



德律科技股份有限公司
www.tri.com.tw

報告人：陳冠元/財務長兼代理發言人

德律科技股份有限公司



- 成立時間：1989年4月10日
- 創立人：陳玠源董事長
- 資本額：新台幣23.62億



主力產品: 電路板組裝檢測設備

RI
innovation

☆ 自動光學檢測設備(IT/Image Tester)

- ☆ 錫膏自動光學影像檢測機(SPI)
- ☆ 自動光學影像檢測機(AOI)
- ☆ X-ray自動檢測機(AXI)

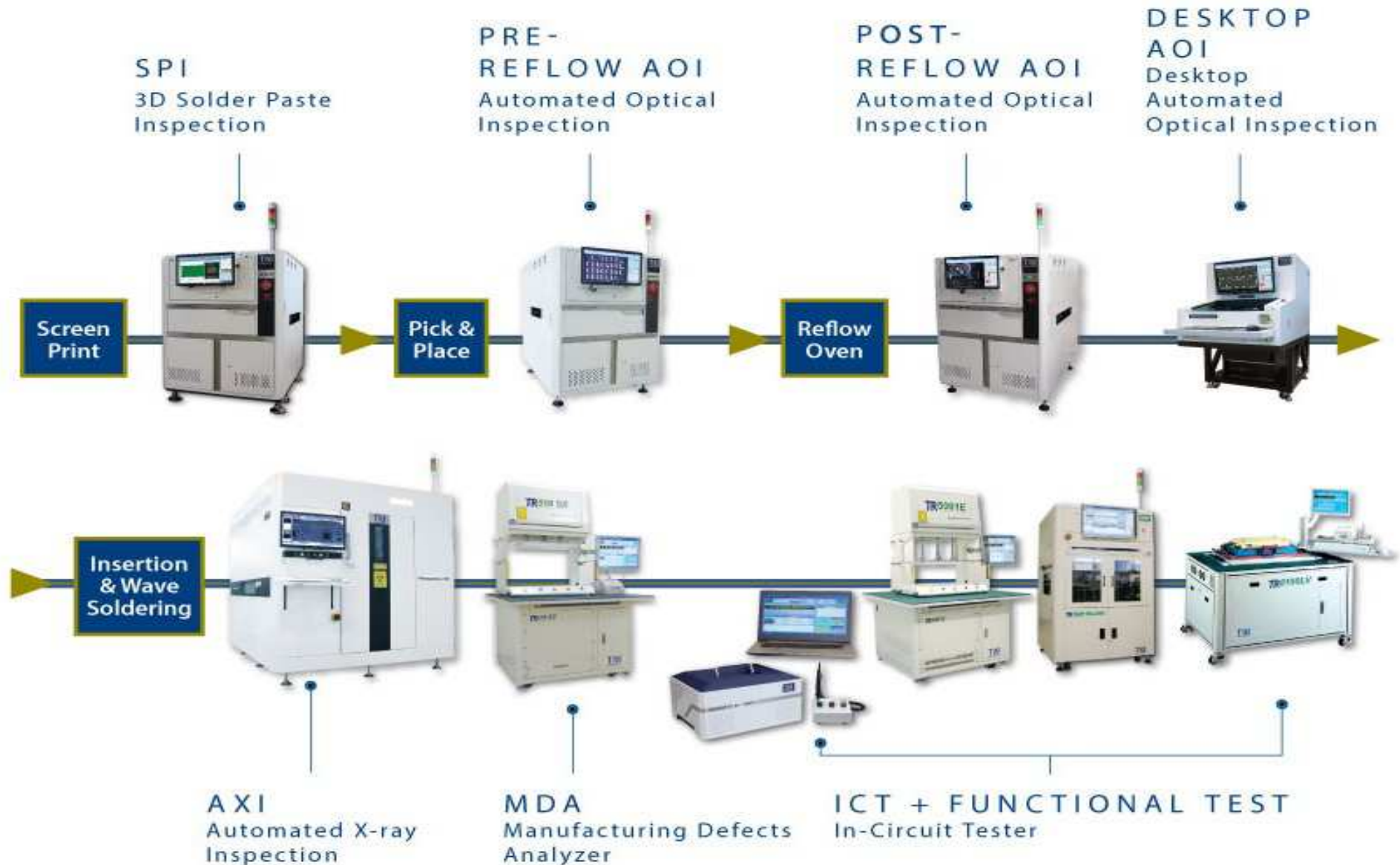
☆ 電路板測試機(BT/In-Circuit Board Tester)

- ☆ 組裝電路板測試機(MDA)
- ☆ 全功能電路板自動測試機(ICT)

全球唯一“一條龍”電路板組裝檢測設備廠

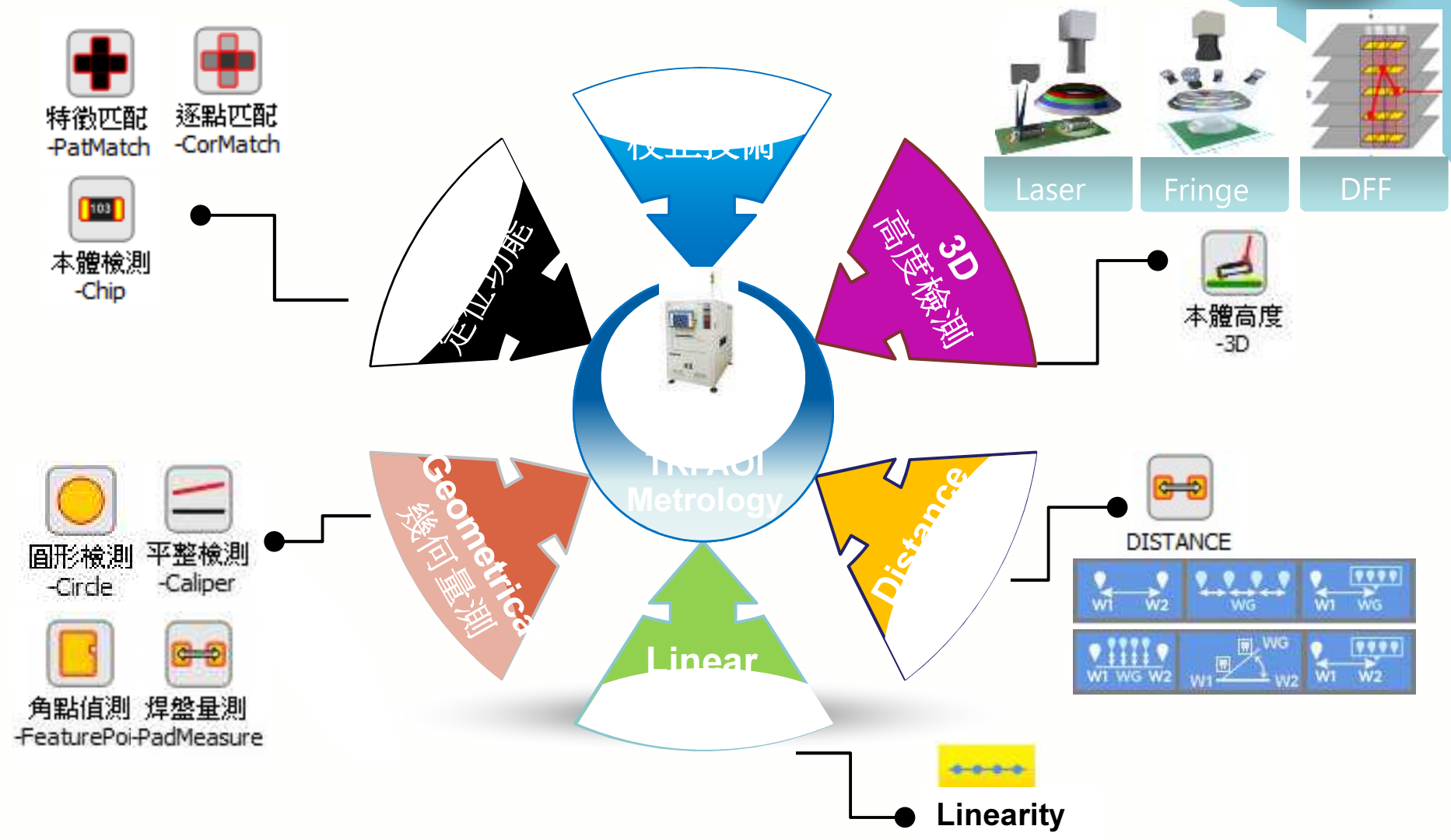


德律產品在客戶的電路板組裝產線的應用



整合多項視覺核心新技術 因應:

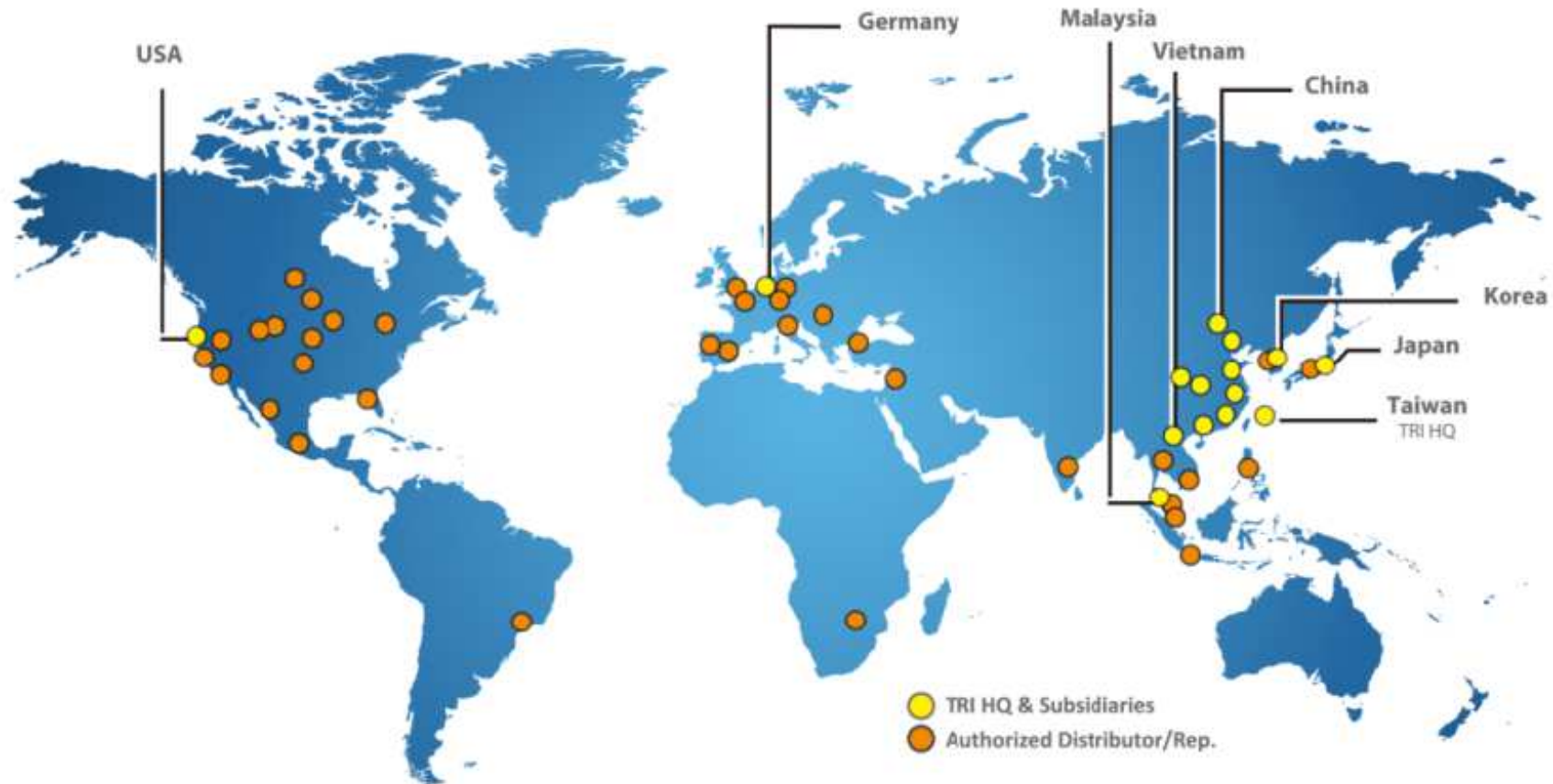
- 高精密電子料件量測需求
- 先進半導體製程/封裝檢測需求



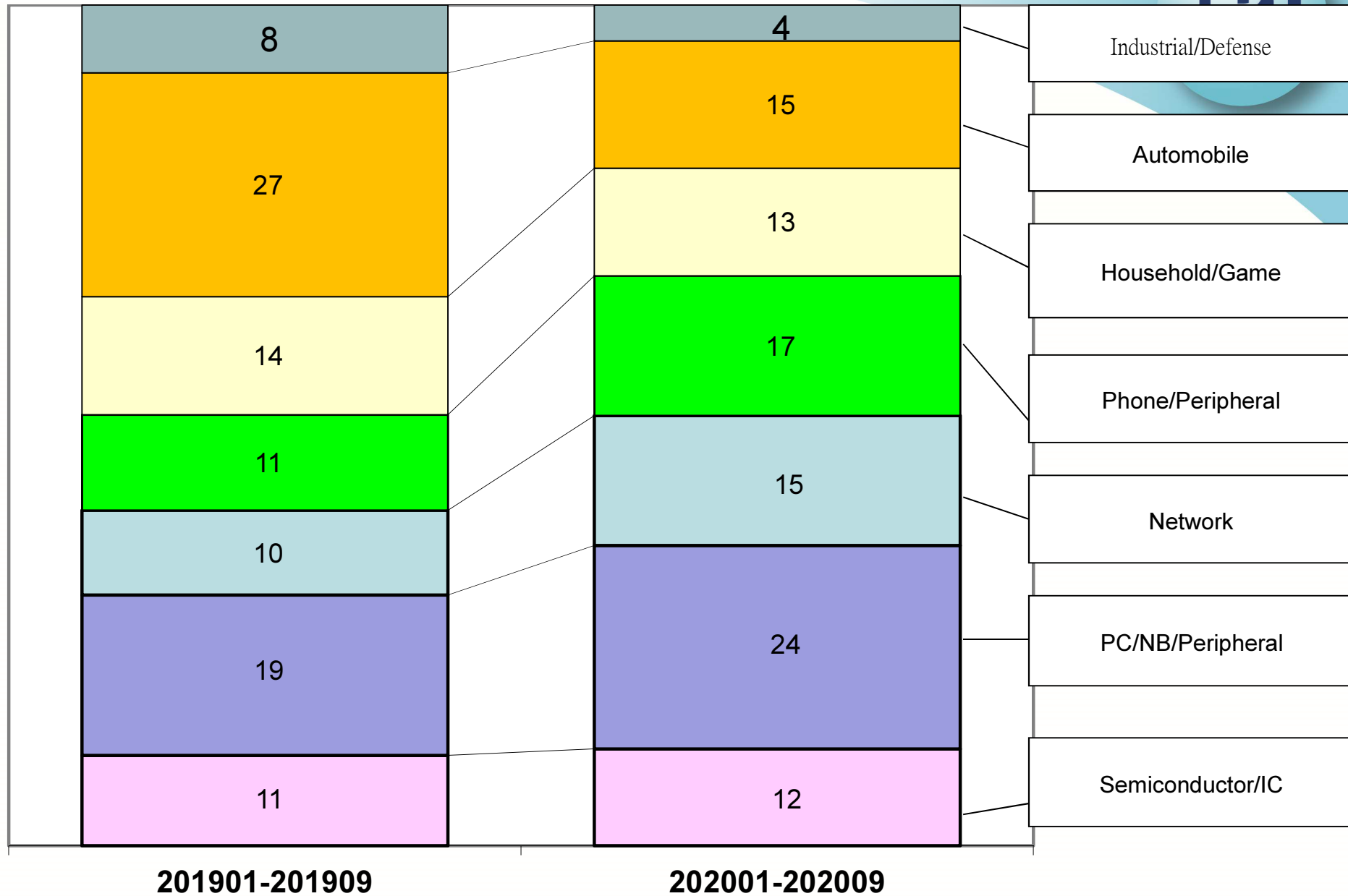
全球銷售服務網



主要客戶為全球各大電子產品組裝廠



Electronic Industry/Revenue Movement

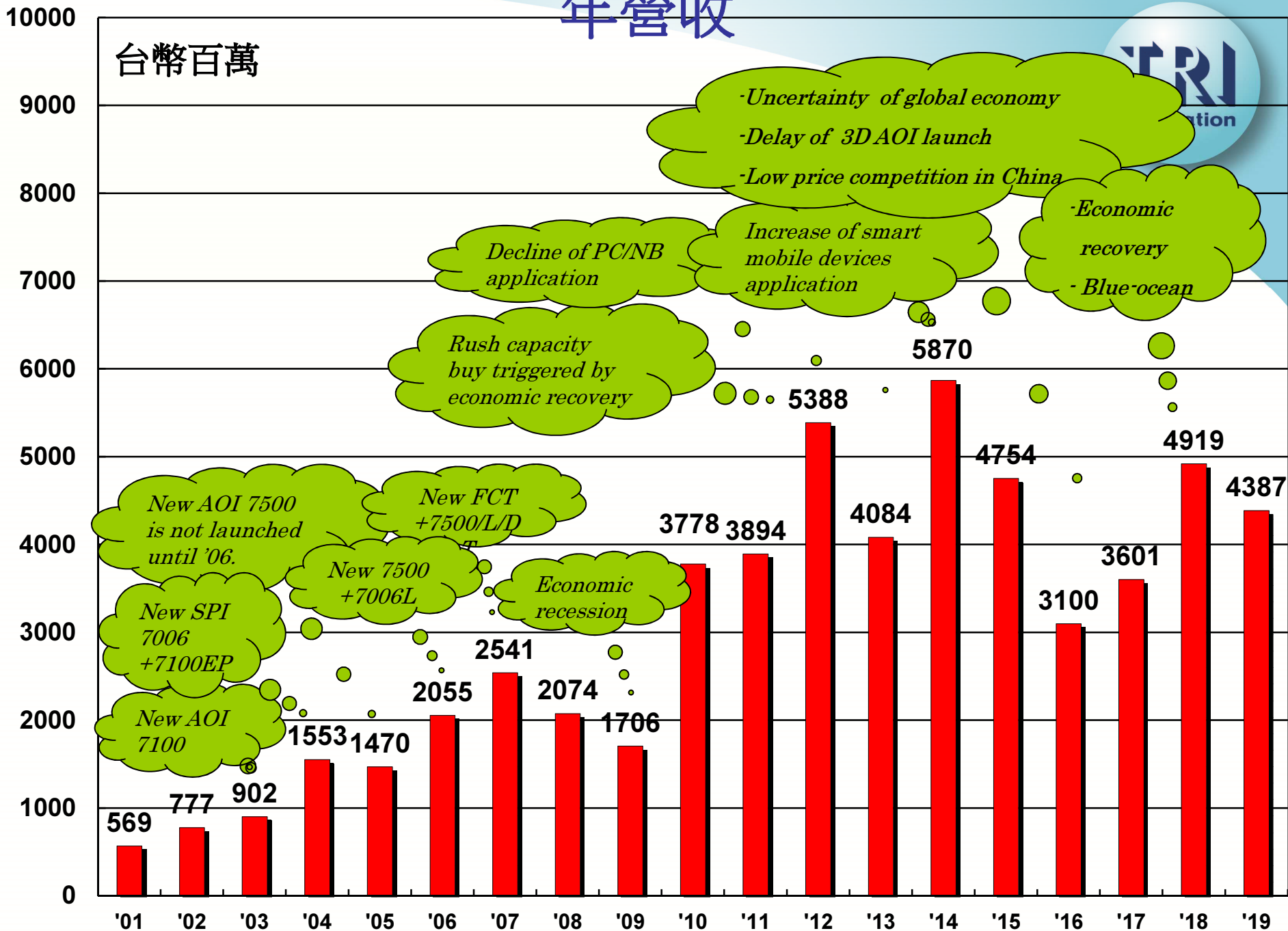


主要競爭對手

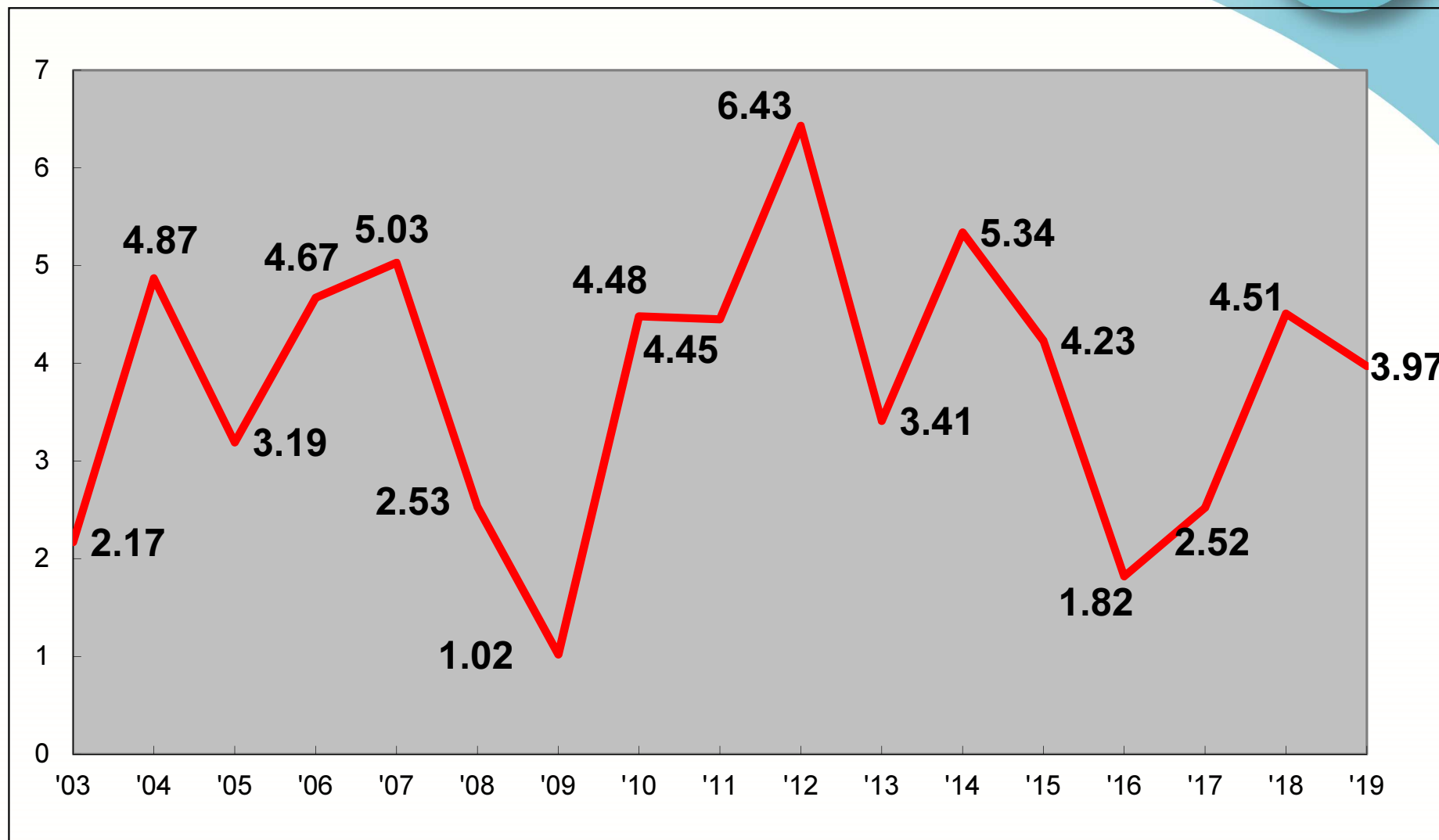


- 韓國: Koh Young
- 日本: Omron
- 中國大陸: Jutze/Sinic-Tek/Holly
- 馬來西亞: Vitrox
- 美國: Keysight/Teradyne
- 德國: Viscom/SPEA

年營收



每股盈餘



紅海與藍海市場營收變化



台幣百萬

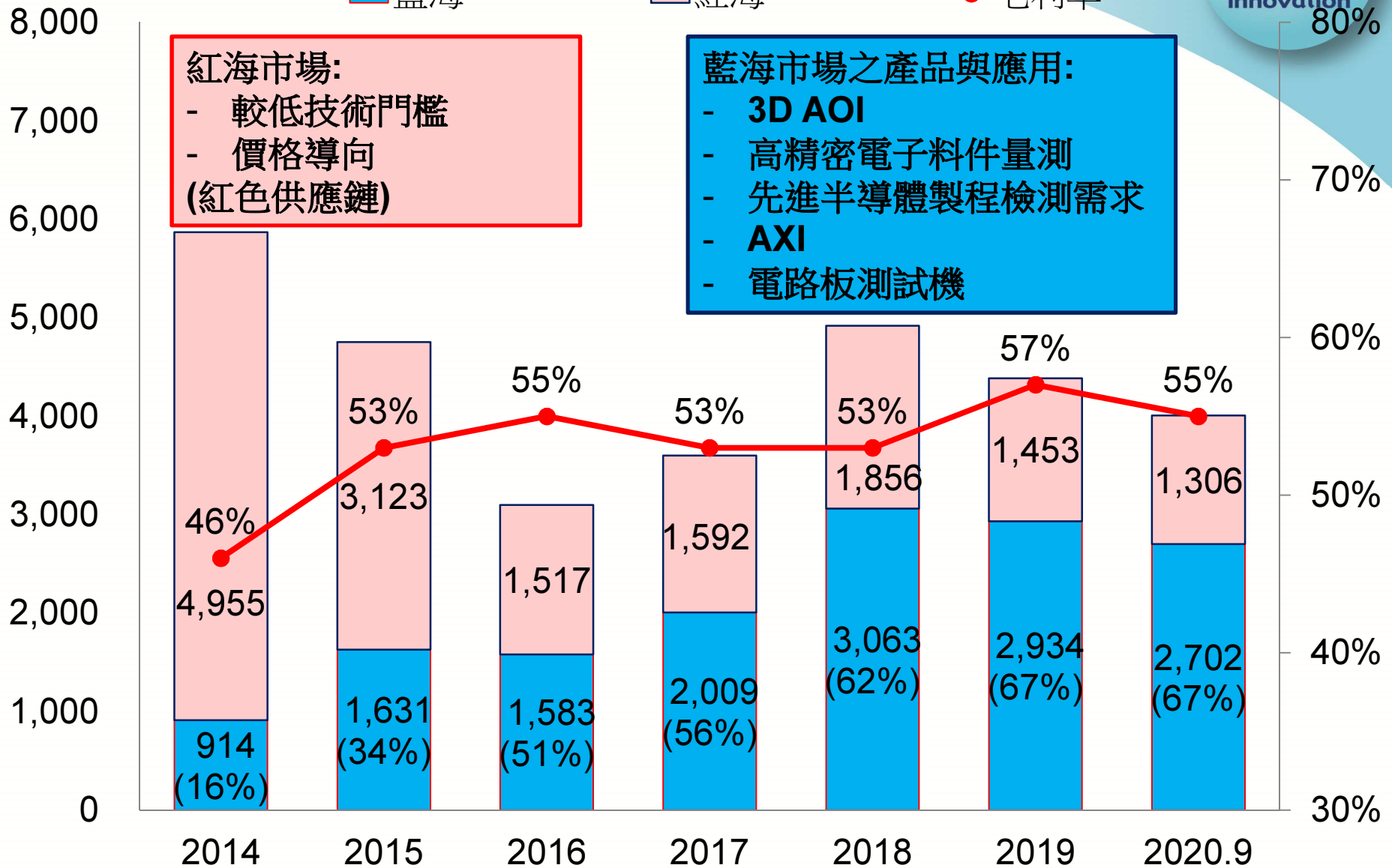
藍海

紅海

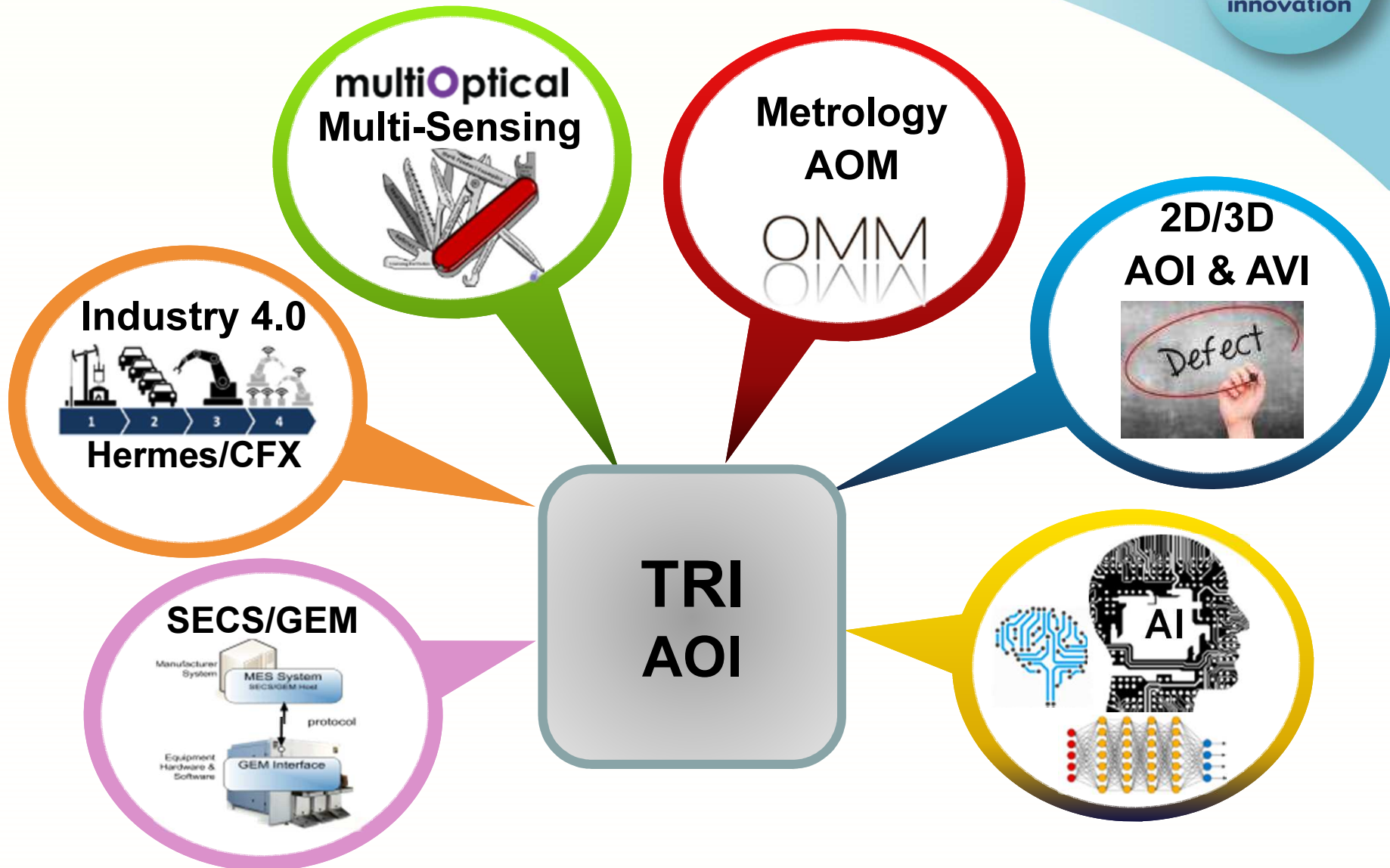
毛利率

紅海市場:
 - 較低技術門檻
 - 價格導向
 (紅色供應鏈)

藍海市場之產品與應用:
 - 3D AOI
 - 高精密電子料件量測
 - 先進半導體製程檢測需求
 - AXI
 - 電路板測試機



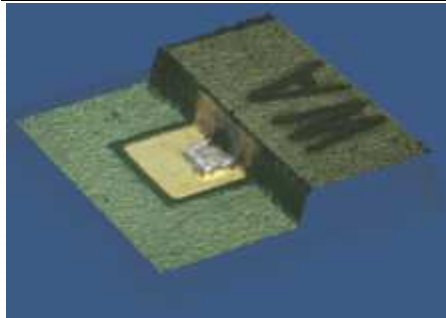
TRI 整合完整的解決方案



升級 DFF 3D 科技



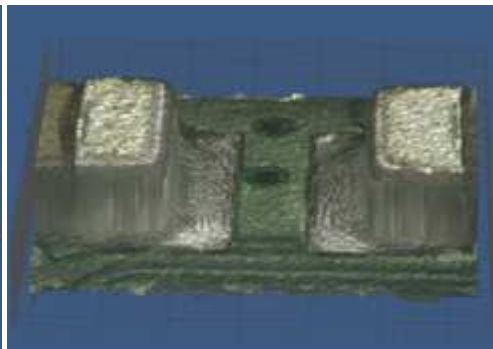
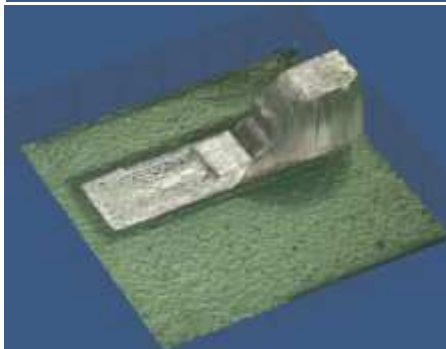
- Optimal **focus** position
- **Clearer** 2D Images
- **Sharper** images
- **Shadow-free** 3D Image



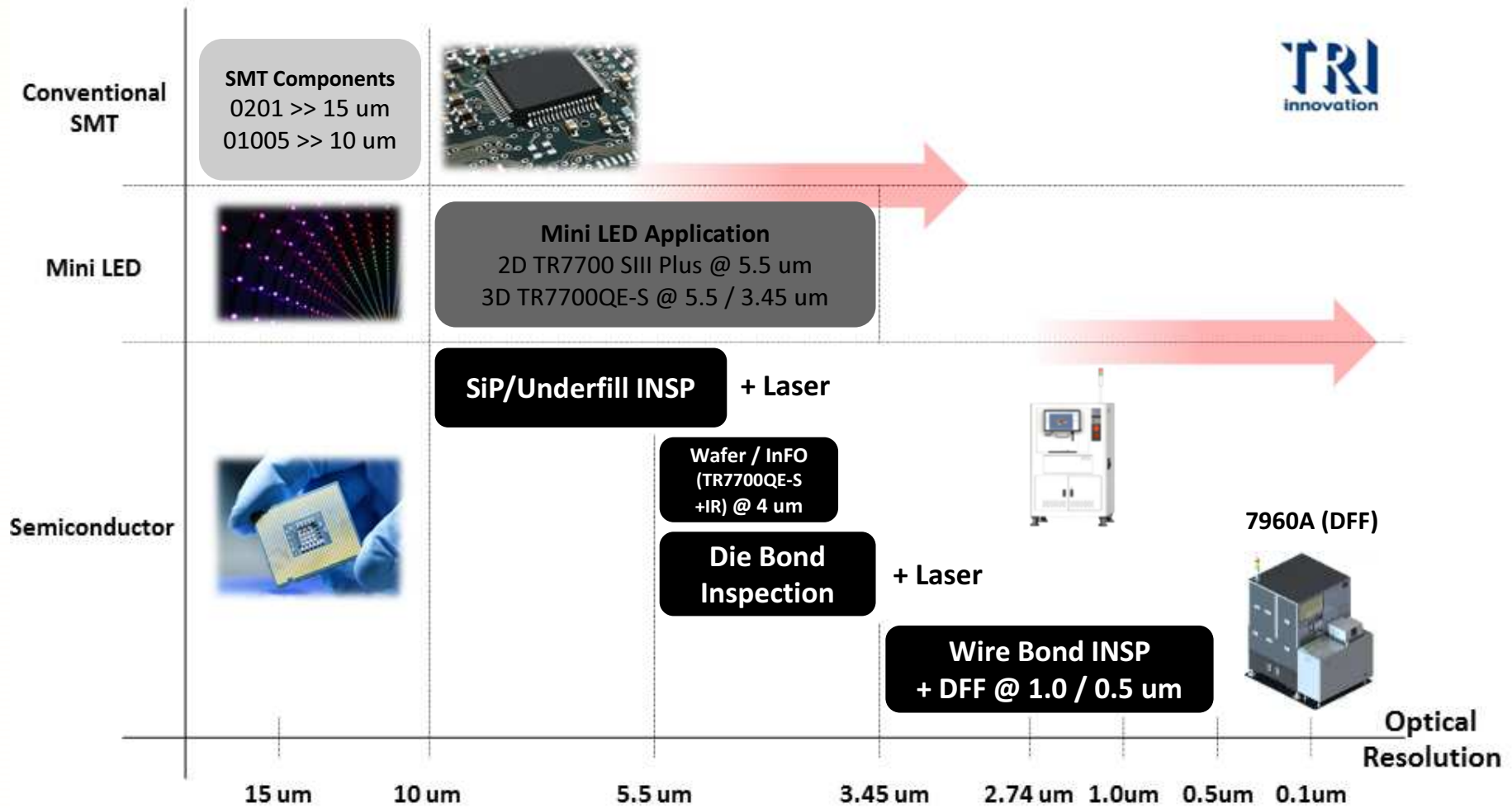
SMT
-Solder joint



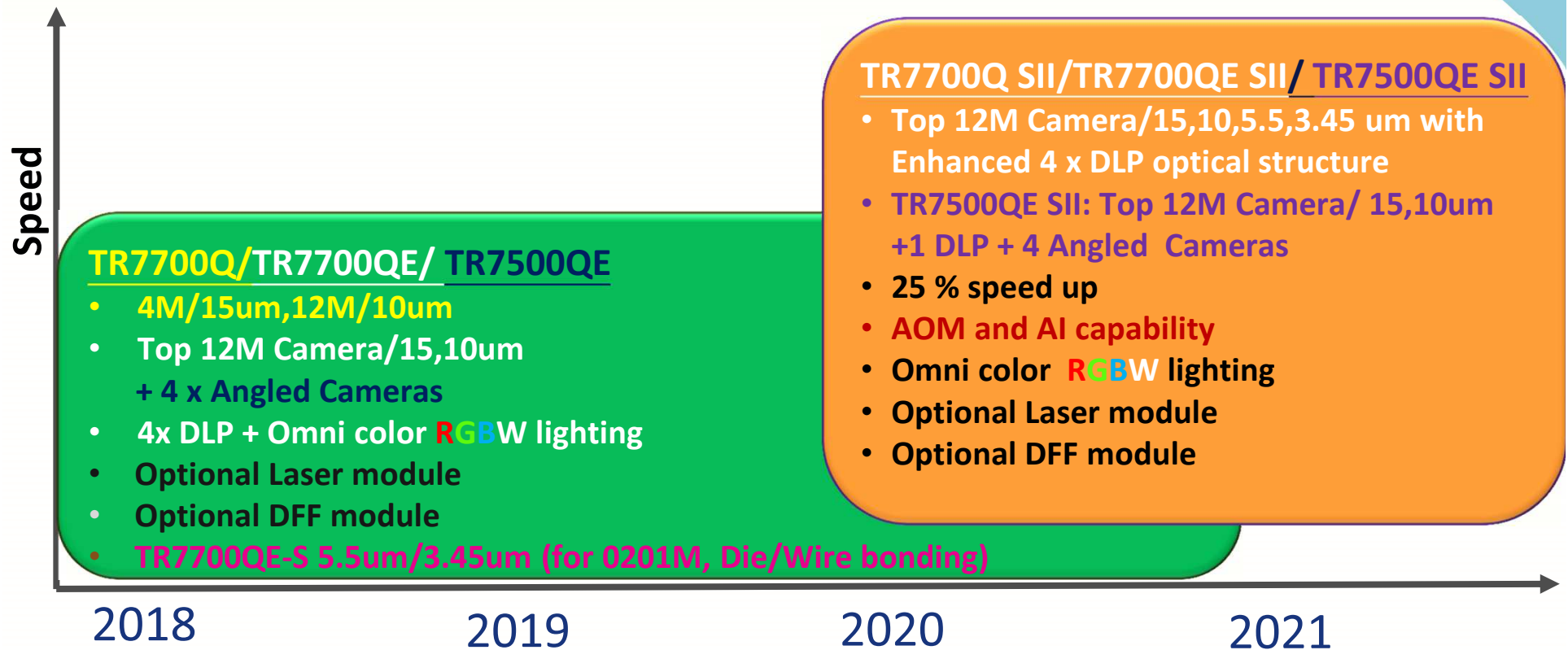
Semiconductor
-Wire bond



TRI 3D AOI Product Roadmap



TRI 3D AOI Product Roadmap



NEW

TR7700Q SII 3D AOI 特點



**Industry-Leading Inspection
Speed up to 57 cm²/sec**



**Ease of Programming with
TRI's Smart Library**



**Multiple 3D Technologies:
Zero-escapes Inspection**



TR7700QE-S 3D AOI 特點



NEW



**Supports 3.45 / 5.5um
Ultra High Resolution**

**Inspection Solutions for
Semiconductor Packaging Level:**

SMD

Bump

Die / Wire Bonding

Underfill



TRI's SPI 最新應用項目



Fast Inspection Speed



Large FOV

CoaXpress Technology

Dynamic Imaging

Stop & Go Imaging

Precision Inspection

5.5 μm

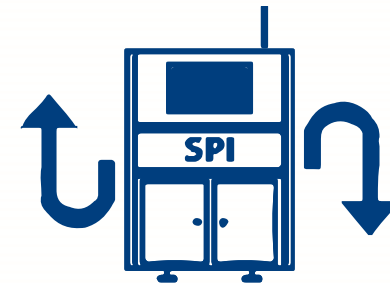
High Resolution

Shadow Free

Smart Warpage Technology

High Inspection Range

Smart Factory



Closed Loop

IPC-CFX

Smart Library

YMS 4.0

完備的3D在線型 AXI



TR7600 SIII

為TRI新一代具指標性的在線型PCBA檢測解決方案。
TR7600SIII包含可配合生產線速度達到100%檢測覆蓋率的設計，結合了業界最快速的高解析取像速度，並在業界最先進的自動X光檢測中大大提升了影像品質。



TR7600TL SIII

針對大型伺服器、網通應用和大型PCB所設計的高性能、高速3D AXI。



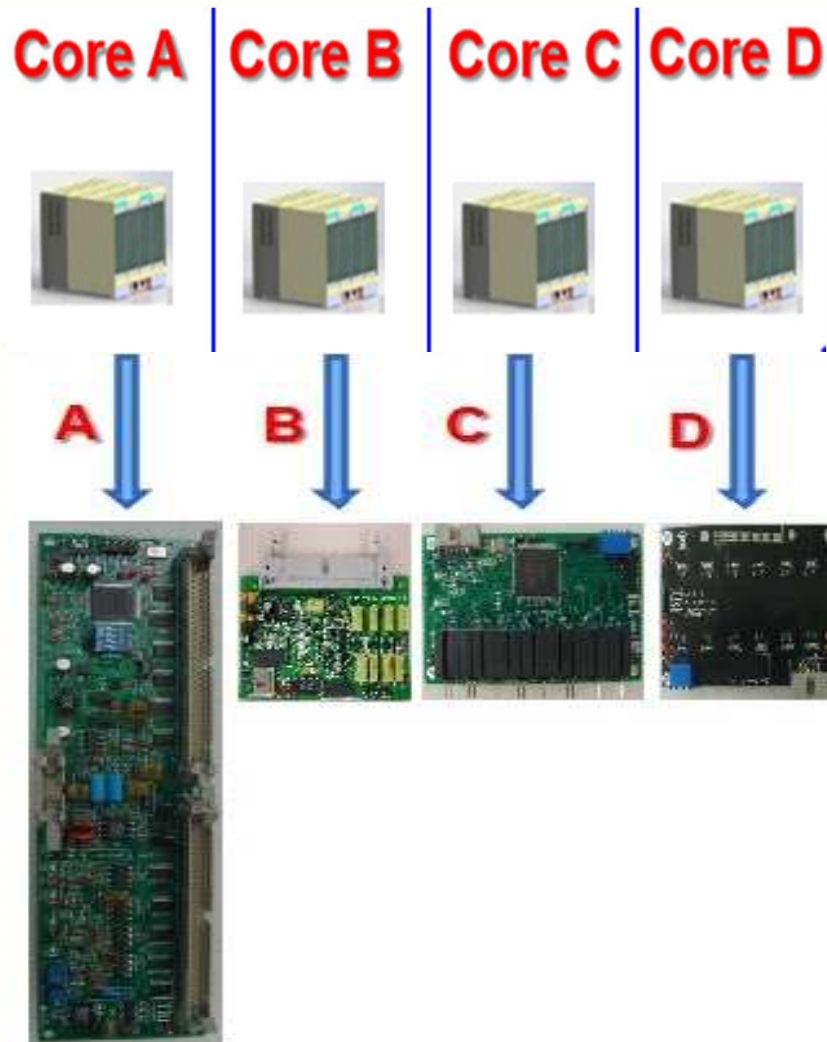
TR7600F3D SII

大幅提升檢測速度的高解析度在線型3D AXI，並可應用CT電腦斷層掃描科技，專門用於檢測需要高影像品質的組裝電路板和軟板組件。

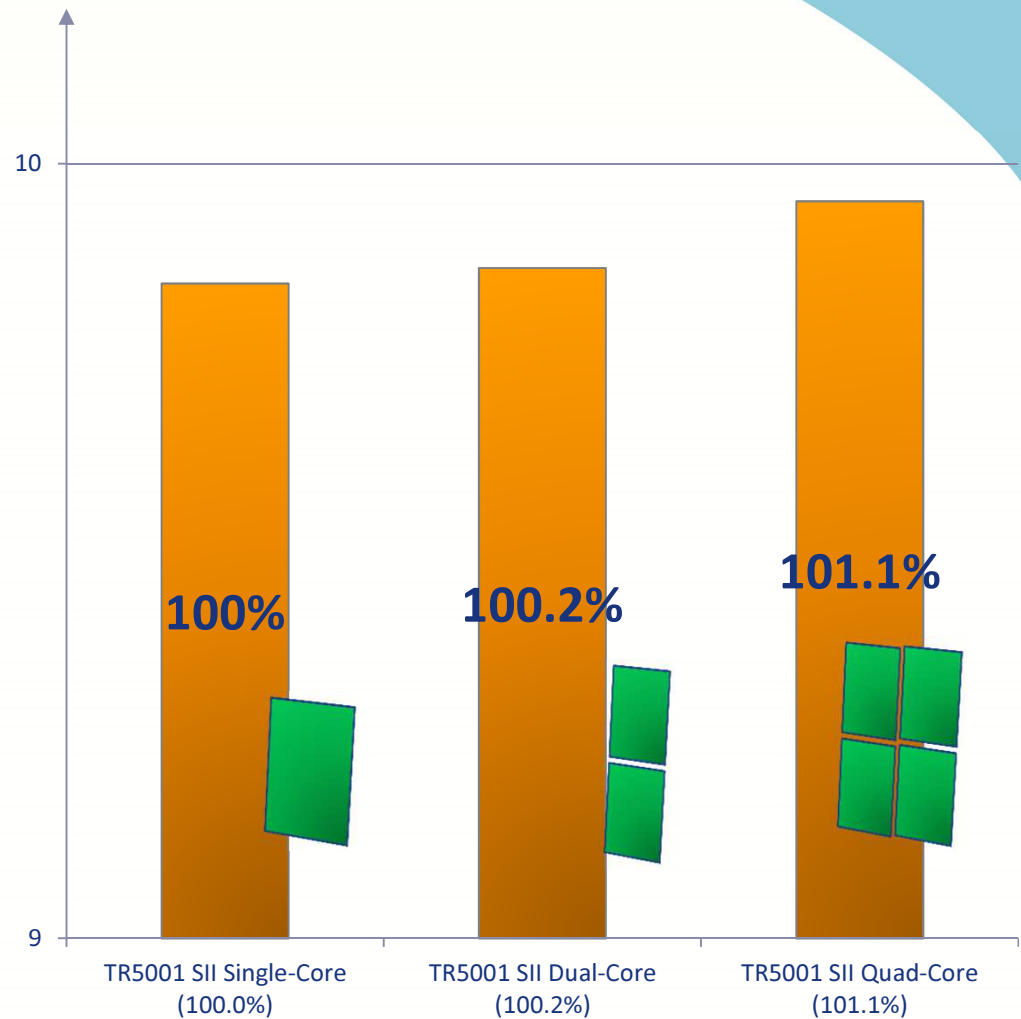
電路板測試機-多核心配置



TR5001 SII Quad-code System



單核心與多核心測試時間比較



高密度測試點數ICT TR8100H SII / TR8100HL SII



| Original Model | 測試點數/腳位 | New SII Model |
|----------------|-----------|---------------|
| TR8100LV | 3584 pins | 7056 pins |
| TR8100LLV | 5632 pins | 11088 pins |



全新TRI量測功能(AOM)

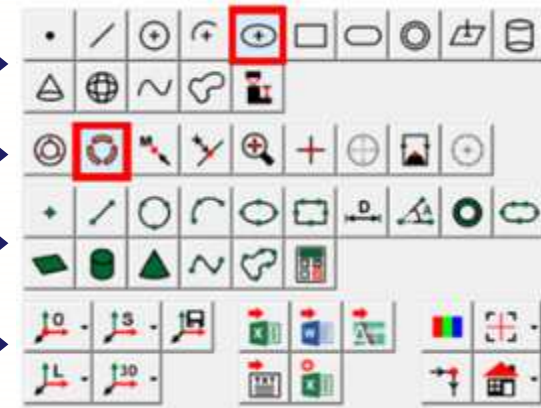


- ❖ UI: New designed and friendly user interface

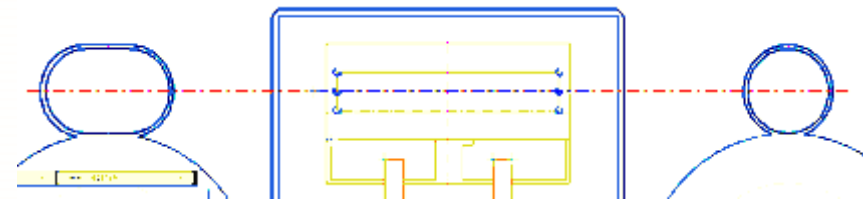


- ❖ Features: More complete measurement functions will be available

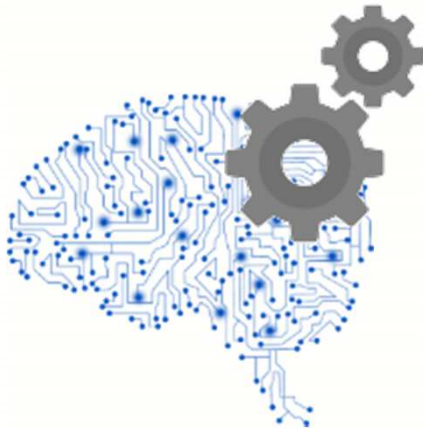
- 量测元素
- 构造方法
- 量测目标
- 指定坐标系



- ❖ High Flexibility: Multi-Layer measurements



AI 應用優點



Combines traditional Image process data and AI technology

Integrates different TRI models to enhance the production process

Reduces the labor cost of the production line



TRI 的AI應用

檢測階段

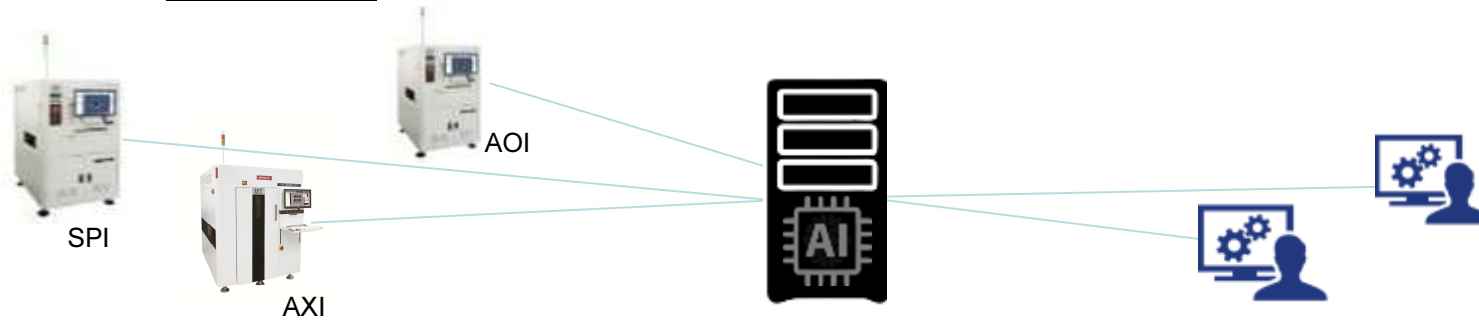
Defect Detection / Character Recognition / Visual Inspection / Measurement assistance

Advantage: Improve Inspection Quality and Reduce False Calls

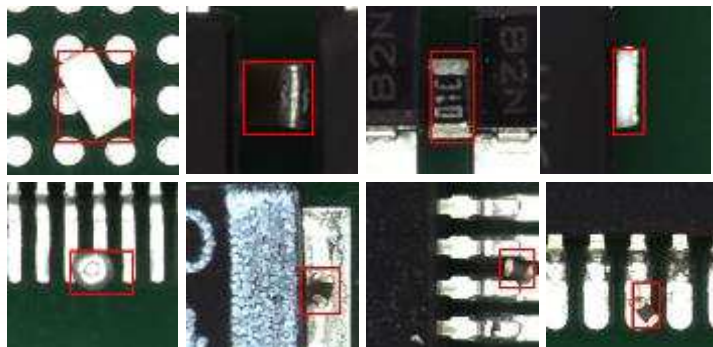
複判階段

Repair Station Defect Classification and Re-Inspection

Advantage: Reduce the workload of manual Re-Inspection



TRI Inspection Solutions



TRI AI Station

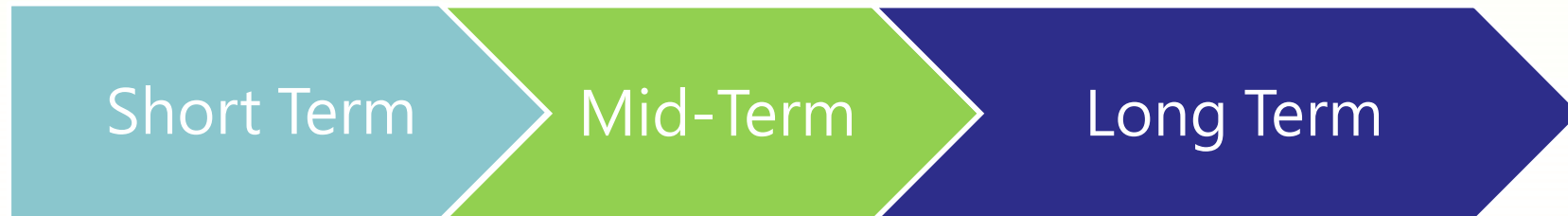
| Std-Img | Insp-Img | Gray-Img | Edge | Line | Original Type | Result Type |
|---------|----------|----------|------|------|---------------|---------------|
| | | | | | Missing Parts | Tombstone |
| | | | | | Billboard | Missing Parts |
| | | | | | Billboard | Missing Parts |
| | | | | | Billboard | Billboard |

Repair Station(s)

TRI AI 發展歷程及 Roadmap 規劃



AI Road Map:



❖ Fast development

- ❖ Commercial Library
- ❖ Cooperation

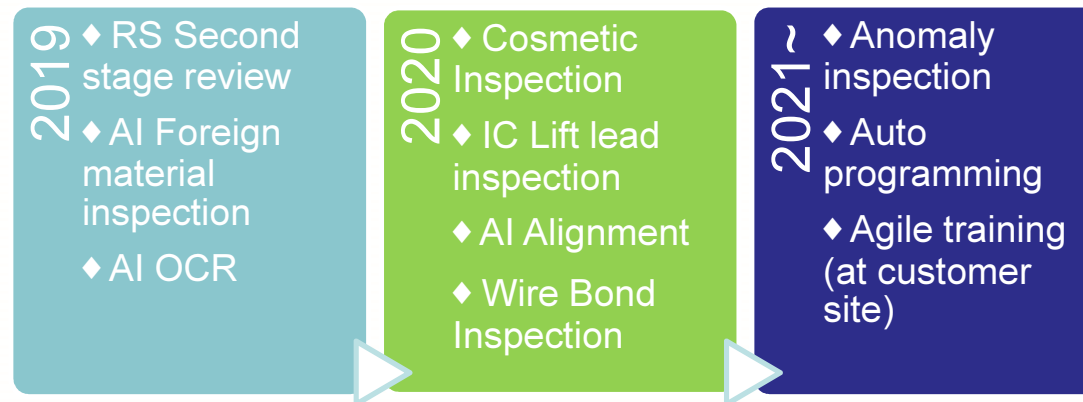
❖ Technical cultivation

- ❖ Open-source Solution
- ❖ Inference/Training Server
- ❖ Faster and more accurate

❖ Unmanned AOI

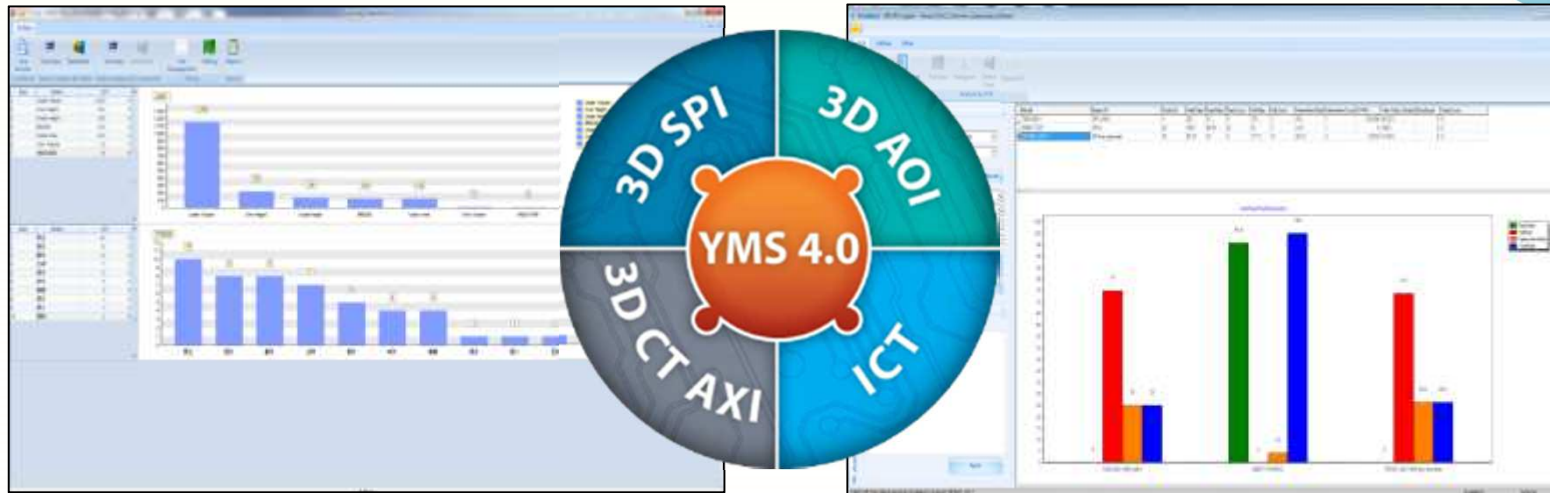
- ❖ Zero escape and false call
- ❖ TRI Standard Spec

AI applications:



TRI YMS 4.0 良率管理系統

協助客戶提升生產力及品質管理



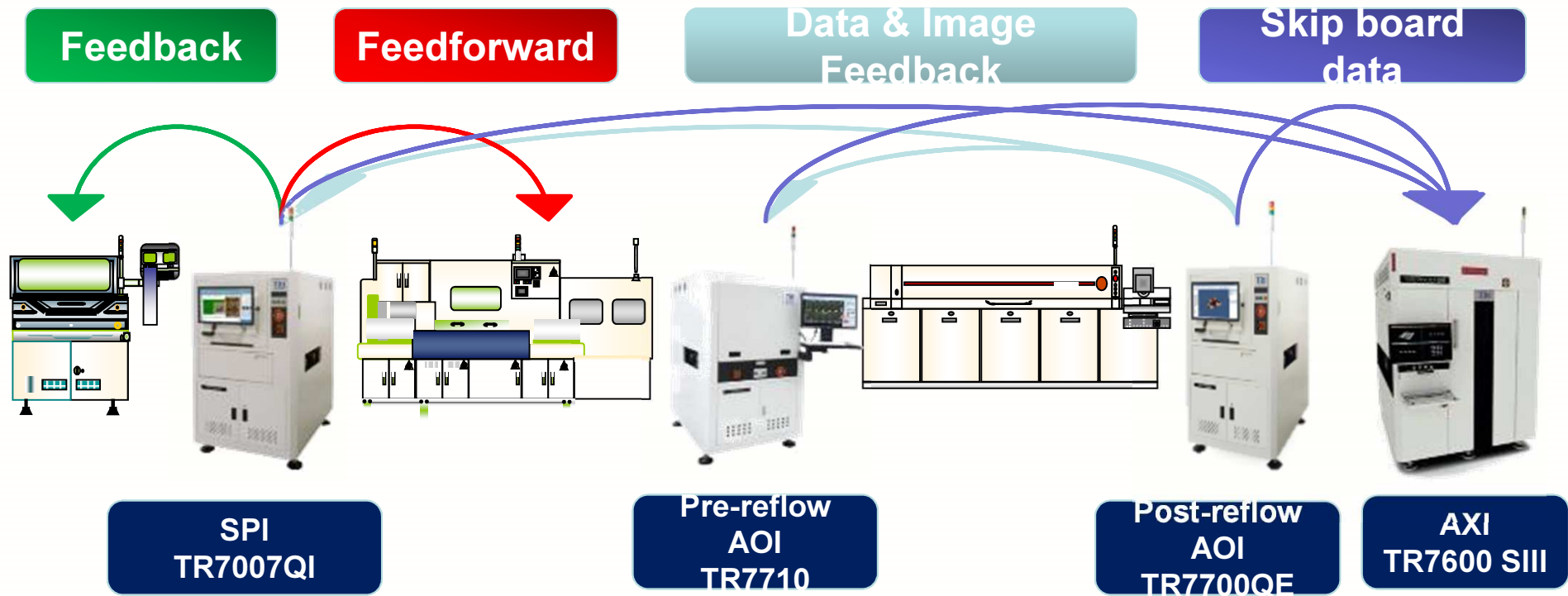
- 實時狀態檢查
- SPC和生產力監控
- 列出排名前10的不良項目和對應圖像
- 依各站別, 線別, 流程找出問題點
- 監控生產問題改善狀況
- PDCA改善循環
- 支持品質優化
- 輸出報告到MES / SFCS

工業4.0解決方案

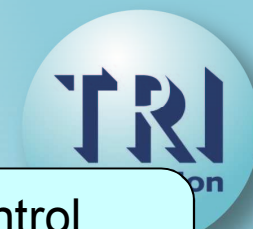
TRI 支援封閉迴路控制系統



TRI SPI, AOI, AXI 檢測資訊的串流 IPC CFX(data)/HERMES(M2M)



內部研發團隊



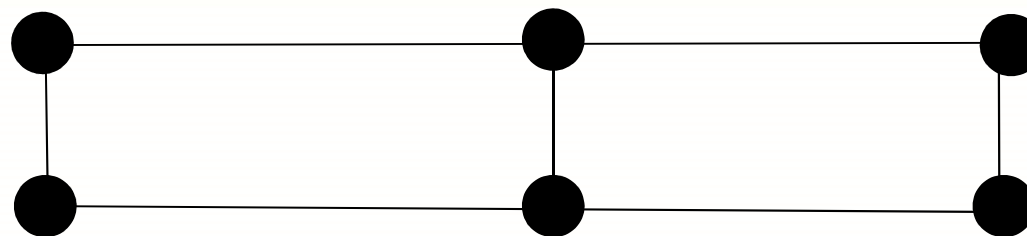
- Optical Dept.
- Mechanical Dept.

- system S/W
YMS, R/S

- PLC control
- Lighting control

光學檢測

電路板測試



180+ RD

外部機構技術支援

Department of Computer science, 台灣大學

- 影像處理 / Understanding

Department of Power Mechanical, 清華大學

- X-ray 3D Reconstruction/Digital Tomosynthesis Algorithm/電腦切層演算法

Center of Measurement Standards, 工研院

- Length/ Camera / 色彩校正

近年獲獎



- 2016 EM 最佳供應商獎
- 2016 Global Technology Award
- 2017 EM 亞洲創新獎
- 2017 Circuits Assembly NPI Award
- 2018 Circuits Assembly NPI Award
- 2018 EM 亞洲創新獎
- 2018 EM 最佳供應商獎
- 2019 EM 傑出產品獎
- 2020 Global Technology Award

*德律歷年研發成果/獲獎紀錄:

<https://www.tri.com.tw/tw/about/about-21-1-2.html>

免責聲明



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Better Testing Better Quality



THANK YOU!

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Test Research, Inc.***



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