Real Time Data Monitoring and Analysis System

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ABSTRACT

With the continuous development of information technology sector, people are gradually moving from the digital age to the more intelligent era. At present ,the Internet of Things has been formally included the emerging strategic industries in the country. In mechanical industries there is need for sensing device which can monitor and analyse data from remote location. To build an automated system the device data logger is used to sense the data. Data logger is an instruments which records various parameters such as temperature and humidity etc. A system is build to capture the data from the data logger. The application program is designed and implemented using non blocking event driven real time operating system. It reads data from sensors and sends the data to a system which is then visualize and analyse.
Keywords: Internet Of Things, Real Time System, Classification, Visualization.

ARTICLE INFO

I. INTRODUCTION

Internet of Things is current trending technology which is been used world wide for various purpose. Real time data monitoring is an important support application in order to monitor temperature, humidity, voltage, current and wind condition. Internet of Things with real time devices makes data transferring and accessibility around the globe possible where machine could communicate with computer while performing its operation . The wireless data transmission is used to reduce the cost of communication over the wired system and provide device simplicity. In some cases, the frequent human site visit is not possible due to some issues such as safety, huge cost per visit, weather condition and danger wildlife etc. To overcome these issues, an effective and user friendly wireless monitoring system, which required low maintenance essential to be established. In taking the advantage of nowadays technology achievement, an unmanned monitoring system can be established in order to overcome the stated difficulties. On top of that, by establishing the real time monitoring system, the human site visits for configuration and maintenance could be minimized. Hence, project and manpower costs could be also minimized. In this research project, a real time remote data monitoring sensors device is developed along with web based data acquisition system for user friendly data access and analysing the captured data using different machine learning algorithm.

II. LITERATURE REVIEW

[1] This research proposes the system is designed to monitor electrical devices voltage, the system self-current, self-voltage, surrounding temperature, humidity. Thus the monitoring system allow the user to monitor device condition from anywhere. The electronic operations is controlled by a single micro-controller unit. The acquire data will be uploaded over GSM module to remote monitoring database to provide user the real time data.

[2] This research proposes k-Nearest Neighbour classification is an easy to implement and easy to understand classification technique. various data mining techniques such as Classification, Prediction, Clustering and Outlier analysis can be used for data analysis k-Nearest Neighbour algorithm used to find hidden patterns inside a large data so as to transfer the retrieved information into usable knowledge for classification and prediction of temperature and humidity. The k-NN along with clustering method would increase the accuracy of temperature and humidity.

[3] This research proposes some technique to design embedded real-time data acquisition and classification. The system consist of two main parts, an embedded system and a web-based application. The embedded system has 4 main

units, processor, sensors, actuators and communication. web-based application used for data visualization and system parameters configuration. The application is designed to visualize data sent from micro-controller and to examine the behaviours of algorithm running in both micro-controller and web browser.

[4] This device in the paper is an essential feature that could be added to enhanced the capability of the system. This module is intended for wireless monitoring. Series of tests has proven that the module was functioning according to specification.

[5] This research proposes a GSM modem is a type of modem which accepts a SIM card, and operates on a subscription to a mobile operator, just like a cell phone. From the cell phone operator perspective, a GSM modem looks just like a cell phone. When a GSM modem is connected to a computer, the computer uses the GSM modem to communicate over the mobile network.

[6]This research proposes the real time data logging of a process variable is mission critical in process dynamics. Process variables (like temperature, humidity) vary with time in certain applications and this variation should be recorded so that a control action can take place at a defined set point.

III. PROPOSED SYSTEM

The System uses Data logger which is a device to sense the physical data such as temperature etc. The data will be uploaded over GSM/GPRS module to remote monitoring database to provide user the real time data. The data is accessible anywhere through web base application where the data stored inside cloud storage application. The web-base application serve as remote data acquisition application which shows real-time data and graphical data plotting. Hence, the data is accessible anywhere and any form of internet capable electronic gadgets such as laptop, desktop. The data collected by the sensors will be uploaded into website server and these data will be updated at the website specific channel and displayed for viewing in tabular and graphical form. The data will be updated after certain intervals. The system design architecture can be referred in Figure 1 as follow.
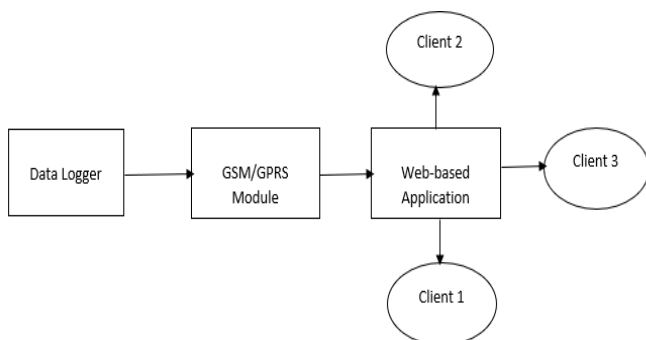
1) Data Logger:

A data logger is a device that records various types of data. Protek Instrument Data Logger is chosen for the purpose. This Data Logger is 4/8 Channel Recorder with PC + Pen-drive Interface

2) GSM/GPRS Module:

For long range remote duplex data communication, General Packet Radio Service (GPRS) communication is suitable candidate to execute the task. The data packet will be sending over GPRS and uploaded into data storage cloud.

3) Web-based Application:

The web-based application will have login page designed to prevent unauthorized access to confidential data and provide user friendly interface. By login the client can access the information from data logger remotely.

IV. CONCLUSION

In this system, the task is to capture data from sensor and it could be accessed by any remote client. In this system web server & types of sensor are used. .These sensors are Temperature sensor, Humidity sensor etc. The device will continuously acquire data. This acquired data from the device will successfully display on the webpage when requested from any other system connected to the server. The different machine learning algorithms are used to analyse acquire data.

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