psc_ **TRANSITION** TECHNOLOGIES

Industry 4.0 Use Cases Catalog

_Smartify Your Factory

Discover the potential
of digital manufacturing with
Transition Technologies PSC

_Voice of the Ekspert

Jakub Kaczyński

Portfolio Director
Transition Technologies PSC

jakub.kaczynski@ttpsc.com
+48 661 781 949

(**LinkedIn**)

> 66
>
> *Digitalization is a key enabler and element of the strategy to ensure efficient industrial operations.*

Let's compare some simple statistics based on the latest research:

Representatives of **83% of manufacturing companies** agree that the implementation of Industry 4.0 helps increase competitiveness in the industry.

Already 1/3 of manufacturers plan to spend up to **40% of their innovation budget** for this purpose.

At the same time, **half of the respondents** mention the following as the greatest difficulties: undefined business results, information noise around Industry 4.0 and lack of clear guidelines on how to start these initiatives.

We know that the area of Industry 4.0 is full of buzzwords and complex technologies.

Our goal is simple – to show you how these solutions optimize and improve your everyday work.

Let's sort out this chaos and **focus on the benefits.**

_Table of Content

_Production Challenges Map

A summary of the most common production challenges, along with dedicated solutions that effectively tackle them. Find out how we can help you to **produce more for less.**

1

Challenge

- Increasing **production capacity** without investing in new lines.
- Unplanned and prolonged **downtimes.**
- Lack of **operational flexibility** and low ability to adapt to changes.

Solution
Production Monitoring with OEE ❯

2

Challenge

- Inability to predict failures and a high cost of **unplanned downtime.**
- High **maintenance cost** (labor costs, spare parts).
- Lack of understanding of the **impact of production process parameters** on machine life.

Solution
Predictive Maintenance ❯

3

Challenge

- Current root cause analysis doesn't enable **proactive response** to quality problems.
- **High costs** resulting from **low quality.**
- Unsatisfactory **first pass yield.**

Solution
Predictive Quality ❯

4

Challenge

- **Paper-based production event reporting.**
- **Complex and delayed flow of information** and the process of cooperation between different teams.
- **A multitude of standards,** document templates and data used.

Solution
Paperless manufacturing ❯

5

Challenge

- The need to make frequent changes to **paper instructions.**
- **Difficulty in learning and following paper instructions,** resulting in a decline in quality and lack of compliance with standards.
- Inability to efficiently **track and report** on individual stages of the process.

Solution

Digital Work Instructions >

6

Challenge

- Improve the **efficiency and profitability of field service.**
- Reduced visibility into the **performance of products** after they have been sold to **optimize** their usage.
- High **costs of after-sales service** related to travel costs of the field team.

Solution

Remote monitoring and service >

7

Challenge

- Excessively **high costs of energy** and other resources (water, gas, compressed air).
- Difficult to **optimize energy efficiency.**
- The need to **reduce CO_2 emissions.**

Solution

Energy monitoring >

8

Challenge

- No ready-made solution that responds to **changing needs.**
- Inability or difficulty in developing or adapting **current systems.**

Solution

Tailored industrial applications >

_Production Monitoring with OEE

Monitor and improve OEE

Addressed to: operators, maintenance and quality control teams, production managers, plant managers

Thanks to direct integration of machines and controllers, it is possible to report production status and production statistics (e.g., OEE) in real time.

This is usually the first step towards digitalization, because the OEE indicator is used as a benchmark for all other initiatives optimizing production, also using artificial intelligence and machine learning (AI/ML).

_Challenges

- Increasing production capacity without investing in new lines.
- Unplanned and prolonged downtimes.
- Lack of operational flexibility and low ability to adapt to changes.

_Solution

Automatic data acquisition
Automate real-time acquisition of data and signals from production machines and systems.

Real-time KPI monitoring
Display data in the form of easy-to-read dashboards and screens, allowing for comparison between plants or production lines.

Downtime reporting
Automatic downtime reporting with categorization of root causes and Pareto analysis.

Bottleneck identification
Troubleshoot the issues with all relevant data (actual, historical, trends).

Alerts and notifications
Alerts and SMS/e-mail notifications to improve information flow and reaction time.

_Results

Improvement of OEE – up to 15% in the first year
Increase production efficiency and better resource utilization.

Unplanned downtimes reduction – up to 25%
Elimination of unexpected disruptions in the production process.

Increase employee efficiency and productivity
Improve staff efficiency and time management.

_Success Stories

Lacroix – electronic manufacturer from France
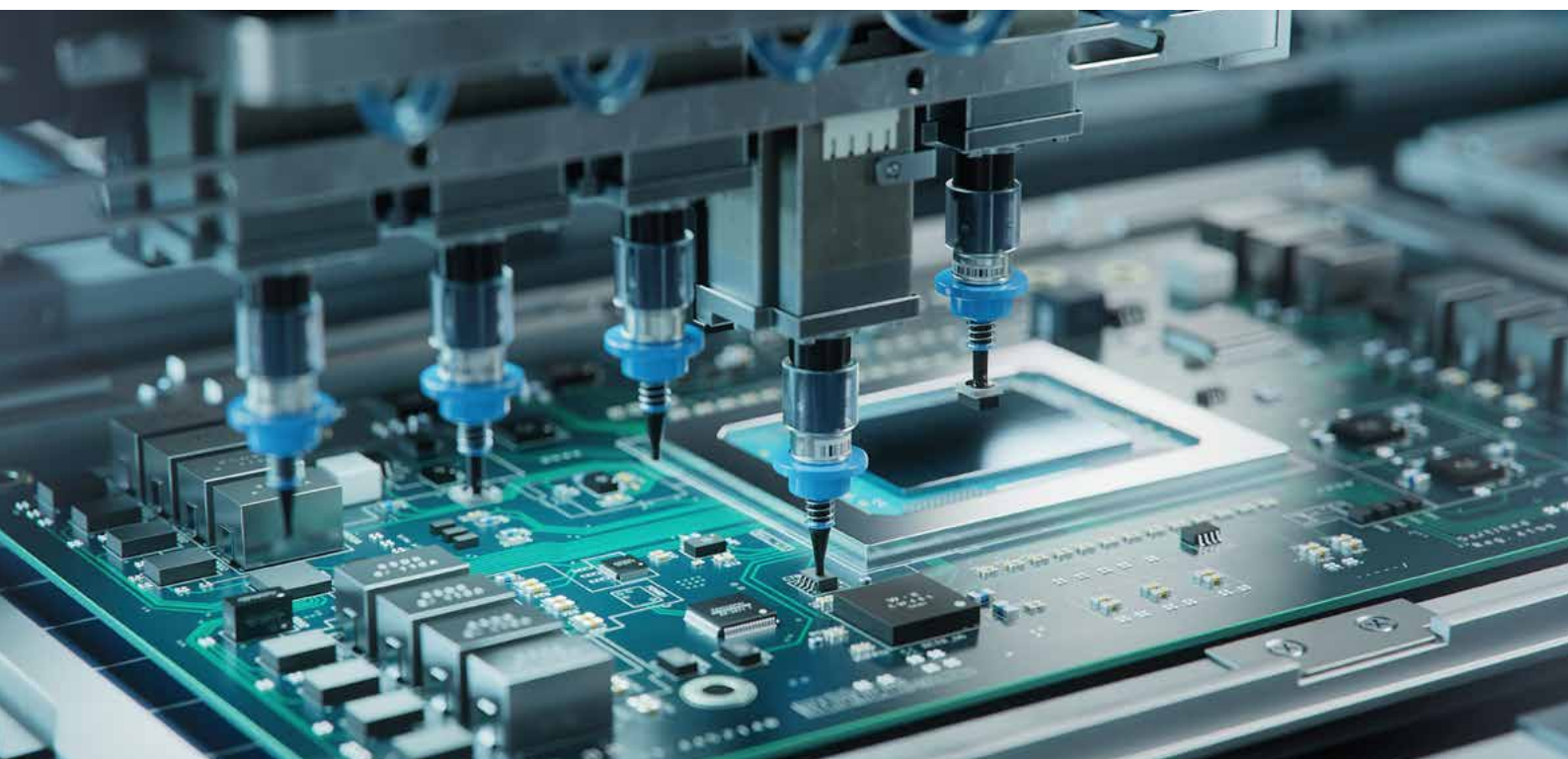

Challenges

- The need to ingest data from 1000+ machines.
- No possibility to monitor production KPIs in real-time.
- Insufficient control of the production process.

Results

- Reduction of product quality defects.
- Minimizing non-automated tasks and manual inputs.
- Improvement of OEE.

Read full description >

Medical products manufacturer

Challenges

- Difficult OEE tracking and process optimization.
- The need to automate processes.
- Manual and time-consuming integration of data from multiple sources.

Results

- Unplanned downtimes decrease.
- Increased line efficiency.
- Better identify and resolve bottlenecks.

Read full description ❯

Building materials manufacturer

Challenges

- Too many unplanned downtimes.
- The need to improve efficiency and enable data-driven decision-making.

Results

- Unplanned downtimes reduction.
- Increase operational efficiency.
- Accelerating decision-making processes.

Read full description ❯

_Related materials

7 ways how data visibility helps manufacturing improve efficiency ❯

_Predictive Maintenance

Reduce the numer of failures and their duration

Addressed to: maintenance engineers, operators, plant managers

---

Prevention is the most effective maintenance strategy to reduce the number and duration of breakdowns, save money and increase productivity.

Use real-time data and predictive algorithms powered by AI (artificial intelligence) to move away from fixed schedules and move from traditional maintenance to a forecast-based approach.

_Challenges

- Inability to predict failures and a high cost of unplanned downtime.

- High maintenance cost.

- Lack of understanding of the impact of production process parameters on machine life.

_Solution

Seamless integration

Integration with any existing systems enabling automatic monitoring and pattern detection to ensure maximum equipment uptime.

Trends and correlations

Identification of relationships between process parameters and machine condition using AI/ML engines.

More effective maintenance decisions

Advanced machine learning algorithms analyze data from all sources, detect anomalies and predict failures in advance.

Real-time monitoring and alerts

Information about the expected time until the next machine failure occurs, based on ongoing monitoring of their health and AI technology.

Hardware failure prediction

Defining and identifying critical areas on the production line and receiving real-time warnings of their failure well in advance.

_Results

Reduction of maintenance costs by up to 15%

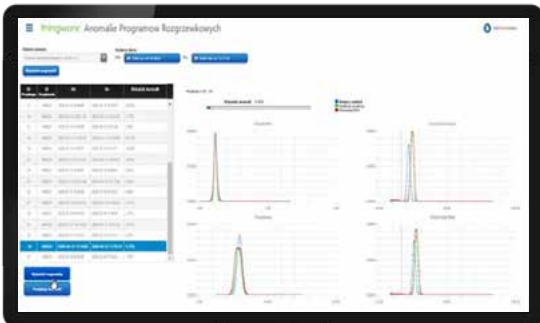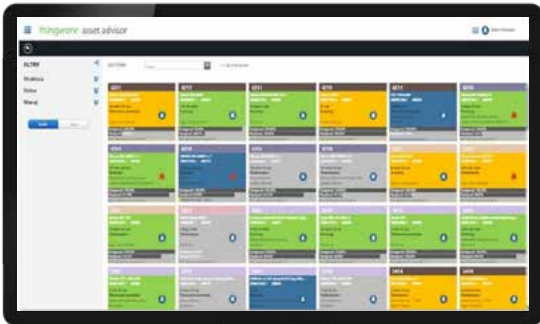Machine maintenance cost reduction, more effective budget management.

Reducing machine failure rate by up to 15%

Machine downtime reduction, increased process reliability and stability.

_Success Stories

Global manufacturer of aerospace and defense components and assemblies

Challenges

- Low machine uptime and high maintenance complexity.

- Inability to understand and predict failures.

- Inflexible scheduling of maintenance work.

Results

- Awareness of the conditio of machines and their statistics – better control over the production process.

- Fast and targeted maintenance resulting in a reduction of unplanned downtimes.

_Related materials

Predictive Maintenance ›

AI-driven Industrial Analytics accelerator ›

Industrial Analytics ›

Data Workshops (AI Data Discovery) ›

_Digital Work Instructions

The path to efficiency and precision at every stage of production

Addressed to: production technicians and engineers, machine operators, quality managers

Replace paper versions of work instructions, quality control or standard operating procedures (SOPs) with electronic versions. Display them on a workstation HMI, tablet or AR glasses.

Extended with additional information, such as recordings, photos, or data collected in real time (e.g. from intelligent tools) allow for even more effective performance of complex procedures.

_Challenges

- Frequent changes of paper instructions.
- Difficulty in learning and following paper instructions.
- Inablility to efficiently track and report on individual stages of the process.

Exemplary use cases

Operator

Digital and step-by-step standard operator manuals (SOPs).

Maintenance Engineer

Support in carrying out repairs and the ability to document them.

Quality Engineer

Control and automatic reporting of quality control processes.

Training & onboarding

More effective on-the-job training and knowledge sharing.

Field Engineer

Context-sensitive help in performing repairs and recording their progress.

Warehouse logistics

Optimization of warehouse logistics and the order picking process.

_Solution

Effective scheduling

Planning and assigning orders to operators, maintenance engineers, and quality engineers in a standardized and efficient way.

Digital instructions with full monitoring

Digital instructions guide you step-by-step through the process, with the ability to collect and display key data and track progress, duration, measurement values and visual parameters.

Integrated process planning

Synchronization of process plans, material lists and linking orders and production paths in a central database.

Flexible display of instructions

Display instructions on various devices such as HMI screens, tablets and augmented reality glasses for greater flexibility and accessibility.

Available on:

Mobile devices

Industrial Glasses (Realwear)

_Results

Work more efficiently with intelligent tips

Increase staff productivity thanks to contextualized suggestions and user guidance.

Fast and automatic distribution of work instructions

Reduce the time needed to create and distribute instructions thanks to automated processes.

Less paper consumption in production

Reduce paper usage by switching to digital documentation.

_Success Stories

Vestas – Danish wind turbines manufacturer

Vestas.

Challenges

- Work instructions in paper form requiring frequent updating.
- Service work at heights requiring free hands of the employee.
- Aging workforce, lack of people willing to work.

Results

- Faster onboarding of new employees.
- Easy recording and sharing of knowledge.
- Contactless operation of work instructions.

Read full description >

Linak – Danish manufacturer of electric actuator systems

LINAK ⚓
WE IMPROVE YOUR LIFE

Challenges

- The need to optimize production processes.
- Difficult access to real-time data.
- Lack of uniform and centralized monitoring of production statistics.

Results

- Minimization of operator errors.
- Reducing training cost.
- More effective decision-making process.

Read full description ❯

Solaris – European leader in electric buses manufacturing

SOLARIS
A CAF GROUP COMPANY

Challenges

- The need for effective and quick service and to provide customers with access to expert knowledge.
- Strive to reduce vehicle downtime.

Results

- Quick diagnostics and remote support for service technicians.
- Lower costs of business trips.
- Minizmizing bus downtime.

Read full description ❯

_Predictive Quality

A new generation of quality control processes using AI

**Addressed to:** quality managers and engineers, production operators, production managers

An innovative solution aimed at improving production quality. By analyzing process parameters in real time, it identifies and diagnoses quality problems before they appear in the finished product.

Our artificial intelligence-based solution uses predictive analytics, analyzing incoming data and identifying problem areas, which allows us to minimize the number of defects.

Watch the demo

_Challenges

- Current root cause analysis doesn't allow to proactively respond to quality problems.

- High costs related to ineffective quality assurance and control.

- Unsatisfactory first pass yield due to quality issues.
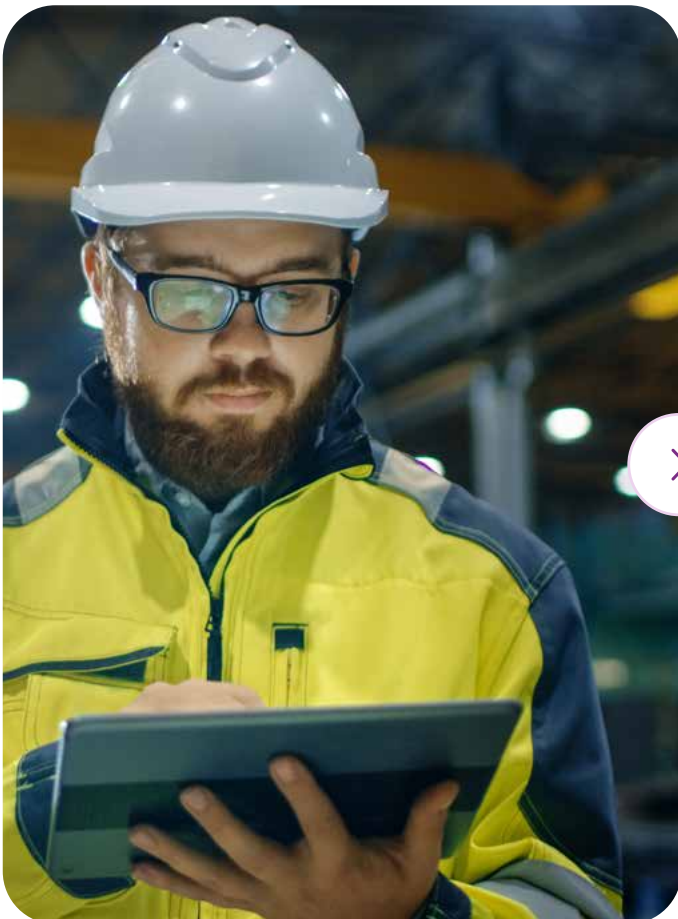
_Solution

Analysis of the production process
To extract valuable trends and construct an appropriate machine learning model.

Identification of quality problems
Constant monitoring of the production process, including its parameters and factors influencing it.

Dynamic quality control limits
Applied in real time to specific signals instead of classic SPC (Statistical Process Control).

Quality prediction
For a specific production batch based on historical data.

Recommendations
Concerning process optimization to ensure the highest possible quality.

_Results

Lower defect rate and repair rate (8-12%)
Reduce the number of defects and repair rate, which increase the overall reliability of the system.

Quality index increase (4-15%)
Increase the overall product quality to increase customer satisfaction and market competitiveness.

_Success Stories

VOSS Automotive Polska Sp. z o.o. – German automotive supplier

Challenges

- Risk of releasing defective products to the market.
- Expensive warranty returns.
- Inability to holistically analyze qualitative data.

Results

- In-dept analysis of production and quality.
- Identification of key causes of quality errors.
- Risk of quality errors prediction with 85%+ accuracy.

Semiconductor manufacturer

Challenges

- Issues with the product quality.
- Costly losses during chemical filtration process.
- Low end customer satisfaction and frequent warranty returns.

Results

- Optimize batch quality by detecting anomalies.
- Reduce waste by detecting issues before adding expensive materials to batch.
- Understand physical relationships during the process.

_Related materials

Predictive Quality Analytics >

AI Data Discovery >

How can AI Data Discovery help manufacturing companies? >

_Energy monitoring system

Monitor and control the consumption and costs of energy utilities

Addressed to: production managers, energy engineers, process improvement teams, teams responsible for sustainable development initiatives

Energy Advisor – an award-winning energy management system for manufacturing companies.

Thanks to data available in real time, in a user-friendly interface, it allows to indicate deviations from the norm, losses and areas where it is possible to optimize utility costs.

Watch demo

_Challenges

- Excessively high costs of energy and other resources (water, gs compressed air).

- Difficult to optimize energy efficiency.

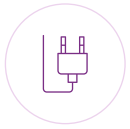- The need to reduce CO_2 emissions.

Award-winning EMS system

Innovation in business
Technology Innovator Awards
2022

GERMAN INNOVATION AWARD '23

The Best of Industry 4.0 ····¢

_Solution

Real-time energy consumption monitoring

Real-time monitoring of energy (and other resources) consumption with energy efficiency metrics.

Cost analysis

Including the energy and utilities component of production with the possibility of optimizing the energy mix and production planning.

Power Guardian

Monitoring current consumption of electricity in relation to the ordered power, predicting total consumption, alerting and notifications in the event of expected exceedances.

Calculation of future costs

Analyze future costs based on historical data, variable rates and consumption levels. Counting and comparing different scenarios for the future billing period.

Alerts and notifications

Monitoring important areas (such as quality parameters, measurements, KPIs, predicting exceedances of the ordered capacity) and notifying individually defined groups of recipients via SMS, email or in the application.

_Results

Reducing energy bills by up to 30%

Energy costs reduction to drive financial savings.

Minimizing energy losses

Process optimization to reduce energy waste.

Reducing CO_2 emissions and carbon footprint

CO_2 emission and carbon footprint reduction from production processes.
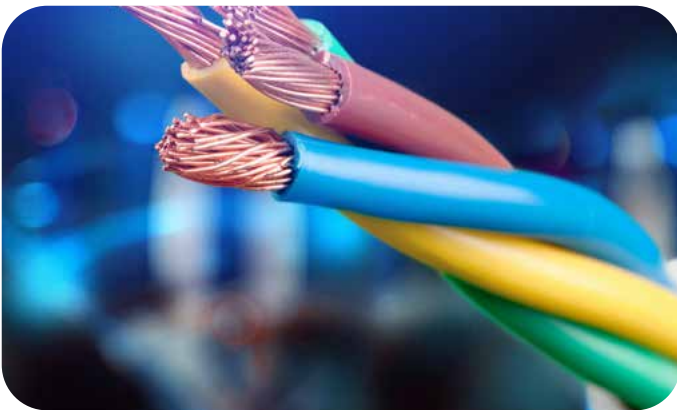
Energy costs reduction up to 30%
Discover our system and see how to achieve that.

Check out

_Success Stories

Mexican cable manufacturer

Challenges

- High electricity costs.
- Inability to easily identify areas and machines causing consumption exceedances.

Results

- Significant cost reduction by identifying areas and equipment causing the greatest wear and tear.

Global company in the food industry

Challenges

- Difficult utility consumption monitoring.
- Complex process of energy losses identification.
- No central utilties usage source of truth.

Results

- Reduction of media consumption.
- Simplified analysis and loss reduction.
- Central source of information for the organization.

Read full description >

_Related materials

5 ways Manufacturers can reduce energy costs >

5 steps to increase energy efficiency for Manufacturers >

# _Remote monitoring of machines and devices (remote service)

Remote Service 4.0: innovative monitoring, immediate response

Addressed to: product design engineers, customer service teams, operators, process technicians

For manufacturers of machinery and equipment who provide additional maintenance services to their customers, it is most important to create products that are reliable. Faults should be detected and repaired as quickly as possible, preferably remotely and without the need for technicians to travel. This is enabled by digital solutions that allow not only remote product monitoring, but also remote diagnostics and product software updates. In addition, they allow to analyze customer usage of the product.

_Challenges

- Improve the efficiency and profitability of the field service.

- Reduced visibility of the performance of products after they have been sold to optimize their usage.

- High costs of after-sales service related to travel costs of the field team.
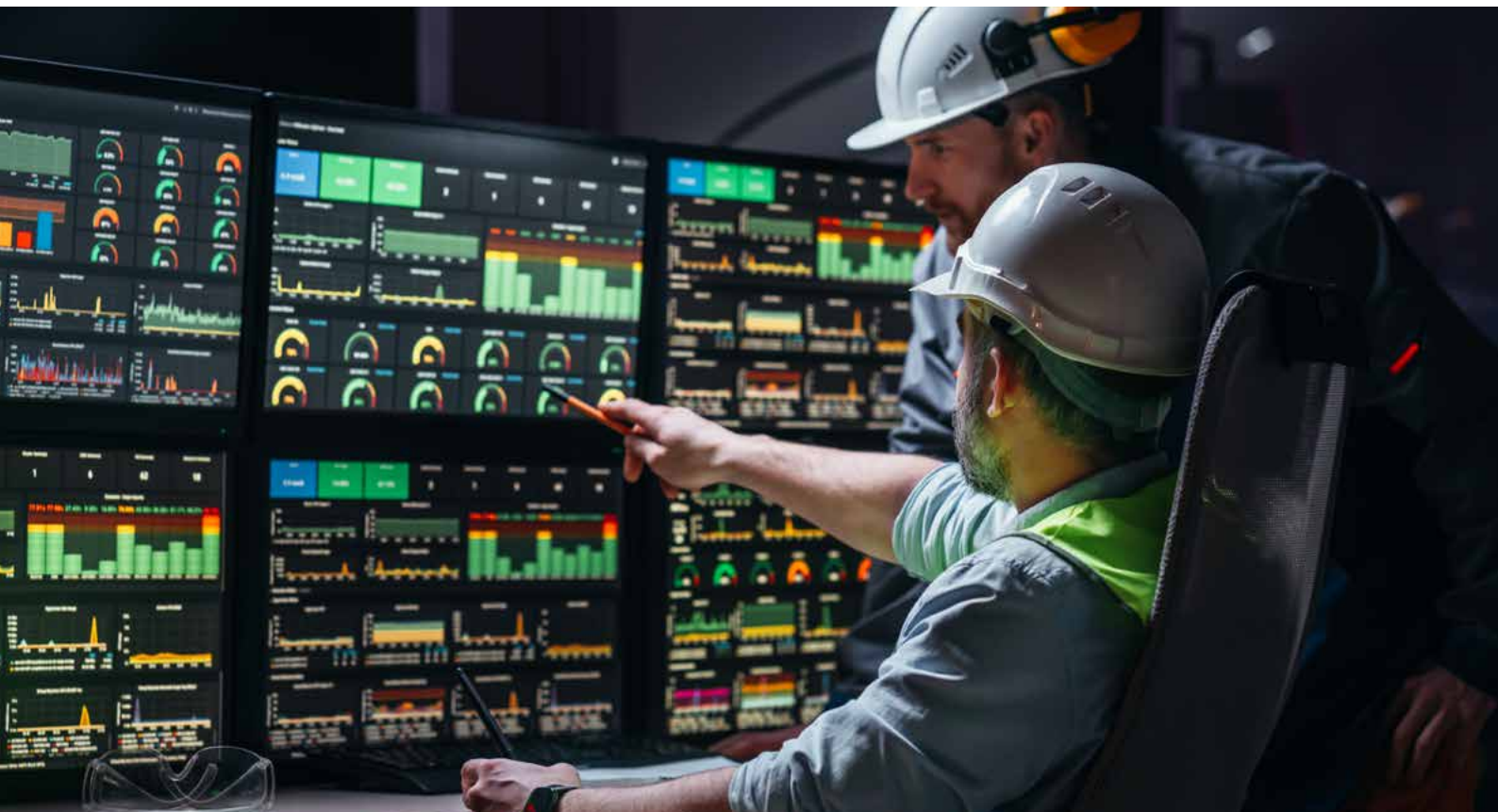
_Solution

Device connectivity

Secure, remote connection to the device to collect data in real time and send it to a central system.
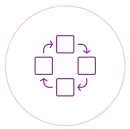
Central data platform

Data is safely collected in a central system that enables their management and further analysis (including the use of artificial intelligence algorithms).

Real-time monitoring

The transmitted data is constantly monitored to analyze the condition and use of the product and to notify all disturbing events (e.g. anomalies).

Integration of data sources

Connect to other after-sales systems to automate your workflow.

Remote service

Possibility to perform safe, remote service and diagnostics as well as remote software update without the need to visit the site.

_Results

Improved first-time-fix-rate up to 92%

Increase repair success rate for more effective management.

Reduction in the time to resolve a service request (up to 30%)
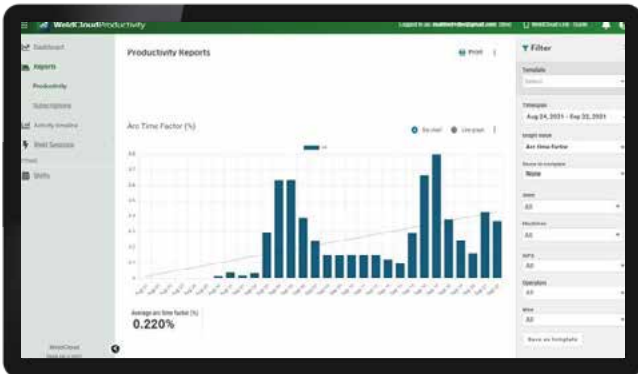
Faster response to customer problems.

Increase in the number of tickets resolved remotely (up to 63%)

Improved efficiency and travel costs reduction.

_Success Stories

ESAB – global manufacturer of welding and cutting equipment and materials
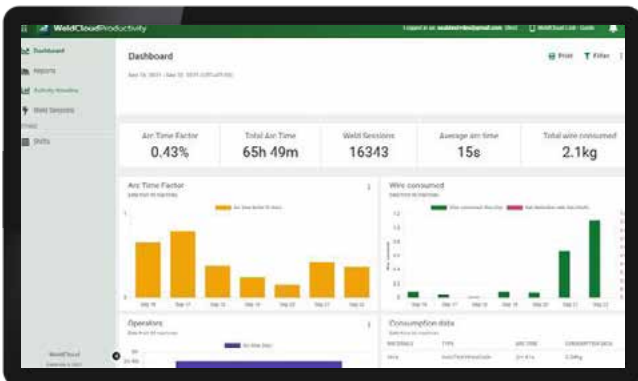

Challenges

- The need to build innovation and competitiveness.
- The desire to improve the quality of services and products.
- Lack of insight into the use of welding equipment and the welding process.
- Difficulties to update equipment firmware.

Results

- A safe and scalable system based on the public cloud.
- Enabling continuous improvement of the welding process and tools.
- Quick detection of problems and anomalies.

Read full description 〉

Haarslev – leader in the production of food processing equipment

Challenges

- The desire to develop a new offer around monitoring production processes and machine performance.

- Time-consuming, manual data collection and analysis.

Results

- Full visibility of current machine status and key indicators.

- Minimizing access time to data for analysis.

Read full description ›

Planet Innovation – manufacturer of medical equipment

Challenges

- Ensuring the highest possible reliability of devices.

- Improved and accelerated repair times.

- Allowing remote monitoring of the device's status and operation, as well as remote troubleshooting.

Results

- Make it easier to monitor devices around the world in a central system.

- Speeding up the process of problem identification and solution.

- Reducing the number and duration of local service visits - increasing profitability of the service area.

Read full description ›

_Paperless manufacturing

Give up paper and gain process efficiency

Addressed to: production managers, process improvement teams, production plant and enterprise managers

Digitizing the acquisition and flow of data in the factory between different areas and teams allows for improved communication, faster response times and making better decisions based on data analysis. It is based on dedicated software that replaces paper documents used in production and in areas such as planning, purchasing and quality control.

The application collects data and monitors production processes to speed up and facilitate the flow of data and work between teams.

_Challenges

- Paper-based production event reporting.

- Complex and delayed flow of information and the process of cooperation between different teams.

- A multitude of standards, document templates and data used.

_Solution

Industrial communications

Ensuring automatic data collection in the enterprise (from machines, processes, systems) allows them to be displayed in the context of a given step in the process.

Document change management

Tools for managing changes to documents or plans with the option of version control and immediate distribution after approval.

Reports and summaries

Automation of generating reports, both in real time and summary reports (after the completion of a process or change).

Lists of tasks to complete

Lists of tasks and instructions that guide the user step by step in a specific process.

One source of truth

A central system for storing data, documents and feedback allowing for faster access, control and analysis.

_Results

Better communication and work efficiency

Improve information flow to reduce time and increase efficiency.

Reducing errors in documentation

Minimize inaccuracies and mistakes in documents.

Improving the management competences

Efficient employee training processes.

_Success Stories

One of the world's largest producers of glass packaging

Challenges

- Ineffective data collection in an outdated system.

- High labor and maintenance costs of the technological process.

- Difficult to introduce innovations into processes based on paper documentation.

Results

- Digitization and standardization of the work of all departments involved (operators, quality, maintenance, supply, technology and process support).

- Faster implementation of new processes and their monitoring in real time.

Global company in the food industry

Challenges

- Difficult work flow and team cooperation.

- Inefficient processes based on paper documentation.

- Problems with visibility of process progress and control of ongoing tasks.

Results

- Reducing labor costs through digitization and automation of processes.

- Higher competitiveness and faster adaptation to changes.

- Current view of work progress.

_Tailor-made industrial applications

85% of companies implementing Industrial Internet of Things solutions build them completely or partially "from scratch"

Addressed to: managers of production companies

There are plenty of "out-of-the-box" systems and solutions on the market, but they often do not meet all needs and their customization is difficult and time-consuming.

Ready-made solutions have various limitations, e.g. they have a "closed" code, require adapting company processes to the tool or being vendor-locked.

_Challenges

- No ready-made solution that responds to changing needs.
- Inability or difficulty in developing or adapting current systems.

_Solution

Team of experts
Experienced in creating dedicated solutions based on various technologies.

Proven operating methodology
Support throughout the entire process, from defining requirements to implementation and adaptation.

A unique set of Industry 4.0 technologies
Specialization in Industry 4.0 technologies, including: *IIoT*, *AI*, ML, *AR*, *cloud* and *PLM* enable us to create innovative industrial applications.

Full flexibility of approach
Various variants of cooperation enable flexible adaptation to customer preferences.

Global expertise
TT PSC's international presence and collaboration with various industries translates into successful delivery of advanced industrial solutions.

_Results

A solution 100% tailored to your needs
Fully customize the solution to meet your requirements and expectations.

Possibility to develop the application at any time
Develop your system according to changing needs at any time.

_Success Stories

Philip Morris International – global manufacturer in the tobacco industry

PHILIP MORRIS INTERNATIONAL

Challenges

- Complex process of identifying production problems and finding solutions.

Results

- Immediate issue recognition by error code and display of recommended solution.

Read full description ›

Global drug manufacturer

Challenges

- Lack of a ready-made solution on the market that would address all requirements in the production area.

Results

- Solution implemented and adapted in 3 locations with the prospect of additional ones.

- Compliance with industry regulations (GxP and others).

Leading manufacturer of drilling equipment

Challenges

- Inability to report the operating status of machines and machines underground (without internet access).

- Difficult reporting, analysis of work efficiency and profitability.

Results

- Solution for monitoring and reporting working time without Internet access.

- Easy analysis and automatically generated reports.

_Benefits of implementing digital solutions

For production

✓ **Access to information** at various organizational levels.

✓ **Increased efficiency** and productivity by optimizing production processes.

✓ **Cost reduction** thanks to the identification and elimination of losses and optimal resource management.

✓ **Improved quality of products and services** by monitoring processes and machines and introducing innovations.

✓ **Increased flexibility and speed of response** to production events, as well as market changes and customer demand.

## For the entire organization/business

✓ **Increasing competitiveness** through innovation.

✓ **Reducing the time to market.** New business models, new offers built around products and services.

✓ **Improving operational efficiency** and resistance to changes, adapting to market requirements.

✓ Closing the customer feedback loop to ensure **greater customer satisfaction.**

✓ **Inter-departmental integration of data and processes** (purchasing, planning, production, logistics, warehouse).
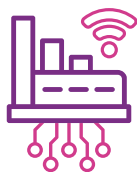
Smart Factory
Explained

Join a free video course

How to build a next-generation manufacturing plant.

Sign up

_About Transition Technologies PSC

Transition Technologies PSC is an expert in digital transformation, on a mission to accompany their customers as a trusted Global Premium Solutions Integrator and make their vision a reality together.

Their track record proudly boasts over 1200 successful projects around the globe, demonstrating their commitment to the idea of constant technological development. They are experienced specialists in a spectrum of cutting-edge technologies, including **IIoT**, **Cloud**, **Augmented Reality**, **AI**, **PLM,** and more. They are at the forefront of technological evolution, not merely as observers but as active contributors and innovators. They believe the future is green, and so are their brand new solutions.

TT PSC serves customers in various sectors, including Automotive, Machinery & Heavy Equipment, Energy, Media & Telecom, Consumer goods, Healthcare & Life Sciences, Software & Technology, Commercial & Prof. Services. They tailor their solutions to the unique needs of each industry, ensuring they thrive in the digital era.

They take pride in their long-term partnerships with industry giants like **AWS, Microsoft, Google, PTC, Rockwell Automation, Atlassian, Ansys, BMC and RealWear**. They actively contribute to their partners' strategies and business plans by empowering them with state-of-the-art technologies and innovative solutions.

_Contact

Your factory, our technology

Check out

Contact us and **gain IT support in the transformation of production.**