

## OCR for Railway Locomotives (Transportation Industry)





## Client Background

Client is a global IT solutions and services company based in India. It was among the top 15 IT service providers globally. It employs standards of the Software Engineering Institute's (SEI) Capability Maturity Model Integration (CMMI) and is a Maturity Level 5 assessed organization.

OCR for Railway Locomotives project is based on LabVIEW Vision system. This document provides basic overview of OCR railway locomotive project. This Vision based system is capable of identification of Locomotive Engine number in any condition. This system consists of Camera as an image capturing device for Train Images & light source as an illumination source for better lighting for night vision. System will identify number written on loco and generate database in text file. This database file will contain date, time and loco numbers.





## Challenge

Indian Railways boasts of one of the largest fleet of locomotives in the world. It requires significant amount of time, energy, and money to keep these locos up to date and in healthy working condition. But more than that is the opportunity cost of locos that costs dearer to the railways when a loco is out for maintenance. In order to minimize the time that a loco is not on a job, railway requires seamless integrated solution to manage maintenance, pre maintenance and post maintenance activities at a diesel loco shed. It is required for the system to trigger a job card issuance base on entry of a loco and to conclude the activity at exit of loco. System consist of smart camera-based system that would detect the arrival or departure of a loco and read its serial number in moving condition of loco at speed of 15 kmph and any weather condition.

# Engagement Journey

Started With



Extended To



Ongoing Support



## Solution

Real time software is designed and dumped in remote camera target. Software sets specific value of brightness, contrast and gamma of image. It continuously measures intensity in image for checking presence/ absence of locomotive engine and check direction of locomotive engine.

In line with direction of loco, software flow will be directed either “Right to Left” or “Left to Right”. It detect edges of driver’s window and doing pattern matching of driver’s window.

A coordinate system will be set to left bottom corner of detected driver’s window. Once coordinate system sets, automatically new ROI will be defined at specific distance from bottom edge of driver’s window. This ROI is used for OCR application to recognize loco ID number.



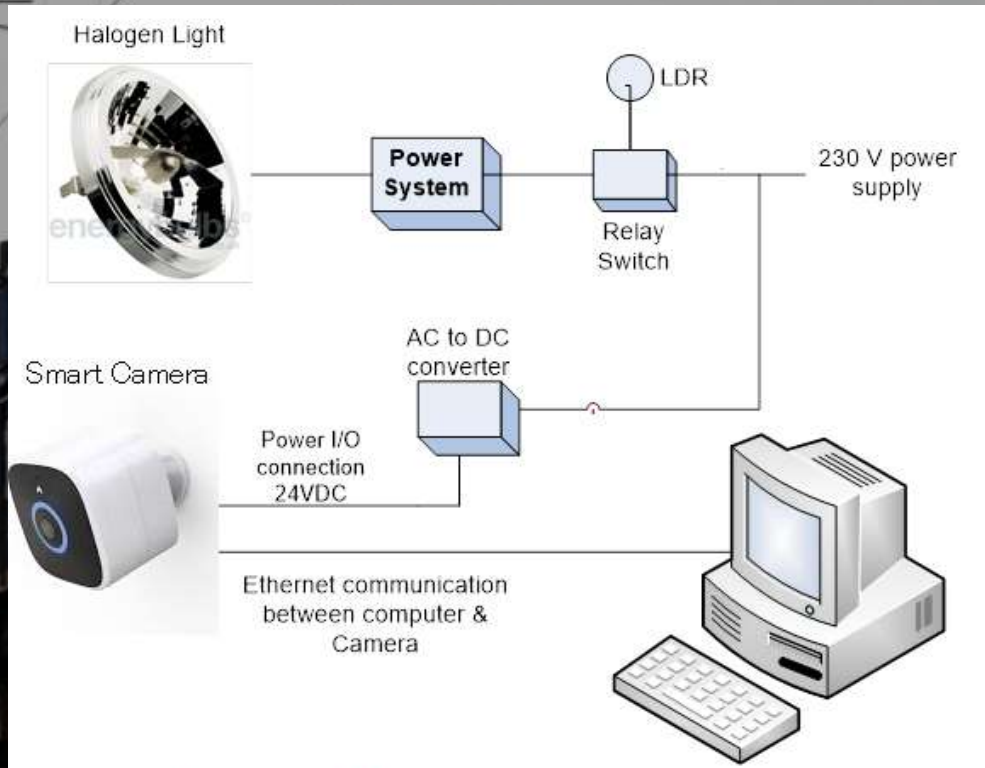


## Solution

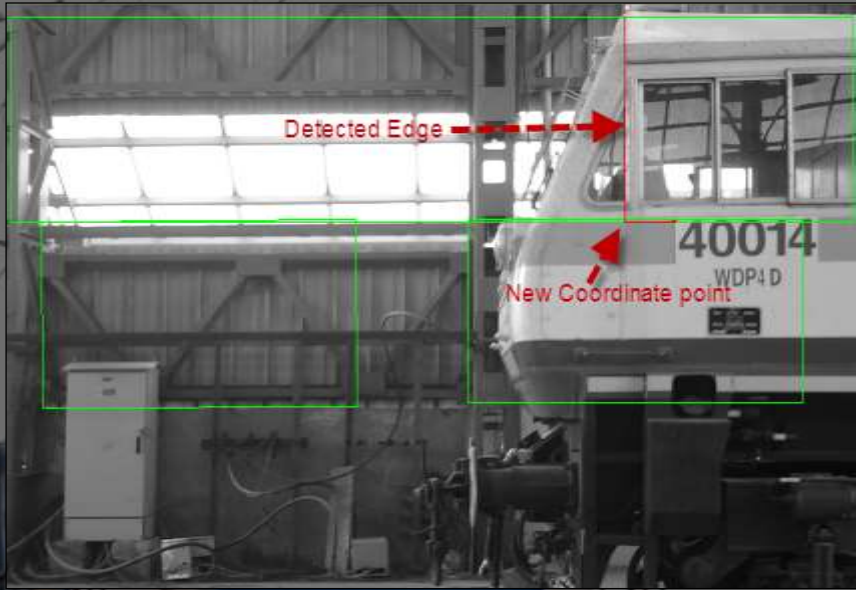
When all characters are detected, software will generate loco ID number text file in camera database. After recognition of loco ID number, generated text file will be sent to local server.

After recognition of locomotive ID number , software will generate loco ID number text file in camera database and generated text file will be sent to local server. Second time loco engine come in reverse direction and software also recognize same loco number and directly append data in old generated text file with current date and time

Real time image data acquisition is done through smart camera. The software does not have any GUI. All algorithm written inside the smart camera and once test data is captured, it transfer test data to data server via TCP/IP communication.



High Level Block Diagram



## Benefits

- Precise Measurement
- Cost saving
- No human Error
- Work in any weather condition



## Benefits against alternatives

Manual intervention and human errors in existing solution was overcome with help of smart camera-based system within build real time controller. Detection algorithm written inside the smart camera which does not require any other software and operators.





## Value Proposition

Optimized Solutions has provided this solution to test any kind of pump and it is suitable for any type of environmental conditions. It follows the international testing standards to compare the pump tested data. Cost wise and pump capacity wise solutions available. Simultaneous pump testing is possible based on requirement.