1. INTRODUCTION:

Now-a-days, man’s life and work are increasing with the fast growth in information technology and communications. The enlightenment civilization has varied human way of life as well as demanded the conventional residence. With the fast economic augmentation, living standard keeps boosting up day by day that people have a higher requirement for residence functions. The elucidate society brings different information where economic, safe, convenient life and comfort has become the classical for every modernized family. It knows that the idea of home automation has centralized the attention of lifestyle practitioners, researchers, and the customers are more interested for the usage of the trending Technology. With the considerable efforts made to the improvement of controlling methods for home automation. Home automation is defined as automatically controlling home or household activities. Home automation controls all the home appliances like heating, air conditioning, lighting, ventilation and appliances in order to accommodate enhanced security and safety. Home automation system can accommodate best way of life for the elderly, disabled people and also for the individuals who requires institutional care or caregivers. Home automation also contributes a interface to all the appliances of the home through wireless transmission, telephone line, or the internet, which monitor and control through a web or smart phone. In this paper how the home appliances are monitored and controlled using android smart phone will be described.

2. LITERATURE SURVEY:

1. RFID and near-field communication – In the 2000s, RFID was the dominant technology. Later, NFC became dominant (NFC). NFC has become common in smartphones during the early 2010s, with uses such as reading NFC tags or for access to public transportation.

2. Optical tags and quick response codes – This is used for low cost tagging. Phone cameras decode QR code using image-
processing techniques. In reality QR advertisement campaigns gives less turnout as users need to have another application to read QR codes.

3. Bluetooth low energy – This is one of the latest tech. All newly releasing smart phones have BLE hardware in them. Tags based on BLE can signal their presence at a power budget that enables them to operate for up to one year on a lithium coin cell battery.

4. Low energy wireless IP networks – embedded radio in system-on-a-chip designs, lower power Wi-Fi, sub-GHz radio in an ISM band compressed version of IPv6 called 6LowPAN.

5. ZigBee – This communication technology is based on the IEEE 802.15.4 protocol to implement physical and MAC layer for low-rate wireless Private Area Networks. Some of its main characteristics like low power consumption, low data rate, low cost, and high message throughput make it an interesting IoT enabler technology.

6. Z-Wave – is a communication protocol that is mostly used in smart home applications.

7. LTE-Advanced – LTE-A is a high-speed communication specification for mobile networks. Compared to its original LTE, LTE-A has been improved to have extended coverage, higher throughput and lower latency. One important application of this technology is Vehicle-to Vehicle (V2V) communications

3. PROPOSED SYSTEM:

Smart home can be done by using both hardware components and software application. The required hardware components are Arduino mega board, Wi-Fi module, relay modules and sensors like ultrasonic sensor, fire sensor, smoke sensor and LDR which are used for monitor and control the home appliances. Arduino mega board provides interface between the hardware and software application. The software application used in this system is Blink application. After providing power supply to the Arduino mega board and by using blink application home appliances can be controlled. Some of the home appliances controlled are automatic light on or off based on the surrounding light intensity, automatic motor on or off based on the water level, detection of fire, smoke and gas leakage.

3.1 ARDUINO MEGA 2560

The 2560 MEGA is a open-source hardware one can design their board employing the different files. It is a micro-controller chip, it have 54 I/O pins. in that 16 can be used as analog inputs, 15 PWM outputs, USB connection and 16MHZ crystal oscillator, one reset button. it contain every connection.
need to be micro-controller, and provides an IDE based on processing project which supports programming languages of C, C++, Java. Arduino features:

- 8kb of SRAM
- 7/12v operating voltage
- 256kb Flash memory
- 20 milli ampere Dc current for every input/output pin
- 5v Operating voltage
- 16MHZ clock speed

3.2 ULTRASONIC SENSOR:

The Ultrasonic (US) sensor (HC-SR04) is a four pin component whose pins are Trigger, Vcc, Echo and Ground correspondingly. This sensor has more demand and used in number of applications in which measure of distance or objects can be detected. It has two parts in the front side which contains Receiver and transmitter of ultrasonic waves. This sensor works on the principle of Distance = Time × Speed.

The Ultrasonic transmitter continuously transmits a signal that is sound wave which travels in air and gets detected by any material which gets reflected from the material and move towards the sensor’s receiver part. By using the above formulae distance value can be known and by knowing the values of speed and time. As we are sending the ultrasonic signal from the transmitter part, we know that the speed of ultrasonic wave is 330m/s at room conditions. Time required by the ultrasonic wave to come back and echo pins turns on high can be calculated with the help of inbuilt circuitry, in this manner time can be determined. And now distance can be calculated using a microprocessor.

FEATURES:

- Operating voltage: +5V
- Theoretical measuring distance: 2cm to 450 cm
- Practical measuring distance: 2 cm to 80 cm
- Operating Frequency: 40Hz
- Measuring angle cover: <15°
- Accuracy: 3mm
- Operating current: <15mA

3.3 ESP8266:

ESP8266 is a Wi-Fi microchip of low cost which uses TCP/IP protocol. It has one mega binary byte of in built flash which allows all the devices for connecting to the Wi-Fi. Every ESP8266 can be directly connected to the devices of arduino and provides Wi-Fi by using the pre-programming part with required AT command set.

FEATURES:

- IEEE 802.11
3.4 LDR:

LDR’s are similar to the Photo resistors which are one of the special types of resistor which has no polarity and is mostly used to represent the absence or presence of light. When the light is exposed to the LDR sensor the resistance will drop rapidly and it may be up to few ohms and when the surroundings are dark sensor’s resistance increases up to 1MΩ according to the light intensity. These are used in much number of applications and some of the devices like phototransistors and photodiodes. LDR symbol is similar to that of the resistor except the addition of arrow mark which indicates the light signal.

Fig. 5 LDR

Fig. 6 symbol of LDR

FEATURES:

- It is easily available, small and cheap.
- It can be easily used on the breadboard.
- It is mainly used to sense the light.
- It is available in PG5-MP, PG20, PG20-MP, PG12, PG5, PG12-MP series.
- It is easy to use with the microcontrollers or with Analog/Digital IC.

3.5 FIRE SENSOR:

Fire sensor is used to identify and react to the flame presence during the detection of flame. Detected flame response may be a alarm sound, switch on the fire elimination system or shut down a fuel line. This sensor is mainly used in many applications like in industries whose position is to authenticate that furnace is lit properly and do not perform the operation beyond alerting the operator of control systems. This sensor works more correctly than smoke sensor because it uses different methods for identifying the fire.

Fig. 7 Fire sensor

3.6 SMOKE SENSOR:

The Gas or smoke sensor is used for gas leakage and smoke detection. It can be able to detect the gases like methane, butane, LPG and smoke. It can easily detect the gases because of its high sensitivity whose value can be varied by its potentiometer. This sensor shows only appropriate
concentration of gas not the exact value. The operating voltage of this sensor is 5V.

![Smoke sensor](image)

**Fig.8 Smoke sensor**

**RESULT:**

![Water level sensor](image)

**Fig.8** based on the surrounding light intensity light will become on/off automatically

![Light sensor](image)

**Fig.9** based on the water level motor will on/off automatically

4. CONCLUSION:

Home automation provides a good interface and user friendly access to the hosts of the home. In this project we can monitor and control the home appliances like motor on/off based on the water level in the tank, Light on/off based on the ambient light intensity, detection of smoke, gas leakage, fire and sends SMS to the hosts of the home by using android application (BLINK) and internet.

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