

USE CASE

ASSEMBLY VERIFICATION OF ENGINES



CLIENT/INDUSTRY BACKGROUND

The client is a leading automobile manufacturing company. They manufacture and assemble motor vehicle engines. Having a major share in the automotive market they are one of the biggest players.

The engine converts heat energy to mechanical energy to reduce the

human effort required for transportation.

PROBLEMS

- Manual identification of the presence/absence of the part in the assembly, which is not efficient even after the training to operators for inspection
- Due to manual inspection, only 50 checkpoints could be properly examined

PROBLEM IMPLICATIONS

A single component missing in an engine can result in complete disqualification of the whole assembly.

CLIENT REQUIREMENTS

To automate the process of multiple checkpoints inspection with the help of machine vision to reduce the cycle time and achieve higher accuracy.

CURRENT PROCESS

Manual inspection is being carried out that takes 103 seconds to complete the cycle with additional 5 operators.

1. The client wants to increase the number of checkpoints to be inspected efficiently.
2. Also, to reduce the cycle time from 103 seconds to 30 seconds with accuracy close to 100 percent.

BUSINESS IMPACT

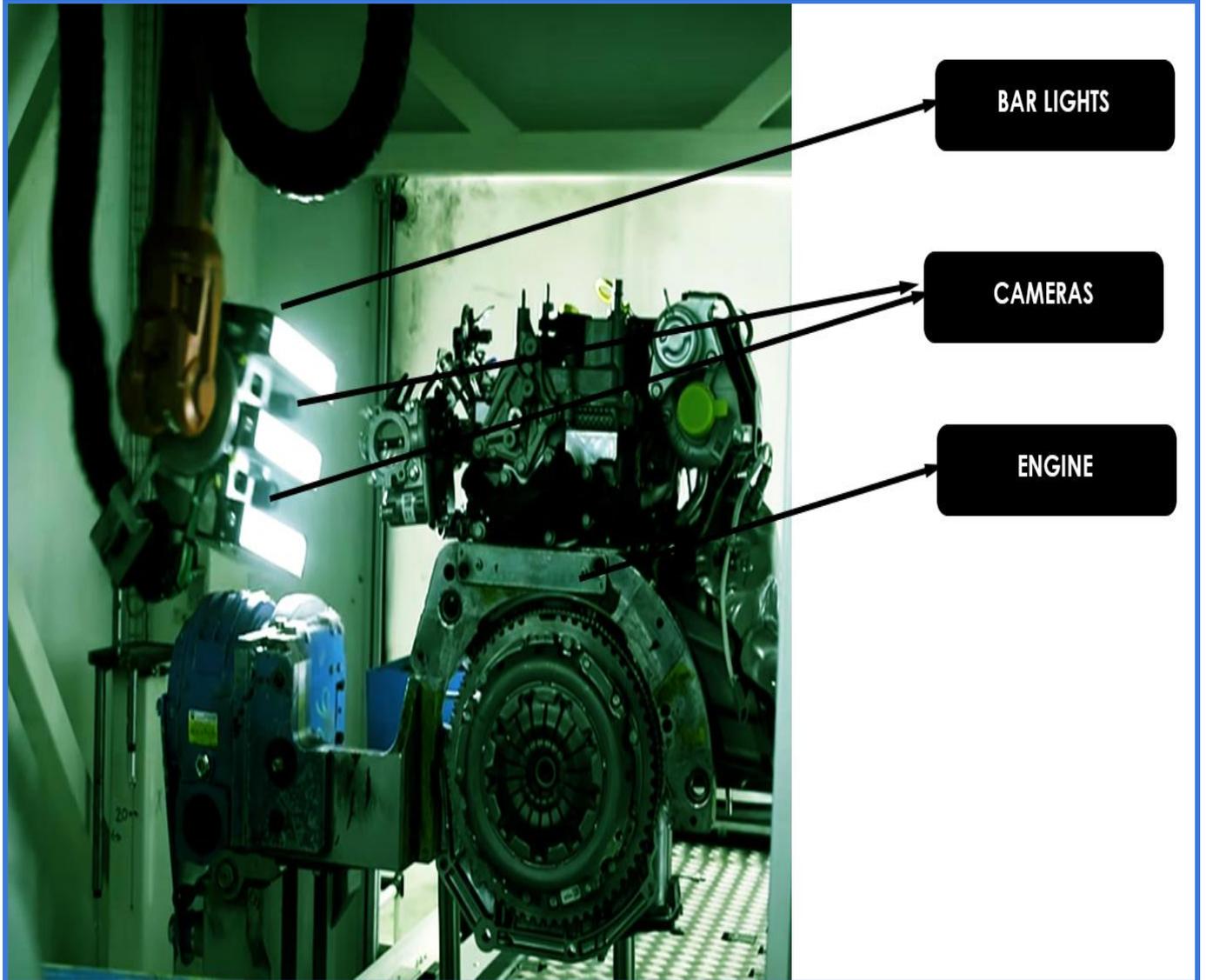
1. Increase in reparation cost
2. Increase in cost of quality (COQ)
3. Increase in cost for labor training

SOLUTION USING MACHINE VISION AND AI

A set of cameras with different angles along with the proper lighting is set up to [Identify the presence/absence of the parts](#) in the assembled engine. Images are captured and sent to the software [\(Qualitas EagleEye® Platform\)](#) cloud where the training is done using the deep learning algorithm. Once the program is trained, real-time part detection takes place, based on which the results are sent to PLC to take action.

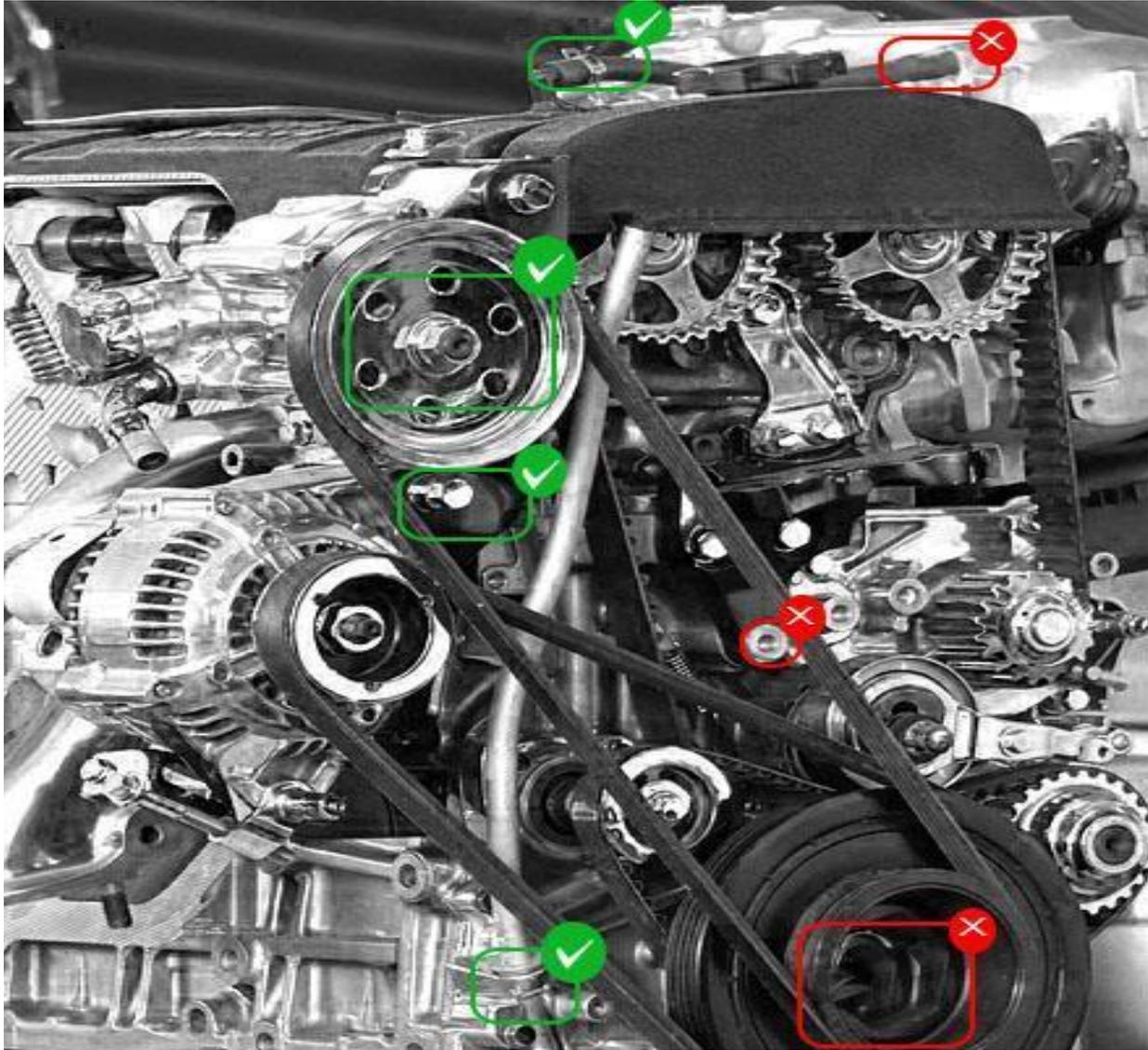


SETUP

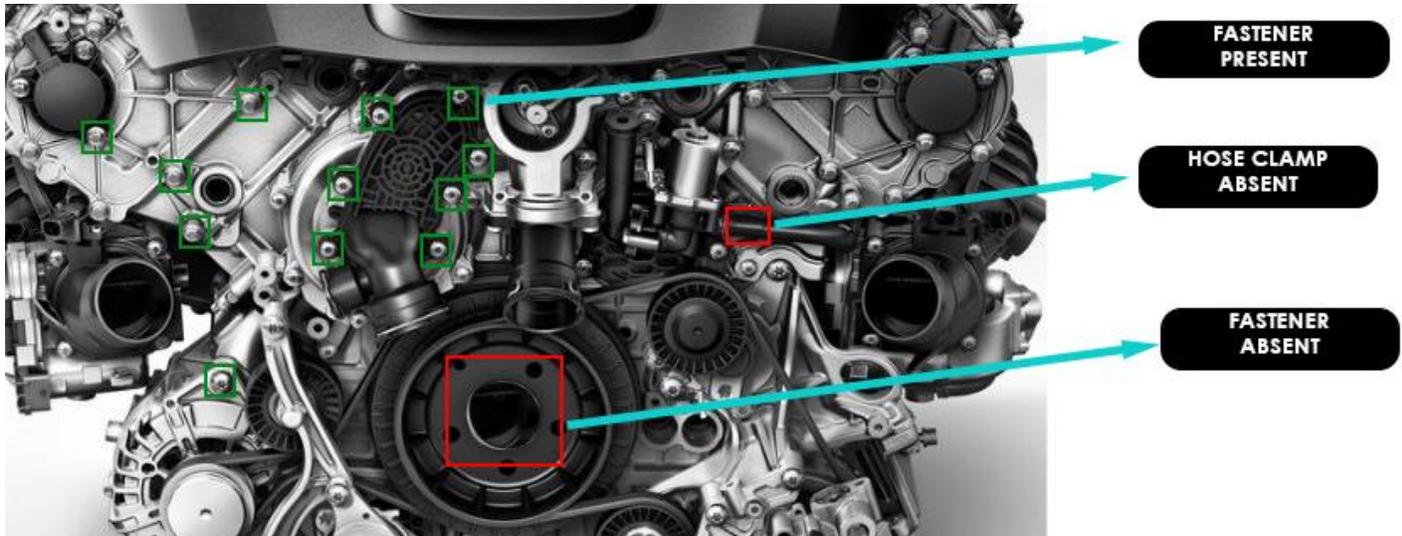


IMAGES

ASSEMBLY VERIFICATION IN QEP(QUALITAS EAGLE-EYE® PLATFORM)



MULTIPLE CHECKPOINTS INSPECTED



MULTIPLE CHECKPOINTS INSPECTED

CONCLUSION

A POC(Proof Of Concept) was conducted and the following conclusion was observed -

1. The number of checkpoints increased up to 90, ensuring better structural integrity
2. The accuracy is increased up to ~98%
3. Inspection cycle time is reduced to 30 seconds
4. Observed labor and training cost is reduced



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