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

Date	16 October 2022
Team ID	**PNT2022TMID35796**
Project Name	**Emerging methods for early detection of forest fires.**
Maximum Marks	4 Marks

Technical Architecture:

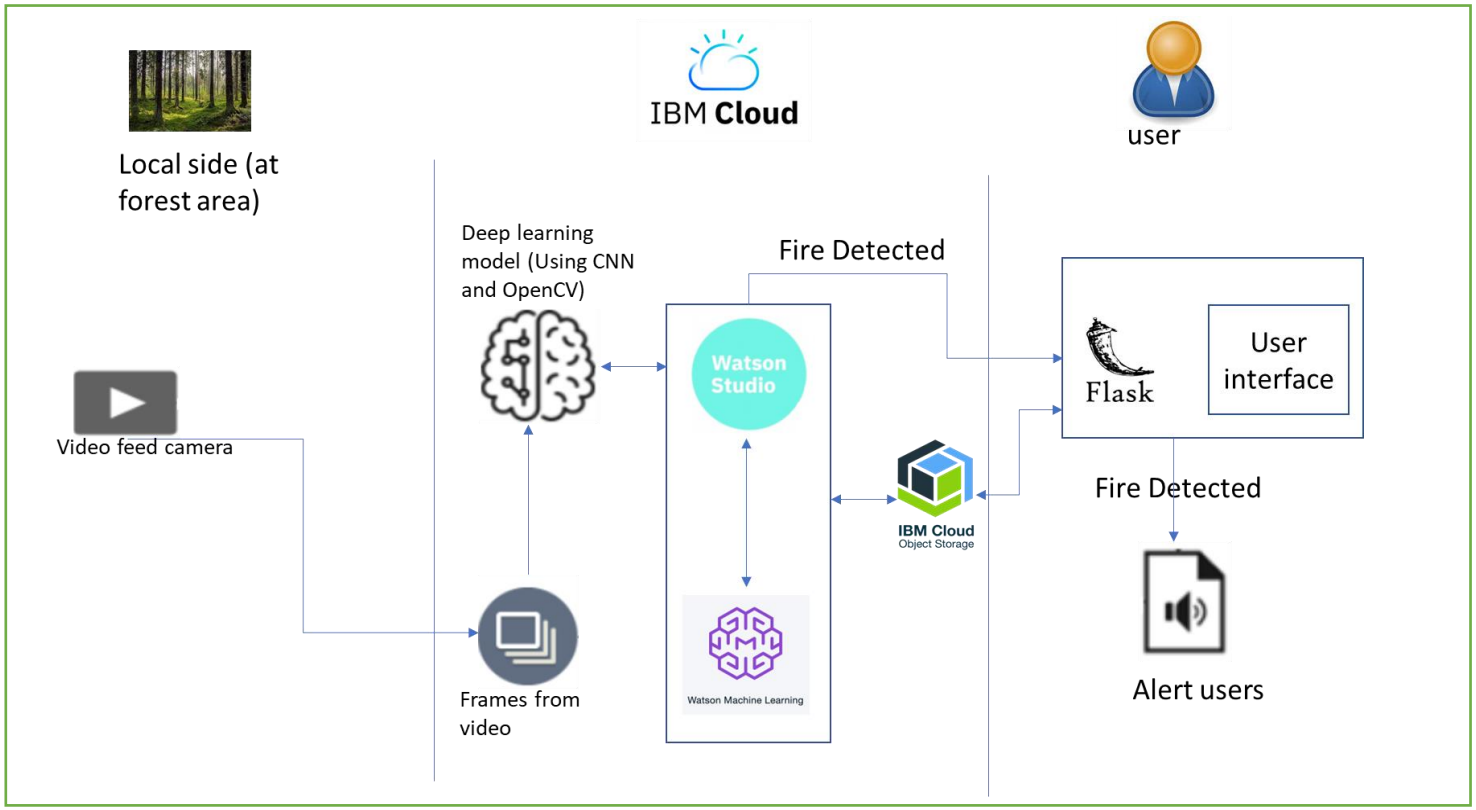

Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	The user interacts with the web UI application.	HTML, Python flask,CSS,etc
2.	Application Logic-1	Getting the video feed of forest places.	Python.
3.	Application Logic-2	Predicting whether fire is detected or not.	IBM Watson studio and Watson machine learning
4.	Application Logic-3	Alerting the forest fire officials (users)	Python flask, IBM watson
5.	Database	Datatype – The images and user input details are stored. The details of location and timing of detection of fires are stored in database for future reference.	MySQL, Js, IBM DB2
6.	Cloud Database	Database Service on Cloud	IBM DB2, IBM Cloudant etc.
7.	File Storage	The recieved user input details and images are stored in the cloud.	IBM Block Storage or Other Storage Service or Local Filesystem
8.	External API-1	API used to predict probability of fire at a particular season using weather data.	IBM Weather API, etc.
9.	External API-2	API to send message to users when fire is detected	Twilio service API
10.	Machine Learning Model	The Machine Learning Model collects the video frames and processes the image to find if fire is present or not.	Convolutional neural network(CNN) model using python tensorflow library for fire detection.
11.	Infrastructure (Server / Cloud)	On the cloud server we will be deploying the AI model using flask in the webpage.	Python flask, IBM cloud

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	Open-source frameworks used is IBM Watson and cloud services	Technology of Opensource framework – Watson studio, Watson machine learning, IBM cloud object storage , node red services
2.	Security Implementations	Certified Watson assistant for encrypted file systems, storage systems, key management systems.	IBM cloud
3.	Scalable Architecture	Web server - Static and dynamic website content present in website will be updated based upon user demand and suggestion. Application server - Updation of basic functionality of the website and integration of new features for forest fire detection can be done. Database server - The model can be retrained for the new database once in a month based on the new useful images found.	Python, IBM Watson, MySQL
4.	Availability	The Application is made available 24 hours since immediate action needs to be taken in case of emergency.	IBM Watson Cloud assistant.
5.	Performance	The deep learning model is trained using IBM Watson studio for better performance and quick accessibility.	IBM cloud services and Watson studio.