Connecting Physical Things to Smart City-OS using Sensor Network

Jayanthdwijesh H P, Gowpiya B K[2], Harshitha H M[3], Kavana N U, Ranjitha K N
Department of ECE
BGS Institute of Technology, BG
Nagar

Abstract: **Smart City represents one of the most promising, prominent and challenging Cyberspace of Thing (IOT) applications. In the last few years, indeed, the smarting metropolis concept has played an important person in academic and industry fields, with the development and deployment of various middleware chopine and IOT-based infrastructures. However, this expansion has followed distinct accesses creating, therefore, a fragmented scenario, in which different IOT ecosystem is not able to communicate between them. To fill this opening, there is a need to re-visit the smarting urban center IOT semantic and vortex a global common approach. To this purpose, we browsing the semantic annotation of the sensing element in the cloud, and innovative service can be implemented and considered by bridging Cloud and Internet of Matter. Things-like semantic will be considered to perform the aggregation of heterogeneous resources by defining the Cloud of Things (Crib) substitution class. We sight the smart urban center visual sensation, providing information on the main requisite and highlight the benefits of integrating different IOT ecosystems within the cloud under this new COT vision. Last word city is the growth terminal to monitor quality of resource in the city .To improve good management and faster ontogeny of the city required necessity is to climb healthy and welfare city that delivering real time service and latest eagerness .To implementing concept of smart city use IOT concept by which easy tuner communication is possible .Scheme consist of sensors, collect different types of data from sensors and transference to the Raspberry Pi3 comptroller.**

Keywords: **IOT, Smart City, Sensors, Raspberry etc.**

I. INTRODUCTION

A metropolis may be called ‘smarting cape ’ when investments in human and sociable capital and traditional and communication base fuel sustainable economic growth and a high quality of spirit , with a Sir Leslie Stephen Samuel Wise management of cancel resources through participatory governance . A smart city is also defined as a city connecting the physical substructure, the social bag and the business infrastructure to leverage the collective intelligence of the city. The IOT construct, hence, heading at making the Internet even more immersive and pervasive. Furthermore, by enabling easy access and interaction with a wide potpourri show of device such as, for example, abode appliances, surveillance photographic camera, monitoring detector, actuator, displays, vehicle, and so on, the IOT will foster the maturation of a number of lotion that make use of the potentially enormous sum of money and variety of information generated by such objective to provide new services to citizens, company, and public organization. This paradigm indeed finds application in many different domains, such as house mechanization, industrial automation, medical aid, Mobile River healthcare, elderly assistance ante, intelligent Energy management and smart grids, automotive, traffic management, and many others. "Affair," in the IOT sense, can refer to a wide variety of quintet senses of device such as health monitoring implant biochip transponder on farm animals, electric automobile boodle in coastal waters, motorcar with built-in sensor, DNA analysis 5 senses of device for environmental/food for thought /pathogen monitoring or field operation gimmick that assist attack - fighters in lookup and saving procedure. Legal scholars suggest looking at "Things" as an "inextricable mixture of hardware, software, data and service". These gimmicks collect useful data with the help of various existing technologies and then autonomously flow the data between other devices. The Smart City paradigm helps renovate the traditional city concept. In fact, it is possible to realize and develop efficient demand-side strategies integrating the monitoring and automation features. Ensured by intelligent devices and their communication apparatus typically used in many applications. The increasing popularity of the IOT concept is also due to the constantly growing number of very powerful devices like smart phones, tablets, laptops and lower powerful devices like sensors that are able to join the Internet. In the context of Smart Cities, it makes sense to consider the scenario of the various different and heterogeneous devices, the Wireless Sensor Networks interconnected to each other and to exploit these” interconnections” to activate new type of services. The ICT trends suggest that the sensing and actuation resources can be involved in the Cloud and solutions for the convergence and evolution of IOT and cloud computing infrastructures arise. The concept of IOT, with underlying physical objects abstracted according to thing-like semantics, seems a valid starting point for the orchestration of the various resources. The Cloud concept could play the role to connect the IOT with the Internet of People through the Internet of Services, by the means of a horizontal integration of various things. We will refer to this horizontal integration and to the Cloud computing associated to the IOT as the Cloud of Things. As we will see, this concept goes beyond to the interconnection and hyperlink of silos. We will explain how abstraction, virtualization and management of things have to be properly designed and implemented in order to develop solutions for the convergence of diverse IOT

platforms and Clouds. A precise design of these mechanisms will permit the development of a technological-agnostic architecture, where the integration and deployment of diverse devices and objects can be considered by neglecting their underlying architecture. We will present the VITAL project as a Cloud of Things-based architecture, able to meet many critical requirements of a smart city, and we will show how this platform can be considered to bridge different and heterogeneous IOT silos. The preliminary description of the VITAL platform, where we just introduce the platform and the Cloud of Things paradigm, we will give more details about the services that VITAL implements and we will describe specific use cases where the VITAL platform plays a very key role. The European FP7 VITAL 1 project, introduces an abstract virtualized layer that operates across multiple IOT architectures and platforms. This layer allows the development, deployment and operation of IOT applications for Smart Cities, thereby turning VITAL into an operating system that can monitor, visualize, and control all the operations of a city. We also describe the VITAL-OS architecture and how it is designed to deal within different Smart City scenarios. We present a practical use case of monitoring in a Smart Building context; we first illustrate a discovery and ranking mechanism for Sensor Networks (SN), then, we show how to connect those sensors to VITAL-OS and how to use them. In order to evaluate the performance of the proposed algorithm, we performed experimentation on the FIT IOT-LAB tested.

II. LITRATURE SURVEY

M. Serrano, A. Kazmi, E. Dilek, Y. Yaslan, S. Oktug, J. Soldatos, and A. Lennis: "The future of smart cities: A practical case of connecting cities with vital-os". The advancement in wireless communications and electronics has enabled the development of low-cost sensor networks. The sensor networks can be used for various application areas (e.g., health, military, home). For different application areas, there are different technical issues that researchers are currently resolving. The current state of the art of sensor networks is captured in this article, where solutions are discussed under their related protocol stack layer sections. They also points out the open research issues and intends to spark new interests and developments in this field.

R. Petrolo,S. Guzzo Bonifacio, V. Loscri, and N. Mitton: "The discovery of relevant data-sources in a Smart City environment". They present the VITAL architecture, which aims to integrate Internet- Connected Objects (ICOs) among multiple IOT platforms and ecosystems. And also introduce the "ICOs and Services Discovery" module, which makes completely transparent, for users, the exploration of data-sources that are appropriate for his/her business context. The mechanism is at the basis of the Cloud of Things paradigm and a key feature as the platform agnostic property is an essential goal for VITAL.

A Roukounaki, J. Soldatos, R. Petrolo, V. Loscri, N. Mitton, and M. Serrano,:"Visual Development Environment for Semantically Interoperable Smart Cities Applications". They present IOT architecture for the semantic interoperability of diverse IOT systems and applications in smart cities. The architecture virtualizes diverse IOT systems and ensures their modeling and representation according to common standards-based IOT ontologies. Furthermore, based on this architecture, the paper introduces a first-of-a-kind visual development environment which eases the development of semantically interoperable applications in smart cities. The development environment comes with a range of visual tools, which enable the assembly of non-trivial data driven applications in smart cities, including applications that leverage data streams from diverse IOT systems.

III. EXISTING METHOD

The Internet of Things (IOT) is in continuous expansion as a result of the huge interest raised in both academia and industry. The number of devices deployed nowadays is already massive thanks also to the cost reduction of smart technology - and it will reach 50 billion according to CISCO white paper. Thanks to those devices, the IOT will change all the aspects in our lives, e.g., work, health, transport, etc. Looking at the bigger picture, the Smart City concept represents a clear example of coexistence and cooperation between different IOT ecosystems; it can be seen, indeed, as a system that integrates all the IOT solutions, especially the ones that are crucial for a city scenario. To confirm this momentum, in the last years, the Smart City concept gained significant interest behind which there is a real need to make cities ready to face new challenges (e.g., waste management, traffic congestion, etc.). In this context, the IOT has a primary role since it represents the main "supplier" in terms of data streams and information. According with this vision, the number of IOT solutions is, nowadays, rising exponentially involving different scenarios, from street lighting, to traffic intersections management, etc. Nevertheless, those initiatives are standalone, based on different protocols and standards, while the need of integration and interoperability among all the Smart City stakeholders is clear.

IV. PROPOSED METHOD

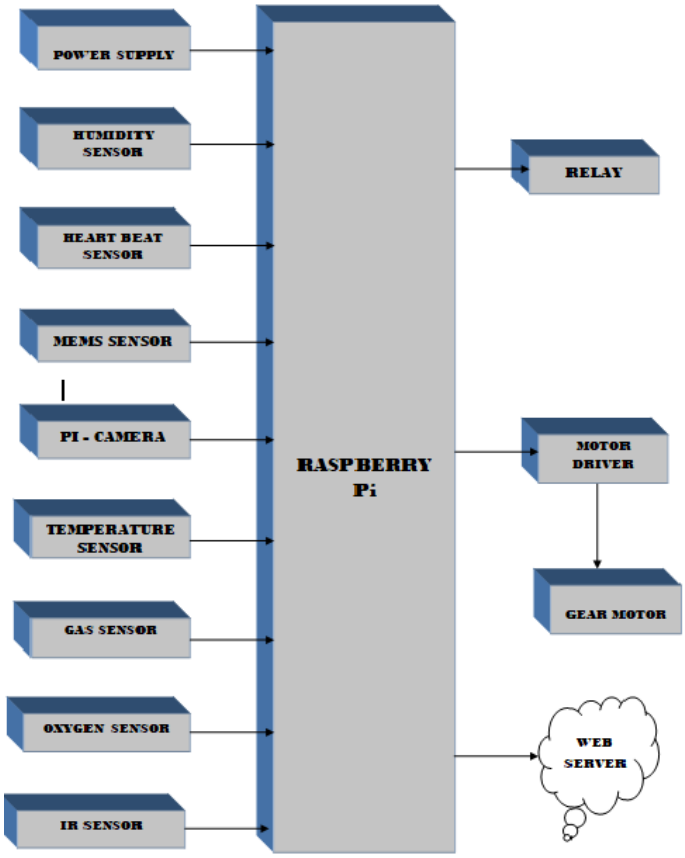


Fig 1: Proposed method system

The system consists of Raspberry pi3 controller, humidity sensor, heartbeat sensor, temperature sensor, IR sensor, pi camera, MEMS sensor, oxygen sensor, gas sensor, relay etc. as shown in block diagram. Sensors senses information and give this information to the Raspberry pi3 module which process on further and gives output value.

Humidity sensor: - Humidity sensor scenes, measures and reports the relative humidity in the air. Humidity measurement can be done using dry and wet bulb hygrometers, dew point hygrometers, and electronic hygrometers. There has been a surge in the demand of electronic hygrometers, often called humidity sensors.

Temperature sensor: - It is a device, typically a thermocouple that provides temperature measurement through electrical signal. We can measure temperature more accurately than a using a thermistor. The sensor circuitry is sealed and not subject to oxidation, etc. The LM35 generates a higher output voltage than thermocouples and may not require that the output voltage be amplified. Heart beat sensor gives speed of the heart beat as digital output.

MEMS sensor: - It is able to gather information from environment by measuring mechanical, electrical, thermal, biological, magnetic phenomena. MEMS are separate and distinct from the hypothetical vision of molecular nanotechnology or molecular electronics.

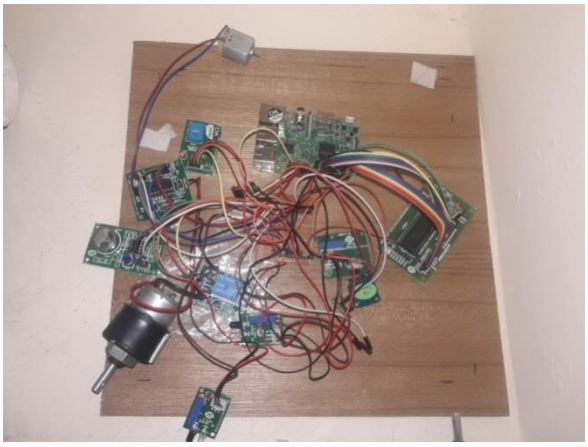
Gas sensors and Oxygen sensor: - measures the concentration of target gas and oxygen by oxidizing or reducing.

IR sensor: - It is used to sense the characteristic of surroundings, measure the heat beating. Relay are switches that control electric circuit by opening and closing contacts.

Motor: - A small motor designed specifically with an integral gear reducer (gear head). The end shield on the drive end of the motor is designed to provide a dual function. The side facing the motor provides the armature/rotor bearing support and a sealing provision through which the integral rotor or armature shaft pinion passes. Motor driver allows dc motor to drive on either direction. The function of motor drivers is to take a low current control signal and then turn it into a higher current signal that can drive a motor.

V. WORKING

Raspberry Pi is latest technology having lot of application in real world. The best part is high technology with low cost. This technology is utilized for home automation, environmental monitoring and health monitoring and in many applications.



A. HEALTH MONITORING:

In the advancement of Internet technologies all machineries are interred related. Using the technology improvement, we can make many things in high effective and simple for human life. There are several places of Internet of Things (IOT) is used. In medical field also, there are several process are used internet. We monitor patient's heart rate, body temperature, Respiration rate and body movements using Raspberry Pi. After connecting Internet to the Raspberry Pi board it act as a server. Then the server is automatically sends data to the web server .Then these parameters are monitor using webpage

anywhere in the world using laptops, smart phone etc. If these parameters are goes to abnormal, it will automatically send alert message to the doctor. From the development of technologies (Internet of Things) is changing the human life into a new level. IOT is change the normal human life to smart life with new technology level. There are several processes such as smart home, smart city; health monitoring systems are monitor using Internet of Things. Internet of Things is used for monitor all patients in any level.

Raspberry Pi and internet connection is a new innovative technology in healthcare systems. In health monitoring we have temperature; patient's body movements and heart beat reading are monitoring using Raspberry Pi. The patients connect the sensors to their body and the other end of the sensors is connected to Raspberry Pi. The data acquired by sensors is stored in the Raspberry pi.

B. ENVIRONMENTAL MONITORING

There is nowadays, a real demand to monitoring the environment in order to face challenges. The development in wireless sensor networks can be used in monitoring and con- trolling various parameters in the agriculture field, weather station field. Due to uneven and natural distribution of rain water it is very difficult for farmers to monitor and control the distribution of water to agriculture field in the whole farm or as per the requirement of the crop. There is no ideal and advanced irrigation method for all weather conditions, soil structure and variety of crops cultures. Farmers suffer large financial losses because of wrong prediction of weather and incorrect irrigation methods and the amount of pesticides and insecticides used for crops. In this context, with the evolution of miniaturized sensor devices coupled with wireless technologies, it is possible remotely monitor parameters such as temperature and humidity and sun light intensity. Weather monitoring plays an important role in human life, so the collection of information about the temporal dynamics of weather.

C. HOME AUTOMATION

The process of controlling or operating various equipment, machinery, industrial processes, and other applications using various control system and also with less or no human interaction is termed as auto machine. Home auto machine is the process of controlling home appliances automatically using various control system. The electrical and electrical appliances such as fan, lights, outdoor lights, kitchen timers etc can be controlled using various control techniques and web servers.

VI. RESULTS

This composition proposes the arrangement which provides the better quality of life history and effective use of imagery. It can also monitor leading device the Surroundings conditions, Health of the patient role function s and Domicile mechanization organization. IOT technologies have much reward in smartening city. Some of those application programs are tracking of citizenry and target including affected role, staff and ambulance, identification of masses, and automatic pistol data gathering and sensing. Environment monitoring system detects the oxygen level and various gas levels in the surrounding areas and sends the warning signal substance. Using IP address anybody can monitor the patient's health condition anywhere in the world using laptops, tab s and smart phone s. If these argument are goes to abnormal it will automatically sends alarum chain mail to the doc and congregator. Raspberry PI 2 is interfaced with either PC or Mobile Phone by Using Vane Protocol. Raspberry PI is connected to Electronic Switch Placement. By Using Electronic Switching System we mastery various electrical devices like Mutant fan, Tube light etc., All the electronic gismo are operated and control through our smart phone or computer or tablet

VII. CONCLUSION

There is nowadays, a real demand to make cities smarter in order to face challenges - i.e., waste management, traffic congestion, etc. - caused by the population growth. In this context, one key role is played by the Internet of Things and its data streams that can be converted into relevant information used to address the above issues. According with this vision, the number of IOT solutions is, nowadays, increasing, but on the other hand those initiatives are standalone and based on different protocols and standards. The VITAL-OS presented in this paper deals with this problematic, by introducing an abstract virtualized layer that operates across multiple IOT architectures and platforms. This layer represents the end-point thanks to which it is possible to monitor, visualize, and control all the operations of a city.

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