PROJECT DESIGN PHASE - I
PROPOSED SOLUTION TEMPLATE

Date	28-09-2022
Team ID	PNT2022TMID34944
Project Name	Emerging Methods for Early Detection of Forest Fires

Proposed Solution Template :

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Forest fires events are mainly caused by the actions of humans, but different nature and environmental phenomena, like lightning strikes or spontaneous combustion of dried leaves or sawdust, can also be credited for their occurrence. Regardless of the reasons for the ignition of the forest fires, they usually cause devastating damage to both nature and humans. The way to overcome these great effects is detecting the emergence of the Forest Fire earlier. By doing so, the sensor would alert the emergence of the fire in the Forest to the officers on duty. They should take further steps to stop the fire and it's wide spread. This would be greatly helpful to prevent the great loss of the Forest resource and the animals livelihood.
2.	Idea / Solution Description	To detect the Forest fire earlier, the software sensors, digital cameras, image processing, and deep learning algorithms resulted in the development of a system for optical, automated early recognition and warning of forest fires. The software sensor which would be mounted on the great poles and the vandal proof cameras would continuously gather the information of the forest with the

		cameras fixed with it. It would get the images captured and perform a Deep Learning Algorithm with the use of the information already trained and given in the knowledge base. If there is any spark of fire, then the sensor would compare the data with the trained data and detect the fire and make an alert using the alarms fixed. The alarms should be fixed for every 2 Kms and also at the Forest Fire Control room. The information regarding the forest fire spread range and its exact location should also be sent to the nearby Fire station. The location would be spotted with the help of the GPS tracker which is there embedded with the sensor. The fire spread range would be calculated by referring 5 to 6 images and by using the Deep Learning Algorithm it can be given properly.
3.	Novelty / Uniqueness	A new solution in which the information about the fire's exact location and the range of the fire spread should be alerted to the nearby Fire Station. This information should be helpful to make sure about the solution or to execute the plan to stop the fire as soon as possible. And also appropriate steps can be taken, depending on the fire's spread range.
4.	Social Impact / Customer Satisfaction	The fire detector impacted society greatly because it's a great device to control fires. The environmentalists felt the great use of this when it came to use. The Ecologists over the world appreciated the work as they were terrified of this Forest fire as it had swallowed a wide range of rare species and genre of plants and animals. The fire spread range calculator works well and it has been welcomed with open arms as the further plans and procedures to stop the fire can be taken without any complications. Software sensors improve the world

		in which we live by making it a safer place and by reducing the devastation caused by uncontrolled fire. They must recognize the need for fire prevention activities, the necessity of educating both children and adults in fire safety, and the importance of enforcing fire prevention codes. As the solution given will detect the fire earlier and intimate them, the Forest officer feels well as they are able to set off the fire easily.
5.	Business Model (Revenue Model)	Timely information about the appearance of fire reduces the number of areas affected by this fire and thereby minimises the costs of fire extinguishing and the damage caused in the woods. Monitoring of the potential risk areas and an early detection of fire can significantly shorten the reaction time and also reduce the potential damage as well as the cost of fire fighting. It may not look like it at first with the initial up front investment that can be substantial, however, over the long run a well maintained and tested commercial fire detection system can lower the insurance cost thus lowering overhead cost. With a high quality, well installed and well maintained fire detection system this minimises or even erases the unnecessary interruption of alarm. This reduces the amount of damage to the property. Fire detection systems can be connected to sprinklers that will automatically respond when a fire is detected.
6.	Scalability of the Solution	This solution is scalable enough to fit the vandal proof cameras by constructing great poles in the Forest. The cost of establishing the cameras and poles for the entire forest may be high. It is acceptable to fit them over any place of the forest.