Problem-Solution fit canvas 2.0

Purpose / Vision

Define CS, fit into

1. CUSTOMER SEGMENT(S) — CS

- Forest department
- Fire Fighters.

6. CUSTOMER — CC

The goal of our work was to create a robust application capable of detecting fire through videos and images that works in any environment.

5. AVAILABLE SOLUTIONS — AS

The result of the classification is displayed to the user, and depending on the result, further actions are taken. If the result is a fire, then an email is sent to the concerned stakeholders along with the video frame and date-time stamp to alert them. The email to which the mail is delivered can be changed by the user. An entry will also be made in the cloud database for the purpose of analysis.

Explore AS,

Focus on J&P, tap into BE, understand

2. JOBS-TO-BE-DONE / PROBLEMS — J&P

Fires are a major threat to the world, from sprawling cities to dense jungles. These could be avoided by installing fire detection systems that can save innumerable lives along with saving properties from permanent infrastructure damage and the consequent financial losses.

9. PROBLEM ROOT CAUSE — RC

We intend to create a classification model that uses Deep Learning and Transfer Learning to recognize fires in image/video frames, ensuring early detection and reducing manual labor. This model can detect fires in surveillance footage. Unlike existing systems, this does not necessitate specialized infrastructure for setup, as hardware-based solutions do, nor does it necessitate domain knowledge or prohibitively expensive computation for development.

7. BEHAVIOUR — BE

The government must take the initial steps to install a fire detection system to monitor potential risk areas and detect fires early, which can significantly reduce reaction time, potential damage, and firefighting costs.

Focus on J&P, tap into BE, understand

Identify strong TR & EM

3. TRIGGERS — TR

When smoke, fire, carbon monoxide, or other fire-related emergencies are detected, a fire alarm system alerts people. These alarms can be activated automatically or manually using fire alarm activation devices such as manual call points or pull stations.

4. EMOTIONS: BEFORE / AFTER — EM

Fire accidents have killed and destroyed people all over the world, claiming countless lives and causing billions of dollars in damage. This implies that developing an accurate, timely, and cost-effective fire detection system is critical. As a result, we proposed a deep learning fire detection model for videos/video frames based on transfer learning.

10. YOUR SOLUTION — SL

The application can be enhanced by training the model with a larger dataset consisting of fires at various stages and dimensions. An email alert feature has also been incorporated to our application to provide real time alerts to the concerned stakeholders along with a logging system, which is implemented using Firebase. The GUI offers a user- friendly experience and allows user with non-technical background to make use of the application. The application performed exceptionally well during testing. It was able to identify fires in all of the twelve test fire videos but misclassified some instances of non-fire videos.

8. CHANNELS of BEHAVIOUR — CH

8.1 ONLINE

Queries can be taken through government (Administration) official websites.

8.2 OFFLINE

This is meant for detecting fires with using visual input and hence it is integrated with surveillance infrastructure.

Extract online & offline CH of BE

AMALTAMA