Project Design Phase-II
Technology Stack (Architecture & Stack)

Date	03 October 2022
Team ID	PNT2022TMID15063
Project Name	Project – Gas leakage monitoring and alerting system for industries
Maximum Marks	4 Marks

Technical Architecture:

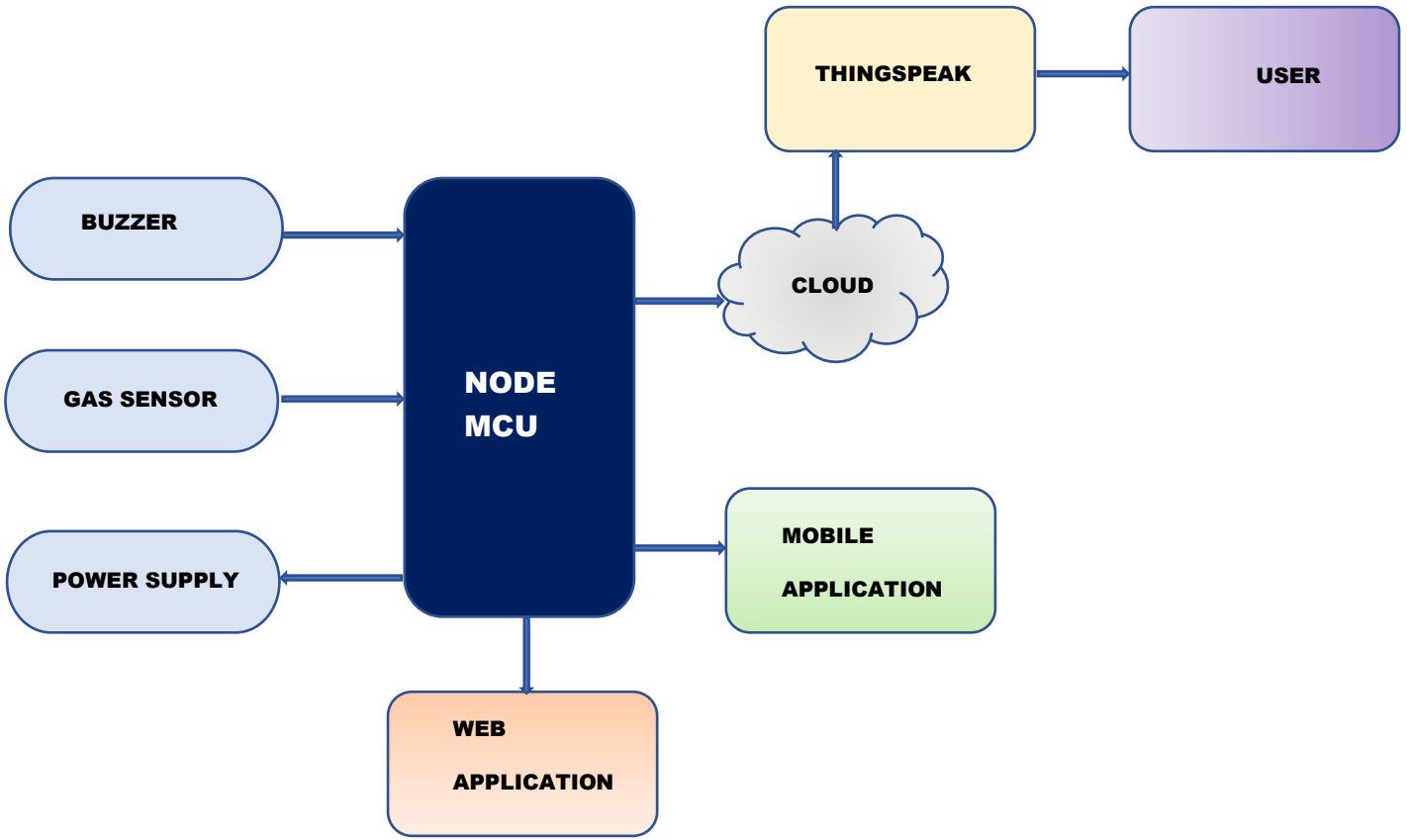

Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	Microcontroller MQ2 gas sensor	MQ2 is a flammable gas and smoke sensor detects the combination of combustible	Gas sensor
2.	Buzzer	Audible sign of the present of LPG gas	Audio signalling device
3.	LCG display	Wall mounted device fitted close to the floor level with an alarm setting at 20% window	Sigma delta
4.	Arduino MEGA	The Arduino Mega 2560 is a microcontroller board based on the ATmega2560 (datasheet). It has 54 digital input/output pins (of which 14 can be used as PWM outputs), 16 analog inputs, 4 UARTs (hardware serial ports), a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button.	Basically, the processor of the Arduino board uses the Harvard architecture where the program code and program data have separate memory. It consists of two memories such as program memory and data memory. Wherein the data is stored in data memory and the code is stored in the flash program memory.
5.	LED-Red,Yellow,Green	LED, in full light-emitting diode, in electronics, a semiconductor device that emits infrared or visible light when charged with an electric current.	LEDs operate by electroluminescence, a phenomenon in which the emission of photonsis caused by electronic excitation of a material.
6.	Web Application	An application that is used to the see the gas level, gps location and see the total overview of the system	An app is a type of software that allows you to perform specific tasks. Applications for desktop or laptop computers are sometimes called desktop applications, while those for mobile devices are called mobile apps. When you open an application, it runs inside the operating system until you close it.
7.	Siren	A siren is a loud noise-making device. Civil defense sirens are mounted in fixed locations and used to warn of natural disasters or attacks. Sirens are used on emergency service vehicles such as ambulances, police cars, and fire trucks. There are two general types: mechanical and electronic.	Mechanical sirens blow air through a slotted disk or rotor. The cyclic waves of air pressure are the physical form of sound. In many sirens, a centrifugal blower and rotor are integrated into a single piece of material, spun by an electric motor.

8.	MQ5,9,135 gas sensor	The Grove - Gas Sensor (MQ5,9,135) module is useful for gasleakage detection and for monitoring the air quality	A gas sensor is a device which detects the presence or concentration of gases in the atmosphere. Based on the concentration of the gas the sensor produces a corresponding potential difference by changing the resistance of the material inside the sensor, which can be measured as output voltage. Based on this voltage value the type and concentration of the gas can be estimated.
9.	Mobile Application	Whenever the excess gas is detected SMS will be sent to a particular phone number. Smoke and gas leakage detectors are very useful in detecting smoke or fire in buildings, and so are the important safety parameters in order to prevent disasters.	The system alerts notifications to the enduser - who responds accordingly with the help of connected devices such as a smartphone on the go.
10.	GPS module	The NEO-6M GPS module is a well performing complete GPS receiver with a built-in 25 x 25 x 4mm ceramic antenna, which provides a strong satellite search capability.	It can track up to 22 satellites on 50 channels and achieves the industry's highest level of sensitivity i.e. -161 dB tracking, while consuming only 45mA supply current.

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	MQ5,9,135 gas sensor, WiFi, Arduino processor chips.	Internet of Things
2.	Security Implementations	MQ5,9,135 gas sensor, Alerting device which consists of siren and LED light.	Internet of Things
3.	Scalable Architecture	Detecting room temperature , if the temperature is above specified temperature , it will alert workers.	Python
4.	Availability	Use of WiFi IP address	Wireless Network
5.	Performance	Performance is efficient	Internet of Things