

An IoT Service-Oriented System for Motor Controller and Monitor

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Abstract-Wireless Sensor Networks, Internet of Things(IoTs) are nowadays being used very much in Agriculture sector. The test of joining those innovations requires another and savvy remote system topology for gadgets correspondence. Issues like adaptability and reasonability are vital difficulties when there are numerous gadgets. This paper displays the outline of a savvy IoT correspondence framework administrator utilized as a minimal effort engine controller. During rainy seasons, it is difficult to handle the motor. In this project, we are mainly focusing on electrical motor controlling(on/off) with Graphical User Interface(GUI) using IoT, measuring current fluctuations, motor fault detection by using CTPT technology. So that we can control the motor from anywhere. The created sight and sound stage can be controlled remotely by a cell phone or PC.

Keywords:- Raspberry Pi/3,DC Motor,Signal Conditioner, CTPT, MCP3008.

I. INTRODUCTION

The main aim of the project is to avoid motor damage or failure from uneven power supplies. If we get any fluctuations beyond the motor operating threshold voltage, then motor turned off automatically and SMS alert is sent to the registered mobile number. User can also communicate with our project through web page to control various events such as motor on/off, monitor current status of the motor. If motor may also damage due to various factors such as life time gets expired, winding failures. Etc.. In this case also SMS alert is send to end user.

1.1 Overview

Problems of already existed ones:

Problems caused due to the existed systems are doesn't provide any power status, motor on/off status. Some of the systems are purely SMS based systems but not web-based application.

Solutions:

So premier intension behind is minimizing work hazards, improving the use of irrigation, maintaining optimal usage of

electricity to provide an interactive system to formers. The main aim of this project is to provide flexibility to farmers to trigger the motor pumps from any location in an easy way. What we are aiming at to provide the options to former through our system.

1.2 Need of Project:

- Automatic controller for industrial or agricultural based motors.
- motor can be controlled from any location by a mobile phone or laptop.
- Responsive Graphic User Interface(GUI).

Additional hardware is not required to send sms alert. It can be done programmatically by using web technology(Twilio,way2sms etc..)

II.BLOCK DIAGRAM OF PROPOSED SYSTEM

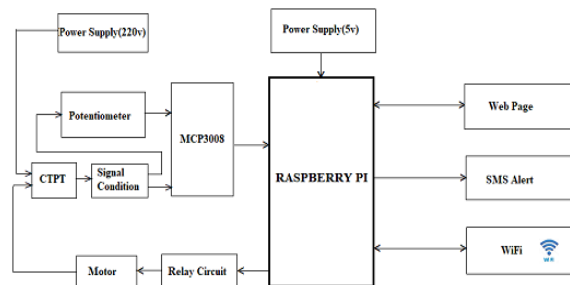


Fig1. Block Diagram of Proposed System

III. FLOWCHART

Flow Chart for Login page:

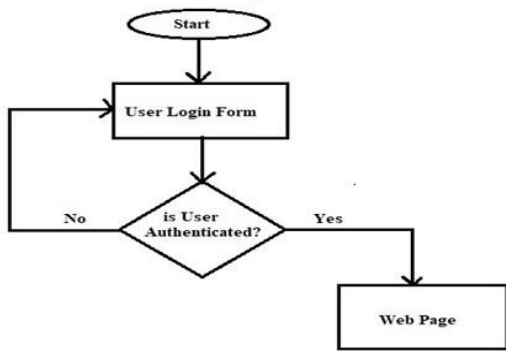


Fig2. Flow chart for user login

working flow chart:

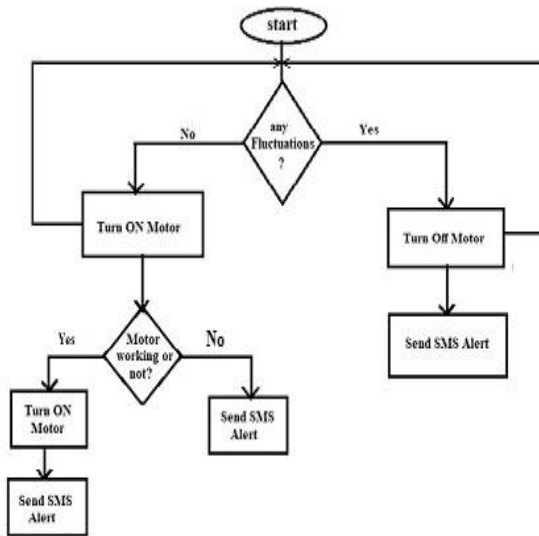


Fig 3. Working flow chart

IV. HARDWARE COMPONENTS



Fig4. Raspberry Pi

Raspberry Pi is a credit sized computer that can be plugs into monitor or and uses normal keyboard and mouse without CPU means directly we connect monitor through power supply of 5v. The amount bore of the arrangement is accomplished application a Raspberry Pi 3 board; it's a \$ 35 bare-bones computer advised and developed by the Raspberry Pi Foundation, the Pi 3 appearance a BCM 2837 System-on-Chip which includes a Quad- Core 64-Bit ARM Cortex A7 CPU clocked at 1.2 GHz consist of 1 GB of RAM. It aswell has Video Core IV GPU for graphical processing applications, it as well includes four USB ports for peripherals and 40 Pin General Purpose Input (GPIO) pins for interfacing the Pi with alien internal circuits, these GPIO pins are acclimated to interface the Pi to the web server by using wiring Pi software. The Raspberry Pi is advised to run assorted Linux based operating systems and has Raspbian as its general operating arrangement and Python is general programming language.

In this arrangement the amount bore plays a awful pre-eminent role and is obedient for assorted functions, the amount bore is obedient for accepting the images from the camera, processing and storing. It's as well obedient for advancement the facial database which consists of pictures of all the accustomed bodies for reference.

DC MOTOR

A dc motor is any engine inside a class of electrical machines whereby coordinate current electrical power is changed over into mechanical power. frequently this kind of engine depends on powers that attractive fields deliver. Not with standing the sort dc engines have some sort of inward instrument which is electronic or electromechanical. in the two cases the bearing of current stream in part of the engine is changed occasionally.

The speed of a dc engine is controlled utilizing a variable supply voltage or by changing the quality of the current inside its field wind rings. while littler dc engines are usually utilized as a part of the making of machines instruments toys and car components, for example, electric auto seats bigger dc engines are utilized as a part of derricks lifts and electric vehicles.

A 12v dc engine is little and economical yet ground-breaking enough to be utilized for some applications. since picking the correct dc engine for a particular application can be testing it is essential to work with the correct organization. a prime case is metmotors which has been making top notch perpetual magnet dc engines for over 45 years. choosing the correct engine as a major aspect of the choice procedure for picking the correct dc engine the experts with metmotors will initially find out about your correct application and afterward consider a few distinct qualities and specifications to guarantee you wind up with the most ideal item. one normal for a 12v dc engine is the working voltage. at the point when

an engine is fueled by batteries low working voltages are regularly favored since less cells are required to acquire the predetermined voltage. anyway at higher voltages hardware to drive an engine are regularly more proficient. despite the fact that task is conceivable with volts as low as 1.5 that goes up to 100 the most widely recognized are the 6v dc engine 12v dc engine and 24v dc engine. other key determinations of a 12v dc engine that metmotors can help with incorporate the working current speed torque and power. in spite of the fact that a dc engine at this voltage is perfect for some applications the organization will consider everything preceding making the last suggestion.

INSTRUMENTATION TRANSFORMER



Fig 5. Instrumentation Transformer

In control framework, the streams and voltages are extensive – Therefore, their immediate estimations are unrealistic.

- It may create the impression that the expansion of range could be advantageously done by the utilization of shunts for streams and multiplier for voltage estimation, as in DC. – But this strategy is appropriate just for little estimations of current and voltage.
- Difficult to accomplish exactness with a shunt on AC
- Capability of having shunt of expansive range isn't conceivable
- The power devoured by multipliers turn out to be huge as the voltage increments
- The estimating circuit isn't confined electrically from the power circuit
- The arrangement is to step down these streams/voltages with the down these ebbs and

flows/voltages with the help of Instrument Transformer – So that, they could be metered with instruments of direct size .

SIGNAL CONDITIONER

The electric throughput signal produce by a transducer often needs “sharpening” before it can be measured by an ADC. The signal may necessitate amplify, filter out, linearization and more ahead of the ADC can accurately read it. Additionally, some transducers necessitate an inputs or proper biasing to complete measuring s. The Signal-conditioner scheme provides the transducer with any requisite arousal or biasing and execute all essential sharpening of the electric throughput signal.

MCP3008

The RPi doesn't have analogue input signal pins. To read analog signals, and Analog-to-Digital Converter (ADC) should be used. The MCP3002 and MCP3008 are two examples of commonly used, inexpensive ADCs. These connect to the RPi via the SPI protocol. We can build a circuit with an analog circuit and read the values from the ADC via SPI using the SPIDEV library.

V. PROJECT IMPLEMENTATION

Working of the System:

Stage 1: Turn on power supply.

Stage 2: Generate voltage fluctuations using potentiometer. If fluctuation is beyond the threshold, then motor turned off automatically.

Stage 3: SMS alert is sent to the registered mobile number.

Stage 4: To check motor fault detection by using load (bulb 60W) . If load not consuming power, it indicates that load failure.

Stage 5: Send appropriate sms alert to end user.

Stage 6: browse url which is configured in raspberry pi. You get a login page. Then Login with authenticated credential.

Stage 7: Home page is displayed to control the motor as well as status monitor.

stage 8: click on Logout from the homepage.

USER LOGIN

- Click on command prompt icon of raspberry pi which is on home page of raspberry pi.
- Type command **sudo ifconfig** and then click on enter.
- You will get server ip address.(eg. 192.168.x.xx).
- Browse above address in any browser, you will get login page(i.e. index.php which is located in /var/www/html/index.php is automatically loaded by the server.).
- Enter authenticated credentials to login, after that you will get home page.

VI. RESULTS



Fig 6. Hardware Connections

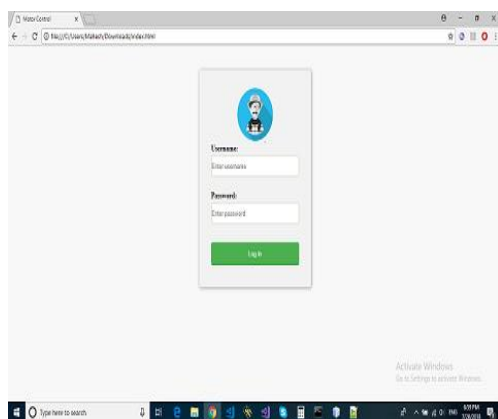


Fig 7. User login page

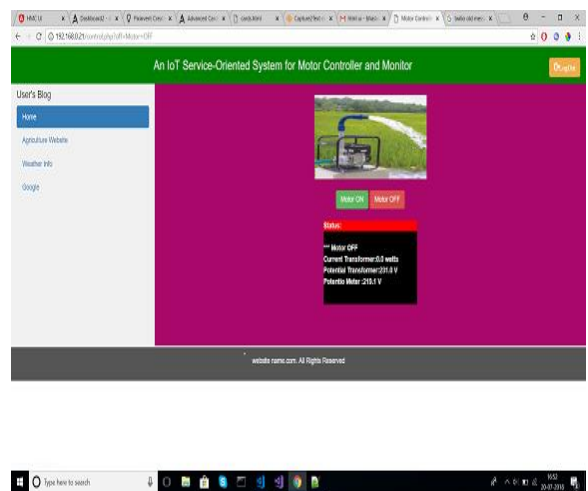


Fig 8. Home Page

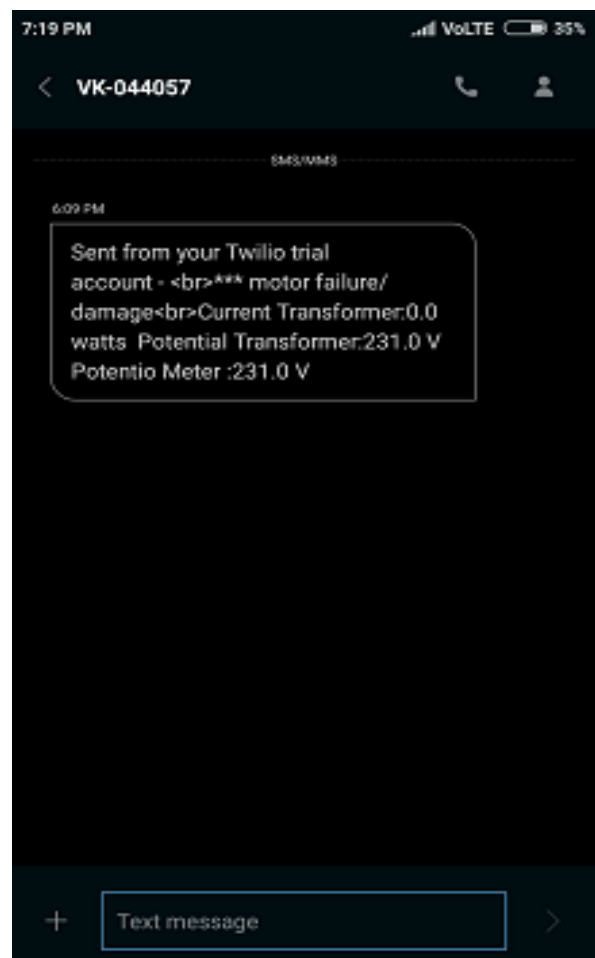


Fig 9. SMS alert for failure case

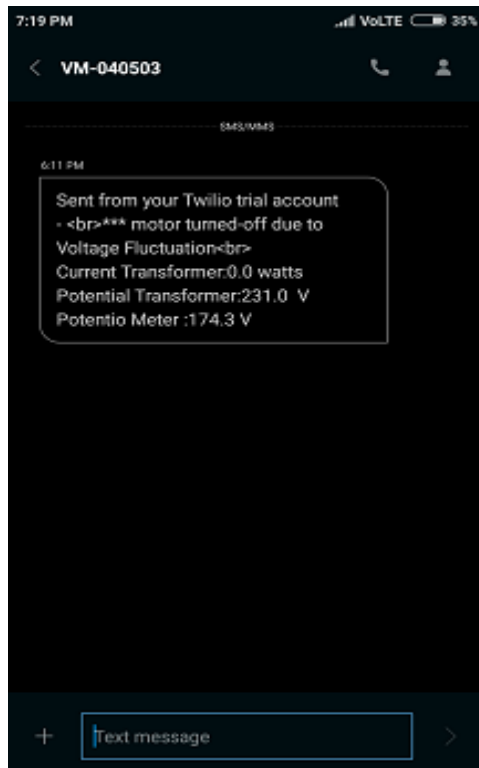


Fig 10. SMS alert for voltage fluctuation case

VII. CONCLUSION AND FUTURE SCOPE

The Project “AN IoT SERVICE-ORIENTED SYSTEM FOR MOTOR CONTROLLER AND MONITOR” has been effectively planned and verified with the results. As farmers can ensure timely water supply for their crops it will help them to make easy way and live a good life. The innovation helps the formers get an equitable space in society.

1. We can control the motor pump from any place of the world by hosting our applications in a website.

2. We can also set motor scheduler to automatic on/off at a specified time which make our system more responsive .

3. We can also use in industrial applications with few modification based on specifications of industrial devices.

4. Simplified Graphic User Interface(GUI).

VIII. REFERENCES

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KORRA BHASKAR his M.Tech degree in 2018 from CMR College of Engineering & Technology, TS, India. He is currently working towards Post Graduation degree in the department of Electronics and Communication Engineering in CMR College of Engineering & Technology, TS, India. His research interest is in Embedded systems.



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