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

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|---|---|
| **Date** | 03 October 2022 |
| **Team ID** | PNT2022TMID35809 |
| **Project Name** | IOT based Smart Crop Protection System |
| **Maximum Marks** | 4 Marks |

## Technical Architecture:

- The Deliverable shall include the architectural diagram as below and the information as per the table1 & table 2

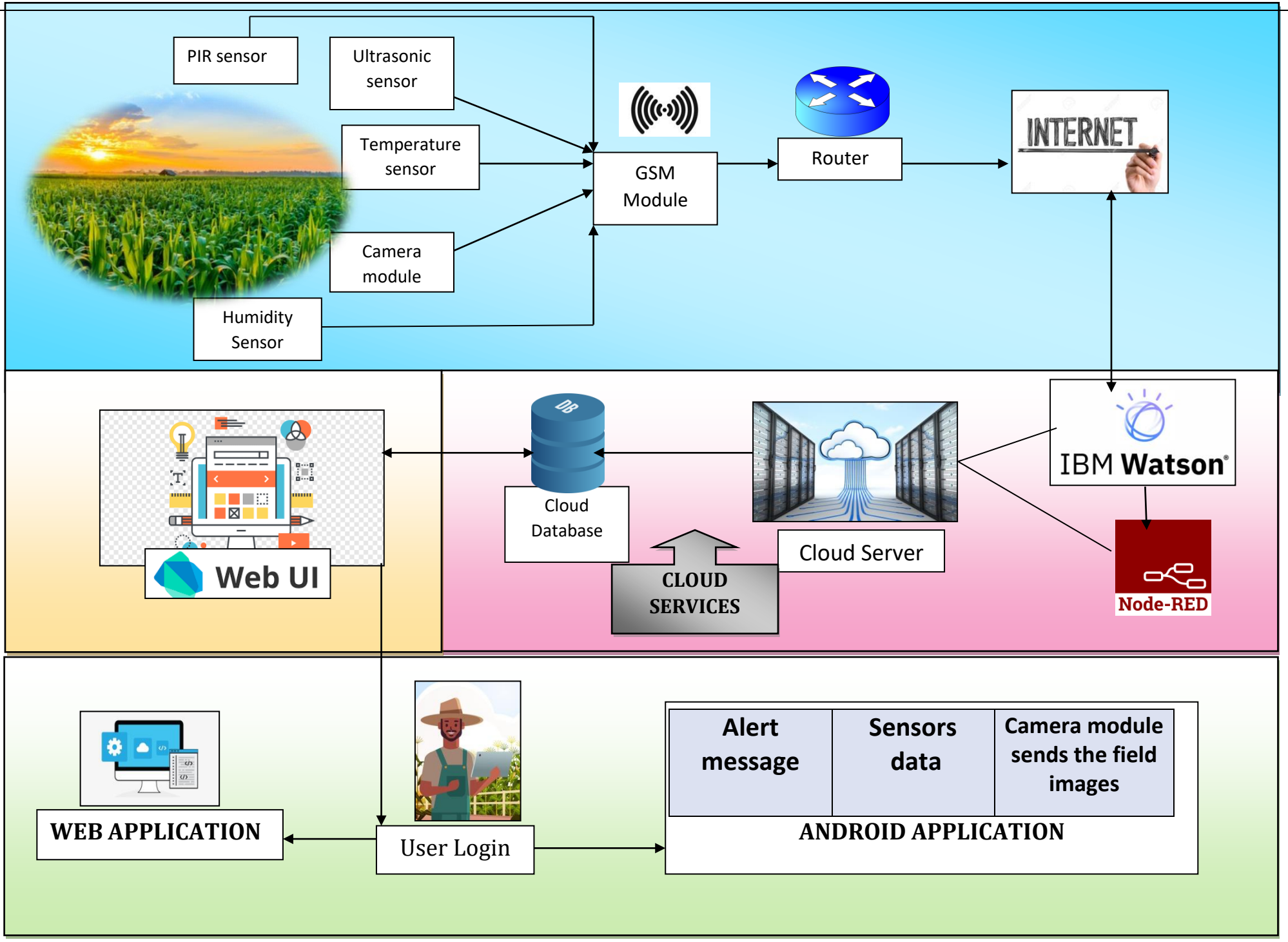
PIR sensor
Ultrasonic sensor
Temperature sensor
Camera module
Humidity Sensor
GSM Module
Router
INTERNET
Web UI
Cloud Database
Cloud Server
CLOUD SERVICES
IBM Watson
Node-RED
WEB APPLICATION
User Login
Alert message
Sensors data
Camera module sends the field images
ANDROID APPLICATION

**Table-1 : COMPONENTS & TECHNOLOGIES:**

| S.No | Component | Description | Technology |
|---|---|---|---|
| 1. | User Interface | User can interact the entire field system through web based UI or app via internet module | HTML, CSS, JavaScript / Angular Js / React Js etc. |
| 2. | Arudino uno / raspberry pi | To interface the data from various system and connecting the peripeheral devices | C++ / Python |
| 3. | Chat bot service | Communication for help and suggestion | IBM Watson STT service |
| 4. | Web server | Node red is used to wiring together all the hardware device. | Node-red, Javascript |
| 5. | Database | Data about the farming field ,climatic condition and water level etc… | MySQL |
| 6. | Cloud Database | Database Service on Cloud | IBM Cloudant |
| 7. | File Storage | File storage requirements for storing the sensed information of the field | IBM Block Storage or Other Storage Service or Local Filesystem |
| 8. | Weather API-1(Temperature sensor,humidity sensor etc..) | To know the climatic and environment condition. | IBM Weather API |
| 9. | GSM | To intimate the threats immediately and update the field report. | Python/C++ |
| 10. | Machine Learning Model and Sensors. | To detect the objects causing threats to field | Object Recognition Model/python/CNN |
| 11. | Maps -external API 2 | Used in system to locate the crops | Google maps geolocation API |

**Table-2: APPLICATION CHARACTERISTICS:**

| S.No | Characteristics | Description | Technology |
|---|---|---|---|
| 1. | Open-Source Frameworks | Frameworks used in IBM Watson | Python |
| 2. | Security Implementations | Data encrypted by IBM Cloudant and User password based system protect the entire system | SHA-256,IBMcloudant specific securities. |
| 3. | Scalable Architecture | New features can be added and updation of the system is done based on the development in technology. | python |
| 4. | Availability | The system can access from anywhere and available at all time. Control and maintenance of field through the cloud service. | API ,python ,cloud services. |
| 5. | Performance | Sensors and other integrated device help to sense the data of climatic condition ,soil condition etc.. to protect the crop cultivation from threats. | IBM cloud services.IBM Watson platform. |