Project Design Phase - 2
Technology Stack (Architecture & Stack)

Date	15 - 10 - 2022
Team ID	PNT2022TMID34944
Project Name	Emerging Methods for Early Detection of Forest Fires

Technical Architecture:
The Deliverable shall include the architectural diagram as below and the information as per the table 1 & table 2.

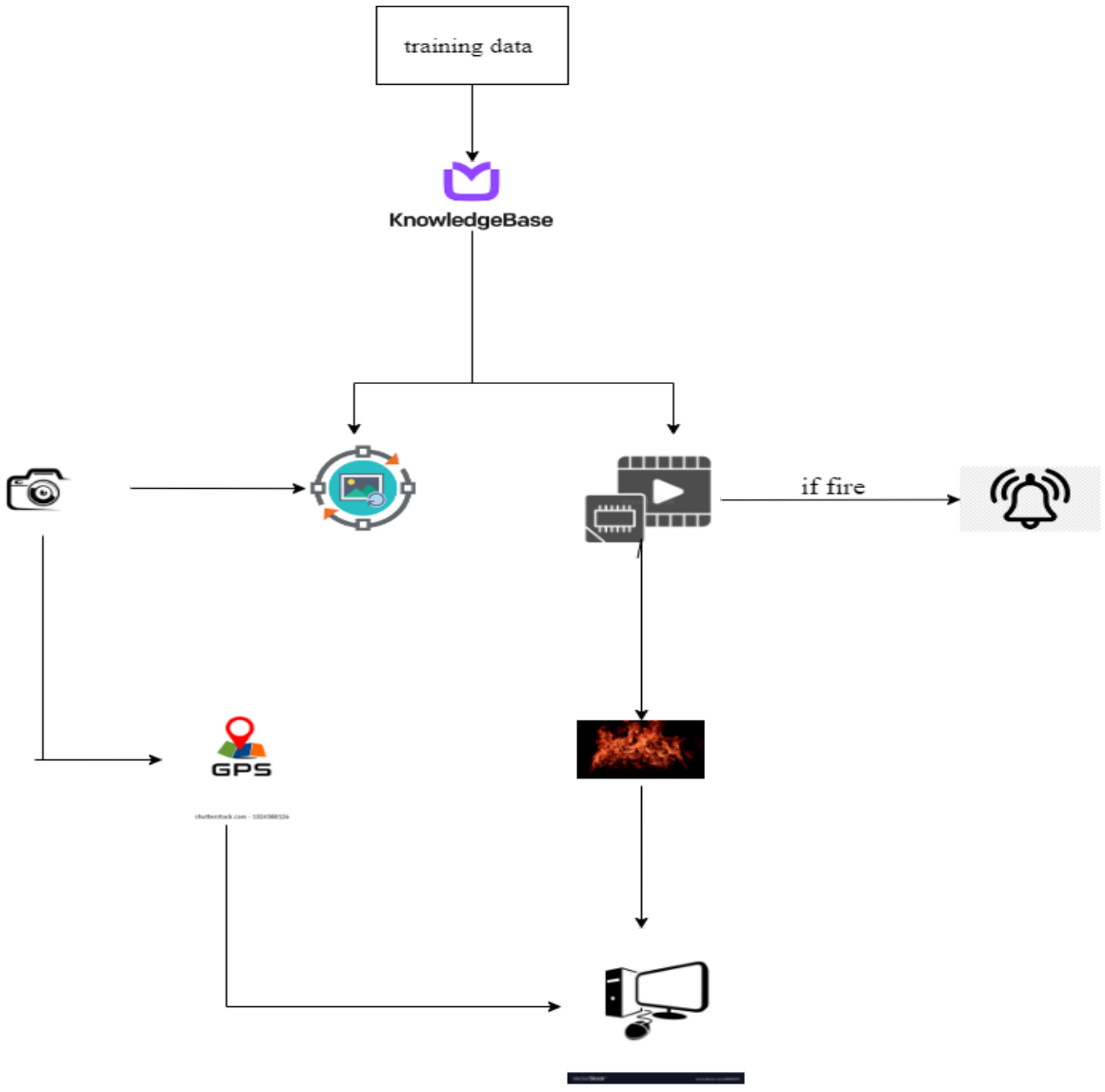

Table 1 :

Component	Description	Technology
Infra-red camera	The infrared camera-based FireTIR system captures the temperature distribution in an area and automatically detects the hot spots. The thermal imaging cameras of the FireTIR system are calibrated and they get in real time the temperature information in each pixel, automatically detecting any outbreak of fire.	Forward Looking Infra-Red (FLIR)
Image Processing	Faster R-CNN is used mainly for image processing. It is a deep Convolutional Architecture used for fire detection, that appears to the user as a single, end-to-end, unified network. The network can accurately, and quickly predict the locations of the fire.	OpenCV, TensorFlow, PIL / pillow, Keras
Video Processing	Video processing is a set of operations that we do on each frame. For example, to transform video from compressed to raw format, we need decoding. After that, we may perform some computation on the received frame. The final step is encoding, which we apply to convert a given frame back to a compressed state	Adobe, Naive, Kamua, Descript
GPS Tracker	A GPS tracking device is a portable unit that allows users to monitor and track its location. These devices are most commonly used in vehicles as car tracking systems. While tracking devices are similar to in-car navigation systems, there are a few key differences.	Onelap Micro, ClearpathGPS, Autowiz

Table 2: Application Characteristics

Characteristics	Description	Technology
OpenSource Frameworks	The RNN and the CNN used here for the detection of fire as a part of the Deep Learning algorithms are the open-source framework.	RNN, PyTorch, Flask
Security Implementations	This project doesn't contain any secured information so there is no role of security factors.	No Technology needed.
Scalable Architecture	The Convolutional Neural Network Knowledge base should be scalable enough to store the data. The system should be trained with some data and information and those data would be stored in the Knowledgebase of CNN.	continuous knowledge base (CKB)
Availability	The image processing and video processing and monitoring is available as part of the Faster R-CNN.> These things are helpful to identify the fire and the Fire Spread range.	Adobe, OpenCV, TensorFlow
Performance	The performance mostly depends on fully monitoring the forest and giving alert when the fire occurs. It must be processed and executed within a fraction of seconds using the deep learning algorithm. If fire occurs, it would be detected by the Deep learning algorithm and then the information would be sent to the nearby Fire station.	Convolutional Neural Network.