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Center of Excellence-IoT & AI
A MeitY Initiative with Govt. of Karnataka, Haryana, Gujarat & AP

mSense

Case study – Digital Eyes Solution For Frame Number Verification

Abstract : One of the leaders in high volume Asian motorcycle manufacturing is always looking for new ways to improve their manufacturing production efficiency. This use case describes how mSense metal stamp character reader improved their frame number verification with an automatic ergonomic solution.

Problem statement

Verification of metal-stamped frame number on reflective surface from difficult to read location on a moving assembly line.
The previous method required an assembly line operator to read the metal-stamped frame number manually and verify if it matched with chassis number on the assembly document.
Since the characters were 17 digits long, the verification was done at three stations by splitting number of characters to be verified at each station.

Description of the solution

Our solution is comprised of three modules:

- Patented handheld imager with guide to capture image from reflective surfaces. Imager is self contained with light source to capture accurate images even in low light conditions
- VisionDL™ model to process the image and accurately recognize the text stamped on metal
- Easy to use factory floor dashboard to display GO/NG

Business impact / RoI

Our solution enabled the manufacturer to increase verification productivity with a faster, better and safer assembly line process with the following benefits:

- 6X improvement in frame number verification time
- 100% traceable accurate
- Cost effective.

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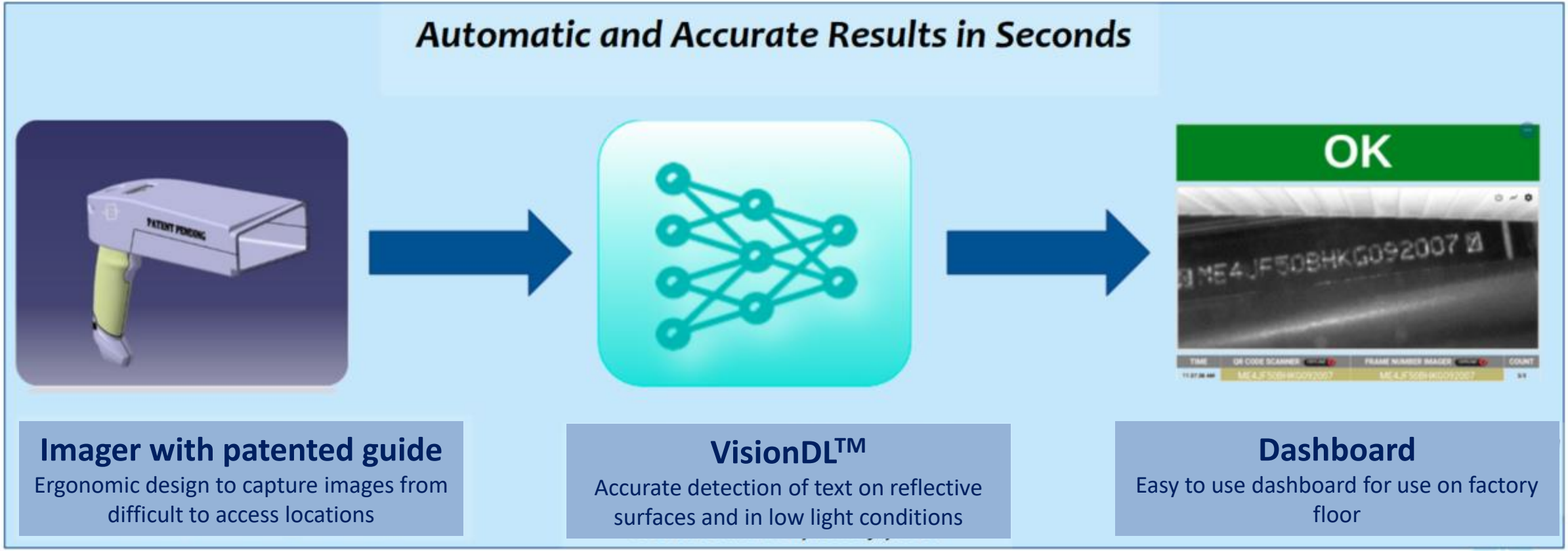
Photographs / Videos of Solution deployed : ***mSense's automatic frame number verification system for the factory floor showing the three major solution modules.***



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mSense

Case study – Digital Ears For Engine Defect Detection

Abstract : One of the leaders in high volume Asian motorcycle manufacturing wants to improve Quality Assurance (QA) for Engine Defects using automated solution and remove dependency on human. The current manual method of technician hearing the engine sound and detecting the defect is error prone and hazardous to health

Problem statement

Explore Artificial Intelligence (AI) transformation for the factory floor to see if it could improve engine defect detection ergonomically
The current process was manual, labor intensive and error prone, and was not sufficient to keep up with the forecasted run rate. Customer needed a solution which improves their safety, manufacturing productivity and engine quality assurance.

Description of the solution

Non-Invasive acoustic hardware with array of microphones was able to automatically detect defects within seconds. AcousticDL™ enabled quick detection of faulty engines in factory floor environment without need for controlled environment or acoustic chamber. Now, the technician while adjusting the throttle sees a green or red light for a good or defective engine.

Business impact / RoI

AcousticDL™ inference model improved QA by 5x in detecting the bad engines that were getting missed earlier.
It also helped in capturing boundary conditions which were difficult to judge by skilled technicians.
Our solution also reduced dependency on skilled noise detection technicians while bringing in traceability.

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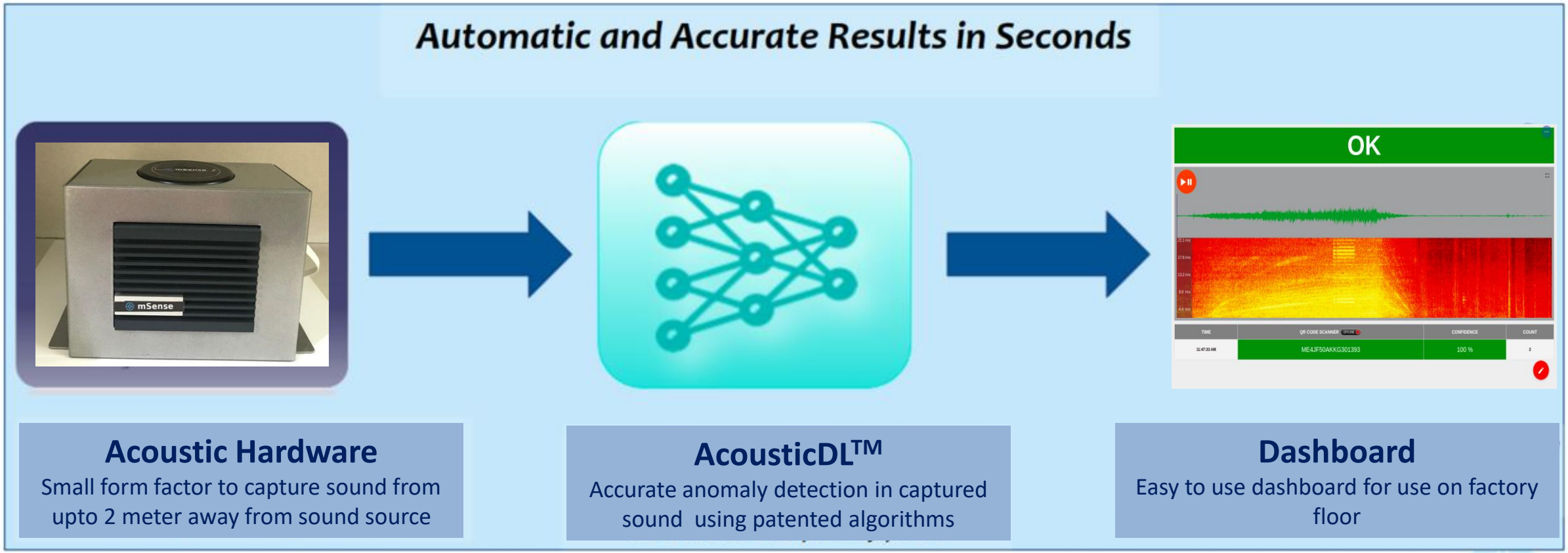
mSense

Case study – Digital Ears For Engine Defect Detection

Photographs / Videos of Solution deployed *mSense factory floor automatic acoustic inspection*



Top 10 Industry 4.0 Use cases

1 Manual data & process management
Solution: Shop floor digitisation using AI and analytics
Business benefit: Process improvement, paperless operation, high productivity and efficiency

2 Manual inventory management
Solution: Paperless inventory management using AI & Analytics
Business benefit: Lower material management cost

3 Frequent machine failures
Solution: Predictive maintenance using IoT, AI and Analytics
Business benefit: Planned shutdown, lower production loss, lower machine failure cost

4 High Energy Cost
Solution: Smart Energy Management using AI, ML and IoT solutions
Business benefit: Improved energy efficiency

5 Product quality issues
Solution: Computer Vision/IoT Solutions for Quality Inspection
Business benefit: Better quality control

6 Low market reach
Solution: VR based plant visits
Business benefit: Better customer reach

7 Remote customer / expert support
Solution: AR/VR based solutions
Business benefit: Quick problem solving, remote outreach

8 Managing worker health & safety
Solution: AI & IoT based remote monitoring of worker's health
Business benefit: Better worker mgmt.

9 Compliance Management
Solution: Computer vision and AI based solutions
Business benefit: Safety & Compliance

10 IoT security
Solution: Cybersecurity based solutions
Business benefit: Data protection, User access control, better security