

Intelligent Factory

Reshaping Manufacturing Business Operations with Industrial IoT



iFactory assists EMS
factory in smart energy
management

P.16



Machine networking
platform improves hand tool
factory production efficiency

P.18



Leveraging expertise
to overcome roadblocks
to Industry 4.0

P.20

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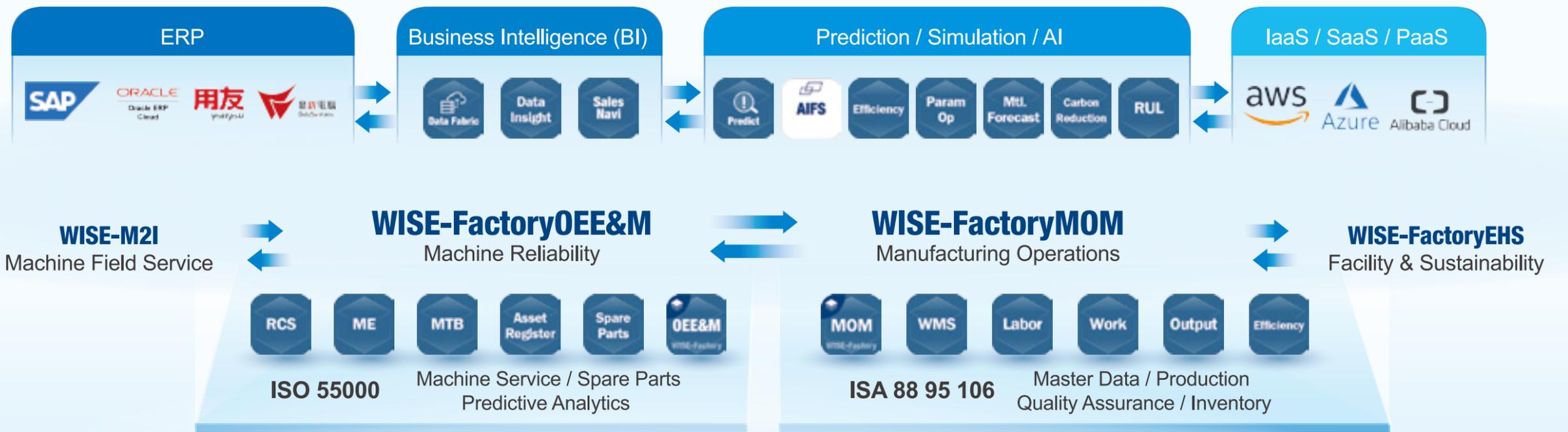
Advantech Industrial Intelligence (All) iFactory Solution Architecture

Level 4
Business Planning
Twin Space

Level 3
Manufacturing Operations
Pivot

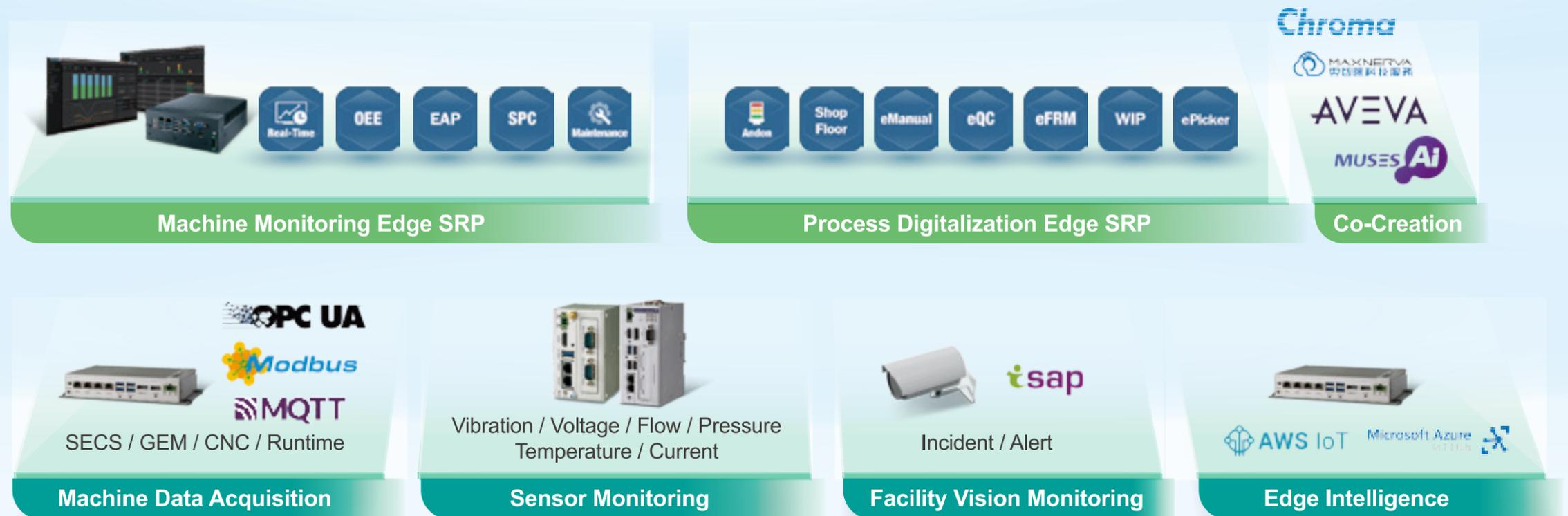
Level 2
Control Systems
Real-time

Level 1
Intelligent Devices



WISE-IoTSuite

Windows Server, vmware, kubernetes, /IOTCONNECT



Industrial Challenges and Smart Manufacturing Trends in Industry 4.0

Photos provided by Advantech
Interview with Willie Lin, Director of WISE-All (Advantech Industrial Intelligence)

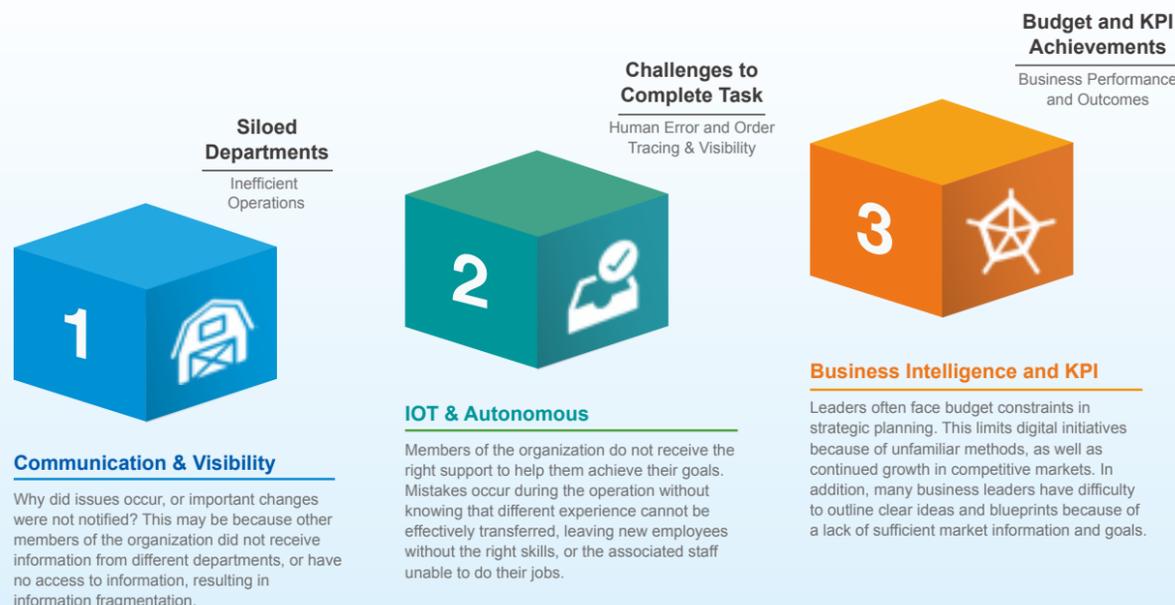
Over the past decade, three major driving forces have accelerated advancements in smart manufacturing. First, despite Industry 4.0 initially emerging in Germany, many countries have since been developing their own industrial digital transformation to ensure national competitiveness by offering subsidies to companies adopting digital transformation solutions. Second, intelligentization has been able to alleviate pressure from labor shortages, workforce aging, and rising labor costs in manufacturing.

Third, manufacturing industries that depend on maritime transportation had their supply chains severely impacted by the trade war in 2018 and the COVID-19 pandemic in 2020, which has amplified their need to accelerate digital transformation.



The Pain Points of Manufacturing Industry

➔ Digital Transformation



Rethinking and reshaping business operations in manufacturing

Willie Lin, Director of WISE-All (Advantech Industrial Intelligence), pointed out that manufacturing in the past focused on lean and just-in-time production processes, emphasizing cost reduction, waste elimination, and increased efficiency of the entire organization through customer demand-driven processes. Nowadays, digital technology provides fundamental benefits that deliver commercial value through the immediacy and accuracy of information, driving rapid responses and decision-making. Many manufacturers who have progressed through Industry 2.0 (automation) and Industry 3.0 (informatization) are now preparing to move toward Industry 4.0 (Intelligentization).

Thus, their needs have moved gradually from a single point of automation, towards more comprehensive smart applications. Mr. Lin explained that single-point operation problems are caused by IoT fragmentation resulting from information silos. In a competitive landscape, the major pain points manufacturing faces include supply chain preparation, dynamic budget planning, and business KPI progress. To counter these challenges, manufacturing needs to reshape its business thinking. What opportunities and new directions will their transformation uncover? What systematic approaches will shorten their learning curve, reduce the cost of failure, and create a return on their investment in digital transformation?

Advantech proposes strategies for three transformation trends

With deep knowledge on the three major

“Manufacturing CIOs must deploy and leverage technologies to overcome new challenges, remain competitive, and build businesses that can grow and transform faster by implementing innovative technologies.”
- Willie Lin, Director of WISE-All (Advantech Industrial Intelligence)

trends driving future industrial developments in smart manufacturing, Advantech launched the iEMS product planning solution for applications such as FEMS/EHS/air compressor monitoring. iEMS empowers manufacturers in promoting smart manufacturing with a focus on developing products and services that support customers wanting to implement sustainable business models.

• Trend 1: Equipment as a service

Industry 4.0 offers new production modes through IIoT, IoT platforms, cloud computing, and edge computing. In addition to optimizing production capacity and return on investment, it also provides new value-added services for equipment providers. Catering to the equipment-as-a-service trend, Advantech’s WISE-Factory kit can help factories establish smart manufacturing

and equipment monitoring through IoT data acquisition and recording.

Trend 2: Energy sustainability forecasting

With the goal of net-zero carbon emissions, manufacturing industries began accelerating the promotion of low-carbon transformation. This saw industrial operations require increased investment in green processes and equipment for energy conservation, energy storage, and environmental system integration. To help achieve net-zero carbon emissions, Advantech's WISE-FactoryEHS provides energy KPI, energy management, and AI prediction models and apps to assist companies with accelerating the implementation of environmental, safety, health, and sustainability systems.

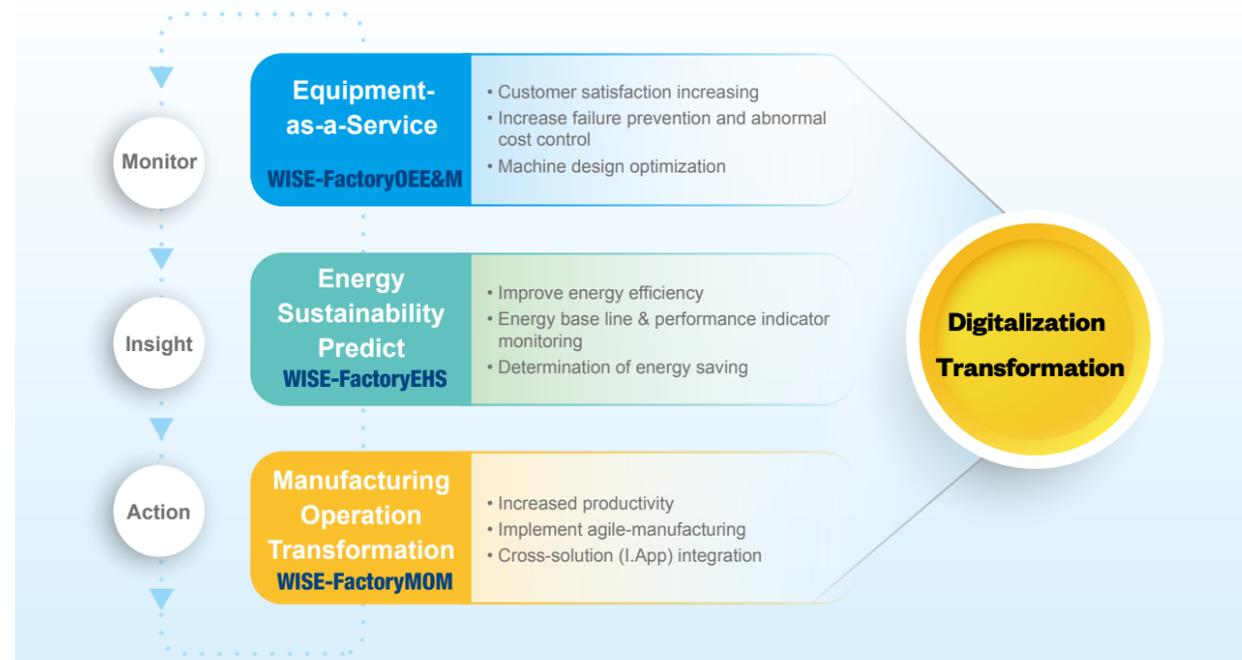
Trend 3: Data monetization in manufacturing operations

Data is a critical component in successfully

transforming manufacturing operations. A value chain's efficiency can be optimized through data analysis and application, and significant momentum can be generated through new data-driven business models. To this end, Advantech's WISE-Factory solution combines the WISE-PaaS platform with a data center architecture that aggregates internal and external data sources to transform and upgrade discrete manufacturing processes through data analysis and hierarchical management.

With technology constantly evolving, the acceleration toward smart manufacturing is inevitable. Along this path, Advantech WISE-Factory will continue to be a key player and driver of smart manufacturing through close collaboration with manufacturers moving toward Industry 4.0. ■

Cross-domain Digital Development to Drive Transformation and Upgrades



Achieve Better OEE and Asset Management Efficiency with Advantech Smart Equipment Optimizer



ADVANTECH

Enabling an Intelligent Planet

Focus on New Factory Asset Tasks

- Smart real-time monitoring of production efficiency
- Quick deployment and integration on a low-coding development platform
- Easily access factory asset management anytime anywhere via iMobile services
- Improve decision making with intuitive data visualizations and custom dashboards



Request a Demo



OEE I.App

Overall equipment effectiveness solution



Equipment Maintenance I.App

Reduce unplanned downtime and equipment failures



iMobile Services I.App

Access equipment status and progress across all mobile devices



IFS-RTM-M770W4(5) OEE

iFactory RTM package with OEE 20(50) license, MIC-770 V2



IFS-RTM-770W4(5) MNT

iFactory RTM package with Maintenance 20(50) license, MIC-770 V2

iFactory OEE-Overall Equipment Effectiveness Solution

Overview

iFactory OEE (Overall Equipment Efficiency) solution provides real-time status of equipment and presents the most important information such as product quality and ratios through data acquisition and dashboard presentation to fully optimize productivity.

Application Scenario

TA1: For manufactures

Avoiding outages and minimizing downtime and interruptions to production is critical for implementing OEE projects in factories. iFactory OEE solution can be fast deployed with little set-up time, configured with other iFactory solutions, and integrated with 3rd party software and databases. The configuration template provides intuitive management dashboards and allows future upgrades and maintenance with new functionalities.

TA2: For system integrators

Shortening development time and reducing project costs in deploying OEE applications is a win-win. With industry-standard interfaces, easy configuration tools, and expandable software platforms, iFactory OEE solution enables customizable KPI dashboards and incremental updates. With rapid project implementation, more IT resources can be invested to provide further value-added services for business transformation.

Benefits



Solution Suite

iFactory OEE solution comprises one MIC-770 V2 application service server, OEE I.App, OEE dashboard software, and licenses for managing 10/100 machines depending on choice of Standard or Professional kit.

Software

OEE I.App, OEE dashboard

Hardware

IFS-RTM-M770W50EE: edge computing terminal with Intel® 10th Gen Xeon®/Core™ i5/i7 CPU socket-type (LGA1200) with Intel® W480E/H420E chipset, 16/32 GB DDR4, SSD 128GB & HDD 512GB/1T, and Windows 10 IoT Enterprise (64-bit) OS

Others Suite

1. iFactory OEE – Data Center Suite: IFS-RTM-SKY72WX0EE: OEE I.App with high performance hardware configuration.
2. iFactory Statistical Process Control (SPC) Suite: IFS-RTM-M770W5SPC: SPC I.App production quality management compatible with iFactory runtime.
3. iFactory Maintenance Suite: IFS-RTM-M770W5MNT: Maintenance I.App asset management compatible with iFactory runtime.

Customer Testimonials

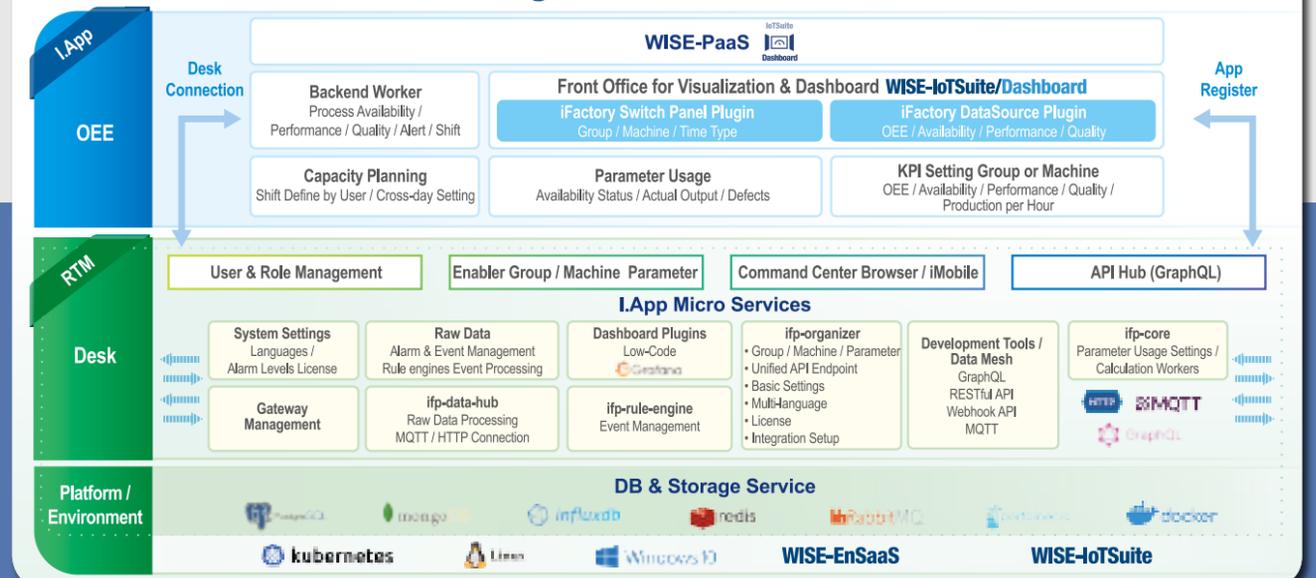


More accurately grasp the real-time status of your production line and improve data reliability. Significantly reduced the personnel to process production information time by 70%.



- James Wei, Manager, Re-Dai Precision Tools Co., Ltd.

iFactory OEE Architecture



iFactory FEMS- Factory Energy Management Solution

Overview

Based on real-time data obtained from smart meters, iFactory FEMS allows energy-intensive manufacturing owners to monitor energy consumption information, accurately evaluate energy costs, and optimize energy efficiency, thereby aiding business intelligence strategies for energy management.

Application Scenario

TA1: For factory managers

iFactory FEMS integrates hardware and software within industrial applications where typically a 7-10% energy saving can be achieved in facilities, compared to where iFactory FEMS is not used. Based on real-time data obtained from smart meters, iFactory FEMS allows users to monitor energy consumption information, accurately evaluate energy costs, and optimize energy efficiency, thereby aiding business intelligence strategies for energy management.

TA2: For information technology engineers

iFactory FEMS provides a no-code backend configurable platform. By simply clicking the corresponding buttons, the organizational structure can be quickly generated to get a clear overview of operations. This accelerates energy management strategies and saves on excessive wasteful energy charges.

Benefits

- Accelerate ISO 50001 compliance
- Reduce hidden energy waste
- Instantly eliminate abnormal usages
- Improves energy management efficiency

Solution Suite

iFactory FEMS solution comprises one MIC-770 V2 application service server with real-time monitoring functions, FEMS I.App, and 20 ~ 50 licenses for managing meters.

For small scale:

Software

iFactory FEMS I.App: Real-time monitoring with FEMS 20 Licenses.

Hardware

MIC-770W-20A1: terminal with Intel® Core™ i5 processor, 16 GB DDR4, SSD 128 GB & HDD 512 GB, and Windows 10

For medium scale:

Software

iFactory FEMS I.App: Real-time monitoring with FEMS 50 Licenses.

Hardware

MIC-770W-20A1: terminal with Intel® Core™ i7 processor, 32 GB DDR4, SSD 128 GB& HDD 1T, and Windows 10



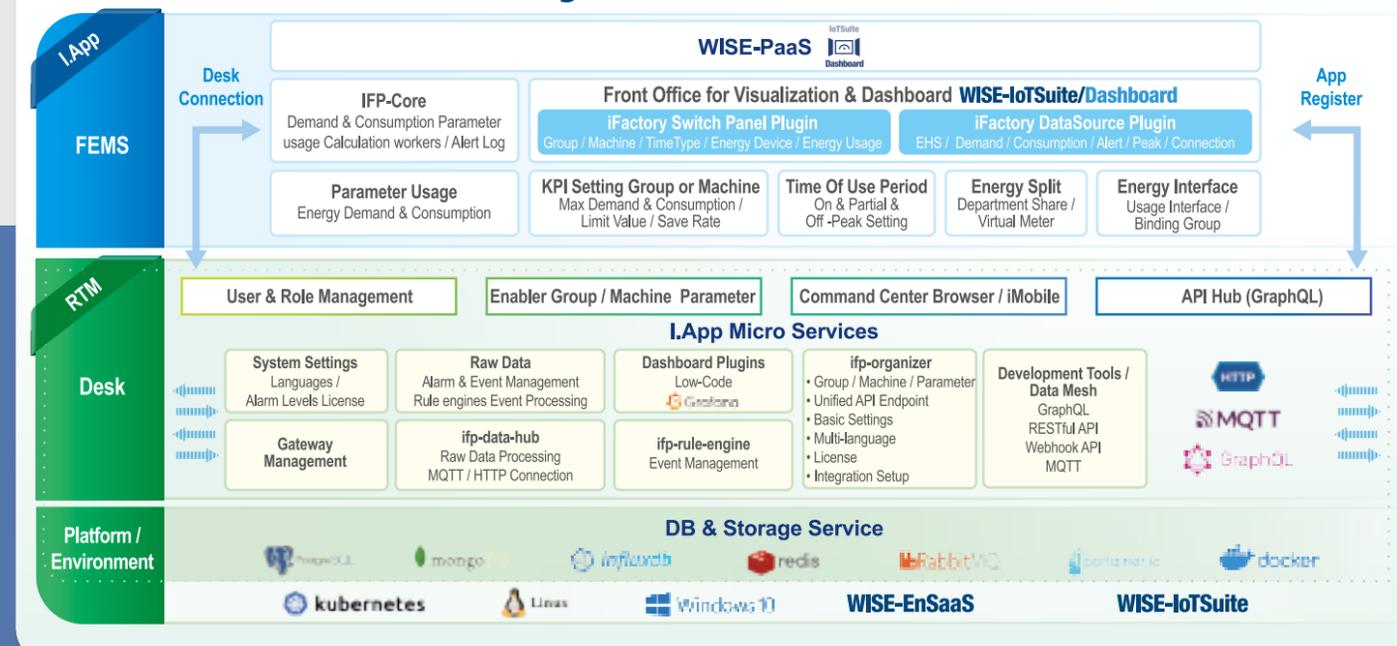
Solutions Page

Customer Testimonials

"We now fully understand the power consumption of our factory. We get an overview of all energy consumption, which enables us to analyze energy usage trends more efficiency."

- Zhang Xiaobo, Supervisor of the Information Technology Center of Taichia Glass Fiber Co., Ltd.

iFactory FEMS Architecture



iFactory Shop Floor Solution

Overview

iFactory Shop Floor solution is a management system tailored by Advantech for factory production sites. The main goal is to help factories improve production efficiency and reduce turnaround time by data acquisition, real-time data monitoring, and capability process indexes analysis.

Application Scenario

TA1: For production management professionals

Provides production management professionals with a powerful tool to manage any needs from the production site, such as the distribution of work orders, progress follow-ups, and production planning optimization. Moreover, dispatched workers use online communications and paperless management to reduce information lag.

TA2: For operators

Provides on-site job reporting and production record tracking. Assists on-site operators to have a clear view of production progress to achieve their goals.

TA3: For managers

Summarize and analyze raw data collected from the production line, generate process capability indexes, and provide visualized dashboards to support decision-making.



Metal Process



Electronic Assembly



Footwear

Benefits



Solution Suite

iFactory Shop Floor solution comprises one MIC-770 V2 application service server with real-time and Shop Floor I.App for managing stations or accounts via tablets/Panel PCs.

Software

iFactory Shop Floor I.App: Real-time monitoring with ShopFloor iApp

Hardware

MIC-770W-20A1: terminal with Intel® Core™ i7 processor, 32 GB DDR4, SSD 128 GB& HDD 1T, and Windows 10

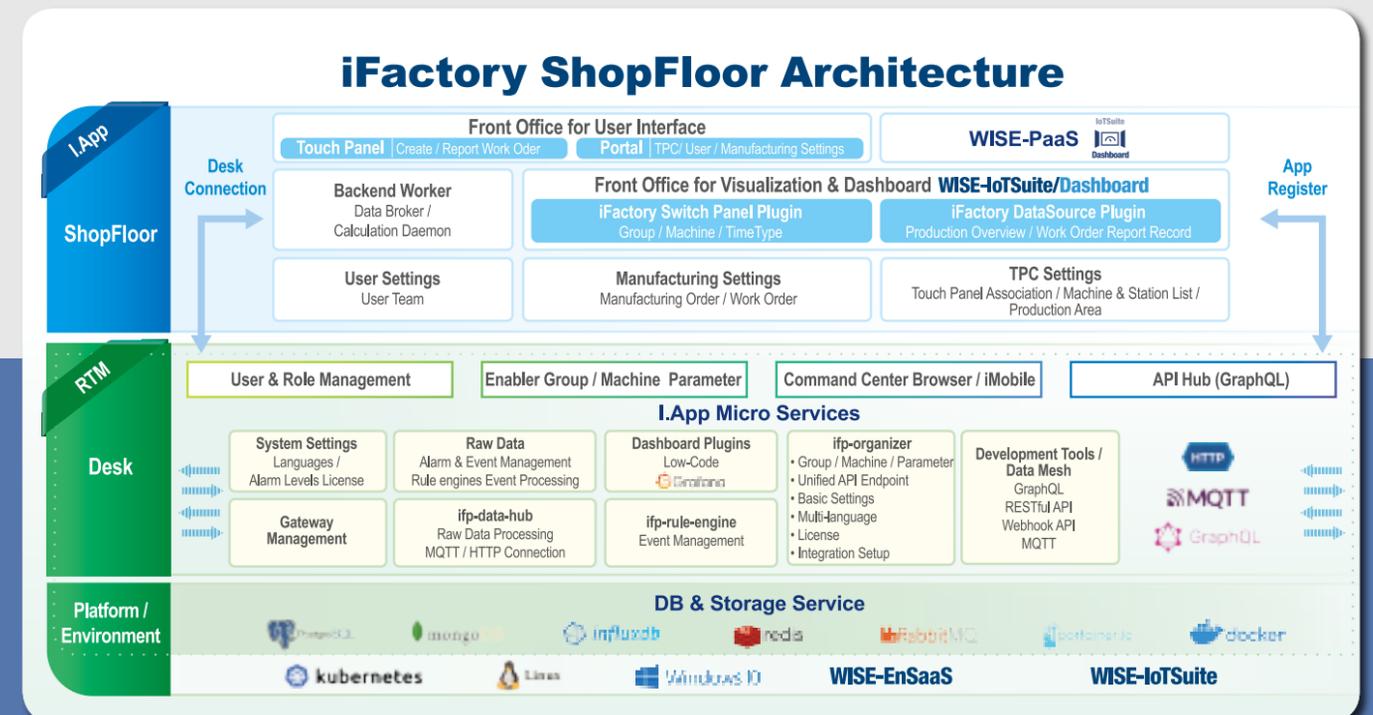
Customer Testimonials



Information of production such as production output, efficiency, production loss, and inventory can be recorded directly from the shop floor and used for analyzing and prediction to speed up production for better management.



- A well-known Taiwanese footwear manufacturer.



iFactory Assists EMS Factory in Smart Energy Management

Photos provided by Shutterstock

According to World Energy Outlook 2021, energy consumption by the industrial sector accounts for 40% of total global energy consumption and this is dominated by fossil fuels, resulting in high carbon emissions of 8.7 billion tons, which is second only to the levels generated by the power sector.

To reduce industrial energy consumption and achieve carbon emission reduction goals, major economic blocks such as the EU, as well as organizations including the UN, have set out agreements and norms aimed at reducing emissions. For example, the European Commission announced its Fit for 55 plan in 2021, with the expectation that the EU will reduce its net greenhouse gas emissions by at least 55% (relative to 1990 levels) by 2030.

To achieve these carbon reduction goals, manufacturing plants worldwide have adopted smart technologies and solutions to improve their energy management. For example, a well-known Taiwanese electronics manufacturing service (EMS) foundry has adopted Advantech's iFactory Energy Sustainability Management Solution in its factory in Mexico to accelerate regulation compliance.

Modular I.Apps provide flexible features

Despite most factories having sufficient resources and capabilities to develop effective energy management systems, the time it takes to do so still incurs a considerable expense. Therefore, most businesses are

constantly looking for solutions that can be implemented quickly at lower cost.

Advantech's IFS-51A-EGW1 iFactory Energy Sustainability Management Suite is a complete solution that integrates software, hardware, and various systems. Using data acquired by IPCs at the edge, the suite utilizes modular I.Apps that allow companies of all sizes to flexibly select which features they want to implement based on their needs, which is why this particular EMS factory sought to implement Advantech's solution.

To date, the factory has integrated and implemented three I.Apps. These allow factory personnel to monitor energy consumption in line with their management system and accurately assess their energy costs while optimizing energy efficiency. Ultimately, it helps them realize a sound business intelligence strategy in energy management. First, the EMS I.App monitors energy consumption, optimizes energy usage, reduces energy waste, and minimizes costs. Second, the Energy KPI I.App, which complies with ISO 50006 for setting energy efficiency management key indicators, provides an

Case Study Benefits

- Enables factory energy management without a large capital investment while also reducing energy waste costs by 8% to 13%.
- 24/7 monitoring of factory energy usage helps operators respond quickly to abnormalities.
- 7-day energy consumption forecasting helps avoid exceeding the contracted energy capacity.

Advantech's Solutions and Application Benefits

iFactory's IFS-51A is a complete solution that integrates software, hardware, and various systems. It can swiftly acquire information from facilities, obtain real-time data from smart meters, and help comprehensively master analytical data and smart factory energy management through data visualization and dashboard management.



effective method for optimizing energy processes, and this can be leveraged in making critical judgments in production processes in order to understand possible causes of waste and make timely improvements. Third, the Predict I.App combines statistical models and can also expand on or add AI for performing energy demand analysis, thereby helping businesses work out their energy baselines and use them as a strategic basis for energy management.

Meeting the all-round needs of enterprises with multiple suites

In addition to the IFS-51A-EGW1, Advantech's iFactory also has the IFS EGM Starter Suite and IFS-51C Data Center Suite, which provide enterprises with even more options and allows factories to determine their own most suitable energy management solution. This means that factories are more able to quickly respond to international environmental norms while also reducing their energy costs, thus helping them achieve carbon emission reductions and meet social responsibility goals at the same time. ■

Machine Networking Platform Improves Hand Tool Factory Production Efficiency

Photos provided by IMPELEX
Interview with James Wei, Manager of Re-Dai Precision Tools



Modern factories derive insights from data to make better decisions in manufacturing. However, a lack of data, transparency, and insights are the largest barriers to achieving data-driven smart manufacturing. To overcome this problem, machine-to-machine (M2M) connectivity is essential. Without this, data collection needs to be performed manually by physically accessing each system's interface to record data, which is both time-consuming and creates opportunities for human error and data discrepancies.

Being aware of that the latest trends and technologies in data-driven smart manufacturing is key to remaining competitive, reducing costs, improving efficiency, and optimizing production. As such, a world-renowned hand tools manufacturer, RE-DAI PRECISION TOOLS, commissioned IMPELEX DATA TRANSFER to build an application that combines M2M connectivity and their own MES for its two factories in Taichung and Chiayi, Taiwan. Their goal was to acquire the precise data they needed to map KPI targets, integrate data on the hours worked by personnel, machine operation, incoming material management, production engineering parameters, SOPs, and quality inspections in order to realize smart manufacturing.

Data collection: the cornerstone of smart manufacturing

Specializing in IoT and smart manufacturing solutions, IMPELEX partnered with Advantech to propose a total solution comprising a self-developed MES as well as

Advantech's IFS-RTM-UNO1372A real-time monitoring data gateway, ESRP-CNC-UNO1372 CNC machining tools data gateway, and IFS-51A-AG01 servers with a built-in data visualization management platform. At the first stage of the project, IMPELEX implemented real-time production feedback and data visualization in a situation room in order to realize the integrated management of human resources, machine utilization, and SOPs, while considering the possibility for future expansion.

Two IFS-RTM-UNO1372A gateways and one ESRP-CNC-UNO1372 gateway were installed on the production line to collect various data, such as stack light status as well as counter and production engineering parameters (e.g., load,



M2M connectivity can more accurately indicate the real-time status and production efficiency of a machine, while improving the reliability of data related to production times. The time required each day for personnel to process production information has also been significantly reduced by 70%.



*- James Wei, Managers,
Re-Dai Precision
Tools Co., Ltd.*

Case Study Benefits

1. Reduced data collection time by 70%.
2. Improved production management efficiency and equipment utilization.

System Advantages

1. Intuitive situation room dashboards
2. A comprehensive view of the real-time situation
3. Overall analysis and visualization of the production data
4. Connection to various CNC machines
5. Supports MQTT protocol

speed, temperature). This data was then sent in MQTT format via a network switch to IMPELEX's MES and WIP production management system, as well as the IFS-51A-AG01 servers in the situation room.

Integrating data collection, aggregation, visualization, and analysis, the IFS-51A-AG01 was the core of this project. Both the IFS-RTM-UNO1372A and ESRP-CNC-UNO1372 feature protocol-conversion software that supports several communication protocols used by both newer and legacy machines. Moreover, the ESRP-CNC-UNO1372's pre-installed software, Runtime, allows for the connection to various CNC machines from different manufacturers, including FANUC, Siemens, Mitsubishi, HEIDENHAIN and Brother, making it easy for RE-DAI to collect data from their Mitsubishi CNC machines.

Improve production management efficiency

The intuitive situation room dashboards and overall analysis and visualization of the production data gave management a comprehensive view of the real-time situation of the entire factory, including real-time alarms, production capacity, utilization rates, downtimes, production progress, and more. It also reduced data collection time by 70%. Thus, the total solution significantly improved production management efficiency and equipment utilization.

The modular design of Advantech's cloud-based solution also accommodated a phased implementation of the project, with easy integration and flexible expansion options. IMPELEX has now completed the first phase of implementation and is planning to adopt other applications to assist with such tasks as migrating system data to the cloud. Energy management targets required by the factory can also be implemented gradually within the existing structure, thereby helping the customer realize smart manufacturing and real-time management in progressive stages. ■



Leveraging Expertise to Overcome Roadblocks to Industry 4.0

Photos provided by Shutterstock
Interview with Beng Kee Tan, Managing Director of Signal Transmission

Many industry experts and research reports have suggested that Industry 4.0 can provide manufacturers with not only right digitalization tools, but also business insight analysis to help them fight and overcome the post-COVID recovery and subsequent crises caused by new spikes in the pandemic. However, an August 2020 survey by the SME Association of Malaysia revealed that only 26% of local SMEs prefer digital transformation as their strategy for surviving the pandemic.

“Over 90% of businesses in Malaysia are SMEs, and because they do not understand the various technologies used in Industry 4.0 solutions, they need a considerable amount of education on the topic,” said Mr. Beng Kee Tan, Managing Director of Signal Transmission. With lockdown restrictions and related uncertainties, Signal Transmission’s customers are holding back on new projects due to a lack of confidence in future returns. However, imposed lockdowns present the perfect time to prepare proposals and promote awareness of Industry 4.0.

Realizing Industry 4.0 with iFactory Solutions

To help businesses in Malaysia understand the

concept of Industry 4.0, a government-owned industrial research and technology organization sought out suitable solutions from Advantech for two CNC machines. The organization has always been known for supporting the country’s industrial ecosystem through research and development and new technology innovations. Therefore, regardless of the concerns and difficulties of application assessment and deployment during the lockdown, the project does was allowed to go ahead.

Advantech and Signal Transmission have joined forces and proposed an Advantech iFactory OEE solution that combines an SRP-IFS250 on-premises OEE server, EK12528 unmanaged ethernet switches, machine monitoring solution, edge gateway solution, and some monitoring sensors for vibration and environment. To cover the entire installation site, three wireless telecommunication technologies were adopted:



Having Advantech’s reputable brand behind every project is the best warranty for customers.



*- Beng Kee Tan,
Managing Director of
Signal Transmission.*

Advantech’s Solutions and Application Benefits

The OEE solution can remotely monitor and collect data in real time, offering an immersive Industry 4.0 experience for businesses seeking consultancy on smart manufacturing solutions.



WiFi, LoRaWAN® and LPWAN. Mr. Tan commented, “The success of this project lay in Advantech’s proven full range of hardware and software solutions that work really well together.” After deploying the OEE solution, the organization was able to remotely monitor and collect data in real time, offering an immersive Industry 4.0 experience for businesses seeking consultancy on smart manufacturing solutions. Due to the promising results, the organization is now planning to implement Advantech’s WISE-PaaS Cloud Platform so that management dashboards can be viewed from any browser-enabled device.

Dedication to continuous development helps local partners grow their market share

Although manufacturers in Malaysia are still at the stage of connecting islands of information for overall monitoring and data acquisition, Mr. Tan believes that going forward, advanced technologies such AI, big data, and visual recognition will gradually be adopted in Malaysia’s manufacturing sector. Also, Advantech is dedicated to the development of new solutions that utilize the latest technologies and they encourage knowledge sharing with all their partners, which will help Signal Transmission raise awareness of Industry 4.0 solutions for their customers.

Mr. Tan pointed out that Advantech is a renowned brand in Malaysia. “Having Advantech’s reputable brand behind every project is the best warranty for customers. We can leverage Advantech’s advanced technology to provide custom solutions to our customers, in areas such as Industry 4.0, cloud services, remote monitoring, and conventional WebAccess/SCADA solutions.” Looking to the future, Signal Transmission and Advantech will grow steadily in the Malaysian market and expanding their market share together. ■

Smart Energy and Time Management with Advantech Energy Management Kick-Starter Package



Making Energy Management Easier for Smart Manufacturing

- Simplifies compliance with ISO 50001 international certification standards
- Energy optimization and abnormal waste reduction
- Vertical integration with comprehensive IT to OT product solutions
- Intuitive data visualizations with custom dashboards
- Easy deployment and no-coding back-end configuration



FEMS I.App

Factory energy management system



RTM I.App

Real-time monitoring and management applications



iMobile Services I.App

Access energy status and progress across all mobile devices



IFS-RTM-M770W4FEMS

iFactory RTM package with FEMS 20 license, MIC-770 V2



IFS-RTM-M770W5FEMS

iFactory RTM package with FEMS 50 license, MIC-770 V2

HITI Partners with Advantech to Accelerate IoT Deployment in Factories

Photos provided by HITI Industrial Automation
Interview with Hsu Kuo Yu, General Manager of HITI, and Lu Wei Ren, Vice President of HITI

In recent years, many manufacturers have implemented smart production management in response to growing labor shortages resulting from increasingly aged populations and other factors. Market competitiveness and productivity are also expected to increase due to transparency requirements, enhanced production controls, and increased automation in manufacturing. Other key factors influencing industry include the need to collect production data in real time and the ability to optimize production planning and scheduling. To cater to industry trends, HITI Industrial Automation has collaborated with Advantech to provide all-in-one solutions that assist enterprises in the chemical, shoe, and fastener supply industries with implementing smart manufacturing.

Joining Advantech's WebAccess+ IoT solution alliance

Established in 2001, HITI started out as a supply agent for industrial control equipment, later transforming into a systems integrator. With 21 years of experience in automated controls and systems integration, HITI has gained considerable domain knowledge and technical expertise across many industries.

Hsu Kuo Yu, General Manager at HITI, pointed out that from bottom to top, a smart

factory includes operational technology (OT), communication technology (CT), information technology (IT), and data technology (DT). To ensure a solid foundation for implementing smart manufacturing, companies first need to establish a comprehensive OT system. This provides the stability that allows digitalization, visualization, cloud migration, and smart development to be implemented. Leveraging its extensive industry experience, HITI offers OT- and CT-based industrial control automation solutions that facilitate the realization of smart manufacturing.

In 2016, HITI joined Advantech's WebAccess+ IoT Solution Alliance and moved closer toward OT and IT integration. According to Mr. Hsu, after gaining an in-depth understanding of the benefits of Advantech's iFactory solutions, HITI collaborated with Advantech to assist manufacturers transitioning toward Industry 4.0.



“
HITI and Advantech complement each other and represent the perfect partnership for OT and IT integration.
 ”

- Hsu Kuo Yu, General Manager at HITI

Two companies' collaboration represents seamless integration of OT and IT

Mr. Hsu stated that HITI is combining its 21 years of practical OT experience with Advantech's strengths in industrial hardware and software solutions, IoT application development, and IoT cloud platforms. The two companies complement each other very well and represent the ideal partnership for integrating OT and IT.

Over the past five years, HITI in collaboration with Advantech has cultivated talented teams with IT and DT capabilities. By developing technology for OT and IT integration, HITI were able to successfully shift from an industrial solutions agent into a competitive systems integrator in the field of smart manufacturing.

Mr. Hsu believes that over the next five years, as well as working toward becoming a leading expert in smart manufacturing, HITI will continue to cooperate with Advantech in an effort to replicate their success across Southeast Asia. Additionally, HITI is looking forward to launching its industrial apps (I.App) on Advantech's WISE-Marketplace in order to give more factories the tools to accelerate the implementation of IoT applications and Industry 4.0. ■

Manufacturing industry accelerates towards industry 4.0

Lu Wei Ren, Vice President at HITI, explained that HITI has integrated Advantech's intelligent energy management system (EMS) to assist one of the biggest plastic manufacturers in Southern Taiwan with building a smart command center in order to realize real-time electricity monitoring and management.

For the past two years, HITI and Advantech have also achieved great results with IoT deployment in the fastener and shoe manufacturing industries. In the shoe industry, HITI have completed several machine networking projects for various companies, including the Feng Tay Group. This enabled them to develop automated reporting mechanisms and realize smart applications, such as production and energy consumption data collection and analysis.

In the shoe-making machinery industry, HITI has helped companies like Hung Chi Technology with implementing machine and equipment networking in order to transform from a traditional machinery manufacturer into a smart machinery supplier. In the fastener industry, HITI has assisted more than 13 fastener manufacturers in Southern Taiwan with machine networking, resolving transparency issues and optimizing production management to promote smart manufacturing in this sector.



Leveraging Expertise to Overcome Barriers to Industry 4.0

Photos provided BioEnergy
 Interview with Paul Phuah, Managing Director of BioEnergy Projects

For manufacturers, overall equipment effectiveness (OEE) is a key performance indicator for measuring a factory's production efficiency. While many manufacturers are aware that deploying OEE is the first step on their Industry 4.0 journey, it still requires the complex integration of diverse resources, including data collection sensors and analysis technology, to generate business insights. To address the barriers to realizing Industry 4.0, such as a lack of integration and implementation knowledge, BioEnergy Projects and Advantech are collaboratively offering their extensive domain knowledge and technological resources to manufacturers in Malaysia.

Winning Strategies: Customization and Industry Expertise

Founded by a group of engineers in 2006, BioEnergy Projects specializes in providing innovative Industry 4.0 and smart city solutions for smart metering, equipment management, energy efficiency monitoring, and OEE applications. In-house engineering and installation teams enable the company to offer competitive end-to-end services (E2ES) ranging from hardware/software design and development to system integration, implementation, and installation.

Referring to OEE solutions as an example,



Mr. Paul Phuah, Managing Director of BioEnergy Projects, recalled the difficulty most manufacturers face trying to collect accurate equipment and production data. “E2ES allows us to freely develop or customize solutions based on specific project criteria and customer needs,” he stated. “Even though they are all in the manufacturing industry, their factories have different conditions, and the factory managers have different focuses.” The provision of E2ES differentiates BioEnergy Projects from their competitors and enhances their ability to implement Advantech's products.

Realizing Industry 4.0 with iFactory Solutions and Systems Integration

BioEnergy Projects has been an Advantech solution partner since 2014. After witnessing each other's strengths while completing several projects, BioEnergy Projects became one of Advantech's many domain-focused solution



The close relationship with Advantech, continuous communication, and mutual leveraging of expertise has helped BioEnergy Projects quickly secure many projects and penetrate the Industry 4.0 market.



- Paul Phuah, Managing Director at BioEnergy Projects

partners (DFSPs). Mr. Phuah asserted that although they have always focused on semiconductor manufacturing, since becoming an Advantech DFSP, the company has received opportunities from other manufacturing segments.

Recently, the two companies cooperated on an OEE project for a plastic injection molding factory and co-created a custom solution for the factory's legacy machines. BioEnergy Projects began by installing IoT I/O modules to automatically collect machine data and implementing tower lights to indicate machine status. This allows operators to observe the task line-up and input various production data, such as defect counts. Then, data from the I/O modules and panel PCs is transmitted to Advantech's iFactory OEE system and visualized via dashboards, graphs, and text-based reports to provide factory administrators with an understanding of day-to-day operations.

According to the customer's feedback, user-friendly panel PCs played a vital role in

the success of this project. With panel PCs, operators can record production numbers and defect counts immediately after completing a production batch, rather than manually inputting production-related figures at the end of each day. This not only simplifies data collection and saves time, but also prevents data omissions. Overall, the total solution assisted the factory with obtaining meaningful insights regarding equipment utilization, production performance, and product quality.

Mr. Phuah emphasized how Advantech has always shared its extensive technical resources and provided timely support. Since BioEnergy Projects partnered with Advantech as a DFSP, Advantech has introduced them to many new customers from various manufacturing segments. This close relationship, continuous communication, and mutual leveraging of expertise has helped BioEnergy Projects quickly secure many projects and penetrate the Industry 4.0 market.

Accordingly, BioEnergy Projects looks forward to introducing other Advantech solutions, such as the iFactory FEMS (factory energy management system) platform and iFactory RTM (real-time monitoring) gateway, to both its existing and new customers in the future. ■



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Metal industry page



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Reduce unplanned downtime and equipment failures



Co-creation CNC I.App

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IFS-RTM-M770W5A

iFactory RTM package, MIC-770 V2

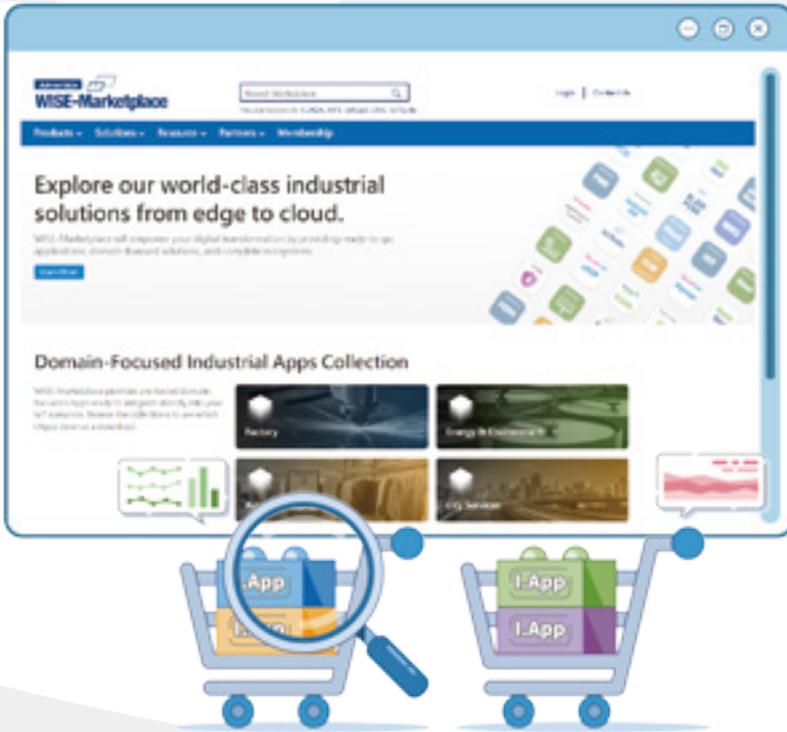


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