

ADVANTECH

Enabling an Intelligent Planet

Advantech iFactory

Power-up Your Manufacturing & Equipment Efficiency with iFactory TPM Solution Suite



ADVANTECH

WISE-iFactory

Who are you?

1.1

I am an Automation Creator

I would like to get a better understanding of my machines once they are out at factories in the world.

Examples

- Give better support to customers. Customer can implement correct maintenance to reduce downtime.
- Learn from insights in the field to improve innovation in RnD.
- Compare machines automatically to see if anyone is behaving different. This might give insights to humidity, temperature or other local parameters geographically.
- I would like to make predictive & preventive maintenance to avoid longer production stops and enhance the lifetime of my machines.

Touch panel for Smart Automaton
Smart Factory edge computing

WISE-iFactory
Multitenant
RTM

1.2

I own a factory

I have a factory and would like to understand my factory values better.

Examples

- I would like to see my OEE values.
- I would like to improve efficiency and reduce carbon as a whole and at each machine in order to price my created products more correctly and to become more sustainable.
- I would like keep real-time tracking of quality outcome and improve effective output
- I would like to know my current capacity and order progressing to make sure if I can feedback more requirement from customers.
- I would like to have cost saving and reduce waste and implement predictive maintenance

On-Premises
SaaS platform

WISE-IoTSuite
WISE-iFactory
Single Tenant
RTM

1.3

I own many factories

I have > 1 factory and would like to understand how they are doing.

Examples

- All from 1.2.
- I would like to see production parameters from all my factories in a war room.
- I would like to compare good production factories to less good in order to improve all.
- I would like to have the same Standard Operating Procedure at all facilities.
- I need server in each site and data center to accumulate all data
- I have data science team to investigate detail and improvement area

High-Availability Data Center
Virtual machine SaaS platform

WISE-IoTSuite
WISE-iFactory
Multitenant
RTM

Right Stakeholders – Making Data-Driven Decisions

	Production Managers	Plant Managers	C-Suite Managers
Responsibilities	<ul style="list-style-type: none"> ■ Ensure all manufacturing processes, machines and assembly lines run reliably and efficiently 	<ul style="list-style-type: none"> ■ Ensure daily production is on-time, on-delivery, and on-budget ■ Also ensure safety among all factory workers 	<ul style="list-style-type: none"> ■ Ensure all plants are efficient, profitable and on-schedule ■ Customer satisfaction standards are met and quality is ensured
Key Performance Indicators Insights (Business Outcomes)	<ul style="list-style-type: none"> ■ Scrap/rework ■ Cycle time ■ Takt time ■ Unplanned downtime ■ MTTR/MTBF ■ Changeovers 	<ul style="list-style-type: none"> ■ OEE ■ Conversion costs ■ Changeovers ■ Perfect order 	<ul style="list-style-type: none"> ■ Perfect order ■ Demand forecast ■ SCM cost ■ On-time & complete shipments ■ % of products in compliance ■ Cost of goods sold ■ Labor utilization ■ ROI of plant investments
Insights (Business Outcomes)	<ul style="list-style-type: none"> ■ Reliability ■ Efficiency ■ Less waste <p>IoT is digitalizing data needed for daily operations, improving transparency and response time to enhance process stability</p>	<ul style="list-style-type: none"> ■ Productivity ■ Working capital (inventory levels) ■ Cost performance ■ Cost of poor quality (COPQ) <p>Make data available for past processes which were gut feelings or experience driven, to identify bottlenecks for optimization & securing on-time delivery</p>	<ul style="list-style-type: none"> ■ NPI ■ Customer service levels ■ Cost to serve

Total Productive Maintenance

WISE-iFactory TPM (Total Productive Maintenance) leverages IoT data to monitor productivity and raise events to flag anomalies affecting production, dashboard visualizations assist production manager to grasp the situation more quickly.



Real-time Visualized Data for production management

ISA-95

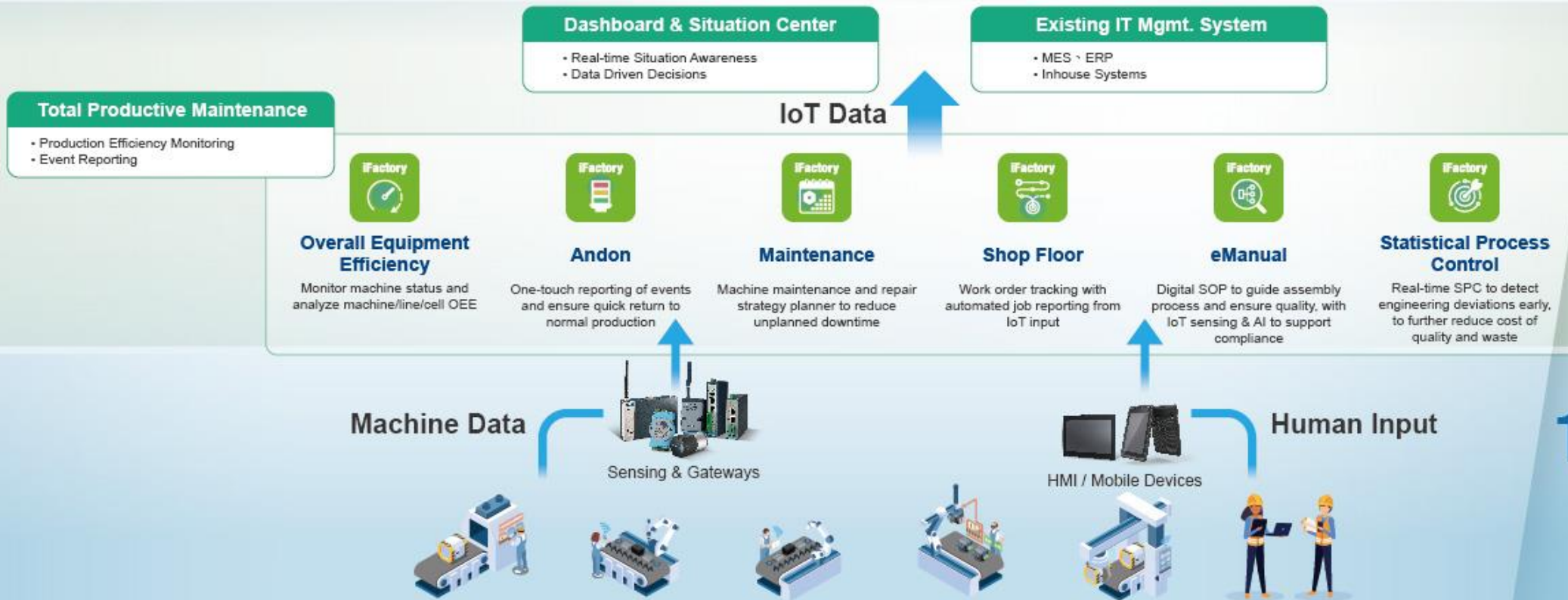
4 Business Planning

3 Manufacturing Operations Management

2 Monitoring & Supervision

1 Sensing & Manipulation

Level



How can we easily understand the productivity & equipment efficiency of our factory?

Where do we start?



Managing Overall Equipment Effectiveness

A First & Essential Step toward Industry 4.0

Track your OEE with **Quick Response**

ERP – Enterprise Resource Planning
Executive level – Business Decisions

Order Fulfillment	Forecasting Sales	Inventory Distribution	Procurement Planning	Corporate social responsibility (CSR)
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1. Monitoring the real-time status of equipment and machine **OEE** with **Internet of Things** technology
2. Presenting important information such as equipment **turnover ratio**, **manufacturing performance**, and **production quality ratio** through dashboard presentation without writing code
3. Select from **cloud-hosted** / **on-premise** services to quickly enable managers to control on-site production information and manage performance indicators anytime, anywhere

TPM – Total Productive Maintenance
Bridge between floor and execution level
– Plant wide Mfg. Decisions.

IFactory (Overall Equipment Effectiveness)

2 OEE
(Overall Equipment Effectiveness)

Plant Floor - Monitoring in Real-time
Production Line/ Process decisions / Plant & Environment Facility

1 Machine Operation

- Sensor/ PLC data acquisition
- Pre-processing machine data

Process Control

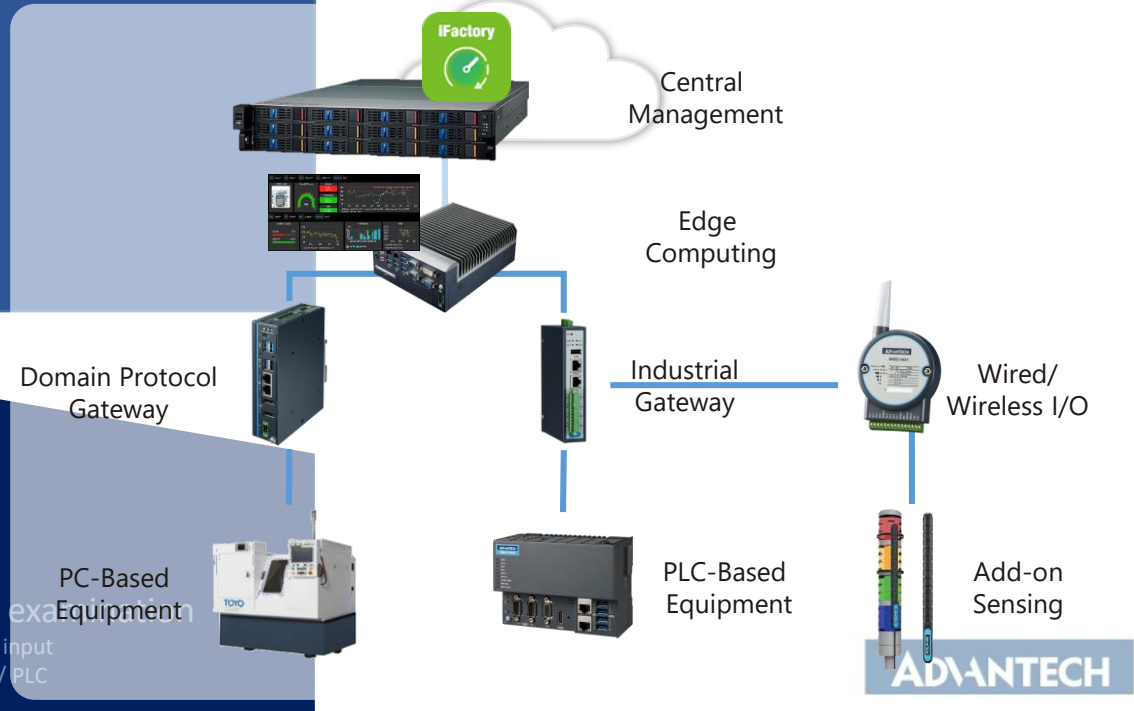
- Work & Routing instructions
- Job Report / field operation

Operator interface

- HMI/ Touch Panel
- Bar code Scanner/ RFID/ NFC

Visual examination

- Camera input
- Sensors/ PLC



Application Scenario

Decision-makers

Enable decision-makers to quickly understand production trends

Plant Floor

Real-time monitoring of equipment status at the production line

Gateway

Real-time data collect and calculate

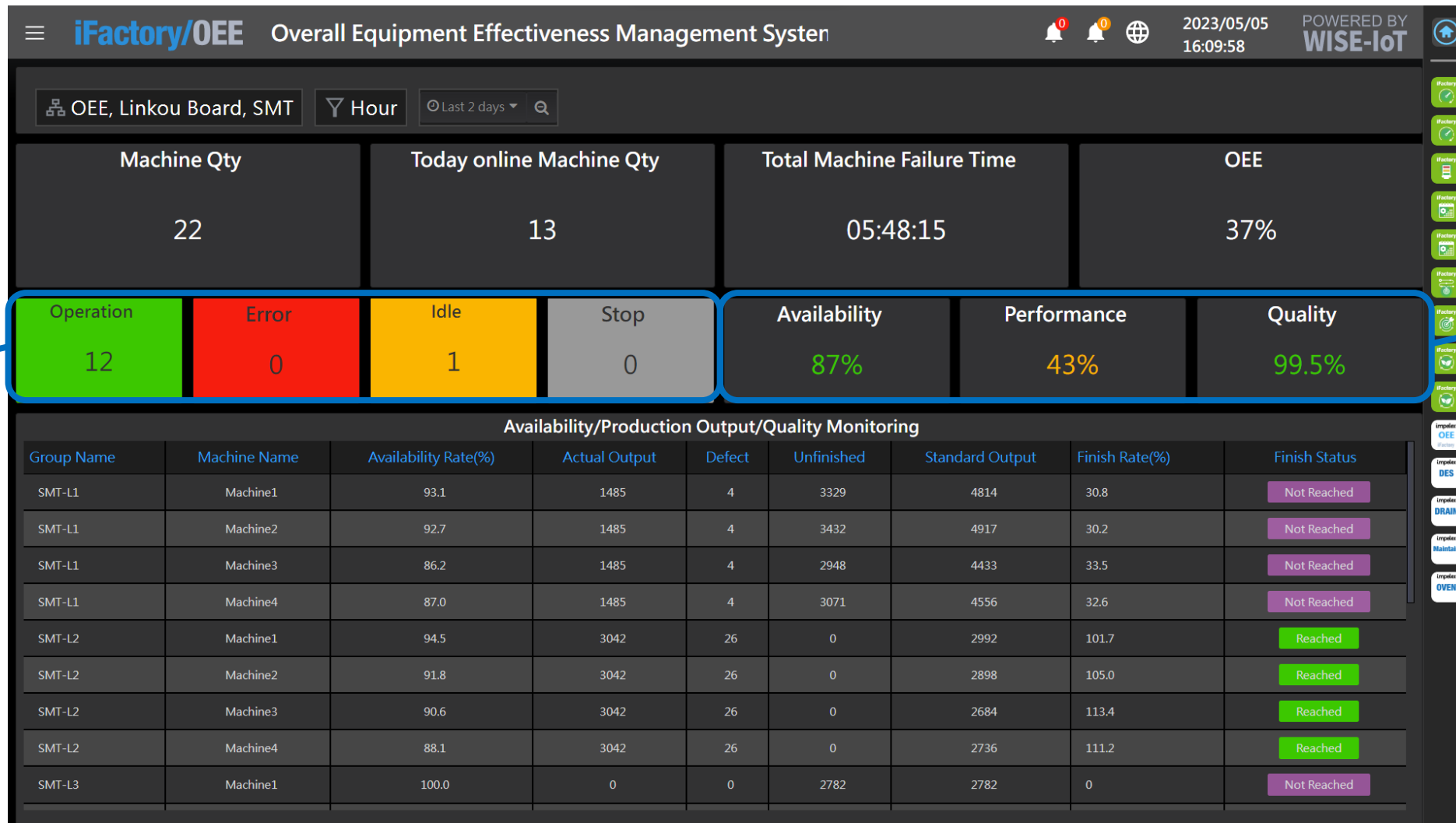
The equipment status, actual output, defect count are transmitted in real-time through the gateway and instantly calculated into OEE information.

Overall Efficiency Ranking		Availability Ranking		Performance Ranking		Quality Ranking	
83.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%
85.0%	82.0%	82.0%	82.0%	82.0%	82.0%	82.0%	82.0%
87.0%	84.0%	84.0%	84.0%	84.0%	84.0%	84.0%	84.0%
89.0%	86.0%	86.0%	86.0%	86.0%	86.0%	86.0%	86.0%
91.0%	88.0%	88.0%	88.0%	88.0%	88.0%	88.0%	88.0%
93.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%
95.0%	92.0%	92.0%	92.0%	92.0%	92.0%	92.0%	92.0%
97.0%	94.0%	94.0%	94.0%	94.0%	94.0%	94.0%	94.0%
99.0%	96.0%	96.0%	96.0%	96.0%	96.0%	96.0%	96.0%
100.0%	98.0%	98.0%	98.0%	98.0%	98.0%	98.0%	98.0%



Line/Cell OEE Overview Dashboard

Overall Equipment Effectiveness dashboards show multiple or individual equipment' availability, performance, and production quality, allowing managers to identify bottlenecks in the production process.

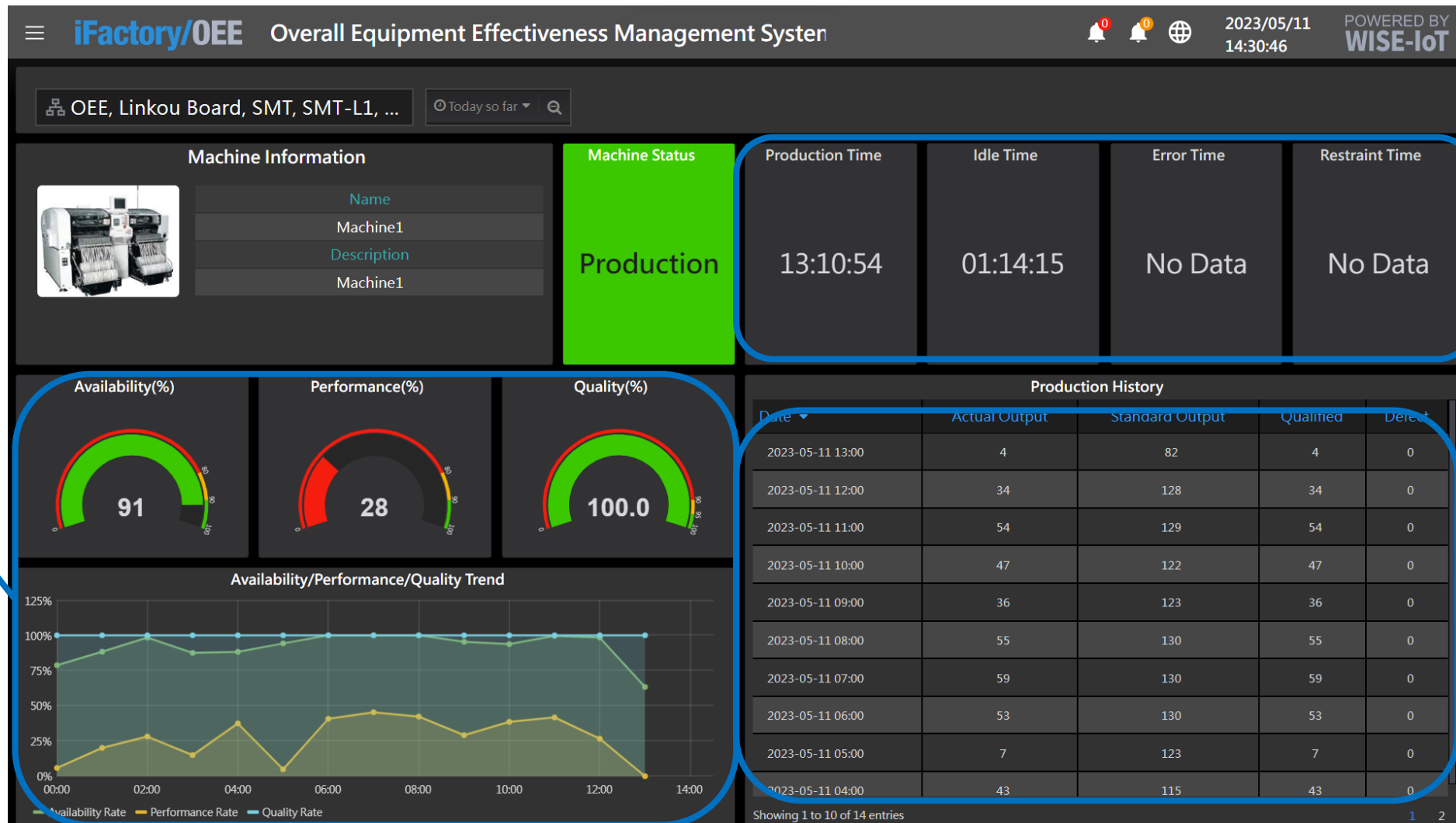


Shows machine status like signal tower

Real-time calculation of availability, performance and quality

Individual Equipment OEE

A single machine can display not only the OEE value, but also trends, the quantity of output, and defects within a unit of time.



Numeric display the machine status elapsed time

Real-time calculate machine APQ and trends

Listing production history of this machine

Equipment & production efficiency at my plant is kind of low...

How can we improve?



Digital Andon to Improve Productivity & Resolve Anomalies

Reduce response time with alerts and notification

ERP – Enterprise Resource Planning

Executive level – Business Decisions

Order Fulfillment

Forecasting Sales

Inventory Distribution

Procurement Planning

Corporate social responsibility (CSR)

Event Alarms & Job Dispatch

TPM – Total Productive Maintenance

Bridge between floor and execution level
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2 OEE

(Overall Equipment Effectiveness)



3 Andon

Plant Floor - Monitoring in Real-time

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Increase machine availability with **Quick Response**



MACHINES

I.App: OEE

Monitor equipment status & efficiency

- Real-time monitoring of equipment status
- Availability of machines
- Productivity & performance
- Quality of production



PROCESS

I.App: Andon

Reduced downtime by alarms dispatch and tracking anomalies

- Controlled stop of production upon fault
- Auto-alerts and event trigger processing
- Easy, interactive events reporting with questions and parameters

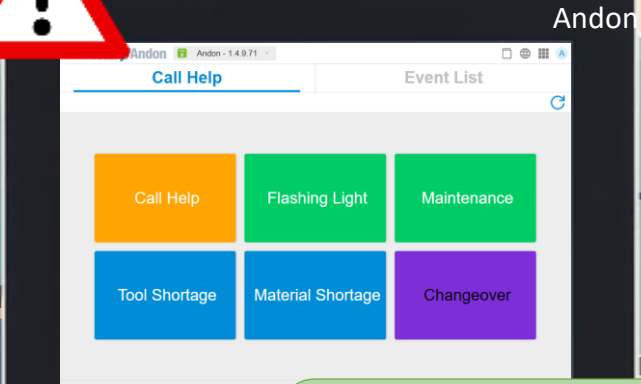


Touch Panel

1. Increase **machine availability of OEE** by providing a digital tool for easy on-site abnormal event management
2. Assists factory managers to discover and solve problems impeding production quickly, **reducing machine and production line downtime**
3. **Quantitative management** indicator supports managers to identify key issues and make more accurate decisions

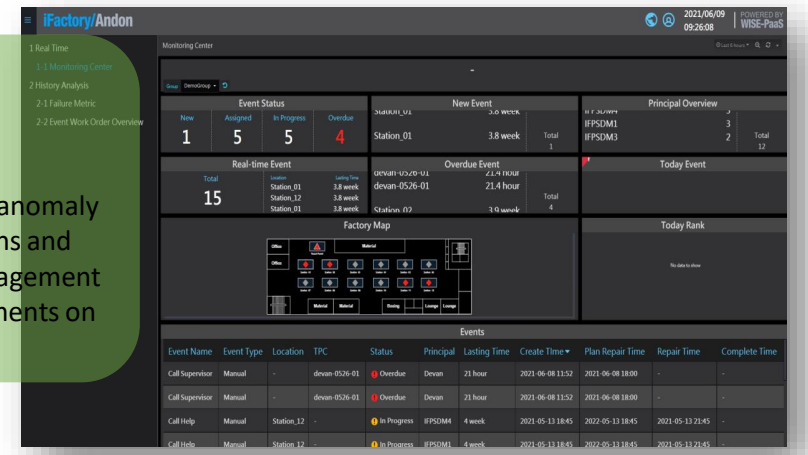
Andon Scenario

Shop floor

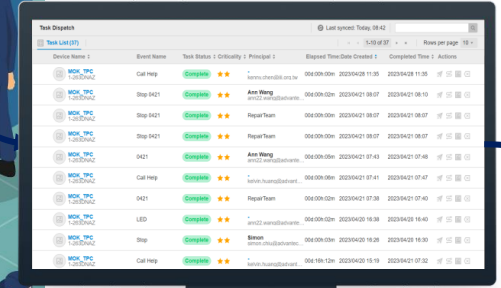


Abnormal Event Alarm
Production staff can report events on HMI or triggered by machine status automatically.

Dashboard
Anomaly Overview shows real-time anomaly status of production lines and stations and allows maintenance teams and management to have more control over improvements on the production line.



Floor supervisor's office



Abnormal Event Dispatch
Supervisors can assign tasks to team members directly with real-time notifications.



Engineers/Staff



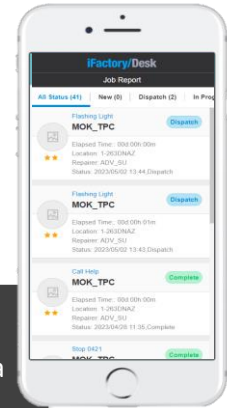
Abnormal Event Report
Team members can receive tasks both from shop floor and supervisors and report job status, time and comments from iMobile interface.

Abnormal Event Handling Process

Event Trigger

- Detect abnormal event such as material shortage, flashing light, machine stop.
- Trigger event via touch panel or machine.

Provide notification information to multiple media such as dashboard, email, instant messaging

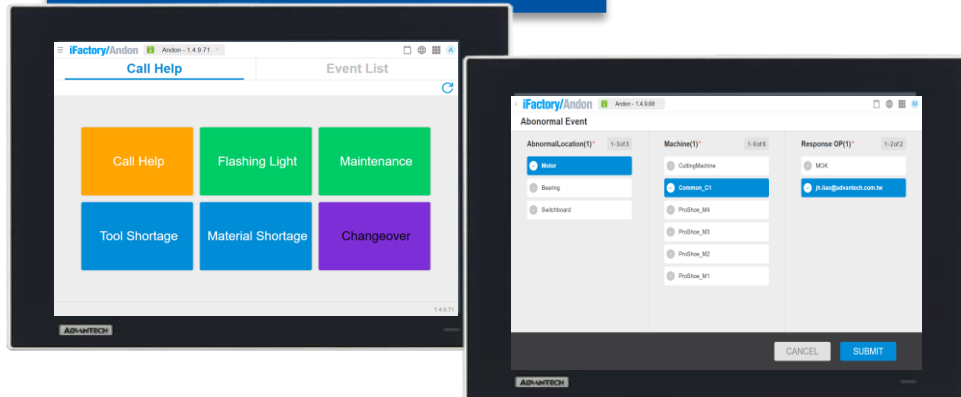


Respond

Event Notification

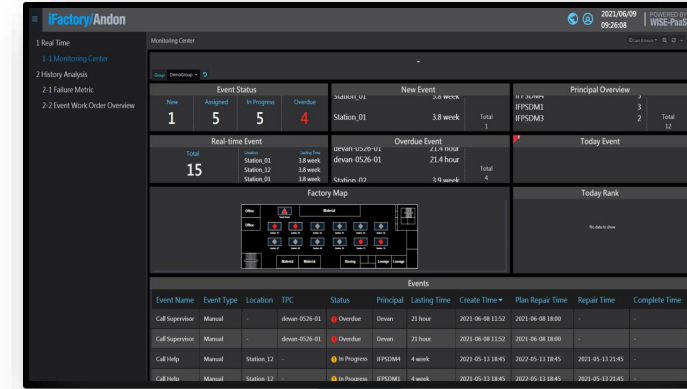
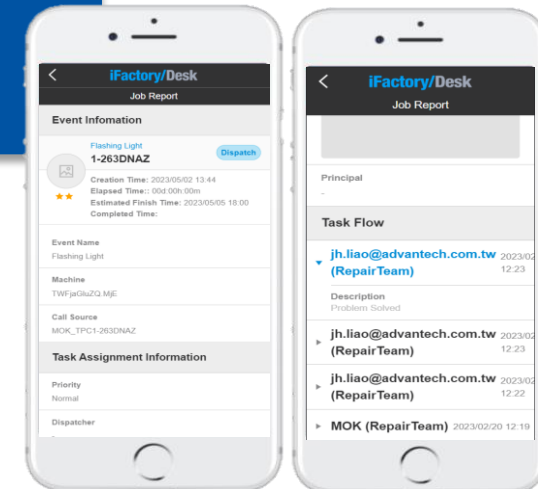
Real-time processing and tracking of events, precise management of time points

- Customizable processing time
- Customizable with corresponding levels.
- Ability to fill in exception reasons.



After abnormal events are fixed, Andon creates the event log and distributes them through multiple platforms such as Dashboard, email, and instant messaging.

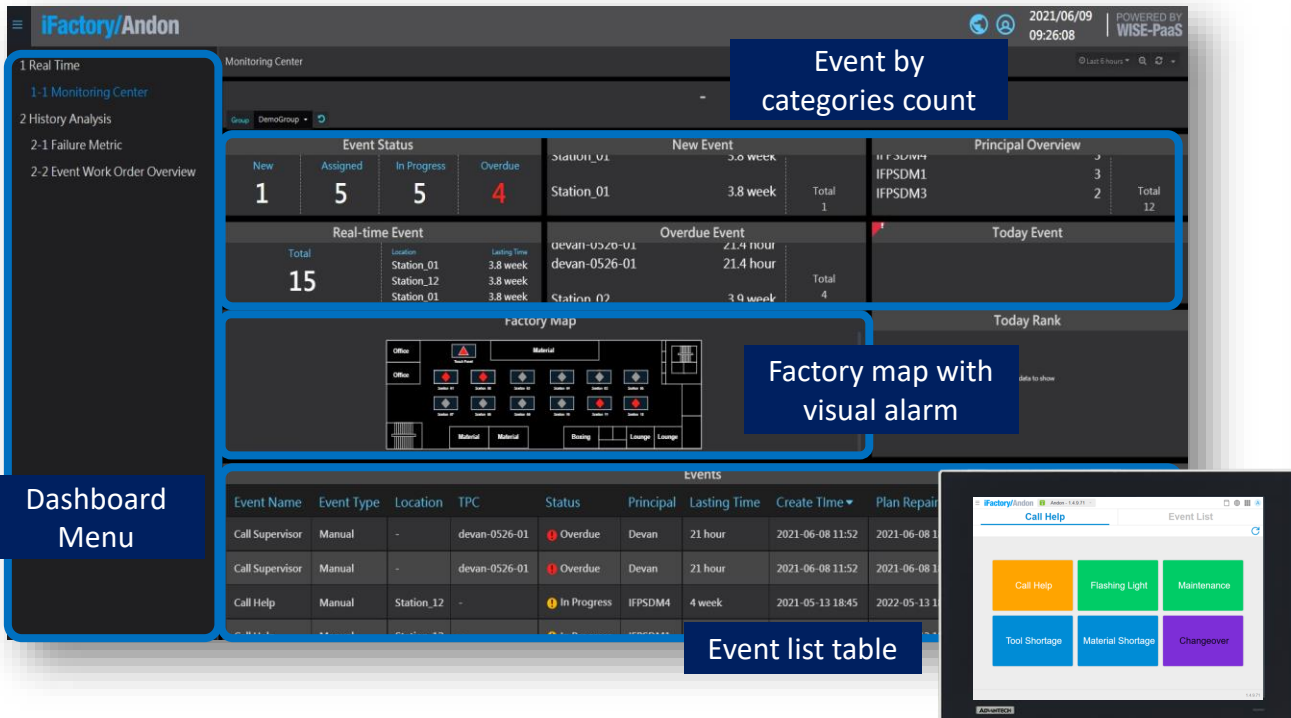
Resolved



Visualize Your Exception Data

Anomaly Overview Dashboard

Anomaly Overview Dashboard shows real-time anomaly status of production lines and stations and allows maintenance teams and management to have more control over and improvement the production line.



Failure Breakdown Dashboard

By tracking and analyzing failure metrics, including MTBF/MTTR/MTTD ratios and abnormal root causes, managers can reduce the downtimes.

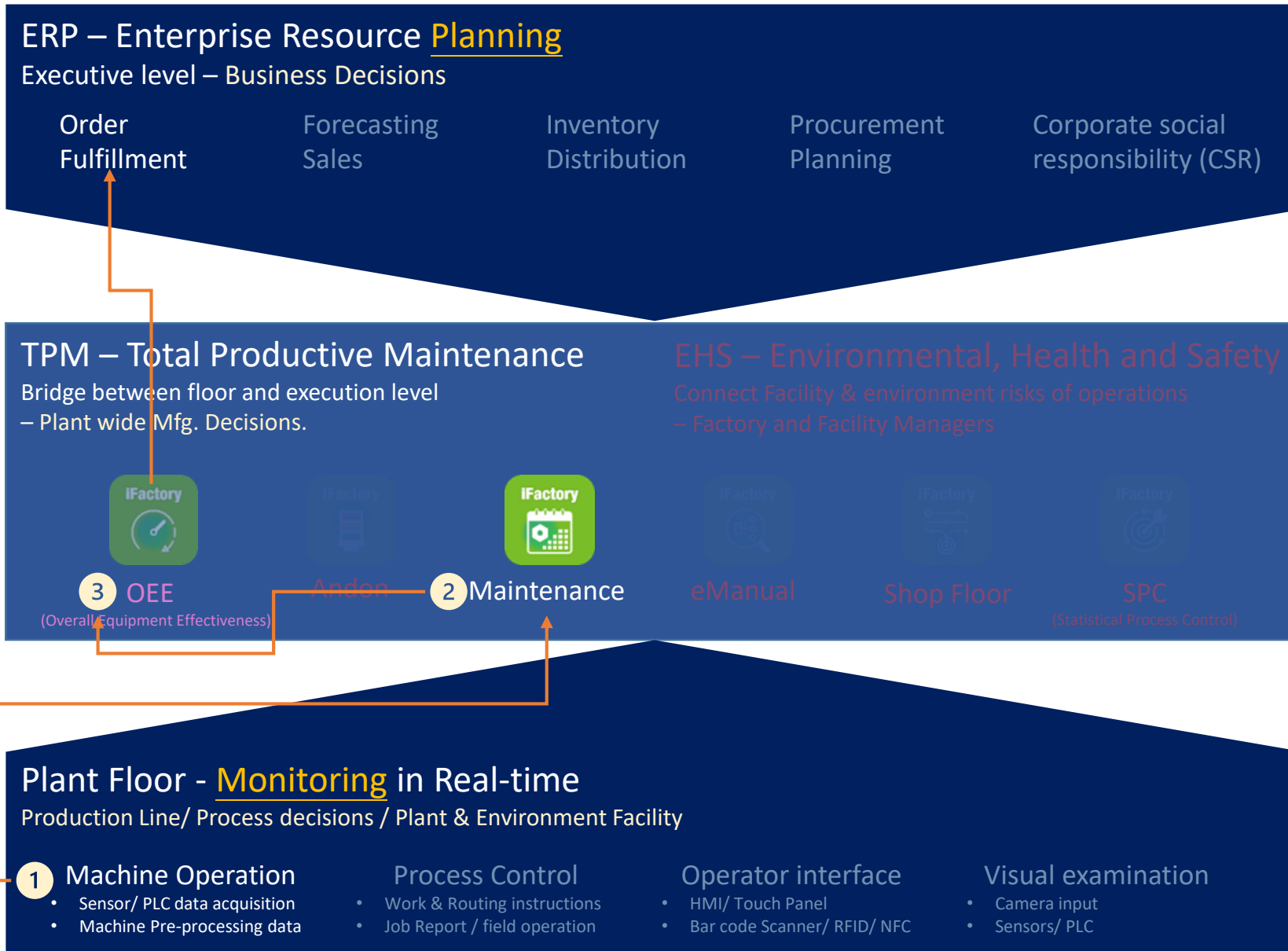


What check-ups and maintenance can be scheduled to help prevent unexpected machine downtime?



Reduce Machine Downtime with Maintenance

Pre-diagnosis critical equipment to increase reliability and uptime

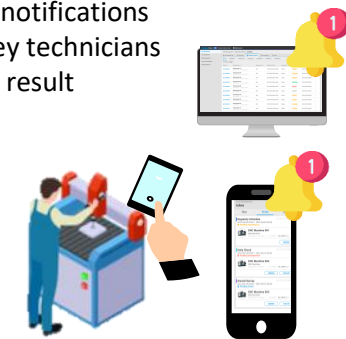


Increase Machine Availability by reducing down time with **Machine Inspector**



I.App: Maintenance
Monitor Maintenance requirement

- Reduce downtime
- Pre-planned maintenance action
- Define actions and notifications dispatch work to key technicians
- Track maintenance result



1. Increase **Availability of OEE** by pre-planned maintenance activity and tracking maintenance results
2. **Maintenance I.App** to monitor specific parameter of machines, including running hours and quantity or usage to adopt appropriate **routine maintenance** to avoid unplanned downtime.
3. Field engineers are able to repair & maintenance tasks on the **mobile app**, record work logs and help management track the progress of service jobs

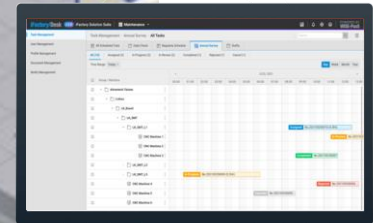
Maintenance Scenario

Maintenance



Real-time Machine Monitoring

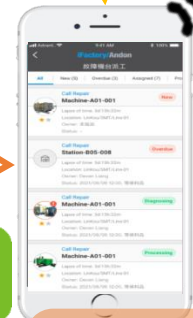
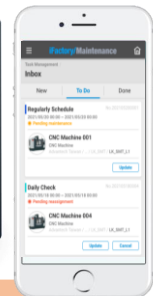
Error codes, usage time, processing times or specific critical parameters that will affect production quality can be monitored in real-time.



Maintenance Task Dispatch

Supervisors can assign tasks to team members via mobile and web without having to return to the office

Supervisor's PC or mobile device

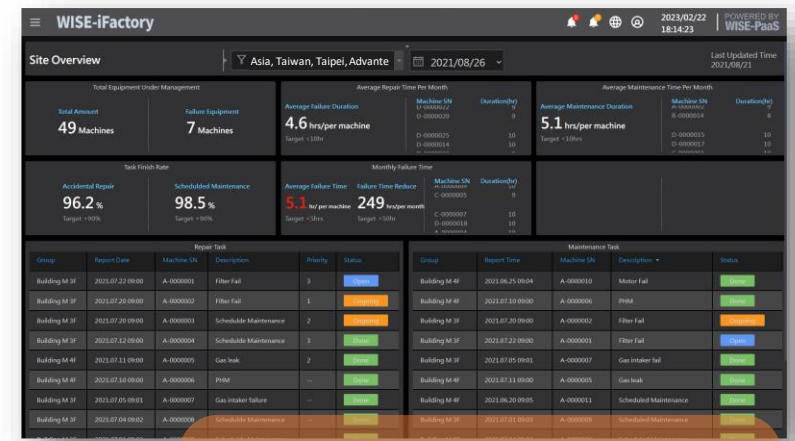


iMobile



Repair personnel

Maintenance Task Report
time, maintenance standards and report task status in images or text from their supervisor.



Dashboard
Utilize existing work order records to calculate equipment MTBF, MTTR, and other related analysis data, and promptly present the status of maintenance work orders.

Maintenance Functions

When you have to arrange maintenance plan



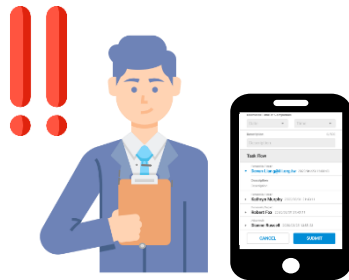
You can create a task on web

When you receive a task need to be done



You can update your work with mobile phone

When you find a problem in production line



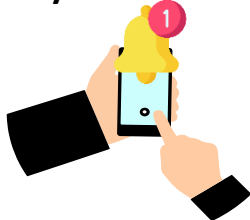
You can report a problem with mobile phone

When you receive a task need to be review



You can check the work done by your engineer

When you received a task unassigned

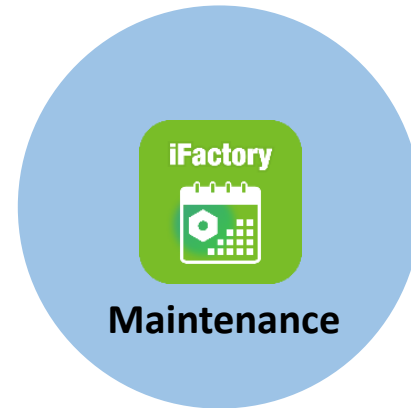


You can assign a personnel to handle new task

When you being as stakeholder

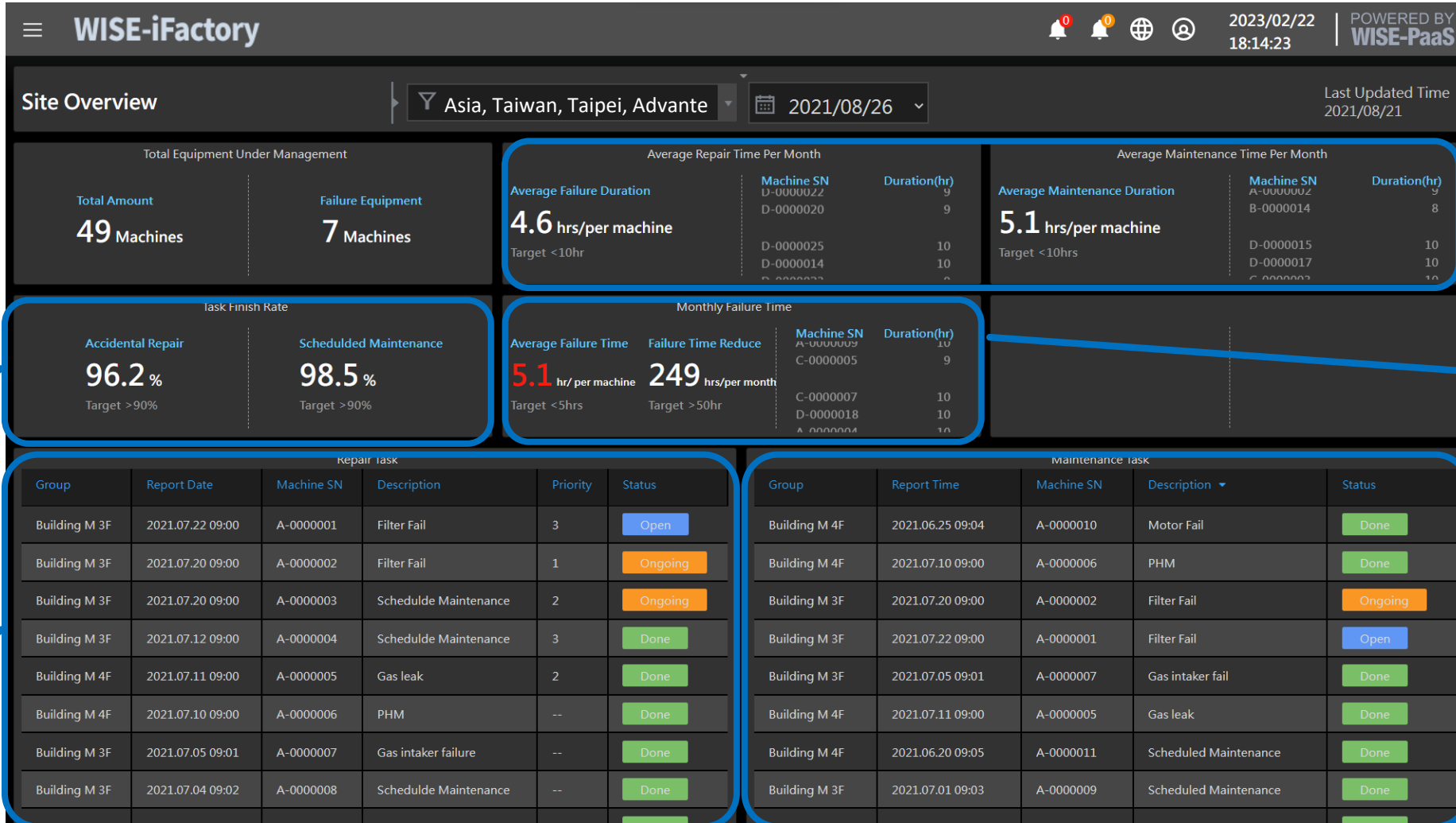


You can receive the status update of task



Site Overview Dashboard

Total number of managed equipment, the average time spent on maintenance work orders and the real-time status of maintenance tasks, helping the management to understand whether the equipment is producing normally, or down for repairs.



Find Machine Availability Lost

Check machine stability

Check real time status of maintenance task

Check engineer finish tasks or not

Check real time status of repair task

How can we further improve production output and performance after automation investments?



Shop Floor Management and Control

Increase productivity and ROI of automation investments

ERP – Enterprise Resource Planning

Executive level – Business Decisions

Order Fulfillment

Forecasting Sales

Inventory Distribution

Procurement Planning

Corporate social responsibility (CSR)

TPM – Total Productive Maintenance

Bridge between floor and execution level
– Plant wide Mfg. Decisions.

EHS – Environmental, Health and Safety

Connect Facility & environment risks of operations
– Factory and Facility Managers



3 OEE
(Overall Equipment Effectiveness)

Andon

Maintenance

eManual

2 Shop Floor

SPC
(Statistical Process Control)

Plant Floor - Monitoring in Real-time

Production Line/ Process decisions / Plant & Environment Facility

Machine Operation

- Sensor/ PLC data acquisition
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1 Process Control

- Work & Routing instructions
- Job Report / field operation

Operator interface

- HMI/ Touch Panel
- Bar code Scanner/ RFID/ NFC

Visual examination

- Camera input
- Sensors/ PLC

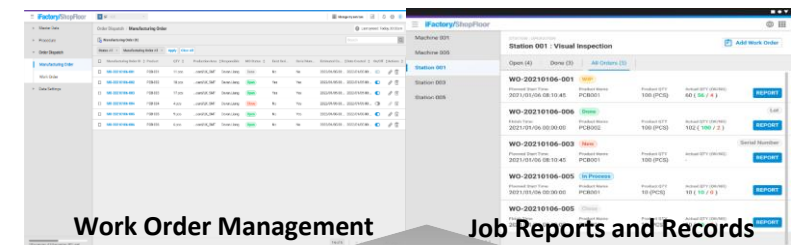
Increase productivity performance with
Real Time Progress



I.App: ShopFloor
Set, track & execute production goals

- Workforce information to supervisors
- Efficient work order management
- Transparent work order status
- Analyze production performance
- Centralize operation information

1. **Shop Floor I.App integrates** relevant real-time IoT data sources along every step in manufacturing processes for live reporting
2. **Real-time tracking** and routing control to increase performance of OEE



Shop Floor Scenario

SCM / Production Control

Dashboard

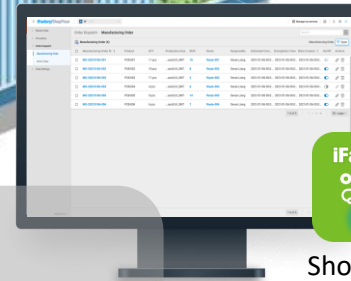
Work order status dashboard shows real-time progress of production, allowing managers to identify bottlenecks in the production process.



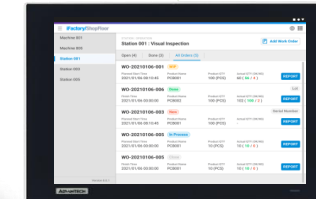
iFactoryShopFloor							
1 Real Time							
1.1 Production Overview							
2.3 Status of Work							
Total Work Orders		Completed Work Orders		Open Work Orders			
24		5		19			
Work Order	Manufacturing Order	Product Name	Target	Good	Status	Plan Start Time	AchieveRate
WO-20220129-141046-001-1-1	MO-20220129-141046-001	原料	100	145	Done	2022-03-29 15:42	145.0%
WO-20220129-141046-001-2-1	MO-20220129-141046-001	原料	100	14	WIP	2022-03-29 18:10	14.0%
WO-20220129-141046-001-3-1	MO-20220129-141046-001	原料	100	90	WIP	2022-04-01 13:50	90.0%
WO-20220130-172116-001-1-1	MO-20220130-172116-001	排板机	100	200	Done	2022-04-22 10:47	200.0%
WO-20220130-172116-001-2-1	MO-20220130-172116-001	排板机	25	0	New	-	0%
WO-20220130-172116-001-3-1	MO-20220130-172116-001	排板机	200	0	New	-	0%
WO-20220130-172116-001-4-1	MO-20220130-172116-001	排板机	200	300	Done	2022-04-22 10:46	150.0%
WO-20220130-172116-001-5-1	MO-20220130-172116-001	排板机	100	0	New	-	0%

Work Order Dispatched

SCM & Production control dispatches work orders to internal production lines, outsourced production or suppliers after creating work orders and scheduling production dates



Shop Floor



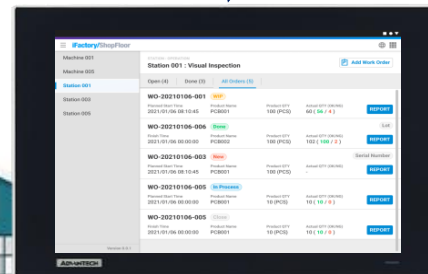
Inhouse Plant Floor



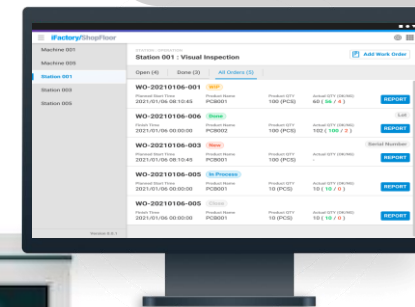
Job Report

Both internal & external work teams report production information such as throughput, scrap quantities, and reporting times through HMI or browser-enabled device for real-time progress updates

Supplier



Outsourced Production

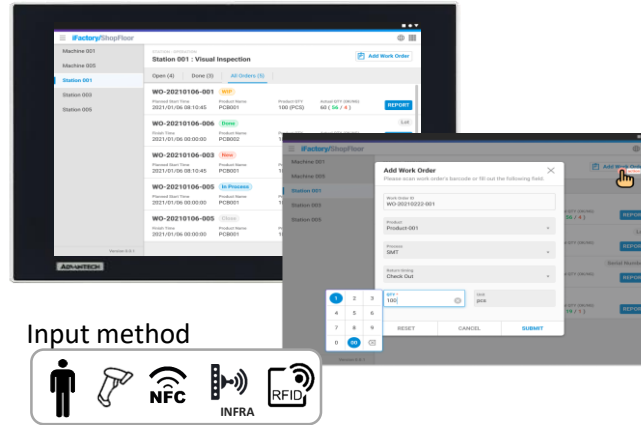


Real-Time Job Progress Reporting

Inherit production orders from ERP or MES via data integration with our Datafabric service, or create orders manually

- Product Definitions
- Routing
- Manufacturing Orders

Production managers can dispatch work orders through Shop Floor to each client on the plant floor



The screenshot shows a dashboard with the following statistics:

Total Work Orders	Completed Work Orders	Open Work Orders
24	5	19

Below the statistics is a table of work orders with columns: Work Order, Machine/Setup Order, Product Name, Target, Count, Status, Plan Start Time, and Achieve Rate.

Work Order	Machine/Setup Order	Product Name	Target	Count	Status	Plan Start Time	Achieve Rate
WO-20220329-14596-001-1-1	MO-20220329-14596-001	WPL	100	1/0	Done	2022-03-29 15:42	115.0%
WO-20220329-14596-001-2-1	MO-20220329-14596-001	WPL	100	3/1	WIP	2022-03-29 18:10	31.0%
WO-20220329-14126-001-1-1	MO-20220329-14126-001	SEI	100	9/1	WIP	2022-04-01 13:50	90.0%
WO-20220330-172316-001-1-1	MO-20220330-172316-001	SETH	100	0/0	Done	2022-04-22 08:47	200.0%
WO-20220330-172316-001-2-1	MO-20220330-172316-001	SETH	25	0	New	-	0%
WO-20220330-172316-001-3-1	MO-20220330-172316-001	SETH	200	0	New	-	0%
WO-20220330-172316-001-4-1	MO-20220330-172316-001	SETH	200	0/0	Done	2022-04-22 08:46	100.0%
WO-20220330-172316-001-5-1	MO-20220330-172316-001	SETH	100	0	New	-	0%

Work Setup

Work Order Management & Dispatch

Job Report

Visualization



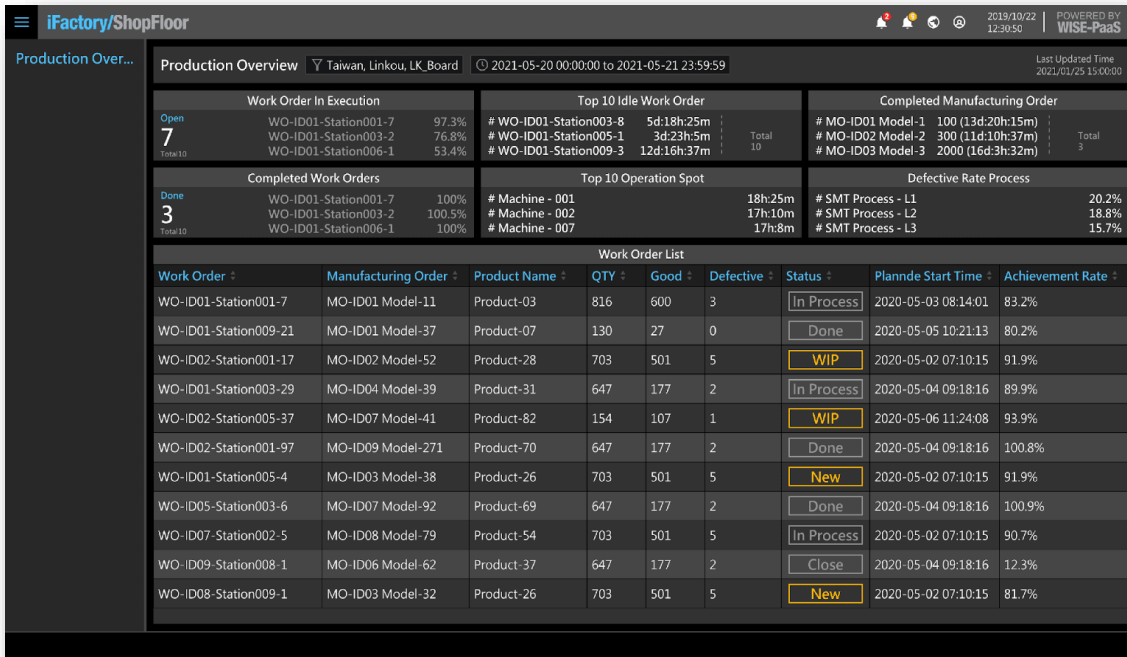
Staff on the floor make live updates about production statuses such as throughput, NG quantities, and production times

Plant floor managers can track progress via dashboards in real-time and make resources adjustments to ensure on-time delivery

Visualize Your Production Data

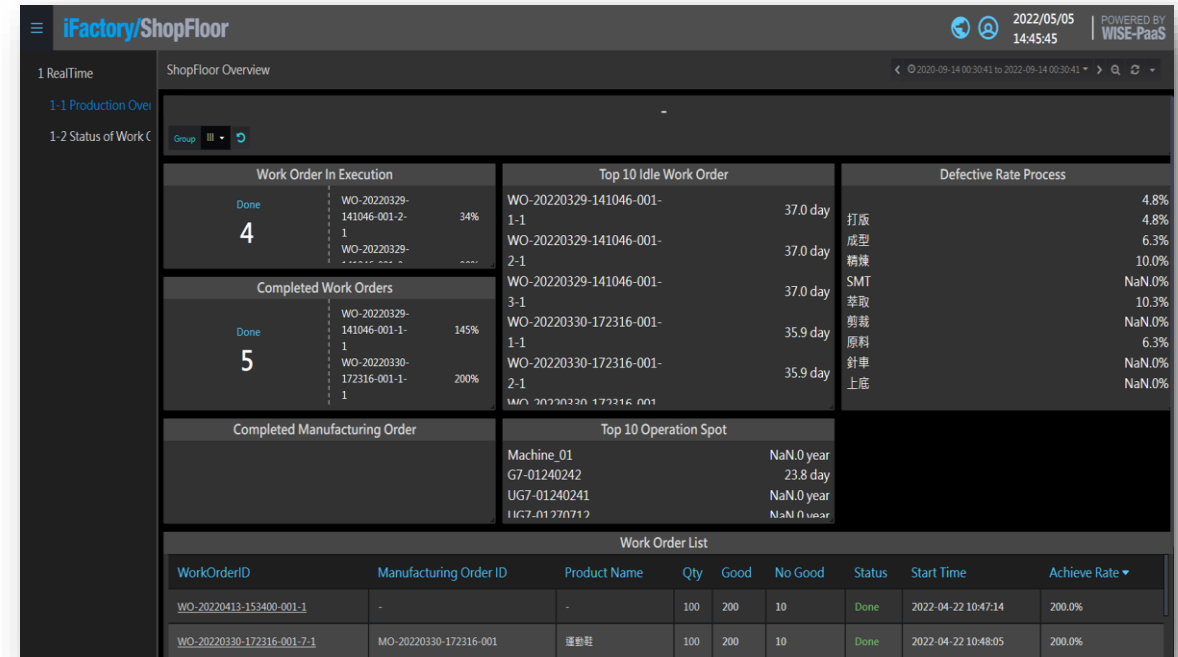
Shop Floor Dashboard- Production Overview

Work Order Status Dashboard shows real-time progress of production. Including tracking status of work order by individual work stations, allowing managers to identify the bottleneck in the production process.



ShopFloor Management System- Production Overview

Production overview dashboard can calculate and display the timely status of work orders, facilitating decision-making to improve production efficiencies.



How can we empower employees with information, and secure productivity with good quality outcomes?



Digital Work Instructions to Empower Employee Productivity

Interactive guidance to support changing products and secure quality

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Visual examination

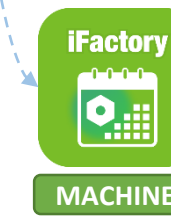
- Camera input
- Sensors/ PLC

Increase manufacturing performance & quality with **Work Mentor**

Ensure the quality of mass production, procedures of the instructions have their own standard operating procedures (Instructions).



Digital Instructions



I.App: eManual

Provide digital instructions to guide production

- Always-correct versioning
- Accelerate production efficiency with clear instructions including videos, text, with highlight markup
- Integration for barcodes to support material use tracking
- Job report for complex operations

I.App: ShopFloor

Set, track & execute production goals

- Workforce information to supervisors
- Efficient work order management
- Transparent work order status
- Analyze production performance
- Centralize operation information

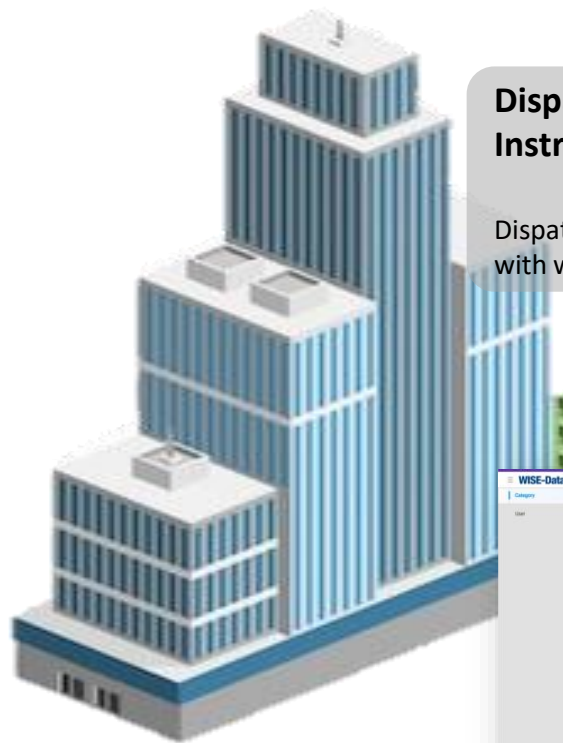
I.App: Maintenance

Monitor Maintenance requirement

- Reduce downtime
- Pre-planned Maintenance action
- Define actions and notifications Dispatch work to key technicians
- Track Maintenance result

eManual Scenario

Process Engineering Team

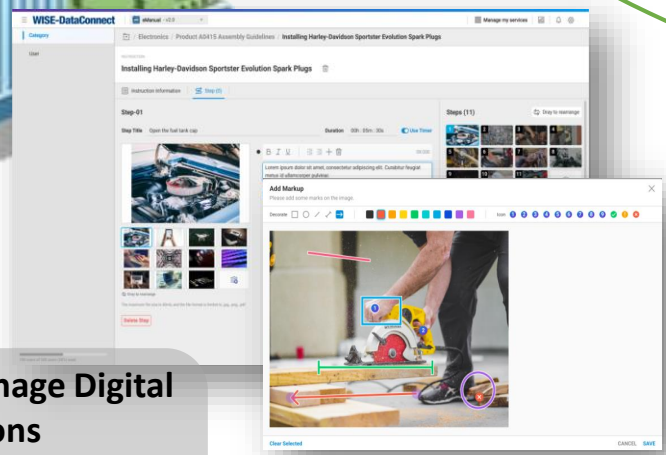


Dispatch Instructions

Dispatch correct instructions with work orders

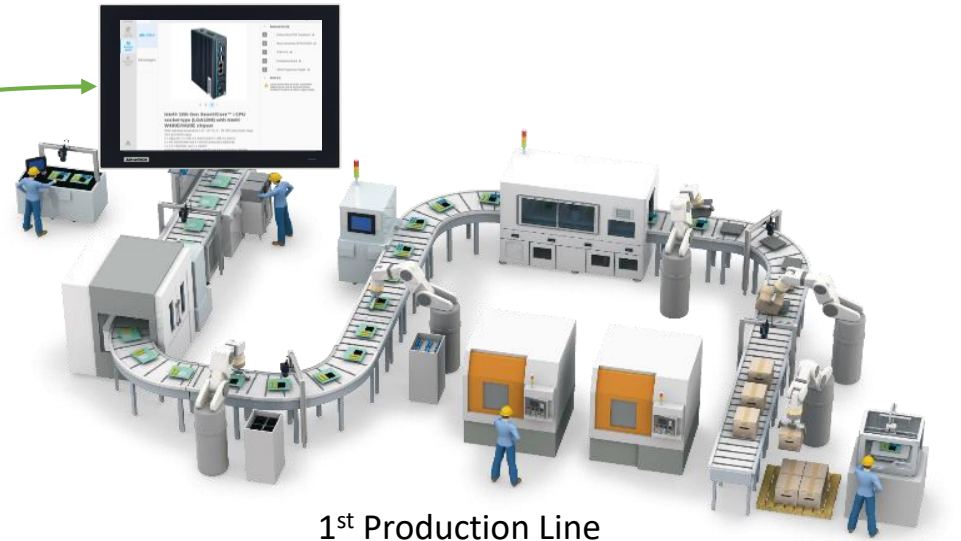


eManual



Create and Manage Digital Work Instructions

Simply create, edit, and update via a web-based editor without installing additional software



1st Production Line

Instruction Display

Display digital instructions on the plant floor via any browser-enabled devices, to support both production and maintenance operations for compliant outcomes



2nd Production Line

Digital Instruction Editor

The screenshot shows the WISE-DataConnect interface for editing an eManual. The breadcrumb path is: Electronics / Product A0415 Assembly Guidelines / Installing Harley-Davidson Sportster Evolution Spark Plugs. The main content area shows a step titled "Step (0)" with a duration of "00h : 05m : 30s". A text editor below the step contains placeholder text: "Lorem ipsum dolor sit amet, consectetur adipiscing elit. Curabitur feugiat metus id ullamcorper pulvinar." A grid of 11 step thumbnails is visible on the right. A callout box titled "Markup Key Points" shows an image with red and green annotations. Another callout titled "Step Duration Configuration" points to the duration field. A third callout titled "Text Instruction Editor" points to the text input area. A fourth callout titled "Upload Image, PDF and Video" points to a media gallery containing various images and a PDF icon. A fifth callout titled "Select multiple pages PDF to upload" points to a PDF selection interface showing a grid of 18 pages, with pages 3, 5, 8, 11, and 12 selected.

Markup Key Points

Step Duration Configuration

Text Instruction Editor

Upload Image, PDF and Video

Select multiple pages PDF to upload

WISE-DataConnect | eManual - v2.0 | Manage my services

Category | Electronics / Product A0415 Assembly Guidelines / Installing Harley-Davidson Sportster Evolution Spark Plugs

INSTRUCTION

Installing Harley-Davidson Sportster Evolution Spark Plugs

Duration 00h : 05m : 30s Use Timer

Steps (11) Drag to rearrange

1 2 3 4 5 6 7 8 9 10 11

Step (0)

open the fuel tank cap

Information

• B I U 59/300

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Curabitur feugiat metus id ullamcorper pulvinar.

Save

Clear Selected CANCEL SAVE

Dray to rearrange

The maximum file size is 40mb, and the file format is limited to .jpg, .png, .pdf

Delete Step

100 users of 200 users (50%) used

Source > Manual

PDF

EBC-GF23 SYS SOP_AZ.pdf

Select Pages (3)

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

SELECT ALL CANCEL SUBMIT

ADANTECH

Digital Instruction View

Start and stop of each process task and target time


WISE-DataConnect eManual - 1.2.5.112 **Quickly Instruction Switch**

Category: AI Demo File / Guide: POC Guide f... / Instruction: op1 Demo Ins

No	Step Description	Status	Time
1	Overview	OK	
2	Suggested Reading	-	
3	Complex slots cut	-	

Steps Switching and Time Capture

Overview




Actual Time
0,00


Target Time
0M00S

AI Verify

Images and written Instructions



One of the key concepts in electronics is the printed circuit board or PCB. It's so fundamental that people often forget to explain what a PCB is. This tutorial will breakdown what makes up a PCB and some of the common terms used in the PCB world.



How can we manage and reduce variation in production to ensure stable quality?



Statistical Process Control

Early detection & warning for production deviations with real-time machine data

ERP – Enterprise Resource Planning

Executive level – Business Decisions

Order Fulfillment

Forecasting Sales

Inventory Distribution

Procurement Planning

Corporate social responsibility (CSR)

TPM – Total Productive Maintenance

Bridge between floor and execution level
– Plant wide Mfg. Decisions.



3 OEE
(Overall Equipment Effectiveness)



2 SPC
(Statistical Process Control)

Plant Floor - Monitoring in Real-time

Production Line/ Process decisions / Plant & Environment Facility

1 Machine Operation

- Sensor/ PLC data acquisition
- Machine Pre-processing data

Process Control

- Work & Routing instructions
- Job Report / field operation

Operator interface

- HMI/ Touch Panel
- Bar code Scanner/ RFID/ NFC

Visual examination

- Camera input
- Sensors/ PLC

Increase Production Quality of OEE

iFactory



MACHINES

I.App: Statistical process control (SPC)
Monitor: Quality of parameters

Real-time SPC as a monitoring tool including Ca, Cp, CPK and different control charts, to detect process variability during production

Cpk can also be regarded as an indicator to measure the stability of the process

1. **Early warning** of abnormal trends in the production process.
2. Take **emergency action** to eliminate the abnormality and restore the stability of the process
3. Real-time analysis of equipment production
4. Built-in ready to use **SPC algorithm**



SPC Scenario

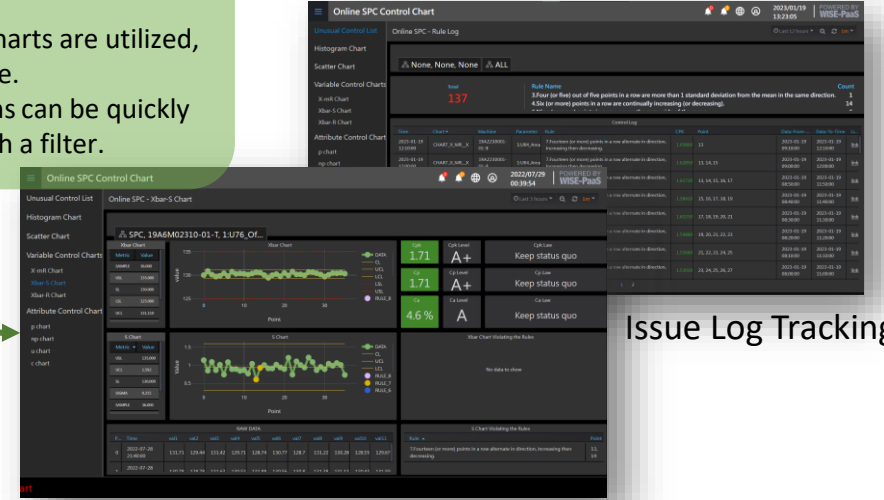
Real-time machine monitoring

Collecting key production parameters related to product quality and performing real-time calculations.



Dashboard

SPC attribute/variable control charts are utilized, and Cpk is calculated in real-time. Key and important rule violations can be quickly extracted and processed through a filter.

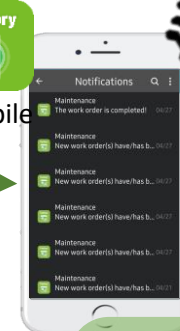


Standard Control Chart

1. Real Time Data Collect

2. Ready to use Dashboard

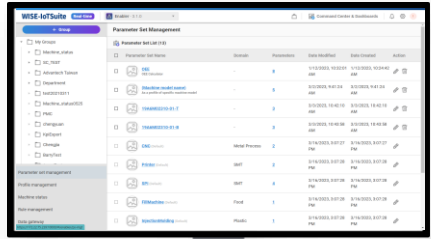
3. Issue problems immediately



Receive notification

Support email, WeChat, Telegram or iMobile Android/iOS apps to receive notifications and keep stakeholders informed.

How SPC Control Chart Helps You



Access critical data sources



By collecting real-time parameters and controlling the process variations, we can avoid continuous impacts on production quality caused by variations.

Monitor variations in real-time

By cross-referencing the frequency and number of occurrences of statistical rules, the root causes of anomalies can be identified.

Identify the root of the problem

Send Immediate Alert

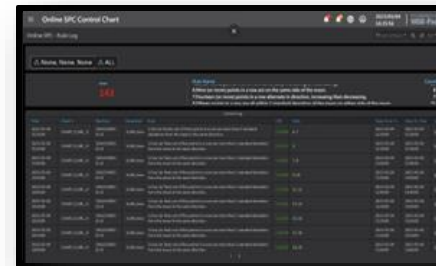
2 types of alerts are available:

- Nelson rule violation
- Cpk abnormality

You can choose to receive alerts with email or mobile phone



Test to confirm correction



Reduce waste

By using statistics and analysis, we can identify problems, solve them, and improve production efficiency, thereby creating value.



SPC Variable Control Chart

We can see that there are line graphs and use the upper and lower limits to find out quality abnormalities and calculate Cpk in real time to assist in judging whether it is necessary to increase/decrease maintenance costs



X-bar line chart helps you check quality distribution

R line chart helps you check quality distribution with another reference source

Real-time calculate Cpk to help QA team making decision of quality policy

Rule log display the possibility of quality issue

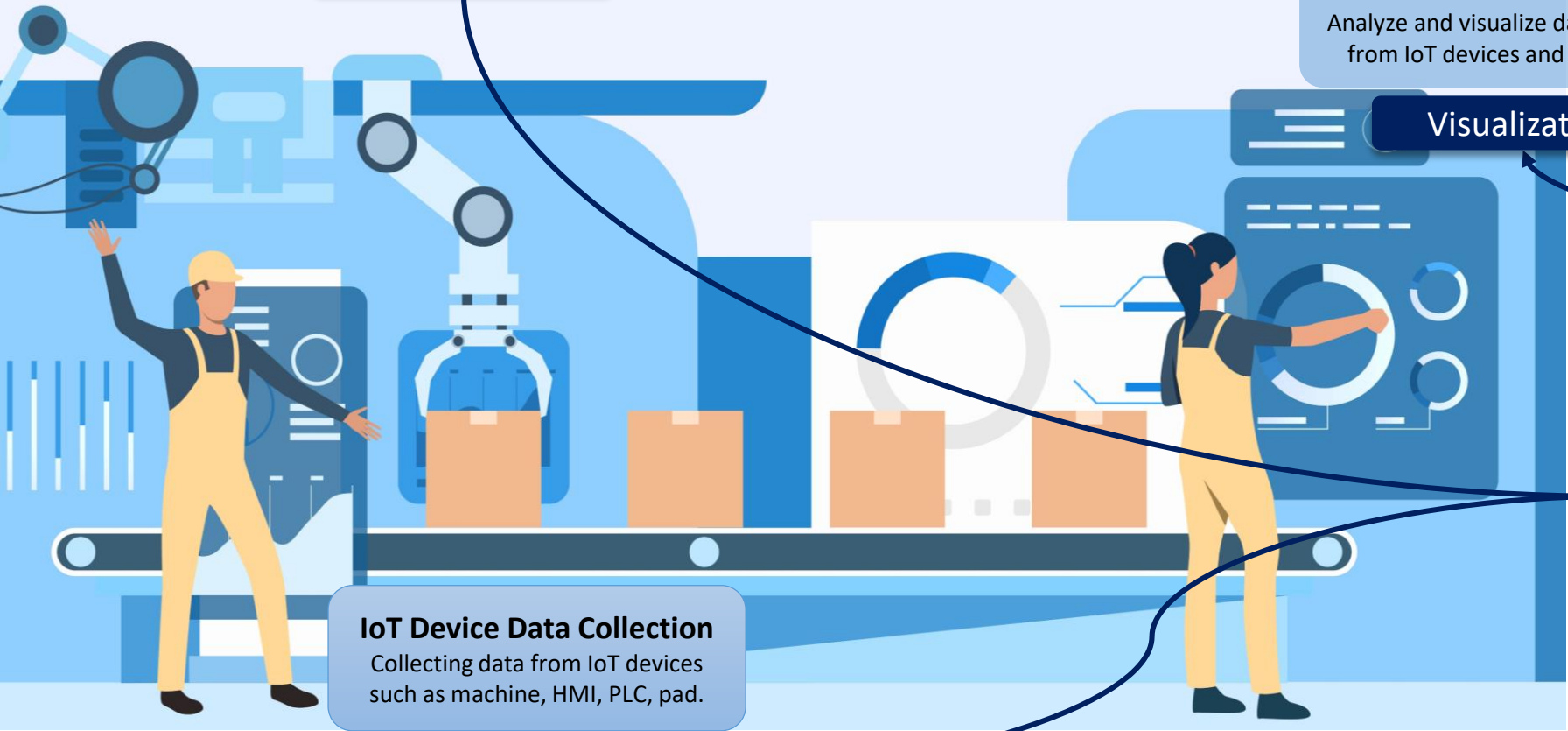
How do I make sense of all the accumulated data and use the data to make good decisions and optimize operations?



Dashboard and Situation Center Scenario



IT System Data Collection
Collect data from various systems such as iApp OEE, Andon of iFactory TPM, your IT system, or even manual files such as Excel.

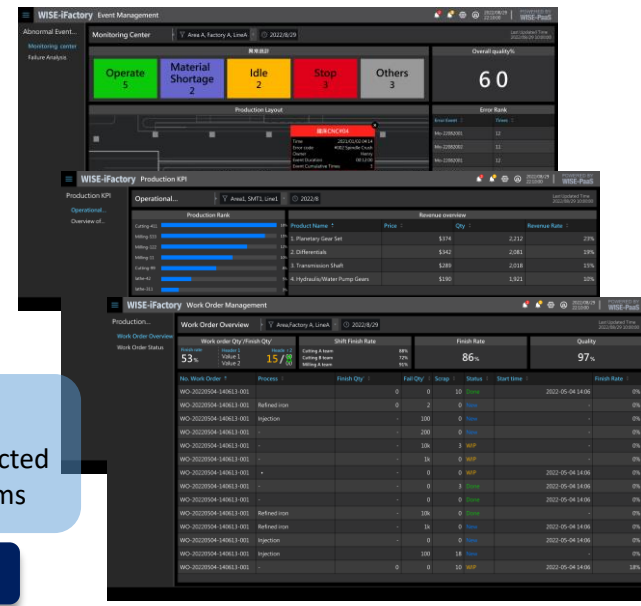


IoT Device Data Collection
Collecting data from IoT devices such as machine, HMI, PLC, pad.

IoT Devices

Dashboard
Analyze and visualize data collected from IoT devices and IT systems

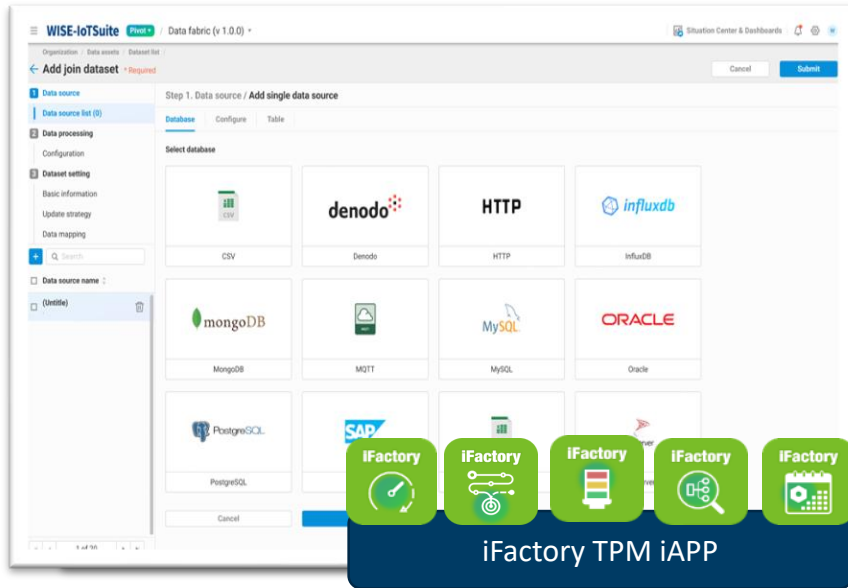
Visualization



KPI engine
Set up the required formulas for the KPIs on the dashboard.

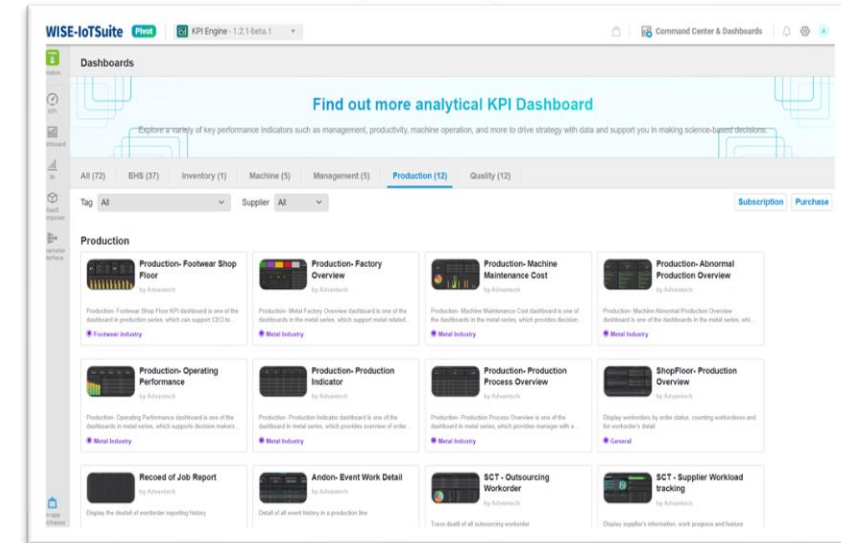
Data Integration
Integrate data from both IT system and OT devices

Process Data Visualization



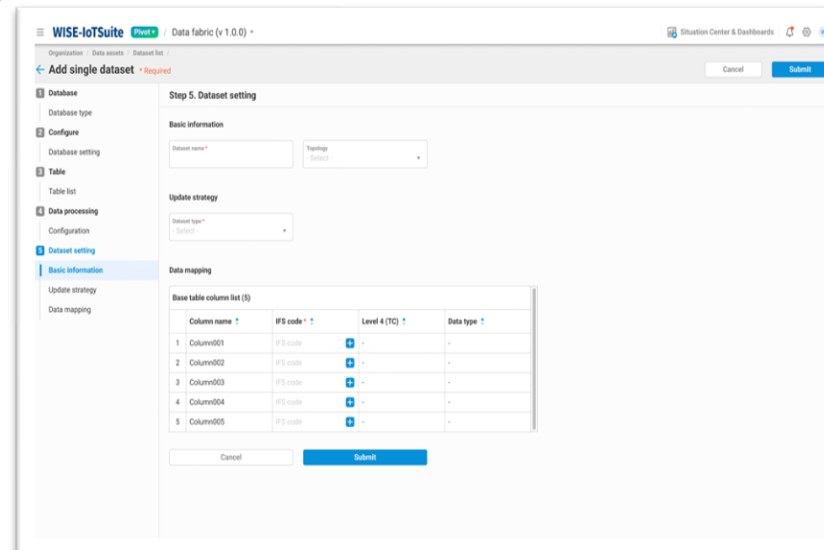
Mapping Data

Align column names from different systems to consolidate data views for metrics reporting.



Input Data

Input data from both IT systems and OT devices. We support many common databases to ingest data.



Present Data

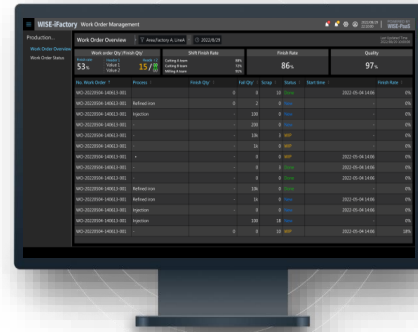
Dashboard templates cover productivity, quality, inventory, machines and management, as well as different management methodologies.

Strengths

The KPI Dashboard and Situation Center are designed to provide a macro view of Production, Inventory, Quality, Machine Details, Management, analyzed and presented visually.

01 Productivity

Provides real-time information on the progress of tasks, helping teams improve communication and increase productivity.



03 Inventory

To track inventory levels, sales trends and stockouts to ensure optimal inventory management and reduce costs.



05 Management

To track inventory levels, sales trends and stockouts to ensure optimal inventory management and reduce costs.

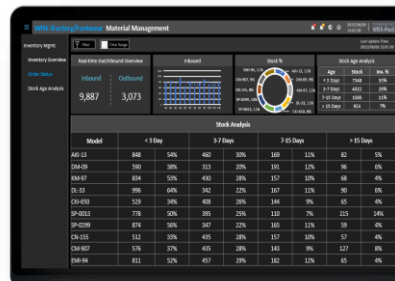
02 Quality

To monitor key performance metrics and identify areas for improvement to ensure consistent quality of products or services.



04 Machine Operation

To monitor machine performance, identify downtime, improve maintenance, and optimize production to reduce costs and increase efficiency.



WISE-iFactory Situation Center



01
Aggregate IoT Data

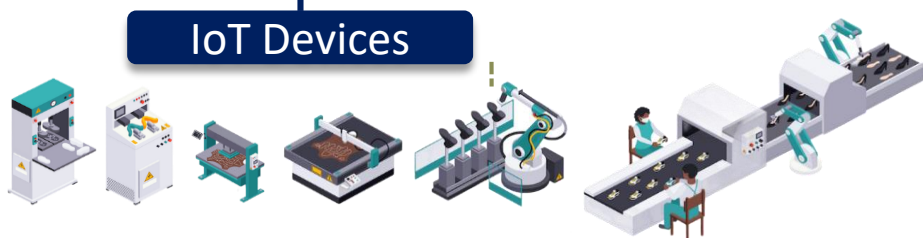
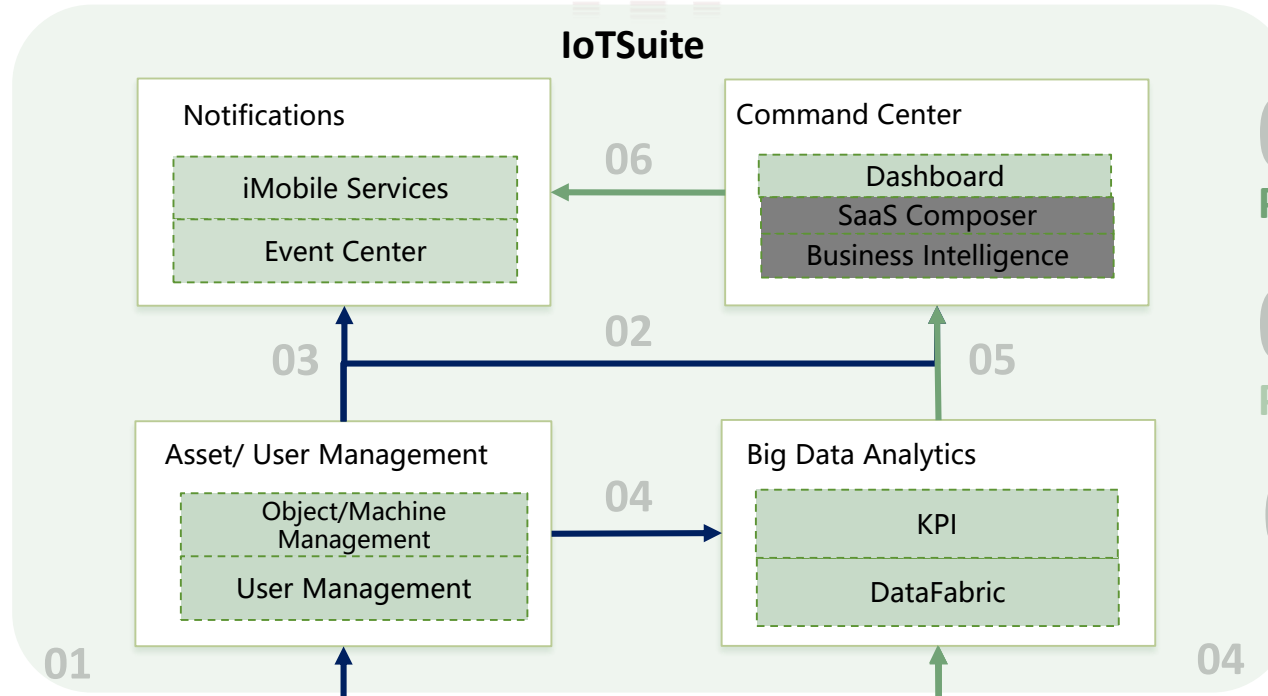
02
Visualize Live Data

03
Event/Alert
Notifications

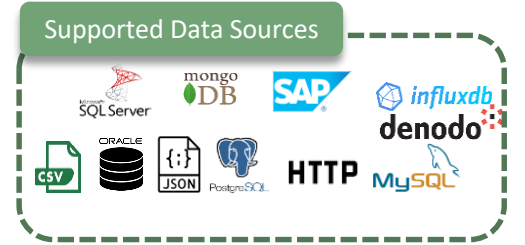
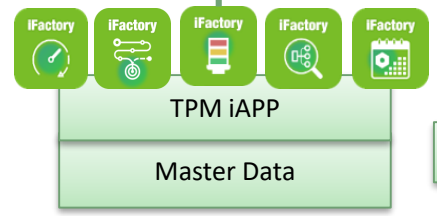
04
Performance Analysis

05
Present KPIs

06
KPI Warnings



IoT Devices



Co-Creating the Future of the IoT World



What are some successful cases using WISE-iFactory/ TPM suite?



Total Productive Maintenance (TPM)

Enhancing Productivity for Asset Intensive Industries

ERP – Enterprise Resource Planning

Executive level – Business Decisions

Order Fulfillment

Forecasting Sales

Inventory Distribution

Procurement Planning

Corporate social responsibility (CSR)

TPM – Total Productive Maintenance

Bridge between floor and execution level
– Plant wide Mfg. Decisions.



OEE

(Overall Equipment Effectiveness)



Andon



Maintenance



eManual



Shop Floor



SPC

(Statistical Process Control)

EHS – Environmental, Health and Safety

Connect Facility & environment risks of operations
– Factory and Facility Managers



MACHINES

I.App: OEE

Monitor Production Status

- Real-time monitor of equipment status
- Availability of Machines
- Productivity & performance
- Quality of Production



PROCESS

I.App: Andon

Reduced Downtime By Alarms

Dispatch And Track Maintenance Work

- Suspend Production Fast Upon Fault
- Alert And Event Trigger Processing
- Connected To Machine Via Gateway
- Create Events With Questions And Parameters



PROCESS

I.App: ShopFloor

Monitor: Set, Reached & Exceeded Goals

- Workforce information to Supervisors
- Efficient Work Order Management
- Transparent Work Order Status
- Analyze Production Performance
- Centralize operation information



MACHINES

I.App: Maintenance

Monitor Maintenance requirement

- Reduce downtime
- Pre-planned Maintenance action
- Define actions and notifications
- Dispatch work to key technicians
- Track Maintenance result



PROCESS

I.App: eManual

Reduce Maintenance Time

Provide A Standard Operating Procedure (Instruction)

- Source Savings (Auto Update, No Paper)
- Accelerate Production Efficiency Use Videos, Text, PDFs And Markers
- Accessible By QR/Barcode Directly
- Job Report for Longer time Operation per (longer then 2 min per)



MACHINES

I.App: Statistical process control (SPC)

Monitor: Quality of parameters

- Be able to use SPC as a monitoring tool including Ca, Cp, CPK and different control charts
- Cpk can also be regarded as an indicator to measure the accuracy of the process

Plant Floor - Monitoring in Real-time

Production Line/ Process decisions / Plant & Environment Facility

Machine Operation

- Sensor/ PLC data acquisition
- Machine Pre-processing data

Process Control

- Work & Routing instructions
- Job Report / field operation

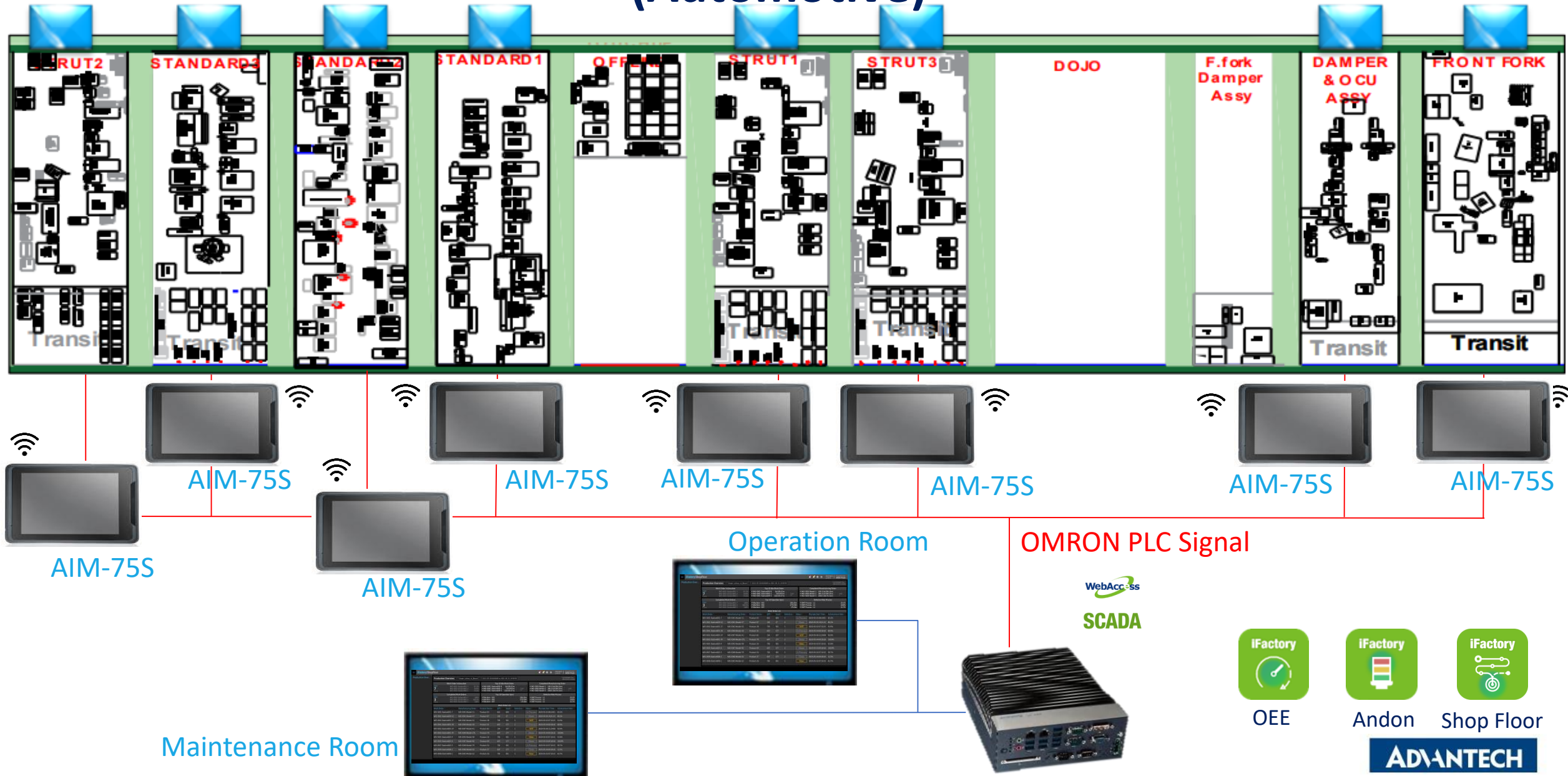
Operator interface

- HMI/ Touch Panel
- Bar code Scanner/ RFID/ NFC

Visual examination

- Camera input
- Sensors/ PLC

Success Story- Digitalizing Legacy Shop Floor for Metal Processing (Automotive)



Successful Story – Total productive maintenance in auto parts making robotics cell

Pain point

Full range of automation but limited to visibility of production.

- Hard to make sure all machines are running 100% and achieve target output on time
- Hard to track and trace production process for customer audits
- Difficult to manage maintenance schedules and to optimize cost

Expectation

- Limit unexpected breakdowns
- Remote monitoring with OEE
- Realtime anomaly notification
- Fulfill supplier chain audit certification



Application

Machine performance monitoring & product process traceability :

- Each Machine OEE display on dashboard.
- Integrate with MES work order fulfill status.
- SPC support real time quality report.

Preventive maintenance strategy:

- Conduct maintenance service ticket decided by machine real time condition like running hours...etc.

Alert center: notice abnormality to tight person at right time.

- Abnormal notification & log analysis
- Instant alarm message via instant messaging/email/...



Success Stories – Enable data aggregation & reduce management lag with legacy production equipment

Pain point

Limitations on data platform to integrate MES/ERP & IIOT data in a situation center.

- Hard to integrate from different data base(IT) and IoT data (OT) without a lot of coding
- Hard to aggregate data from varied industrial protocol via a single gateway
- Hard to quick deploy the diversified KPI dashboard to cross over departments

Expectation

Simplify data collection engineering

Build a data lake in a unified space

Deploy KPI dashboard in a short time

Solve the data silo issue

Application

Improve production efficiency and equipment utilization.

- Improve the performance of OEE by 20%
- Shorten delivery time by at least 14 days

Enhance data visibility through dashboard.

- Reduce time costs of daily shop floor reports by 80%
- Plug and play diversified ready functional dashboard

Data aggregation platform

- Integrate IT and OT data source with no code tool, saving engineering efforts on hard coding environment
- Collect OT layer data with 200+ PLC supports drivers on the full range of IOT devices



Success Stories – Production transparency for efficient operations in FnB Industry



Application
Network
Data collection
Equipment
processing



IFS-51A.Suite

Situation Room



WISE-PaaS/EdgeLink



Energy Management

Behavior Analysis



WISE-iFactory TPM Starter Packages to Jumpstart Transformation



Digital Transformation: Improving Step By Step



Toolset

1. Secure better tools to **streamline work processes and improve productivity**

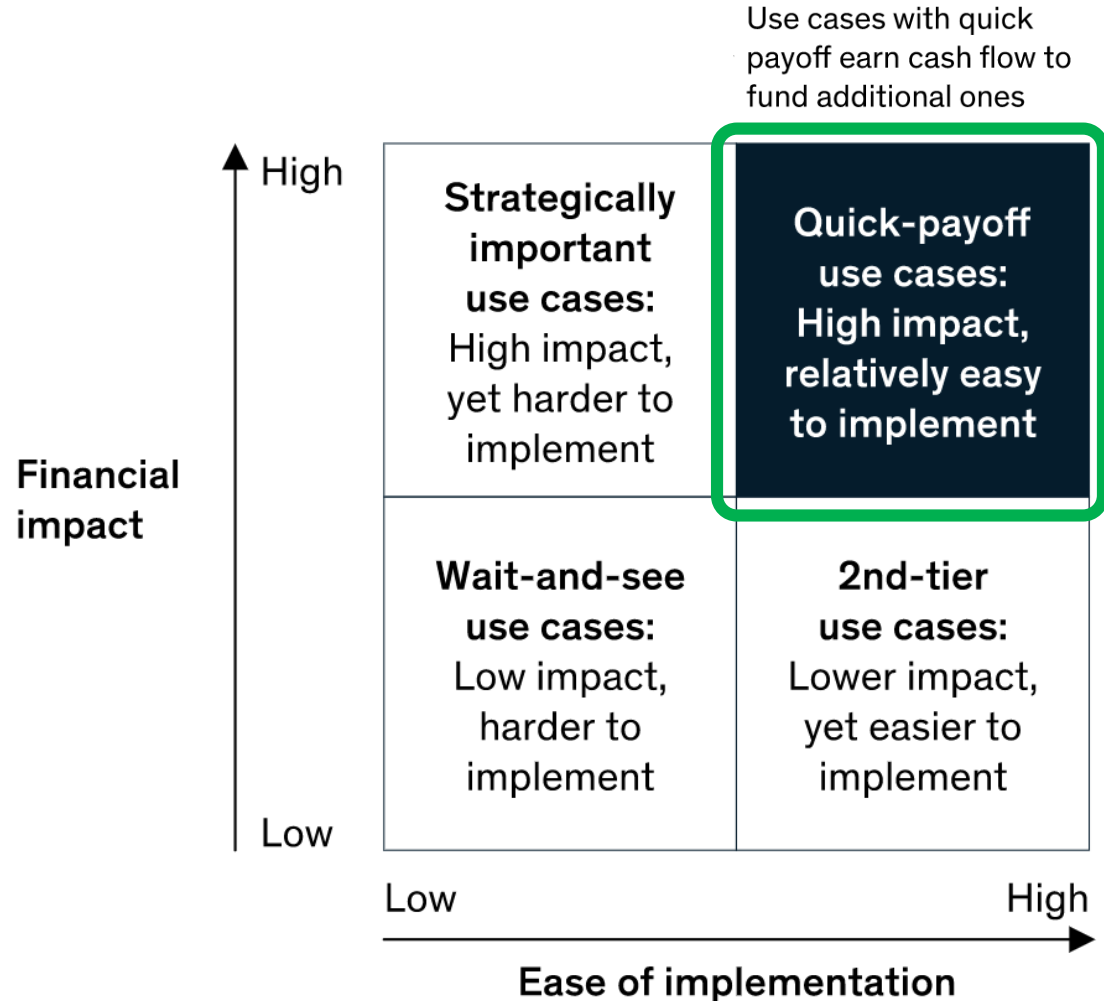
Skillset

2. Upskill employees to **leverage and maximize benefits** of new tools

Mindset

3. Formulate new work models from accumulate experience and **transcend to new levels of productivity**

Getting Started on Your Digital Transformation Journey



- Start small and build confidence and experience
- Complement existing systems instead of replacing what's already working
- Enable correct, accurate data for your central management systems such as MES, ERP
- Support production & plant management with live data

Kick-Start with TPM Starter Packages

Quick Response



- Monitor production equipment & process anomalies
- Real-time equipment efficiency tracking with OEE I.App
- Easy event reporting for resolving production issues using Andon I.App

Real-Time Progress



- Real-time production reporting from employees with IoT interfaces
- Automated progress updates from machine data & sensors
- Consolidate timely work order progress by Shop Floor I.App

Machine Inspector



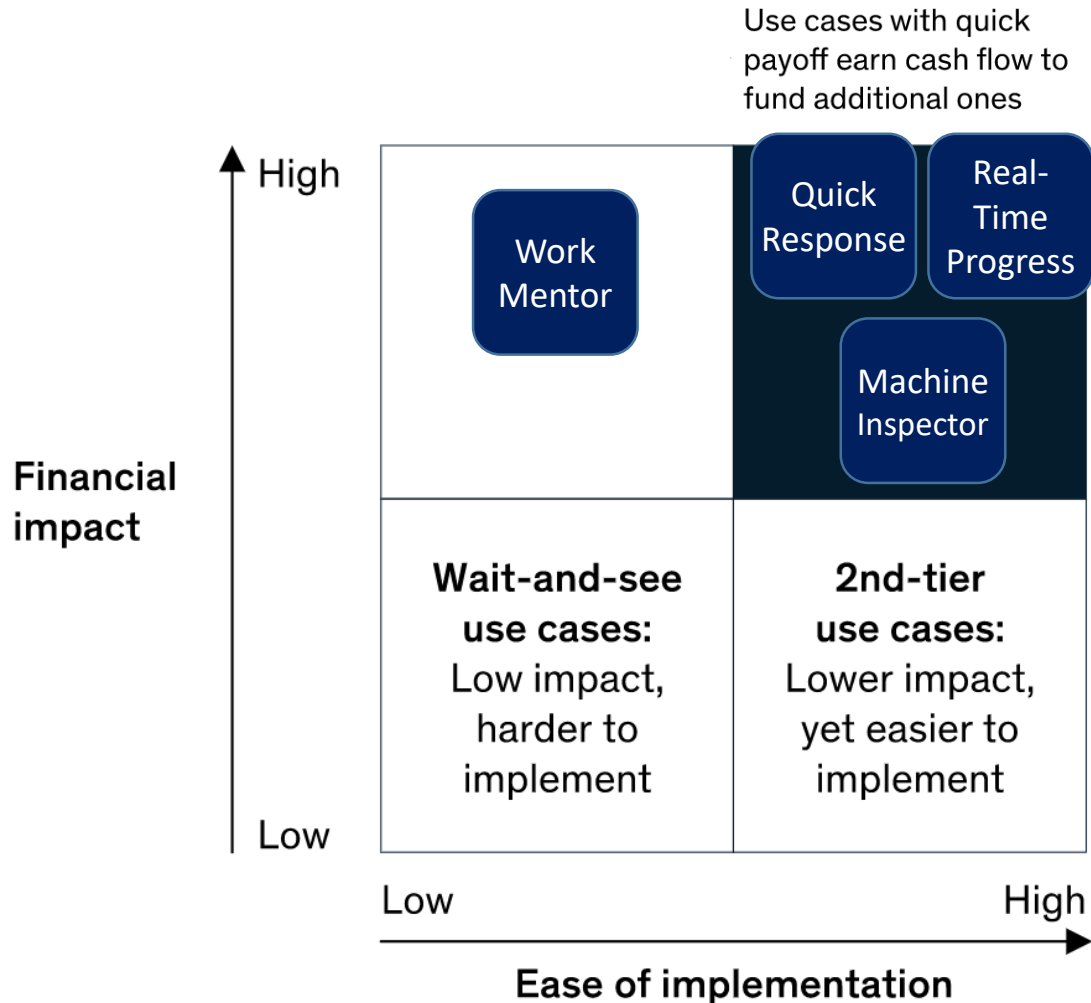
- Setup routine maintenance schedules to reduce unplanned downtime
- Quickly respond to need for repair and return to normal production
- Mobile app to support field operations by Maintenance I.App

Work Mentor



- Digital Instruction guidance for operators and technicians
- Step-by-step instructions with confirmation via IoT and sensors for complex assembly production
- Skill-up and support your employees with eManual I.App for better quality and productivity

Getting Started on Your Digital Transformation Journey



Source: McKinsey

- **Prioritize use case by financial impact & ease of implementation**
 - Identify key scenarios for transformation
 - Build capability and working model
 - Bring & deploy required technology
 - Quantify results & achievements
- **Build confidence and experience with continued successful cases, gradually transforming different parts of the company**

Quick Response Starter Package



Data collection

Data transfer

Cloud Computing and Application

SRP-IFS420-E15OEE

Multi-Protocol Support



OEE Operator

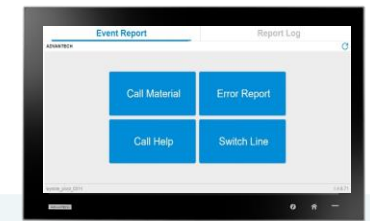
MQTT



Create Service Order
(API/ticket)



Andon



OEE Metrics

- Availability
- Performance
- Quality

OEE & Andon Features



Machine Events & Notices



Real-Time Dashboard



Service Ticket Records & Process Tracking

Value Added Benefits



Data Visualization



Responsive Maintenance

Real-Time Progress Starter Package





Increase Transparency



Reduce Report Waiting Time



Dynamic Planning



Optimize Productivity

Solution Highlight

Real-time Progress is a solution for production tracking, scheduling and production status reporting

Dashboard Visualization

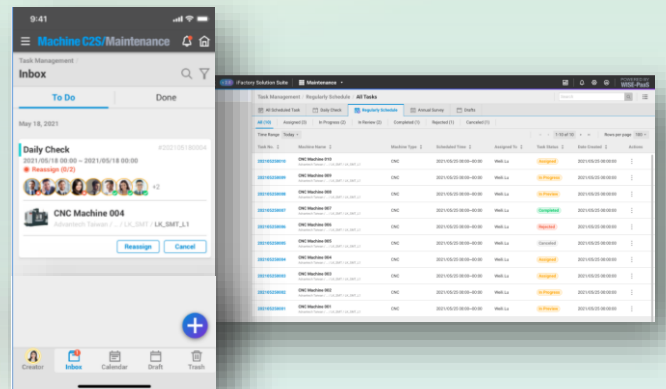
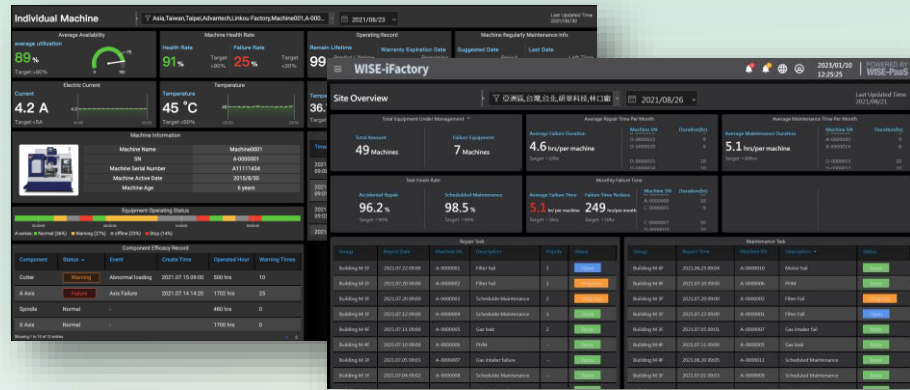
Live updates as work is progressing, providing timely updates to find bottlenecks in production and optimize cycle times, production schedules

Effective Production Management

To develop and maintain an effective management system, information about production line functions must go from the lowest level of the organization to the decision-making top.

Machine Inspector Starter Package

Industry Machinery Metal Processing Aerospace Bicycle Automobile /EV Parts Hand Tools Fastener



Dashboard Monitoring

Web/Mobile Service



CNC



IMM (Injection Molding Machine)



PLC-based machine



Work Mentor Starter Package



Correct
Documentation



Reduce Process
Errors



Quicker
Changeover



Improve
Productivity

Solution Highlight

Digital work instruction guidance for manufacturing employees to reduce chance for human error in era of rapidly changing production requirements

Empowering employees in a time of high mix production

Shorten training and time to familiarity for new employees, and supportive guidance for veteran teams for production with complex work steps, high mix of product variations

Interactive Guidance

Step by step guidance with both text and multimedia, including barcode input for material usage records, as well as AI for confirming critical action steps for compliance requirements

Work Mentor



ADVANTECH

What kind of options are available to purchase iFactory TPM?



Make It Yours – Brand Labeling & Hosting

For Partners & Customers

- Private labeling option available, brand it with your company logo
- Re-sell as your own brand, with or without additional content
- Hosting can be in a self-owned data center, customer's data center or server, or even a public cloud of choice



Hosting Options



A. Public Cloud Hosting

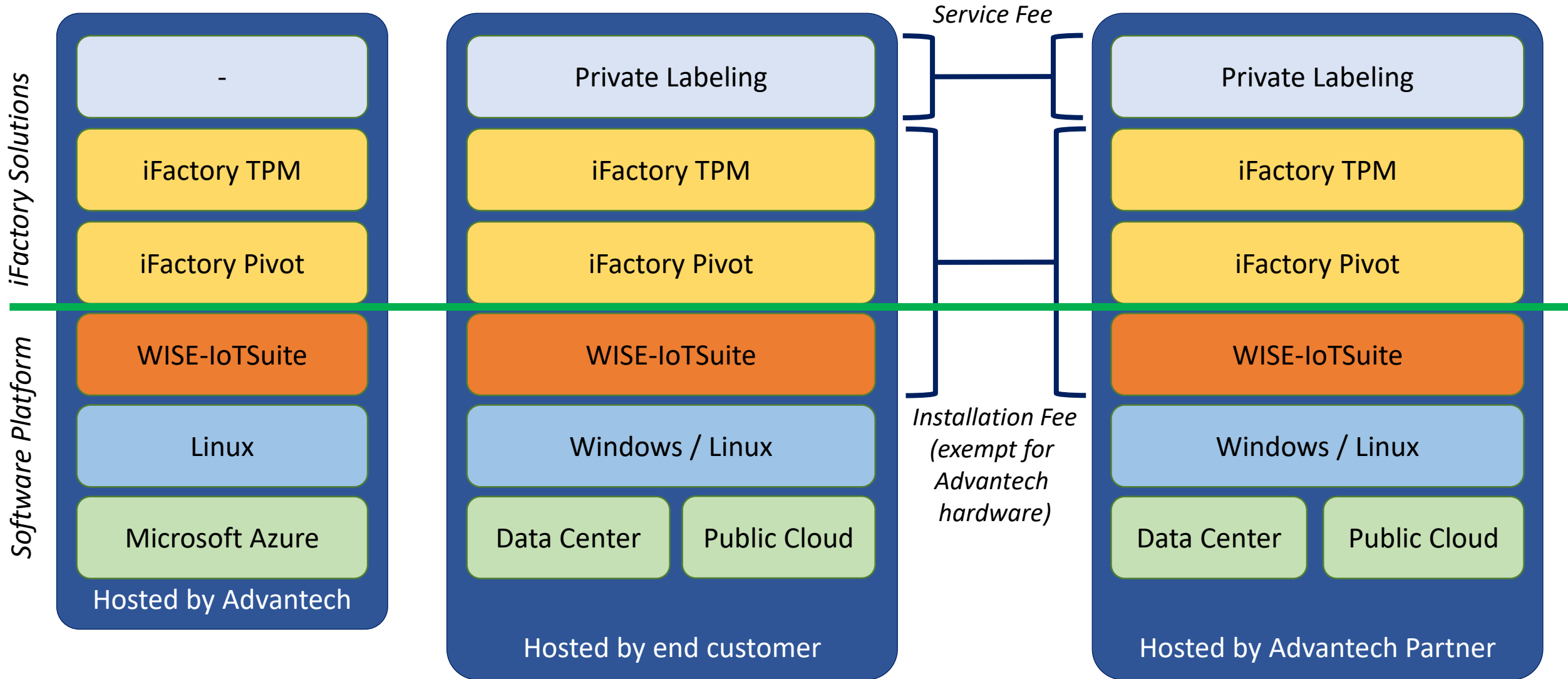
1. Hosted by Advantech on Microsoft Azure
2. Hosted by Advantech Channel Partner on public cloud



B. Private Cloud Hosting

1. Hosted on servers provided by the end customer
2. Hosted by Advantech Channel Partner on private datacenter

Value Stack



Offering – On-Premise

Item	RLP (USD)	
WISE-iFactory TPM Software Licenses (OEE, Andon, Maintenance, Shop Floor, eManual, SPC) <i>1 license is needed per machine/app</i>	1 license	378
	10 licenses	3,600
	100 licenses	23,400
WISE-IoT On-Premise Server <i>Includes Pivot IoT Core Services</i>	Server Standard (Linux)	21,750
	Server Lite (Linux)	10,000

* Pivot licenses are included with server hardware purchases

** Prices included 1-year warranty for software, warranty for 2nd year onwards may be purchased separately

*** If you would like to host on your own hardware, additional charges apply for deployment

**** If you would like to brand the system with your own logo, private labeling services are available with a service charge

Offering – Public Cloud

Item	RLP (USD)	
WISE-iFactory TPM Software Licenses (OEE, Andon, Maintenance, Shop Floor, eManual, SPC) <i>1 license is needed per machine/app</i> <i>Includes Pivot IoT Core Services</i>	1 license	216
	10 licenses	1,765
	100 licenses	10,660

* Hosted on Microsoft Azure, with data centers located in Asia, Europe, America

** Prices are for one-year subscriptions

*** If you would like to host on your own cloud space, additional charges apply for deployment

**** If you would like to brand the system with your own logo, private labeling services are available with a service charge (only available for hosting on your own cloud space)