

Monozukuri Innovation Using IoT

Hitachi Metals IR Day 2017

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***Monozukuri* Innovation Using IoT**

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1. Overview of the *Monozukuri* Innovation Project
2. Examples
3. Further Developments in Information Technology Utilization

1-1. Overview of the *Monozukuri* Innovation Project

Monozukuri skills to achieve greater organic growth

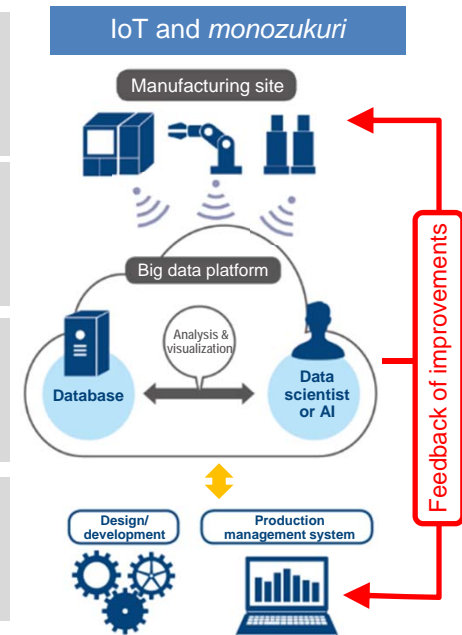
Build innovative *monozukuri* through IoT



Achieve innovation in manufacturing technology throughout the entire material flow

Improve cash flow by rolling out company-wide activities

Company-wide activities	Reduce lead time and inventories.
Analysis of manufacturing conditions	Reduce loss costs and defect rate. Launch new products quickly.
Establishment of new production line using IoT	Establish an innovative production line for magnets. (Scheduled for operation in FY2018) Establish a new continuous casting and rolling line for wires/cables. (Scheduled for operation in FY2018)
Visualization of manufacturing data	Establish a highly efficient production management system.



Impact in FY2016: ¥3 billion → FY2017: ¥10 billion → FY2018: ¥20 billion

1-2. Overview of Initiatives in IoT

Build *monozukuri* skills that are among the best in the world
by utilizing IoT*

Improve
quality

- Reduce loss costs
- Eliminate mega recalls
- Improve risk management

Traceability

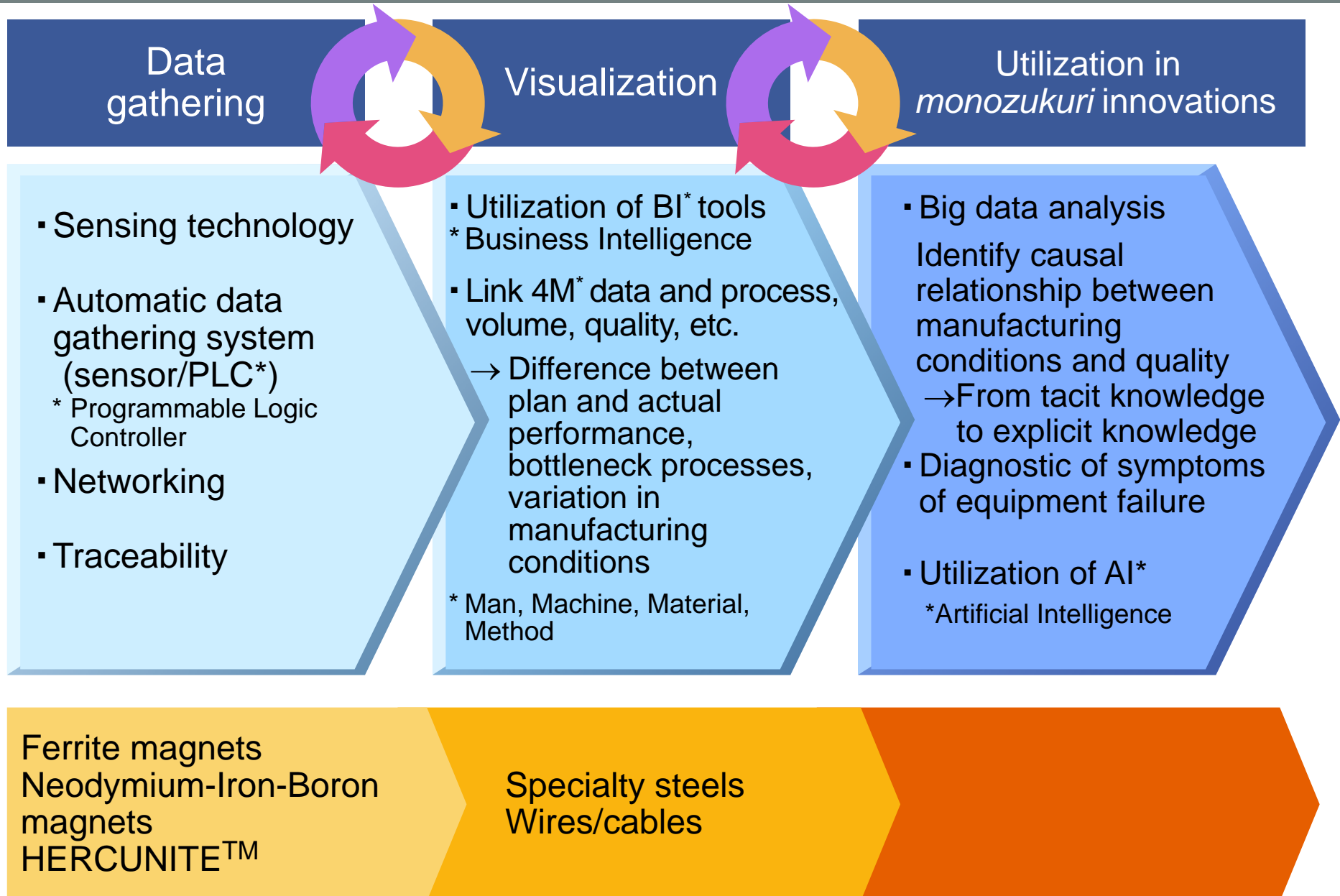
- Improve risk management
- Strengthen the customer base

Symptoms
diagnosis

- Ascertain anomalous conditions quickly
- Roll into the business model

*IoT: Internet of Things

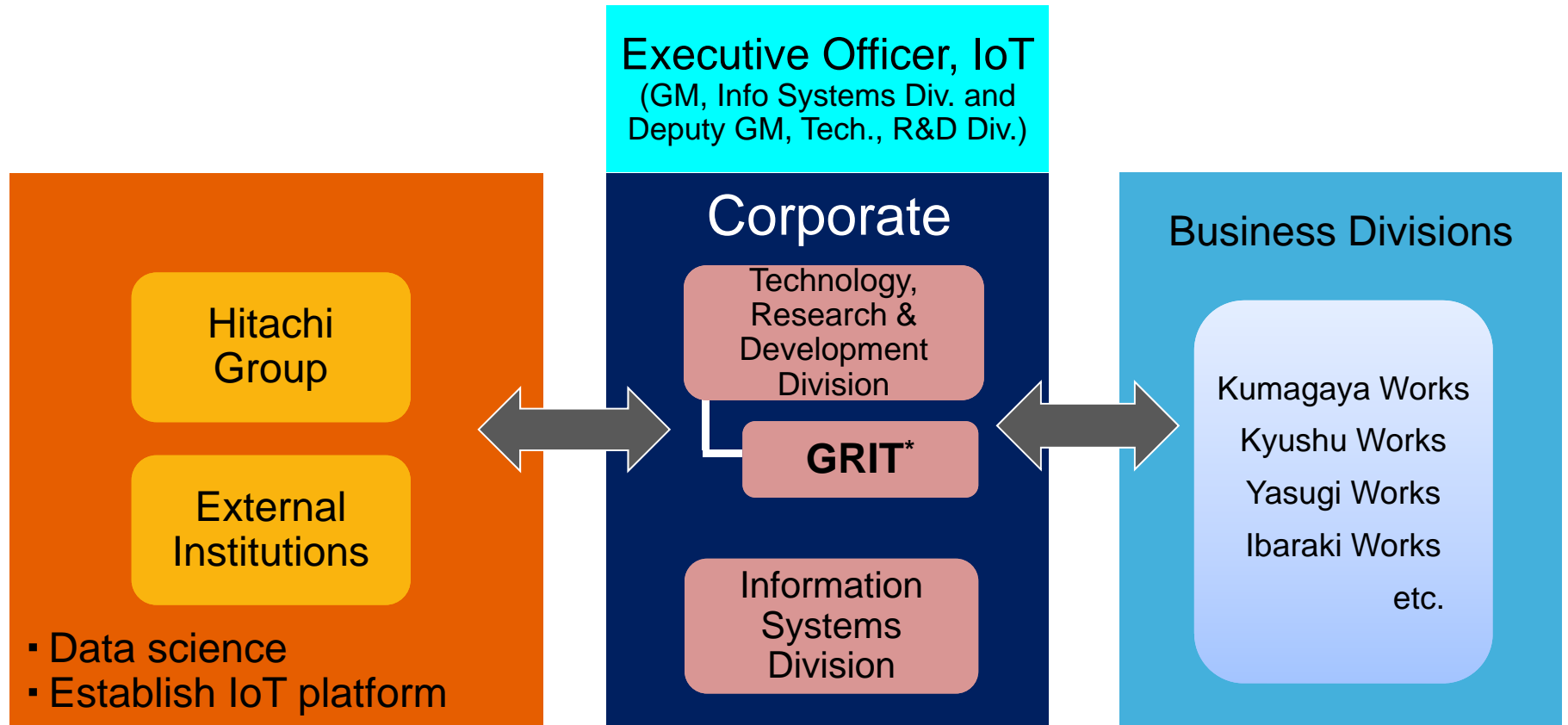
1-3. Roadmap



1-4. Promoting System

Promoting System with Corporate as the Core

- Aggressive investment led by Corporate, rapid developments
- Introduction of advanced expertise from within and outside the Hitachi Group



*GRIT: Global Research & Innovative Technology Center

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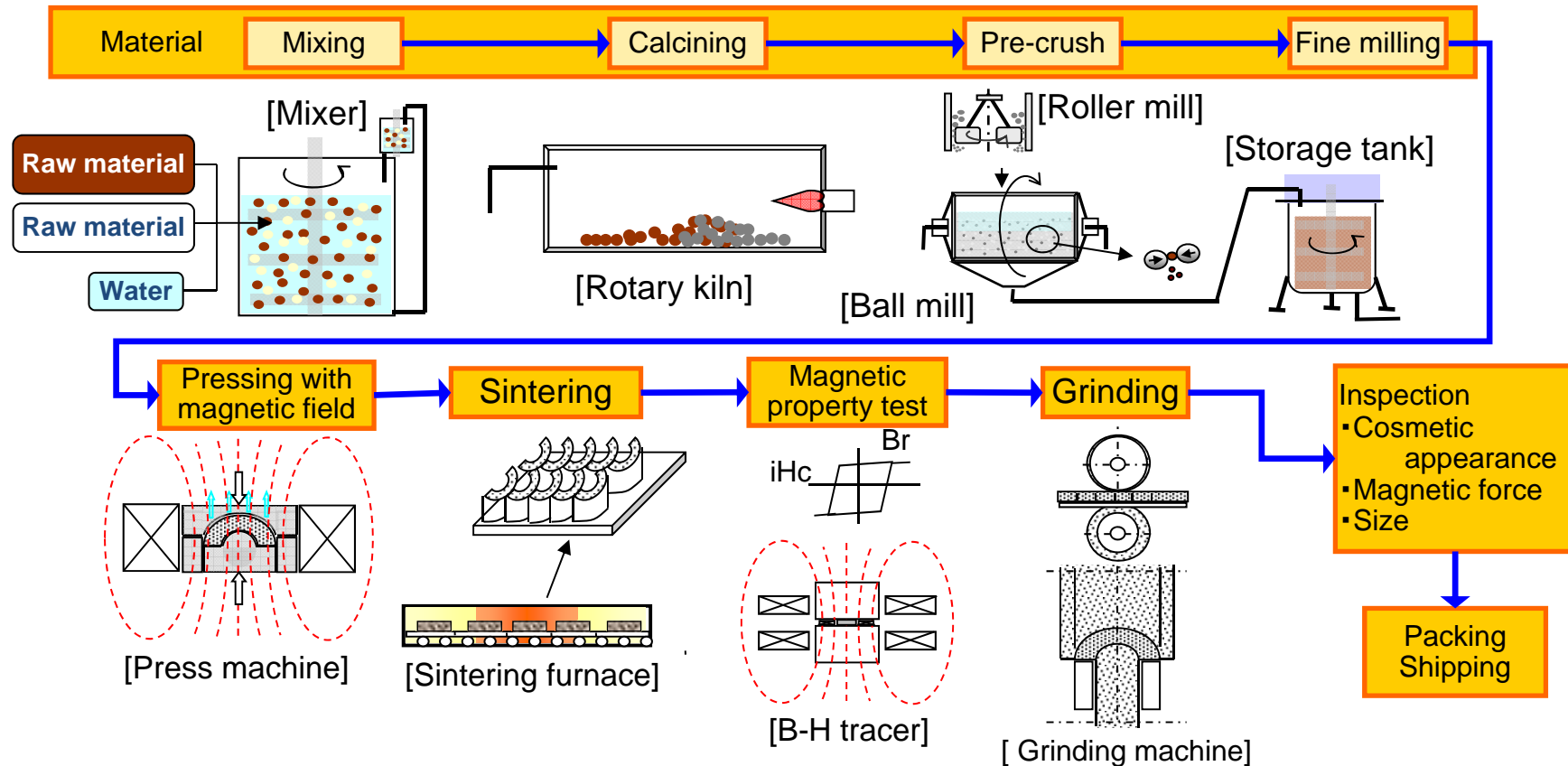
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2-1. Example 1: Quality Stabilization of Magnetic Materials

Visualization Instrumentation of material, pressing, sintering, and grinding process (FY2016)

Technological innovation Quality stabilization based on big data analysis (FY2017)

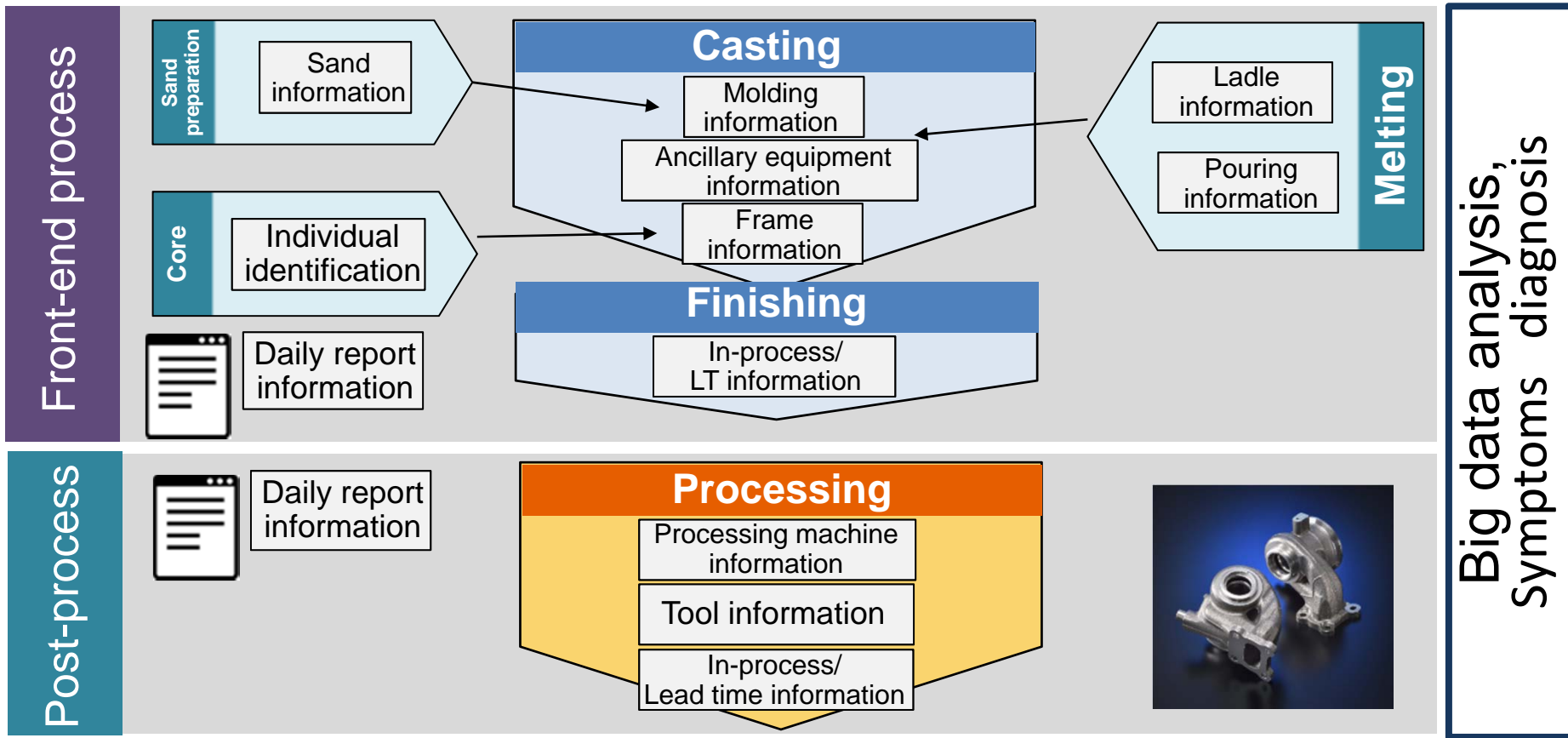


Establish innovative production line at Kumagaya Works (Operation in FY2018)
 ⇒ Global rolling out of achievements

2-2. Example 2: Heat-Resistant Cast Steel Establish Highly Robust Manufacturing System

Data gathering Establish IoT platform (FY2016)

Visualization Analyze manufacturing data (FY2017)



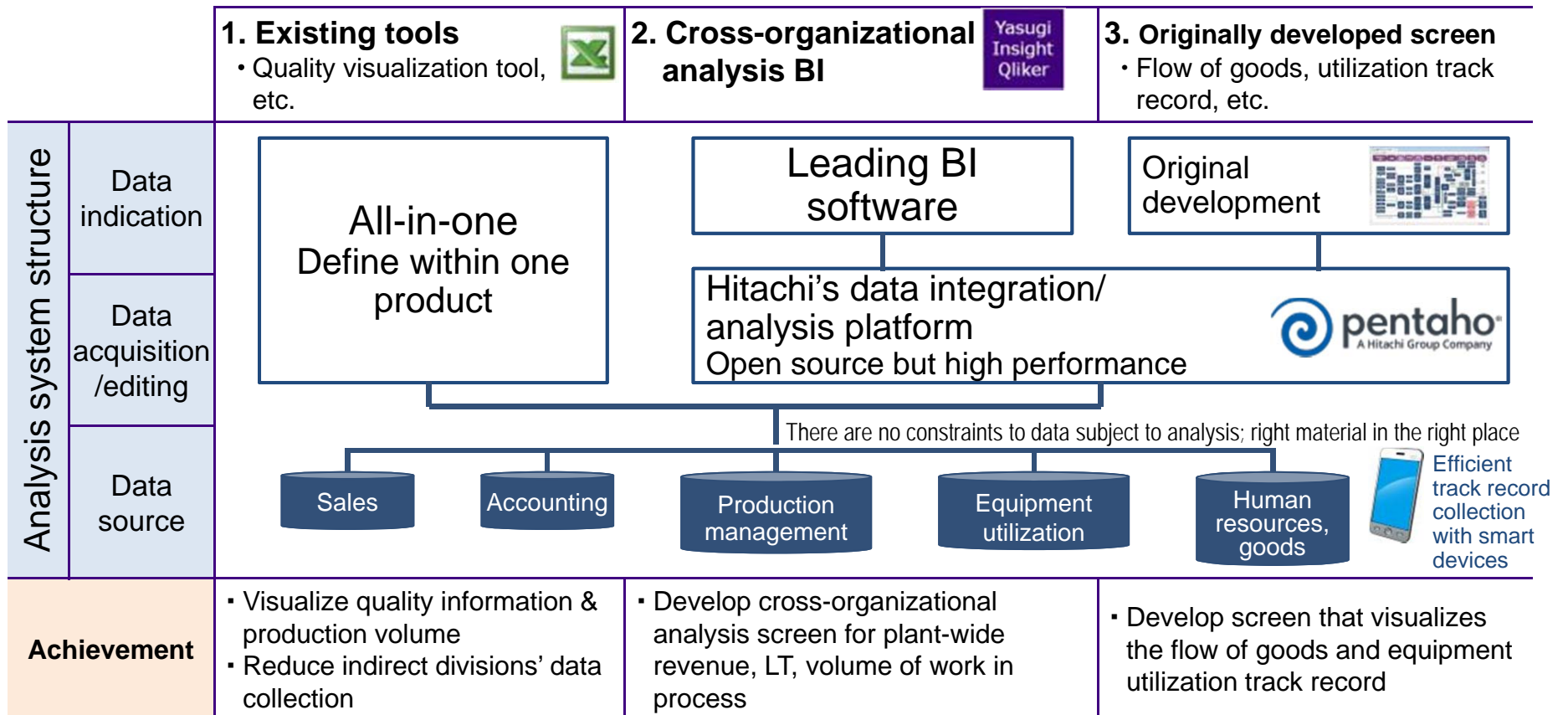
Big data analysis,
Symptoms diagnosis

Production innovation that links analysis with symptom (FY2018)

2-3. Example 3: Visualization of Specialty Steel Production Track Record Data

Visualization Visualization of operation ratio, work-in-process, lead time (FY2016)

Production innovation Establishment of data integration system using BI tools (FY2016)



Refine production plans under complex constraints

2-4. Example 4: Wires, Cables & Related Materials Develop Highly Efficient Technology

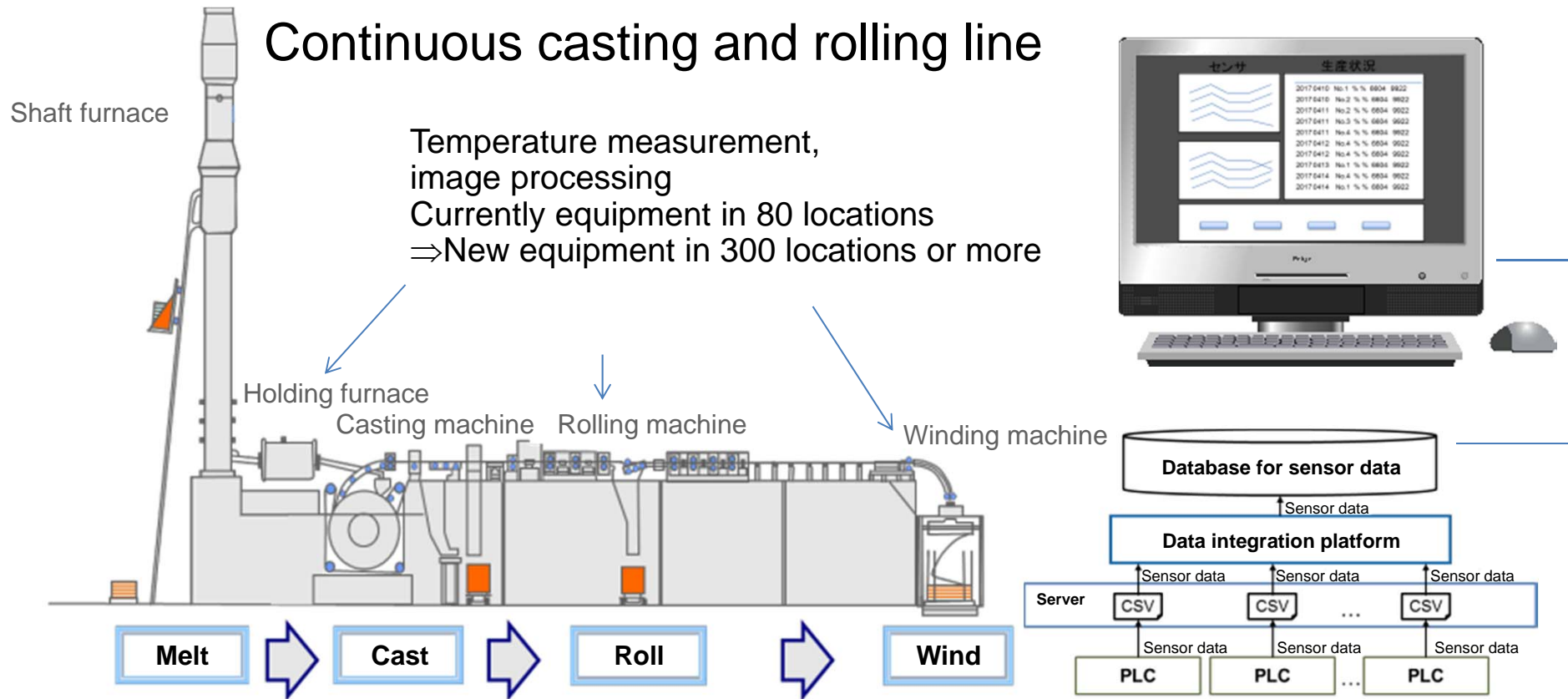
Visualization

Sensor data analysis in a current production line (FY2016)

Technological innovation

Develop dashboard with BI tools (FY2017)

Continuous casting and rolling line



Build innovative line at Ibaraki Works (Operation in FY2018)
⇒ Roll out to HiFC™* and other high-quality copper wires

*HiFC™: A new copper alloy developed by Hitachi Materials with a properties equivalent to high-purity copper

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3-1. Further Developments in Utilization of Information Technology

Accelerate four innovation projects using information technology

Monozukuri
innovation

**Build innovative *monozukuri*
through IoT**

Sales
innovation

**Strengthen sales data linkage within
the Group**

R&D
innovation

**Material Informatics
(Participation in IBM Research Consortium)**

Work-style
innovation

**Improve work efficiency
Focus on more innovative work**

Utilization of AI

Information on Risks Inherent in Future Projections



This document contains forward-looking statements—such as results forecasts and management plans—that are not historical facts. All such forward-looking statements are based upon all available information and upon assumptions and projections that were deemed reasonable at the time the Company prepared this document. Changes to the underlying assumptions or circumstances could cause the actual results to differ substantially. The factors causing such differences include, but are not limited to, the following:

- Changes in economic conditions and regulations in the main markets where the Company operates, particularly Japan, the United States, Asia and Europe
- Sudden changes in technological trends
- Changes in competitive advantage and the capabilities of the Company and its subsidiaries and affiliates to develop and commercialize new products and businesses
- Fluctuations in the status of product markets, exchange rates and international commodity markets
- Changes in financing environment
- The capability of the Company and its subsidiaries and affiliates to cope with fluctuations in product supply and demand, the status of product markets, exchange rates and international commodity markets
- Protection of the Company's intellectual property, and securing of licenses to use the intellectual property of other parties
- Changes in the status of alliances with other parties for product development, etc.
- Fluctuations in Japanese stock markets



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