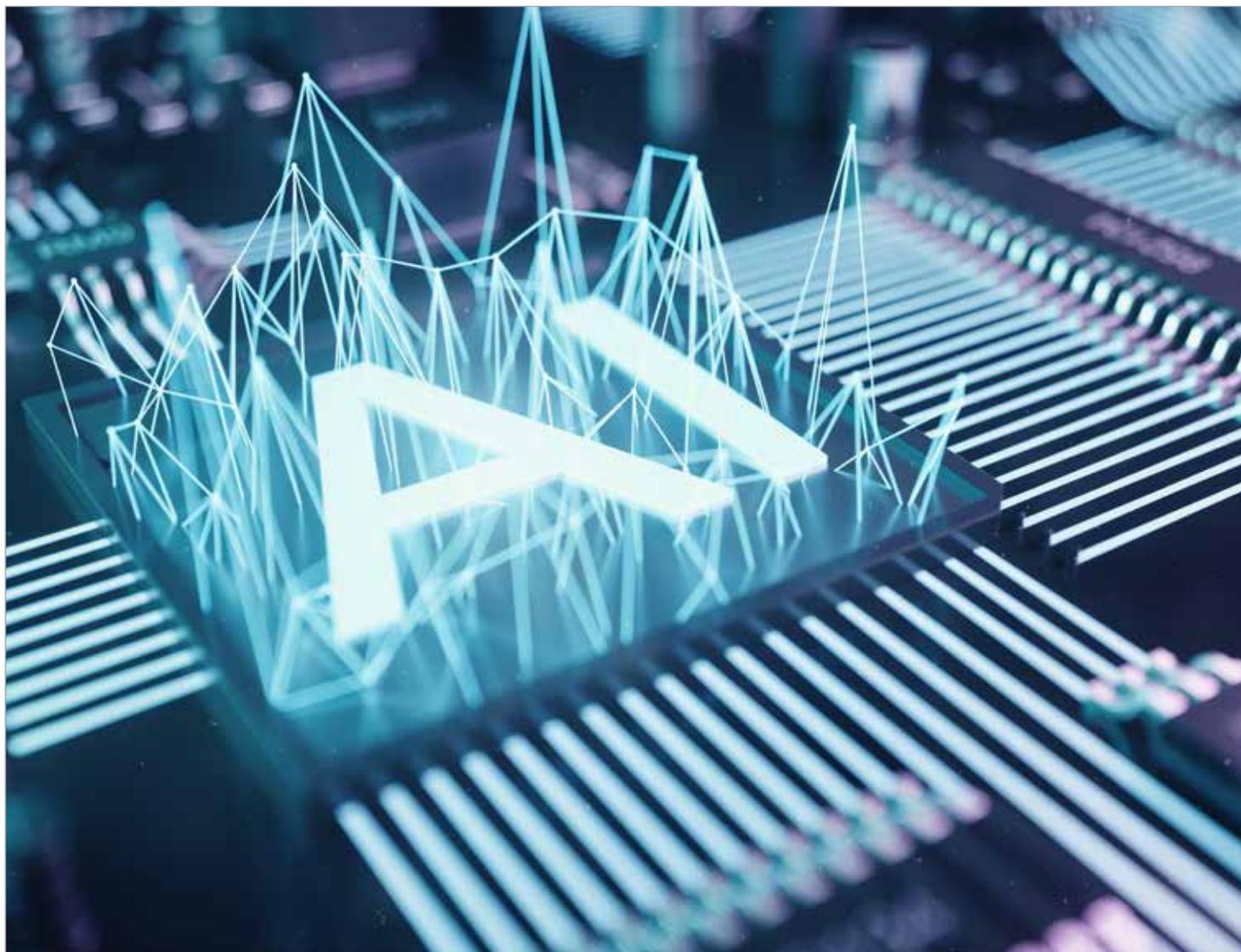


PRODUCTION manager

Magazine for logistics & production



Machine Learning Optimizes Evaluation of Raw Business Process Data

Deep Qualicision AI Analyzes Data Streams

User Report

Fiege Relies on PSIwms for Warehouse Management and Process Control

Improved Efficiency and Flexibility

Product Review

AI Reduces Downtimes and Increases Quality in Production

Decreasing Costs with Predictive Maintenance & Quality

User Report

Process Standardization at Vallourec Soluções Tubulares do Brasil

An Upgrade with Consequences

EDITORIAL

Dear readers,

Deep Qualicision AI labels business process data qualitatively. Labeling means that raw business process data is linked to process-related content in an automated way.

In this way, AI can detect relations in the business process data and trigger both classic improvements to be introduced on an organizational level in business processes as well as improvements organized through downstream algorithms. In the leading article in this edition, you can read how Deep Qualicision can be directly used for analyzing data streams in business processes and almost without preparatory work. You can also be inspired as to how this is possible in your business processes.



Further articles in this issue concerning Production Management discuss new developments in logistics, in the area of software for the metal industry, and on the topic of ERP software and its users.

The issue finishes with information on upcoming exhibitions and events. Already now you can see which exciting topics will be pending next year. There will be a great deal to report on then as well. One thing is for sure: The topic of artificial and industrial intelligence will be facing more and more.

Warm regards,

Dr. Rudolf Felix
Managing Director
PSI FLS
Fuzzy Logik & Neuro Systeme GmbH

CONTENTS

TITLE STORY

Deep Qualicision AI Analyzes Data Streams 3

USER REPORTS

Improved Efficiency and Flexibility: Fiege Relies on PSIWms for Warehouse Management and Process Control 6

An Upgrade with Consequences: Process Standardization at Vallourec Soluções Tubulares do Brasil 8

PRODUCT REPORTS

Costs Decrease with Predictive Maintenance & Quality 10

Plan B for Brexit with PSIGlobal Strategic Logistics Software 12

Act Rather than React: How PSImetals Prevents Defects Using Machine Learning 16

R&D

Multimodal, ecological and flexible: AI-based Online Traffic Optimization 14

NEWS

WMS Controls DFB Logistics Center from the PSI Cloud 13
Bratislava Airport Orders PSI Airport Software 15

EVENTS

CSM Steel Congress in Beijing: Intelligent Manufacturing in China 17
Adaptable for the Future: Gleanings from the 33rd IPA Customer Conference 18
Events 19



Machine Learning Optimizes Evaluation of Raw Business Process Data

Deep Qualicision AI Analyzes Data Streams

As an integral part of the PSI framework for industrial intelligence, Deep Qualicision AI's qualitative labeling prepares raw business process data for process owners in an understandable form. This takes place by qualitatively evaluating directly measurable data in business processes using KPIs and learning relations to this data. In this way, new insights are automatically obtained from the raw business process data, which can then be used to improve organizational measures in the business processes. This software-based method shows how data stream analysis by way of artificial intelligence can enhance added value.

Deep Qualicision is a machine learning software tool that is based on independent recognition of KPI-based relations in business processes. Raw business process data is evaluated using Extended Fuzzy Logic and special cluster processes. This makes the introduction into the world of AI methods conceivably easy for companies—even for SMEs. The KPI relation analysis automatically allows business process data to be classified in such a manner that relations can be derived from raw data, which enables further meaningful use of data for humans by means of AI methods.

Easy Input Consisting of Time Series Using Business Process Data and KPIs

Software input consists primarily of two main components: first, data streams from the business process to be analyzed are recorded and automatically converted into time series (in short, TS) using timestamps. Second, indicators (KPIs) that are to be used for analyzing the relevant business process are determined with the owner of the business process (in short, POWN). In addition, the value ranges of the KPIs are divided into required and non-required value ranges. If, for example, the utilization and

the setup times for an unit in a manufacturing company are seen as KPIs, a percentage value greater than 85% can be specified as desirable and positive. Values below 85% by contrast are negative, and are considered to be progressively more unfavorable the more they deviate downwards from this minimum value. Similarly, a setup time portion of less than 10% can be considered positive; over 10% is not desirable and is considered as negative (see Figure 1). This evaluation of positive and undesirable ranges can also be performed by a POWN without in-depth AI knowledge because this is in line with the process owner's daily evaluation of process workflows.

Learned Knowledge in the Value Chain Made Understandable for Humans

When these and similar data streams and associated KPIs are provided with timestamps and continuously stored along the business process value chain, they result in time series which are

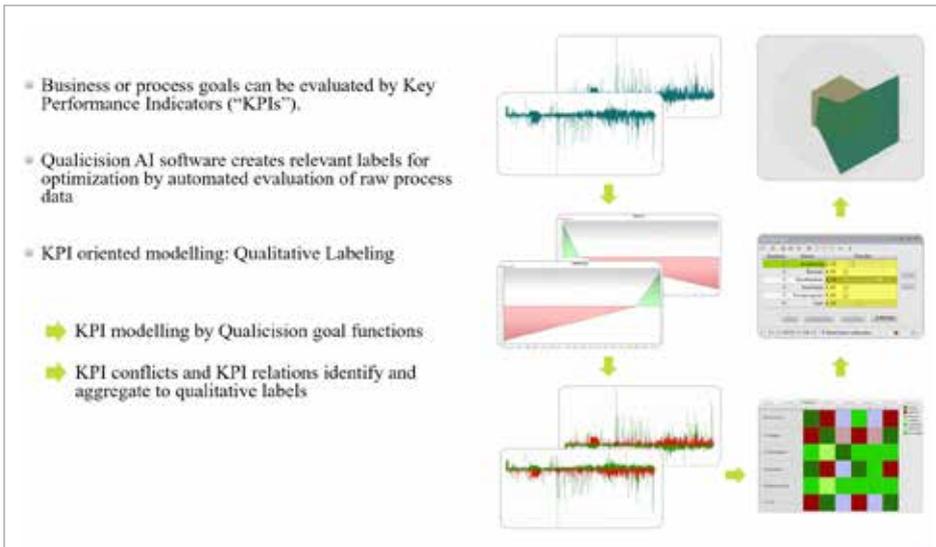


Figure 1: Qualitative evaluation of process KPIs.

evaluated directly by Deep Qualicision in such a way that positive and negative relations are recognized and learned in sense of KPIs. These can be made available to the process owner (POWN) in an easily understandable form.

Examples of positive relations could be properties of orders that match the capabilities of the manufacturing process particularly well. Negative rela-

tions could for example be the reasons for delays in relation to planned dates, or classes of order properties that increasingly lead to bottlenecks in the business process.

Automated Recognition of Improvement Potential

Findings of this nature can be directly considered and used by the POWN to

initiate organizational measures. For example, if for certain variant combinations of product properties deadlines are missed frequently, or if the unit utilization is reduced, a different approach can be taken specifically for products with these properties.

Based on the KPIs, it is also possible to accurately evaluate what improvement potential the measures to be introduced would offer from a monetary perspective. With a high degree of certainty the initiation of these measures will be successful, as the measures are derived directly from the business process data using Deep Qualicision AI.

Preparing for the Usage of Advanced Optimizing AI Methods

Automated derivation of qualitative knowledge by learning about relations from raw business process data combined with KPI information of the business process is also useful not



Figure 2: The Deep Qualicision framework with qualitative relations learned from time series of business process data.

only for gaining knowledge about the relevant business process. In fact, the proceeding prepares companies for the subsequent use of additional AI methods for optimizing their business processes. Each newly acquired relation is potentially the basis for

Deep Qualicision AI as an Integral Part of the PSI Framework for Industrial Intelligence

The learning analysis process described above can be repeatedly initiated on a rolling basis. The universally applicable nature of the software

processes (see Figure 3). As a result, an AI-based architecture of analysis and usage logic gradually evolves. This logic enables the detection of process relations, beginning with raw business process data, through qualification of data using KPIs to machine learning.

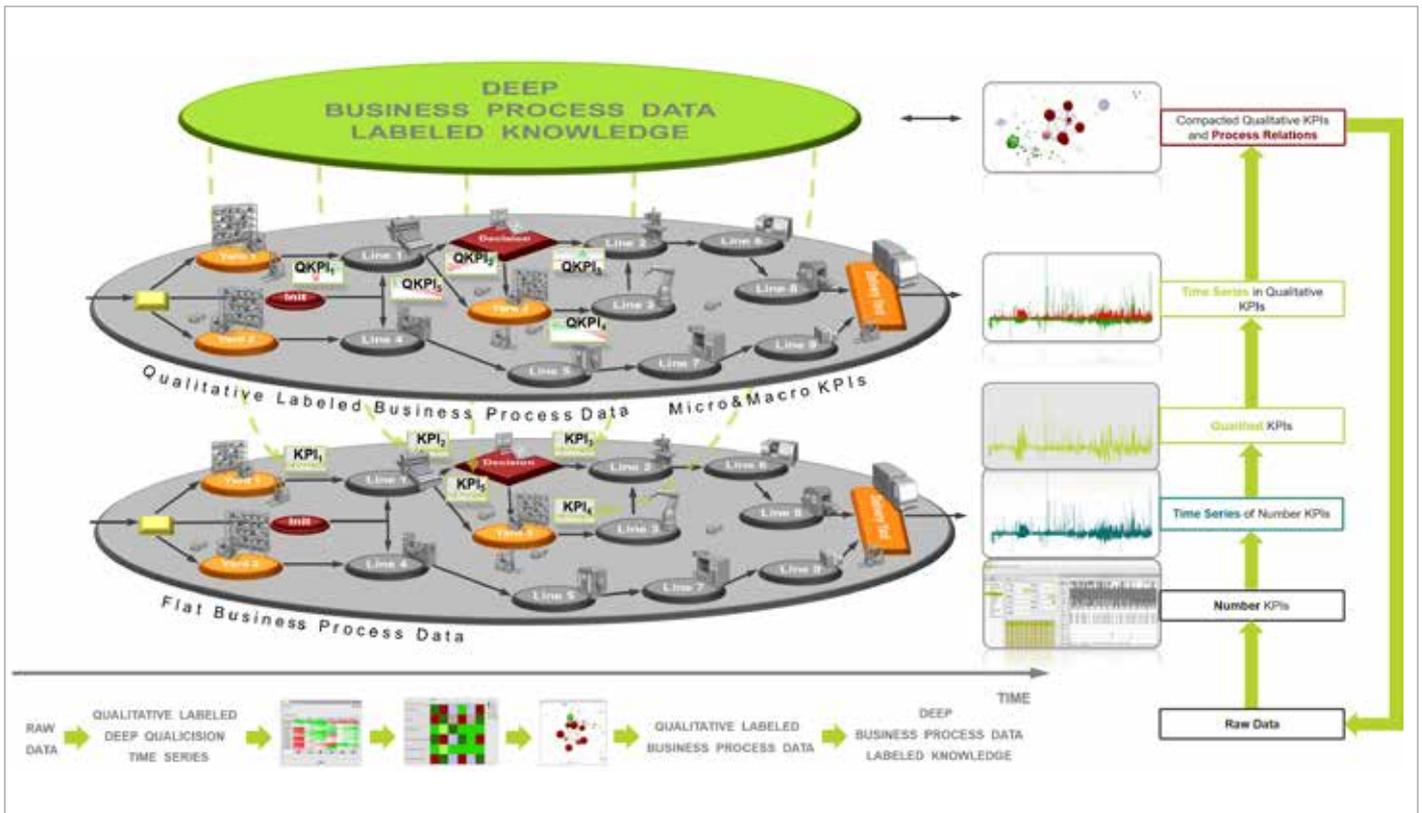


Figure 3: Level model of business process data analysis.

an additional indicator that can be included in the Deep Qualicision analysis as feedback in the form of a KPI.

In this way, companies can not only control their business processes in a targeted manner, but can also progressively transfer them into de facto self-optimizing closed loops.

Using business process data therefore makes it a great deal easier to meet the challenges of the increased dynamics of business processes. These dreaded dynamics lose their fear factor. The interface of the associated software is shown in Figure 2.

means that any existing PSI software that operates on the basis of processing KPIs can be used as a KPI analysis machine. Any existing PSI application can be extended with self-learning analysis capabilities that systematically lay the groundwork for the introduction of additional AI functionalities. To make this extension permanently available in the future, the software is linked to the PSI framework for industrial intelligence (CII framework) by means of the PJF-based PSIbus technology, for example. The methodology shown can be introduced across all layers of the business

Summary

Differential concentration of business process data results in a new quality of data evaluation for added value in your own companies. Business process data becomes information and the actual raw material of the future. 

PSI FLS

Fuzzy Logik & Neuro Systeme GmbH
Dr. Rudolf Felix
Managing Director
felix@fuzzy.de
www.qualicision.de

User Report: Fiege Relies on PSIWms for Warehouse Management and Process Control

Improved Efficiency and Flexibility

Contract logistics company Fiege relies on the PSIWms Warehouse Management System for warehouse management and process control in three of its largest logistics centers. Multi-client capability, single-source implementation with cross-location functionality, programming of functions that differentiate them from the competition, and an option for extensive in-house configuration in tailoring the system offer maximum flexibility in future-proof system design and a solid basis for additional growth.

The Fiege group is based in Greve, Westphalia in Germany, and proudly characterizes its 30 most important logistics centers as “mega centers.” In total, the group controls three million square meters of warehouse and logistics space worldwide, of which 1.8 million square meters is handled by around 7200 staff in Germany.

Correspondingly, the 30 mega centers are multi-client capable and are each focused on one of the core sectors in terms of their resources. For example, the mega center in Burgwedel, Lower Saxony is one of the newest Fiege warehouse locations.

The 50 000 square meter mega center is set up as a goods distribution warehouse for customers in the fash-

and accessories for the fashion brand Mango.

“In addition to returns processing, complex processes run in the B2B and the B2C segments where we are supported by powerful software in the PSIWms Warehouse Management System from the PSI Logistics Suite,” says Departmental Manager Lienhard.

Systematic intelligence is reflected for example in simplified reservation of item contingents and order preparation using batch formation, two-step commissioning, and consolidation. Moreover, Fiege can do its own extensive software configuration.

“In this way, it can be set up flexibly and individually for the processes that our customers require. As third-party logistics providers, we can then offer them a comprehensive range of services that are tailored precisely to their requirements,” says Lienhard. “E-commerce and multi-channel concepts in retail are strong growth drivers for us. We offer online retailers a comprehensive package for everything that can be done using a click. So it is an advantage if IT can be easily tailored.”

Specific Requirements Covered Precisely

Using the innovative Click design, PSIWms allows for simplified process control with a transparent overview of stock, processes, and the relevant order processing status. In addition, PSIWms is multi-client capable, which means that Fiege can handle multiple customers in a virtually separated environment. It is also multi-site capable—a single installation can handle



The mega center in Burgwedel, Lower Saxony is one of the newest Fiege warehouse locations.

“Our logistics solutions are in key sectors, ranging from fashion, healthcare, Fiege Industry, consumer goods, tires, media, and online retail, from engineering to logistics management across the entire spectrum of logistics services,” says Leif Lienhard, Fiege Departmental Manager for IT Applications.

ion industry and online business. The logistics center is designed as an area storage system on multiple levels and contains significantly more than 250 000 storage spaces. Up to 80 000 items are dispatched every day—including hanging and flat garments, small items, shoes,

multiple locations, and their processes can be coordinated in a concerted manner where necessary. “Using the functional WMS components and our own configuration, we are able to cover the specific requirements of different business areas precisely, and provide tailored functions and optimiza-

tions for other locations in which PSIWms manages the intralogistics,” explains Lienhard.

During product development of upgrade and release-ready PSIWms, PSI Logistics has separated product standards and individual configurations. In the case of an upgrade, when switching to the current PSIWms release, the new functions of the product standard can be used while retaining customer-specific modifications.

Basis for Solid Growth

Now that administration and process control are used in the multi-client logistics centers in Burgwedel, Erfurt, and Worms, 10% of the 30 Fiege mega centers are already using PSIWms. Introduction into additional mega centers is currently being tested. In Erfurt, PSIWms controls B2C order fulfillment from over 80,000 storage spaces as well as for warehouse management for leading Fiege customers from the e-commerce sector such as Amorelie, onquality Deutschland, and eBay PowerSellers. In Worms, Fiege Busi-



Burgwedel is used as a storage location, as well as for order processing and dispatch preparation for fashion brand Mango.

ness Unit Consumer Goods operates a mega center in which untaxed imported goods are also stored.

“This is a massive challenge for the information backbone,” states the IT Departmental Manager. “A consumption function that separates taxed and untaxed goods and takes account of

Different warehouses, warehouse and order fulfillment processes, different customers, differentiated service offerings—using PSIWms the Fiege Group covers a wide range of requirements and offers their customers individually tailored solutions that can be mapped using a common IT system standard.

“The diverse functions, the customization options, and the convenient in-house configuration from PSIWms offers us maximum flexibility and supports the efficiency of our intralogistics by way of intelligent process control,” summarizes Fiege IT Departmental Manager Lienhard. “This means that we are optimally equipped for rapidly growing



Fiege relies on the PSIWms Warehouse Management System for warehouse management and process control.

the effects on order commissioning must be incorporated into warehouse management.” Together with the Fiege IT department, the PSI Logistics systems developers have included the corresponding functionality for the consumption/taxation model into PSIWms.

client numbers and processing of an increasing range of items that is ever changing. At the same time, PSIWms opens up additional optimization options in the processes. A solid basis for additional growth.”

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

User Report: Process standardization at Vallourec Soluções Tubulares do Brasil

An Upgrade with Consequences

As we all know, Edison did not invent the lightbulb by trying to make better candles. Similarly, steel producers today are driven by the same spirit of innovation in their search for new, ever better solutions. That is where standardized business processes come in. They play an important role in enabling producers to react quickly and flexibly to market requirements. With the implementation of PSImetals Production and Quality modules, Vallourec Soluções Tubulares do Brasil is using the MES standard for the steel and aluminum industries to shine a brighter light in the industry.

When two companies merge, they want to accomplish great things together—as in October 2016, when Vallourec Soluções Tubulares do Brasil (VSB) was founded. As part of the global transformation plan announced in early 2016, Vallourec Tubos do Brasil and Vallourec & Sumitomo Tubos do Brasil merged to improve their competitiveness in the market. With the Barreiro plant in Belo Horizonte, Brazil, and the Jeceaba plant only 150 km away, VSB supplies national and

international customers with high-quality seamless steel tubes.

The Barreiro plant, with an annual production capacity of 550,000 tons of pipes, produces a wide range of products for the oil, processing, automotive, energy and construction industries, making it one of the most diversified steel complexes in the world. Located at the junction of two railway lines near the small town of Jeceaba in southwestern Brazil, the Jeceaba plant with 2.5 million square meters of industrial space is also one of the

most modern steelworks, producing 600,000 tons of seamless steel pipes a year exclusively for the oil and gas market.

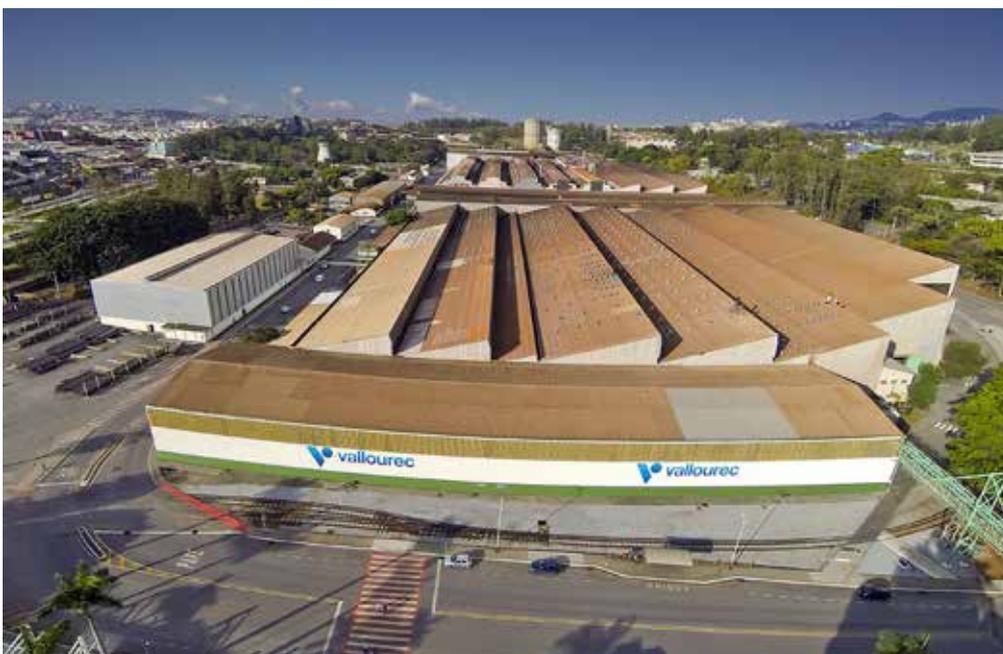
How it all began

In June 2011, after a short implementation phase, VSB started the operation of the PSImetals Production and Quality solution version 4.04 in its new Jeceaba plant. Here PSImetals supported the warehouse management, production execution as well as the quality and production data acquisition in the plant and thus enabled a genealogical view of the entire product chain. Seven years later, the existing solution was upgraded with PSImetals Release 5.14.

An upgrade with consequences

With the PSImetals upgrade, VSB pursued the goal of merging the Barreiro and Jeceaba plants into an integrated

production chain which would enable an exchange of materials between the production processes depending on market demand and plant availability. Both the new corporate strategy and the enhanced 5.14 release features such as the new user interface (GUI), bulk handling, process data collection, production journal, and various quality features called for an upgrade. VSB therefore started a roll-out project at the Barreiro plant in October 2017 with the PSImetals 5.14 solution implemented in Jeceaba as a



The Barreiro plant in Belo Horizonte, Brazil.

template—a decision with far-reaching consequences.

Fit for the future

The aim of the rollout project was to enable the Barreiro plant benefit from the strengths of the Jeceaba plant—both have comparable processes in the areas of bar cutting, bar rolling mill, plug mill (HRM), quenching and tempering and finishing lines for the production of seamless tubes from 15 to 35 cm in diameter.

With the final acceptance in November 2018, the following improvements were made:

- The new functions of PSImetals 5.14 replaced complex spreadsheets which were previously used for production monitoring, quality and inventory control.
- Horizontal integration of production processes, including material exchange between plants, now enables traceability and better use of available capacity, maximizes throughput and minimizes production costs.

Shortly asked

Ronaldo Mendes Magalhães, VSB Project Manager

PSI: What were the strategic reasons for the rollout of PSImetals 5.14 in Barreiro?

Ronaldo Mendes Magalhães: Vallourec considered PSImetals as its global MES solution right from the start. The rollout of the Jeceaba solution at the Barreiro plant was therefore the best strategy, as both plant processes are very similar. This strategy also ensures full integration of data exchange between the Barreiro and Jeceaba solutions.

PSI: What are the advantages of the project from today's perspective?

Ronaldo Mendes Magalhães: The most important advantages for us were

- The processes in various production areas have been standardized.

the new user interface on the MES level (the old solution was a database and integration level between Level 2 and the ERP systems, without user interface), the material genealogy and piece-by-piece traceability of pipes across plants.

PSI: What made PSI the right partner for this project?

Ronaldo Mendes Magalhães: The synergy of the Jeceaba and Barreiro plants was essential for Vallourec. That's why we needed a solution that would standardize our production processes and align them with the systems. That's why we chose PSI.

- The new GUI helps users retrieve important information from the database.

How to proceed

The rollout of PSImetals Production and Quality at the Barreiro plant enabled a company-wide standardization of the MES solution. Important functions for production monitoring, quality control and product traceability with WIP (Work in Process) inventory management are now available, while assuring the accuracy of data and information generated and processed between plants. 

PSI Metals

Carlos Matuck
Project Manager
cmatuck@psi.de
www.psimetals.de



The Jeceaba plant is one of the most modern in the world.

Product Report: AI Reduces Downtimes and Increases Quality in Production

Less Costs with Predictive Maintenance & Quality

Optimized utilization and high availability of technology are particularly important in the area of comprehensive machine parks and automated production systems, like those found widely in series production.

Machine and system downtimes naturally have a direct influence on the capacity utilization (and therefore on the Overall Equipment Effectiveness, in short OEE) and consequently also on production costs. Unplanned disruptions play a crucial role here. As a result, cyclical and preventive maintenance measures are often undertaken to avoid such disruptions in the production flow. These measures cause potential unnecessary costs due to downtimes or spare part usage and the resultant higher stock levels of “critical” parts.

Besides the classic methods of maintenance and repair (reactive, planned, and preventive) additional options arise as more and more data from the production process and its surrounds become available. The existing database can be used to make predictions

about future maintenance events with the help of applications based on artificial intelligence. The technological requirements for this (data capture and computing technology) have improved dramatically in the last few years. Today, there is sufficient, reliable time-synchronized data available for AI applications in many cases.

Avoiding Downtime Costs

Machine downtimes have a direct influence on capacity utilization and cost structure, and are often not considered in the planning phase. Unplanned downtimes are at the top of the list when it comes to disruptions in manufacturing. In the past, cyclical maintenance was performed “for safety” (preventive) to avoid this type of failure. Maintenance of this nature is cost-intensive and increases the need for spare parts and/or results

in costs due to external maintenance partners—not to mention the disruptions in the production flow.

An additional aspect is the quality of the products manufactured. This is directly affected by the maintenance status of systems and tools. Options for implementing proactive maintenance also exist. An example of this is the drift behavior of production technology through wear or suboptimal operating conditions. Although quality data is captured, it is often not correlated with the machine data.

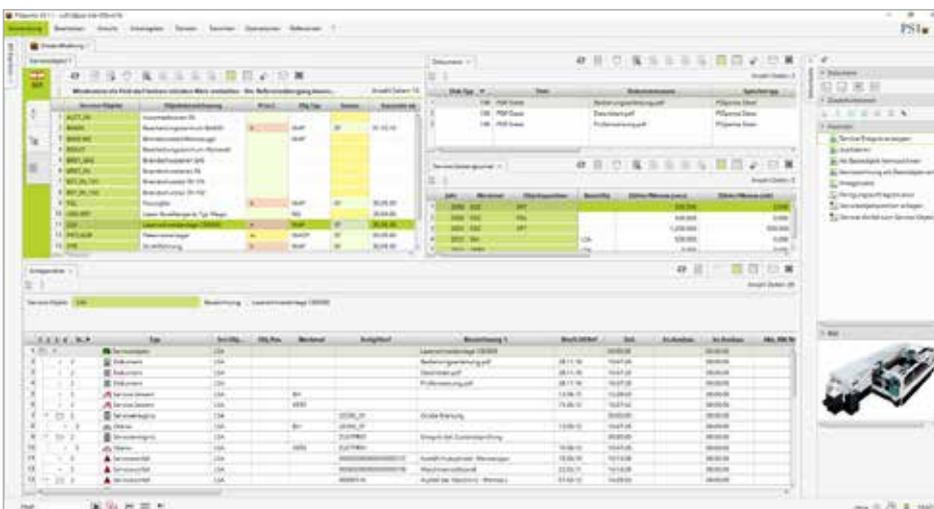
Today, all these operating parameters can be evaluated and analyzed. Hidden connections can also be discovered as a result of AI-supported proactive maintenance. Suggestions for process improvement or setup of production technology are also provided in this way. Maintenance measures become plannable and quality deviations are minimized.

Drift Behavior in Production Quality

Another aspect is the quality of the products or components manufactured. The maintenance status of the equipment and tools has a direct influence on the quality (and thereby also on the OEE). Automated production systems in particular display drift behavior in the quality of the goods produced. This can be due to wear or unfavorable operating conditions.

Using Data from ERP and MES

It is now important not only to consider purely machine-related operating data (e.g. pressure, temperature, rotations), but also captured (or cap-



PSIpenta Service Management offers a comprehensive tool for maintenance and repair of machines and systems.



Unplanned repairs result in higher costs.

turable) quality data (e.g. tolerances, surface finishes, function). In addition, the relationship between the data items must be determined and evaluated. All this data is available when integrating ERP, quality management, and MES, depending on the configuration of the applications and system structure.

AI Determines Maintenance Times

PSI offers AI-based tools to determine appropriate maintenance times based on relevant and labeled machine data as a supplement to PSI's own ERP and MES solutions. In addition to machine data, data from orders, material, quality data, as well as maintenance history is included. Similarly,

expected usage data from orders that are already planned is also input into scheduling of maintenance activities. Deep Learning methods are used, as is extended fuzzy logic (Deep Qualification technology). Data is evaluated using so-called qualitative labeling. Interdependencies between specific data items become identifiable and can be taken into consideration. Business aspects such as the criticality of a system can also be considered by weighting individual criteria differently. Together with PSI Maintenance Management, the implementation and documentation of all activities is insured. Maintenance data flows into the process again and continually improves the predictions for necessary maintenance activities.

Fast Results with Predictive Maintenance & Quality

Depending on the machine park or the focus on critical systems or bottlenecks, the implementation of methodology such as this can be performed at short notice. A prerequisite is of course the networking of the systems and the availability of sensors. Besides the continual expansion of the database, experiential knowledge gained from order processing can also be included. This allows for even quicker results, especially right at the beginning of the implementation. 🌀

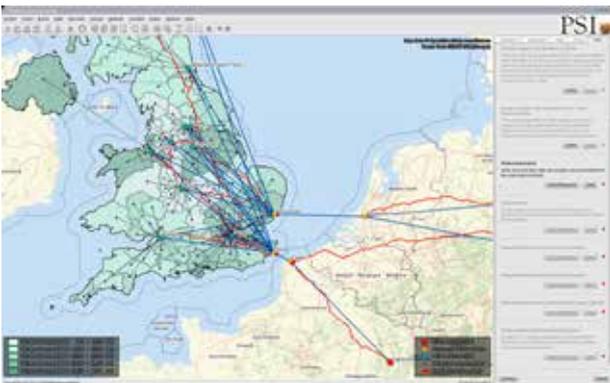
PSI Automotive & Industry GmbH
Karl Tröger
Business Development Manager
ktroeger@psi.de
www.psi-automotive-industry.de

Product Report: Strategic Logistics Software Guarantees Important Supply Chains

Plan B for Brexit

Intelligent software systems can help companies reduce the consequences of risks related to the Brexit process. The optimal alternative for network design—Supply Chain Network Design—can already be realized in advance for every Brexit scenario to guarantee important supply chains.

Since the British referendum at the end of June 2016, the issues on the topic of Brexit are largely still uncertain. Accordingly, air, rail, car, and shipping traffic are still facing unknown challenges.



PSIGlobal screenshot in the case of a hard Brexit scenario.

Discontinuation of free goods traffic will increase processing times at borders due to import duties, goods inspections, and reinforced administrative procedures. Companies need to anticipate delays, bottlenecks, and increased costs. However, according to the results of a survey in spring by the Institut der Deutschen Wirtschaft (IW—German Economic Institute), more than 80% of companies in Germany are either not prepared for or are insufficiently prepared for a British exit from the EU.

Planning Possible Brexit Scenarios In Advance

Despite all the uncertainties regarding future trade relations, the possi-

ble Brexit scenarios can be analyzed and evaluated in advance, particularly with regard to companies' own supply chains.

Showcase 1—Hard Brexit

A no-deal scenario with Britain's unregulated exit without trade agreements. UK becomes a third-party country for the EU and future economic relations are defined according to the rules of the World Trade Organization (WTO): without free goods and services traffic, with new duties,

and conditional access to the EU domestic market.

Showcase 2—Soft Brexit

In a soft Brexit with a scheduled transition phase and subsequent agreement, an initial 14-month transition phase would come into force in which the details of the future collaboration would be negotiated.

Showcase 3—Exit from Brexit

In the case of an exit from Brexit, the exit request would be withdrawn after a second referendum on the part of Britain; everything remains as it is, changes in the supply chain do not need to be implemented.

“It is possible to prepare for all possible Brexit scenarios,” says Dr. Giovanni Prestifilippo, MD of PSI Logistics GmbH reassuringly. Strategic software such as the planning and optimization system of PSIGlobal Supply Chain Network Design provides extremely helpful support. This software enables the relevant scenarios and their effects on logistics networks to be precisely analyzed and the supply chains to be optimally designed and organized.

Besides supply chain monitoring and the integrated simulation and scenario technology, PSIGlobal offers a comprehensive set of instruments including those for logistics analysis, network planning, and supply chain optimization. This means that for every Brexit scenario, the core functionality of PSIGlobal can be used to cover the entire application and optimization potential in advance in terms of the design and coordinated process control of logistics networks. “Using a prognosis generator and structure analyses for a selected location and stock optimization, companies can apply an intelligent plan B for their supply chain,” summarizes Dr. Prestifilippo. 

Read more
on this in
our blog.



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

News: Warehouse Management System organizes equipment supply for national football teams

PSIwms controls DFB Logistics Center

The German Soccer Federation (Deutscher Fußball-Bund e.V., DFB) organizes the equipment supply for the national teams from its new logistics center in Langen near Frankfurt/Main with the warehouse management system from PSI Logistics GmbH. PSIwms has been in use for administration and coordinating of picking and order processing since the beginning of September.

Action-specific order management on an individual basis

In addition to the essential core functions according to VDI 3601, PSIwms includes numerous additional func-

The DFB will supply all the German national teams with equipment for training camps, international matches and EC/WC tournaments from the new 4000 square meter, completely newly built logistics center. In addition, the logistics for approximately 350 nationwide talent promotion bases, the school football program and other DFB projects will be supported.

Functional scope and visualization functions main reasons for decision

The DFB ships, for example, more than 1.7 tons of freight during the U-17 national team's international match trip alone. Against this backdrop, the functional scope and vis-



DFB organizes the equipment supply for the national teams from its new logistics center with the warehouse management system from PSI.

contract to PSI. The selection procedure was supported by the Fraun-

tions such as returns management, serial number administration, customs handling and a forklift control system. The specific functionalities include cockpit functions, parts list management, warehouse visualization and archive functions. This means that the software takes over order management on an "action-specific" basis for individual players, teams and squads and, for example, equipping the physio suitcases. 🌀

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

“ Particularly in view of the fact that the time frame for implementing the new system was very tight, we are very satisfied with the consistently constructive and target-oriented cooperation with PSI.

Jan Fritsche
Head of Central Services, Real Estate and Logistics at the DFB

ualization functions offered by PSIwms were among the main reasons for the decision to award the

hofer Institut für Materialfluss und Logistik (Material Flow and Logistics).

R&D: KIBO-NUM—AI-based Online Traffic Optimization for Sustainable Urban Mobility

Multimodal, Ecological, and Flexible

In the KIBO-NUM research project (AI-based Online Traffic Optimization for Sustainable Urban Mobility) Urban Mobility Innovations as the consortium leader, PSI, and the City of Rosenheim as an associated partner are jointly developing a solution for controlling traffic flows in cities and communities for managing current and future traffic problems.

Algorithms for estimating traffic situations in road traffic that are supported by machine learning and that run on real-time capable, cloud-based platforms are researched and implemented for a new AI-based

Modern information and communication technologies combined with the use of artificial intelligence provide an opportunity to calculate an objectively balanced equilibrium while having regard for the needs of road users, citizens, and the environment, using increasingly available “Urban Big Data”. This results in an attractive, ecological, and flexible mobility offering. In KIBO-NUM current real-life issues in cities and communities are addressed with regards to existing traffic problems, and appropriate solution methods and concepts are researched or developed. Artificial intelligence processes from



New mobility: also part of the smart city strategy in Rosenheim.



the area of “Big Data” are applied in particular. Using these processes, data on current traffic states is captured, consolidated, and prognoses on how these will develop in the minutes and hours that follow are derived.

Multicriteria and Multimodal Traffic Optimization

Based on this datascape, collective and multimodal measures for traffic flow optimization are identified and evaluated using a multicriteria approach, as are suggestions for individual journeys. These are multicriteria as different views are incorporated with different requirements and criteria for the relevant current objectives. They are also multimodal as other additional environmentally friendly modes of transport such as short-range transit or bicycle traffic are incorporated into a holistic traffic concept besides motorized individual traffic.

prognosis of the traffic situation, taking into account parking space data, floating car data, and other data sources.

Linking of Machine Learning and Extended Fuzzy Logic

In the research project, Urban Mobility Innovations integrates the urban systems data into an open urban data platform. PSI supplies the necessary software components as well as the expert skills for AI-based optimization and decision engines in the area of traffic flow optimization (central control and individual route planning). The main innovation is the linking

of machine-learning technology with the proven PSI optimization solution Deep Qualicision AI, which is based on extended fuzzy logic, in the area of traffic flow control as well as the transfer of existing concepts for superordinate traffic networks on urban traffic structures.

Testing Ground in the Medium-sized City of Rosenheim

Within the framework of the project, the entire approach is being tested in a real environment to be able to transfer this approach to additional medium-sized cities at a later stage. For this purpose, the medium-



sized city of Rosenheim (pop. approximately 65 000), which is char-

acteristic of a number of cities and communities in Germany, was used. As part of the project, Rosenheim represents a test case and allows for the implementation of measures for collective influencing of traffic, for example by means of the integration of traffic computers for traf-

fic light control. A mobile APP for individual journey planning is also planned for testing in Rosenheim. The KIBO-NUM project will run for two years, and is being promoted by the Bavarian State Ministry of Eco-



Multicriteria and multimodal traffic flow optimization are state-of-the-art in terms of sustainable urban mobility.

Funded by

Bayerisches Staatsministerium für
Wirtschaft, Landesentwicklung und Energie



nomics, Regional Development, and Energy within the framework of the “Information and Communication Technology” R&D program. 

PSI Mines&Roads GmbH

Arnd Grootz

Head of Marketing & Sales

agrootz@psi.de

www.psi-minesandroads.de

News: Operator counts on baggage identification with PSIAirport/BRS 2019

Bratislava Airport orders Airport Software from PSI

The operator of the Airport Bratislava, a.s. (BTS) has contracted the PSI Logistics GmbH, via the integrator LogTech, with the delivery and implementation of the new system PSIAirport/BRS 2019 for the baggage identification.

For the first time, BTS will focus with the proven airport system from the PSI Logistics Suite on an extensive software support. In the IT infrastructure of airports PSIAirport/BRS will take over the control and documentation of process sequences for baggage handling in ground traffic in accordance with international guidelines.

At the largest airport in the Slovak Republic Bratislava, the software system will organize the bag-

gage handling between the conveyor technology in the airport building and the aircraft. The terminals with 29 check-in counters are designed for a capacity of up to five million passengers per year. In 2018, round 2.3 million travelers used the airport with a corresponding volume of baggage.

For the efficient processing, PSIAirport/BRS controls the timely and targeted loading and transfer of baggage to the transport vehicles and airlines, including trolley man-

agement and cost allocation—integrating all security aspects. The PSI system offers inbound and outbound baggage recording in accordance with IATA Resolution 753, which has been in effect since mid-2018. According to this resolution, the continuous monitoring of baggage upon receipt, handling and loading also applies to transfer baggage. Commissioning of the PSI airport system is scheduled for January 2020. 

PSI Logistics GmbH

Phillip Korzinetzki

Marketing Manager

p.korzinetzki@psilogistics.com

www.psilogistics.com

Product Report: How PSImetals Prevents Defects Using Machine Learning

Acting Instead of Reacting

Errors in production reduce product quality and lead to economic losses. Ideally, steel producers want to exclude defects right from the start. What's important here is: The earlier a defect can be predicted, the more options are available for avoiding that defect. The latest models of Machine Learning (ML) provide remedies. They examine the effect of combinations of different factors on actual quality indicators. The new PSImetals service for quality prediction relies on ML to be able to predict production defects. The new PSImetals Service Platform ensures that these types of technology can also be integrated into existing IT landscapes.

Data is the oil of the 21st century, as it is the raw material that feeds AI algorithms. However, raw data is of little value to an organization if it is not meaningfully linked and connected via a framework with data from other systems and no clear methodology for creating a predictive model based on ML exists.

Creating a Model

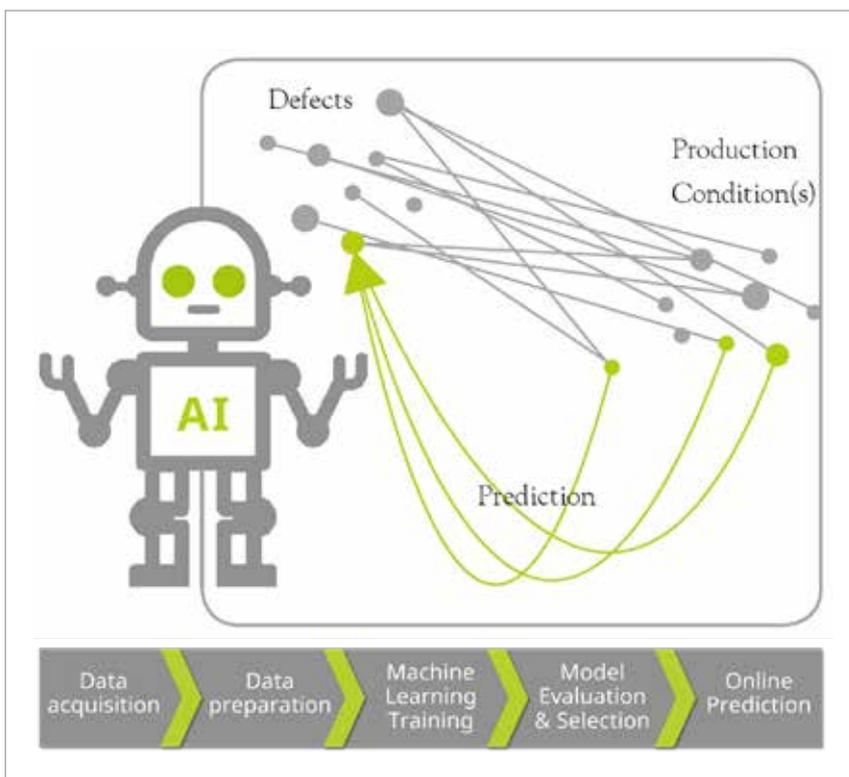
The process starts with the capture of historical data on production orders and steps, quality information etc. that is extracted from the PSImetals Factory Model. This raw data is linked with historical production and defect information in consistent data records. This volume is then divided in two: 75 percent of the data is used for

training and 25 percent for validating the model. The training of one of more predictive models using various ML methods that are compared with each other based on different KPIs only begins now. When the most efficient model is found, it is used in the online system to create operational defect prognoses.

For example, this allows the user to select the last coils produced in the system and predict defects in later production processes with the aid of the model. Based on the prediction, the quality expert decides what is to be done.

Short Lifespan

The precision of such models decreases over the time. Therefore, it is important to systematically monitor the quality of the model and to train it regularly using newer historical data. 🕒



AI methods for investigating defect correlations.

And what does soccer have to do with Machine Learning? Read more in our blog!



PSI Metals

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

Event: 12th CSM Steel Congress in Beijing

Intelligent Manufacturing in China

In this golden October, all eyes were on Beijing. On October 15 and 16, the 12th CSM Steel Congress took place in the Beijing International Conference Center. The biennial event is organized by the Chinese Society for Metals (CSM), and is one of the most influential metallurgical conferences in China, attracting around 1500 delegates. PSI was also there.

The topic of the two-day conference was “Innovation and Development for a Stronger Steel Industry.” Industry experts, management, and technical elites from all over the world exchanged up-to-date information from the world of steel. The subject of discussion was the current challenges in the steel industry as regards product quality, sustainability, intelligent production, and internationalization. In conclusion, the congress provided a guideline for successful further development of the industry in a new age.

The LEGO Prototype

Based on a hot rolling mill prototype, PSI presented selected AI technologies and their application in the metal sector. The mini factory consisting of approx. 1500 LEGO bricks

was equipped with an AI model for quality prediction. This makes it possible to explicitly predict defects during the milling process.

Research Overview

PSI also gave two presentations on the effects of new technology on steel production. In this regard, Dr. Liu Xiaoqiang, MD of PSI Metals China introduced new findings in the area of quality management: How do users make decisions about process quality? How can PSI metals quality indicators and process snapshots support

them in this regard? In his presentation entitled “The use of big data in the steel industry” Fang Shengchan, PSI Metals Senior Project Manager introduced the basic ideas of neuronal networks and the latest devel-



Von links: Zhao Zhanbo (PSI Metals Ingenieur), He Hui (Marketing Manager), Thomas Quinet (Geschäftsführer PSI Metals) und Chen Dong (PSI Metals Ingenieur) auf dem CSM Kongress 2019.

opments and algorithms in machine learning. 

PSI Metals
Helen He
Marketing Manager
hhe@psi.de
www.psimetals.de



Industrial Intelligence

At the Hannover Messe trade fair from April 20–24, 2020, PSI will present a wide range of software solutions for production, logistics, service and maintenance with a focus on AI applications.

We look forward to welcoming you.



Events: 33rd IPA Customer Event with Many New Ideas and Suggestions

Adaptable for the Future

This year's PSI Automotive & Industry customer event IPA was held under the banner of "Adaptable for the Future." The chairman of the board of PSI Software AG, Dr. Harald Schrimpf also picked up on this motto in his opening address. He classified the developments in ERP and MES against the background of the political and social changes towards Society 5.0, in which production will be more decentralized, faster, and more ecological.

PSI has responded to these developments in many ways, including the introduction of a comprehensive cloud strategy, adaptable user interfaces, functions for Business Process Management, and an Enterprise Service Bus (PSIbus) for easy integration of IT landscapes.

Directors Dieter Deutz and Dr. Herbert Hadler then examined the current challenges facing production SMEs. They spanned new thinking regarding business models from a digital perspective through the second wave of digitalization right up to intelligent ERP and MES in terms of the smart factory of the future. It became clear that this future is already available to PSI customers today.

Existing development effort in the areas of agile, process-oriented products, smart planning functions, and artificial intelligence (AI) are paying off. Companies are able to improve their business processes in terms of production planning, predictive maintenance, and quality control, for example. PSI solutions are the central platform for value-creating processes. PSI now puts even more emphasis on

merging its knowledge of production with AI skills. This type of "industrial intelligence" has a number of advantages for production companies. However, the prerequisite for this is data



The podium discussion on the topic of ERP in the future was followed with interest.

as the "fuel" for AI-optimized processes. In contrast to the giants of the data economy, production companies often manufacture in smaller quantities and therefore have only a limited amount of data.

The solution: In future, a cognitive production system will combine the "classic" smart factory with AI methods (such as the digital twin), thereby allowing connections to be derived directly from ERP and MES data, and the planning to be comprehensively optimized.

Responsive, smart, and highly integrated planning solutions are required, because of market requirements that change faster and faster. In its solutions, PSI relies on taking into consideration the requirements of a wide range of business models (project manufacturers to series manufacturers), ERP as a direct digital twin, automatic validation of data as well as planning models, automated adaptation of basic data relevant to planning, and the integration of PLM.

The directors also gave participants some advice: Companies should identify doable, small projects and implement these in an agile manner instead of expensive, large digitalization projects.

In a top-class podium discussion, Achim Stapf (Gemü), Stephan Klein (TROVARIT), Michael Grimme (Lödige) and Dieter Deutz (PSI) exchanged ideas about the ERP system of the future. Participants

in the event were able to pose questions using an app, and made good use of this opportunity. Various opinions were expressed in the discussion, although there was a broad consensus as well. There was some agreement that in a few years real AI will be an everyday part of the functions of ERP. Production sites will in future be smaller, but will be networked and will move closer to consumers in the large metropolises. Instead of monolithic specialized systems such as ERP, CRM, etc., modular solutions that fea-

ture highly agile adaptability of business logic will in future be used. These will be controllable from a template. Simpler search options in software in particular, and better usability in general are desirable and will become more important.

There was also great interest again in the many workshops in which practical experiences with PSIpenta

step towards digitalization here. The PSIpenta MES suite was introduced in 2019 to control the completely new production system in a fully automated manner.

On a different note, Goldschmitt techmobil recounted their experiences with migrating four plants to PSIpenta V9, while KAMPF discussed the options for timed assembly con-

The 2019 IPA annual event was a success, thanks to the open exchanges. We are already looking forward to next year: IPA 2020 will take place on November 12 and 13 in Mainz. 

PSI Automotive & Industry GmbH

Felix Saran

Content Marketing Manager

fsaran@psi.de

www.psi-automotive-industry.de



Participants were able to get detailed information from the accompanying exhibition.

were presented. The Neuenhauser Maschinenbau workshop addressed issues of timed line manufacturing and how technical production processes and the logistical value-added chain are optimized for series and variation manufacturing in just-in-sequence and just-in-time strategies.

By contrast, the topic for Perusch Paletten was automated production using the entire PSI product suite ERP and MES. The successful introduction of PSIpenta V9 was the first

control in specialized machinery manufacture. The wide range of topics was rounded off by Mahr, who provided a practical insight into the challenges and potential of a PSIWms implementation.

Additional workshops by PSI subsidiaries showed the broad palette of offerings from the PSI group. Plug-compatible solutions for ERP, MES, WMS, and AI optimization together enable comprehensive digitalization of production companies.

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: iStock.com/Rost-9D,

Page 2, 4, 5: PSI FLS

Page 6, 7: Fiege

Page 6: PSI Logistics

Page 8, 9: Vallourec Soluções Tubulares do Brasil (VSB)

Page 10: PSI Automotive & Industry

Page 11: iStock.com/pankration

Page 12: PSI Logistics

Page 13: iStock.com/efks, PSI Logistics

Page 14: iStock.com/J2R

Page 15: © Klaus Koziol Author/Photographer, City of Rosenheim, Bavarian State Ministry of Economics, Regional Development, and Energy

Page 16, 17: PSI Metals

Page 18, 19: PSI Automotive & Industry

EVENTS

www.psi.de/en/events



10.–12.03.2020	LogiMAT 2020 Stuttgart, Germany	PSI Logistics
20.–24.04.2020	Hannover Messe 2020 Hanover, Germany	PSI Group
31.03.–02.04.2020	26 th Passenger Terminal Expo 2020 Paris, France	PSI Logistics

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 