

The Design of Food Quality supervision Platform Based On The Internet of Things

^[1] C.Geetha, ^[2] Lakshmi Kanth Reddy.K, ^[3] Hariteja.G,

^[1] Assistant Professor, Department Of Cse, Biher,Bist,Chennai,Tn,India

^[2] ^[3] UG Student, Department Of Cse, Biher,Bist,Chennai,Tn,India

Abstract: Remote sensor frameworks have a strong impact wherever all through the world over the wired frameworks in light of the progression of new models and advancements from the latest decades. Remote sensor frameworks are used as a piece of a broad assortment of uses including remote Monitoring, social protection, present day robotization or biological watching. Each WSN may have specific goals and application targets. Here we will likely ensure most outrageous quality and minimum crumbling of the set away food in sustenance industry, by keeping up and checking of the temperature sensor, sogginess sensor, gas sensor, level sensor and shading sensor of the earth. Substantial data starts from temperature, moisture,gas and shading sensors of different zones, where sustenance is secured and got at the gatherer. WSN is figured by a social occasion of sensor centers outfitted with short-go correspondence capacity. Every sensor center point contains no not as much as a handset, a taking care of unit, a transducer and a power unit. New gages and advances like web of things, having a specific parameter of low power use, are used for short range remote trades. This paper gives the implementationof checking and controlling of sensors using first class board raspberry pi.

I. INTRODUCTION

A sustenance sullying can occur in the creation method, yet also a generous part caused by the inefficient food managing because of wrong encompassing conditions when the sustenance is being transported and secured. There are numerous segments provoking food hurting, usually changes in temperature and dampness are essential factors. So the watching structure fit for measuring temperature and clamminess irregularity in the midst of transport and limit is of prime criticalness. Today for all intents and purposes everybody is getting influenced by the food they use, it's about the rubbish sustenance, and all the squeezed supports, vegetables, things ate up and used as a piece of step by step life, as each one of them don't offer quality since their temperature, sogginess, oxygen content move sometimes. Prevailing piece of purchasers simply concentrate on the information gave on the packaging, i.e. the measure of fixings used and their dietary regard anyway they neglect that they are erratically taking a risk with their prosperity by slighting the biological conditions to which these packs are subjected. Every thing making firm essentially need to attract a regularly expanding number of costumers towards them their guideline method of reasoning is to offer the thing at any rate like by including more flavors, shading chemicals and added substances to fabricate the taste and appearance anyway they disregard that these money making systems are truly impacting the purchasers prosperity.

To ensure sustenance security it should be seen at each period of stock system. It fills the need of preventive purchaser prosperity security by keeping up the required standard encompassing conditions anticipated that would spare the idea of sustenance. The execution and examination of routine estimations, went for distinguishing changes in the supporting or prosperity status of the sustenance doesn't guarantee that. Assessments of food and supplement affirmations describes by the right standard of characteristics that has been settled by the sustenance prosperity relationship so as to recognize potential nutritious insufficiencies and uncivilized support use plans. This fuses issues specific to the dispersion focus or cool storing watching where it must be fittingly checked at every movement. Support and sustenance watching and surveillance incorporates unending depiction of the portions of the food and sustenance structure for the explanations behind masterminding, approach examination, program appraisal and example envisioning. Information accumulated through checking and surveillance must be bankrupt down and transmitted to pioneers in a reasonable arrangement and in an advantageous way if it is to be of honest to goodness regard. Dispersal of information must be a shrewd methodology. Therefore, Integration of the sensors with remote web server for data logging and an item application which grants scattering of data log additionally prepared messages is the need of incredible significance. Consistent customer see instrument is also required to ensure provoke preventive action.

II. LITERATURE SURVEY

Mirjana maksimovic, Vuka karadzica, Enisa Omanovic

Nourishment wellbeing is a logical field which incorporates various schedules and examinations at each phase of the natural pecking order that ought to be received to maintain a strategic distance from conceivably hazardous wellbeing dangers. Novel and proficient arrangements over the inventory network are the result of steady updates of data and correspondence advances. With the assistance of web of things (IoT) associated testing gear, nourishment quality can be observed anytime from ranch to table, interfacing in the meantime sustenance makers, transportation and friendliness/retail organizations. Depending on the way that nourishment transporting and bundling units are the most basic focuses in sustenance generation, the study of IoT applications in sustenance bundling and transportation is given in this paper. To show the importance of IoT apparatus and characterized ideas, a proposition of ease arrangement in view of IoT for ongoing nourishment traceability and observing in sustenance transportation process is exhibited.

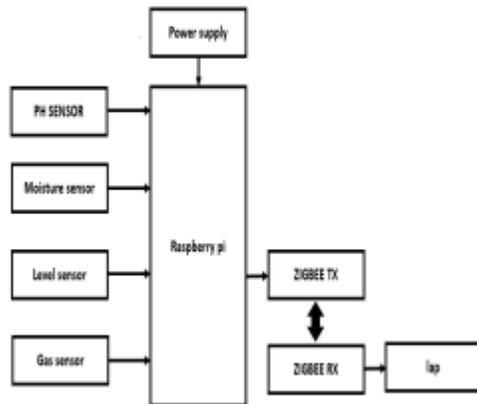
III. EXISTING SYSTEM

The existing system consists of two wireless sensor networks based on Zigbee and Bluetooth. The heart of the system is the microcontroller, which controls both of the networks by relay switching. A relay is connected with the microcontroller, when the relay is on, wireless sensor network based on Bluetooth works and when it is off, then the network based on Zigbee works. Different sensors like temperature and humidity sensors are used to measure the temperature and humidity of the environment. After measuring the temperature and humidity, the data is sent to the monitoring unit, where the data is recorded. If the temperature or the humidity of the environment increases from a particular point, then we can control the temperature or humidity wirelessly.

IV. PROPOSED SYSTEM

- The PH sensor is used to identify the PH level of a liquid content
- Moisture sensor is used to identify the environment moisture content
- Temperature sensor is used to identify the food and external environment level
- Colour sensor is used to identify the food colour to find whether it is good texture or not
- Gas sensor used to identify the rotten smell in food
- This sensor data is getting analysed through single board computer called raspberry pi and it send data to cloud if any of the sensor value is critical it send the Gmail alert using SMTP library and message alert through IP protocol
- And finally send the data to the monitoring section through wireless using Zigbee transmitter

BLOCK DIAGRAM



RASPBERRY PI

The Raspberry Pi is a series of credit card-sized single-board computers developed in the United Kingdom by the Raspberry Pi Foundation with the intention of promoting the teaching of basic computer science in schools and developing countries. The original Raspberry Pi and Raspberry Pi 2 are manufactured in several board configurations through licensed manufacturing agreements with Newark element14 (Premier Farnell), RS Components and Egoman. These companies sell the Raspberry Pi online. Egoman produces a version for distribution solely in Taiwan, which can be distinguished from other Pis by their red colouring and lack of FCC/CE marks.

The hardware is the same across all manufacturers. The original Raspberry Pi is based on the Broadcom BCM2835 system on a chip (SoC), which includes an ARM1176JZF-S 700 MHz processor, VideoCore IV GPU, and was originally shipped with 256 megabytes of RAM, later upgraded (models B and B+) to 512 MB. The system has Secure Digital (SD) (models A and B) or MicroSD (models A+ and B+) sockets for boot media and persistent storage. In 2014, the Raspberry Pi Foundation launched the Compute Module, which packages a BCM2835 with 512 MB RAM and an eMMC flash chip into a module for use as a part of embedded systems.

The Foundation provides Debian and Arch Linux ARM distributions for download. Tools are available for Python as the main programming language, with support for BBC BASIC (via the RISC OS image or the Brandy Basic clone for Linux), C, C++, Java, Perl and Ruby. As of 8 June 2015, about five to six million Raspberry Pis have been sold. While already the fastest selling British personal computer, it has also shipped the second largest number of units behind the

Amstrad PCW, the "Personal Computer Word-processor", which sold eight million. In early February 2015, the next-generation Raspberry Pi 2, was released.

The new computer board is initially available only in one configuration (model B) and features a Broadcom BCM2836 SoC, with a quad-core ARM Cortex-A7 CPU and a VideoCore IV dual-core GPU; 1 GB of RAM with remaining specifications being similar to those of the previous generation model B+. The Raspberry Pi 2 retains the same US\$35 price point of the model B, with the US\$20 model A+ remaining on sale.

Hardware



The Raspberry Pi hardware has evolved through several versions that feature variations in hardware performance, memory capacity, and peripheral device support. This block diagram depicts models A, B, A+, and B+. Model A and A+ lack the Ethernet and USB hub components. The Ethernet adapter is connected to an additional USB port. In model A and A+ the USB port is connected directly to the SoC. On model B+ the chip contains a five-point USB hub, of which four ports are available,

V. MODULE DESCRIPTION

GAS SENSOR

In current technology scenario, monitoring of gases produced is very important. From home appliances such as air conditioners to electric chimneys and safety systems at industries monitoring of gases is very crucial. **Gas sensors** are very important part of such systems. Small like a nose, gas sensors spontaneously react to the gas present, thus keeping the system updated about any alterations that occur in the concentration of molecules at gaseous state.

Gas sensors are available in wide specifications depending on the sensitivity levels, type of gas to be sensed, physical dimensions and numerous other factors. This Insight covers a **methane gas sensor** that can sense gases such as ammonia which might get produced from methane. When a gas interacts with this sensor, it is first ionized into its constituents and is then adsorbed by the sensing element. This adsorption creates a potential difference on the element which is conveyed to the processor unit through output pins in form of current. What is this sensing element? Is it kept in some chamber or is kept exposed? How does it get current and how it is taken out? Let's find out in this Insight!!!



LEVEL SENSOR:



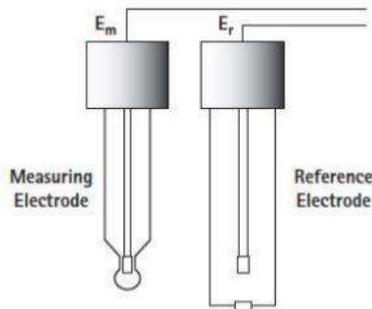
THE pH SENSOR

pH Electrodes

A pH electrode assembly, or sensor, consists of two primary parts:

- Measuring electrode: The measuring electrode is sometimes called the glass electrode, and is also referred to as a membrane or active electrode.

- Reference electrode: The reference electrode is also referred to as a standard electrode.

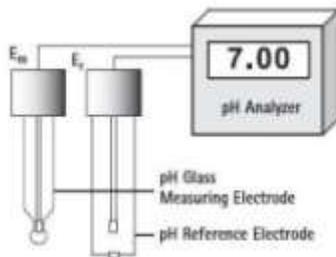


The pH measurement is comprised of two half-cell, or electrode, potentials. One half-cell is the pH sensitive glass measuring electrode and the other is the reference electrode. Just as the two half-cell potentials of a battery are required to complete a circuit so does a pH sensor .

The mathematical expression for this is:

$$E = E_m - E_r$$

This type of measurement, in millivolts, is called a potentiometric measurement . Since voltage-measuring devices only determine differences in potentials, there is no method for determining the potential of a single electrode. A galvanic measurement circuit is formed by connecting the measuring electrode (half-cell potential) and the reference electrode (half-cell potential) to the signal input of the measuring device. At the reference electrode, there is a solid/solution interface, where a chemical reaction takes place. This enables an electrical current to flow through the measuring device, the pH meter, which allows the reading to be made.



Since the current that passes through the half-cells and the solution being measured is extremely small, the pH meter must have a high internal impedance, so it does not "drag down" the millivolt potential produced by the electrodes. This low current flow ensures that the chemical characteristics of the solution being measured remains unaltered.

A galvanic potential is formed when charge exchanges occur at the phase boundaries of the glass measuring electrode. In effect, the pH sensor assembly forms a galvanic cell using two metal conductors—lead wires of the measuring and reference electrodes interconnected through their respective electrolyte solutions—and the media. Since phase boundaries cannot be measured individually and there are always more than two phase boundaries present, the pH meter measures the overall potential. The overall potential is comprised of the following elements:

- Metal lead-out wire of the measuring electrode
- Electrolyte of the measuring electrode
- Diffusion potentials at solid/solution interfaces
- Electrolyte of the reference electrode
- Metal lead-out wire of the reference electrode

The measuring and reference electrodes can be in one of two forms: two physically separate electrodes, known as an electrode pair; or the electrodes can be joined together in a single glass body assembly known as a combination electrode .

Thermal: Two thermal sensors conduct electricity based upon the humidity of the surrounding air. One sensor is encased in dry nitrogen while the other measures ambient air. The difference between the two measures the humidity

VI. CONCLUSION

The proposed systems in this paper mainly focus of preserving the food material by applying various techniques and analysis which includes monitoring and safety. We will be taking care to use and design more sensors that could be integrated for the food industry for cold storage or warehouse with the small testing unit features so as to prevent damage to food products with proper monitoring analysis according to surrounding conditions to contamination and degradation. In future we will be taken care to implement for more dipping sensors with the graphs and plots to be used at the user or remote end with the proper integration of all the log files of data values taking from sensors and sent wirelessly over the server so as to be taken and used by another controlling or remote unit in a range or over the internet.

REFERENCES

- [1] Ki-hwanEom, Chang Won Lee, Nghia Truong Van, Kyung Kwon Jung, JooWoong Kim And Woo Seung Choi “Food Poisoning Prevention Monitoring System Based On The Smart RFID Tag System” InInternational Journal Of Multimedia And Ubiquitous Engineering Vol.8, No.5 (2013), Pp.213-222
- [2] Kong Xiangsheng Xinxiang University, Xinxiang, China “Design And Implementation Of Food Monitoring System Based On Wsn”
- [3] Karleigh Huff “Active And Intelligent Packaging: Innovations For The Future” Graduate Student Department Of Food Science And Technology Virginia Polytechnic Institute And State University (Virginia Tech) Blacksburg
- [4] “Food Borne Patogen Detection” In Adv. J. Food Sci. Technol., 6(11): 1241-1248, 2014
- [5] Evangelyn C. Alocilja, Member, IEEE, Nichole L. Ritchie, And Daniel L. Grooms “ Protocol Development Using An Electronic Nose For Differentiating E. Coli Strains” IEEE SENSORS JOURNAL, VOL. 3, No. 6, December 2003
- [6] Kang Along, Zhang Chenrui, ZongweiLuo, Lai Xiaozheng, Han Tao “ SAWRFID Enabled Multi-functional Sensors For Food Safety Applications” Program For The IEEE International Conference On Rfid-technology And Applications, 17 - 19 June 2010 Guangzhou, China
- [7] P.-Y. Cresson , C. Ricardi , L. Dubois , S. Vaucher , T. Lasri , J. Pribetich «Temperature Measurement By Microwave Radiometry” I2MTC 2008 - IEEE International Instrumentation And Measurement Technology Conference Victoria, Vancouver Island, Canada, May 12-15, 2008
- [8] Ove Schimmer¹, Frank Daschner² And Reinhard Knöchel „Uwb-sensors In Food Quality Management – The Way From The Concept To Market” PROCEEDINGS OF THE 2008 IEEE INTERNATIONAL CONFERENCE ON ULTRAWIDEBAND (ICUWB2008), VOL. 2
- [9] Zhibo Pang, Jun Chen, Zhi Zhang, Qiang Chen, LirongZheng “ Global Fresh Food Tracking Service Enabled By Wide Area Wireless Sensor Network “

- [10] Fojan P, Jensen KR And Gurevich“ Label-free Detection Of Biomolecular Interaction – DNA - Antimicrobial Peptide Binding “ 978-1-4577-0787-2/11/\$26.00 ©2011 IEEE
- [11] Dr. Jiten Ch. Dutta “Ion Sensitive Field Effect Transistor For Applications In Bioelectronic Sensors: A Research Review” Cisp2012[proceedings|185
- [12] Lei Wan¹, Yajie Qin¹, Patrick Chiang^{1, 2}, Guoping Chen¹, Ran Liu¹, ZhiliangHong¹ “High-Sensitivity Photodetection Sensor Front-End, Detecting Organophosphorous Compounds for Food Safety”
- [13] HuyQuoc Nguyen, BaoQuoc Ta, Nils Hoivik, EinarHalvorsen, and Knut E. Aasmundtveit “ Carbon Nanotube Based Gas Sensor for Expiration Detection of Perishable Food” Proceedings of the 13th IEEE International Conference on Nanotechnology Beijing, China, August 5-8, 2013
- [14] Dr.M.S.Saravanan, Jeyanta Kumar Singh, N.Thirumoorthy “RFID Sensors for Food Safety Centre by Identifying the Physical Factors that Affecting the Food”
- [15] Alok Shah* and OP Chauhan, “Applications of Bio-sensors in Agri-food industry and mitigation of bio-threat paradigm” Proceedings of the 2015 2nd International Symposium on Physics and Technology of Sensors, 8-10th March, 2015, Pune, India.

