home automation allows them to save significantly on this without compromising your comfort and it also saves your time and money.
* As we all know that the problem of water is one of the most concerning problems prevailing within Pakistan. We will eradicate the problem of wastage of water that takes place in the scenario of water overflowing when using water pumping motors by giving the users an upper hand to schedule the timings of the motor i.e., the user will be able to schedule when the water pumping motor need to start and on which day. Also, the electric supply of the motor will be cut off if the water tank is near to overflowing.
* On the other hand, the ability to make houses smart. This has, in a way, reducing your home’s dependability on you, and somehow allowed it to ‘think’ on its own while still giving you control in a luxurious, efficient, and convenient manner. We give them control with home automation; all they have to do is look through an app on your smart phone. They can close the door and switch off the lights and appliances with just a tap. Better still, they can automate your home to automatically switch off the lights when they close the door on the way out.

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# CONCLUSION:

Nowadays water is being wasted in many ways and wastage due to overflowing of tanks is a major contributor for this. Thus, Water Tank Monitoring System helps to reduce the wastage of water due to overflowing by automatically turning off the pump when the water level in the tank reaches a threshold limit. Proposed system can also be enhanced by monitoring the entire activity through an app. An application is developed to help the users turn on the pump through the app and off the pump automatically. So, this system creates barrier for wastage of water and provides more financial gain and energy saving. Also, it reduces the man power and increases the usage of technology.