

PRODUCTION manager

Magazine for logistics & production



Rollout of Digitization Along the Entire Value-Added Chain

ERP Trends 2020

User Report

Mahr Handles Item
and Inventory Management
With PSImms
Logistics as a Success Factor

Product Review

PSImetals Advanced Quality
Management
A New Era of Quality
Management

Product Review

AI and KPI-Based Decision
and Optimization Algorithms
Explainable AI by Means of
Interpretable KPI Labels

EDITORIAL

Dear readers,

The efficient use of resources has always been important to PSI. Smart planning solutions are now receiving a whole new level of attention under the microscope of the climate debate. With the right ERP and MES, companies can not only save time and money in the future. In fact, optimized processes can reduce the use of resources and energy. The ecological added value becomes a competitive advantage in an economy that is to switch to completely CO₂-neutral production by 2050.

AI will play a key role in this goal. In the next few years, manufacturing companies will therefore increasingly rely on intelligent ERP systems, which will comprehensively optimize com-



pany processes. AI will automatically add data, increase the data quality enormously and ultimately improve efficiency. In quality assurance, AI-based image recognition will recognize defective parts in production and therefore proactively prevent com-

plaints. At Goods Receipt, the AI assigns items to a specific goods category, saving unnecessary journeys. With regard to our own business, we are also concerned with how to avoid wasting resources. Software will be immediately available in the cloud at the touch of a button and will be put directly into productive use via auto-installation. The result is that the time until use is dramatically reduced while unnecessary journeys are eliminated.

Here's to a green future! Yours,

Dr. Herbert Hadler
Managing Director

Dieter Deutz
PSI Automotive & Industry GmbH

TITLE STORY

ERP Trends 2020 3

USER REPORTS

Mahr Handles Item and Inventory Management With PSIWms 6
The Move to an Industry Standard: How ArcelorMittal Belval Benefits From PSImetals 8
Order and Series Production From a Single Source at Schiepek Maschinen und Werkzeugbau 12

NEWS

Würth Elektronik Commissions Extended Functional Scope for PSIWms 9
Green Electricity-Certified Data Center Offers Green Intelligence Cloud 14

Uniform IT Infrastructure: elobau Relies on PSIWms... 15
PSI Metals Welcomes a New Generation 18

PRODUCT REPORTS

Explainable AI by means of Interpretable KPI Labels ... 10
PSImetals: A New Era in Quality Management 16

R&D

IT Fundamentals for "LandLeuchten" 19

EVENTS

Events 19

CONTENTS

TITLE STORY

Rollout of Digitization Along the Entire Value-Added Chain

ERP Trends 2020

Digitization and smart factories have arrived in German industry. According to Statista, 48 percent of companies are in the process of implementing Industry 4.0 projects. Now it is a question of evaluating flagship projects and rolling out digitization along the entire value-added chain.

These trends will play an important role in 2020:

RPA Becomes CPA

Robotic Process Automation (RPA) has been a topic of discussion for some time. Especially in the context of ERP systems as a central tool for controlling production and supporting the associated secondary and commercial processes, the potential benefits appear exceptionally high. However, it is important to identify the "right" processes and start with pilots.

An extension of RPA is Cognitive Process Automation (CPA). This is focused on knowledge-based sequence control. Examples are query procedures for service cases or the monitoring of data entries in the context of master and transaction data. The system learns typical or meaningful data entries and can draw the user's attention to implausible combinations as soon as they are entered. Completely automatic processes are also conceivable. In such cases, the system recognizes and learns certain relationships and uses them to derive the next work steps.

Digital Ethics: Transparency and Traceability Create Trust

With the progressive application of algorithms for the most diverse applica-



tions in value-adding processes, there is a lack of transparency, while the complexity of the systems themselves increases and the understanding of the results or recommendations for action from algorithmic systems decreases.

Providers of AI-supported ERP systems will in future have to deal with ethical and socio-economic factors in addition to the technological aspects. Clear rules are necessary for handling the data and particularly the results from the algorithmic systems. Traceability and transparency must be ensured for all involved. The support for the learning processes of AI applications must be objective and free of

subjective influences. This applies all the more, but not exclusively, if personal data is used.

OT & IT Are Merging: Integration of Production Technology and IT

The consistency of all processes from the ERP level to the machine and

back is one of the drivers of Industry 4.0 activities. The systems are increasingly able to dynamically network. As the autonomy and modifiability of production increases, the networking of all participants becomes the critical success factor.

One of the essential requirements for ERP and MES is therefore their ability to network with all systems, components and devices on the shop floor. This is the only way to continuously monitor the status of a production system. In general, it is about establishing interoperability between all components and software systems with the aim of merging operational technol-

ogy (OT) and information technology (IT) to form an OT platform.

ERP as a Platform for Production

ERP systems act as providers and consumers of services or materials and must be able, together with MES, to serve as a platform for carrying out all the necessary activities.

This includes a massively increased ability to network with production technology and other services. In the future, the functionality provided will no longer be linked to a single system, but will result from the orchestration of services provided. This mixed functionality can be tailored very flexibly to a specific application and can be easily adapted to new circumstances.

Edge Computing

The growing availability of data and high computing power is driving the spread of AI. In the meantime, applications have arisen that analyze data and control processes almost in real time. The higher the demands on the timing of the applications, the more critical the bandwidth, runtimes and latencies of the network—in addition to the computing power itself. Therefore, such time-critical and/or data-intensive applications are increasingly moving closer to the origin of the data—to the "edge" of the production system.

The data sources include machines and systems, but also IoT devices and communication technology. In the

near future, 5G will allow high data rates with very low latency and it will become increasingly difficult to process these centrally in a reasonable amount of time as the volume of data increases. A solution to the problem could be preprocessing the data or even operating the corresponding application at the point of origin.

Digital Twins Are Growing Up

The progressive integration and networking of the shop floor with all systems across all levels, from ERP to production technology, provides a digital image of the production system and the products running through production.

cal functions right up to the application of AI should be used. One of the next steps would be to stimulate a digital twin to simulate future states of manufacturing resources in imaginary order and operating situations.

Advanced Planning Models and Demand-Driven SCM

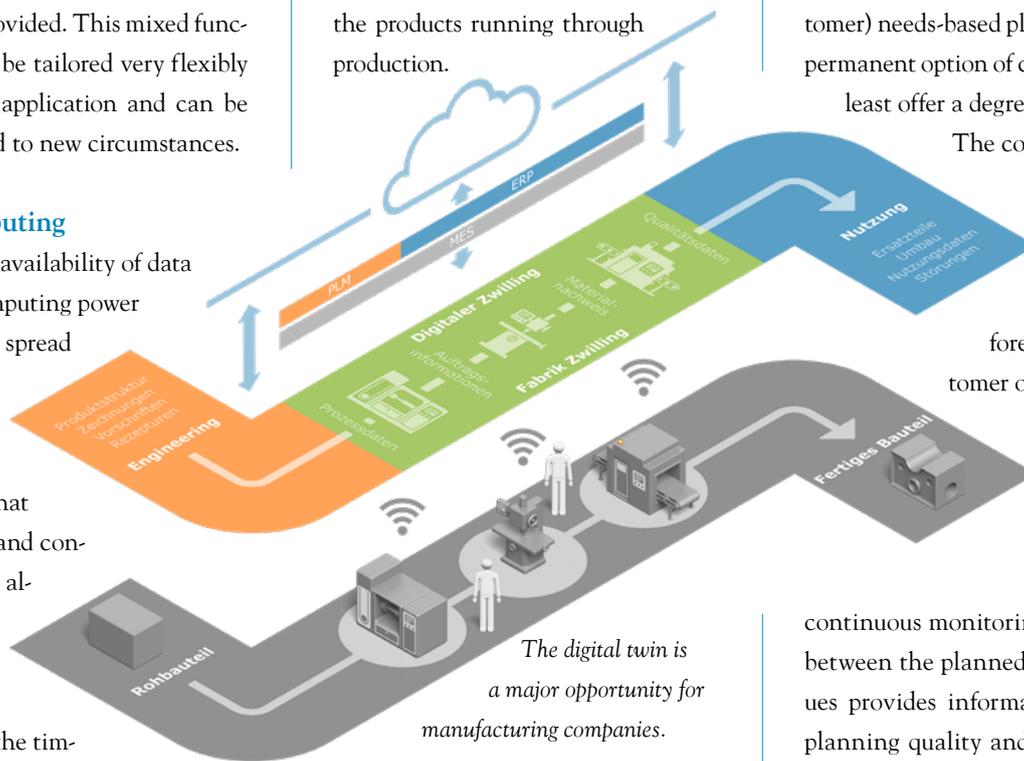
The framework conditions for reliable production planning are becoming more volatile, uncertain, complex and ambiguous. The planning systems of a factory must also take these conditions into account. Planning is becoming more vague. (Customer) needs-based planning with the permanent option of correction can at least offer a degree of certainty.

The connection of historical data, already known order situations and forecasts about customer or market behavior result in statistically reliable planning scenarios. The

continuous monitoring of deviations between the planned and actual values provides information about the planning quality and shows starting points for a change in the planning. With the appropriate initial data, AI approaches can also help to counter the volatility of the overall situation.

AI Enhanced Analytics

In recent years, a change has taken place in the field of business intelligence—from classic reporting to an analytically designed platform. It is no longer enough to generate information retrospectively. It is increas-



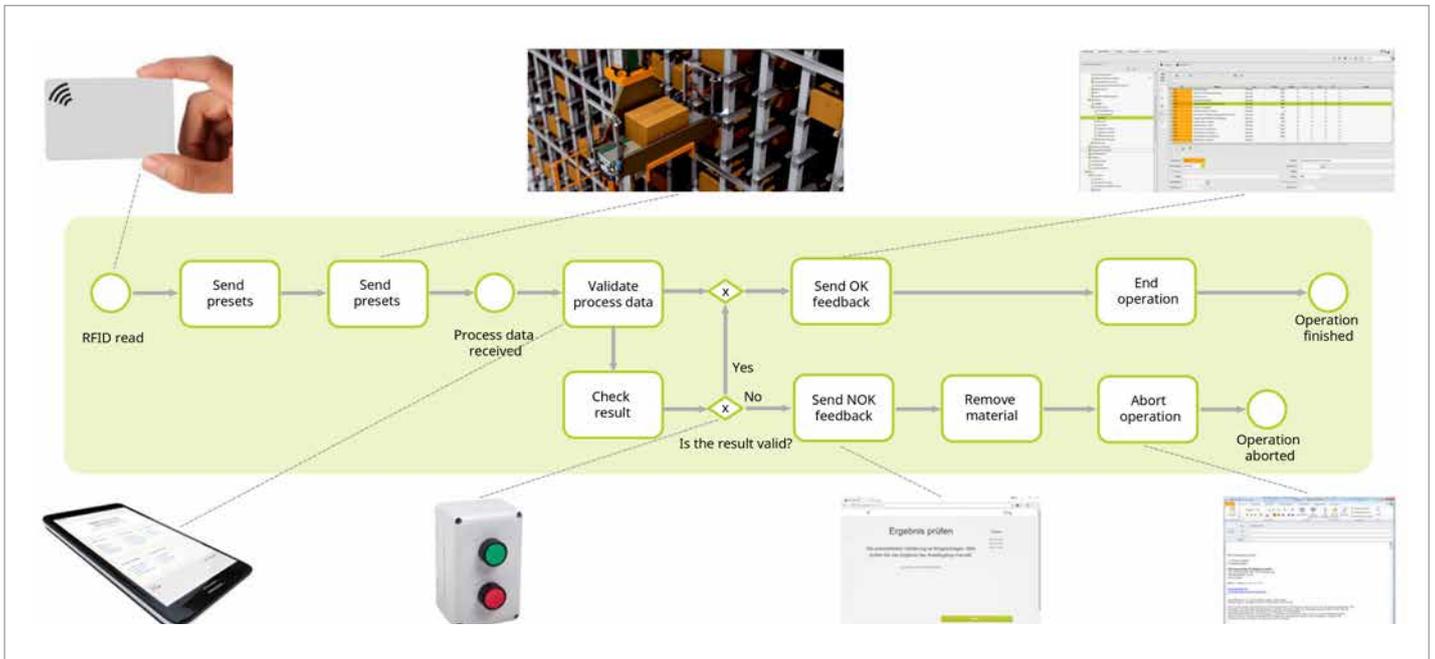
A large amount of data is collected and generates information about the processes.

This information can be used in a variety of ways—be it to improve processes or to build a product-related genealogy. In the future, it will be even more important to use the data from the production systems on site or in the field to develop new business models. The entire spectrum of analyti-

ingly important to make reliable forecasts. Prominent examples of this can be derived from the discussions about predictive maintenance or the

targets for reducing CO₂ emissions, such systems are once again in the spotlight. The imminent shutdown of entire power plant groups in the

Production planning and manufacturing execution in particular can make a major contribution to increasing sustainability. Advanced al-



The orchestration can include all system components that have an API.

analysis of expected customer behavior in modern Demand-Driven SCM solutions.

In all cases, it is about decision support for users of ERP and MES solutions in an increasingly uncertain world in terms of the framework conditions under which planning and production take place today.

These predictive (forecast-based) or prescriptive (normative or evaluative) analytical systems increasingly use AI methods. This can sometimes even be done in real time (edge computing).

Energy Management: Between Volatile Supply and Environmental Protection

In the past, energy management systems were often only used in very energy-intensive industries. Due to climate change and the ambitious

next few years and the increasing use of renewable energies will ensure a more volatile supply situation overall. The pricing of CO₂ also creates a new cost factor for manufacturing companies. Electrical energy is therefore increasingly becoming the subject of planning because there is a need for load and charge management. This also means that in the event of bottlenecks and impending restrictions on the purchase of electricity, production planning must be changed to prevent an outage.

Sustainable Production

In the future, ERP and MES solutions will have to do more from a sustainability perspective. The focus will be on increasing energy and material efficiency, supporting a circular economy and using environmentally friendly forms of energy.

gorithms also determine quantities and deadlines from an environmental point of view, sequences are optimized and resources are used in the best possible way. Upcycling and recycling decrease the use of materials and at the same time reduce the amount of waste. They also help to counter rising raw material prices to a certain extent. 🔄

Find out more on this in our corporate blog.



PSI Automotive & Industry GmbH
Karl Tröger
Business Development Manager
ktroeger@psi.de
www.psi-automotive-industry.de

User Report: Mahr Handles Item and Inventory Management With PSIWms

Logistics as a Success Factor

With the warehouse management system PSIWms from the PSI Logistics Suite, measurement technology specialist Mahr has sustainably optimized the processes for production supply and order manufacturing and reduced lead times. Networking with the ERP system PSIpenta ensures data exchange with reduced interfaces.

Mahr GmbH, based in Göttingen, has broken new ground in production supply: the manufacturer of production measurement technology handles item and inventory management of raw materials and finished products with PSIWms. In addition, the process control for order picking, just-in-time picking and route planning for both production supply and shipping processing is also controlled via the warehouse management system.

The central production site is the main plant in Göttingen. Items including high-precision measuring systems and gear metering pumps are manufactured here in eleven production areas. PSIWms has formed the information backbone for controlling complex intralogistics processes since the end of 2017. "It is an essential basis for achieving our ambitious sales targets," says Mahr Logistics Manager Christian Hofmeister.

Another particularity is that Mahr already relies on the ERP system PSIpenta at the overlying IT level. "This positive previous experience and the optimal integration of ERP and WMS helped us make the decision to award the contract," says Mr. Hofmeister: "Both systems will run on a common platform

in the future. The continuous networking eliminates the need for an interface and optimizes the information flows."

Separate Flows of Goods for Production and Shipping

The Mahr logistics center is divided into two hall complexes. A total of more than 40000 different items

and semi-finished products for production supply are stored there in a total of 713 pallets and more than 2600 automated small parts storage spaces. With its integrated multi-site capability, PSIWms also runs a nearby external warehouse, where additional production material is available on demand in a heavy-load rack and a 300 m² bulk storage area.

The second hall, totaling 700 m² on the Göttingen premises, houses salable merchandise and customer material. In addition to more than 3700 pallet spaces, a shelving system with almost 1100 spaces as well as



Pallet racks at Mahr.

are stored there. In the larger hall, a heavy-load rack, an automated small parts store as well as an approximately 100 m² bulk storage area are set up in an area of 1000 m². The raw materials

25 packing areas, two packing stations for large orders and two packing stations for CEP shipments have been set up there. "By separating the hall areas into production warehouses

and finished goods warehouses, the flows of goods toward production and the customer orders to distribution are completely separated," explains Kevin Heinemann, manager of the logistics center. "This way we avoid the goods flows crossing one another and significantly speed up the individual processes."

At the Goods Receipt gate, the deliveries of raw materials and semi-finished products for production are checked and received. The goods receipt posting is made in PSIpenta. PSIWms receives the corresponding advice data from the ERP system and uses the master data stored in the system to determine the corresponding storage locations. At three booking terminals, the goods received are repacked for storage in transport containers.

The item and the transport unit are linked by scanning. The goods are then stored in the storage locations specified by PSIWms. The programmable logic controllers (PLC) of the automated small parts store are incorporated into the coordinated process control of PSIWms via an interface. For forklift-based transport, the integrated forklift control system (FCS) ensures route-optimized forklift activities.

100 000 Picks for Production Supply and Shipping

The FCS also takes care the transport planning and control of the tugger trains. Two tugger trains with a total of seven trailers make round trips of the eleven production sites to supply goods. For production call-offs, PSIWms calculates just-in-time pick-

ing that is optimally sequenced according to unloading points. It initiates the processes in Hall 1, distributes the orders, controls the correspond-

the shipping zones in the Goods Issue area of Hall 2.

With currently around 3500 picking orders a month, the employees at the



Process control of goods received at Mahr with PSIWms.

ing consolidation of the order items as well as their assignment and the loading of the tugger train trailers according to the receiving station.

For storage of the shipped items, the finished products are taken from production by means of the Kanban circulation of the tugger trains and stored in the storage spaces in Hall 2 according to the specifications of PSIWms. Here the orders are picked for shipping with the aid of the FCS, order picking trolleys and mobile data terminals.

With its cross-docking function, the warehouse management system also controls the provision of finished products directly from production to

Mahr logistics center in Göttingen reach approximately 100000 picks for production supply and shipping each year. "Logistics is now a success factor for us," summarizes Warehouse Manager Mr. Heinemann. "Thanks to the transparent stock management and precise control of intralogistics and production supply as well as the simplified exchange of information between PSIpenta and PSIWms, we are significantly above the previous throughput levels. The introduction was worth it." 

PSI Logistics GmbH
Phillip Korzinetzki
Marketing Manager
p.korzinetzki@psilogistics.com
www.psilogistics.com

User Report: How ArcelorMittal Belval Benefits From PSImetals

How a Move to an Industry Standard Pays Off

After extensive tests, the MES (Manufacturing Execution System) of the ArcelorMittal Belval steelworks in Luxembourg was successfully put into operation in June 2018. The plant is now equipped with a system that paves the way for Industry 4.0 and that continuously benefits from all PSImetals releases.

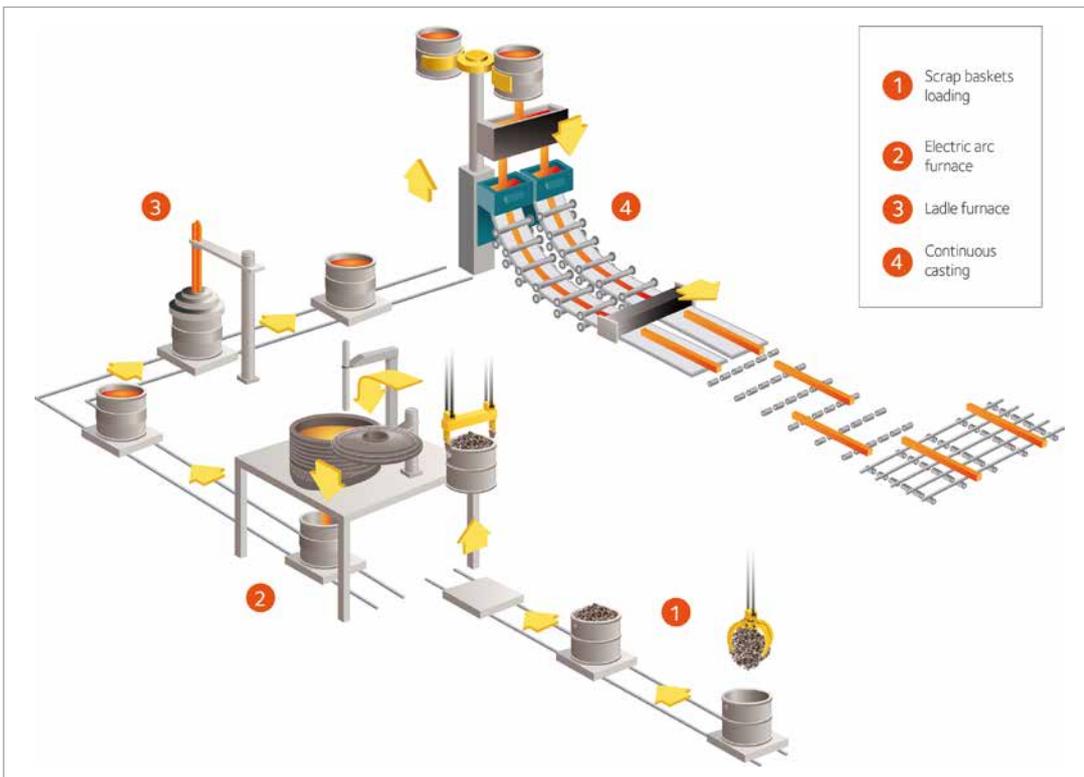
At ArcelorMittal Belval, the PSImetals Production & Quality system covers the production flow from scrap baskets loading to evacuation of the

setpoints for the automation level, quality management, performance management and facility management. These contribute to the optimization of process efficiency and

of ArcelorMittal's long products. The challenge of replacing a system that is over 20 years old with a market product is significant, and the change that such a migration brings in terms of project implementation and software configuration should not be underestimated. Thanks to the close collaboration between the engineers from ArcelorMittal and the PSI experts, however, the expectations of the production management system were fulfilled.

A Competence Center for Increased Independence

Over the course of the project, a competence center was created for the new MES. This created a certain degree of independence from the PSI experts on the one hand, meaning that the competence center was able to take on a few implementation tasks among other things, such as the screen configuration based on PSImetals Click-Design. On the other



Overview of the processes at Belval handled using PSImetals.

semi-finished products to the stock hall, passing through the production at the electrical furnace, the ladle furnace and the continuous caster.

The main features are production scheduling, production and consumption tracking, product traceability, optimization models, specification of

therefore to additional savings in production costs.

From Homemade Software to an Industry Standard

The switch from a self-programmed software system to a market standard for the "liquid phase" application area is the first in the European sector

hand, this means that the template that was developed for Belval can be rolled out independently in future to the Differdange plant. 🔄

PSI Metals
Peter Bergfort
Sales Director
pbergfort@psi.de
www.psimetals.de

News: Würth Elektronik orders extended functional scope for PSIWms

Control of Automated Production Processes

Within the framework of an expansion and modernization project, Würth Elektronik eiSos GmbH & Co. KG has commissioned PSI Logistics GmbH with the integration of the new plant components as well as the warehouse and contract manufacturing processes for the PSIWms process-leading warehouse management system.

As a result of increasing demand and significant company growth, Würth Elek-

In addition, the existing automated small parts warehouse (shuttle) was enlarged from six to twelve aisles and the

Würth Elektronik eiSos GmbH & Co. KG is one of the leading manufacturers of electronic and electromechanical components in Europe with 17 production sites worldwide and direct sales in 43 countries.



PSIWms for designing transparent and efficient warehouse processes.

tronik has extended the logistics center in Waldenburg by an additional warehouse complex and linked it to the existing site with a new conveyor system.

system components at goods receipt (CEP processing stations) and goods issue (picking stations, packing stations, dispatch lines) were more than

doubled. The plant expansion, as well as the new reporting points, work stations, bypass and conveyor lines enable Würth Elektronik to implement new warehouse and shipping processes.

Extended new functions

For efficient and coordinated control of largely automated production processes, PSIWms was extended with new functions, optimal process sequences, interfaces, strategies and restrictions. The upgrade and release capability of the software guarantees users the latest functionalities for the current system standard. 



Würth extended its logistics center.

PSI Logistics GmbH
Phillip Korzinetzki
Marketing Manager
p.korzinetzki@psilogistics.com
www.psilogistics.com

AI and KPI-Based Decision and Optimization Algorithms

Explainable AI by Means of Interpretable KPI Labels

Qualitative labeling as an AI method combines decision-making and optimization algorithms (DOA) with machine learning. The associated Deep Qualicision software learns to set DOA parameters efficiently, so that almost any DOA technique working on business process data can automatically adjust itself. In more general terms, the method can be used for learning relations that are created by any AI-based decision-making systems. This is done by determining of KPI-based evaluations on the input and output patterns of the respective AI system. The evaluations describe which input and output patterns perform more positively for which values, and which more negatively.

If time series are formed using such generally preprocessed evaluations, Deep Qualicision is able to create systems of data clusters that allow analyzing the behavior of the AI decision-making system to be analyzed from the perspective of the business process the AI system is intended for. This creates a new KPI-related view of the results of the AI system, which

does not help to explain the results relating to AI, but does this from the perspective of the target business process. In this way, an AI system, which represents a black box from the business process's perspective, is given a business process-related KPI explanation component, which helps to understand the behavior of the black box on a KPI basis.

Machine Learning Method Automatically Recognizes KPI Goal Conflicts

The core of Deep Qualicision is a machine learning technique that is based on independent recognition of KPI goal conflicts in business process data by means of extended fuzzy logic. The goal conflict analysis helps to arrange the process data in such a way that the Deep Qualicision algorithm can independently recognize how to label in which situations.

The Deep Qualicision learning logic can be placed as a surrounding layer around each AI system, whose behavior can be evaluated by KPIs.

In this way, systematically and methodologically proven relations can be learned which create qualitative labels for input patterns of the respective AI system using KPIs of the target process

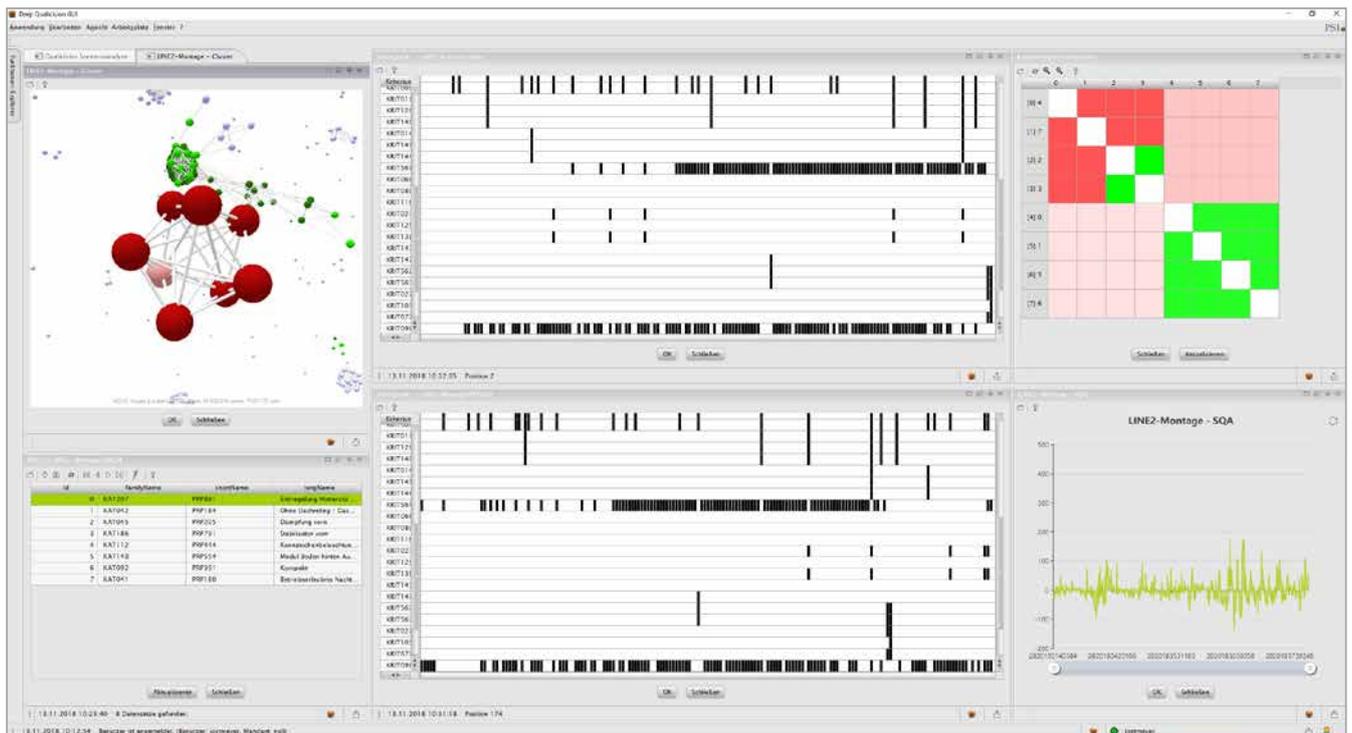


Figure 1: Deep Qualicision GUI based on the PSI Java framework.

or in other words the output patterns of the AI system. Thus, relations, that previously were created by the manual labeling action of human data scientists, can now be detected and interpreted in an automated way. The formerly manual interpretation regarding the positive or negative impact the available data will have on the KPI results of the process (manual labeling) is now done automatically by the analysis of qualitative optimizations. If the results of the analyzed AI system can be evaluated and described using KPIs, the previous bottleneck of data processing for AI methods can largely be replaced by a much simpler process of describing the results by means of KPIs. Since the description by using KPIs essentially requires knowledge about the process for which the AI system was developed, the method is based precisely on this knowledge and not on

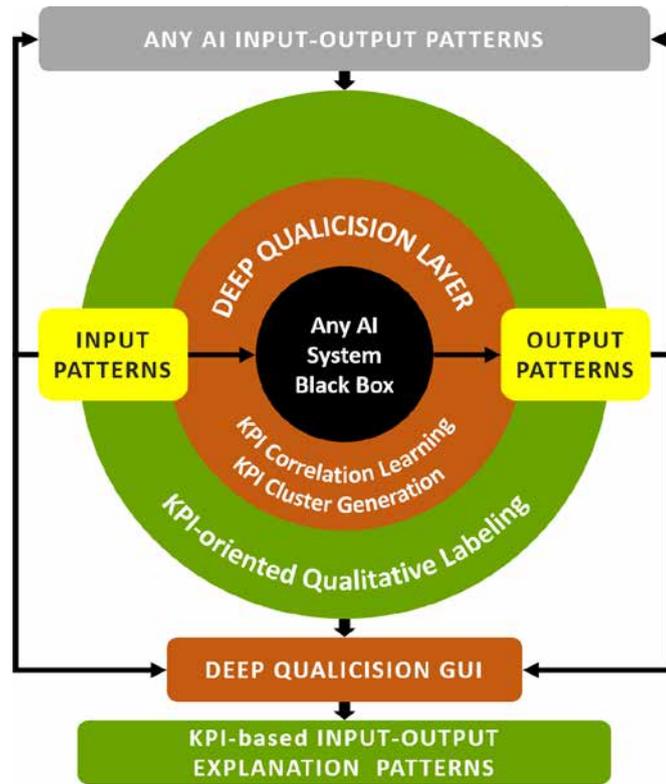


Figure 2: Deep Qualicision layer model for KPI-oriented interpretability.

the technical AI knowledge of data analysts. The qualitatively labeled data of the AI process can also be interpreted by non-AI experts in connection with appropriate visualizations (see figure 1) and can be made available for additional process-oriented analyses.

Since KPI-oriented cluster techniques are one component of Deep Qualicision, the process of automated interpretation and explanation of the behavior of AI systems paves the way to KPI-oriented explicability of AI system results (Explainable AI). Figure 2 shows how AI systems that are used for handling business processes can be embedded in the Deep Qualicision analysis layer. Process KPIs and their results are easier to understand, as their interpretation requires the technical knowledge of process specialists and not the knowl-

edge of AI specialists. 

PSI FLS
Fuzzy Logik & Neuro Systeme GmbH
 Dr. Rudolf Felix
 Managing Director
 rfelix@psi.de
 www.deepqualicision.ai

PSI Introduces Customers



Detlef Schmitz
 Director Business Development
 PSI Metals

In the LinkedIn interview series "Detlef keeps people from working", Menderes Deniz, Director of the PSImetals Template Team at thyssenkrupp Steel Europe, explains how the era of paperless production began at the plant and how he was able to convince individual plants of the advantages of a comprehensive service.

Curious? Then please scan the QR code!






Menderes Deniz
 Director PSImetals Template
 thyssenkrupp Steel Europe

User report: Order and Series Production From a Single Source at Schiepek Maschinen und Werkzeugbau

One ERP Standard for a Mismatched Pair

If a company produces to order as well as in series production, this automatically places special requirements on IT. On its search for a suitable ERP system, Schiepek Maschinen- und Werkzeugbau GmbH came across an industry specialist whose solution has given the family business structure, transparency and planning security.

At Schiepek Maschinen- und Werkzeugbau from Neustadt an der Aisch, its name says it all—at least when it comes to the company's core business. The company, which was founded in 1977 as an engineering office for special machinery, develops and produces machines and tools for high-tech products for the automotive industry, electrical and medical engineering, mechanical engineering and the consumer goods industry. Schiepek's second division involves small-batch and large-scale production of precision parts for the automotive industry—as an extended workbench or as individual outsourcing of custom-made special machines.

ERP & MES From a Single Source

This combination of the two divisions increasingly presented the managers with some major challenges. "We only had an invoicing tool and used complex Excel lists in order management. For the automotive division, we used a supply chain management system that was programmed in-house," remembers Martin Schiepek, CEO and the son of company founder Manfred Schiepek.

This involved an enormous amount of manual effort which also carried an increased risk of errors. "In the automotive division in particular, the daily

SCHIEPEK
MASCHINENBAU



call-offs which we also entered manually into our own solution stretched us to our limits. It was simply time to find a powerful ERP system," says Schie-

pek. "The combination of made-to-order and serial production," remembers the CEO.

Tailor-Made Order Management

The machine and tool manufacturer uses the system to create its production orders and enters into the conceptual and detailed planning stage, including utilization planning, before finally creating an appropriate work plan. The defined, standardized processes are especially helpful here. Em-



The users at Schiepek are very pleased with the new ERP solution.

pek. It came down to the ERP standard, PSIpena. "Essentially there was no alternative, since no other competitor could keep up with the combina-

tion of made-to-order and serial production," remembers the CEO. Employees use the connected production data acquisition (PDA) to confirm times or amend incorrect entries. They can also execute several orders

at the same time. The PDA also provides Schiepek with a basis for further analyses. This allows set-up times and lead times to be optimized. Continuous transparency in the order level is also especially valuable: “Today we know precisely where which part is. This is a tremendous benefit for planning,” summarizes Schiepek.

Changes at the Touch of a Button

The automotive division, for which supply chain management is the central module, can now easily map customer call-offs. The system imports the call-offs via the VDA interface, creates the production orders automatically and then creates appropriate work plans and bills of materials. The system also displays possible changes in call-offs immediately. “This is a huge advantage. Previously, we could only identify changes with a lot of effort. The necessary changes to production were equally problematic,” says Schiepek. Today, this is basically done by pressing a button.

Packaging management also has an important role to play. After all, the specifications of OEMs are not just extremely stringent, they are usually also complex and consequently cannot be managed easily with Excel lists and separate delivery notes.

The ERP system maps these requirements by means of packaging management. For example, it determines the demand for packaging and triggers corresponding requirements, controls repackaging processes and ensures the traceability of the goods down to individual packages. Individual

Interface Layout With a Click

Today, the company works in the two divisions by implementing the



In production at Schiepek.

ERP system in a way that is structured and thus significantly more efficient. Production control has been considerably improved in particular. The impact is clear especially when it comes to on-time deliveries: There haven't been any delivery delays in the automotive division since it was implemented.

Lastly, Schiepek benefits from the options of individual interface design. This configuration option is available with PSI Click-Design. In the truest sense of the word, users can click together their own user interface depending on their tasks and preferences. “Admittedly, we were rather skeptical at the start as to its actual benefit,” says Schiepek. “But in actual fact, this function is used intensively. Many employees work with just two columns for example, and add the others as required. Em-

ployees can even individually customize and arrange colors or the position of individual screens.”

Concentration for Increased Efficiency

Users can concentrate on their areas of responsibility and no longer run the risk of losing track thanks to overloaded interfaces. This affects not just specific areas of responsibility but also preferences regarding color schemes or the position of the relevant entry screens. In this way, the individually tailored interfaces enable people to work faster and, therefore, more efficiently. 

PSI Automotive & Industry GmbH
 Karsten Wette
 Head of Automotive Division
 kwette@psi.de
 www.psi-automotive-industry.de

News: Green Electricity-Certified Data Center Offers Green Intelligence Cloud

Green Logistics

With an extensive range of application management services, PSI Logistics GmbH hosts its customers' cloud solutions in its own data center in Frankfurt. With the certification by TÜV SÜD, the operation of the data center has been switched to 100 percent green electricity from renewable energies at the beginning of the year.

With the previous range of functions for intelligent resource, network and route planning, the systems PSLoglobal, for the supply chain network

able contribution to resource-saving optimization.

"With the changeover, we can now further expand our offerings within the scope of application management

In addition to efficiency advantages and cost-cutting potential, the Green Intelligence Cloud offers users additional value when it comes to improving the carbon footprint.

Sascha Tepuric
Managing Director PSI Logistics GmbH

design, and the warehouse management system PSLoglobal from the PSI Logistics Suite already make a sustain-

services and for green logistics," emphasizes Sascha Tepuric.

Sustainable optimization potential

From the data center PSLoglobal controls complex operational processes for instance in logistics centers of Hilti and the German Football Association (DFB) via the cloud. Thus, all functionalities of PSLoglobal are available on demand in the data center and PSI Logistics takes over the operation and maintenance of the software.

For the operational processes on site, users only need PC clients, mobile data terminals and access points. Process control takes place in the Green Intelligence Cloud, which provides additional and sustainable optimization potential. 

PSI Logistics GmbH
Phillip Korzinetzki
Marketing Manager
p.korzinetzki@psilogistics.com
www.psilogistics.com



News: Sensor and control element manufacturer elobau relies on PSIWms

Standardized IT Infrastructure

Sensor and control element manufacturer elobau GmbH has commissioned PSI Logistics GmbH with the delivery of the warehouse management system PSIWms. The aim is to increase transparency and efficiency in warehousing for production supply and shipping. PSIWms replaces the existing warehouse management software.

In addition to the simplification of the IT infrastructure and an extended range of functions, the increase in process efficiency and performance of the automation systems ensured by PSIWms, the integrated container management, the possibility of digital mapping of logistics and the identification and elimination of inefficient processes were also decisive factors.

Performance increased by 20 %

The warehouse management system will handle the coordinated process

control at elobau in five warehouse areas and one external warehouse. A total of around 1400 pallet spaces will be managed. The central automation system is also a state-of-the-art AutoStore cube with 30 000 storage locations. Due to the connection to a new interface and processes optimized for the AutoStore cube, a performance increase by 20 percent is expected.

Due to the close functional networking with the ERP system PSIpenta, already implemented at elobau, the

number of interfaces can also be reduced. In addition, further optimization options can be developed by means of a uniform IT infrastructure. PSIWms at elobau is scheduled to commence operations in the fourth quarter of 2020.

The elobau GmbH, founded in 1972 and based in Leutkirch in the Allgäu region of Germany, is today one of the leading international suppliers of non-contact sensor technology and control elements. 

PSI Logistics GmbH
Phillip Korzinetzki
Marketing Manager
p.korzinetzki@psilogistics.com
www.psilogistics.com



The AutoStore compact warehouse of sensor manufacturer elobau.

Product report: PSImetals Advanced Quality Management

A New Era of Quality Management

Quality is an issue that can be considered from several angles. Achieving the required quality efficiently is a matter of survival, and not just for premium producers. For that very reason, the wave of digitization offers great potential for increasing quality as a whole and making it easier to handle at the same time.

Sensors can be used to collect enormous volumes of data during the production of metal. Over 500000 measurements are recorded just for rolling a coil—a wealth of data that one person cannot mine. However, the true value doesn't lie in the data itself, but in the ability to assign a meaning to it in its individual process context, and to reconcile this in real time with all persons involved in the current and past production (e.g. order book, plant information).

The Big Picture

With its holistic approach PSImetals has been able to replace previous system silos for data analysis. The integrated view of the Factory Model relieves users from the tedious task of making the information that was obtained from the system silos comparable. Instead, users have faster and easier access—leaving more time for improving the quality through the added value of the information obtained.

We Want Everything, Now!

There's no place for modesty when it comes to quality. The introduction of Quality Indicators—QI for short—makes this holistic approach possible. They combine time-critical, process-based data with material-related measurement values throughout the entire material genealogy.

Once it has been filled with the raw data from production, a QI uses a number of rules and functions to derive quality-determining process and material-related default values from this, such as the degree of purity, surface structure etc. A QI can process any data, including time or length-related raw data. This means



With PSImetals Advanced Quality Management to the new era of quality management.

that it is possible to apply complex tolerances to a thickness profile, for example, such as the recess in belt ends, the tolerance where certain values are not reached or are exceeded, or the recognition of steep gradients (steps) in the material.

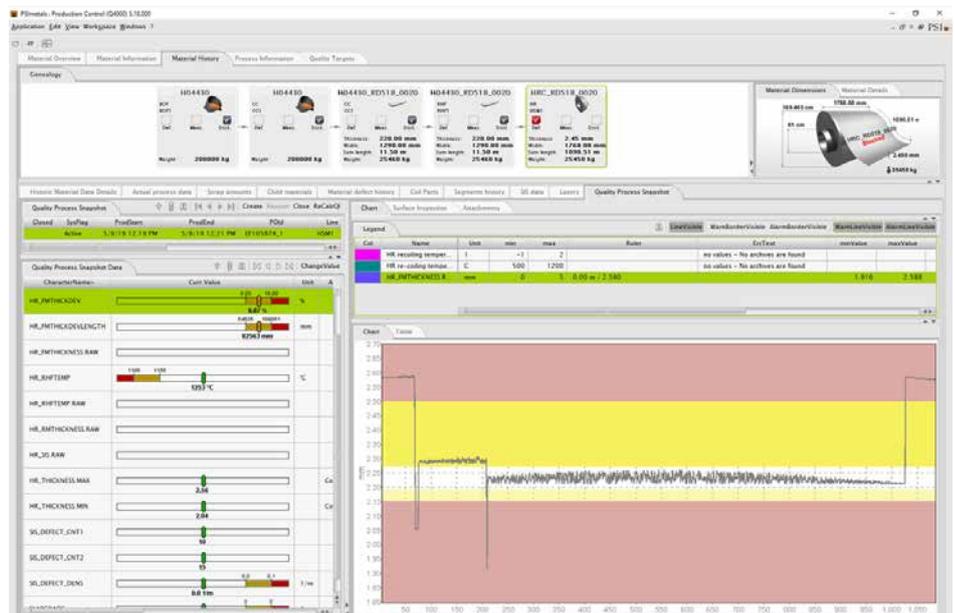
Similarly, surface inspection data (SIS data) can be displayed and used to make automated quality decisions. Here users are given free rein to assess various parameters and define their significance regarding quality and their behavior.

Holistically combining the different perspectives means that real-time decisions can be made for classifying and qualifying the quality of the material.

If it should become necessary to reschedule production, for example because of unsuccessful mechanical tests such as charpy impact test or the tensile test, access to the order book means that the options for re-assigning material can be checked automatically and thus be reclassified according to sales order-specific requirements.

Within the meaning of different perspectives, in addition to material data, it is also the production processes themselves that provide important information about the quality of a product. When combined with SPC (Statistical Process Control), QIs can identify correlations between process conditions and material properties along the supply chain.

The system is thus able to initiate automated warnings for necessary maintenance work, thereby avoiding material damage such as scratches as well as unnecessary downtimes caused by unplanned maintenance stops.



Quality process snapshot analysis based on Quality Indicators.

Autonomous Quality Decisions Become Reality!

The qualitative labeling of QIs opens up entirely new horizons. Together with PSI's Deep Qualicision framework, autonomous quality decisions become reality. The use of AI (Artificial Intelligence) enables the multi-criteria optimization algorithm to adapt itself without losing its connection with the dynamic business process data.

Such a system can, for example, suggest that the roll needs to be changed due to correlations between current and historic material properties such as hardness, dimension and chemistry, its previous and planned sequence in the roll program, as well as machine-specific properties (such as the wear on the rolls).

In addition to the final product quality, the stability and reliability of the process are also a fundamental key to success. The PSI Metals Factory Model, the digital twin of the production environment, contains the genealogy of all materials together with all process-related data. Together

with the QIs, the Factory Model forms the perfect basis for quality forecasts. Precisely with highly integrated, time-critical processes such as heating, detecting quality issues in the process can ensure that the material flow is maintained and secure the associated customer satisfaction—a "Mission Impossible" for system silos.

Everything, Now—or Perhaps Even Yesterday?

With the concept of Quality Indicators, PSI Metals has thrown the door wide open to the world of mass data processing, machine learning and thus the idea of a closed quality control cycle.

To see where this journey takes us, read our machine learning blog series "Acting Instead of Reacting" at: www.psi.de/en/blog/. 



PSI Metals
Raffael Binder
Director Marketing
rbinder@psi.de
www.psimetals.de

News: New strategy committee ensures continuity of product and consulting strategy

PSI Metals Completes Generational Change

As of the 1st of January 2020, Jörg Hackmann and Harald Henning have been appointed as new Directors at PSI Metals. Together with Thomas Quinet, Managing Director since 2017, the new Strategy Committee will focus on accelerating the transformation of PSI Metals towards group standard technologies based on the state-of-the-art PJF3 framework. Sven Busch, managing the metals business of PSI for 22 years, is stepping down and will be available in an advisory role.

In addition to the technological transformation of the product, the new Strategy Committee, which covers all PSI Metals units, will strengthen the project delivery capability with a growing team of consultants.

Jörg Hackmann, a graduate mathematician, entered the metals business in 1991. He joined PSI as software engineer, became the Director of Product & Methodology in 2010 and member of the PSI Metals Executive Board in 2013. Besides his new role as a Director of the Strategy Committee responsible for product, technology and consulting, he also takes over the Managing Director role in PSI Metals GmbH and



Thomas Quinet, Jörg Hackmann and Harald Henning are the new directors at PSI Metals.

PSI Metals Non Ferrous GmbH in Germany.

After his PhD in Applied Physics, Harald Henning joined PSI as developer and project manager in 1988 and became President of PSI Metals North America Inc. in 2011. In his new role as Director of the Strategy Committee, he will be responsible for proj-

ect execution and delivery, focused on providing customers with the benefits of PSI Metals solutions. "IT projects are becoming more complex due to growing customer requirements," he explains. "Our project teams will meet these challenges with know-how

and further expand the position of market leader."

Focus on product and consulting strategy

"To continue the growth course, our focus remains on the product and consulting strategy," says Thomas Quinet, who is responsible for Finance, HR, sales and customer service. "I look forward to helping our customers get

the best out of PSI Metals!"

Controlled Generational Change

PSI thanks Sven Busch who transformed PSI Metals from a German vendor to a global leader for production management software in the metals industry. He will support the company with his expertise whilst accompanying a well-regulated generational transfer. 

PSI Metals
Swetlana Maschinez
Marketing Manager
smaschinez@psi.de
www.psimetals.de

With our knowledge, we drive digitalization and the introduction of new technologies for our customers. As managing director, I look forward to supporting them in this change!

Jörg Hackmann

New member of the Strategy Committee at PSI Metals

R & D: AI-based functions for route-optimized and autonomous driving

IT Fundamentals for “LandLeuchten”

As part of the "LandLeuchten" research project, funded by the Federal Ministry of Transport and Digital Infrastructure, PSI Logistics GmbH develops the necessary IT basics. For transport control, the transport management system PSITms is being expanded to include AI-based functions for route-optimized and autonomous driving.

The central solution component of the research project includes the conception and implementation of regional delivery and personal or transport services with autonomous means of transport and coordinating information service (central logistics). In terms of hardware, a further development of the eGO Mover from eGo Mobile AG is used. The complete transport control such as planning, implementation and billing is based on the transport management system PSITms from the PSI Logistics Suite. In this research project, PSITms is expanded to include basic services for process control in electro-mobile and autonomous driving.

In addition to the development of a software backend for the flexible integration of new services and a cloud server for project-related mobility apps, the focus is on creating a framework. This is used to merge data, an-



Kick-off meeting LandLeuchten.

alyze it using methods and procedures of artificial intelligence (AI) and optimize it continuously.

“The prototype organizes transport vehicles optimally for routes. This experience is very valuable for practical autonomous vehicle mobility under logistic requirements with such complexity,” summarizes Dr. Giovanni Prestifilippo, managing director of PSI Logistics.

Further project partners are, next to PSI Logistics, eGo Mobile AG and eGo Digital GmbH, the Innoloft

GmbH, RWTH Aachen University and the Birkenfeld Environment Campus. 

PSI Logistics GmbH
Phillip Korzinetzki
Marketing Manager
p.korzinetzki@psilogistics.com
www.psilogistics.com

IMPRINT

Publisher
PSI Software AG
Dirksenstraße 42–44
10178 Berlin (Mitte)
Germany
Phone: +49 30 2801-0
Fax: +49 30 2801-1000
produktionsmanagement@psi.de
www.psi.de

Managing Editor
Bozana Matejcek

Editorial Team
Pascal Kätzel; Phillip Korzinetzki;
Swetlana Maschinez; Felix Saran

Layout
Heike Krause

Printing
Ruksaldruck GmbH

DATA PROTECTION

We are glad that you are receiving our customer magazine. Please also refer to our Privacy Policy at <https://www.psi.de/en/privacy/>.
www.psi.de/de/datenschutz/.

SOURCES

Page 1, 3: istockphoto.com/
gorodenkoff
Page 4, 5: PSI Automotive
& Industry
Page 6, 7: Mahr GmbH
Page 9, 14: PSI Logistics
Page 8: ArcelorMittal Belval
Page 10, 11: PSI FLS
Page 12, 13: Schiepek Maschinen-
und Werkzeugbau GmbH
Page 15: elobau GmbH
Page 16: iStock „olm26250“
Page 17, 18: PSI Metals
Page 19: RWTH Aachen University

EVENTS

www.psi.de/en/events



| | | |
|----------------|---|------------|
| 08.–09.12.2020 | Future Aluminium Forum Quebec, Canada | PSI Metals |
| 24.–25.11.2020 | Future Steel Forum 2020 Prague, Czech Republic | PSI Metals |

PRODUCTION manager

PSI Software AG
Dircksenstraße 42–44
10178 Berlin (Mitte)
Germany
Phone: +49 30 2801-0
Fax: +49 30 2801-1000
info@psi.de
www.psi.de

PSI 