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IoT based Standard Water Measuring System using GSM

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Abstract: ***Water pollution is one of the problems in the world. Water is used for industrial purpose. So, it is compulsory for an each officer to visit the ponds at a designated time and perform manually testing to measure the purity level of the water. The industrial visitors are not come directly to the pond and the information about the water to send the Short Message Service (SMS). A pond is a body of standing water, either natural or artificial. The sensor is fixed to the pond water, it senses the water and the data will be collected through these phase pH meters, humidity and temperature sensor is sending the signal to Arduino microcontroller. pH meter is used to measure the hydrogen ion in the water, temperature sensor will sense the temperature is one of the most frequently calculated variables and sensing can be made either through straight contact with the heating basis without straight contact with the basis using radiated energy in its place. Humidity is used to measure the amount of water present in the air. The GSM module sends the message to industrial visitor. The pH is normal or abnormal and humidity value, temperature value. The motor is fixed in the pond and if industries need water then they can switch on (or) off the motor. The motor can be switched on (or) off using microcontroller.***

Keywords: Arduino Microcontroller, pH Meter, Humidity sensor, Temperature sensor, GSM, Relay, DC motor.

I. INTRODUCTION

The water is restricted and essential resource for trade, agriculture, and each one the creatures existing on the earth alongside the answer. Any imbalance in water quality would severely have an impact on the health of the humans, animals and to boot has an impact on the ecological balance among species. Among the twenty initial centuries there are many innovations, however, at that point were pollutions, international warming thus on are being formed, as a result of this there is not any safe drinkable for the world's population. The drinkable may be a ton of precious and valuable for all the people that the standard of water has to be compelled to be monitored in real time. Current water quality observation in real time faces challenges as a result of heating, restricted water resources, growing population, etc. Hence, there is a need of developing higher methodologies to watch the Water quality parameters in real time. Pollution is one among the issues within the world.

The kind of water is taken and quality will be measured by hydrogen ion concentration, hardness and temperature in water level. The hydrogen ion concentration meter is employed to leave the element iron within the water. Hydrogen ion concentration is that the numeric illustration of gram-equivalent per cubic decimeter of proton concentration in any answer. It varies between zero to fourteen. It's the exponent activity of moles of element ions per cubic decimeter of answer. The solutions having a hydrogen ion concentration worth between zero to seven area unit acidic solutions with a giant concentration of element ions, whereas solutions having a hydrogen ion concentration worth between eight to fourteen area unit basic solutions with tiny element concentration[6].

The solutions having a hydrogen ion concentration worth of seven area unit neutral solutions. Activity the hydrogen ion concentration offers the life of traditional or abnormality of a waiter. Hydrogen ion concentration meters live the voltage between a pair of electrodes and show the result regenerate into the corresponding hydrogen ion concentration value. They comprise a straight forward electronic equipment and a mix of electrodes and some varieties of show mark in hydrogen ion concentration units. It continually encompasses a glass conductor and a reference conductor.

The glass conductor to measure the hydrogen ion concentration encompasses a glass bulb specifically designed to be selective to hydrogen-ion concentration. Temperature is one among the foremost oft calculated variables and sensing will be created either through straight contact with the heating basis or remotely, while not straight contact with the premise victimization radiated energy in its place. The motor will be used pump water used for industrial purpose and former. The hydrogen ion concentration and temperature is high the motor will be off victimization the web site. Arduino board designs use a variety of microprocessors and controller. GSM is also a digital mobile telecommunication equipment that is wide utilised within the globe. The GSM module will send the worth of hydrogen ion concentration, hardness and temperature to the mobile[7].

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II. LITERATURE SURVEY

[1] Water pollution is one of the biggest fears for the green globalization. In order to ensure the safe supply of the drinking water the quality needs to be monitor in real time. An IoT is design and development of a low cost system for real time monitoring of the water quality. The system consist of several sensors is used to measuring physical and chemical parameters of the water. The parameters such as temperature, pH, turbidity, flow sensor of the water can be measured. The measured values from the sensors can be processed by the core controller. The Arduino model can be used as a core controller. Finally, the sensor data can be viewed on internet using WI-FI system.

[2] In today's world, IoT and Remote Sensing (RS) techniques are being used in different areas of research for monitoring, collecting and analyzing data from remote locations. Drinking water is a very precious commodity for all human beings as drinking water utilities face a lot of new challenges in real-time operation. These challenges originate because of limited water resources, growing population, etc. Therefore, there is a need for better methodologies to monitor the water quality. In order to ensure the safe supply of drinking water the quality needs to be monitored in real-time. The design and development of a low cost system for real monitoring of water quality in an IoT environment. The system consists of several sensors which are used for measuring physical and chemical parameters of water. The parameters such as temperature, pH, conductivity, dissolved oxygen of the water can be measured. Using this system a person can detect pollutants from a water body from anywhere in the world.

[3] Water is a fuel of life and no lives exist without water on this earth planet. The water has to be monitored regularly using smart technologies. There are various purification technologies proposed for monitoring of drinking water, but the hazards of different category are mixed with the drinking water which comes through industrialization, globalization, urbanization, agriculture etc. Hence, the water quality is needed to be monitored at different places in one stretch to avoid pollution in IoT environment. The IoT has the potential to revolutionize the water industry, as more of its technology is connected to the web. Sensor based smart water meters are a form of IoT, a network of technologies which can monitor the position of physical objects, capture meaningful data and communicate that data over a wireless network to a software application for analysis on a computer in the cloud. Technologies are capable of monitoring objects such as smart water meters and other electronic devices, organisms or a natural part of the environment such as an area of ground to be measured for moisture or chemical content. This paper tells about low cost system that checks the water quality using different sensors, Raspberry pi-module. In the experiment, the output of the sensor will be uploaded to the cloud. Further, from the cloud the data will be examined by Water Monitoring Board (WMB) to know about the contamination and also to send the report. Finally, the uploaded data will be put into public domain; if it is not managed properly by the concerned authorities. In conclusion, the implementation of the proposed sensor based smart meter and other IoT networks can facilitate the data on water quality which can provide actionable information to regulatory authorities for determining compliance by residential, agricultural and other business water users as well as by parties in the water infrastructure. The data can be the basis for enforcement actions so it must be reliable for real time monitoring of water quality parameters in IoT environment through the proposed low cost system.

[4] To ensure the safe supply of drinking water the quality should be monitored in real time for that purpose new approach IoT based water quality monitoring has been proposed. An IoT based water quality monitoring system that monitor the quality of water in real time. This system consist of some sensors which measure the water quality parameter such as pH, turbidity, conductivity, dissolved oxygen, temperature. The measured values from the sensors are processed by microcontroller and this processed values are transmitted remotely to the core controller that is raspberry pi using zigbee protocol. Finally, sensors data can view on internet browser application using cloud computing.

[5] Drinking water varies from place to place, depending on the condition of the source water from which it is drawn and the treatment it receives, but it must meet Environmental Protection Agency (EPA) regulation. The traditional method of testing Turbidity, pH & Temperature is to collect samples manually and then send them to laboratory for analysis. However, it has been unable to meet the demands of water quality monitoring today. So a set of Monitoring of Turbidity, pH & Temperature of Water quality has been developed. The system consists of Turbidity, pH & Temperature sensor of water quality testing, single-chip microcontroller data acquisition module, information transmission module, monitoring center and other accessories. Turbidity, pH & Temperature of water are automatically detected under the control of single chip microcontroller all day. The single chip gets the data, and then processes and analyzes them. If the water quality is abnormal, the data will be sent to monitoring center and alert the public at the same time. It is convenient for management to take corresponding measures timely and be able to detect real-time situation of water quality remotely. The system has realized the automation of water quality monitoring intelligence of data analyzing and networking of information transferring. It is characterized by advantages of shortcut, accuracy and using manpower and material resources sparingly. The technologies are having a high cost associated with installation and calibration of a large

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distributed array of monitoring sensors. The existing technology will be suitable for particular area but it is not suitable for large system.

III.EXISTING SYSTEM

The existing technology will be suitable for particular area, but it is not suitable for large system. Now a days many people suffering from a number of diseases which is only because of impure or unsafe drinking water. In that system they made water quality smart sensors. So the sensors send data wirelessly to the device which collects data from all the nodes.

A Water Quality Monitoring (WQM) system for an eliminating cost consuming jobs of manual monitoring. In this system the measured data of water quality monitoring sensors are collected by the data kit which gives data to the data processing unit through zigbee.

In data processing unit the data from different sensors are differentiated and it is continuously compared with the ideal parameters of the sensor value. If the water isn't meeting its quality parameter value, the alert signal is there which is connected to the buzzer. This system is not reliable for long distance also it will apply to only single unit of water source.

Water application and municipal water storage are gathered at the substation at which the data are processed.

This processed data are sent to the main station through Ethernet networks running on Transmission Control Protocol/Internet Protocol (TCP/IP) and from the main station that data is again differentiated and given to the environment department and public department using the internet. This system has increased data accuracy, reliability and efficiency, also it gives effective data management and fully integrated information systems.

But the drawback is that it cannot provide real time monitoring of water.

The node collects that receive from the different wireless sensor. The node is connected to the base station through the zigbee technology that powered by the solar panel. This system is low cost but if the solar panel cannot be charged because of the some environment effect then the system will stop working.

Every different system consists of some limitation though it cannot meet the aim of real-time, low-cost continuous monitoring of water quality parameters. So, to overcome all this limitation, that leads us to be developed and design the new methodology that will low-cost, real-time and user friendly.

IV.PROPOSED SYSTEM

Water pollution is one of the biggest fears for the green globalization. WQM System using GSM Service for the Aqua-Culture based Industries. This design, when implemented, helps in monitoring the water quality, via GSM (by SMS).

It is compulsory for an every officer from his industry to visit the ponds at a designated time and perform manual testing to measure the purity level of the water. But it is also known, that these kinds of techniques will consume more time and effort.

WQM system is focuses on developing prototypes that can evaluate data collected through these bases: Level of pH in water, Humidity in the water, Temperature level of the water. The sensors send data digitally to the Arduino kit which collects the data transmitted from all sensors.

The received digital data is processed by the data Arduino kit and processed data send to the database at which the processed data is compared with the tolerance value of that data.

If the water quality parameters cross their threshold value, then the alert message will be send using the GSM module, otherwise data keep continuously comparing with its tolerance value.

The ponds square measure isolated to villages and power-supply not accessible to the ponds, information assortment nodes aren't placed at the place.

The system is set up the receiver node at the info assortment center in villages or cities and aditionally send the warnings or a message to the farmers in unsanitary environmental conditions.

So, during this paradigm used the GSM modems for covers long vary communication. GSM electronic equipment features a SIM card, operates beneath a mobile operator, a bit like a movable. It supports the 2G, 3G technologies, HSUPA, UMTS, WCDMA and HSDPA, still because the GPRS and EDGE. GSM modems square measure embedded at each transmitter and receiver station.

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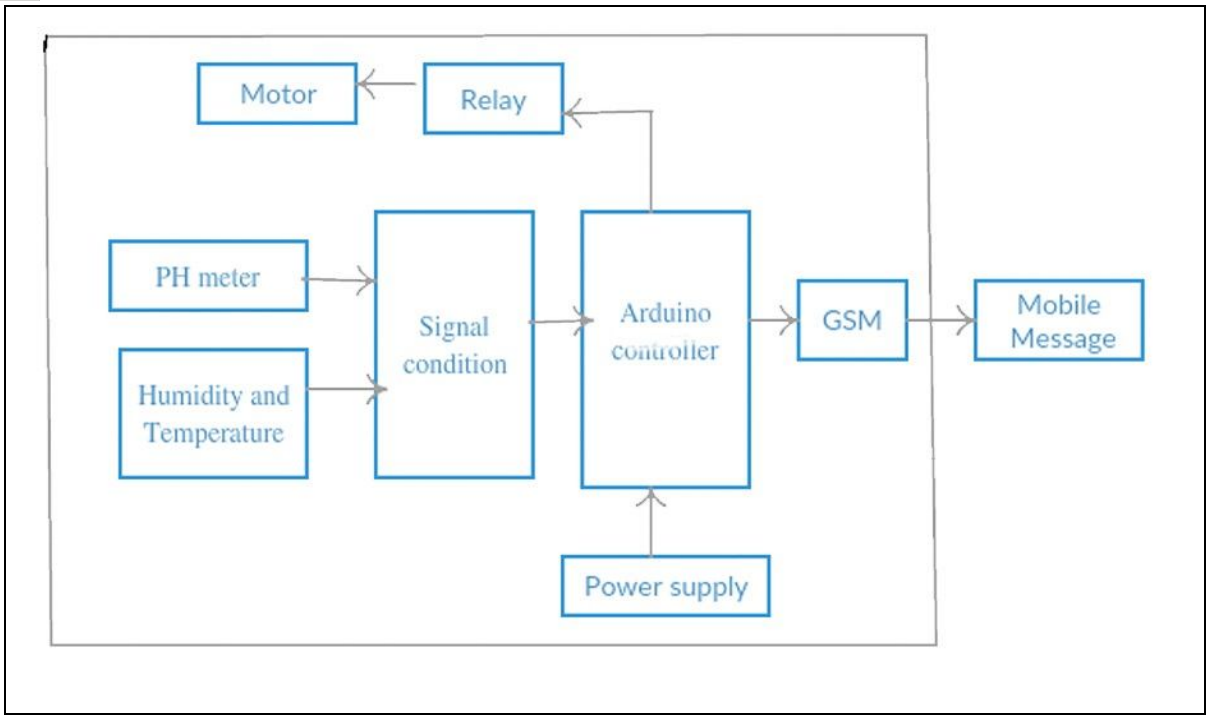


Fig.1 Architecture of Water Monitoring System

V. RESULTS AND DISCUSSION

The message from the GSM is sent to the industrial visitor and its contents of pH is normal or abnormal, temperature and humidity value. The motor is fixed in a place and it is controlled by the website application through on or off mode.

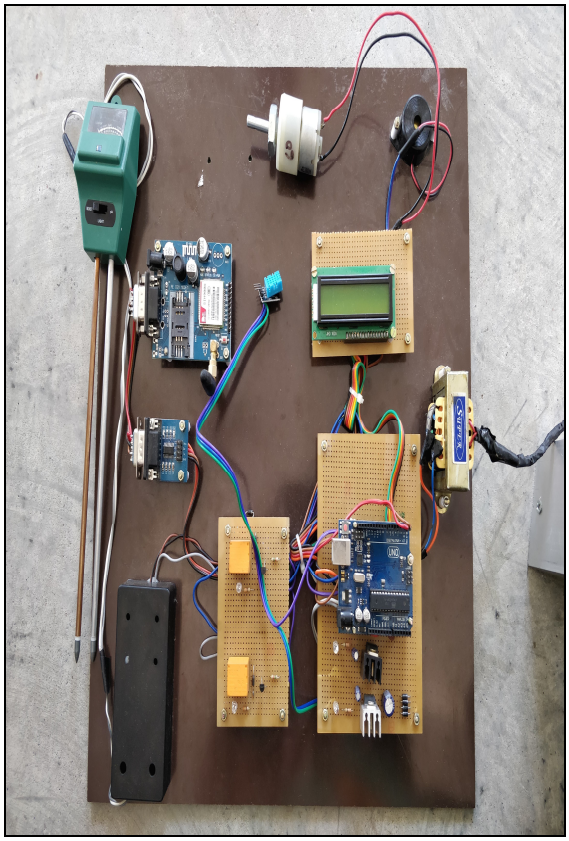


Fig.2 Output

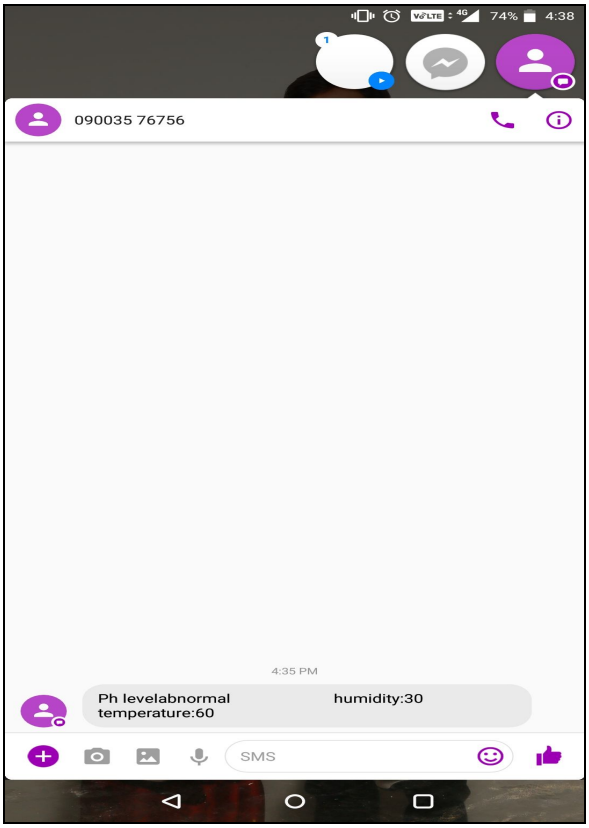


Fig.3 Mobile Message

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Fig.4 Motor on or off condition

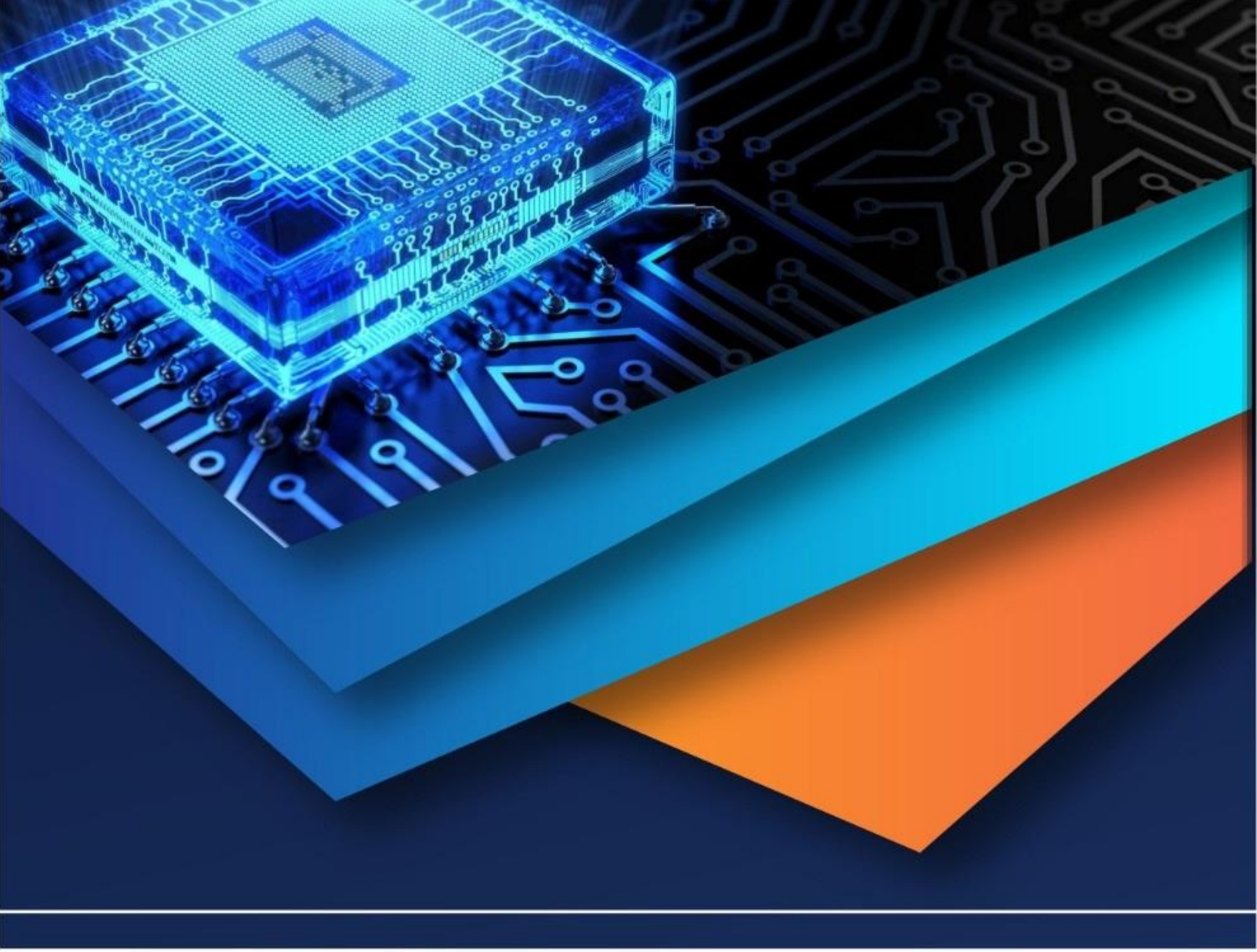
VI. CONCLUSION

Monitoring of pH scale, Humidity and Temperature of water makes use of water detection device with distinctive advantages and GSM network. The system will monitor water quality mechanically, and it's low in value and doesn't need folks on duty. Therefore the water quality testing is probably going to be additional economical, convenient and quick. The system has sensible flexibility solely by replacement the corresponding sensors and dynamical the relevant software package programs, this technique will be to monitor alternative water quality parameters. The operation is straightforward. The system may be expanded to watch hydrologic, pollution, industrial and agricultural production and then on. It is widespread application and extension price. By keeping the embedded devices within the atmosphere for observance permits the self protection of the atmosphere. To implement this got to deploy the sensing element devices within the atmosphere for collection the info and analysis. By deploying sensing element devices within the atmosphere, it will bring the atmosphere into the real world, i.e. it will move with different objects through the network.

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