# Production Systems Research Laboratory

We contribute to the KOBELCO Group in terms of their business competitiveness and profitability via advancement and innovation of production systems. This contribution is based on our measurement, control, production-planning, and data-analysis technologies. Furthermore, we engage in the creation of cutting-edge service menus for our businesses based on our proprietary systemization technology.

Control Technology

- **Process Control**
  - Automatic Process Control System
  - System Identification & Modeling
  - Operation Assist System
  - Machine Learning
- **Machine Control**
  - Embedded System Design
  - Robot Control
  - Software Quality

Systems Engineering

- **Production Control/Logistics**
  - Factory Modeling/Simulation
  - Operation Planning Assistance
- **Data Analysis/Data Usage**
  - Statistical Quality Analysis
  - Data Visualization Assistance
- **Business Model Analysis**
  - Customer/Service Model Analysis
  - Service Business Assistance

Instrumentation Technology

- **Nondestructive Inspection**
  - Surface Inspection
  - Internal Defect Inspection
  - Ultrasonic & Eddy Current Tests
- **Measurements of Industrial Equipment and Processes**
  - Temperature Measurement
  - 3D Shape Measurement
  - Image Recognition

Developed operation assist system visualizing blast furnace condition from various sensor data and realized stabilization of blast furnace operation.
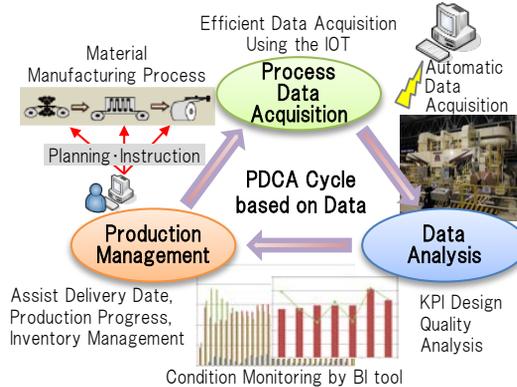

Operation Assist System for Blast Furnace
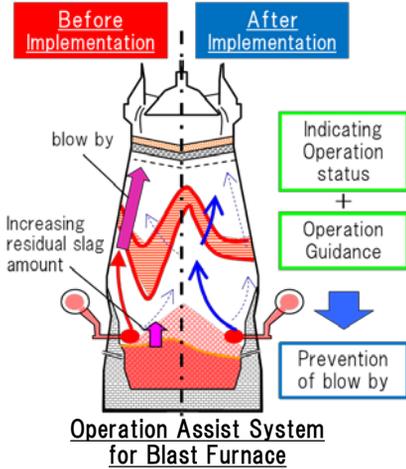
Applications to Products and Processes

Operation and control of various process

Developed an optimization system to markedly improve delivery time and productivity, and to minimize inventory in small-lot, multi-variety variable production situations.

Optimum Management for Multi-variety Variable Production

Applications to Products and Processes

Assistance of operation management at production sites

Developed an automated ultrasonic inspection system for crank throws using probe scanning and noise cancelling technologies.

**Ultrasonic Flaw Detection / Shape Measurement Technology**

Applications to Products and Processes

Crankshafts for marine engines

Applied MBD(Model Based Design) method, data analysis, and software quality management method to control equipment such as welding robots and construction machines.


Motion Control
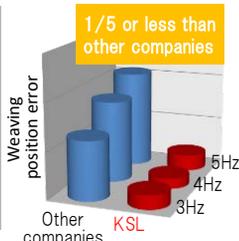
Applications to Products and Processes

Welding robots and construction machines

Developed internet-based ICT platforms for HR development and customer value creation in aftermarket business.

ICT Platforms for Aftermarket Business
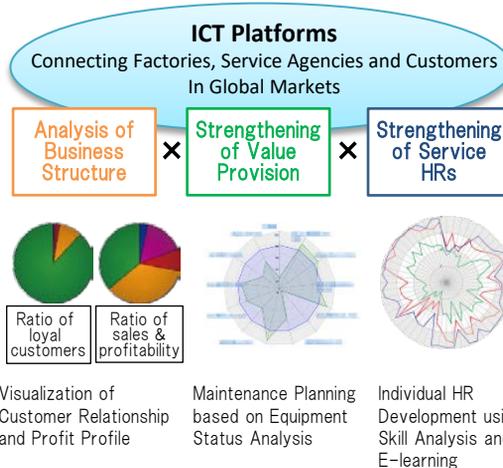
Applications to Products and Processes

Assistance to service business for machinery products

Developed on-line measurement systems (temperature, shape etc.) which can cope with the high temperature / exacting conditions peculiar to the steel industry.
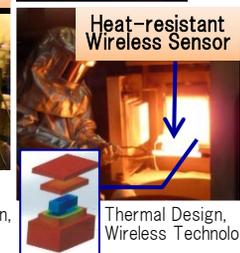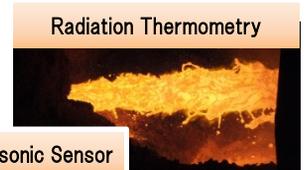
Measurement Systems for High Temperature Processes

Applications to Products and Processes

Process measurement in materials business

KOBELCO