***REAL-TIME MONITORING AND AUTOMATED BOOKING OF HOUSEHOLD PRODUCTS***

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***Abstract---* Now a days, things are changing rapidly in this ultra-modern world. Many machines have been developed which make human life easier. Now, people are getting so much busy in their day-to-day work. People think that there should be a technology that will reduce their work load. Internet of Things fulfils this requirement of people. We proposed the design and construction of an automated product purchasing system based upon their weight. In household needs like gas, water and monthly purchasable things purchased on measuring kilograms criteria. We have deployed the automatic system that would continuously monitoring the weight of those products if any one product is found to be reduced in their weight, system automatically alerts the server about that item which is need to be purchased or booked. From android side user would be able to view that indication alert and booking history of the items purchased.**

**The project intends to make use of Arduino to enable the server to continuously monitor the weight of the household commodities with the help of a load cell and automatically make booking to the corresponding seller of that corresponding commodity.**

***Keywords—automation; booking; weight monitoring;***

1. INTRODUCTION

Now a days, things are changing rapidly in the world. Many machines are developed which makes human life easier. Now, people are so much busy in their work. People think that there should be a technology that will reduce their work load. Internet of Thing fulfils this requirement of people. We proposed the design and construction of an automated product purchasing system based upon their weight. In household needs like gas, water and monthly purchasable things purchased on measuring kilograms criteria. We deployed the automatic system that was continuously monitoring the weight of those products if any one products reduced in their weight system automatically alert server about that item which is need to purchase and book. From android side user view that indication alert and order required item.

Household items weight are measured, each items having individual weight in its own when those all full. On every day usage it may get reduced day by day. Weights of those products are monitored by load cell sensing unit. Load cell connected with microcontroller, which monitor the sensor value and calculate the weight of the product. When product weight gone below minimum level alert message is given to android mobile through Zigbee. Zigbee is connected with microcontroller and receiver Zigbee connected along with mobile by OTG cable. In user mobile receive the alert message, user placed the order based on requirement. Payment also done through mobile.

1. REVIEW OF RELATED WORK

Paper 1: “An Improved Real-Time Surveillance System For Home Security System Using Beagleboard SBC, Zigbee And FTP Webserver”,Rakesh V S,Sreesh P R Sudhish N George, 978-1-4673-2272-0/12,2012 IEEE.

**Description:**

Real-time surveillance is an important aspect of an intelligent building with modern security demands. The proposed system implements an embedded system for monitoring wireless sensor nodes and camera installed inside a building for security surveillance. A number of surveillance devices in a Zigbee protocol (IEEE 802.15.4) based wireless network are connected to a BeagleBoard Single Board Computer (SBC) based surveillance management system. Remote alerting on fire and intruder detection are the key features of the system. When smoke or intruder movement is detected, the system sends warning messages through Short Message Service (SMS) to cell phones, starts capturing real-time video for fixed duration and makes the alarm on. The captured video clip is immediately uploaded to an FTP (File Transfer Protocol) webserver so that it can be retrieved later from anywhere around the world. The advantages of the system are that it guarantees reliability by integrating various components of a security system (sensors, alarm, camera, wireless connectivity etc.) and utilizes an FTP server for camera feeds.

Paper 2: “Automatic LPG Gas Cylinder Booking Software and Weight Measurement Using Load Cell & GSM”,Prof.P.S.Sonawane, Darade Pooja, Kankrale Pratiksha, *IOSR Journal of Electronics and Communication Engineering (IOSR-JECE)*

**Description:**

Liquefied petroleum gas (LPG) is the most important part of domestic daily human life but the safety of human life is required for gas explosion. This methodology are used to gives the protection to human life. When there is a gas leaked by using automatic indication.it also provide the feature for automatic LPG gas booking when owner is busy and measure continues weight of LPG cylinder using load cell. Keywords: ARM7 microcontroller, LCD display, GSM module, Load cell, MQ6 gas sensor.

Paper 3: “ IoT applications on Secure Smart Shopping System”,Ruinian Li, Tianyi Song, Nicholas Capurso, Jiguo Yu, Jason Couture, and Xiuzhen Cheng,2016 IEEE.

**Description:**

The Internet of Things (IoT) is changing human lives by connecting everyday objects together. For example, in a grocery store all items can be connected with each other, forming a smart shopping system. In such an IoT system, an inexpensive RFID tag can be attached to each product which, when placed into a smart shopping cart, can be automatically read by a cart equipped with an RFID reader. As a result, billing can be conducted from the shopping cart itself, preventing customers from waiting in a long queue at checkout. Additionally, smart shelving can be added into this system, equipped with RFID readers, and can monitor stock, perhaps also updating a central server. Another benefit of this kind of system is that inventory management becomes much easier, as all items can be automatically read by an RFID reader instead of manually scanned by a laborer. To validate the feasibility of such a system, in this work we identify the design requirements of a smart shopping system, build a prototype system to test functionality, and design a secure communication protocol to make the system practical. To the best of our knowledge, this is the first time a smart shopping system is proposed with security under consideration.

paper 4 : “Mobile Application for Creating Presence Lists”,Zuzana VANTOVÁ, Ján PARALI, Vladimír GAŠPAR,IEEE 15th International Symposium on Applied Machine Intelligence and Informatics , 2017

**Description:**

This paper presents an application for managing education by creating presence lists. An administration application has also been created in order to allow manipulating with the content of the enumerables in the presence lists. Overviews of possible solutions are presented. Our main motivation was to provide secure and reliable way of evaluating student attendance on specific lectures. In order to accomplish this task, we utilized the NFC technology on a smartphone and student ISIC ID card, the ownership of which is compulsory for every university student at the Technical University of Košice. The application has been implemented for specific conditions at the Technical University of Košice

1. OUTLINE OF THE PROJECT:

The main aim of the project is to automate the daily day-to-day activities which involve manual intervention and can be automated. This could reduce the strain, in keeping track of the quantities of the daily household commodities and having to manually order them. This could ensure that none of the household commodities go out of stock.

Household items weight are measured, each items having individual weight in its own when those all full. On every day usage it may get reduced day by day. Weights of those products are monitored by load cell sensing unit. Load cell connected with microcontroller, which monitor the sensor value and calculate the weight of the product. When product weight gone below minimum level alert message is given to android mobile through Zigbee. Zigbee is connected with microcontroller and receiver Zigbee connected along with mobile by OTG cable. In user mobile receive the alert message, user placed the order based on requirement. Payment also done through mobile.

1. EXISTING SYSTEM

In Existing system**,** Every products of home is purchased after manually check. User check the came to when it’s almost empty its takes some time to deliver. In monthly base purchase need to take list then only purchase order raised.Although the current system keeps track of the quantities of the household products, it does not connect with the suppliers to place the order, to fully automate the process of booking.

**DRAWBACKS OF EXISTING SYSTEM:**

Although the existing system is able to measure the weight of the products it is not able to automatically place orders to the corresponding vendors. Further the existing system is unable to monitor the weight continuously.

1. PROPOSED SYSTEM

In our proposed system household items weight are measured, each items having individual weight in its own when those all full. On every day usage it may get reduced day by day. Weights of those products are monitored by load cell sensing unit. Load cell connected with microcontroller, which monitor the sensor value and calculate the weight of the product. When product weight gone below minimum level alert message is given to android mobile through Zigbee. Zigbee is connected with microcontroller and receiver Zigbee connected along with mobile by OTG cable. In user mobile receive the alert message, user placed the order based on requirement. Payment also done through mobile.

*ADVANTAGES:*

* Arduino simplifies the amount of hardware and software development you need to do in order to get a system running.
* The Arduino hardware platform already has the power and reset circuitry setup as well as circuitry to program and communicate with the microcontroller over USB.

1. ARCHITECTURE DIAGRAM

Major Parts:

* Ardiuno
* Zigbee Module
* Load cell sensors
* Power supply

**Arduino Micro-Controller**

**Power supply 5v**

**ZIGBEE**

**Load cell sensor**

Figure1: architecture of Automatic booking system WORKING

### PERIPHERALS

Embedded Systems talk with the outside world via [peripherals](http://en.wikipedia.org/wiki/Peripheral), such as:

* Serial Communication Interfaces (SCI): [RS-232](http://en.wikipedia.org/wiki/RS-232), [RS-422](http://en.wikipedia.org/wiki/RS-422), [RS-485](http://en.wikipedia.org/wiki/RS-485) etc
* Synchronous Serial Communication Interface: [I2C](http://en.wikipedia.org/wiki/I2C), [SPI](http://en.wikipedia.org/wiki/Serial_Peripheral_Interface_Bus), SSC and ESSI (Enhanced Synchronous Serial Interface)
* [Universal Serial Bus](http://en.wikipedia.org/wiki/Universal_Serial_Bus) (USB)
* Multi Media Cards (SD Cards, Compact Flash etc)
* Networks: [Ethernet](http://en.wikipedia.org/wiki/Ethernet), [Controller Area Network](http://en.wikipedia.org/wiki/Controller_Area_Network), [LonWorks](http://en.wikipedia.org/wiki/LonWorks), etc
* Timers: [PLL](http://en.wikipedia.org/wiki/PLL)(s), Capture/Compare and [Time Processing Units](http://en.wikipedia.org/wiki/Time_Processing_Unit)
* Discrete IO: aka [General Purpose Input/Output](http://en.wikipedia.org/wiki/General_Purpose_Input/Output) (GPIO)
* Analog to Digital/Digital to Analog ([ADC](http://en.wikipedia.org/wiki/Analog-to-digital_converter)/[DAC](http://en.wikipedia.org/wiki/Digital-to-analog_converter))
* Debugging: [JTAG](http://en.wikipedia.org/wiki/JTAG), [ISP](http://en.wikipedia.org/wiki/In-System_Programming), [ICSP](http://en.wikipedia.org/wiki/In_Circuit_Serial_Programming_%28ICSP%29), [BDM](http://en.wikipedia.org/wiki/Background_Debug_Mode_interface) Port, BITP DP9 port

**SENSORS**

Sensors are devices (usually electro-mechanical) which help us measure a physical parameter (such as temperature, pressure, force, acceleration etc.) by providing a signal that either quantitatively measures (level) that physical parameter or provides a simple binary signal that indicates a yes/no signal that tells us if something occurred or not (such as a touch sensor). Most sensors require power to be provided to a sensing element and an electrical signal is then generated after the measurement.

**ZIGBEE**

ZigBee is a wireless technology developed as an open global standard to address the unique needs of low-cost, low-power wireless M2M networks. The ZigBee standard operates on the IEEE 802.15.4 physical radio specification and operates in unlicensed bands including 2.4 GHz, 900 MHz and 868 MHz.

The 802.15.4 specification upon which the ZigBee stack operates gained ratification by the Institute of Electrical and Electronics Engineers (IEEE) in 2003. The specification is a packet-based radio protocol intended for low-cost, battery-operated devices. The protocol allows devices to communicate in a variety of network topologies and can have battery life lasting several years.

**ARDUINO**

Arduino is an open-source computer hardware and software company, project and user community that designs and manufactures microcontroller-based kits for building digital devices and interactive objects that can sense and control objects in the physical world.

The project is based on microcontroller board designs, manufactured by several vendors, using various microcontrollers. These systems provide sets of digital and analog I/O pins that can be interfaced to various expansion boards ("shields") and other circuits. The boards feature serial communications interfaces, including USB on some models, for loading programs from personal computers.

The first Arduino was introduced in 2005, aiming to provide an inexpensive and easy way for novices and professionals to create devices that interact with their environment using sensors and actuators. Common examples of such devices intended for beginner hobbyists include simple robots, thermostats, and motion detectors.

**EMBEDDED HARDWARE INTERFACE:**

In this module, Embedded Hardware is connected with Load cell unit to measure the load of the object along with the Wifi Module which is used for communication. We use Arduino micro controller as the micro controller for effective hardware processing. Load cell unit is used for analysis of the weight of the corresponding item / object.

**ZIGBEE COMMUNICATION:**

ZigBee is a wireless technology developed as an open global standard to address the unique needs of low-cost, low-power wireless M2M networks. The ZigBee standard operates on the IEEE 802.15.4 physical radio specification and operates in unlicensed bands including 2.4 GHz, 900 MHz and 868 MHz . The ZigBee protocol was designed to provide an easy-to-use wireless data solution characterized by secure, reliable wireless network architectures. Support for multiple network topologies such as point-to-point, point-to-multipoint and mesh networks.

* Low duty cycle – provides long battery life
* Low latency
* Direct Sequence Spread Spectrum (DSSS) Up to 65,000 nodes per network
* 128-bit AES encryption for secure data connections, Collision avoidance, retries and acknowledgements.

1. CONCLUSION

Thus the project infer that automatic item booking using IOT. System will automatically book the items if that item is going to empty. So for that we are implementing automatic booking system for the house hold items. We are including android application for the purpose to know the booking details.

REFERENCES

[1] “An Improved Real-Time Surveillance System for Home Security System using BeagleBoard SBC, Zigbee and FTP Webserver”Author:Rakesh V S,Sreesh P R Sudhish N George, 978-1-4673-2272-0/12/$31.00 ©2012 IEEE

[2] “Automatic LPG Gas Cylinder Booking Software and Weight Measurement Using Load Cell & GSM.”*IOSR Journal of Electronics and Communication Engineering (IOSR-JECE)* Prof.P.S.Sonawane, Darade Pooja, Kankrale Pratiksha, Shah Rozmin

[3] “Energy Efficient Solar Based Digital Electronic Weighing Machine”Sandip N. Rikame,Student, E&TC Department Pradip W. Kulkarni ,HOD, E&TC Department 2014 5th International Conference on Computer and Communication Technology.

[4] “IoT applications on Secure Smart Shopping System”Ruinian Li1, Tianyi Song1, Nicholas Capurso, Jiguo Yu, Jason Couture, and Xiuzhen Cheng2016 IEEE.

[5] “Mobile Application for Creating Presence Lists”Author:Zuzana VANTOVÁ\*, Ján PARALISAMI 2017 • IEEE 15th International Symposium on Applied Machine Intelligence and Informatics • January 26-28, 2017 • Herl’any, Slovakia

[6] Balaa, A. "Geographic Information Systems in the Vehicle Tracking and Dispatch Industry: An Applied Experience" GeoVision SAL. Lebanon, Beirut.

[7] Yeung, A.K.W. & Hall, G.B. (2007). "Spatial Database Systems- Design, Implementation and Project Management." Springer, P.O. Box 17 3300 AA Dordrecht, The Netherlands.

[8] J.Refonaa and Dr. M. Lakshmi “Analysis and Prediction Of Natural Disaster Using Spatial Data Mining Technique”,IEEE Conference Publications, Pages:1-6,DOI: 10.1109/ICCPCT.2015.7159379.