

MegAAOI

– A TRAILBLAZER FOR AI-ENABLED,
IOT CONNECTED AOI MACHINE

MegAAOI

2021.05.25



CONTENT

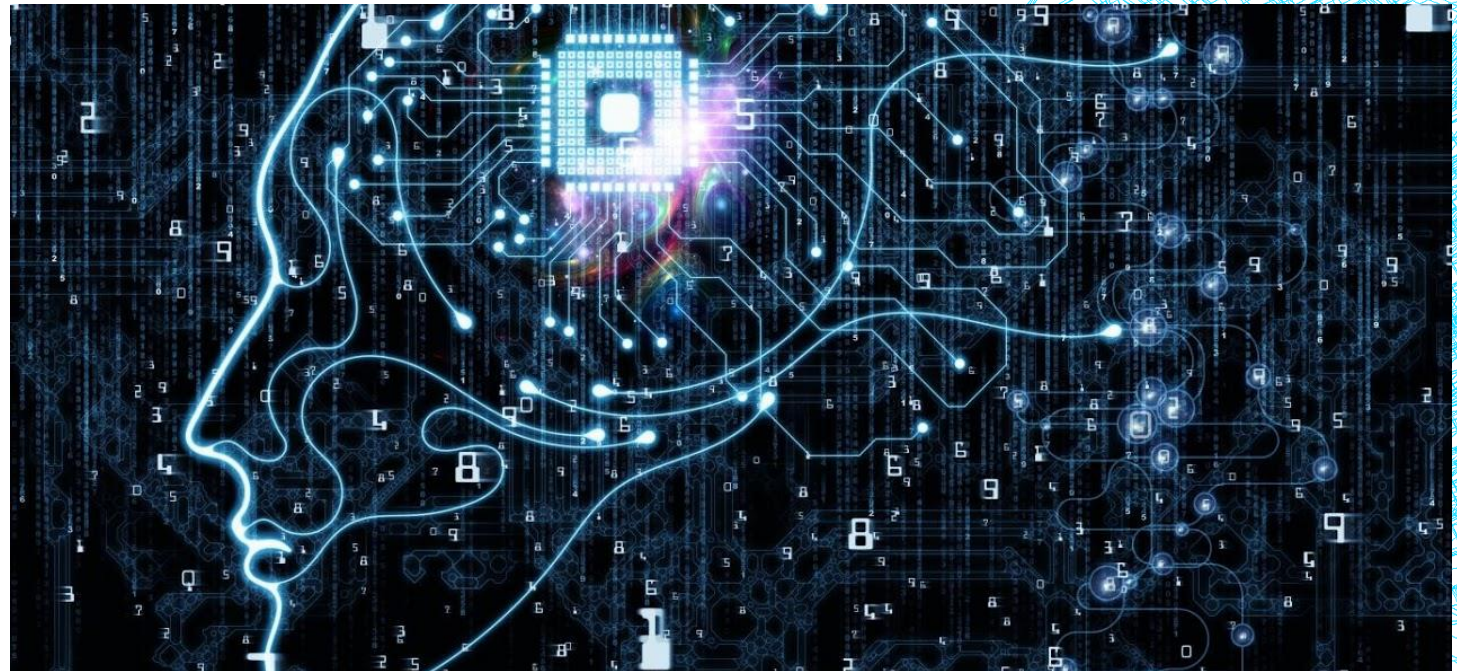
- **The Company**
- **Core Competence**
- **Our Product and Service**
- **Why MegAAOI**

THE COMPANY

The startup company is founded in 2019 by a highly enthusiasm and visionary team of industry veterans with extensive knowledge of artificial intelligence, embedded programming, and client-server information system with more than 30 years of relevant experiences

The team had built extensive experience and credential through many hands-on projects

The core competence of the company is to embody AI and IoT edge/cloud computing to Automatic Optical Inspection (AOI)



OUR CREDENTIAL

MegAAOI is the 1 of the 18 startups, out of 130+, selected by Microsoft for Startups Taipei batch 2 program on 22 April 2020!

https://www.google.com/url?q=https%3A%2F%2Fnews.microsoft.com%2Fzh-tw%2Fstartup-accelerator-microsoft%2F%3Ffbclid%3DIwAR3CHNJaipmF6HAr-03bAf_2qr4L6mwUeSaH5N8wY8KpVQZxSmOffBfmWsM&sa=D&sntz=1&usg=AFQjCNF_FvXX7HC_NkNuvfC8h1hW-cmJKg



Reneata Chang • 1 度

Business Program Manager / Microsoft for startup Taipei

2 週前 • 已編輯 •

Microsoft for Startups Taipei has announced 18 startups that are set to join the inaugural Microsoft for startups Taipei batch 2 program. The startups were elected after an intense final evaluation over 6 hours the Selection Day on April 22. These startups were selected from the Top 28 teams that made it to this round, after a 1.5 month innovation scouting and application review process , short in-person interview as we always do and nearly 130 applications from Taiwan.

Congratulations 🎉 AuthMe、CHANGING.AI、KryptoGO、Earthbook、MegAAOI、NADI System Corp.、Tangram、TAO、Deepinsight、LOCUS Marketing Technology Co., Ltd.、Nexera NexRetail、TDSC、Deep01 Limited、Kenkone、BiiLabs Co., Ltd.、Ihh、International Trust Machines Corporation、Ubestream

<https://lnkd.in/gedeqeC>

翻譯年糕



OUR CREDENTIALIAL

- MegAAOI was proud to have been selected by Startup SBIR Stage-1 2020 as 1 of 150, out of 450+ applicants, to receive subsidy for our innovated product - AI-enabled, connected AOI machine
- Furthermore, MegAAOI was granted by SBIR Stage2 program as 1 of 14 to receive subsidy for working with existing AOI machine makers by furnishing AI AOI kit



經濟部中小企業處廣告

109年度 SBIR 海選計畫新秀組

您是有勇氣、有夢想、有創意的新創業者嗎？

簡易方便的申請方式 8分鐘的簡報

SBIR 中央型 Phase 2

經濟部中小企業處SBIR第389次指導會議 (創業型 Stage1) 新秀組 · 核定名單公告

經濟部中小企業處於本(109)年8月10日召開「小型企業創新研發計畫(SBIR)創業型SBIR-Stage1 新秀組 第389次指導會議」，審議通過150項中小企業所提計畫之研發獎助金，核定名單詳如下附表。

附表：按公司名稱筆畫排序

序號	區域	公司名稱	序號	區域	公司名稱
7	北區	弘翔精密科技股份有限公司	20	北區	彤鳥社會企業有限公司
8	北區	兆米智慧檢測股份有限公司	21	北區	沛樂醫藥有限公司
9	北區	安博創行股份有限公司	22	北區	芋富企業社

「小型企業創新研發計畫 (SBIR)」第402次 (創業型 Stage2) 指導會議

經濟部中小企業處「小型企業創新研發計畫 (SBIR)」第402次 (創業型 Stage2) 指導會議，

審議通過：

「技術創新突破類」案計14件

「服務開發應用類」案計10件

合計24項中小企業所提計畫之研發經費部份補助，核定名單詳如下附表。

附表：

	領域	公司名稱	統一編號
8	技術創新突破類	軒帆光電科技股份有限公司	42695869
9	技術創新突破類	兆米智慧檢測股份有限公司	85094416
10	技術創新突破類	道品股份有限公司	50859055

OUR PATENT AND EXPERIENCE

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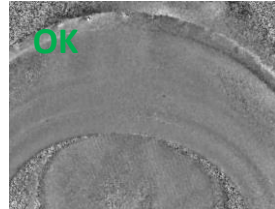
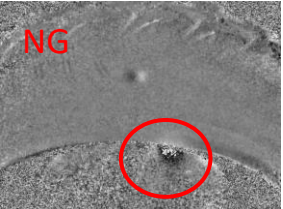
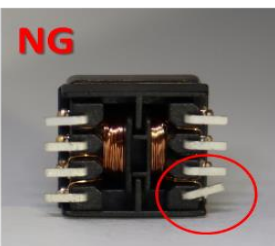
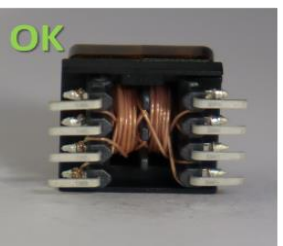
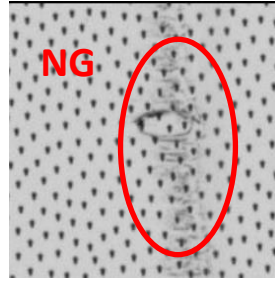
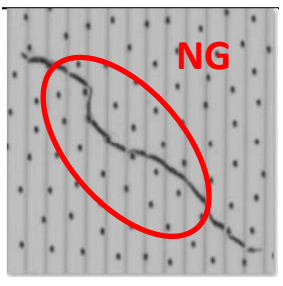
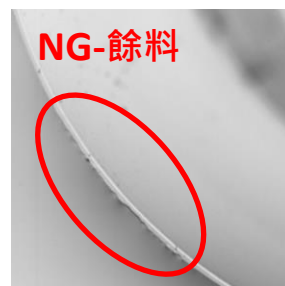
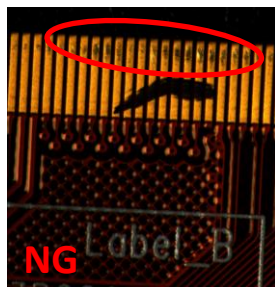
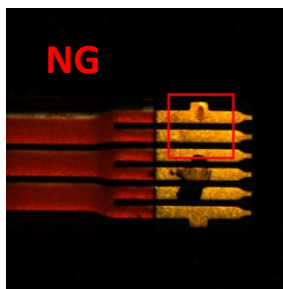
OK

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Outer Lead/Lead Contamination NG

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NG

Lot:FN43NZP304
Plating+Base.Level IP NG



中華民國專利證書

新型第 M604031 號

新 型 名 稱: 基於人工智能的光學檢測系統

專 利 權 人: 兆米智慧檢測股份有限公司

新 型 創 作 人: 萬億中、黃陳漳

專 利 權 期 間: 自 2020 年 11 月 11 日 至 2030 年 7 月 2 日 止

上開新型業依專利法規定通過形式審查取得專利權
行使專利權如未提示新型專利技術報告不得進行警告

經濟部智慧財產局 局長

洪淑敏

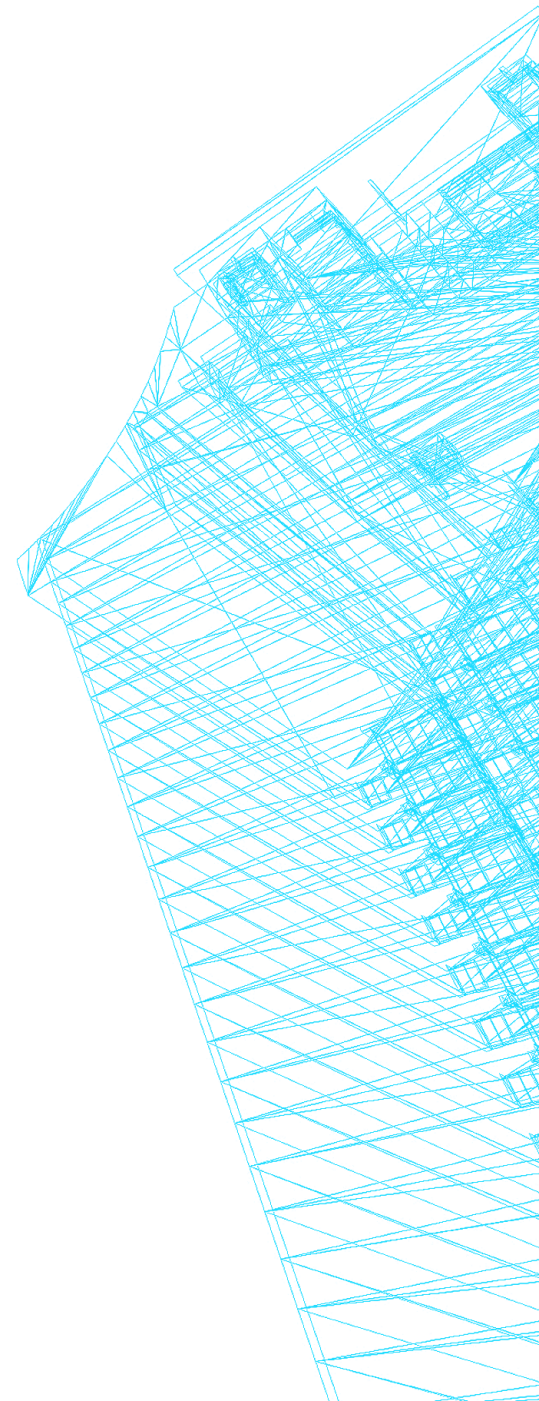
中華民國 109 年 11 月 11 日



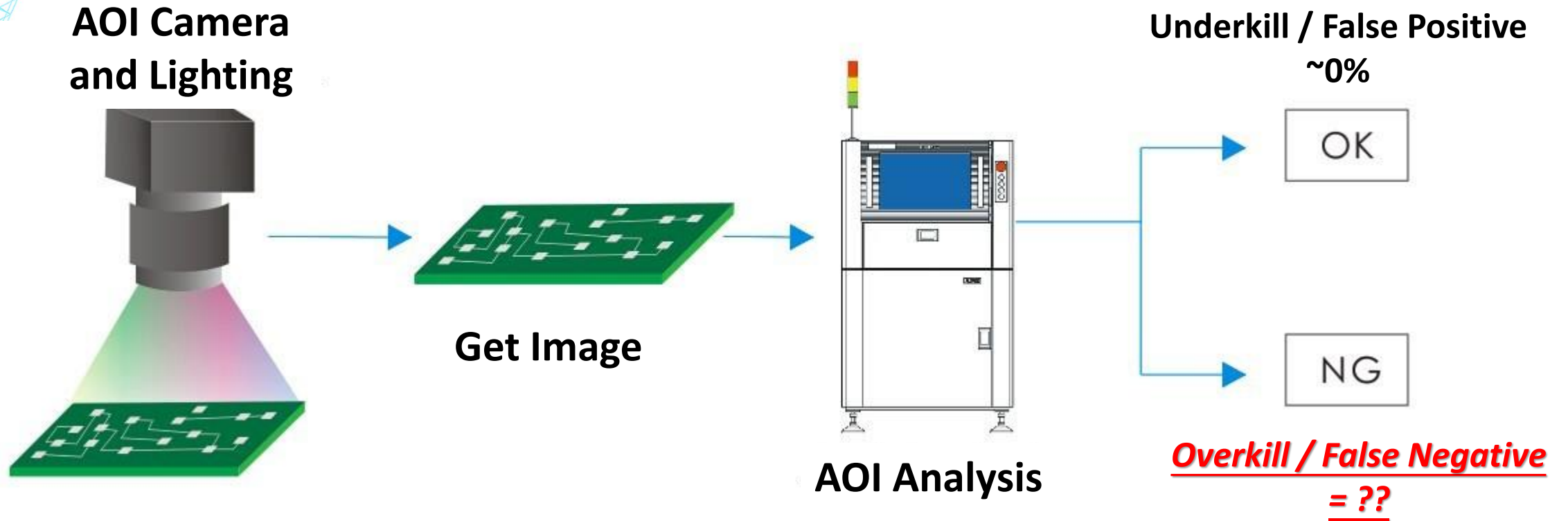
注意: 專利權人未依法繳納年費者, 其專利權自原繳費期限屆滿後消滅。

CORE COMPETENCE

Fostered from hands-on experience and delivery!



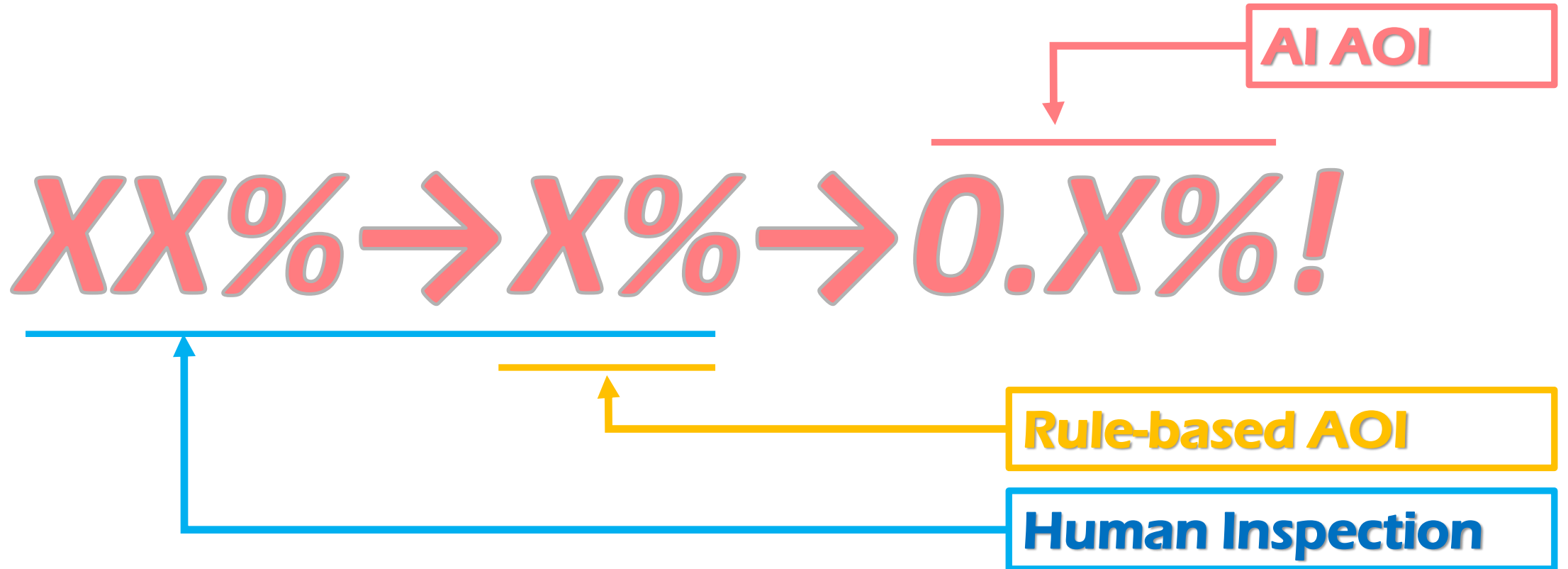
AOI – AN APPLICATION OF CV



Lower the Overkill Rate while Maintain Underkill Approach to Zero!

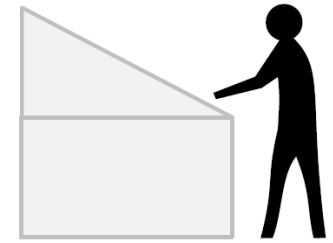
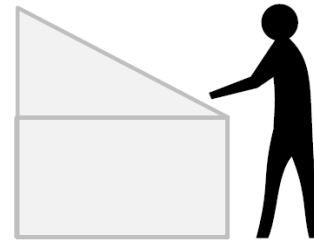
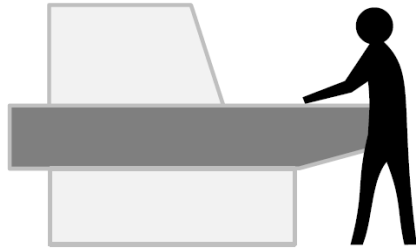
ISSUE TO BE ADDRESSED

- Lower the overkill rate of existing rule-based AOI machine
 - Increase Unit Per Hour (UPH) by decreasing machine stop for verify and repair
 - Lower the production cost in terms of labor and waste materials



ACHIEVED KPI

Human Inspection (HI)
+ Verify and Repair Station
(VRS)



Rule-based AOI+VR



1/6



Hybrid (Rule+AI)
AOI+VR



1/3

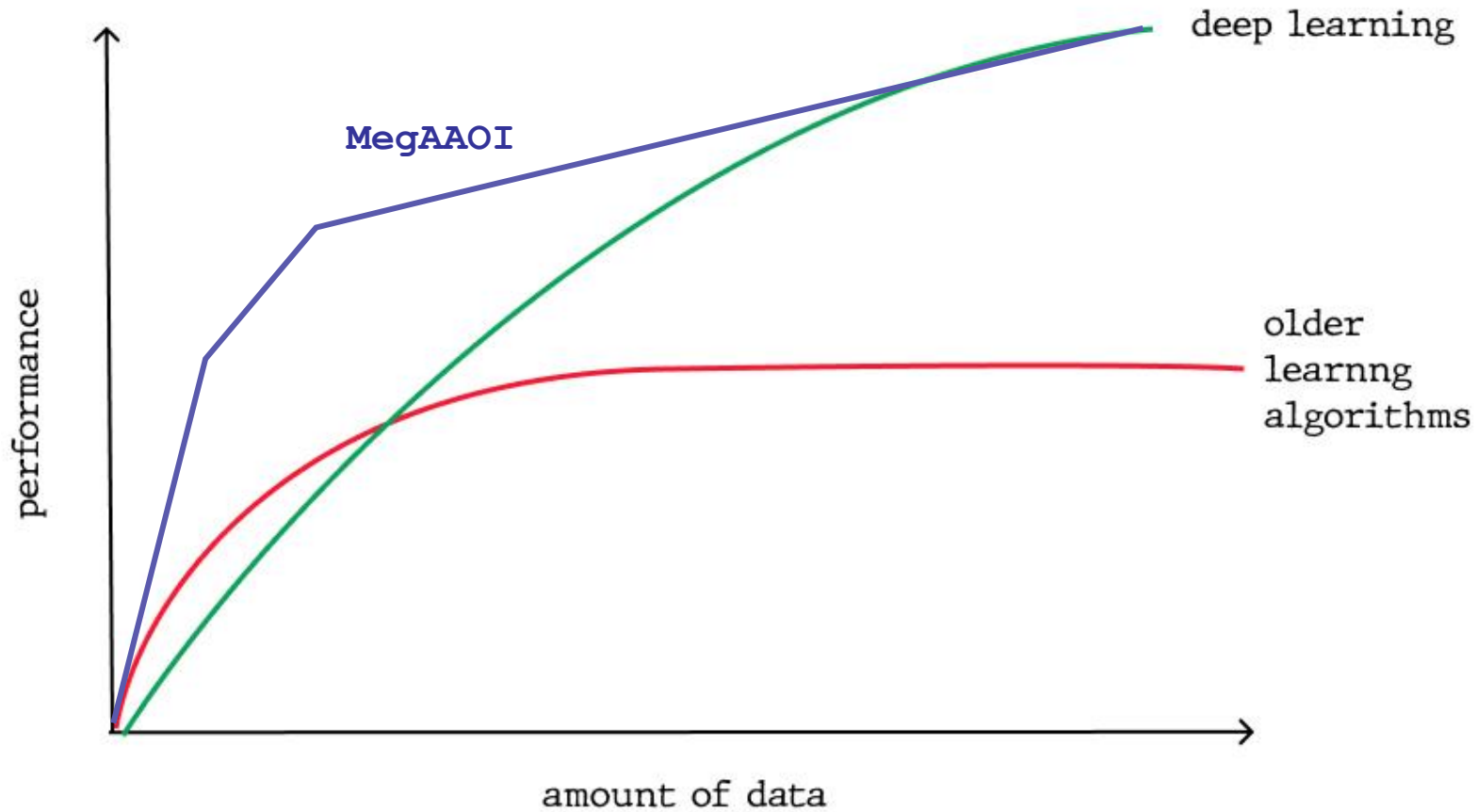


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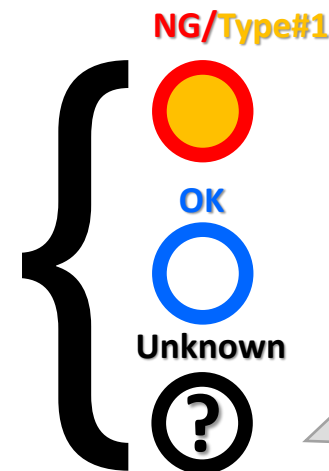
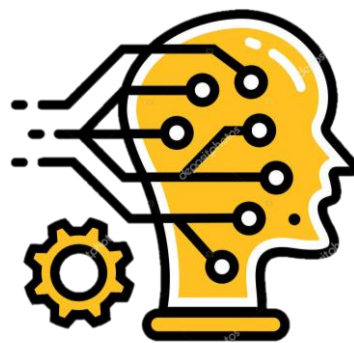
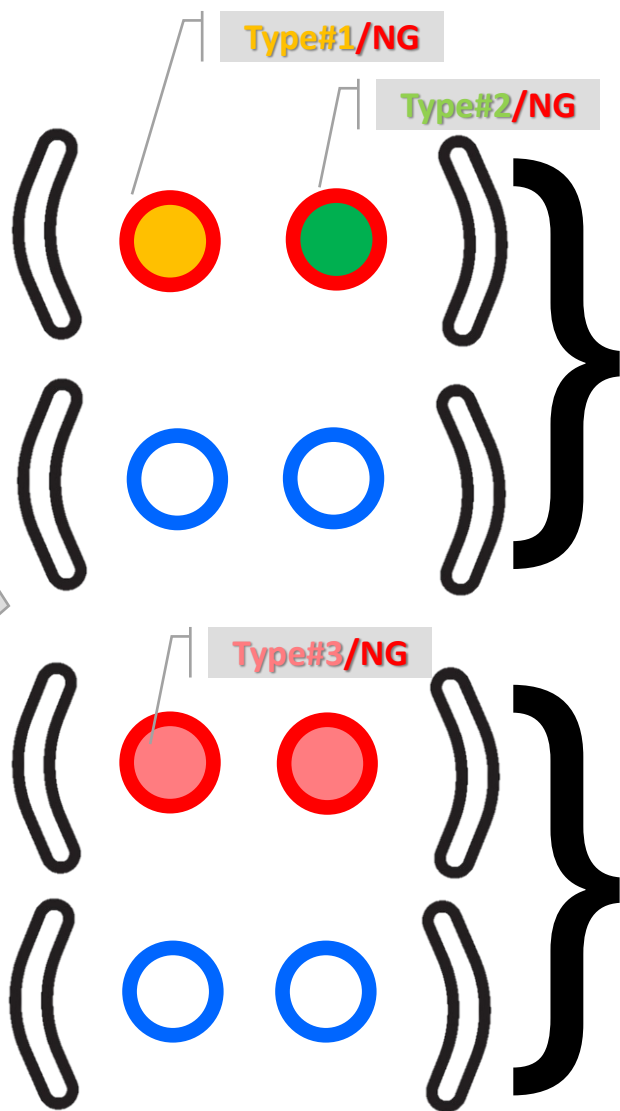
INNOVATED APPLIED AI INFERENCE



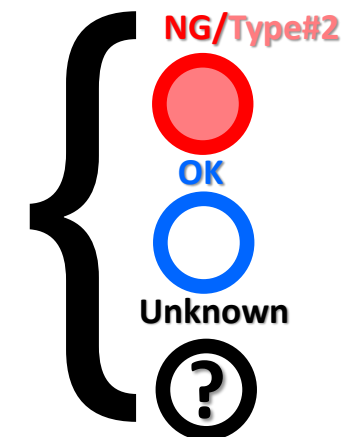
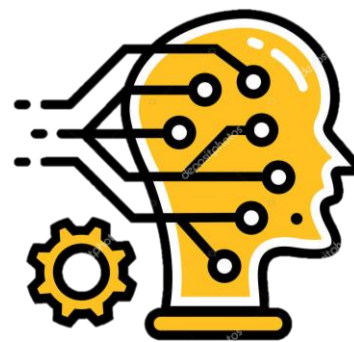
Steeper the Performance with Less Training Data!

PATENTED DATA TRAINING AND INFERENCE

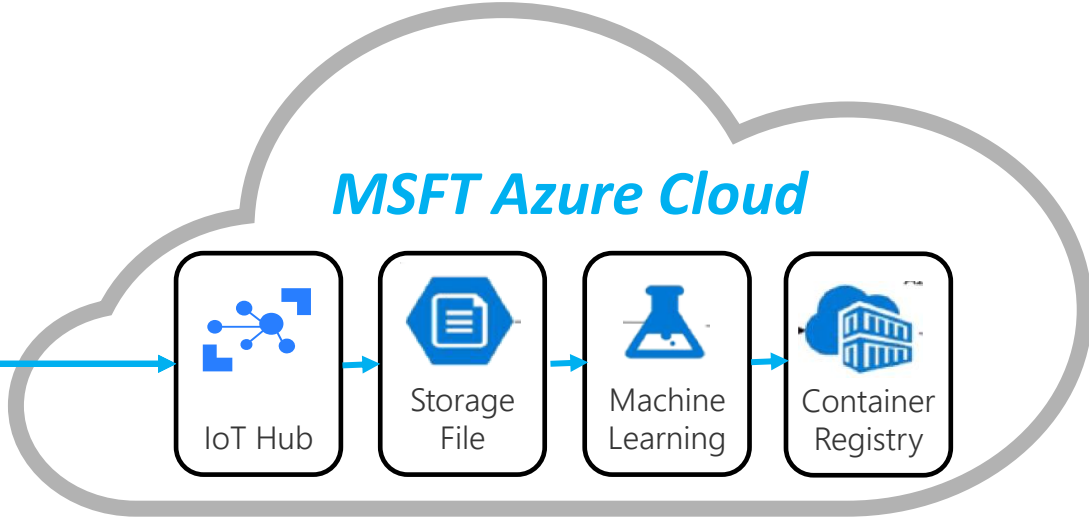
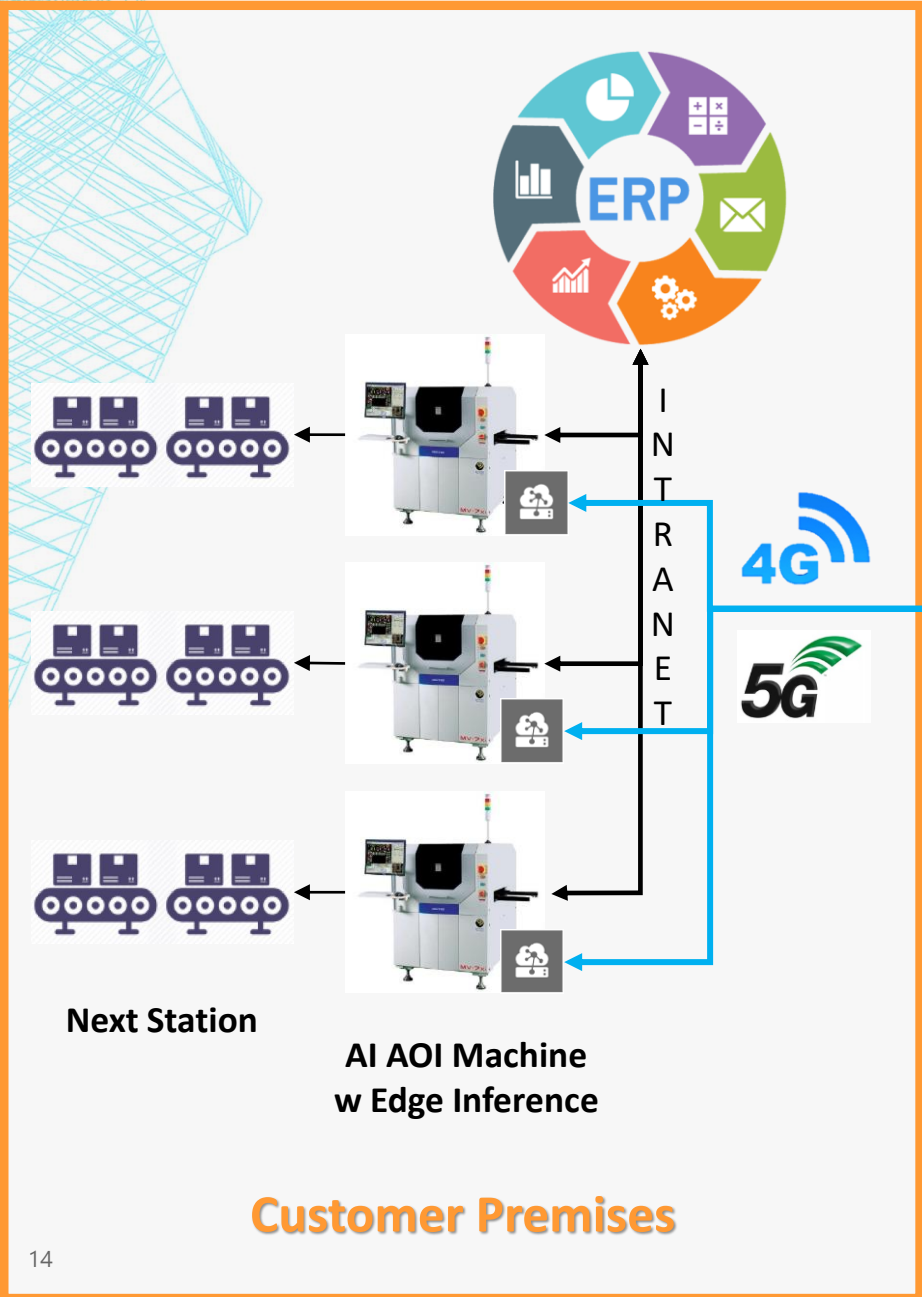
Single & Multi-Defect Type AI Model Training to Facilitate Run-Time Multi-AI Models Development and Validation



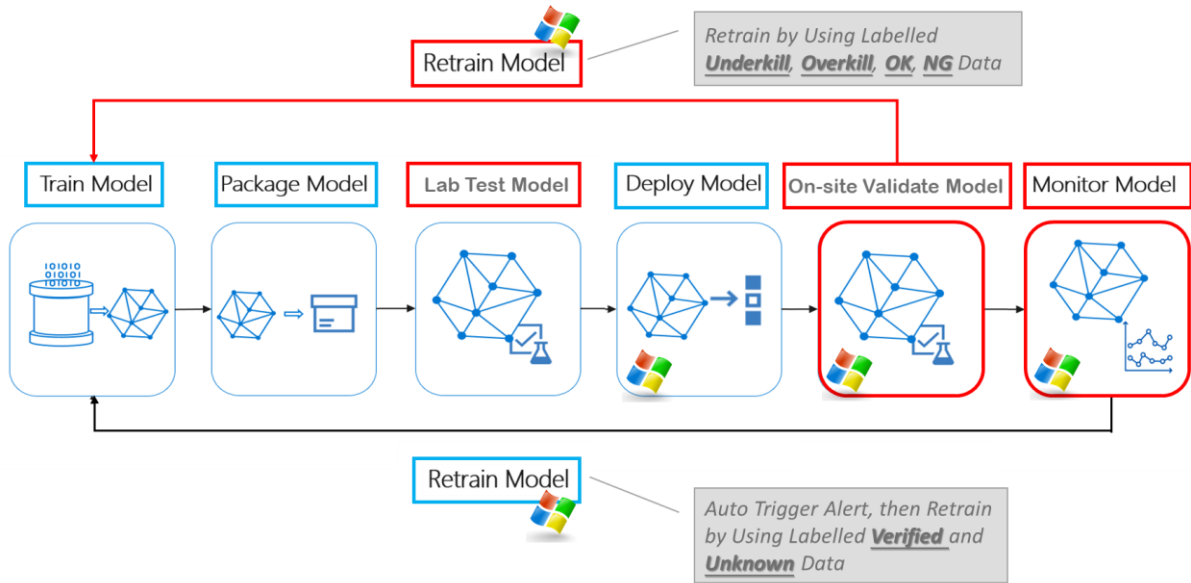
Add "Unknown" Inference Mechanism to Facilitate On-Line AI Model(s) Retrain



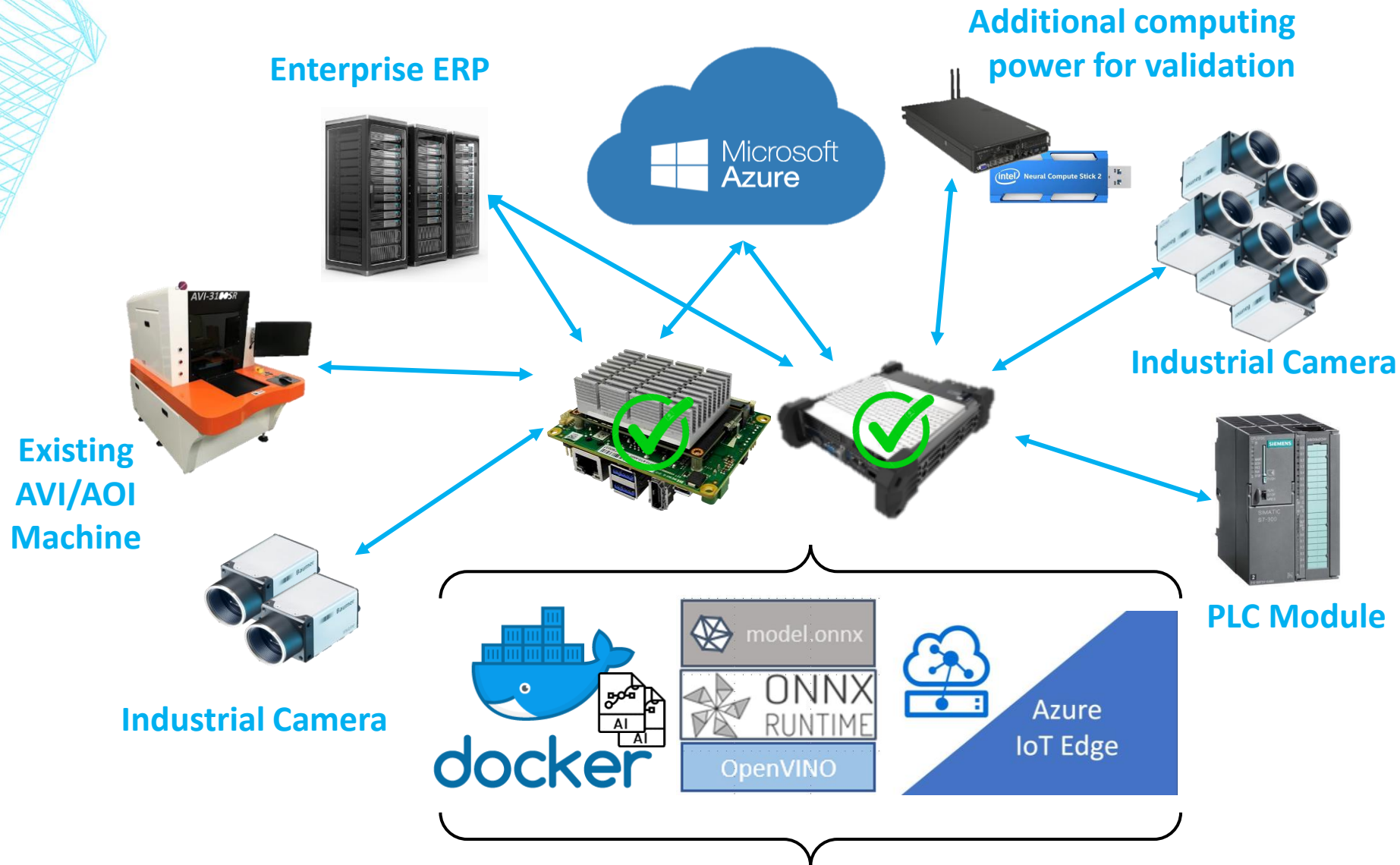
CONNECTED AOI SUPPORTS AI DUAL-CLOSED LOOP RETRAIN



- AI Model (Run-time)
- AI Models (By types)
- Validate Result
- Monitoring Result

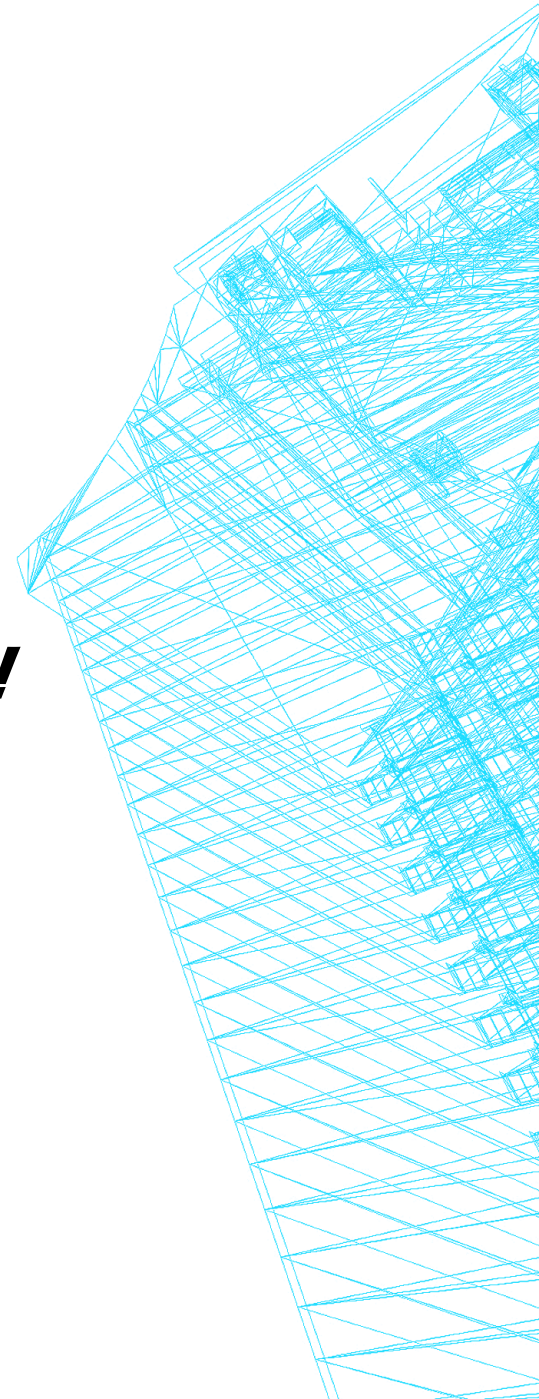


FINE-TURNED EDGE COMPUTER

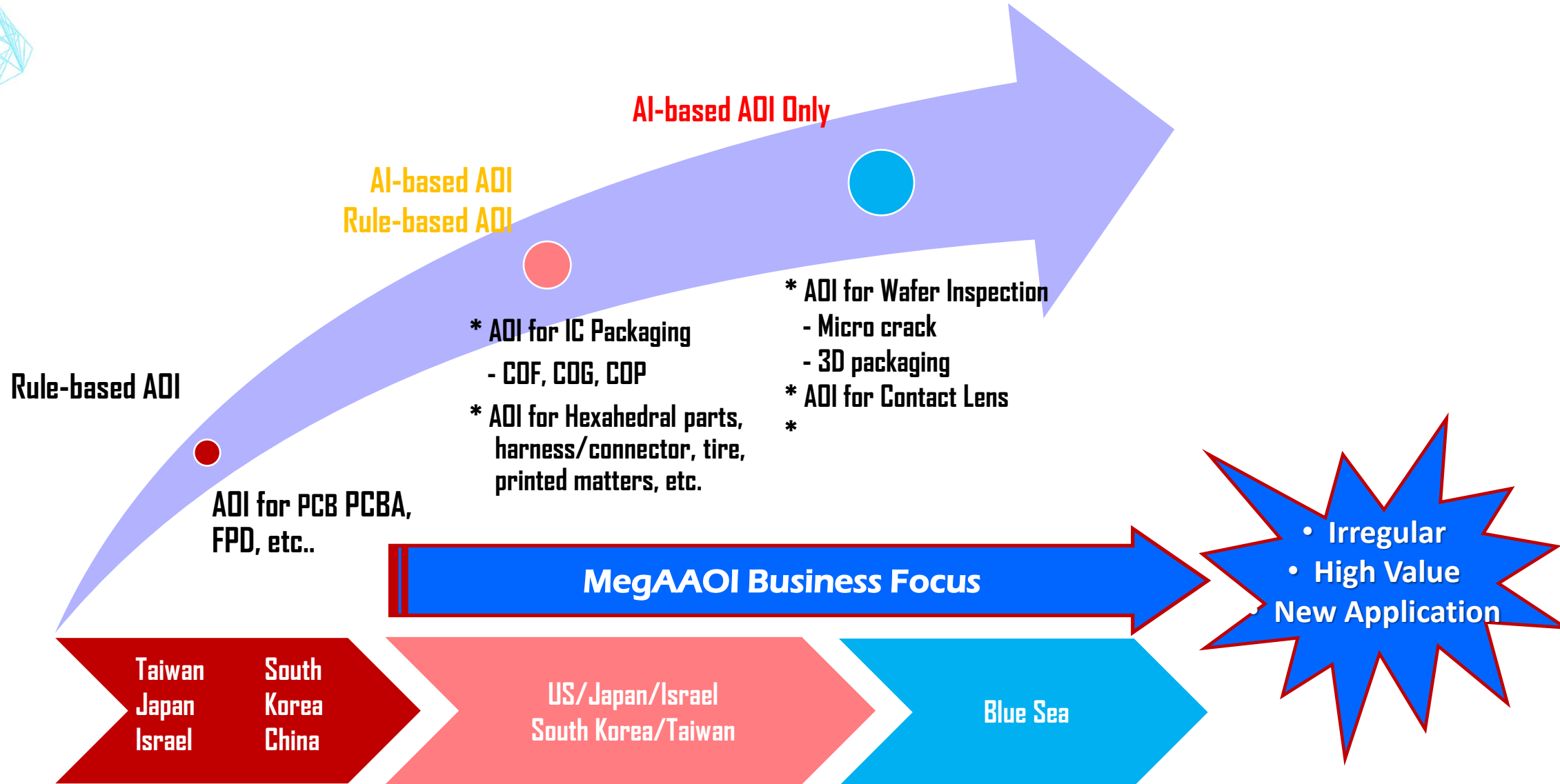


OUR PRODUCT AND SERVICE

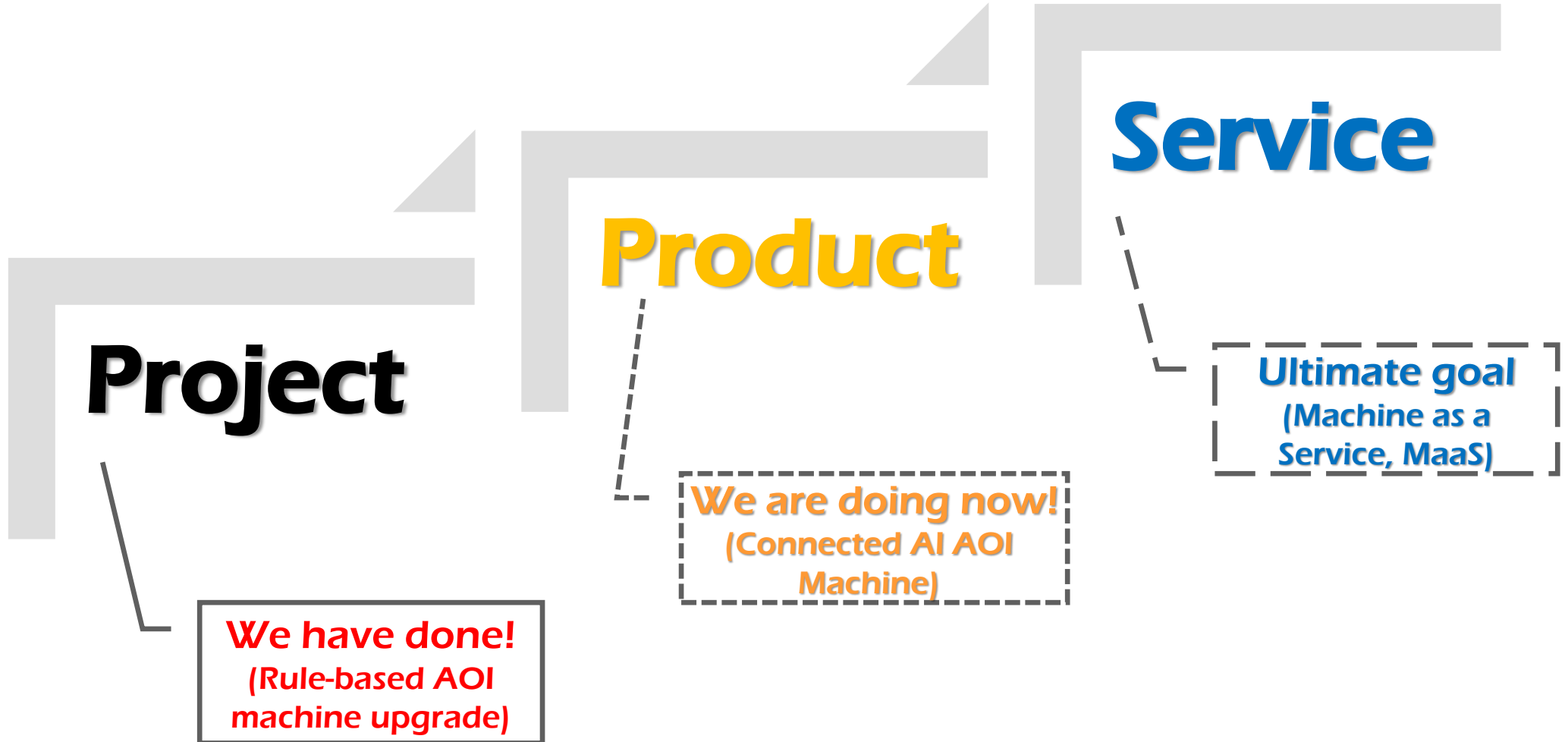
World First, Validated IC Packaging AI AOI Paradigm!



MEGAAOI MARKET FOCUS



BUSINESS MODEL



PROJECT – A HYBRID AOI SOLUTION



Rule-Based AOI Machine



→ Photos (No-go)



← Controls



AI Edge Computer

→ Relabeled Data Set



AI Training Server

AI Solution POC

Project Award

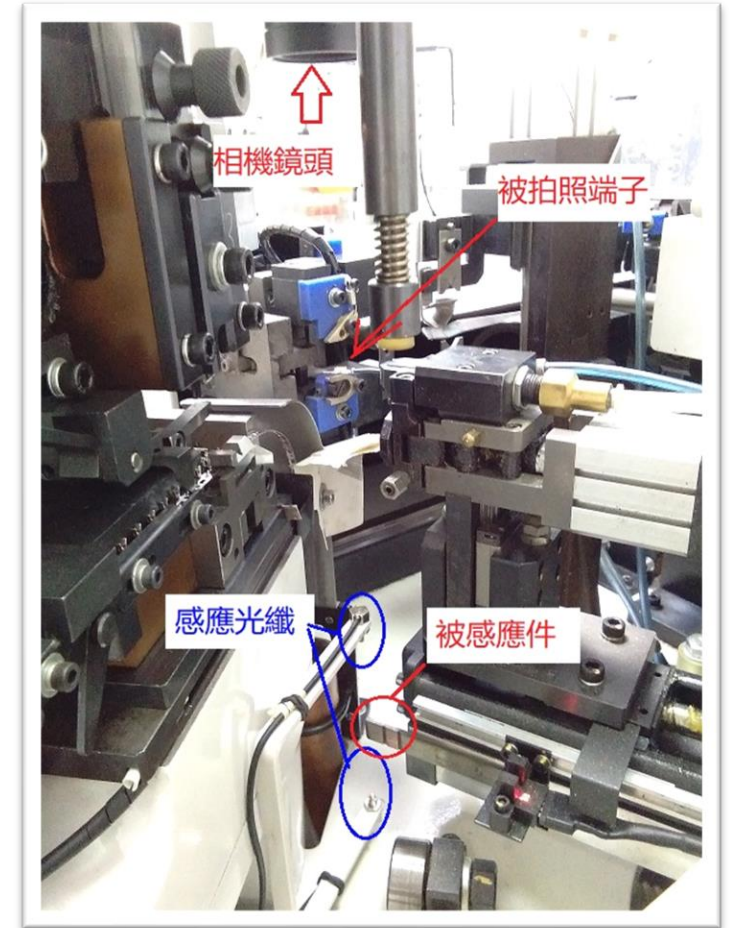
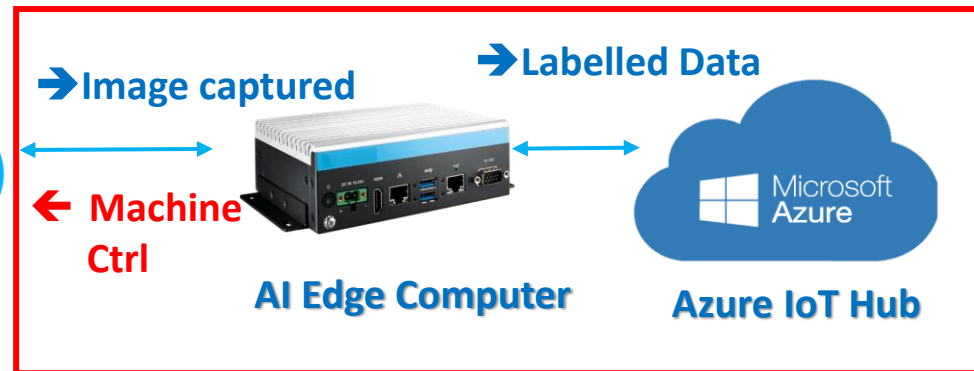
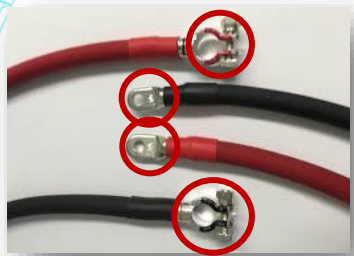
Delivery

System Integration for
Target Production Line

On-Line Operate after
Acceptance

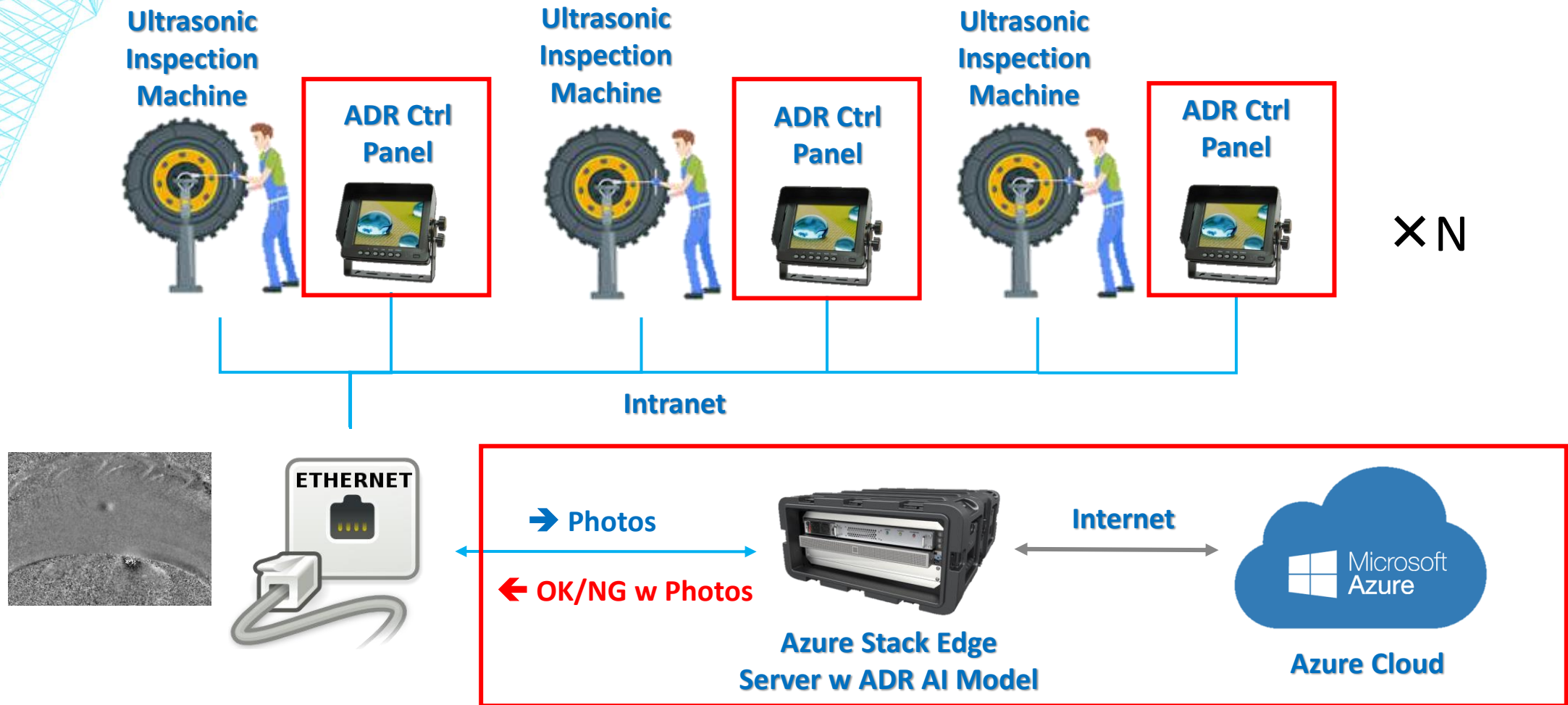
World First Operated AIoT AOI Solution in IC Packaging Industry!

PROJECT – VEHICLE CABLE CONNECTOR AOI



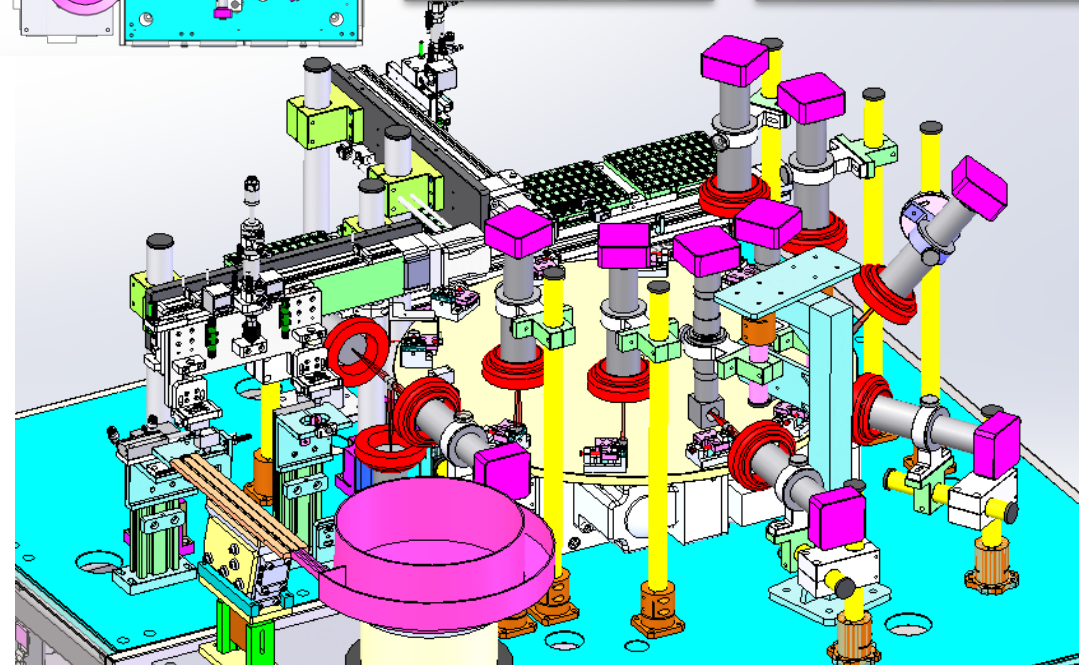
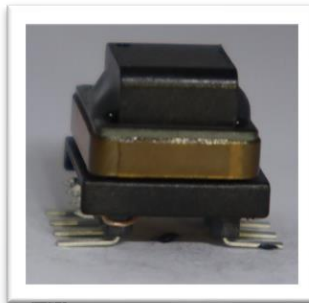
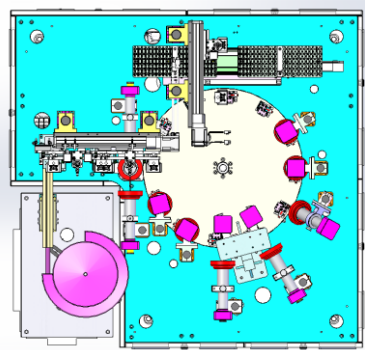
Add No New AOI Station, On-fly Image capture plus AI inference!

PROJECT – TIRE ULTRASONIC AI ADR



World First Tire Bubble AI Automatic Defect Recognition (ADR) Solution!

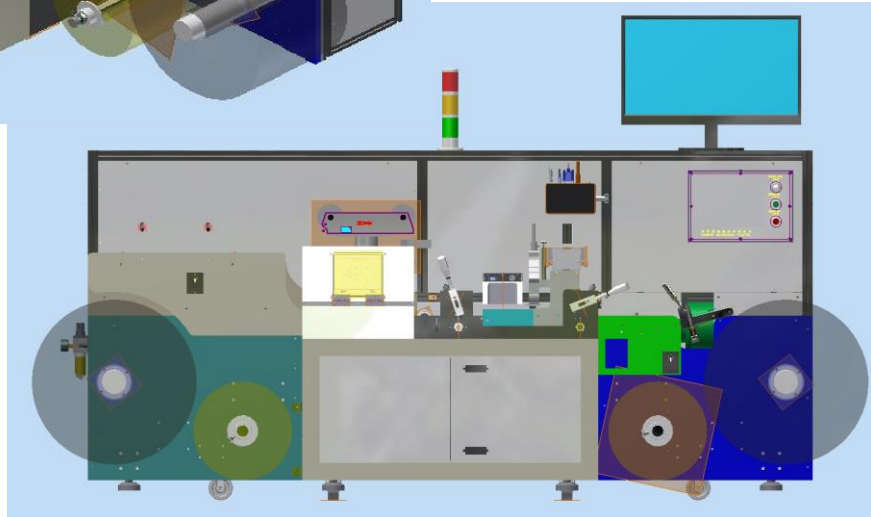
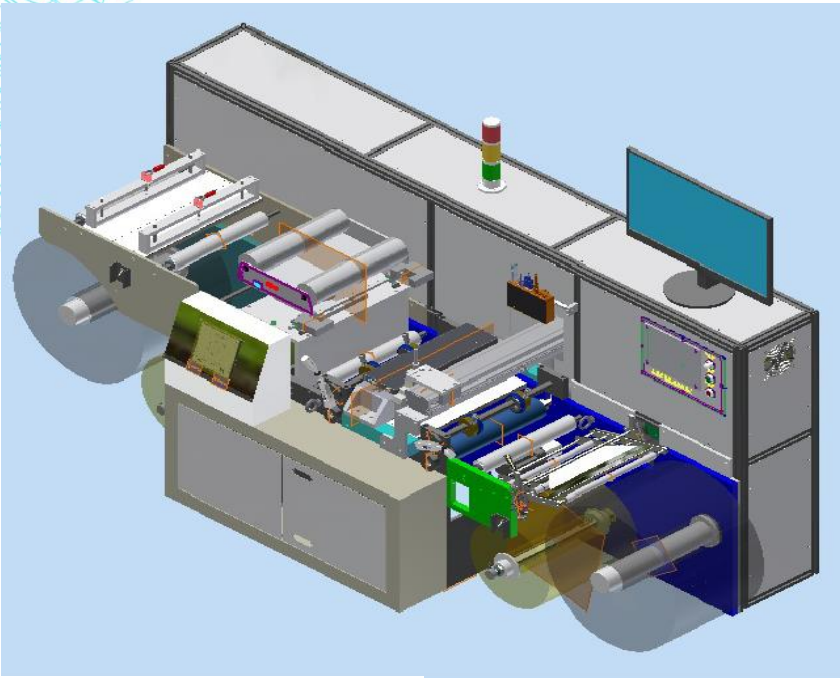
PRODUCT – HEXAHEDRAL PARTS AOI MACHINE



- Capable to capture and inspect the hexahedral of UUT with 12 faces per unit
- Defect to be inspected: foreign debris, dent, stain, deformation, contamination, trimmings, overflow, and chipping
- System Performance:
 - UPH: > 1200
 - Underkill: < 0.05%
 - Overkill: < 1%
- Powerful AI architecture:
 - Cloud-based management, model deployment, and validate /monitoring with retrain by leveraging Microsoft Azure IOT platform
 - Stand alone AI edge inference computers with Azure Edge installed
 - 12 AI models against each camera

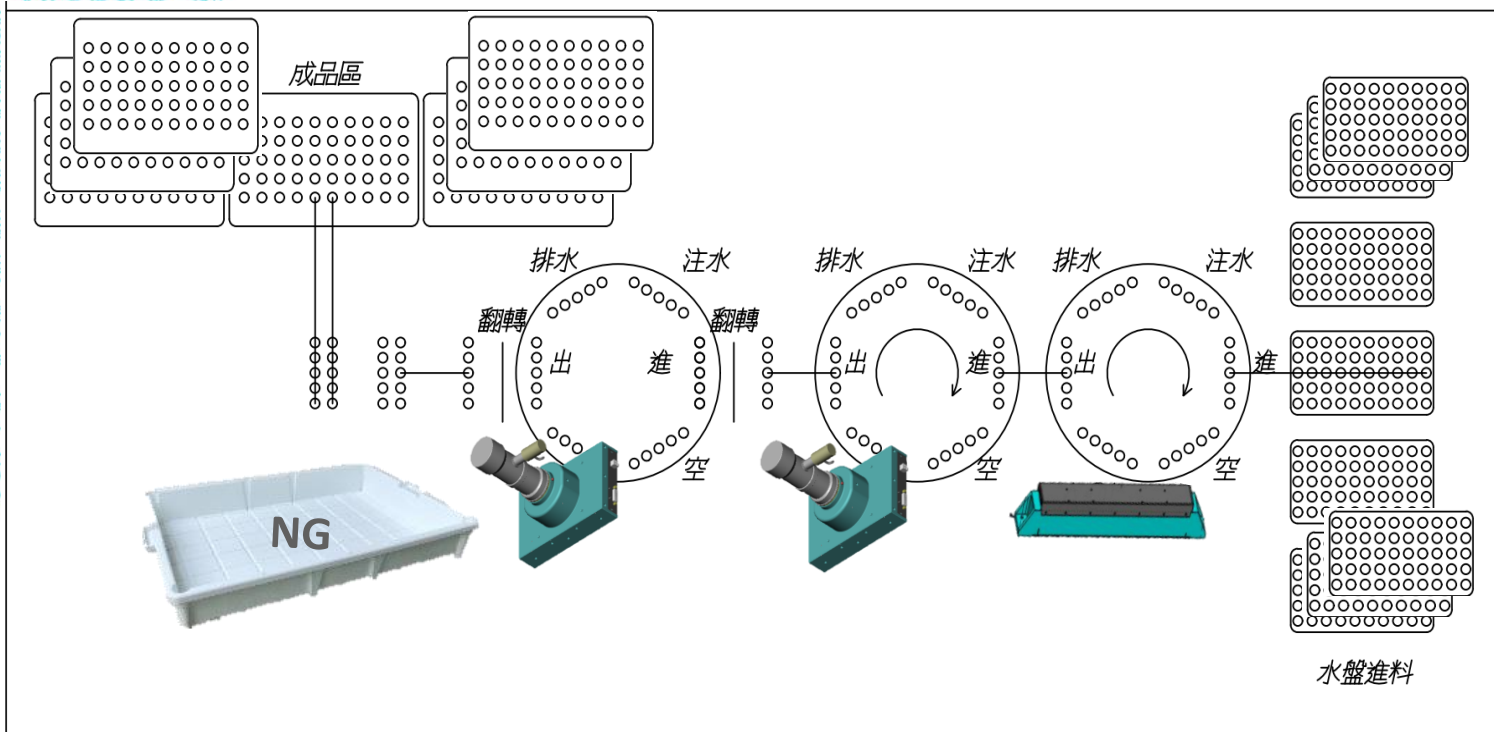
POC Completed, Production Ready!

PRODUCT – R2R HEAT SEAL LABEL AOI MACHINE



- Capable to inspect defects of heat seal label in a roll-to-roll manner:
 - Roll width: 300mm
 - Roll length: 5000mm less than 330mm in diameter
- Defect to be inspected: Misprint, mislocated, iridescence, dirty stains, deformation, contamination, trimmings, overflow, and chipping
- System Performance :
 - UPH: 270m/hrs
 - Underkill: < 0.05%
 - Overkill: < 1%
- Powerful AI architecture:
 - Cloud-based management, model deployment, and validate /monitoring with retrain by leveraging Microsoft Azure IOT platform
 - Stand alone AI edge inference computers with Azure Edge installed
 - AI models trained against defects

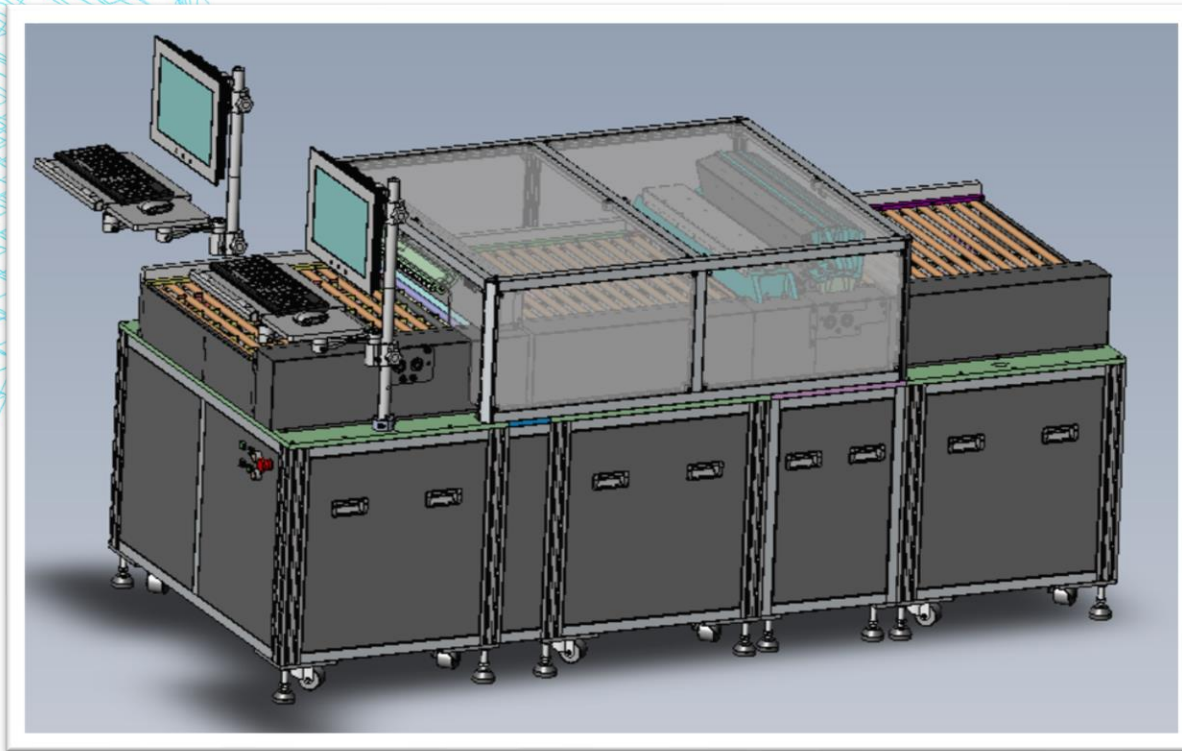
PRODUCT – SOFT CONTACT LENSES AI AOI MACHINE



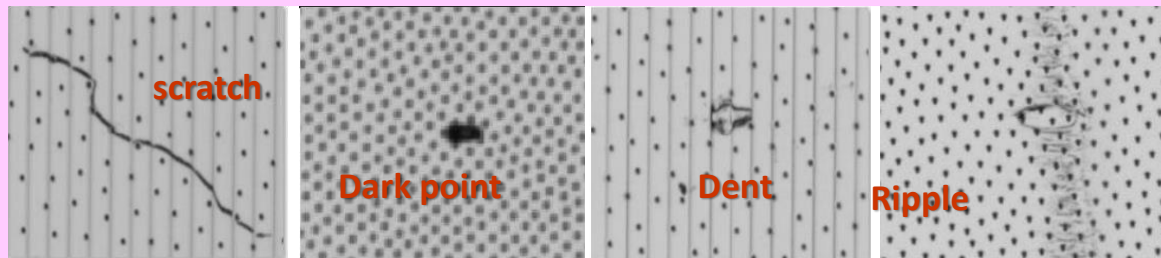
- Capable to inspect the defects of aqua contact lenses including scratch, foreign object, bubble, chipping, out-of-round, crush, tailing, etc..
- Machine function include UUT loading, image capture, AI OK/NG sorting and unloading.
- System Performance:
 - UPH: > 1200 pieces/hrs w/o NG/OK sorting
 - Underkill: < 0.1%
 - Overkill): < 5%
- Powerful AI architecture:
 - Cloud-based management and validate/retrain by leveraging Microsoft Azure cloud
 - All-in-one for AI edge inference and machine control
 - Adopt MegAAOI's Patent for AI training and inference
 - 3 AI models against each line scanner

POC Completed, Production Ready!

PRODUCT – LIGHT-GUIDE PLATE AOI MACHINE



- Capable to capture and inspect varied type of light-guide plate
- Defect to be inspected: scratch, dark points, dent, spot point, ripple, contamination, and overflow
- System performance:
 - Defect Sensitivity: 10.5 μ m
 - UPH: > 1500
 - Underkill: < 0.05%
 - Overkill: < =1%
- Plate thickness: 01.mm ~ 5mm
- Machine Spec :
 - Max. Scan Size: 600mm \times 600mm
 - Min. Scan Size: 70mm \times 130mm
 - Auto. Cleaning tunnel: 122mm
 - NG/OK inspection length: 1050mm
- Powerful AI architecture:
 - Cloud-based management, model deployment, and validate /monitoring with retrain by leveraging Microsoft Azure IOT platform
 - Stand alone AI edge inference computers with Azure Edge and Intel OpenVINO installed



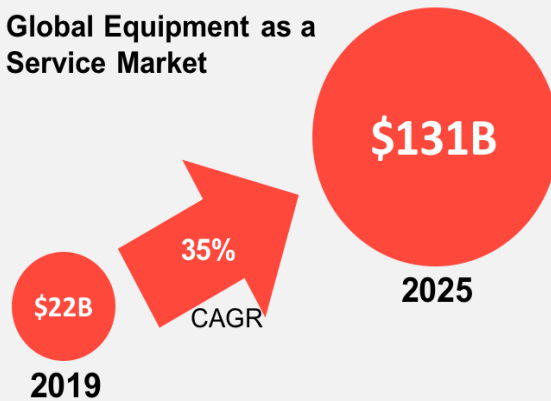
SERVICE – Machine as a Service (MaaS)

Equipment as a Service (EaaS) market to grow to \$131B by 2025



GLOBAL MARKET SIZE

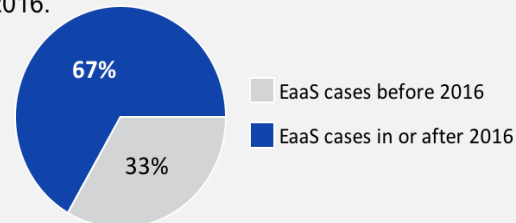
Global Equipment as a Service Market



- Overall EaaS business model penetration currently a low single-digit percentage
- Adoption visible across a few dozen industries

RECENT ADOPTION

Adoption is accelerating. 67% of the 39 EaaS case studies identified as part of the research happened in or after 2016.



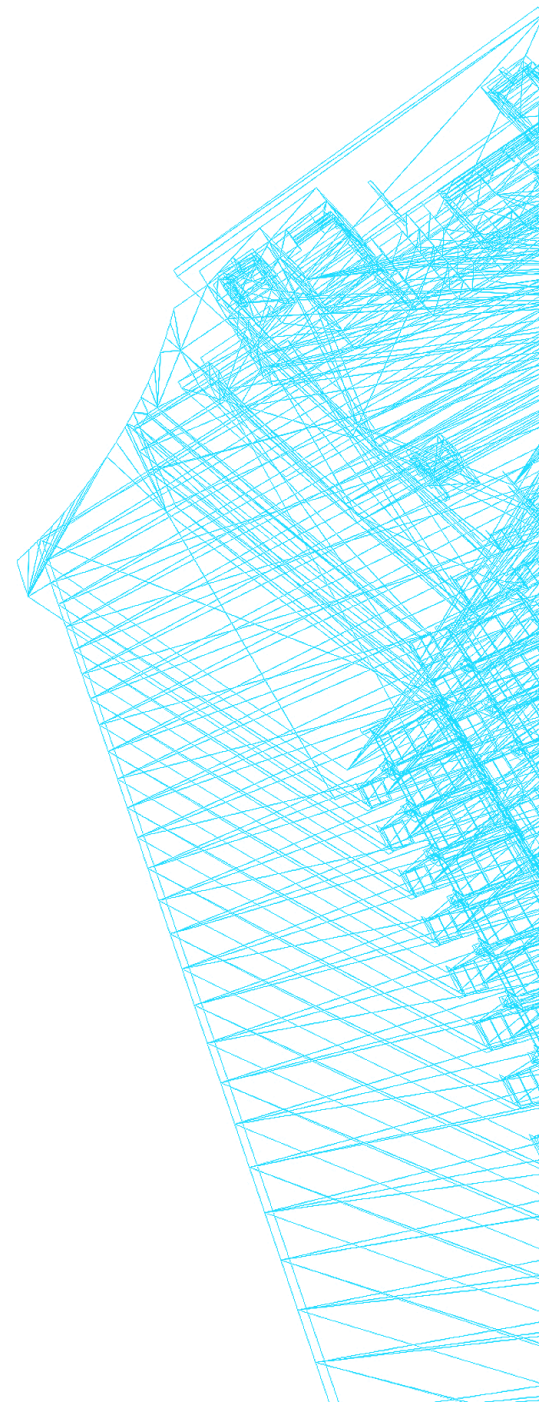
CURRENT MARKET DRIVERS

1. Lower setup costs
2. More mature financing tools
3. New accounting regulations
4. New competition from 3rd party service providers

Our advantages stemmed from following contributing factors:

- Pandemic of COVID-19 derives the need for connected AOI machine
- We have an identified early-adopter
- The H/W cost of AI AOI machine is lower than rule-based AOI machine – a great facilitator to the service model

WHY MegAAOI ?



OUR COMPETITIVE EDGE

1. Proven AOI solution by top-notch semiconductor packaging company
2. Innovated applied AI inference, require much less data set in terms of hundred thousands to only few hundreds/thousands
3. Patented training and inference mechanism to reduce AI deployment time and cost
4. Success implemented connected AOI machine with Microsoft Azure
5. A fine-tuned all-in-one AI edge computer/server to embody above requirements



THANK YOU!

Billion Wan

Email: billion.wan@megaaoi.com

LinkedIn: www.linkedin.com/in/billion-wan

