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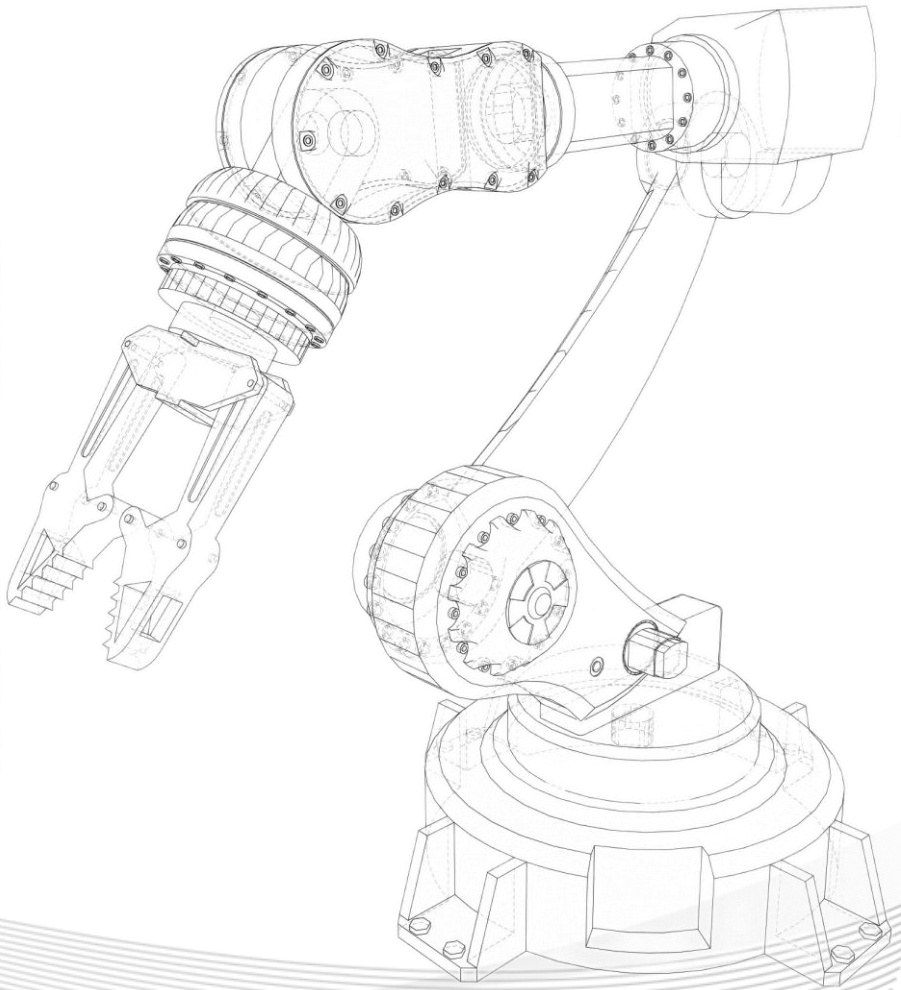
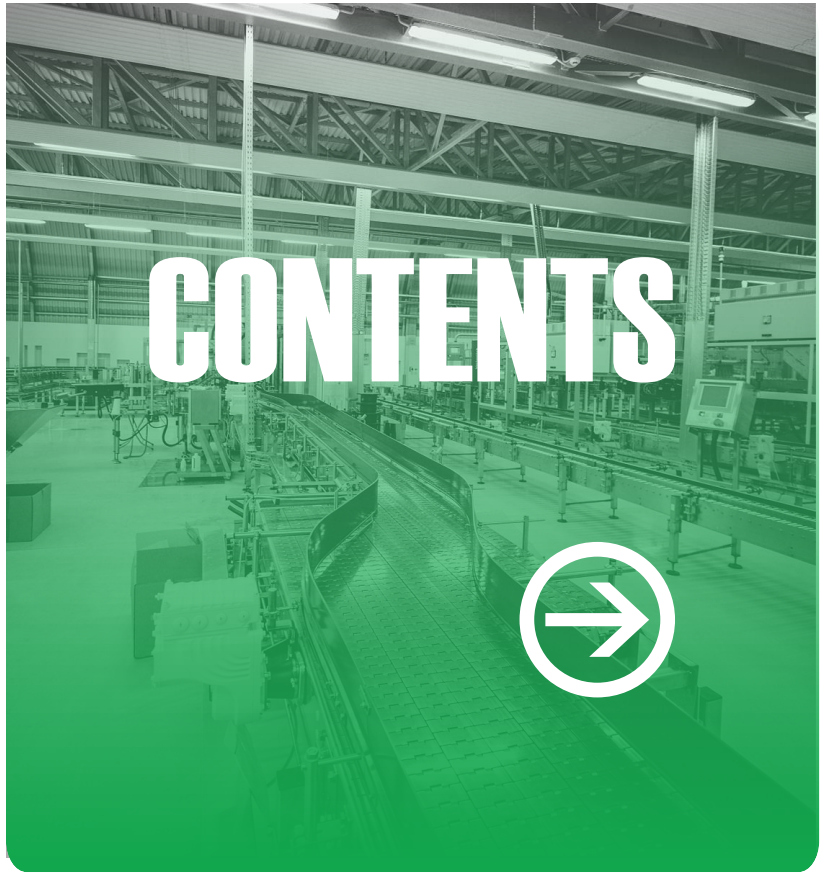
Digital Performance Management (DPM)

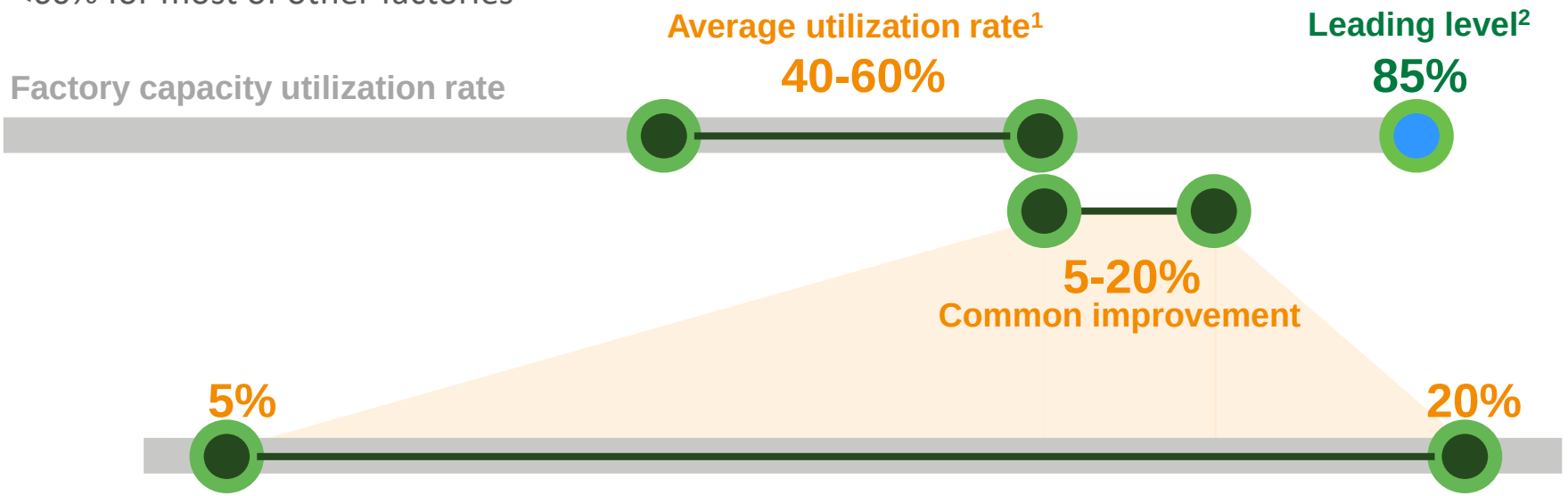




The manufacturing industry has always been trying all kinds of approaches to improve performance continuously.
With the spread of digital technologies, the manufacturing industry has begun to improve equipment efficiency, agility, and revenue for from equipment...

New trends have been pushing the manufacturing industry to increase revenue and efficiency and reduce costs

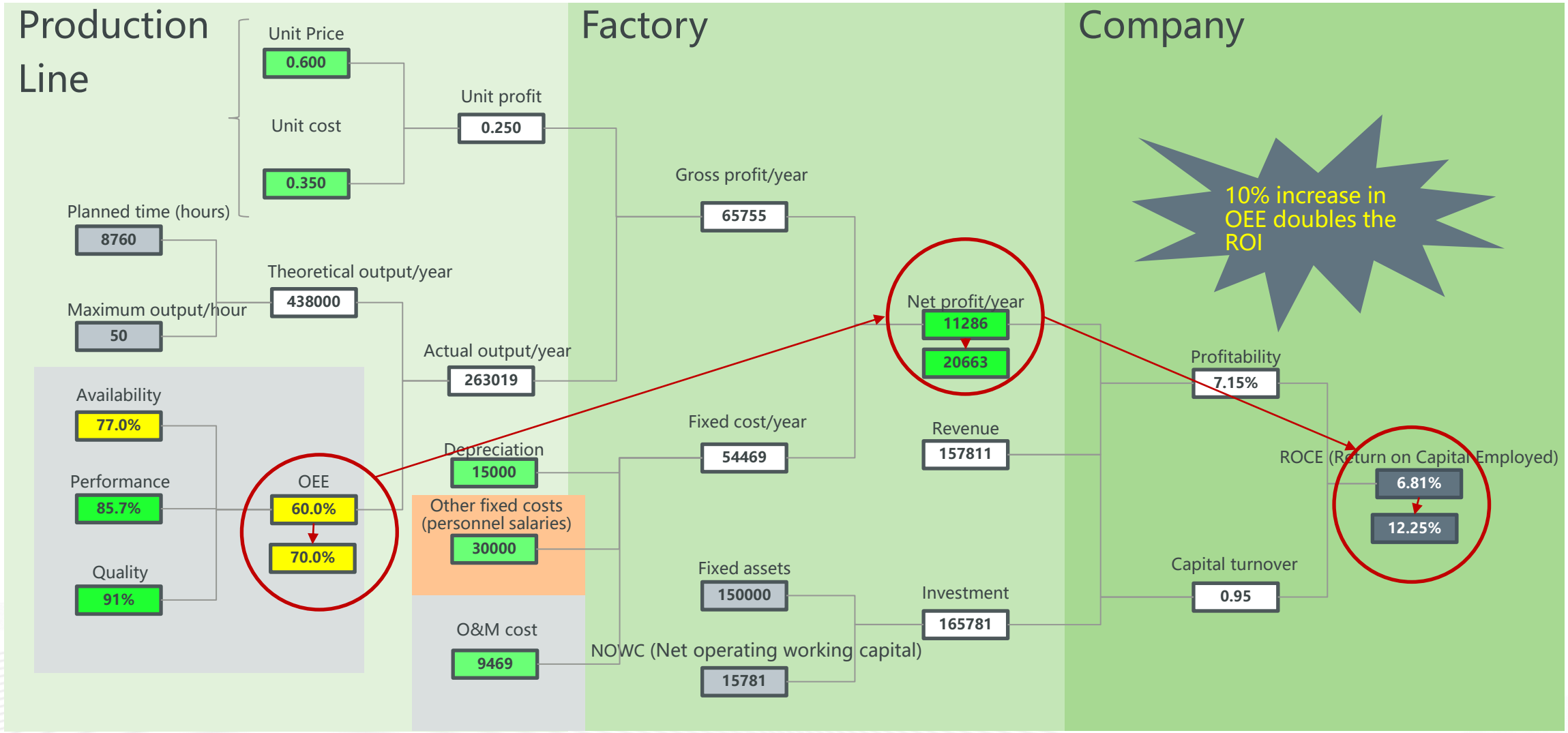
OEE, for example, for integrated equipment efficiency management, can reach >85% for best-in-class factories, while <60% for most of other factories

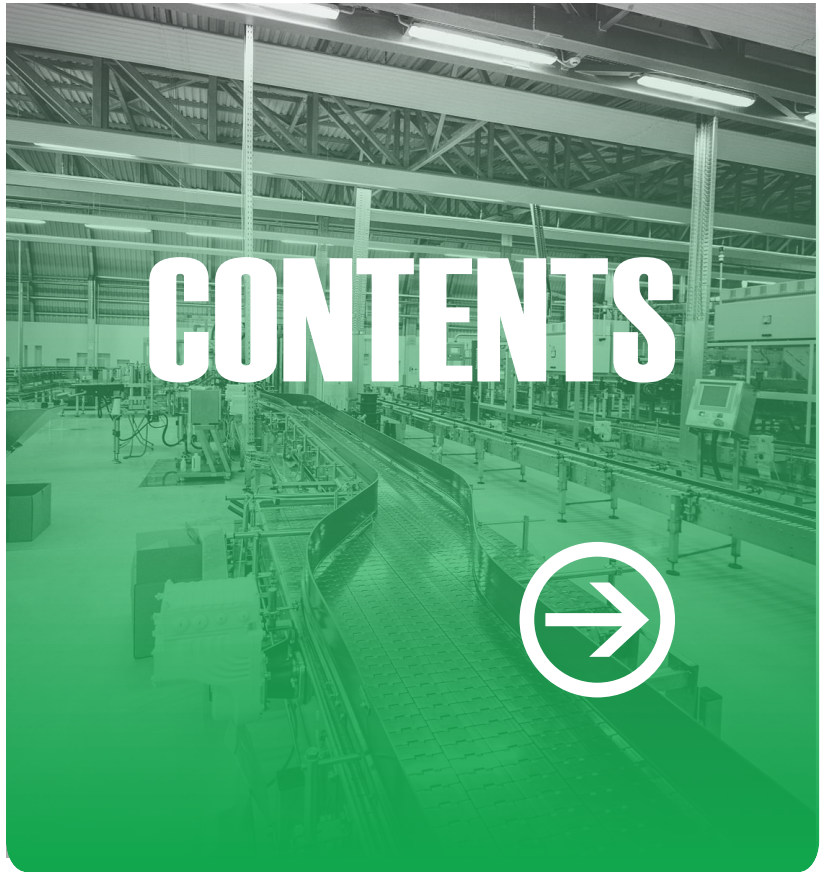


Although many factories keep tracking business metrics such as OEE, few companies are able to use the data to identify optimization strategies and measure the effectiveness of these strategies.

Companies face problems such as inconsistent metric dimensions, inaccurate metrics computing, unsynchronized decision management , and difficulty in finding optimization solutions for performance management.

DuPont Financial Analysis Model





-60%

R&D APP | Supply Chain APP | Manufacturing APP | Marketing APP | Service APP | DPM

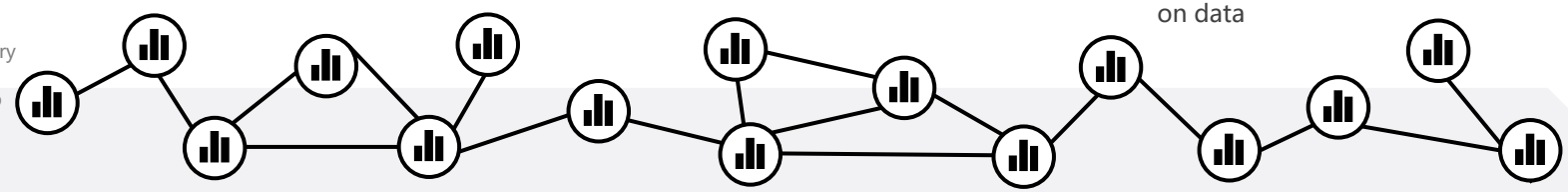
-70%

Accelerated development of industrial apps

- Algorithm Model Encapsulation
- Industrial Microservice Encapsulation
- Industrial Component Encapsulation
- Patchwork, rapid application building
- Rapid adaptation to different scenarios

Metrics | Alarms | Status | Operation data

- Factory
- Workshop
- Production Line
- Shift
- Equipment

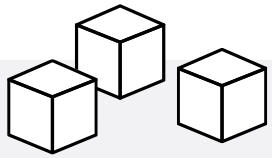


-70%

IT+OT Data Fabric & Fusion Computing

- IT/OT Data Fabric, modeling, fusion computing
- Metrics, alarms, status, operation data
- Multi-dimensional extraction, query, & utilization of business services

Equipment connection | Data integration



Equipment IoT data

CAx | PLM | ERP | CRM | MES | SCM

-50%

Connection of All Industrial Resources

- Equipment connection: Data collection devices, sensors, industrial gateways, & IPC systems
- Data integration in traditional industrial IT systems

Digital insights into performance help improve

Asset Efficiency

Performance insights accurately **identify people and equipment bottlenecks** and analyze the **root causes** of the bottlenecks so that the production operation team can develop **optimization strategies**.

Revenue

Performance insights can help make quick, proactive decisions to improve **factory throughput and deliverability**.

Operating Cost

Performance insights enable companies to use their workforce more efficiently and **reduce the cost of maintaining quality**, thereby reducing costs associated with existing demand

Service Level

Performance insights help companies **reduce lead times**, increase flexibility in production, and reduce inventory/operating costs.

ROI

Performance insights help enterprises **identify the most influential investment projects** and take responsibility for the expected results.

In the digital era, thanks to digital technologies, the requirements, data, and user value in different scenarios can be seamlessly integrated.

Performance management in the digital era is not just about technologies and tools. In the new era, the connotation of performance management has fundamentally changed.

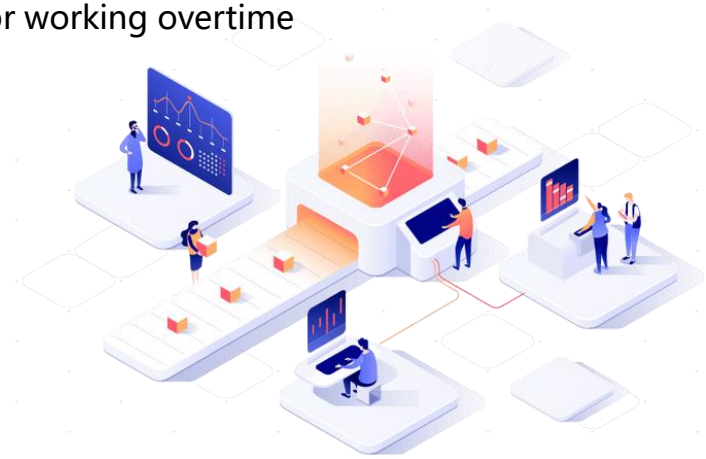
	Traditional performance management	Digital performance management
Flexibility	Inability to adapt to individual differences, as each factory has a unique production environment	The right data: building metrics models allows for fair comparisons in both temporal and spatial dimensions
Data source	Data cannot be automatically extracted, processed and utilized, requiring a lot of manual summarization	The right sources: Automatically acquire OT and IT data and perform fusion computing
Timeliness	Data are not from real time and seriously lag behind business processes	The right time: real-time alarms and notifications to solve problems in a timely manner
Person in charge	Usually, the person in charge is too busy to carry out performance management	The right person: performance is improved anytime, anywhere, and by any person
Execution	Difficult to track changes in conditions and cannot adjust the conditions in time	The right decision: Digital decision execution and result evaluation guarantee the implementation

DPM will bring significant benefits to the company

Take OEE as an example: it can be referred to to reduce planned and unplanned downtime, reduce scrap rate and rework rate, increase labor productivity, and reduce time for transition and for working overtime

Before implementation

- **Fragmented, siloed assets, systems and data** were provided by multiple suppliers using outdated Excel-based reports.
- Large amounts of data were used to **analyze** performance **manually**, with **inconsistent computing methods and benchmarks** across production lines and factories.
- Management was unable to **identify problems** and methods to uncover the highest priority issues, and operations **spent a lot of time reconciling data**.
- The factory was **inefficient**, **lacked flexibility** to resist external fluctuations, struggled to meet product customization needs, had a low return on investment, and was not transparent in its performance.

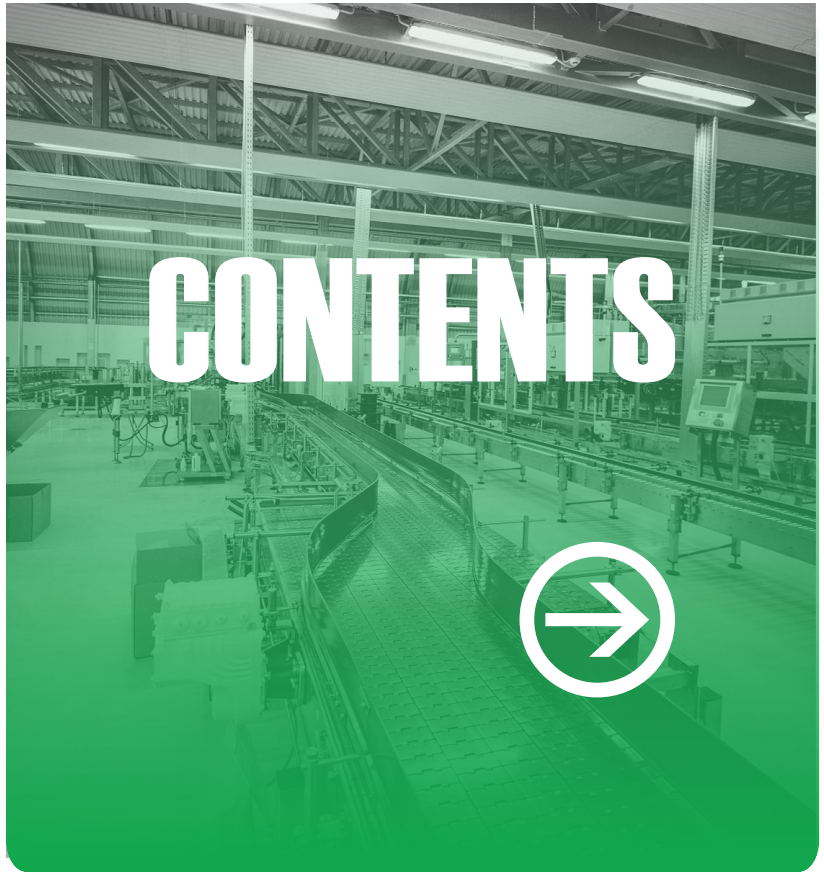


During the implementation

- **Performance transparency**, the ability to understand current performance levels in the context of day-to-day business objectives, throughout the organization, in a common business-oriented language.
- **Real-time performance,** with the ability to quickly identify bottlenecks, their root causes and potential actions, without delay.
- **Closed-loop optimization,** with the ability to explain the progress associated with actions and investments to improve business performance.
- **Performance benchmarking** that enables cross-country, cross-region, cross-factory, cross-production-line, and cross-workstation performance comparisons to quickly find out the best practices.

After implementation

- All group factories can achieve best-in-class performance. Performance reporting is **standardized** across all production lines, and factory resources and efforts are focused on the highest priority issues, solving problems before they happen.
- Revenues are increased; operating expenses are reduced; production flexibility is increased. Return on assets grows, and digitalization and information technology investments are targeted.



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Smart operation from top to down

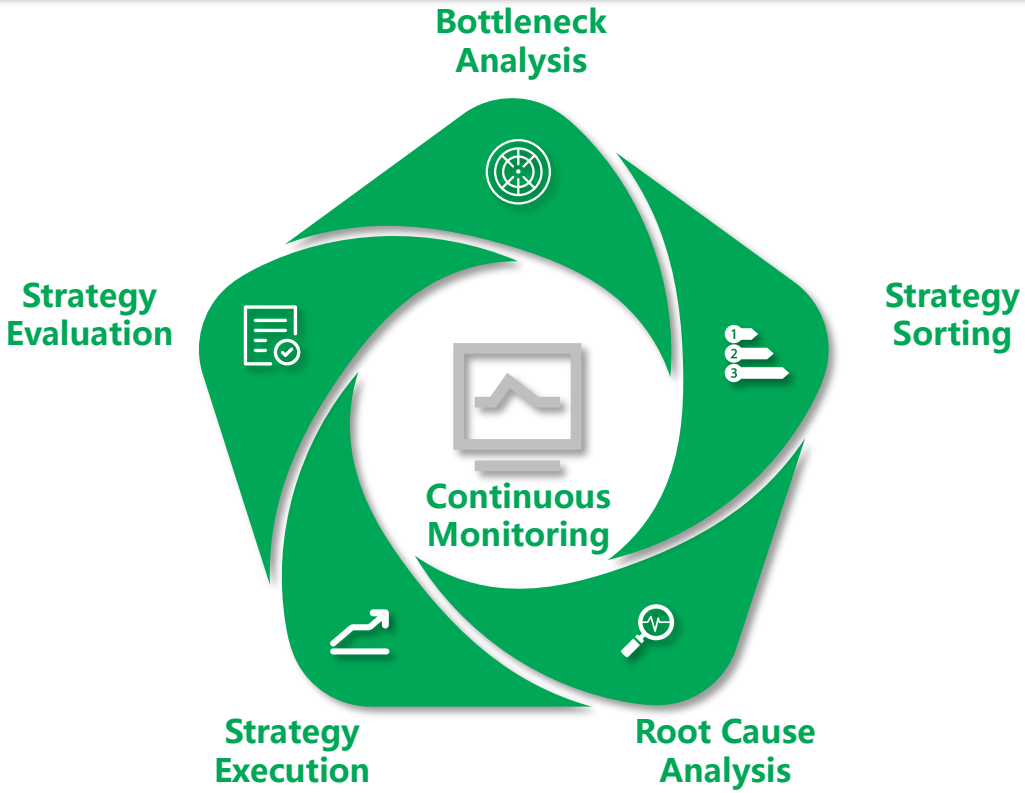
Data collection, processing, analysis and application based on comprehensive business data

Build strategies

Measure results with performance data, and monitor and evaluate all levels of execution to ensure that the strategy produces the desired results.

Implementation of improvement strategies

Provide visual root cause analysis by collecting data manually and automatically, performing data analysis, and
execute improvement strategies and track results.



Uncover potential problems

Quickly identify the most impactful bottlenecks and focus on follow-up to improve performance metrics for critical tasks such as EQUIPMENT, PERSONNEL, and PROCESS.

Strategy Ranking & Root Cause Analysis

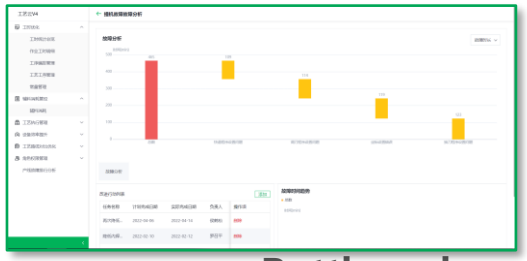
Based on the results of the bottleneck analysis, we find the strategies with the least investment and the most significant improvements, analyze the root causes of losses, focus on the issues that really affect financial performance, and are able to communicate these actions throughout the organization.

DPM is a closed-loop solution that helps manufacturing industries quickly identify performance losses and continuously track and document the results of optimization strategies

Rapid custom business development with powerful scalability

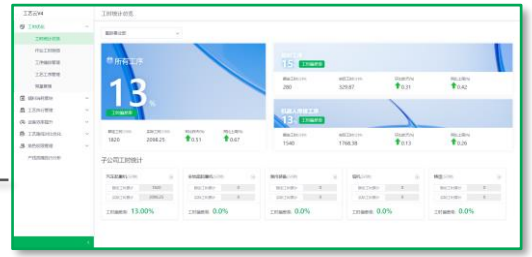
Solutions

ROOTCLOUD

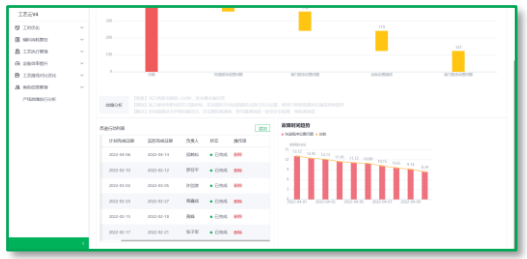


Bottleneck Analysis

Continuous Monitoring

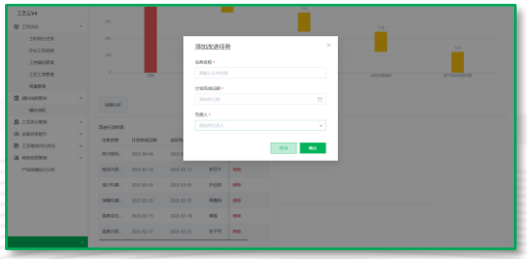


Strategy Evaluation

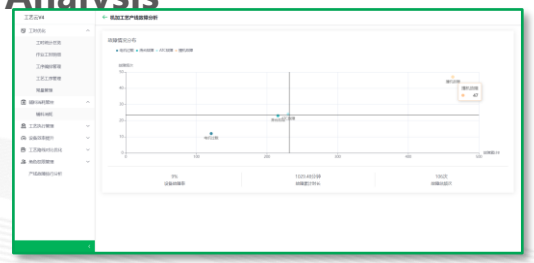


Strategy Sorting

Strategy Execution



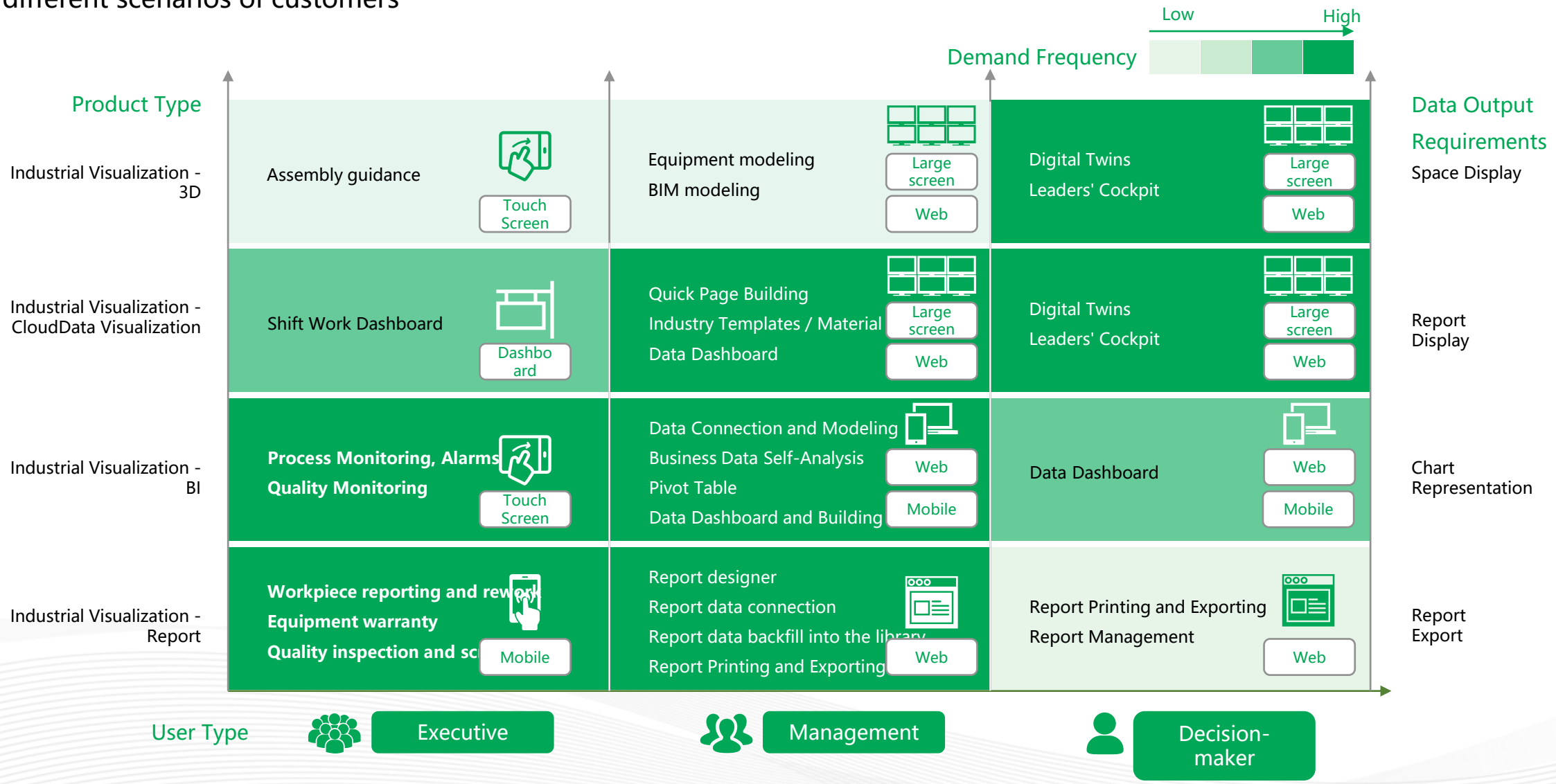
Root Cause Analysis



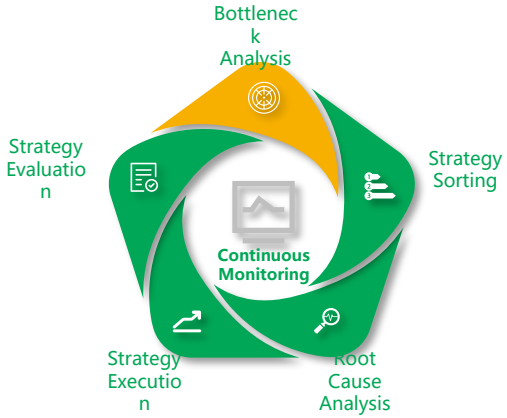
Continuous Improvement / Closed-Loop Optimization

- Bottleneck Analysis
- Strategy Sorting
- Root Cause Analysis
- Strategy Execution
- Strategy Evaluation

According to different business scenarios, industrial visualization can provide different display forms for DPM to meet the needs of different scenarios of customers



Solution | Bottleneck Analysis



Pain point

- Lack of understanding of bottlenecks leads to poor alignment between continuous improvement initiatives and business impact
- Time and effort for manual analysis

DPM capabilities

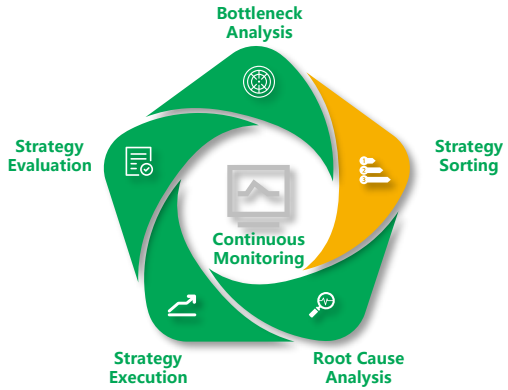
- Automated bottleneck identification and tracking

Benefits for customers

- Efforts and time are focused on continuous improvement opportunities in the process with the the biggest impact

DEMO

Solution | Strategy Sorting



Pain point

- Inconsistent measurement and reporting of performance
- Data is spread across multiple systems and production dashboards cannot clearly compare losses

DPM capabilities

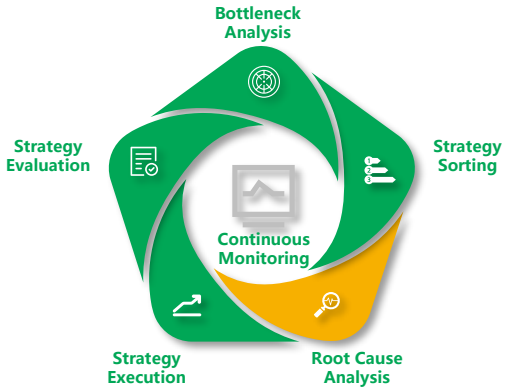
- Compare the differences in man-hours incurred by each process to optimize the strategies

Benefits for customers

- Accelerated identification and prioritization of top losses

DEMO

Solution | Root Cause Analysis



Pain point

- Lack of automated diagnosis of production faults
- Lack of fault traceability

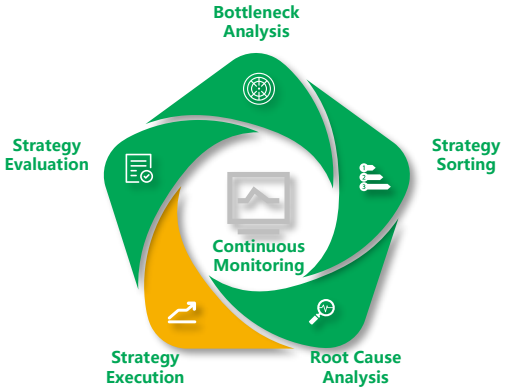
DPM capabilities

- Production fault diagnosis with analytical capabilities to determine root causes and standardized suggestions
- Continuous traceability of the root causes of faults

Benefits for customers

- Find the root causes from root cause analysis to avoid similar value losses

DEMO



Pain point

- Problem is identified but with no action
- Slow and non-transparent implementation progress

DPM capabilities

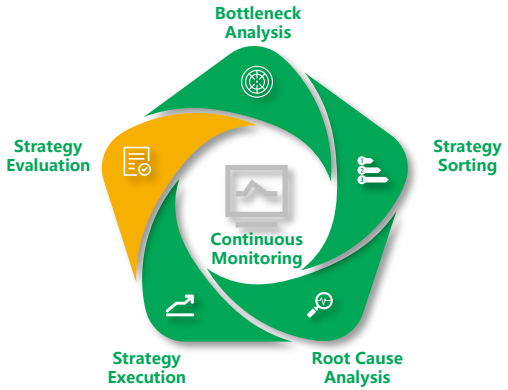
- Create continuous improvement measures related to lost production
- Provide a digital space for collaborative team work

Benefits for customers

- Facilitate team collaboration and continuous improvement plan tracking

DEMO

Solution | Strategy Evaluation



Pain point

- Unable to confirm value of delivery
- Potential misallocation of key resources
- Industry 4.0 investments based on assumptions rather than analysis

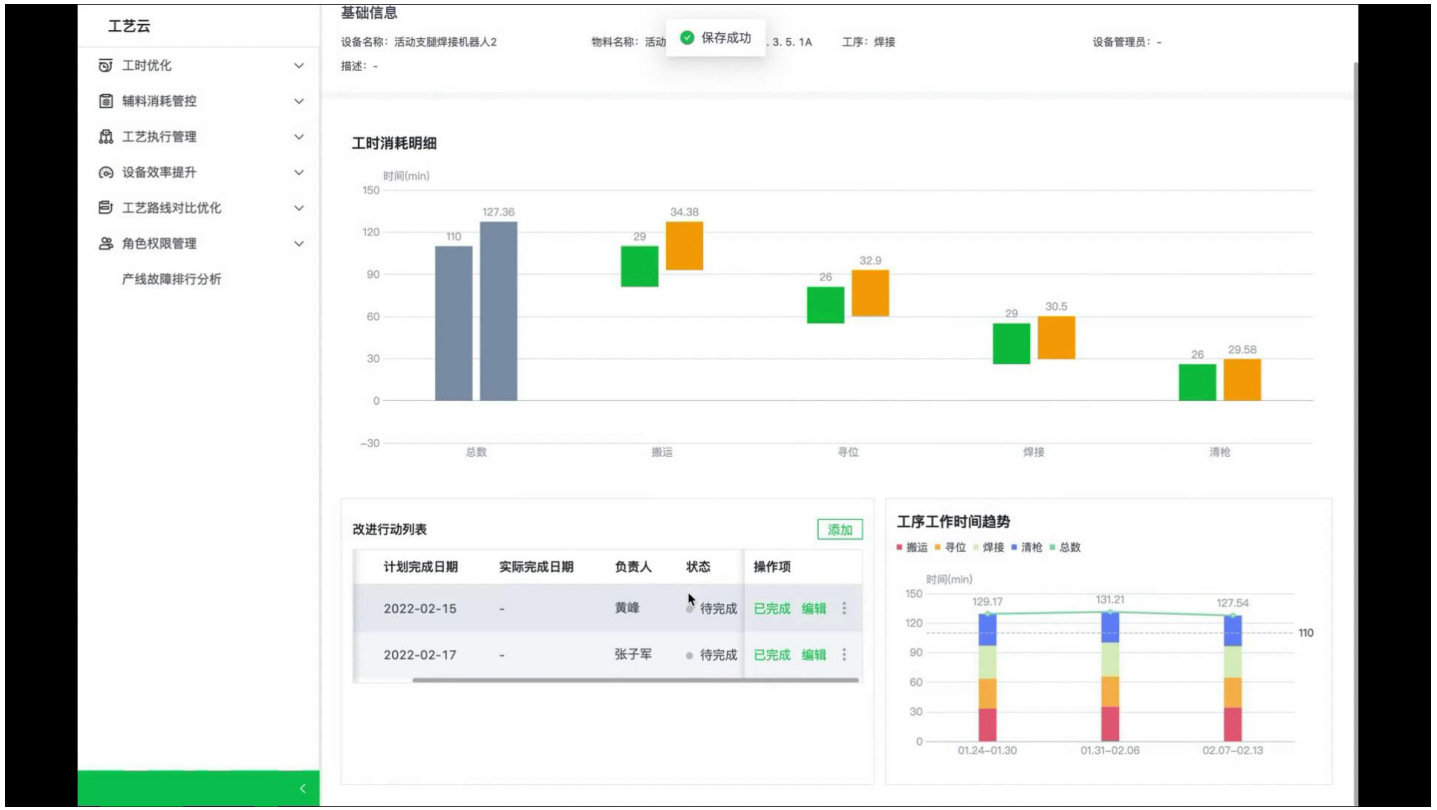
DPM capabilities

- Track performance improvements achieved over time from each operation and production data

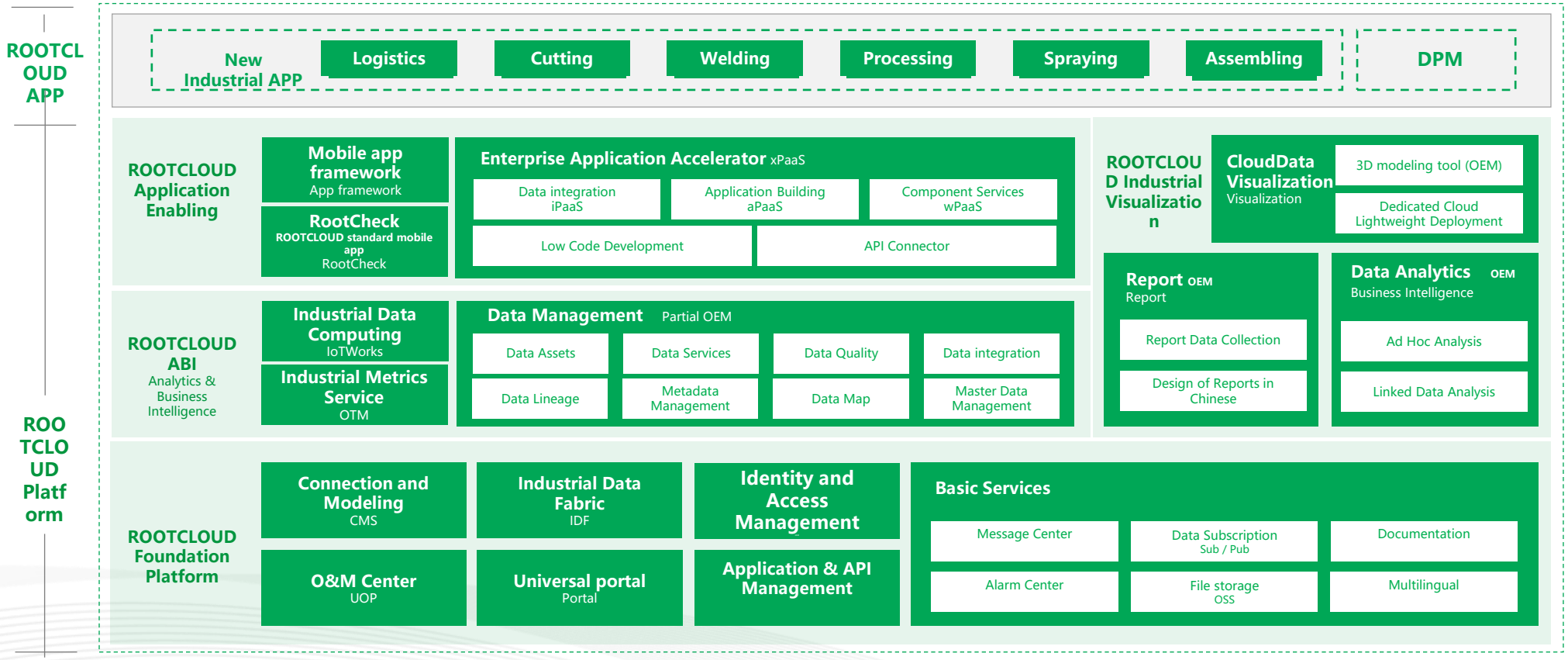
Benefits for customers

- Identify the value of delivery associated with production data
- Assess the ongoing impact of strategy improvements

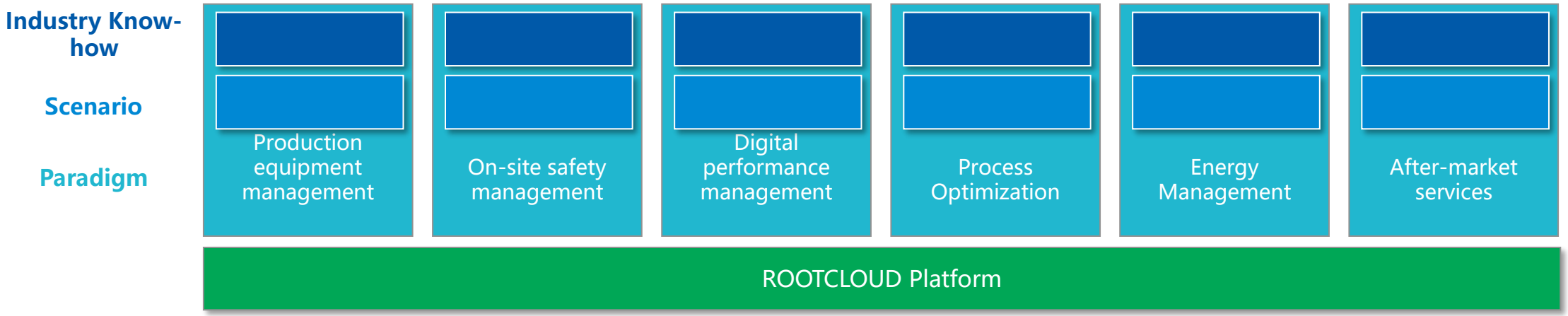
DEMO



The **integrated technology capability of** the ROOTCLOUD Platform provides strong support for the development and operation of various types of industrial apps including DPM, which makes the platform + industrial apps **consume the lowest overall resources, maintain the lowest integration threshold, and utilize the most powerful expansion capacity**.



New Industrial APP Development



ROOTCLOUD Platform = [Connection] x [Foundational Services] x [Metrics] x [Widgets]

Connection

ROOTCLOUD Platform provides industrial equipment IoT connection and industrial software data integration capability, lowering the access entry, weakening the workload and improving the efficiency for integration.

Foundational Services

ROOTCLOUD Platform provides common foundational service capabilities such as identity access, messages, alarm management, data subscription, file storage, document management, and multilingual support.

Metrics

ROOTCLOUD Platform provides business and technical staff with a complete solution that integrates a unified business model, metrics management, metrics processing, and data services.

Widget

ROOTCLOUD Platform supports rapid building of industrial APPs through component services, helping companies to understand and maximize the use of existing assets and functions, and integrate duplicate business activities to reduce wastage.

Solution | ROOTCLOUD Industrial APP Development Paradigm

Industrial APP is based on loosely coupled, componentized, reconfigurable and reusable ideas, oriented to specific industrial scenarios and solving specific industrial problems.

Based on the technical engine, resources, models and business components of the platform, the industrial mechanism, technology, knowledge, algorithms and best engineering practices are carried out in accordance with the principles of systematic organization, modeling expression, visual interaction, scenario-based application and ecological evolution, which is a new form of industrial software development.

Digital Performance Management DPM

ROOTCLOUD - Easy Connection

Communication data management platform

Global localized SIM card operation

Multi-operator system connection and maintenance

ROOTCLOUD internal operation management

ROOTCLOUD - Process Cloud

Process optimization platform

Fully exploit the value of process data

Effective execution of process standards

Automatic process prediction and smart optimization

For Manufacturing

Provide a digital comprehensive approach to improve performance

For industrial APP developers

Provide an efficient, flexible and easy-to-use DPM application development framework

For ROOTCLOUD Platform users

Provide native industrial APP development paradigms on the ROOTCLOUD Platform

ROOTCLOUD - Energy Management

Equipment remote management and monitoring platform

Real-time management of key parameters and faults

Energy consumption data transparency

Systematize energy management

Systematize process order

Visualize energy consumption anomalies

Improve & systematize energy saving technologies

ROOTCLOUD - Equipment Management

Enterprise Equipment Management EEM

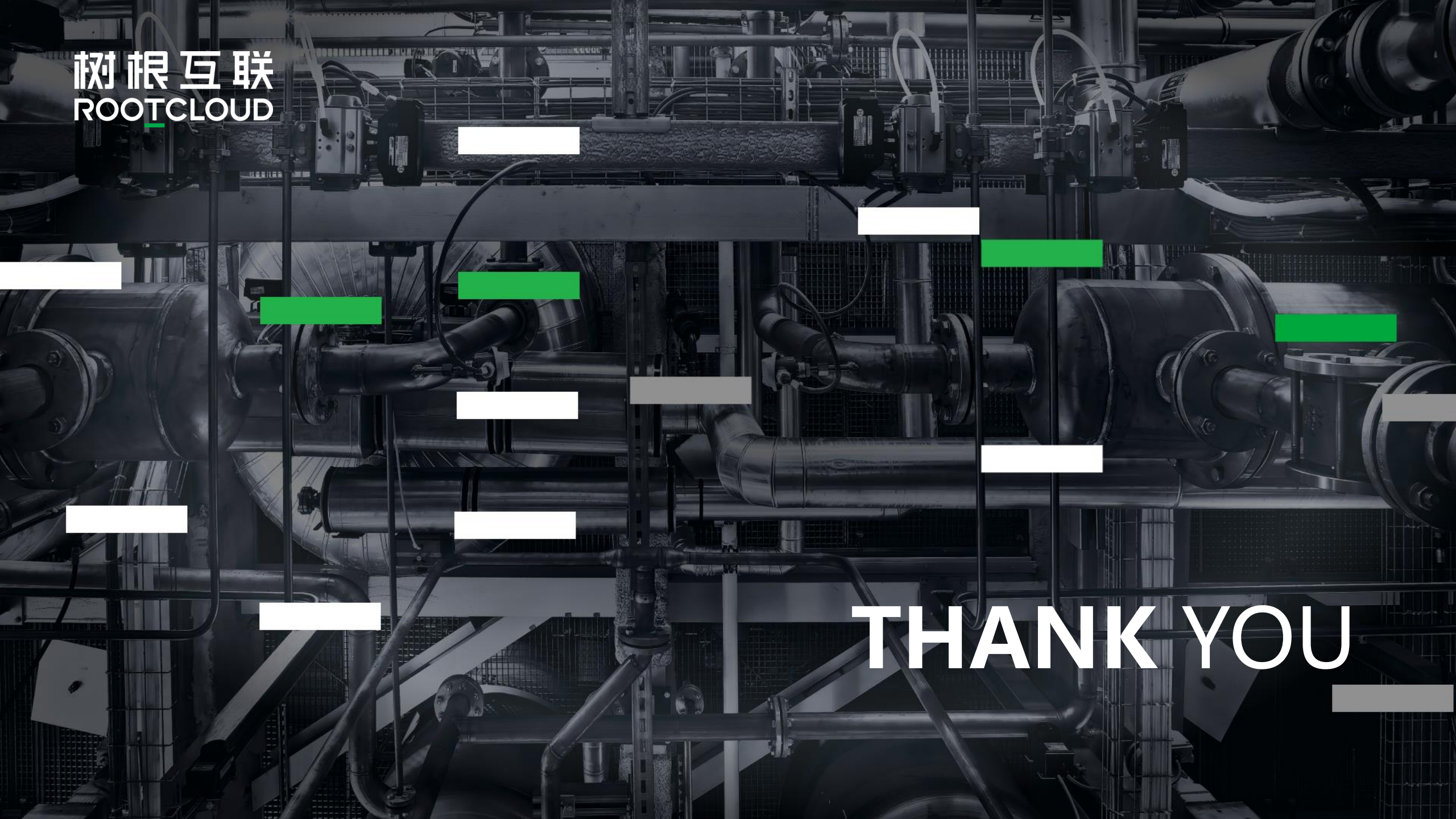
Improve equipment reliability

Improve the overall utilization of equipment

Reduce unplanned downtime

Improve personnel efficiency

Reduce equipment maintenance costs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THANK YOU