Industrial 4.0
Smart Manufacturing Platform

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Company Overview

Since its inception in 2000, ViTrox designs and manufactures innovative, leading-edge and cost effective **automated vision inspection equipment and system-on-chip embedded electronic devices** for the semiconductor and electronic packaging industries. Today, we serve more than **300 customers in 22 countries**.

Financial Background	Workforce	Stock Exchange Listing
Shareholders' Equity: RM262 M (USD 60M)*	**450 Headcount (Malaysia)***	**Established in 2000**
Market Capitalization: RM1.2 Billion (USD272Mil)*	**30 Headcount (Global – China, Taiwan, Philippines, USA & others)***	**Listed in MESDAQ Market in 2005 and successfully transferred to Main Market of Bursa Securities on 9th November 2009.**
***(As of April 2017)**		

Product Milestones

Advanced 3D X-ray Inspection **(AXI)**

Advanced Optical Inspection **(AOI)**

Advanced 3-D Solder Paste Inspection **(SPI)**

Tray Vision Handler **(TH & TR)**

Advanced Robotic Vision System **(ARV)**

Electronics Communications Systems **(ECS)**

Automated Optical Inspection **(AOI)**

Machine Vision System **(MVS)**

Automated Boar Inspection **(ABI)**

ViTrox

Achievements

No. 1
3D in-line AXI

150 AXIs
800 AOIs
Sold Since 3 Years

150 Tray Handles
Sold Since 4 Years

15% Revenue invested in R&D every year

15,000 vision systems installed,
No. 1 Turret Base Vision Solutions!

12 Patents Filed

60 Corporate Product Awards won in 10 Years

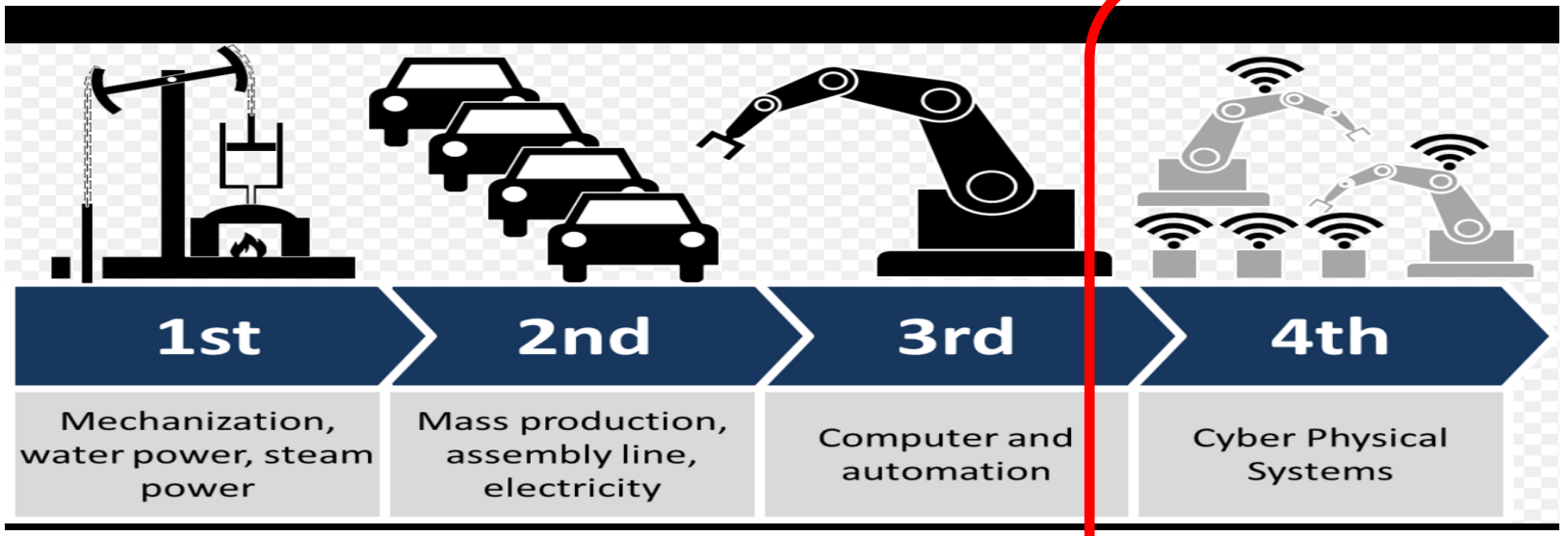
20 countries
255 customers worldwide

VITrox

Industrial 4.0

Industrial 4.0

Industrial 4.0 or "**Smart Factory**", in which **cyber-physical systems** monitor the cyber physical processes of the factory and make **decentralized decisions**. The physical systems become **Internet of Things**, communicating and corporating both with each other and humans in **real-time** via the **wireless** web.



Disruptive Technologies

A number of disruptive technologies will enable digitization of the manufacturing sector

Digitization of the manufacturing sector – Industry 4.0

Data, computational power, and connectivity

Big data/open data

Significantly reduced costs of computation, storage, and sensors

Internet of Things/M2M

Reduced cost of small-scale hardware and connectivity (e.g., through LPWA networks)

Cloud technology

Centralization of data and virtualization of storage

Analytics and intelligence

Digitization and automation of knowledge work

Breakthrough advances in artificial intelligence and machine learning

Advanced analytics

Improved algorithms and largely improved availability of data

Human-machine interaction

Touch interfaces and next-level GUIs

Quick proliferation via consumer devices

Virtual and augmented reality

Breakthrough of optical head-mounted displays (e.g., Google Glass)

Digital-to-physical conversion

Additive manufacturing (i.e., 3D printing)

Expanding range of materials, rapidly declining prices for printers, increased precision/quality

Advanced robotics (e.g., human-robot collaboration)

Advances in artificial intelligence, machine vision, M2M communication, and cheaper actuators

Energy storage and harvesting

Increasingly cost-effective options for storing energy and innovative ways of harvesting energy

SOURCE: McKinsey

Next Horizon of Operational Effectiveness

- New value potential created by eliminating inefficiencies across the "digital thread".
- Paradigm shift from optimizing physical assets to optimising how data and information are leveraged along the product lifecycle

Disruptive technologies increase the value of digital information along the entire product lifecycle

The digital thread is the digital representation of the physical product lifecycle

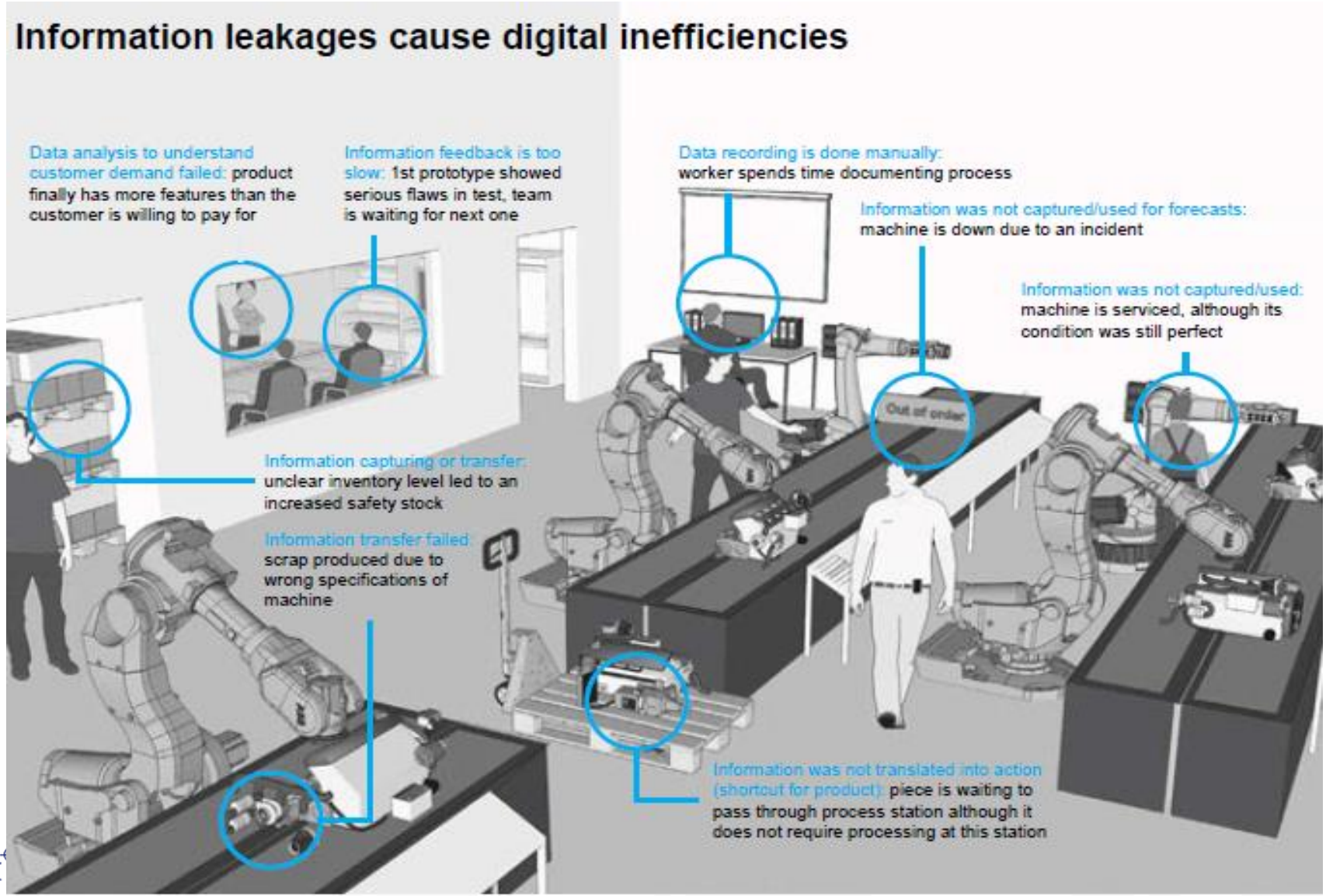
4 activities are required to manage the digital thread

Information capturing and recording	▪ Relevant set of data to prevent information overflow ▪ Automated, real-time capturing via sensors ▪ Recording and storing of both historical and new data in a single information system
Information transfer	▪ Digitally transfer information across departments, production sites, value chain steps, and company borders
Information analysis and synthesis	▪ Identification of relevant data and analysis (ideally, automated) ▪ Synthesis of analysis into relevant insights
Turning information into outcomes	▪ Translation of analysis results into recommendations that suggest actions for workers or automatically trigger actions of machines ▪ Feedback and continuous improvement

SOURCE: McKinsey

McKinsey Digital Compass

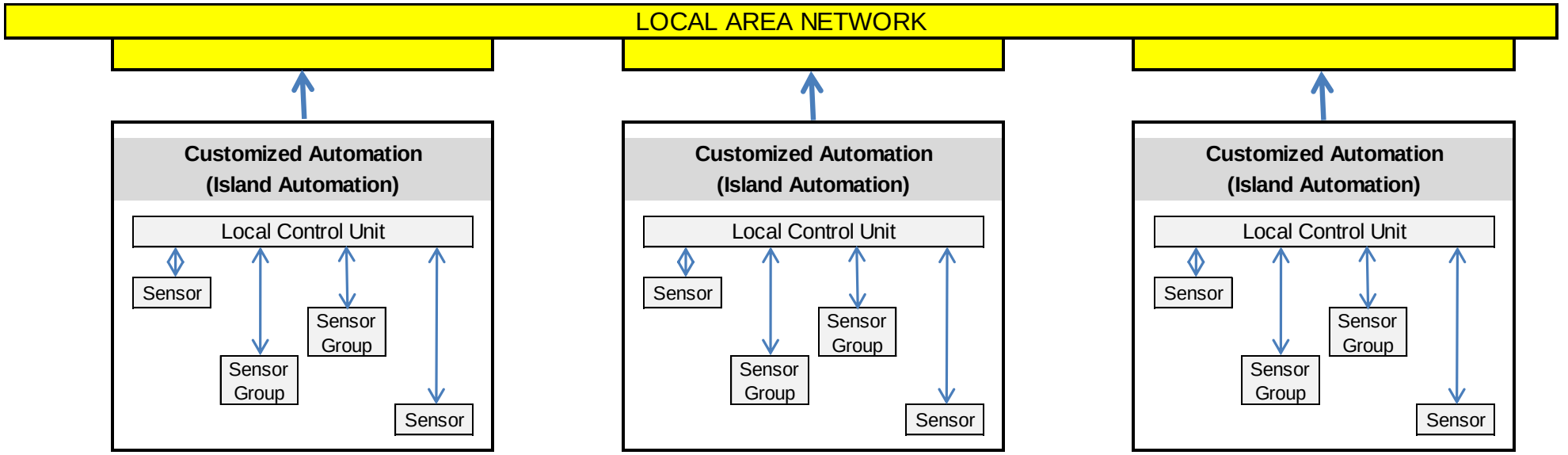
- Help identifying and prioritize optimization opportunities.
- Paradigm shift from optimizing physical assets to optimising how data and information are leveraged along the product lifecycle



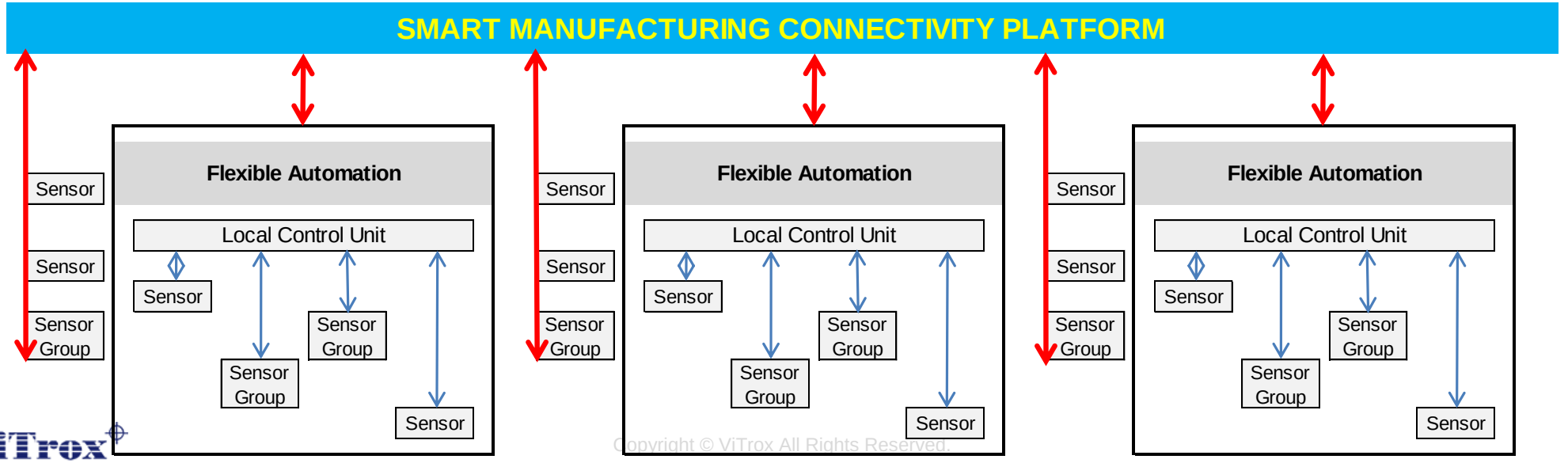
McKinsey Digital Compass

Manufacturing in Industrial 4.0

Industrial 3.0 Manufacturing

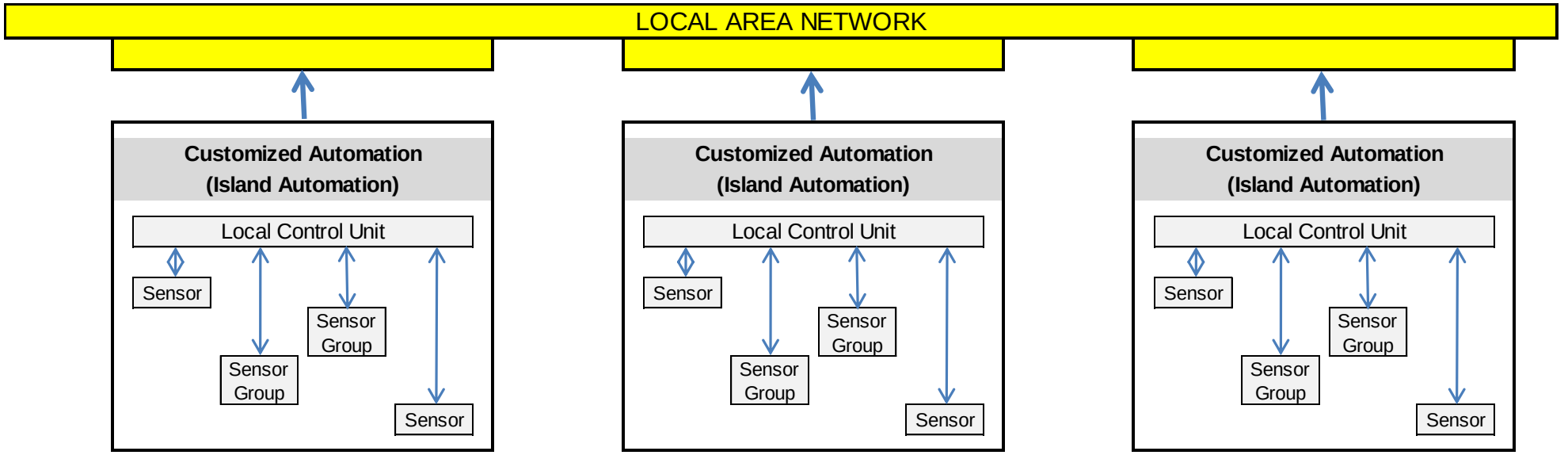


Industrial 4.0 Manufacturing

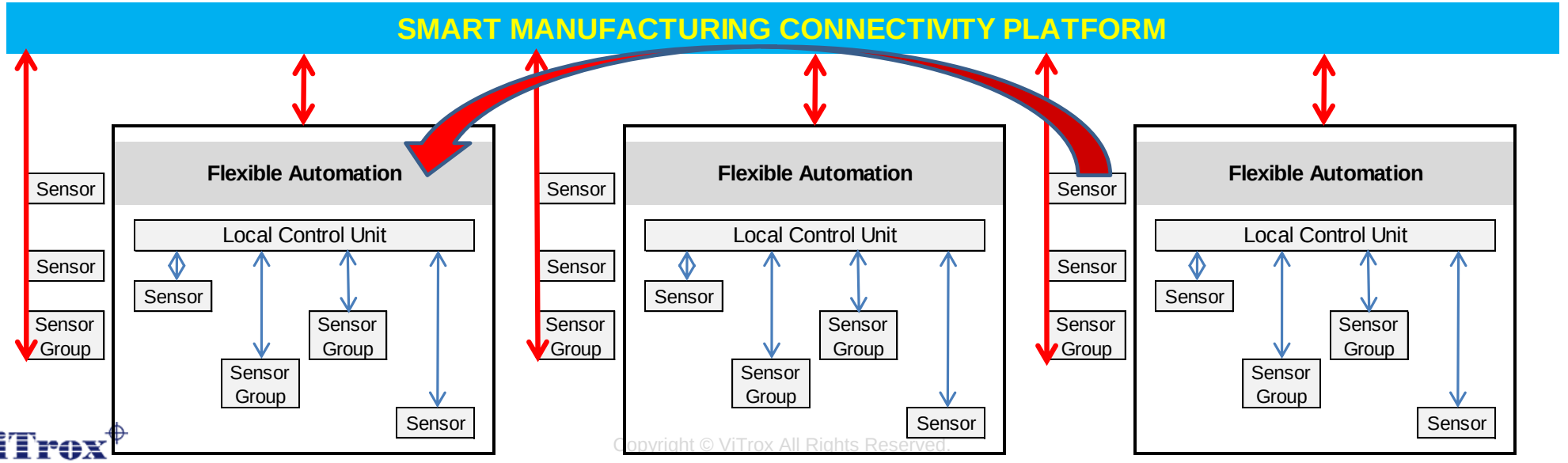


Manufacturing in Industrial 4.0

Industrial 3.0 Manufacturing



Industrial 4.0 Manufacturing



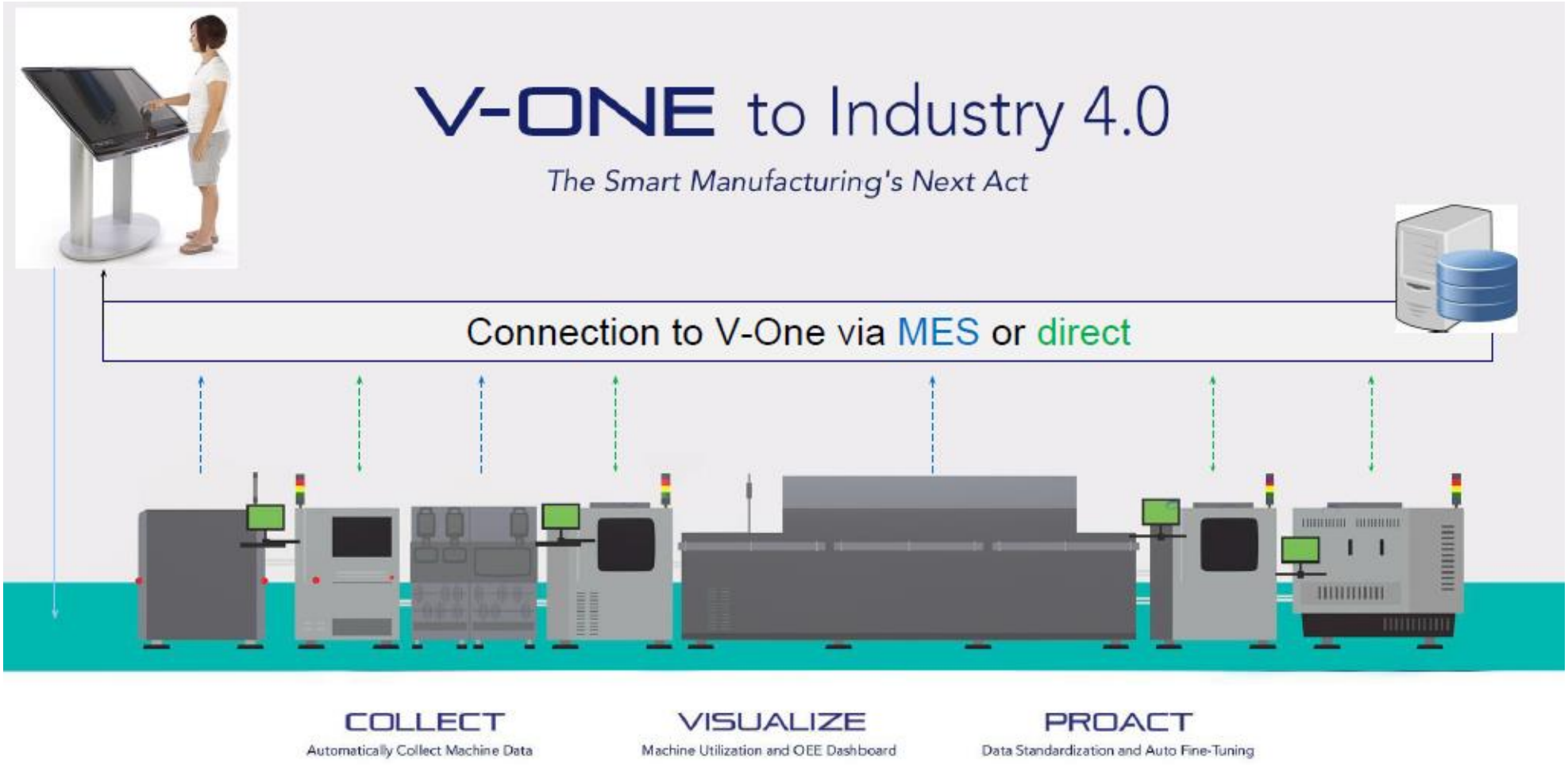
V-ONE

...connecting vision

ViTrox

V-ONE Smart Manufacturing Platform

Single Line in Local Network Solution



V-ONE

Connect the inspection machines in SMT lines to monitor their performance on a real-time basis.

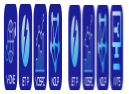
1. **Collect:**
Automatically Collect Machine Data

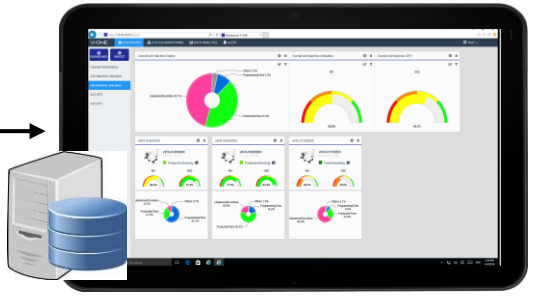
2. **Visualize:**
Machine Utilization and OEE Dashboard

3. **ProAct:**
Data Standardization and Auto Fine-Tuning

V-ONE Smart Manufacturing Solution

User Group





V-ONE Web

Touch Screen TV

Triggering Control

Triggering Control

Triggering Control

SPI Status

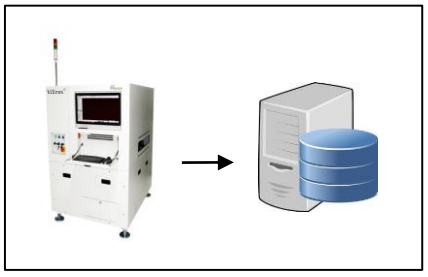
VDSPC

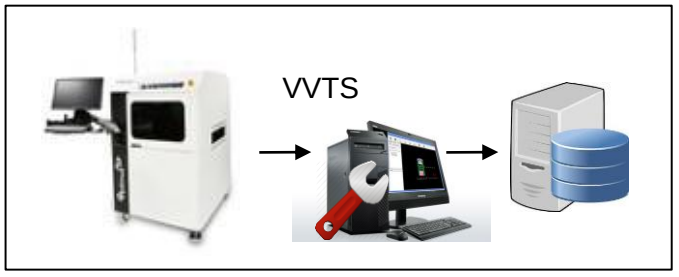
AOI Status

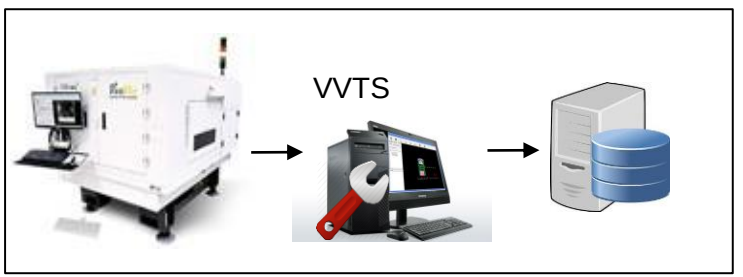
VDSPC

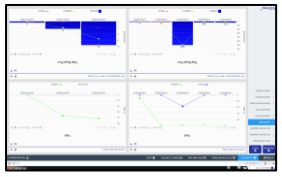
AXI Status

VDSPC







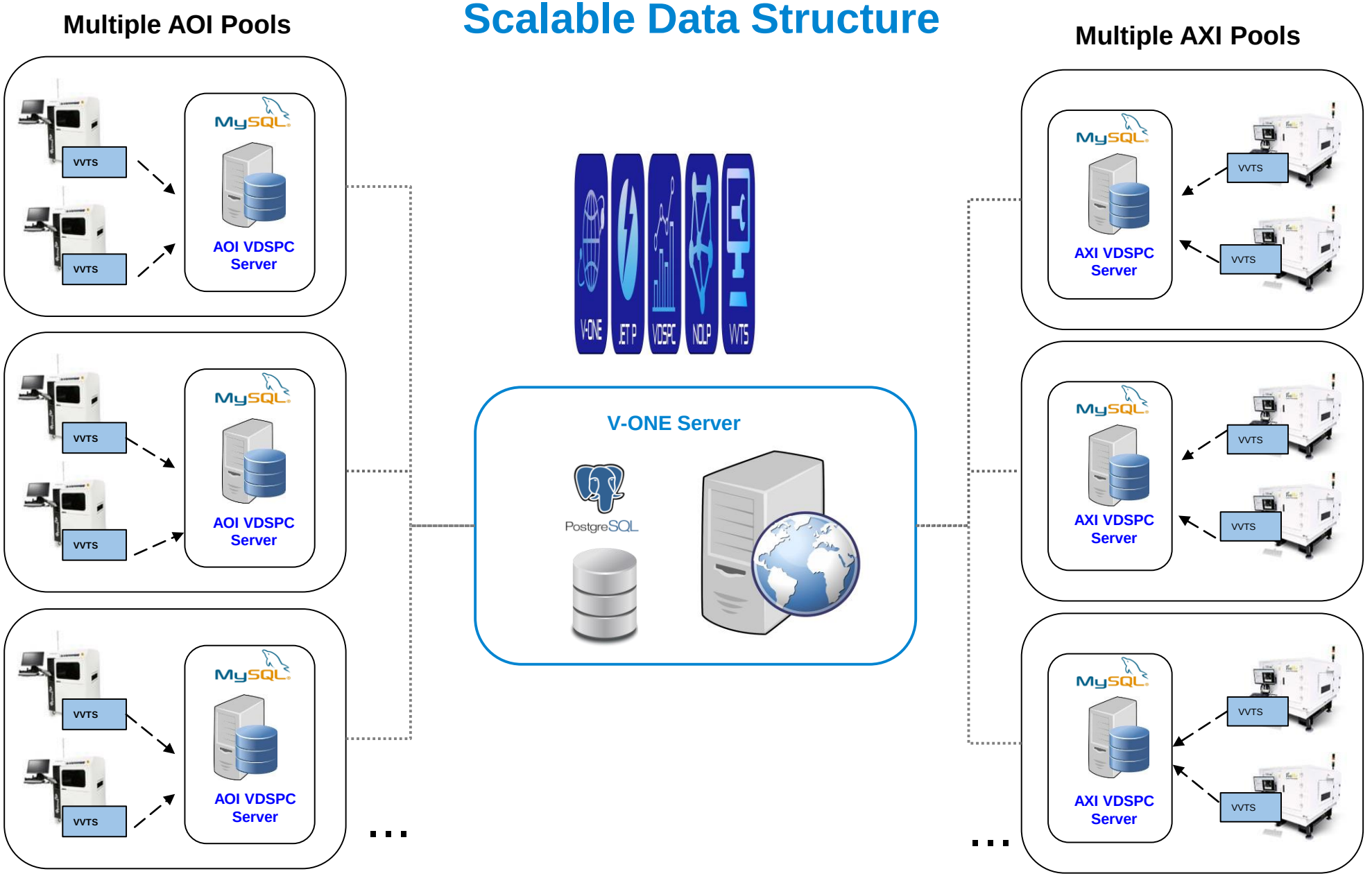


Single SPI Control Board

Single AOI Control Board

Single AXI Control Board

Scalable Data Structure



V-ONE Features (1 / 5) - Dashboard

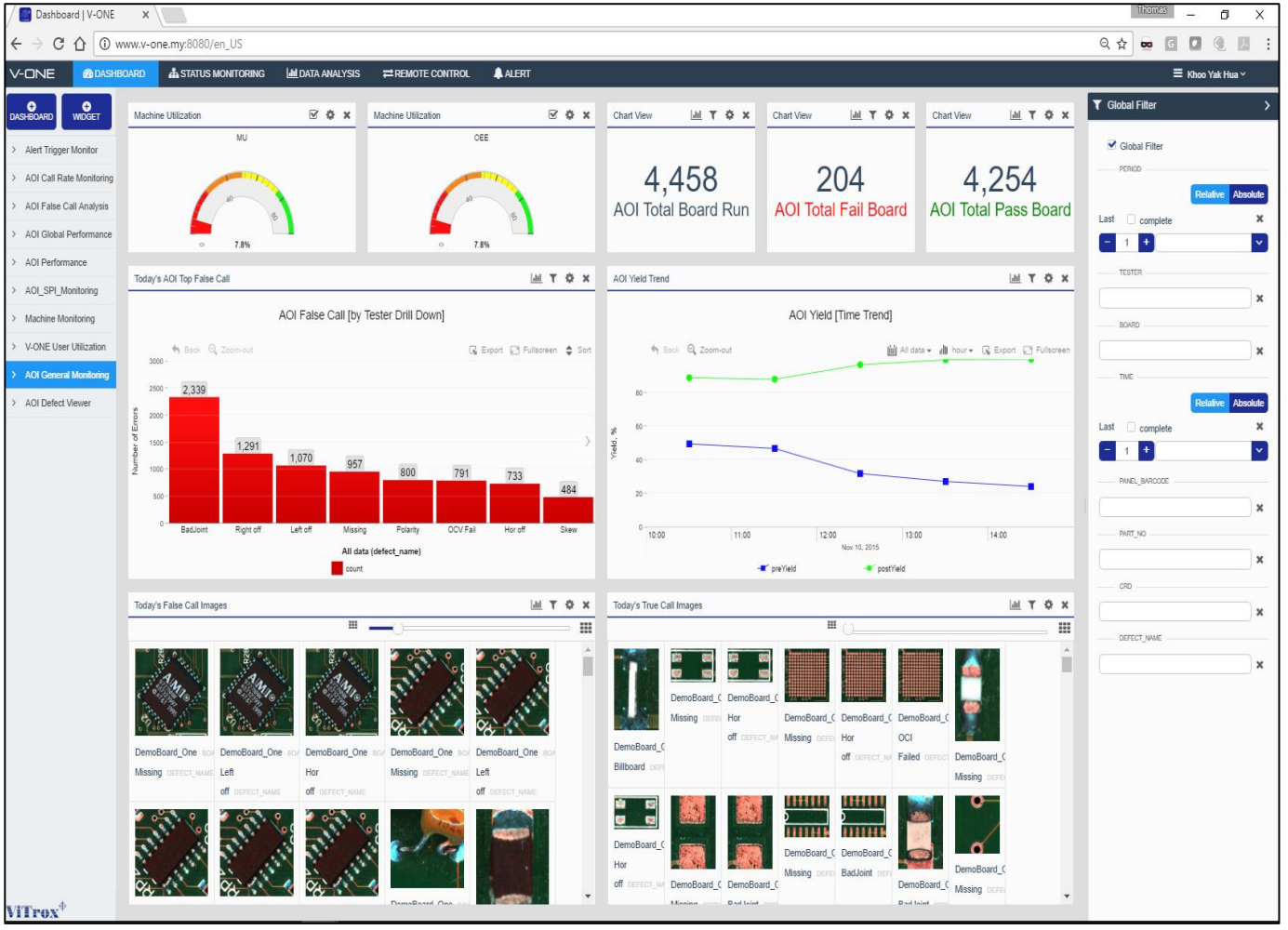
V-ONE | DASHBOARD | STATUS MONITORING | DATA ANALYSIS | REMOTE CONTROL | ALERT

Dashboard

a fully flexible and configurable dashboard that allow user to configure dashboard that suitable to their process needs. Machine status, call rate, yield, chart analysis, floor plan, machine utilization, machine error and etc are able to be viewed even in a single dashboard.

Dashboard Use Model - 1

Production Line Performance Monitoring



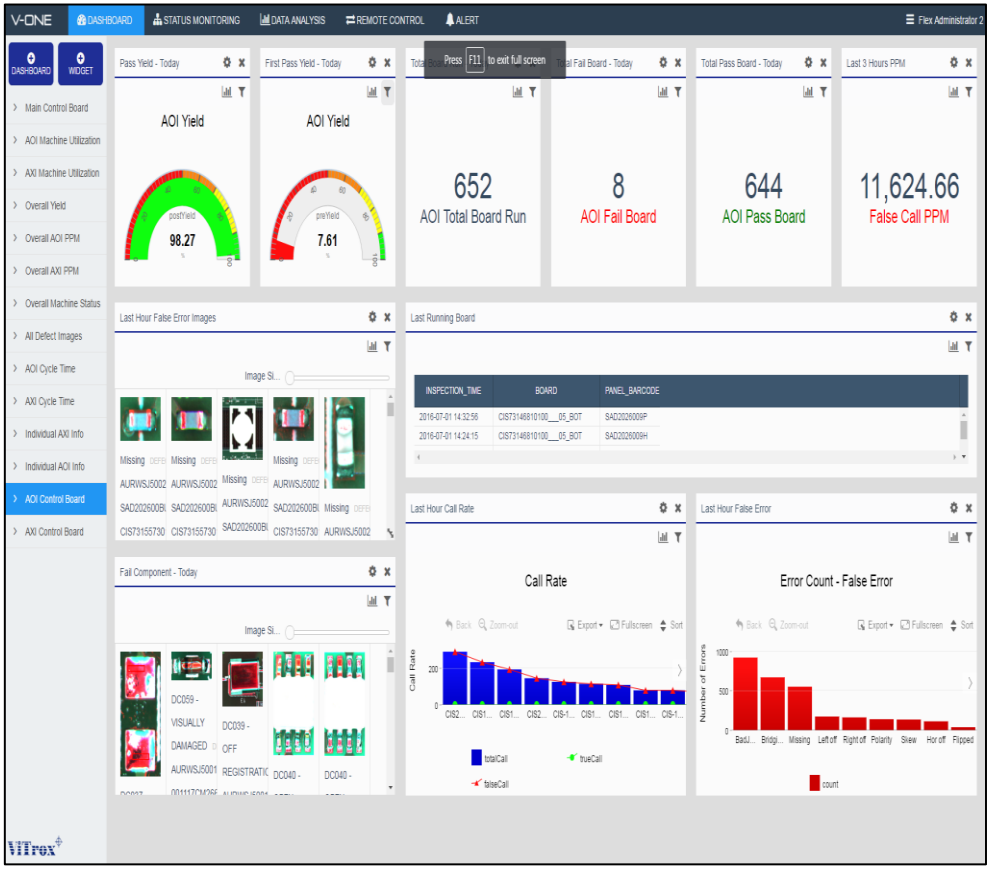
Use Model:

Line information in one page

Summary **auto reporting**

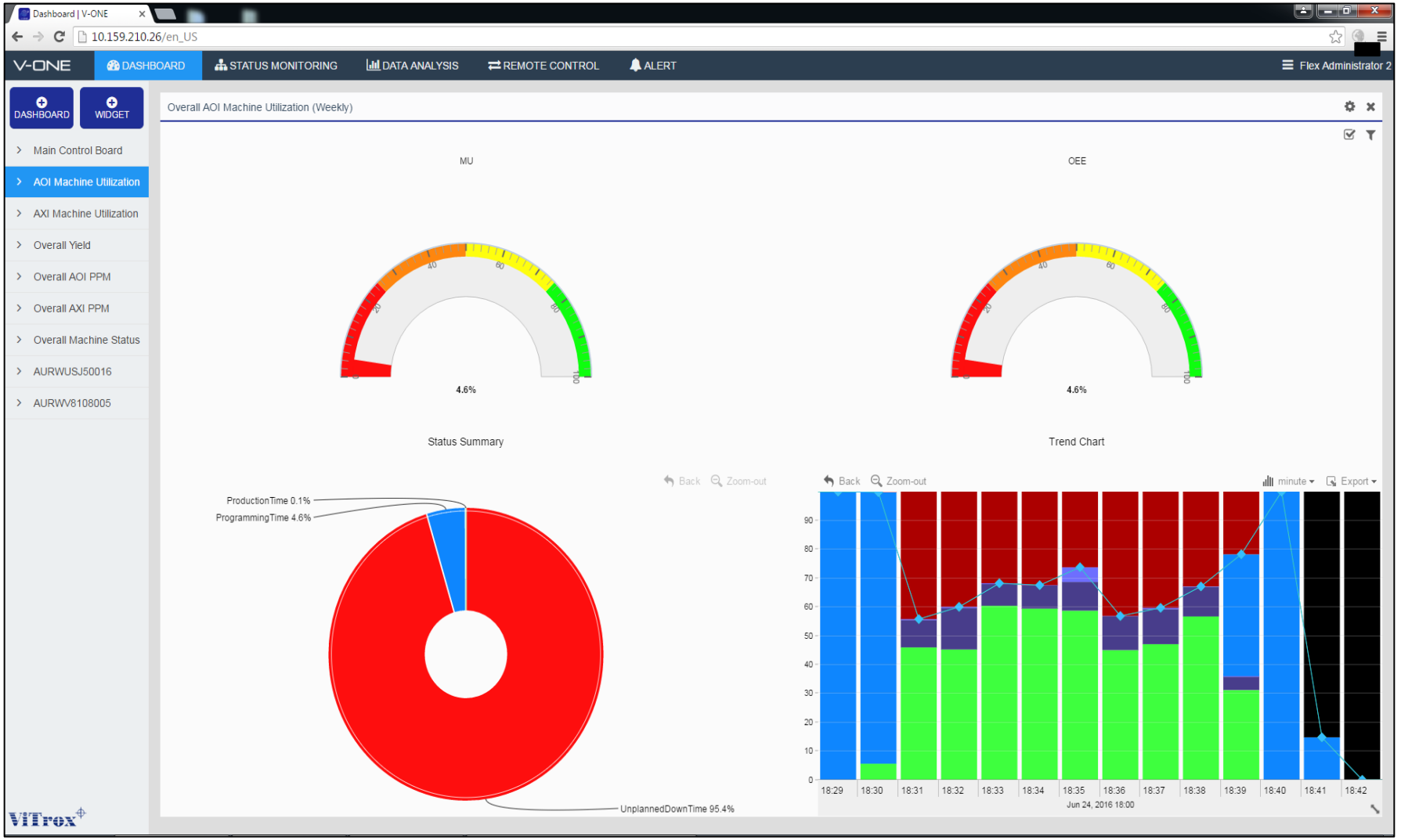
Dashboard Use Model - 2

AOI Machine Performance Monitoring

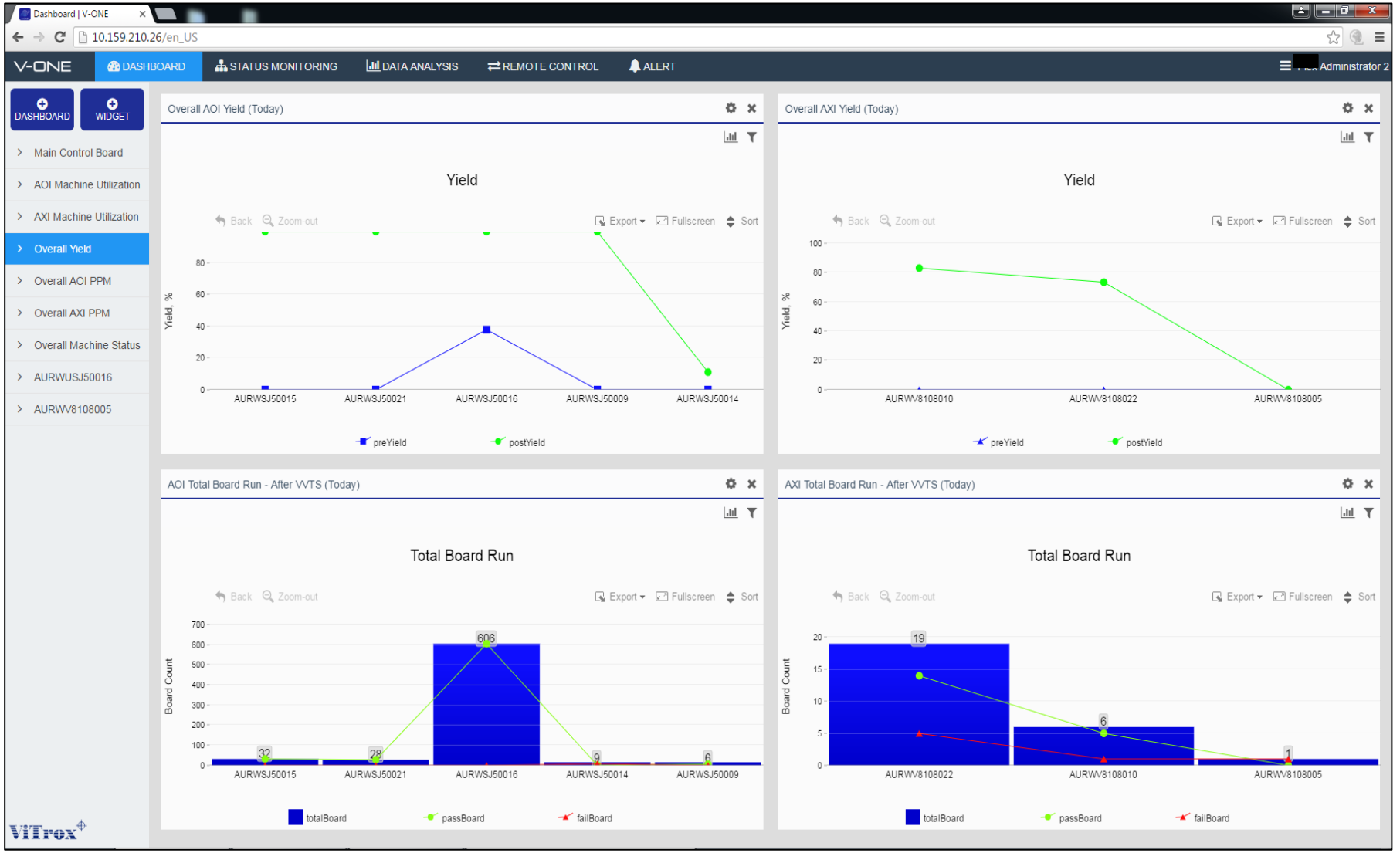


AXI Machine Performance Monitoring

Dashboard Use Model – 3: Machine Utilization



Dashboard Use Model - 4: Yield

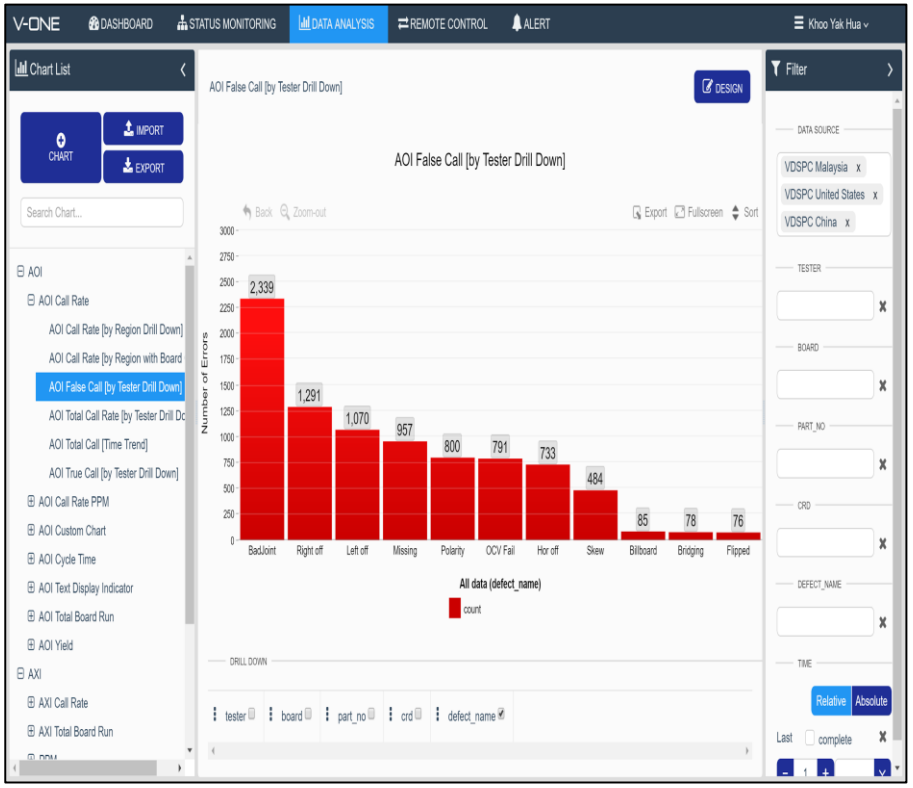


V-ONE Features (2 / 5) - Data Analysis

V-ONE | DASHBOARD | STATUS MONITORING | DATA ANALYSIS | REMOTE CONTROL | ALERT

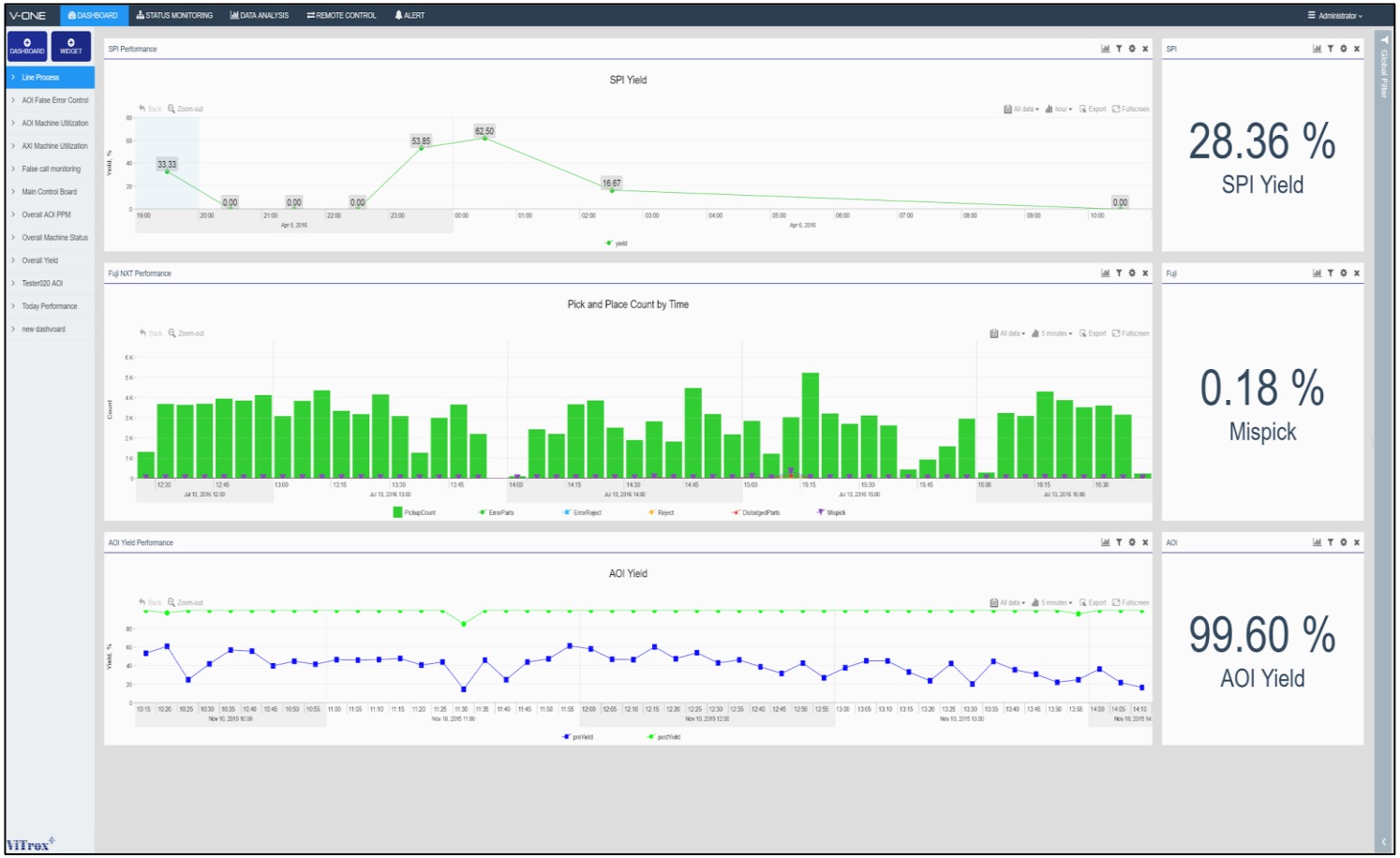
Data Analysis

a fully configurable SPC tools for user to analyze machine data in more efficient way. Real time SPC allows user to monitor the performance and re-act on production defect instantly.



V-ONE Data Analysis Use Model (Example - 1)

Line cross machine monitoring



Use Model:

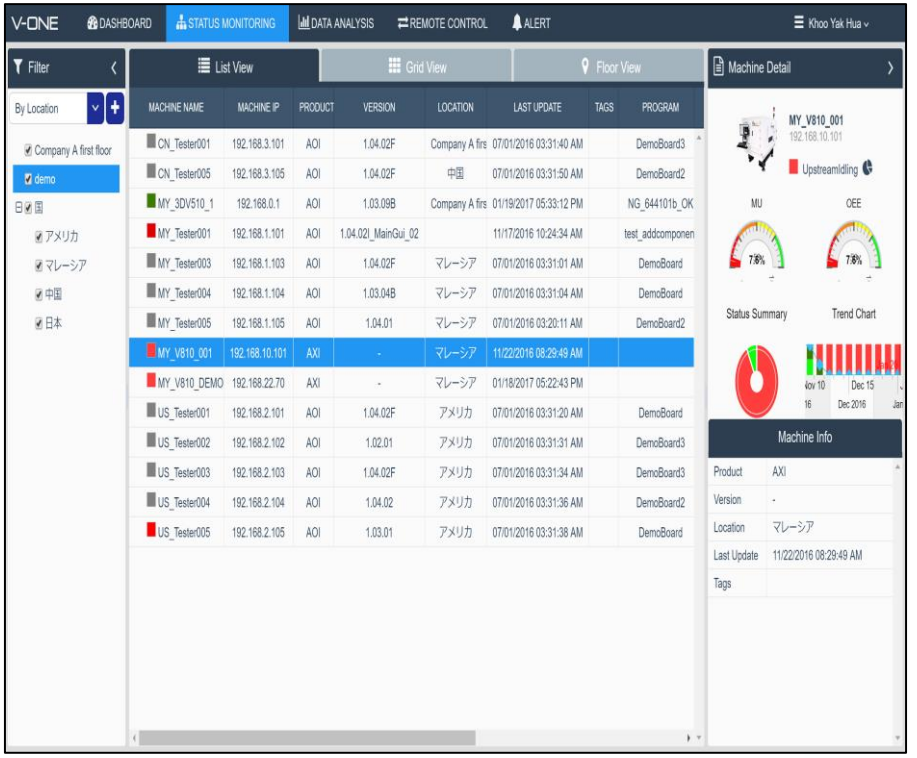
- Visualize different machine process indicator
- Monitor and alert to react in real time.

V-ONE Features (3 / 5) - Status Monitoring

V-ONE | DASHBOARD | STATUS MONITORING | DATA ANALYSIS | REMOTE CONTROL | ALERT

Machine Status Monitoring

a machine monitoring window to track machine activities in real time basis. Machine sensors activities will be tracked and Machine Utilization can be computed automatically in real time.



V-ONE Features (3/5) - Use Model

Machine Utilization Tracking

Use Model:

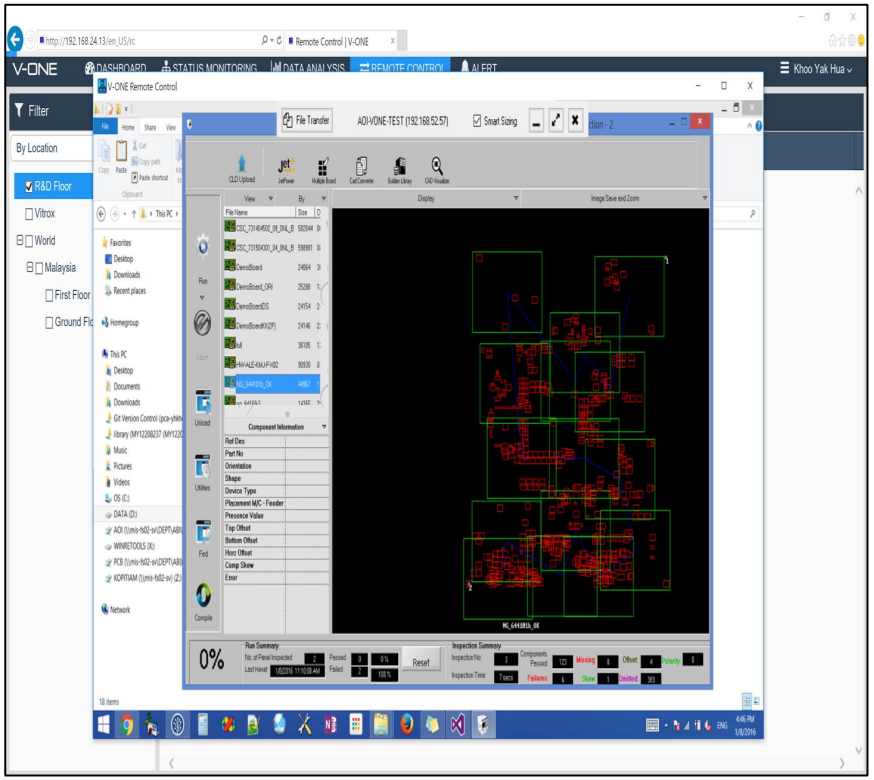
- Machine activities problem tracking
- Daily MU auto reporting
- Trend and Optimization

V-ONE Features (4 / 5) - Remote Control

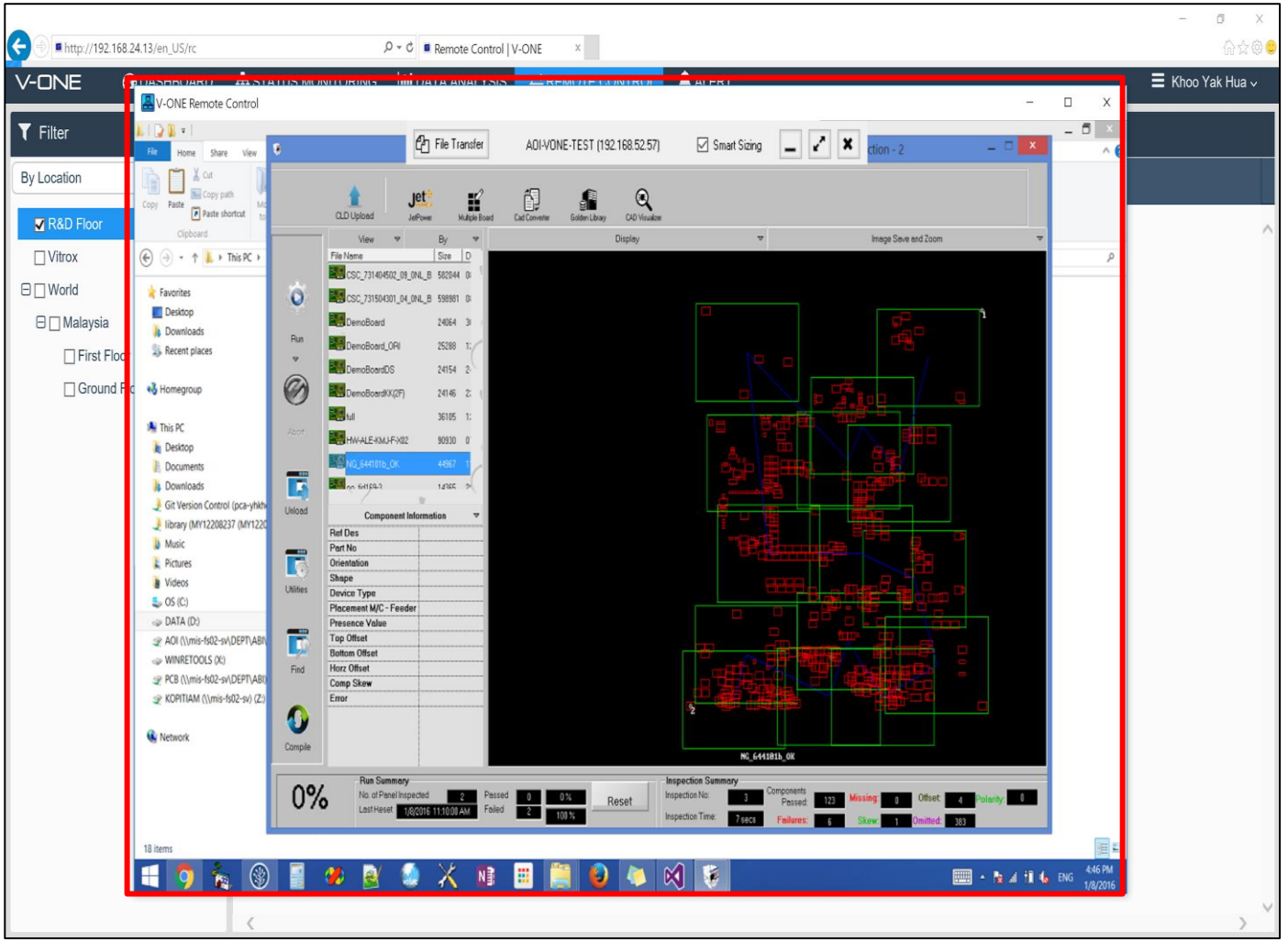
V-ONE | DASHBOARD | STATUS MONITORING | DATA ANALYSIS | REMOTE CONTROL | ALERT

Remote Control

Allow user to remote control to the machine PC via web.



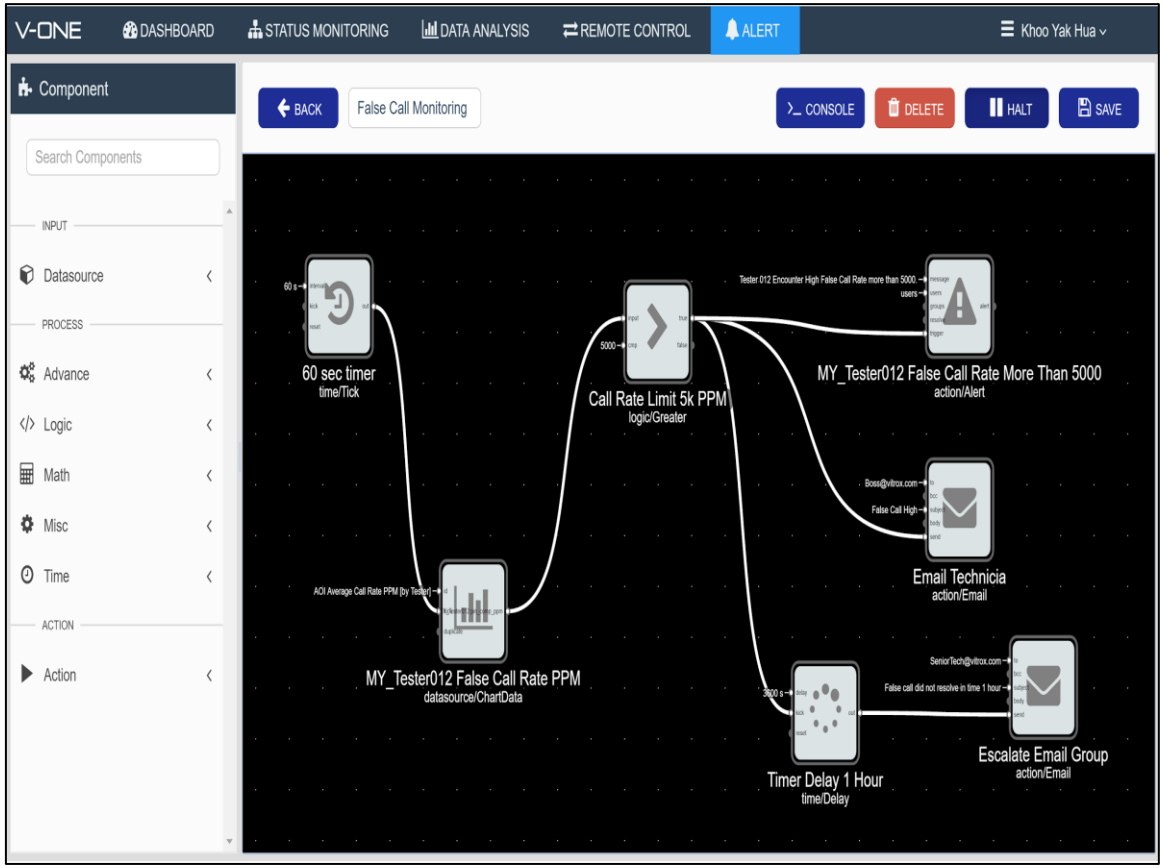
V-ONE Features (4 / 5) - Remote Control



TeamViewer

Remote Desktop Connection

V-ONE Features (5 / 5) - Alert Triggering



Alert Triggering

A fully flexible and configurable triggering module allow user to configure different use model to help production automate monitoring process in real time basis.

Feature 5/5 - Alert Triggering Use Model

production Model A inspection data send to V-ONE

high false call for Board Model A

V-ONE

technician alert via sms/email

lock AOI when high call rate

Escalate to management if not resolve in time frame

Engineer fine tuning

- Machine fine tuning
- Remote NOLP fine tuning

How SME can benefits from V-ONE Smart Manufacturing Platform

V-ONE SMART MANUFACTURING PLATFORM

1. **Collect:**
Automatically Collect Machine Data

2. **Visualize:**
Machine Utilization and OEE Dashboard

3. **ProAct:**
Data Standardization and Auto Fine-Tuning

Physical product lifecycle

Research and design | Source | Make | Distribute | Service | End of life

Digital thread

End-to-end information flow across lifecycle

Conclusion

- From big data to smart data for value creation.
- Data-driven predictive maintenance
- Automation & human-machine collaboration
- Digitized advanced process control
- Interoperability & standardization.
- Combination of analytic and diagnostic with People.
- Increase productivity through connected digital enterprise.
- Reduced cost and scalability.

THANK YOU

www.v-one.my