



# The connected steel plant

Extracting more value at every stage of your process

# Solutions to meet **steel needs**

## GLOBAL STEEL INDUSTRY IN FACTS

**50+**

The average age of major steel company workers in the US

**300**

Metric tonnes per annum of excess capacity predicted for 2020 (globally)

*Source: McKinsey*

**70%**

Potential energy savings through steel recycling

*Source: Worldsteel*

**60%**

China's market share objective for their top 10 steel producers by 2025

### **You are faced with a wide range of challenges daily.**

Trade wars are making the market more complex, a retiring workforce is leaving management with a skills gap to deal with and globally the steel industry is operating at high rates of capacity utilization.

Does this sound all too familiar?

Luckily, there is a way to mitigate these challenges. Optimizing and maintaining critical operations in your steel plant demands expertise and modern, integrated technologies. We offer a wide range of solutions that safeguard your operations and meet economic and performance requirements. These solutions are scalable, flexible and easy to integrate, helping you increase productivity, lower costs, reduce energy consumption and improve safety.





# The challenges you face

With a changing world and a changing steel industry, producers are required to be agile in their operations. Companies focusing their efforts on effective change can help grow the industry as a whole while remaining productive and profitable.

**Focus on controlling these variables is key to remaining competitive:**

- Capital and cost management
- Product quality
- High production yield
- Maintenance costs
- Product innovation
- Flexible production plans/short lead times
- Safety
- Emissions and energy

# How we overcome these challenges

Rockwell Automation® helps steel producers plan their transformation journey from start to finish. Proper planning and project management means challenges can be identified and addressed in the early stages of a project—before the entire project is derailed. Adhering to a project plan keeps your initiatives on budget and on schedule.

Metals application engineering

Project management

Systems engineering design

Machine safety assessment

AC and DC drive controls

Motor control centers

Rotating equipment—motors/brakes/feedback

Level I control system programming

Level II operator interface/HMI

Customer application training

Installation/commissioning services

Conversion and migration



Adhering to a project plan **keeps your initiatives on budget and on schedule.**



# The **connected** steel plant

A connected plant offers major opportunities for companies to improve operational efficiencies, reduce safety risks and drive better decision making.

# Digital technologies

How digital technologies can help steel manufacturers



## Analytics

Improving process and quality, and optimizing the production chain



## Simulation

Reducing costs, and validating strategies beforehand



## Internet of Things sensors

Better tracking of materials, people, consumables and emissions



## Artificial intelligence and machine learning

Predicting failures and increasing yield



## Mobility

Reducing maintenance costs and improving personnel productivity



## Augmented reality and virtual reality

Improving collaborating and making operations safer



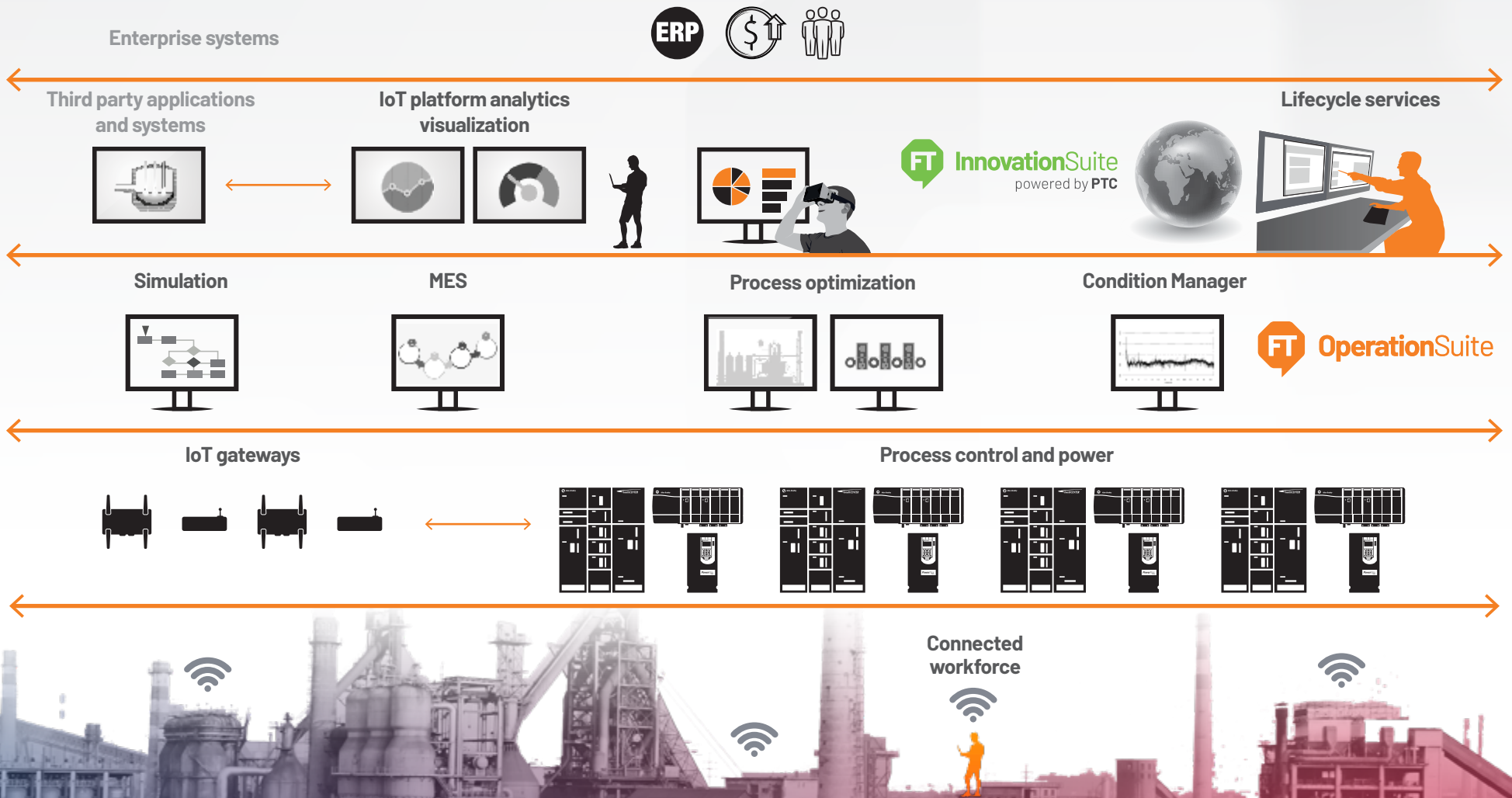
## End-to-end system integration

Improving decision-making with increased supply chain and plant-to-business visibility



# The connected steel plant

End-to-end architecture and systems integration



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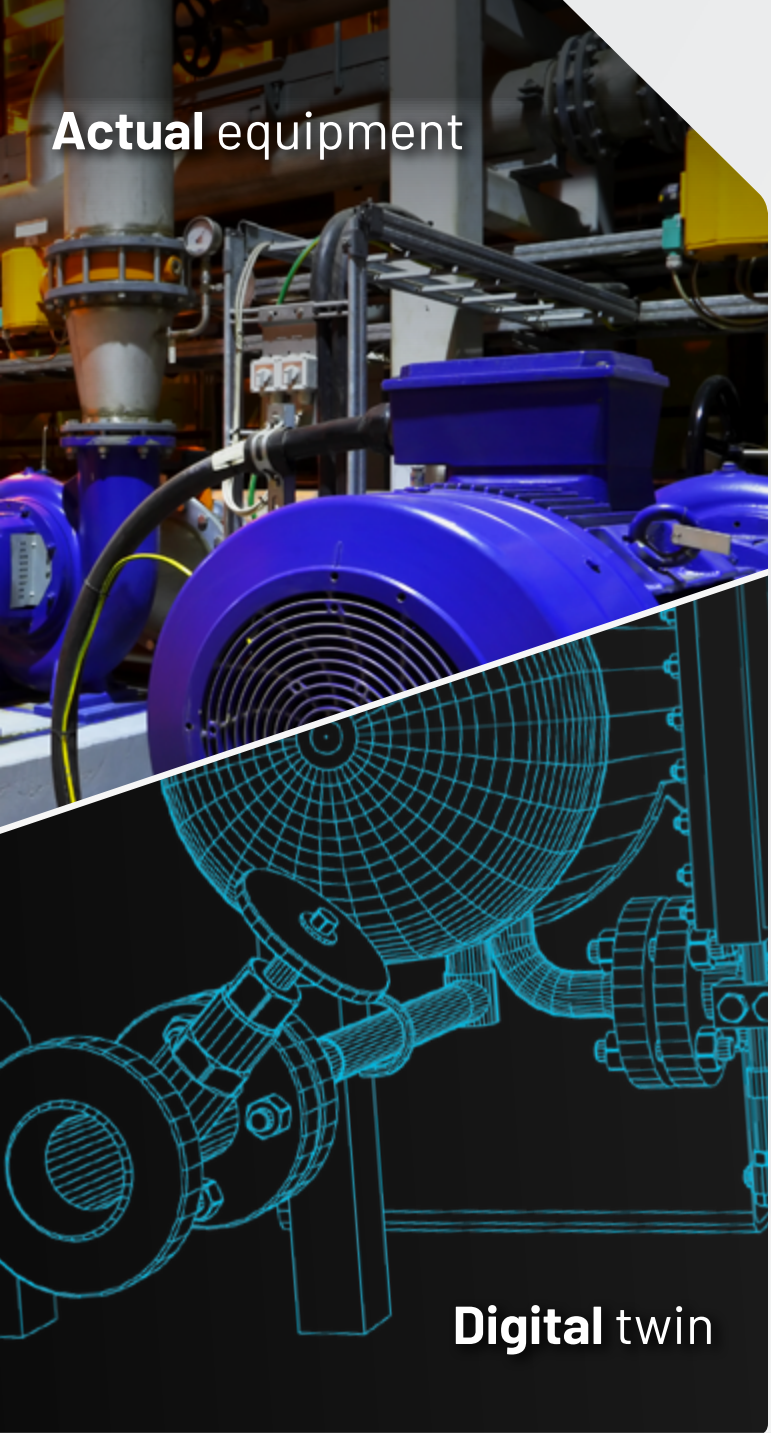
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Modernize and  
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Design, build and  
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**Actual** equipment

# The connected steel mill

## DIGITAL TWIN CONCEPT

Enabling reduced capex and opex optimization

## DIGITAL TWIN FEATURES

Mechanical CAD

Process control

Virtual commissioning

Operator training

Electrical CAD

Mathematical modeling

Mobility

Virtual training

## DIGITAL TWIN BENEFITS

### Better prototyping

Easily design and build the next generation of equipment with confidence.

### Validate your strategies

Optimize throughput with simple, real-time 3D simulation of complex dynamic processes.

### Virtual commissioning

Design, test, validate and commission systems before they are put into service.

### Operator training

Reduce risk and improve operations by training workforce in a safe virtual environment.

**Digital twin**



# Increase **operational efficiency**

Integrated power and control solutions help you get the most out of your process and equipment—improving your overall productivity while reducing maintenance costs.

## SOLUTIONS FOR RAW MATERIALS, IRON AND STEEL MAKING, AND CASTING

### PROCESS CONTROL FROM RAW MATERIALS TO STEEL MAKING

An integrated process control system reduces engineering risks and facilitates smoother operations and simplified maintenance. Our high availability and scalable DCS is a perfect fit for iron making and steel making processes (coke plants, sintering, pellet plants, blast furnaces, EAF)—and its open technology means you can seamlessly integrate process information into your business systems.

### CASTING CONTROL AND AUTOMATION

Looking for a new system or upgrading your caster machine? Our global heavy industries team has extensive caster experience and can deliver an end-to-end caster solution that integrates control systems, motor management, and drives—and also establishes a better operator experience with advanced HMI displays and system diagnostic capabilities.



Bringing process information and business information together can lead to **improved quality and increased ability to meet customer demands.**

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# SOLUTIONS FOR ROLLING AND PROCESSING LINES

## ROLLING AUTOMATION

Integrated controls, visualization and safety combine to create a reliable and easy-to-use solution for rolling applications. Our solution also supports AC and DC drive applications including drive solutions with a shared/common DC bus configuration.

The solution incorporates solutions like gauge control, production scheduling and specialty instrumentation.

## PROCESSING LINES

Our power and control systems provide high performance solutions for finishing lines.

### THIS INCLUDES:

- Drive control
- Tension control
- Welding monitoring
- Cleaning and coating
- Furnace process control
- Auxiliary systems control
- System-wide data analysis  
(tracking of equipment performance trends and product quality)

**We have application expertise**  
in annealing and pickling, hot dip galvanizing, plate leveler, slitting lines, cut-to-length and rewind lines.



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## SOLUTIONS FOR MATERIAL HANDLING

### CRANE AUTOMATION

Automating your crane applications leads to faster and more efficient operations and can increase the life of your equipment by providing real-time diagnostics and alerts about equipment productivity.

Advanced drive systems deliver smoother and more precise crane movement that, combined with automation, can enhance operational performance, improve people safety, and reduce operator stress and fatigue.

### STORAGE MANAGEMENT SYSTEMS

Improve operational efficiency with a better coil management system.

#### IMPROVED MATERIAL IDENTIFICATION CAN:

- Reduce errors and make sure customer orders are filled correctly every time
- Eliminate product damage that occurs as a result of unnecessary movement of product

#### OPTIMIZED CRANE UTILIZATION CAN:

- Reduce wear and tear on cranes
- Improve throughput

#### BETTER INVENTORY MANAGEMENT CAN:

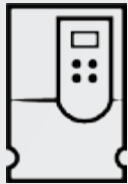
- Increase ability to track products
- Better productivity and inventory management

Improve  
**operational  
efficiency**



# Precise motor control

Metals applications require powerful integration between motor control and automation



Our integrated approach for motor control and automation enables design productivity, safety, visualization, predictive analytics and an easier replacement of a faulty device.

## Fast and precise design

Suite of control and HMI objects to accelerate project engineering including faceplates designed around user roles (operator, maintenance)

## Integrated configuration

Configure the controller, motor control devices and I/O simultaneously

## Smart commissioning

Startup wizards will guide you through the entire commissioning process

## Predictive maintenance

Monitor drive and system components, and extract data upstream so it's accessible through the controller and HMI sets

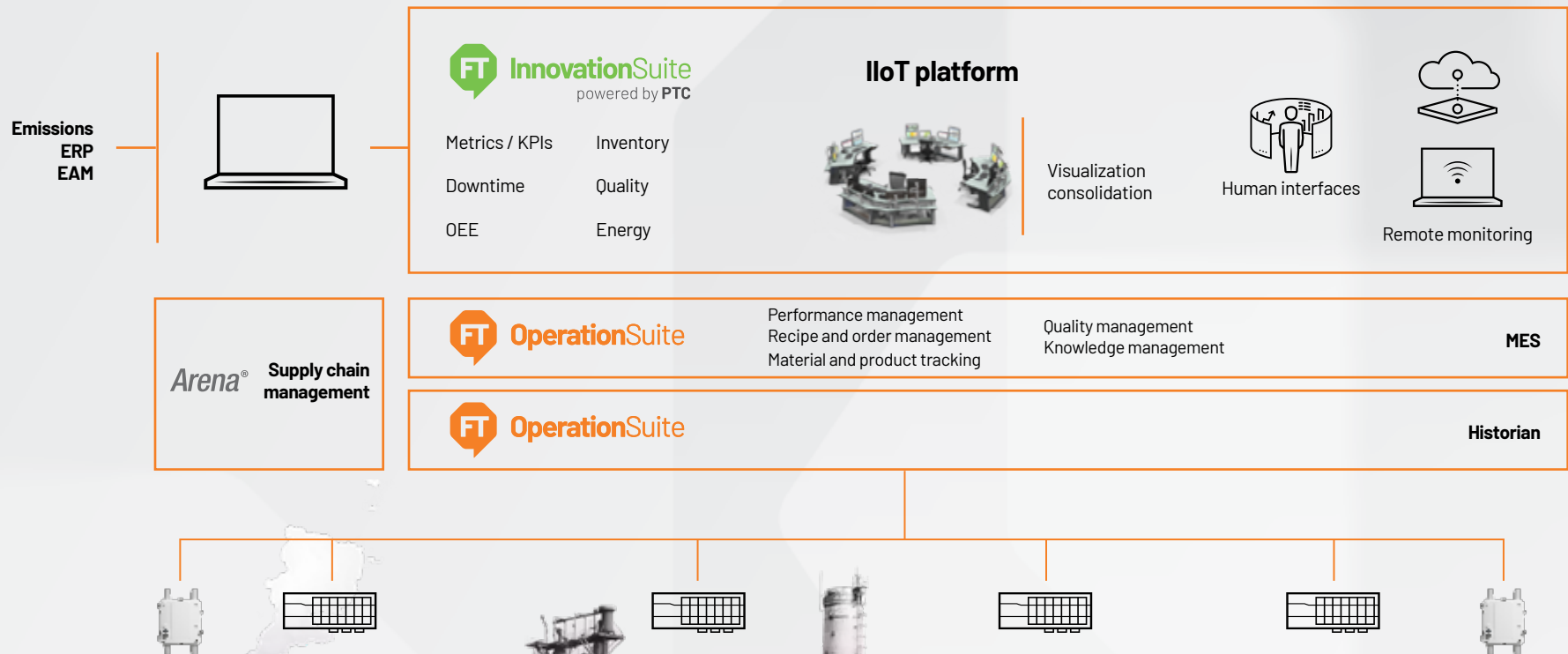
## Automatic device configuration

When a device is replaced, helps users automatically assign the operational configuration of the original device to the replacement

# Knowledge- driven operations

When you collect, aggregate and analyze data across operations, you can spot trends and interdependencies that are missed when data lives in silos. With this type of information, you can make more informed decisions.

# Integration from **raw material to market**



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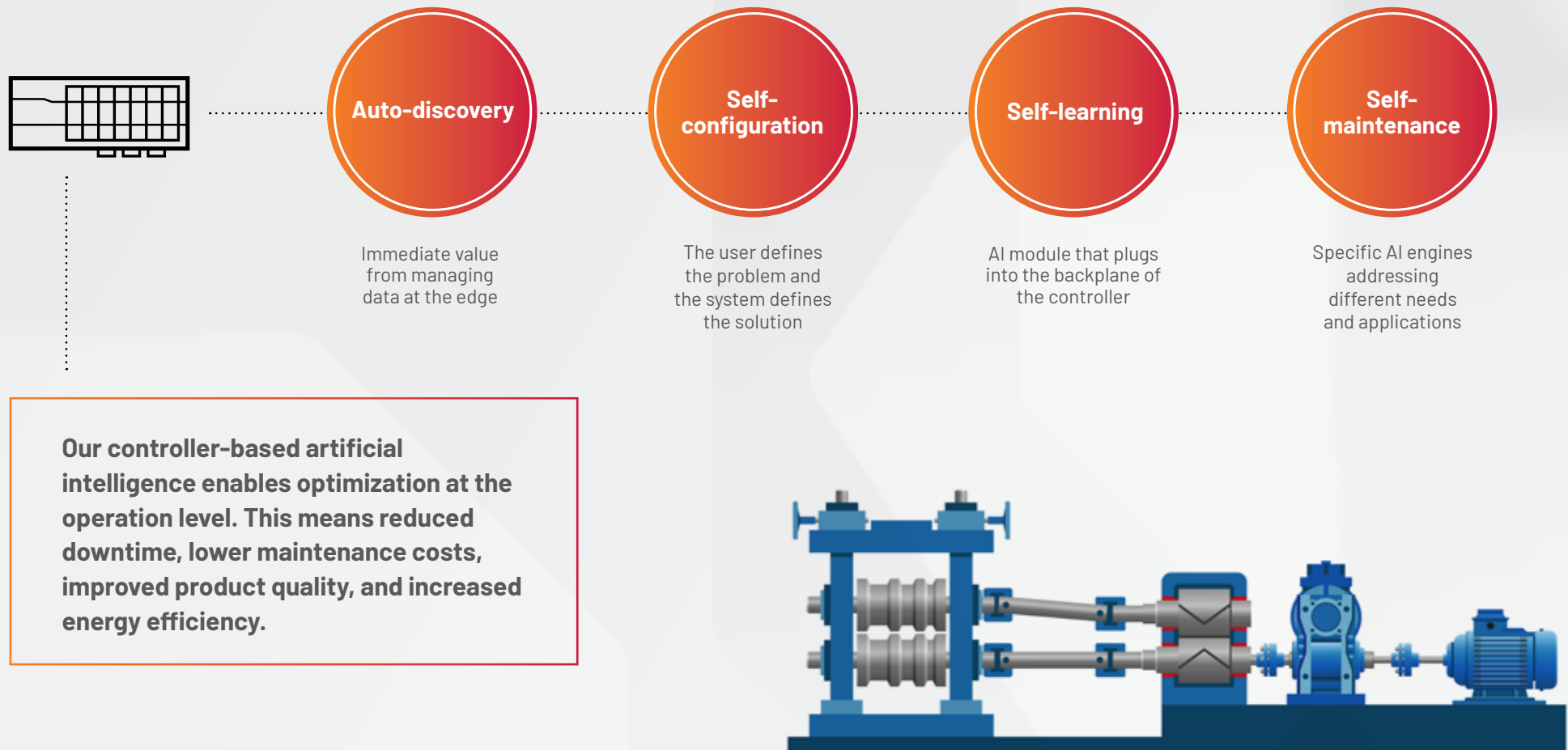
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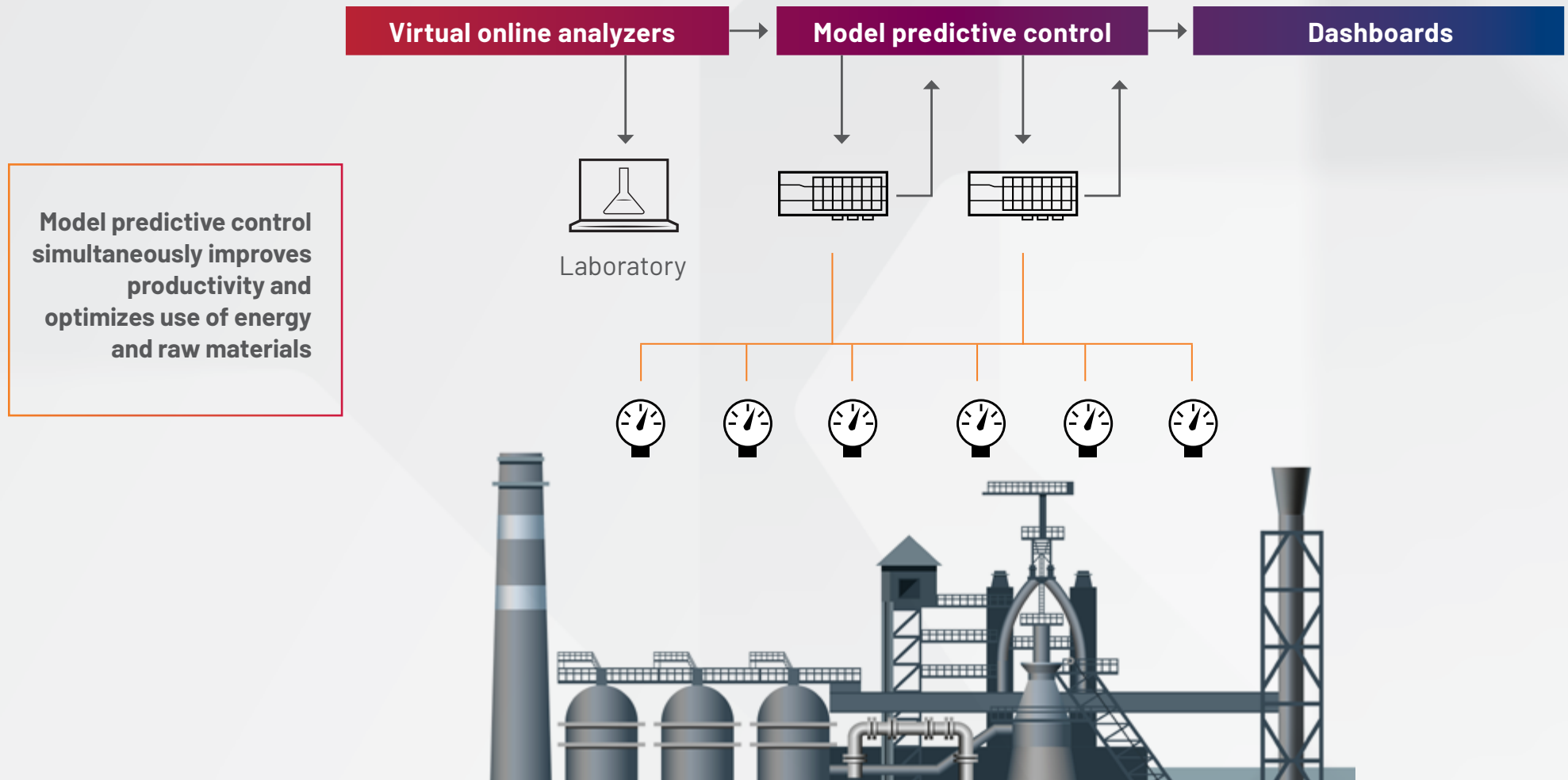


# Scalable analytics from devices to enterprise

Our scalable analytics solutions include our LogixAI™ module, which provides embedded analytics that empower users to apply machine learning at the controller level. No need for a data scientist.



# Process and energy **optimization**



## MANUFACTURING EXECUTION SYSTEMS

### IMPROVE PRODUCTION EFFICIENCY

An MES links business data from systems like an ERP with real-time operational data from plant-control systems. This connection means your manufacturing process becomes information-driven:

- Trigger business actions based on real-time operational data
- Trigger operational activities and rules based on business data
- Manage performance, recipes, and orders in one place
- Improve quality control
- Maximize equipment utilization

## SUPPLY CHAIN SIMULATION

### SIMULATE: EVALUATE THE FULL IMPLICATIONS OF BUSINESS DECISIONS BEFORE THEY ARE PUT INTO PRACTICE

Looking to make changes to your operations or supply chain? Simulation software allows you to analyze alternatives and visualize potential outcomes without the cost or risk of a real project or pilot. Especially today, as global changes in consumption patterns are forcing companies to reevaluate the role of supply chain planning, simulation software can be a powerful tool for testing and validating the implications of an operational or supply chain modification, so you can continuously improve your business without the risk.





# Modernize and **empower your workforce**

New technologies are expanding human possibility. Incorporating these technologies into workers' daily lives can ease workforce transitions, increase worker productivity, foster collaboration, and provide a safer, more engaging environment for all employees.

## WORKER SAFETY AND EFFICIENCY

### MOBILE REAL-TIME INFORMATION

Metals environments are harsh, and the processes involved in metalwork are complex and typically run out of disparate systems. When something breaks down, field workers may find themselves servicing or operating equipment without a direct view into how the specific piece of equipment is performing. This lack of visibility and information can reduce productivity and result in unsafe operations.

Our mobility solutions extend visualization and real-time decision capabilities to browser-based remote users including mobile devices. With features like voice command recognition and on-demand, real-time access from anywhere, every team member benefits from this visibility into the plant.

**57%**

of employee productivity/  
efficiency will increase  
with mobility

Source: Motorola/mobientech.com

Our mobility solutions **extend  
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# WORKER SAFETY AND EFFICIENCY

## AUGMENTED REALITY

Superimpose digital information onto real objects or equipment, providing field personnel with real-time information in context of the true process. This technology helps metal producers enable remote expert advice for equipment maintenance and augment the training process to create customized, memorable instruction for new workers.

### SEE THE RESULTS

Better employee **productivity**

**Safer** operations

**Remote** collaboration

**Expert** advice

51%

of respondents said that their company had already seen a measurable ROI when it came to using AR for employee training/knowledge transfer

Source: PTC/IDC

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# Design, build and **upgrade** **with confidence**

New projects and upgrades can be risky to undertake. Reduce your risk of overspend and delays with better up-front planning, fewer vendors, and tested project methodology and architectures.



**We partner at every stage to expand what is possible** for your business so you can expand what is possible **for your customers.**

## IMPROVE

You strive for continuous improvement to increase both productivity and profitability. As your partner, we can establish a baseline and then continuously work to unlock the potential of your investments. We envision the future together, and then together we make it happen.

- Connected enterprise & OT digital transformation consulting
- IT/OT convergence
- Feasibility studies
- Operational analytics
- Intelligent asset consulting
- Modernization

## SUSTAIN

We bring together your data, systems and processes to provide you with the right information at the right time. Your business is more connected, productive and intelligent.

- Remote & on-site technical support
- OT cybersecurity
- Safety assessments and remediation
- Asset management
- Managed services
- Predictive and prescriptive analytics

## design

## DESIGN

We can help design your network, your system and your application so it's integrated and intelligent.

- System design and simulation
- Functional safety
- Automation, information and equipment requirements
- OT network
- Front-end engineering design (FEED)
- Main automation contractor
- Industrial workforce consulting
- Digital plant

## build

## BUILD

We have the domain expertise to install, start up and commission your machines and systems. We provide complete project management services so you know that your investment is protected.

- Installation
- Commissioning
- Project & program management
- Calibration
- Packaged solutions
- Startup
- OT IaaS
- OT Edge to cloud compute

**unlock**  
the potential of  
**your investments**

INDUSTRY EXPERTISE

TECHNOLOGY EXPERTISE

improve

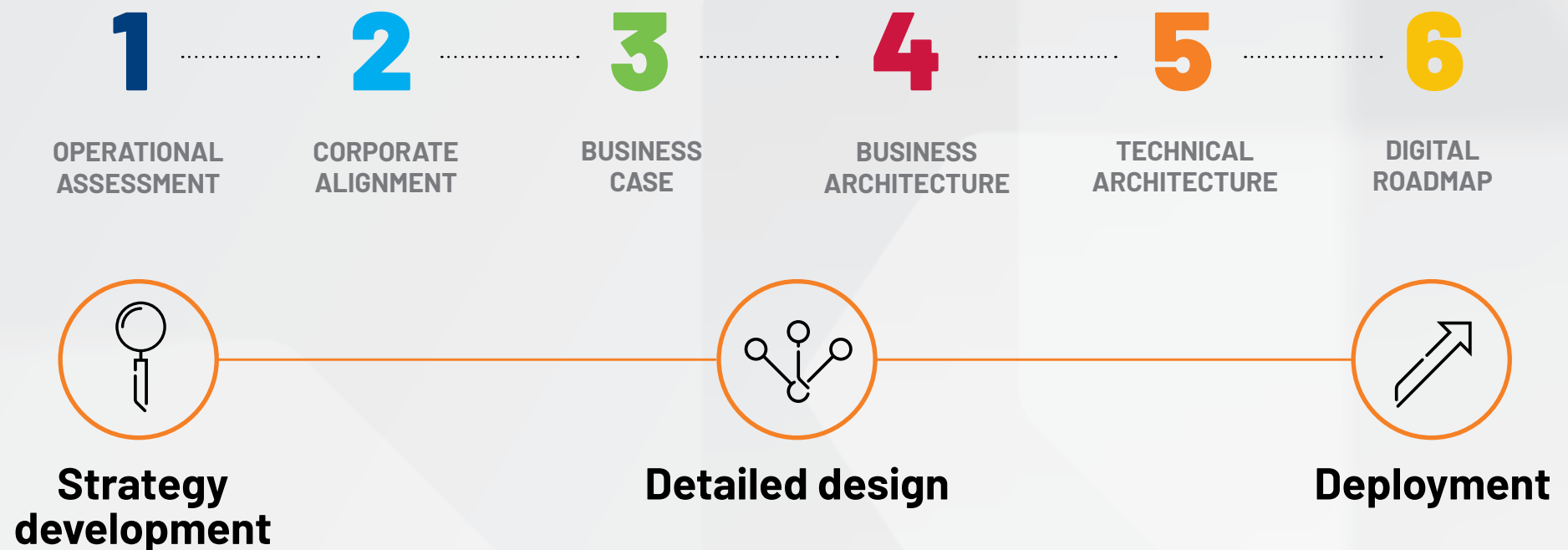
OPERATIONAL EXPERTISE

sustain

APPLICATION EXPERTISE

# Digital consulting services

A partner focused on business outcome and problem solving







# Cybersecurity

Solutions and services

## Validated solutions/architectures

Comprised of a collection of Cisco® and Rockwell Automation® validated designs, our architectures are tested for performance, availability, repeatability, scalability and security. This means you get fast, tested access to 'future-ready' network design.

## Cybersecurity services

From assessment to response plan deployment, we can provide a full lifecycle service focused on industrial security. Our experts understand how to securely bring together IT and OT, and help secure your infrastructure, protect assets, and maintain network availability.

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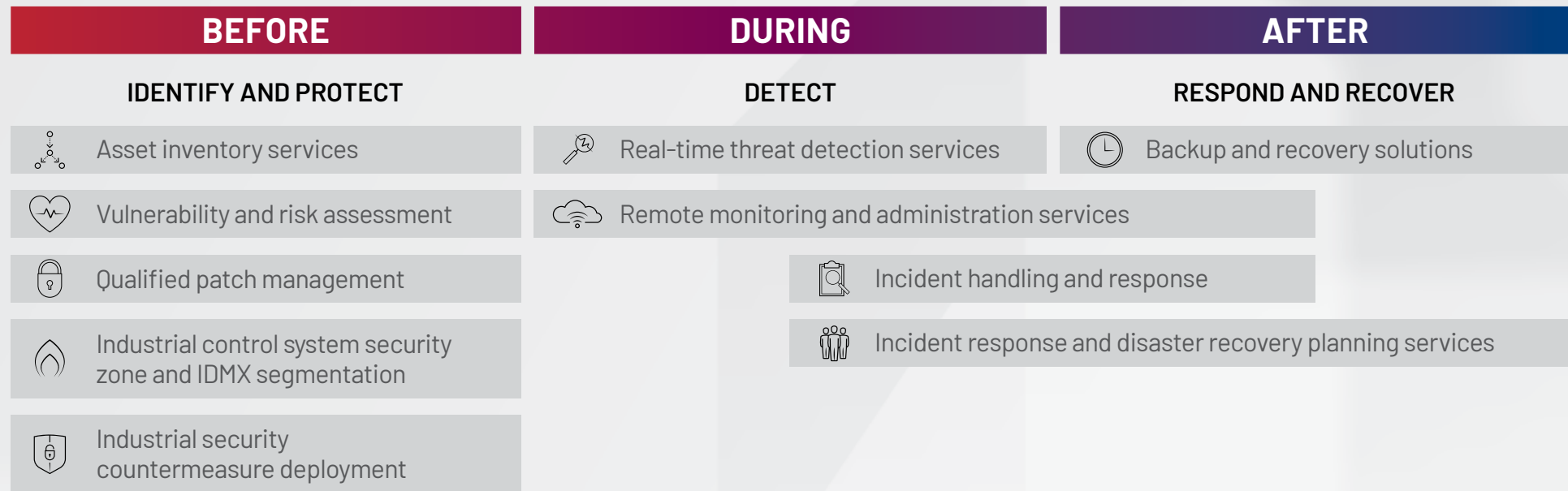
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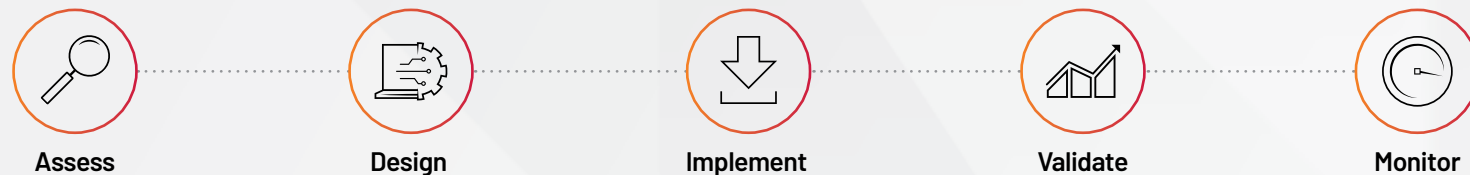


# A proactive approach to industrial cybersecurity

## Attack continuum



## BUILD A SECURE, ROBUST, FUTURE-READY NETWORK FOR YOUR CONNECTED STEEL PLANT



A holistic approach to help you design, deploy, and **manage your network infrastructure**

Connect with us.    

[rockwellautomation.com](https://rockwellautomation.com) — expanding **human possibility™**

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Publication METALS-BR002A-EN-P March 2020

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