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INTERNET OF THINGS FOR SMART HOMES

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***Abstract*—**
Someone would ask what is meant by a smart home. Smart home is all about how much an area is developed, the level of development decides the smartness of any place. Here come some aspects for any smart home. New and advance technology can play a big role in development of any area. In this paper we focus specifically On home automation by making use of communication technologies. But development should not harm any of the ecosystem, and environment. The aim of making any area or place smart is to provide core e-infrastructure and give a decent quality of life to its citizen. This paper hence provides some of the technologies for a smart home.

KEYWORDS :

Introduction

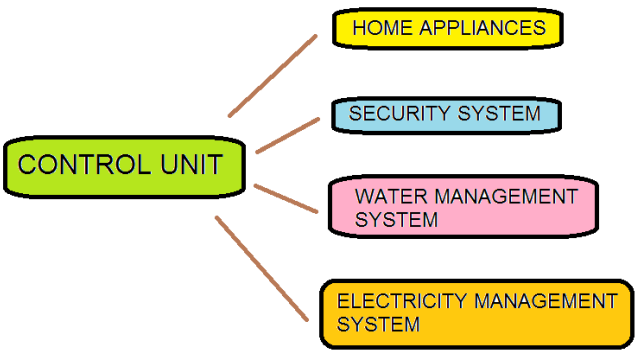
The objective of this paper is to present the basic idea of home automation and its aspects, some of its aspects are, security system, Electricity meter billing system, water management system, motion detectors, sensors and detectors for leakage of gas, control on home appliances, these aspects will be totally controlled by a Single module. The process of home automation is directly connected to computerization or automatic control on different electronics things of home. This paper will demonstrate a simple home which has a remote device controller and some client modules (home appliances). The client modules will communicate with controlling module which cans any simple controlling device or any smart phone having Bluetooth.
Smart home concepts and services

There are many small aspects in automation of home, but in this paper we will through light on some of the important topics which are needed for smart life in a smart home. These are some

- Water management system
- Electricity billing
- Home appliances and control system
- Home security
- Sensors and Detectors for leakage of gas

1. Home appliances and control system

Home Appliance Control System accessed by a remote device such as mobile phone or a palm-top to allow a home owner to control, monitor and coordinate home appliances. this control system Saves time, Save money (Long run), Self Maintenance, Security, Makes life easy.



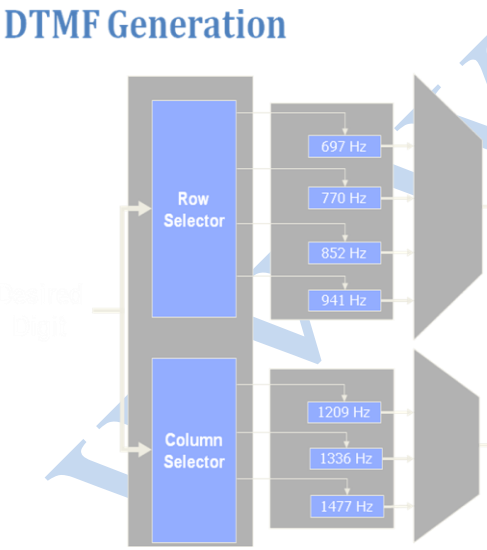
Home appliances can be controlled by using Bluetooth technology, or by wifi technology but these technology have a small range, so we will make use of smart phones This makes the use of DTMF(Dual Tone Multi Frequency) technique. The DTMF Decoder circuit is made using M8870 Decoder IC.Just connect your cell phone headset (headphone) jack to the mobile phone and then mobile control electrical appliances and electrical equipment via DTMF key pad of your cell phone.

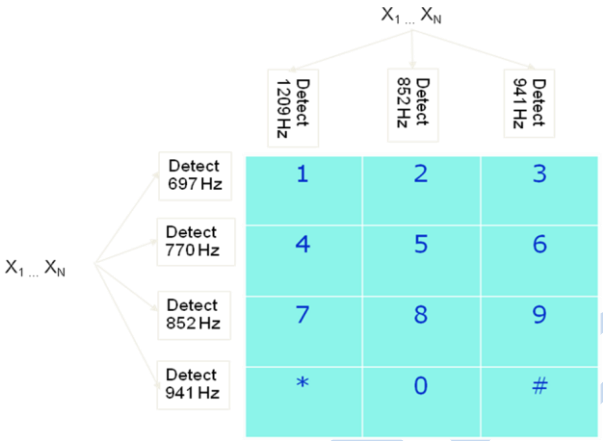
Components for DTMF system[1].

- Regulated power supply
- DTMF decoder IC (M-8870)
- Resistors
- Capacitors
- Crystal oscillator
- IC 7474 D flip flop
- Transistor
- Relay

Working

There is interface between appliances and smart phone for control. This network uses M-8870 DTMF decoder IC which decodes tone generated by the keypad of cell phone. When we press keys on pad of cell phone tones are generated and these tones are received at the other end. These signals are based on DTMF technology. The data is sent in terms of pair of tones. The receiver detects the right pair of tones and gives appropriate BCD code as output of DTMF decoder IC.





We are planning to control home appliances through one single device and appliances should change their operating conditions according to need of controlling device and also with respect to changing environment condition. Switching modes are also controlled by the controlling device.

Sometimes one can fail or forget to switch off the appliances so one can control the home appliances by staying outside the house using automation solution

2. Electricity Billing

- Billing system

Billing is a critical function of both the Electricity and the Water Boards towards getting a meter read. Meter reading, even though it looks simple, it involves a complex procedure that can give various problems. Most problems , currently seen, result from the manual processes followed. Calculation errors, delays in system updating and fault tracking issues are the major problems that companies find difficult to find answers for. This paper suggests a mobile based system to collect process and notify consumers about consumption. This system will be reliable, efficient and accurate to suit the requirements of these companies.

We are also planning to pay electricity bill automatically after the end of every month and bill receipt will be sent on account of that home. Here identification number are provided these numbers are used for billing purpose. The calculations of meter readings can be done by software based devices(low end microcontrollers) , these devices work automatically and the readings are perfect with a high accuracy.

3. Home security

The problem of security for home is one of the aspects of home automation here we are trying to make homes total secure. CCTV cameras are the first step for security, a new logical "face reading technique" in these cameras will make them more powerful in monitoring the area. If any new face is introduced then message will be automatically sent to owner of house. Now he can take help of neighbor or police according to his will. Further door lock systems and window

sensor systems will make home more secure. If anyone tries break in the houses, alert message will be sent to the owner and if required message can also be sent nearby police station.

Sensors and detectors

There will be well calibrated and coded sensors and detectors for the leakages, any minute leakage will be responded by sensor or detector and buzzers or alarm will be turned on and an ultimate alert message will be generated. These sensors and detectors are required to fit in different and important places of home so as to keep home secure from any disaster.

- **leakage of gas**

LPG gas leakage incident in homes is common in India every year hundreds of such cases are traced across the country bringing new digital technology to tackle it may be a good option

SYSTEM WORKING

Using low end microcontroller (AVR ,PIC etc)and LPG gas detector sensor MQ 2 ,MQ 6 sensors and processing the data using controller will transmit the data to the user mobiles .and for quick reaction buzzer can also be used.[2].

- **Water management system**

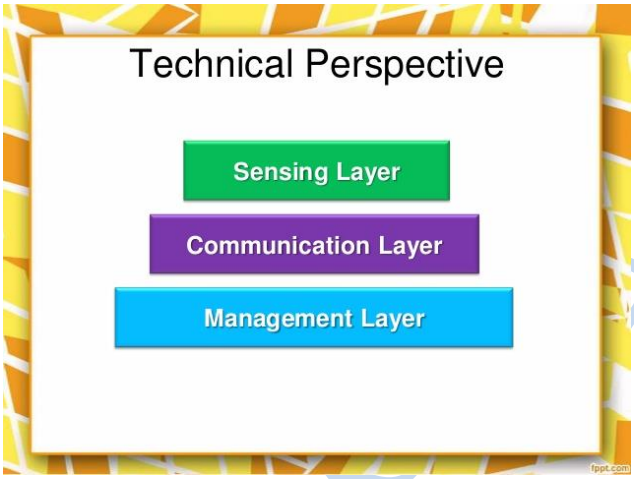
We are going to connect all homes or society together to a water supply meter management which will measure the quantity of water supplied and used by the citizen, there will be a quantity of water for which no bill is paid if user go beyond the limit he has to pay, now each home is given an identification number so as to keep track of water used by home, it will ensure that all will get equal and fair amount water for use. We are giving the identification number to all homes so that, there will be check on how much is supplied to a particular area.

By identification number bills are generated and are automatically deducted from owners account and message is received by owner.

Water wastage and management

For water wastage and management we plan to fix water flow motors in pipes so the motors will count number of rotations of motor, time and speed of water and hence amount of water flown within the diameter of pipe and hence will estimate amount of water flown, hence any leakage in pipe will make flow of water slow and speed which can be detected by these motors.

3. ARCHTECTUTRE



The idea for automation has been presented in a way such that it could be implemented in a cheapest and simplest via DTMF modules for electric appliances and control ZIGBEE [3] module for electric devices communication called M 2 M communication that advantage of which will be complete automation and will make the device smart and enable them to take decision according to users perspective which the controller has designed out of users history

SIZE	**NETWORK SIZE (2^64)**
RANGE	**1 to 100 METERS**
BANDWIDTH	**20 TO 250kbps**

Connecting all the electric appliances under one network and controlling them with the help of mobile app brings out the automation

AUTOMATION TECHNIQUES

VLINGO VIRTUAL ASSISTANT:

- Tell your phone what to do! The Vlingo [4] Virtual Assistant turns your words into action. Vlingo combines voice to text technology with its "intent engine" to help you quickly complete your desired action. Simply speak to your phone or type a

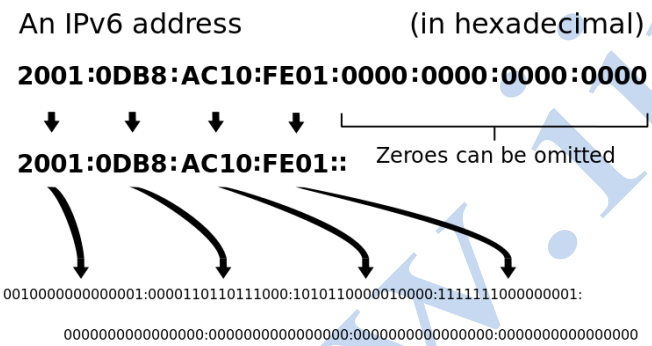
command through the Action Bar to get just about anything done while on the go.

How it feels when we can control every electric devices sitting and speaking directly to the devices or to fetch the data. This will bring power saving technique by controlling the electric supply to the home.

NETWORK

After connecting all the appliances and system such as electric billing home security etc. now it comes to setup a network among these and controlling from anywhere in the city or out of station for this we need proper internet protocols .as the technology will boom it comes to control it million of devices of thousands of users for which following solutions are given

.IPV6, 6LOWPAN.... The 6LoWPAN concept originated from the idea that "the Internet Protocol could and should be applied even to the smallest devices," and that low-power devices with limited processing capabilities should be able to participate in the Internet of Things.



CONCLUSION

In this paper, we analyzed the solutions currently available for the implementation of home automations. The discussed technologies are close to being standardized, and industry players are already active in the production of devices that take advantage of these technologies to enable the applications of interest, the set of open and standardized protocols is significantly smaller. The enabling technologies, furthermore, have reached a level of maturity that allows for the practical realization of IOT solutions and services, starting from field trials that will hopefully help clear the uncertainty that still prevents a massive adoption of the I0T paradigm in "HOME AUTOMATION".

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