

Review Paper On Single Interface To Handle Data Of Multiple Machines Using Iot

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Abstract:

The new era of computing technology is Internet of things (IoT). Internet of things (IoT) represents mainly the general concept of ability of network devices to sense and collect data from around the world and then share that data across the internet where it can be processed and utilize for various converge system. Most of the organisation and industries needs up-to date data and information about the hardware machines, so here is proposed a single interface to handle data of multiple machines using IOT is proposed that allows user to efficient the control over the hardware machines and appliances over the internet. An Arduino is used to process all user commands and to connect to the internet the wifi-modem is used and to receive commands from the user. Human Machine Interface is going costlier day by day and the people are not able to afford it. This system will play a vital role in the busy human life making them easy and more comfortable with low cost and flexibility.

I. INTRODUCTION:

Most of the industrial plants are getting automated without any connection and interaction between the machines and the operator. This makes it more difficult for the operator to handle the state of the industrial machines and the immediate actions taking place in the machines. The operator requires the flexibility and transparency for working in the industrial environment where the processes are getting more complex and requirements for machine is increasing. Nowadays many of the companies are turned to automatic working principle which gives a good efficiency by using Human Machine Interface (HMI).

But the consequences of using HMI came in front. It leads to loss of time, expensive and delicate to handle. The collection of data and data analysis cannot be done using HMI automatically. The only thing is that it will be showing the runtime data of the machine. HMI is used for once per machine which is quite hard to handle. So, to overcome the consequences we can have an Internet of Things (IOT) is good platform where we can handle all the machines in the industry from a single IOT based web portal. Internet of Things (IOT) term represents mainly the general concept for ability of network devices to sense and collect data from around the world and then share that data over the internet where it can be furnished and utilized for various interesting purposes. At the end of 2016 there were around 400 million IOT devices with cellular connections and in 2022 that number is projected to reach 1.5 billion, or around 70% of the wide-area category. IOT is the sort of “universal global neural network” in the cloud which connect various hardware machines. The term IOT was coined by the Kelvin Ashton in 1999.

The IOT is the interrelated system of the computing devices objects, mechanical machines, digital machines, animals or the people which are provided with unique identifiers and it mainly transfer the data

over a network with good ability without requiring human-to-human or the human-to-computer interaction.

II. LITERATURE REVIEW:

[1] The author has proposed an effective "Industry Automation System". This system is developed using IOT or internet of things which deals with the control of physical hardware devices over the internet. The Developers created this system to control the appliances of the industries and machines over the internet. They have demonstrated this system using 2 loads i.e. machines or industrial appliances and an industrial motor. An Arduino is used to process all user commands and the wifi-modem is used to connect to the internet and to receive commands from the user. While sending commands through the internet they are first received by the Wi-Fi modem and then the modem decodes information and passes it to the Arduino microcontroller for further processing. The microcontroller displays the system state on an LCD display. This how the developers automate entire industry using online GUI for easy industry automation. They have used the Wi-Fi IP address to connect with the page. For the conversion of available power of one set of characteristics the power supply unit is used to meet up the requirements. To increase operational efficiency, this industrial automation systems utilize wireless communication to connect remote and local facilities. In this proposed system Wi-Fi modem ESP8266 was used. The ESP8266 Wi-Fi Module which is independent System On Chip and is integrated with TCP/IP protocol stack that gives the microcontroller access to the Wi-Fi network. The ESP8266 module is an expensive board with a large, and ever growing, community. This module used in this system has a powerful enough processing and storage capability which allows it to be integrated with the sensors and other application specific devices through its GPIOs with minimal development and loading during runtime. Minimal external circuitry is allowed by its high degree of on-chip integration, including the front-end module, is designed to occupy minimal PCB area.

[2] Vaishnavi V. Daigavane and Dr. M.A Gaikwad developed a "Water Quality Monitoring System" is developed in [2] which is based on IOT. The System includes the hardware and software part. The hardware includes a core controller i.e. Arduino and several sensors (temperature, pH, turbidity, flow) are connected to it. The core controller accesses the sensor values and process them to transfer the data to the internet and the sensor data can be viewed on the internet wifi system. The pH sensor checks the acidity and alkalinity of the water or can say the solution. The turbidity sensor and the flow sensor check the cloudiness and flow of water respectively. The flow basically consists of a valve body made up of plastic, a rotor and a Hall Effect sensor. The valve and the speed of the water/liquid flow through it will be directly proportional to the flow rate when the pinwheel rotor rotates. The Hall Effect sensor will be given to an electrical pulse with an each revolution of the pinwheel rotor. This System also consists of an Arduino Uno and an ESP8266 Wifi Module. Arduino Uno is the ATmega328P based microcontroller board. It has multiple input/output pins including a USB connection, a power jack, a reset button and an ICP header. In a series of USB Arduino boards first was the UNO board. The WIFI module can give authority to the microcontroller to access the wifi network. Using all this hardware components this system is developed including the software part, the hardware helps to measure the real time values and Arduino ATmega328 converts the analog values to digital values and they are displayed on the LCD. The Wifi modules gives the connection between the hardware and the software. The software programming is done with the embedded C language. When the system gets started dc current given to the kit and Arduino and WIFI gets on. The parameter of water is tested one by one and their result are given to the LCD display. The application provided with hotspot gives the exact value as on LCD display shows on kit. Hence, such as this when the kit is detected on any certain water body and WIFI is given by which we can see its real time value on the android phone anywhere.

[5] The author suggested in [5] a better smart home automation system using the IOT .i.e. Internet of Things the most popular technology used today. In this system they have used different type of components and modules like LDR, Motion Sensors, Temperature Sensors etc. which are connected to the Arduino board and more hardware like light, LCD, etc. To indicate the change in the environment the sensors in the sensor unit are placed, which then report back to the Arduino board. The programming of the Arduino board is done in such a way that if the LDR sensor senses less light intensity then the light glows on. The system includes the android and web application too, to give commands to the hardware. On receiving commands from the application, the hardware processes and acts to turn on or off. One more module i.e. the WIFI module plays a major part in this system. It acts as a bridge between the UI and the Arduino. The connectivity is done with the help of the IP address using the ESP8266 WIFI module in this proposed system. The hardware components like the sensors, fan, LCD display, etc are connected to the Arduino board. These sensors read the data and send it to the Arduino to check the given condition as a program. The respective appliance is controlled if the given condition gets matched and the controlling can be done with the help of application as well as web pages. To display the humidity and temperature LCD is used.

[6] HMI with IOT is specified in [6] where the author explains IoT in Humans that plays an important role in IOT systems. In the current studies, we try to find the accentuate human-in-the-loop problems in the systems and in particular IOT systems through the reviewing applicable literature from various outlooks. Most of the issues are probably highlighted including information visualization, perception and the human trust in the intelligent systems. Kevin Ashton was the first used to the term "The Internet of Things" in the supply chain management domains. Nowadays IOT has covered up the wide range of domains including transportation, healthcare, utilities and logistics, etc.

The IOT domains are classified according to their network availability, scale, user involvement, heterogeneity and impact. The technologies that enable the IOT includes identification and sensing technologies e.g., Radio Frequency Identification (RFID) and Wireless Sensor Networks (WSNs), middleware, cloud computing and IOT application software. Humans play a central role in the IOT systems. Some of the issues are raised in the context of human-automation interaction and by extending human IOT interaction.

[8] The Author suggested a Vehicle Tracking and Vehicle Emergency System using IoT i.e. Internet of Things. In this System they have used different type of components and modules like ATMEGA 16A, ADXL 355, RFID Reader, GSM, GPS, etc. which are connected to the different modules to detect and sense vehicle location, maintain vehicle tracking using GPS technology or it may use different automation system or technology to track the vehicle. Also the vehicle information on electronic maps via internet with specialised software can be viewed.

IoT enables to detect items and control them remotely using various existing system, this infrastructure creates open doors to be more straight forward from the physical world into computer based systems which results to improve efficiency, accuracy and economy benefits in addition to reduce human intervention which is only possible by IoT which connect physical world to the web. In this project websites have been developed a website to interact with the user. User may get notification about its vehicle accident or any nearby police station, hospital will also get notification for the same.

[9] The Author proposed A SURVEY ON IOT PLATFORM, in this paper they mainly focused on the current platform that supports the IoT implementation, so this will provide various platforms to their working and their services by each platform.

In this paper the author grasp a list of cloud providers for the IoT and the protocols which is carrying by them with their particular features such as some engines for data analytics a middleware to connect any

things to clouds dynamically and also their special services such as business analytics services and notification call and they can also manually set some threshold value and when the event happens the cloud can automatically triggers the action in an environment. Thus, this paper mainly aims to provide a general information about some IOT cloud platforms, their services and security by cloud providers.

[10] Marco Brambilla, Eric Umuhoza and Roberto Acerbis proposed a system on Model-driven development of user interfaces for IoT systems via domain-specific components and patterns in which they have given a brief discussion as Internet of Things technologies and the application is developing widely and gaining the traction in all the fields like environments, homes, cities, services, industry and commercial enterprises. Then also many problems are their which have to be addressed for example, the IOT vision is mainly focusing on the technological, infrastructure, aspects, management and analysis of the large amount of the generated data.

The user interaction plays a critical role in a large class of software and systems. Nowadays lot of research has been focusing on the scenario related to the industrial use of the IOT, machine-to-machine (sensor-to-sensor) communication. In the particular area, the solutions proposed mainly focus on the extending standard IFML Language adopted by the Object Management Group (OMG). There are set of design patterns for the common user interactions for those applications. Along the formal definition of the IOT extensions to the IFML language and the modelling of UI design patterns for the IOT.

[11] Ala Al-Fuqaha, Mehdi Mohammadi, Moussa Ayyash, Mohammed Aledhari, Mohsen Guizani proposed a system on “Internet of Things: A Survey on Enabling Technologies, Protocols and Applications in this paper they have reviewed IoT from different angles and summarized the market opportunities, perspectives, investment on this new technology is rational for organizations seeking market competitiveness. From the architectural point of view, the IoT system Layered structure is adopted by the IoT frameworks and research attempts. However, there are number of layers and their scopes are defined differently depending on the underlying infrastructures and technologies. They introduce the different IoT elements and their related technologies and tools which are needed to realize on the IoT system.

They finally presented the need for new smart autonomous management, data aggregation, and protocol adaptation services to achieve better horizontal integration among IoT service. They also detailed about application-use cases were presented to illustrate typical protocol integration scenarios to deliver desired IoT services.

[12] The “Android based interactive Home Automation System through the Internet of Things” is presented in [12]. Smart home systems achieved the high popularity in the last few decades, as they increase the comfort and quality of life. Most of the smart home systems are mainly controlled by the smartphones and microcontrollers. A smartphone application is used for monitoring and controlling home functions by using the wireless communication techniques. The idea of the smart home along is explained with the integration of cloud computing and IoT services, by fixing the intelligence into sensors and actuators. Networking of smart things using the correlated technology and to make interactions feasible with smart things using the cloud computing for obtaining easily access in different locations, increasing storage space, computation power and improving data exchange efficiency. In this we present a composition of three components to build a strong approach of an advanced smart home concept and implementation.

Cloud computing, classic smart home, internet of things and rule-based event processing are the building blocks of the advanced smart home integrated compound. The integration of the loosely coupled components i.e. smart home, Iot, and cloud computing. To arrange and timely manage the large amount of data flow in an efficient and balanced way, by utilizing the strengths of each component they

introduced a centralized real time event processing application. As these components are still at its developing stage, the integration among them may get changed and provide a strong paradigm that generates a new generation of infrastructure and applications.

III. DISCUSSION:

In the end, HMI is going costlier day by day and the people are not able to afford it. The Idea of creating an interface using IOT is proposed to reduce its cost. This will also increase the flexibility of operating machines from any where the user is or the user will be. The users can operate the machines using the application and is able to send the commands like on or off with the help of Internet. The wifi module of IOT plays the major role of sending and receiving the data. This system will also going to help the users to have a record of the past data and the parameters of the machines. Using this the users can observe the readings and also they can check which parameters they have to change to let the machine work better than before. As the use of this system increase, the need of HMI will be going to be vanished and as a result a flexible cost-effective system will come into existence.

IV. CONCLUSION:

We conclude that this system will play a vital role in the busy human life making them easy and more comfortable with low cost and flexibility. The paper gives a literature review on the human machine interface replaced by IOT system. IoT in various applications this paper furnishes the current technology which deals with upbringing of hardware devices management over the internet.

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