Project Title: Emerging Methods for Early Detection of Forest Fires

Project Design Phase - 1
Problem Solution Fit

Team ID:
PNT2022TMID54434

Define CS, fit into CC

1. CUSTOMER SEGMENT(S) — CS

- People
- Forest department
- The National Disaster Management Authority

6. CUSTOMER CONSTRAINTS — CC

- Requirement of fast and constant network connection for both users as well as the setup
- Sensors and drones are to be power efficient

5. AVAILABLE SOLUTIONS — AS

The existing system developed a forest fire detection system based on two UAV types (a fixed-wing drone and a rotary-wing drone). The two UAVs involved in this platform detect the data captured by their thermal cameras. The data was processed locally since the UAVs include onboard processing units. The two UAVs were connected to the base station to send information about their captures. The model recognizes the smoke in the forest images sent by the UAVs and classifies them by means of the neural network model.

Explore AS, differentiate

Focus on J&P, tap into BE, understand RC

2. JOBS-TO-BE-DONE / PROBLEMS — J&P

The main problems of a forest fire :

- Destroying homes, wildlife habitat, and timber,
- Polluting the air with emissions is harmful to human health.
- Many resources are exhausted to extinguish the fires

9. PROBLEM ROOT CAUSE — RC

- Forest fires occur naturally in areas of dry vegetation.
- Forest fires do sometimes occur naturally, either ignited by the sun's heat or a lightning strike.
- However, most forest fires are caused by human activities, including unattended campfires, discarded cigarettes, arson and more.

7. BEHAVIOUR — BE

Directly related:

- Lookout stations
- Evacuation of residents and wildlife
- Response team to tend to people's injuries
- Extinguishing fires to reduce the range of fires

Indirectly related:

- Awareness program regarding the cause and effect of forest fires
- Developing detection and prediction mechanisms with the help of current technologies like Iot, AI and etc.

Focus on J&P, tap into BE, understand RC

Identify strong TR & EM

3. TRIGGERS — T

Natural causes such as lightning, high temperature, volcanic eruption and etc.
Human activities such as the unconscious behavior towards burned cigarettes left, campfire remained burnt and electric supply being disrupted

4. EMOTIONS: BEFORE / AFTER — EM

Losing a home can cause significant emotional distress.
It is common for people to experience several stages of adjustment including shock, anger, depression, and hopelessness.
Ultimately, however, people can reach a stage of acceptance and become able to move beyond disbelief, bitterness, and sadness.
Positive feelings can begin to re-emerge as the focus shifts toward the future. Safety, security, and comfort are regained, and life moves forward once again.

10. YOUR SOLUTION — S

The solution is to develop a model that uses deep learning algorithms such as CNN, trained to analyze and detect forest fires from image and video data along with computer vision in real-time. The model will predict the regions in which the fires could spread.

8. CHANNELS of BEHAVIOUR — C

ONLINE

Sensors can connect through the internet to feed you the current status of the forest. Status is updated to the cloud and notifies users through the mobile application.

OFFLINE

The forest management can send notices to the nearby residential areas.

Identify strong TR & EM