Project Design Phase-II

Technology Architecture / Development stack

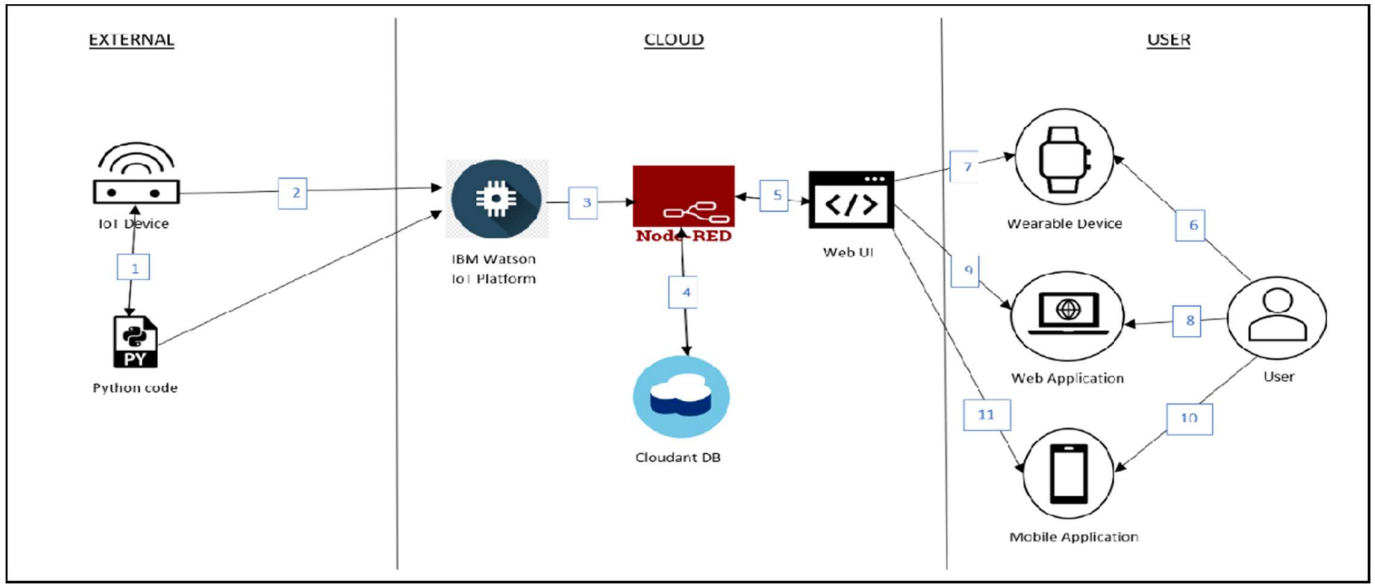
Date	25 October 2022
Team ID	PNT2022TMID49366
Project Name	HAZARDOUS AREA MONITORING FOR INDUSTRIAL POWER PLANT USING IOT

Technical Architecture:

The Deliverable shall include the architectural diagram as below and the information as per the table1 & table2

Guidelines:

1. Include all the processes (As an application logic / Technology Block)



2. Provide infrastructural demarcation (Local / Cloud)
   - microcontroller used is an Arduino UNO rev3 or Pegboard
   - Wi-Fi module to upload all the data to the cloud
   - a Miniaturized MOS sensor for monitoring the gaseous fuel level

3. Indicate external interfaces (third party API's etc.)
   - Node Red is used of design the circuit of device
   - App Inventor to develop application

4. Indicate Data Storage components / services
   - IBM's Cloudant DB is used for storing data in cloud

Table-1: Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	User can interact with device using web application and through SMS	HTML, CSS, Java
2.	Application Logic-1	Get the temperature using sensor and send it to the microcontroller for analysis and compare with standard values	Java / Python
3.	Application Logic-2	Provide solution to monitor data and control the machine and units and provide API between user and devices	IBM Watson STT service

4.	Database	The data will be temperature value at regular interval of time and the combustible gas levels	MySQL
5.	Cloud Database	The measured data is sent to the cloud service using Wi-Fi module	IBM Cloudant
6.	File Storage	Require an encrypted storage service among industry, workers and officers	IBM Block Storage, or Drop box , aws
7.	External API-1	Purpose of External API used in the application	IBM Weather API, etc.
8.	External API-2	Purpose of External API used in the application	Aadhar API, etc.
9.	Machine Learning Model	Purpose of Machine Learning Model	Object Recognition Model, etc.

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	To create web application and circuit designing	App Inventor and Node-Red
2.	Security Implementations	Each user should have their own credential to access data servers	Email and respective password
3.	Scalable Architecture	Industrial 4.0, Internet of Things	Data Analytics, web service
4.	Availability	1. microcontroller with integrated Wi-Fi module to upload all the data to the cloud 2. Temperature sensor	Arduino UNO Wi-Fi or Pyboard or ESP8266 Infrared Miniaturized MOS sensor

		3. monitoring the gaseous fuel level	
5.	Performance	Makes use of advanced sensors Distributed data service High efficient microcontrollers	Lower power consumption Longer range communication High speed data transfer

References:

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https://docs.micropython.org/en/latest/pyboard/tutorial/index.html https://www.geeksforgeeks.org/top-10-most-popular-java-frameworks-for-web-development/