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SMART CITY BASED ON IOT

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ABSTRACT :

Most of the world's population today lives in cities. By 2030, the population of the cities around the world is expected to grow from 3.3 billion to 5 billion people. In Israel, about 6 million people live in urban areas. Due to resource constraints, there will be a problem in the future to provide all the services to the residents. To continue to serve and improve the standard of living of the growing population, it is necessary to develop smart cities. The Smart City aims to make optimal and sustainable use of all resources, while maintaining an appropriate balance between social, environmental and economic costs. In the Smart City, maximum use is made of ICT to improve the functioning, management, and supervision of the variety of systems and services, with an emphasis on saving energy, water, land and other natural resources. The main categories that define smart cities include the quality of the environment, energy, water and waste water, transportation and traffic, information and communication systems, quality of life, government, economics, human resources, housing and land use, homeland security, and emergency preparedness. The degree of preparedness of the city for the collapse of the municipal systems, whether as a result of state security or natural disasters, should also be taken into account. In order to manage and promote the issue in Israel, the Smart City Administration was established two a half years ago, at the initiative of the Ministry of Energy. The Administration will have a representative of each government office and each office will have a team to work on the issue. The Administration will determine where resources will be invested and which projects will be promoted.

INTRODUCTION:

The smart city concept will have different meanings in different cultures and can sound elusive until you break it down into practical terms. A good place to start is with the stupid realities many city dwellers accept as part of their daily lives. In some major cities, residents will spend four years of their lives trying to find a parking place. Elsewhere, they may find themselves stuck in an 182km-long traffic jam. Or they may have trouble sleeping because strong neon lights brighten up their street as if it were a soccer stadium. Using technology – in particular the Internet of Things (IoT) and artificial intelligence – to alleviate such situations would be good for citizens and cities. It is, for example, not uncommon in modern metropolises, for public lighting to account for half of the city's energy budget. In the short term, smart LED lights could use 50 per cent less power than traditional lights. (This is the very least that needs to

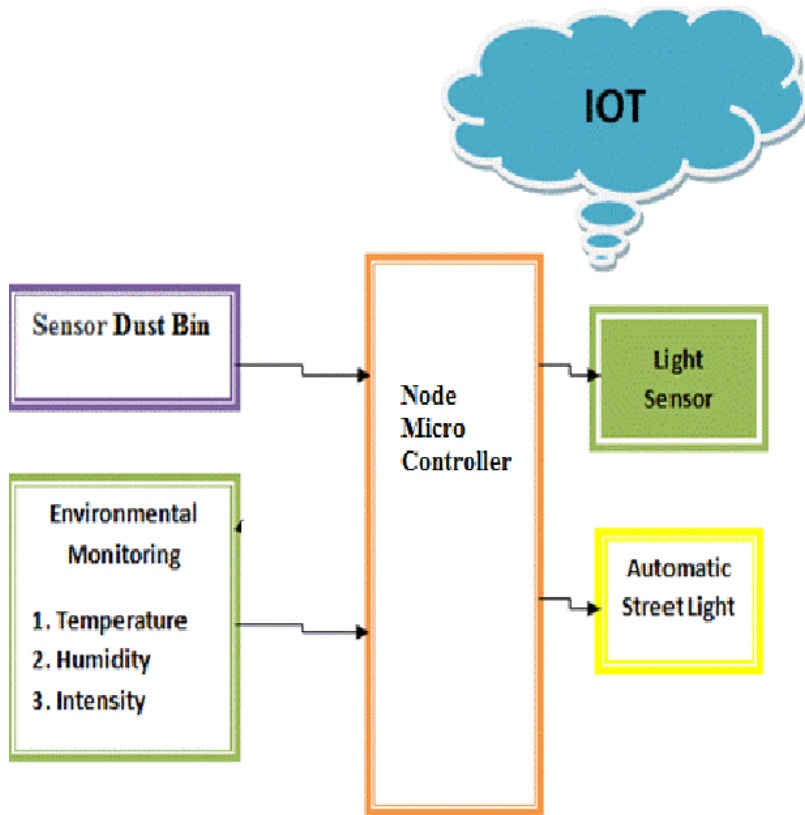
happen if the world's cities are going to cope with their growing populations.) In the near future, as 'dumb' poles become smart, they could form the digital backbone of a city, giving citizens – and officials – real-time, accurate information on anything from rush hour delays to air quality. Most urban governments embrace the compelling environmental, financial and social case for the development of smart cities. What some are struggling with, as this Smart Cities World/Philips Lighting survey underlines, is exactly how to implement such a programme. If smart cities are to become the 'new normal', local authorities and key decision makers need to navigate such difficult areas as technology, communications, data and security.

LITERATURE SURVEY :

Indian cities and cities around the world is gradually evolving. It is not a sudden decision with planned infrastructure in advance. The concept of Smart City has suggested in a planned city, with such impact that each activity carried out in the city is supervised and controlled by technology. Internet of things is an emerging technology in the IT world that can be explored to its zenith to achieve the goal of building a smart city. Building alone is not enough, but to maintain and sustain their identity. The integrity and authenticity is another task to be processed and implemented. There are several challenges in making an smart city in India, as there are several implicit and explicit obstacles that must be confronted. A smart city model is not a solution because each city is unique in its existence. However, a prototype development is needed by having a logical design using for Smart City using IoT.

PROPOSED IDEA:

IoT helps cities connect and manage multiple infrastructure and public services. From smart lighting and road traffic to connected public transport and waste management – the range of use cases is highly diverse. What they have in common is the outcomes. Applying IoT solutions leads to reduced costs for energy, optimized use of natural resources, safer cities, and a healthier environment. However, to enjoy these benefits, municipalities should take a consistent approach to design a functional and scalable smart city architecture. Well-designed, it will allow to reduce investments in IoT development and hasten the implementation of smart city solutions, still leaving space for expansion.



HARDWARE DESCRIPTION:

1. Relay module:

5V Relay Module is a relay interface board, it can be controlled directly by a wide range of microcontrollers such as Arduino, AVR, PIC, ARM and so on.

2. Arduino:

Arduino is an open-source platform used for building electronics projects. Arduino consists of both a physical programmable circuit board (often referred to as a microcontroller) and a piece of software, or IDE (Integrated Development Environment) that runs on your computer, used to write and upload computer code to the physical board.

3. DHT11:

The DHT11 is a basic, ultra-low-cost digital temperature and humidity sensor.

4. LCD:

The term LCD stands for liquid crystal display. These displays are mainly preferred for multi-segment light-emitting diodes and seven segments.

5. WIFI module:

ESP8266EX is among the most integrated Wi-Fi chip in the industry.

6. Moisture sensor:

The **Moisture sensor** is used to measure the water content(moisture) of soil.

7.LDR:

A Light Dependent Resistor (LDR) is also called a photoresistor or a cadmium sulfide (CdS) cell.

8. Accelerometer:

An accelerometer is a device that measures proper acceleration.

9. ISD1820 Voice module:

The Voice module board is based on ISD18B20, which is a single-chip single-message record/playback device.

10. Ultrasonic sensor:

Ultrasonic sensing is one of the best ways to sense proximity and detect levels with high reliability.

11. MQ7:

The MQ-7 is a Carbon Monoxide (CO) sensor suitable for sensing CO concentrations in the air.

12. LED:

The LED has a leg over common orthodox incandescent light in terms of efficiency, low consumption power, compact size, longer range and an ability to retain the quality for a longer period of time.

13. Buzzer:

A buzzer or beeper is an audio signaling device, which may be mechanical, electromechanical, or piezoelectric (piezo for short).

14. DC motor:

A DC motor is any motor within a class of electrical machines whereby direct current electrical power is converted into mechanical power.

15. Infrared Sensor:

An infrared sensor is an electronic device, that emits in order to sense some of the Surroundings.

WORKING:**EARTHQUAKE DETECTOR**

Working of this Earthquake Detector is simple. As we mentioned earlier that we have used Accelerometer for detecting earthquake vibrations along any of the three axes so that whenever vibrations occur accelerometer senses that vibrations and convert them into equivalent ADC value.

SMART STREET LIGHT

The Smart street light provides a solution for energy saving which is achieved by sensing an approaching vehicle using the IR sensors and then switching ON a block of street lights ahead of the vehicle. As the vehicle passes by, the trailing lights switch OFF automatically.

SMART DUSTBIN

The Wi-Fi module ESP8266 will act as an interface between the hardware and the software whereas the ultrasonic sensors will sense the height of the garbage inside the dustbins.

Weather Monitoring system

The sensor devices are deployed in environment to detect the parameters (e.g., Temperature, Humidity, Pressure, LDR, noise, CO and radiation levels etc.) while the data acquisition, computation and controlling action (e.g., the variations in the noise and CO levels with respect to the specified levels). Sensor devices are placed at different locations to collect the data to predict the behavior of a particular area of interest.

TRAFFIC MANAGEMENT SYSTEM

Initially we program our chosen microcontroller with normal time delay of some few seconds, if any road has more traffic density that road traffic signal will blink green LED to allow traffic to cross the junction until the road traffic density reaches to normal level. After getting into normal mode signals with blink as normal with some few seconds delay.

CONCLUSION:

Smart technologies can provide solutions for cities by helping them save money, reduce carbon emissions and manage traffic flows. But the complexity of the agenda is hindering its progress. It involves a large number of stakeholders (local authorities, citizens, technology companies and academics) each having their own vision of what a smart city should be.

FUTURE SCOPE:

It is easy to see why technological innovations that promise resource efficiency and mobility would be attractive to city planners, architects and engineers. Given the scale of the problem, it is no surprise then that the size of the prize for solutions is equally large. Forecasts from Frost & Sullivan suggest the global smart city market will be valued at \$1.565 trillion in 2020.

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