The Industrial IoT disrupts the value chain and demands that companies rethink the way they do business. To succeed in this new environment, they need to engage in their own digital transformation.

The know-how that B&R shares with its customers helps them capture opportunities from the next horizon of operational effectiveness.

- Integrate and analyze data across sources and companies
- Share information across the value chain
- Ensure integration of physical production assets
- Rethink the design of traditional production systems

Systematic analysis and networking of large volumes of data enables more efficient production and more effective customer targeting. It allows companies to explore new products, business models and distribution channels. It creates leaner, more cost-effective internal processes for personnel and knowledge management.

Specifically for brownfield sites, the value lies in end-to-end optimization of how digital data is created and used. This means tapping previously unavailable or un-utilized information as well as eliminating information losses at the interfaces between functions, sites and companies.

For both greenfield and brownfield applications, B&R solutions for smart, connected machines offer benefits in three main areas:

**Maximum asset utilization:**
- Make operations more reliable while ensuring maximum performance at lower cost
- Match customer requirements with highly flexible automation systems
- Make optimum use of available resources

**Additional revenue streams:**
- Generate new business models, e.g. pay-per-use
- Offer machine upgrade recommendations via software
- Offer increased uptime with predictive maintenance in premium service level agreements

**Enhanced service and after-sales support:**
- Leverage data to improve products and processes
- Provide better service at a lower cost
- Analyze historical data for accurate prediction of maintenance cycles
Use cases

**Industry:** Food & beverage

**Application:**
- Lifecycle management
- Connectivity to higher-level IT systems

**Your value:**
- Improved brownfield competitiveness
- Operational effectiveness

**Industry:** Maritime

**Application:**
- Process data acquisition
- Secure remote maintenance

**Your value:**
- Enhanced lifecycle management
- Provide additional services
- Optimized end-user experience

**Industry:** Automotive

**Application:**
- Online vibration monitoring on assembly line
- Data aggregation on edge controller

**Your value:**
- Prevent secondary damage
- Predict achievable product quality and production quantities
- Reduced unplanned downtime

**Industry:** Processing

**Application:**
- Secure remote access
- Update programs and firmware

**Your value:**
- Enable operators to engage with processes from anywhere
- More effective monitoring and service at reduced costs
B&R Industrial IoT solutions

Modular software
B&R’s mapp Technology components simplify machine-level data aggregation. They offer a wide range of functionality, including:

- **mapp Energy:** evaluate a machine’s energy consumption
- **mapp OEE:** measure a machine’s productivity and losses
- **mapp Tweet:** forward key events to tablets and smartphones
- **mapp Data:** back up values of defined process variables

For more information about B&R’s modular software framework, check out the mapp Technology folder.

Edge computing
To achieve maximum network performance and real-time capability, the B&R edge architecture offers a proven solution for on-premises data storage and processing. This strategic architectural choice is essential to Industrial Internet networks.

B&R edge functionality:
- Data historian
- Business intelligence
- Security
- Plug & play / connectivity
- Remote access
- I/O connectivity via OPC UA TSN
- Data aggregation

Secure remote maintenance
B&R’s Secure Remote Maintenance makes diagnosing and maintaining machinery and equipment easier than ever. The solution utilizes the latest IT and security standards and allows for significant savings with low investment costs.

Process data acquisition and business intelligence
Systematic acquisition of raw data directly from the production level in real time is essential in modern manufacturing. Centralized, seamless acquisition of operating and process data from machines and equipment is now much easier thanks to B&R’s Industrial IoT solutions.

Condition monitoring
B&R offers condition monitoring as a pre-installed, pre-configured package that makes implementing predictive maintenance more straightforward than ever.

Energy monitoring
B&R’s energy monitoring package enables measurement, recording and evaluation of all relevant energy usage to provide optimal support for the continuous improvement of processes.

Cloud
The cloud offers extended functionalities in the Industrial IoT environment. It interconnects globally distributed sources of data and enables big data analytics and long-term storage. Cloud-agnostic connectivity solutions are fully implemented in B&R’s system solutions.
For an individual machine, Industrial IoT means real-time closed-loop control and the opportunity to implement the latest software technology in both greenfield and brownfield installations. Machine-level IIoT functionality provides immediate feedback on asset performance.

B&R mapp Technology offers a highly innovative solution for data aggregation and visualization using standard software functionalities.

Key features:
- Suitable for any production environment
- Flexible and scalable
- App-like software upgrades
- Advanced maintenance service

Industrial IoT functionalities embedded in the controller offer the customer further added value. Seamlessly integrated into B&R’s automation software landscape, the controller offers remote access capabilities and all the necessary features for line, plant and cloud connectivity. Local data aggregation and processing complies with the latest security standards. For real-time data processing, it even masters the fastest cycle times.

Remote I/O is one of the standard approaches to system design for brownfield applications. Linked to a 3rd-party PLC, the full-fledged CPU functionality of the X20 Compact CPU plus a plug-in fieldbus module create possibilities that go far beyond simple data preprocessing. There are plenty of reserves for complex application processing as well.

### Brownfield machine installation

<table>
<thead>
<tr>
<th>B&amp;R controller</th>
<th>3rd-party PLC</th>
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<tbody>
<tr>
<td><img src="image1.png" alt="B&amp;R controller image" /></td>
<td><img src="image2.png" alt="3rd-party PLC image" /></td>
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B&R edge functionalities offer centralized data acquisition from every module in a production line. Business intelligence and data historian features offer long-term trend and forecast generation.

Material flow tracking allows each completed production step to be retraced seamlessly at any time. It’s now even easier to automate complex production processes efficiently and safely. As a standalone solution, line controllers can be integrated into existing automation systems without risk.

Open communication standards are key. With the introduction of OPC UA TSN, we now have a uniform language for communication between industrial PLCs and the cloud. Implementation of industry standards like EUROMAP, MTConnect and PackML provides additional advantages for cross communication.

**Key features:**
- Line connectivity for access to all line/plant data
- Data recording and archiving with full redundancy
- Business intelligence solutions for data processing and analytics

For remote servicing, B&R SiteManager establishes secure remote access instantaneously.
Cloud computing delivers scalable and dynamic IT-enabled capabilities as a service. As the gateway to smart manufacturing, it connects smart devices and opens new windows of visibility into processes.

Big data analytics enable better and faster decision-making. Seamless connectivity across plant lines facilitates new collaboration. The connected enterprise makes all this possible – it converges plant-level and enterprise networks and securely connects people, processes and technologies.

New services and products emerge, creating new ways to generate value for customers. Globally generated data can be captured in the cloud for centralized processing of high-level tasks.

Key features:
- Scalability
- Accessibility
- Data transparency
- On-demand services

The Industrial IoT allows automation of processes that can help you get to market faster, measure performance more accurately and respond more rapidly to customer needs. It opens up new models for monetizing additional services on top of existing products.
Integrated automation
Global presence
Solid partnership