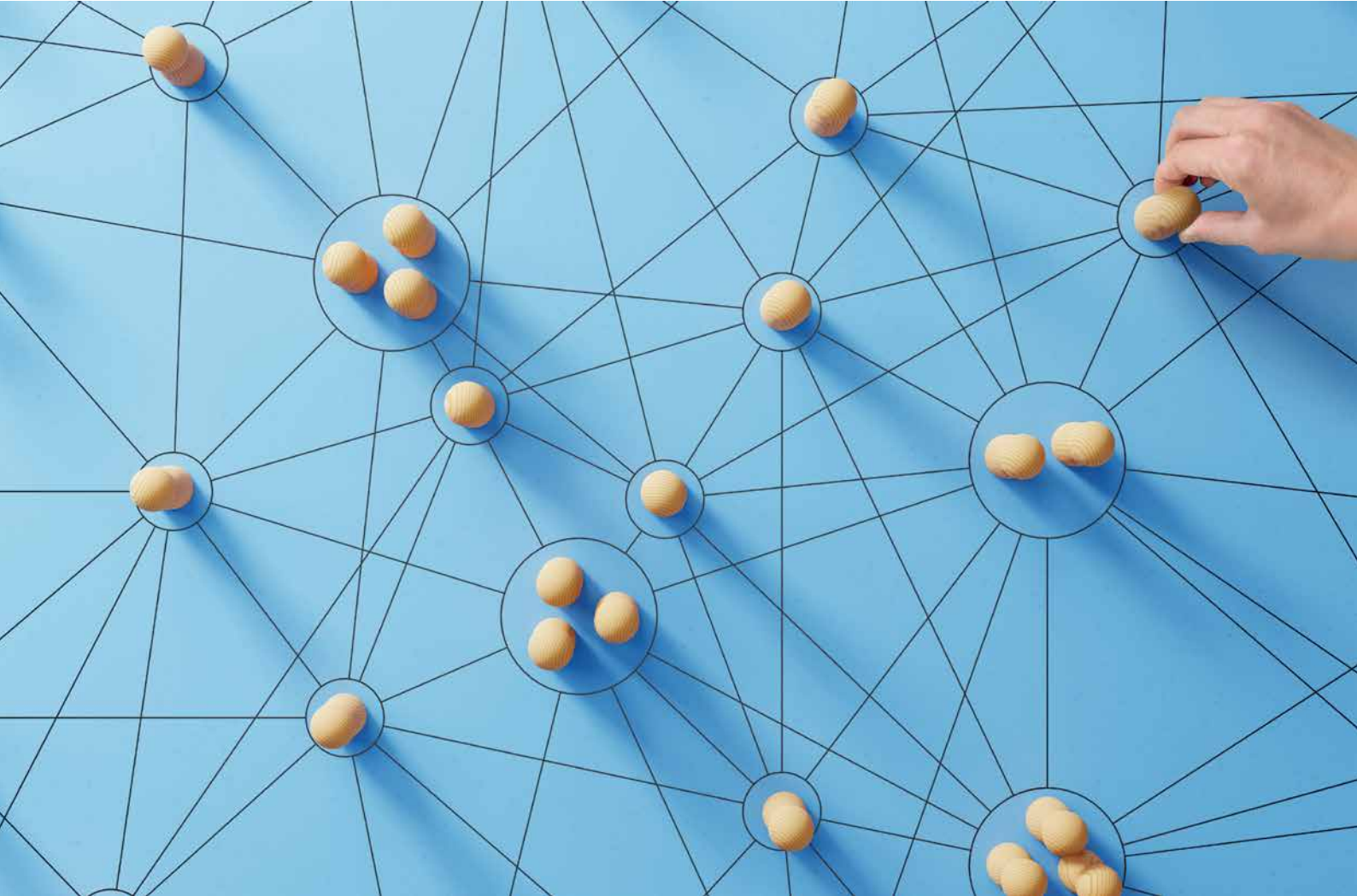


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PRODUCTION manager

Magazine for production & logistics



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EDITORIAL

Dear readers,

As a supplier of ERP and MES solutions for discrete manufacturing, 2024 is a particularly exciting year for us. This is because with the new PSIpenta/ERP 10.0 version, we are not only launching a new major release on the market. At the same time, we have reached the next innovation level with PSIpenta/MES and have successfully launched some very large customer projects.

In all our activities, we always focus on the needs of our target markets, which can also be seen in the latest trends. Integration and simplification are currently the two poles between which industrial companies face challenges within digitalization. In dealing with the associated tasks, we support our customers on the one hand with our workflow technology and on the other with user-defined views, such as the use of PSIpenta/Industrial apps for mobile production data acquisition at GHH Fahrzeuge.

Both the integration of Camunda into other products as part of the workflow approach and the integration



of the apps increase the degree of digitalization and networking of companies using them. At the same time, both ensure that they remain agile and flexible thanks to optimum process support and that the systems can be operated intuitively by simply mapping complex dependencies.

You could also gather a live impression of our solutions at the Hanover Trade Fair. Under the

motto "Industrial Software Powered by AI", the PSI Group launched comprehensive AI-based software for production and energy supply.

We hope you enjoy reading this issue

Dr. Herbert Hadler
Managing Director
PSI Automotive & Industry GmbH

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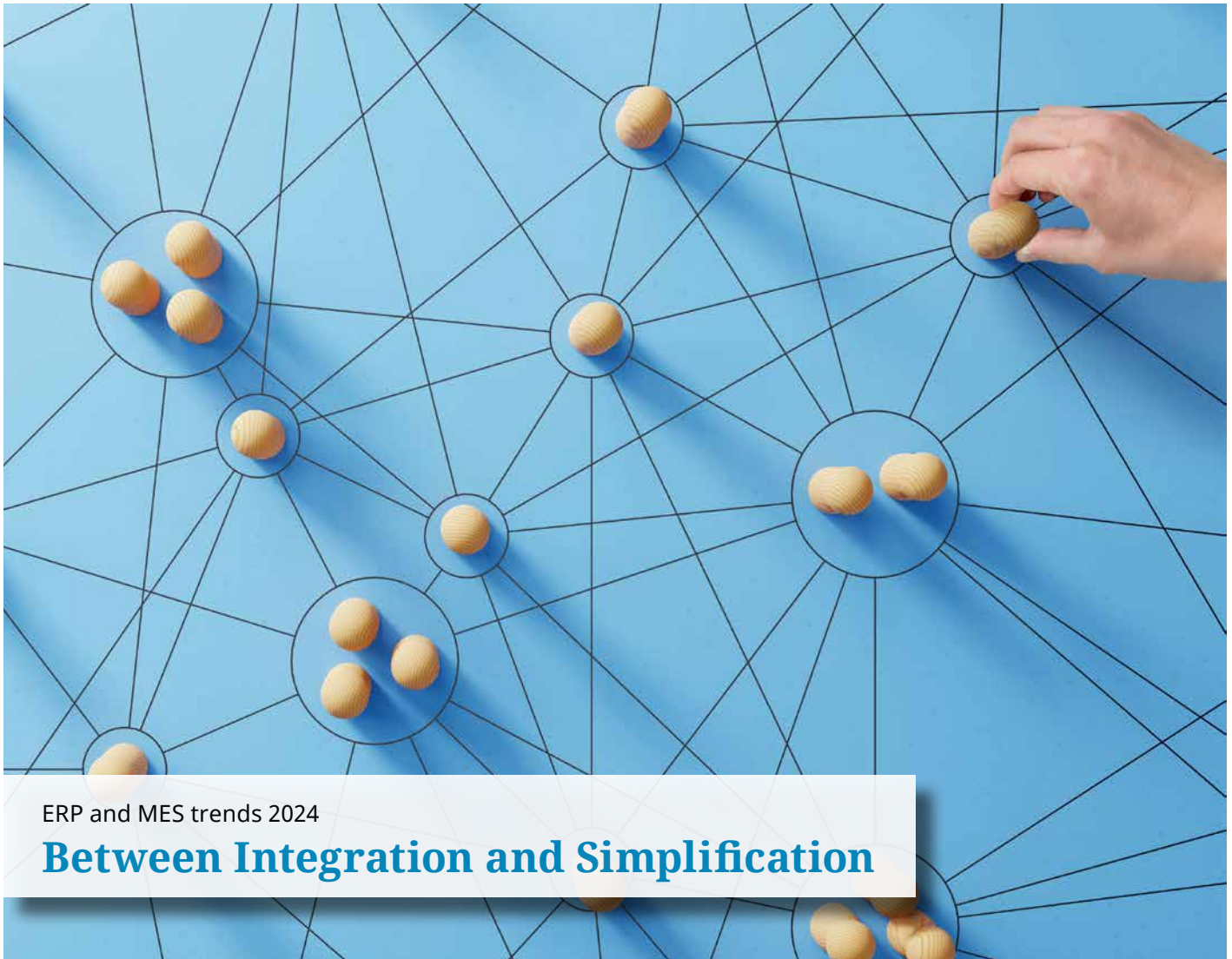
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ERP and MES trends 2024

Between Integration and Simplification

It is in the nature of things: as business-critical systems, ERP-MES solutions are subject to particularly close and constant scrutiny. They are continuously being developed in terms of technology and functionality, with particular focal points emerging time and again. For the year 2024, we have identified four topics that will significantly determine ERP and MES: Simplification, resilience, supply chain data management and system updates.

1 Simplification

For some time now, there has been discussions about the complexity of today's software solutions. The demand to simplify the use of business solutions is only reasonable—also because it results from users' familiarity with the now established usage scenarios of mobile devices and smartphones. This requirement will continue to be met in 2024. The aim is to provide information in a reduced and context-sensitive form. This means that users only see data and information tai-

lored to their specific business situation, allowing them to focus on the essentials.

The challenge is therefore to massively simplify complex and required functionality in its actual use (simplification). Software manufacturers choose different approaches for this. One way is to automate processes on the basis of workflows and decision tables. This allows preconceived process variants to be safely transferred into practice while efficiently avoiding un-

necessary queries or interventions by users. This not only leads to simplified use, but also to stabilized processes.

In the next step, artificial intelligence (AI) can further simplify the use of software solutions. Typical processes and inputs are "learned" and offered situationally during use.

2 Resilience

From the beginning, increasing the resilience of companies and pro-

duction systems was and is a declared goal of all activities in the context of Industry 4.0 and is also one of the top trends in the ERP-MES world in 2024.

Background: Disruptions in production processes are omnipresent, from machine breakdowns and delivery delays to the autumn flu epidemics that regularly lead to a reduction of available staff in production. If a company is resilient, it prevents situations like these through regular preventive measures or is well prepared for exceptional situations. Resilient companies also have the dynamic ability to react quickly to disruptions in

ucts in terms of materials and/or the different design of preliminary products, as well as a high degree of variability in the use of existing in-house or third-party production technologies.

This clearly shows that companies must lay the foundations for product-related resilience as early as the engineering stage and, if necessary, select alternative production specifications or assembly structures at this stage.

3 Supply chain data management

A networked and globally organized industry and the necessary holis-

then can the information obtained be evaluated and related back to the business processes. The result: a continuous improvement of processes and finally a promising digitalization.

It is essential to realize that the acquisition of data is not to be understood as a single event, but rather requires a continuous process that must always be adapted to ever more dynamic environmental conditions. This applies to the data as well as the—possibly temporary—data sources.

Backward-looking descriptive post-mortem analyses must be supple-



Artificial intelligence (AI) can once again simplify the use of software solutions.

order to successfully resolve them. Against this backdrop, it will be important in future to establish a kind of “resilience by design” in companies. With a focus on value creation, two main objectives can be identified: the intrinsic resilience of prod-

tic view of supply chains require stable and reliable data management. In this context, the concept of “data as the new oil of the 21st century” has emerged. Behind this lies the task of finding, tapping into and ultimately extracting data. Only

mented by predictive data analyses (advanced analytics & AI). Thus, status predictions of the supply chain or the production system as a whole as well as the simulation of disruptions and the anticipatory derivation of countermeasures can in-



Karl Tröger.

About the author

Karl Tröger has been with PSI Automotive & Industry GmbH for more than 20 years and has dealt with all aspects of ERP software since then. He has held leading positions in development, consulting and marketing. Today, he sees himself as a link between customers, the market, science, software development and marketing. The graduate engineer in electronics and communications engineering is involved in the Industry 4.0 platform initiated by the German government and regularly releases highly regarded publications on the future of production-related software.

crease the responsiveness of the value chain (keyword: resilience).

In the context of advanced analytics, data management plays a more important role than conventional business intelligence solutions. Above all, companies are required to raise data security (safety and security in equal measure) to a new level. So-called "data lakes" as a place for storing and processing business-critical and potentially cross-company data in a supply chain must be understood as specially protected data rooms.

Another aspect of shared data use is the management of sustainability. This requires data from both the past and the present. This is because planning your own sustainability strategy is only possible with corresponding forecasts. In the context of the supply chain, the main focus is on Scope 3 emissions and the carbon footprint of the products or the company (PCF, OCF).

4 Updating systems (continuous updates)

The following also applies for the year 2024: "Never touch a running system" is not an adequate operating model for highly critical applications such as ERP and MES. There are numerous reasons why it is important to keep the system landscape up to date at all times. One key reason, for example, is the (desired) adaptability of production systems. This also needs to be reflected in the associated software solutions. It also has to take into account the dynamic nature of business processes. In addition, the required digitalization leads to further requirements for the integration of machines and software.

New demands on production often require additional or improved algorithms for planning and controlling all activities. Process integration and, above all, the automation of processes have enormous potential for safeguarding the competitive-

ness of manufacturing companies. After all, they stabilize processes and avoid errors. These integration projects require an appropriately equipped modern software basis. This is the only way to drive digitalization forward.

Another advantage of modern software solutions is the significantly improved user interaction options compared to older legacy applications (usability or user experience). The independent personalization of the working environment increases the efficiency of using even complex applications. By supporting users with workflows, software allows uncertainties to be significantly reduced and at the same time noticeably increases satisfaction with the working environment. 🔄

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Collaborative Framework for Optimization

Artificial intelligence (AI) is rapidly penetrating industrial sectors and has the potential to achieve increasing levels of efficiency in productivity. In the steel and aluminum industries, Manufacturing Execution System solutions are already being used to optimize production. However, by leveraging the strengths of both technologies, metal producers can unleash unprecedented levels of operational excellence.

Manufacturing Execution System (MES) offers numerous functions that close the gap between planning and execution in metals production. From con-

porting, and quality management. It also allows integration with other enterprise systems such as Enterprise Resource Planning (ERP) and Product Lifecycle Management.

ruptions. Interruptions or delays lead to throughput problems and increased energy consumption due to higher tapping temperatures or reheating. To tackle this prob-



lem, PSI Metals, together with PSI FLS Fuzzy Logic & Neuro Systems, has integrated a corresponding module for heat schedule optimization planning into its production management solution. In interaction with the automation systems, the Qualicision Online Heat Scheduler continuously calculates balanced work schedules for each heat. The core of this module is AI-based decision support based on freely

AI revolutionizes Manufacturing Execution Systems.

trolling production processes and workflows to data collection and management, MES systems streamline operations by ensuring tasks are completed in the right order and provide valuable insights from data collected from various sources such as plant automation, sensors and operators.

In addition, MES supports detailed planning and scheduling, resource management, tracking and tracing, performance monitoring and re-

Overall, these features enable manufacturers to work more efficiently and increase productivity and profitability.

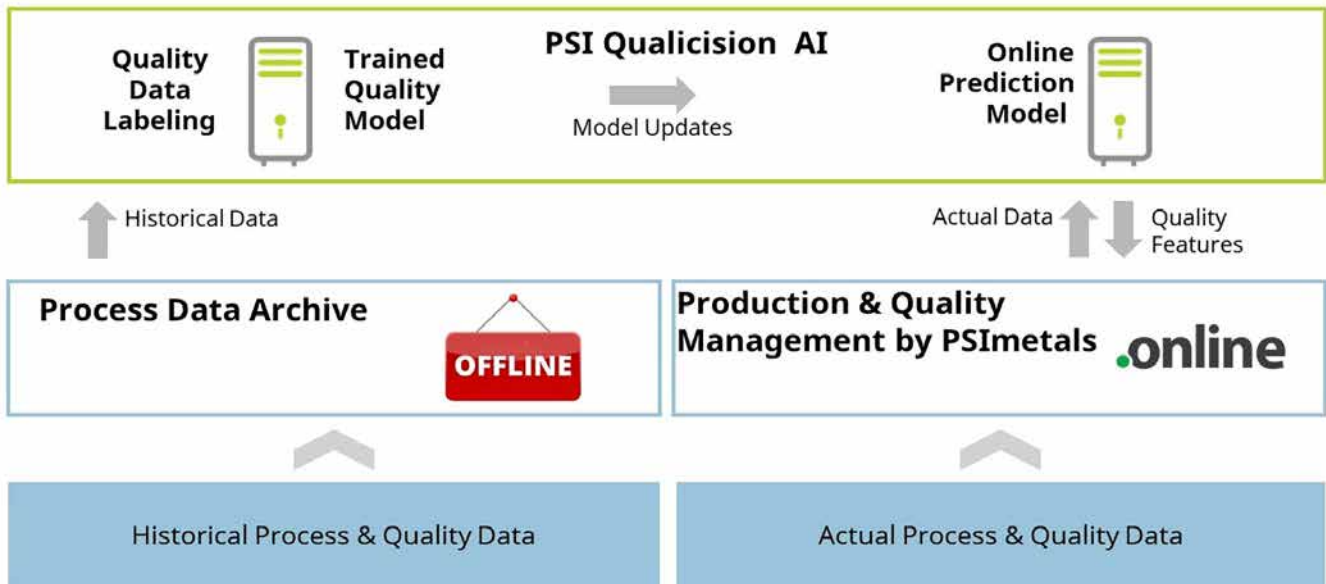
Qualitative data labeling with Qualicision AI and AI prediction functions

An important adjustment screw for a sustainable manufacturing process is the heat schedule optimization, which meticulously clocks the melt shop and helps, among other things, to avoid sequence in-

configurable and flexibly prioritizable key performance indicators and qualitative labeling.

Qualitative labeling of business process data with Qualicision AI

Learning AI methods for optimizing business processes and real-time decision support requires automatically processed data. This means that it must be assigned a meaning before the learning process. This is because, unlike speech or image



PSIqualicision AI and PSImetals, a joint framework for process optimization.

recognition, new data patterns that are constantly being created have to be relearned. This can only be done automatically by software.

Qualitative labeling is one such method. It can be used to automatically identify interactions in past and current data by means of goal conflict analysis—in the form of self-calculated classes of data patterns. These are presented to users for confirmation or correction. Qualitatively labeled data thus builds a bridge between data patterns in the raw data and their meaning in the real world of the respective process. This creates the prerequisite for continuous process improvement in combination with qualitative, optimization-based AI methods (Qualicision AI).

To truly unlock the full potential of MES systems, it is essential to integrate qualitative data labeling and AI predictive capabilities. Qualitative data labeling is the process of assigning descriptive labels or categories to qualitative data points to enable deeper insights and analysis. In addition, AI predictive models analyze historical data to iden-

tify patterns that can be used to make predictions about future events. By combining these two elements, manufacturers can improve their MES systems in several ways:

Proactive production management

Through the use of AI predictive models, MES systems can foresee potential production disruptions and issues, allowing them to proactively intervene to mitigate risks and maintain optimal operations.

Quality assurance

Qualitative data labeling can be used to categorize and analyze data related to product quality, while AI predictive models can predict potential defects or quality issues before they occur, enabling preventive measures to improve product quality standards.

Efficiency optimization

AI predictive models can analyze historical production data to identify opportunities for optimization and increased efficiency. Integrating these insights into their MES solutions allows producers to streamline manufacturing pro-

cesses, reduce downgrades and improve overall operational efficiency.

Real-time decision-making

Through continuous analysis and tagging of qualitative data in conjunction with AI predictive capabilities, MES systems can provide real-time insights and recommendations, empowering operators to make informed decisions that enhance profitability.

Partnerships for improved optimization standards

PSImetals and PSIqualicision AI are working together to realize these AI and MES synergies for metal producers. This collaboration enables them to optimize their processes, reduce costs, improve quality and finally survive in the current competitive environment. 🔄

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Increasing Efficiency with Artificial Intelligence

In a world where the efficiency of logistics processes is becoming increasingly important, the partnership between the Polish clothing giant LPP S.A. and PSI Logistics has set new standards. With the implementation of the AI platform PSIwms AI, LPP has made a significant step forward in the optimization of its warehousing and picking processes, setting the course for the future of logistics in e-commerce.

As a pioneer in e-commerce logistics, LPP has proven its market leadership in Europe for over 25 years and faces the challenge of keeping pace with rapid growth. In this dynamic environment, the efficient handling of online orders, which account for almost 30 percent of the company's omnichannel sales, is a top priority. This is where PSIwms AI comes into play—an advanced solution that revolutionizes warehouse processes through machine learning and Artificial Intelligence.

Seamless software integration

The uniqueness of PSIwms AI lies in its seamless integration with LPP's existing Warehouse Management System PSIwms. This direct connection enables precise simulation and optimization of logistics processes. The platform offers the option to



Optimizing warehouse processes with AI.

work with digital twins in order to test different warehouse operating scenarios and evaluate the effects of changes to the warehouse topology or the acquisition of new warehouse automation technology. These innovative features help to significantly improve the performance of LPP's logistics infrastructure.

duce time-to-market and improve the customer experience. In addition, the AI-based solution enables continuous adaptation and optimization of processes to meet the changing demands of the market.

Consolidating market position through AI technology

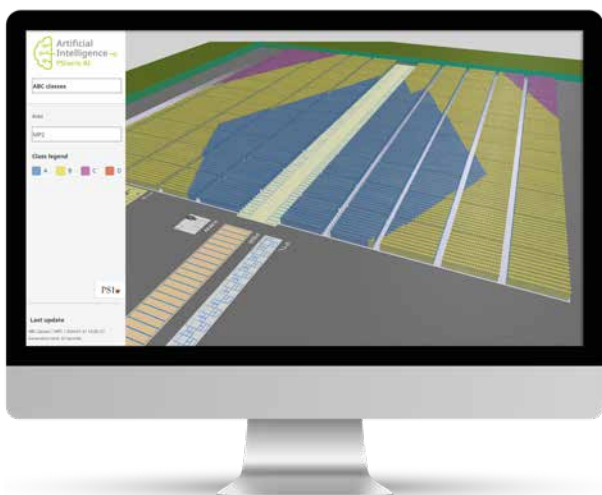
The PSIwms AI platform has proven to be a key enabler for LPP to not only increase operational efficiency but also achieve sustainable competitive advantages. By reducing workload and optimizing inventory costs, PSIwms AI is helping the fashion group to consolidate and further expand its position as a leading apparel company in Europe. 

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Significant shortening of picking routes

One notable outcome of the implementation of PSIwms AI is the drastic reduction in picking routes by more than 30 percent. This increase in efficiency results in a visible acceleration of the entire outgoing goods process. As a result, LPP is able to re-



PSIwms AI in use.

AI Optimizes Order Picking Processes

Dirk Rossmann GmbH (Rossmann) has commissioned PSI Logistics with the delivery of the Warehouse Management System PSIWms and the Warehouse Automation Control PSImfc module for its new distribution center in Hungary.

Since 1993, Rossmann has been operating 250 stores in Hungary and has been selling its products both over brick-and-mortar stores as well as online. Around 1 million items are dispatched from the warehouse every day. Due to the dynamic growth, Rossmann invested in a new 27300 square meter distribution center. This contains more than 20000 articles, over 23000 pallet spaces and 63000 shelf spaces. The implementation of the Warehouse Management System is

“We chose the PSI solution because it offers the functionalities that meet our requirements for managing omnichannel processes and because it is characterized by its innovative features, including the use of Artificial Intelligence in picking processes. Also, the track record of the PSI team in Poland was also an important argument for us, as they have solid experience with system implementations in warehouses of comparable size. This is con-

Dirk Rossmann GmbH, headquartered in Burgwedel near Hanover, is one of the leading drugstore chains in Europe. With around 56200 employees, the company operates over 4500 stores in Germany, Poland, the Czech Republic, Albania, Turkey, Hungary, Kosovo and Spain. The product range includes over 15000 cosmetic and pharmaceutical products. The total storage area is 346000 square meters.

“We chose the PSI solution because it offers the functionalities that meet our requirements for managing omnichannel processes and because it is characterized by its innovative features, including the use of Artificial Intelligence in picking processes.

Csaba Szuchy, Director Logistics at Rossmann Magyarország Kft

part of a larger project to automate the distribution center, executed by SSI Schaefer, a globally leading solutions provider for all areas of intralogistics.

firmed by references from suppliers for automation systems and key customers of PSI”, emphasizes Csaba Szuchy, Director Logistics at Rossmann Magyarország Kft.



Headquarter of Rossmann in Hungary.

As part of the project, PSIWms will be integrated with the comprehensive warehouse automation systems from SSI Schaefer via the PSI material flow control module. At the same time, the processes will be adapted to the needs of Rossmann.

Solid experiences with implementations

The implementation of the warehouse management system at Rossmann is another important step in PSI’s international expansion in the growth market for logistics software. PSI is thus continuing the strong growth of 2023 in the logistics sector, in which several leading European retail companies were acquired as new customers. 🌐

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Qualitative Labeling with Qualicision AI

As part of the Qualicision AI framework, Qualitative Labeling optimizes raw business process data for machine learning applications by qualitatively assessing measurable data directly from business processes in the context of KPIs (Key Performance Indicators) and analyzing interactions based on this. This automatically creates an algorithmic bridge between the unprocessed raw business process data and artificial intelligence (AI) methods, which significantly simplifies the time-consuming process of manual data analysis for labeling data.

Qualitative Labeling is based on the automatic detection of KPI goal conflicts and KPI goal compatibilities in business process data. The KPI goal conflict analysis based on extended Fuzzy Logic helps to automatically classify the business process data in such a way that interactions are derived from raw data, which enable the further use of the data by AI methods. The

In contrast to applications such as image recognition or speech processing, where data patterns remain static once they have been labeled, the patterns to be labeled in business process data are dynamic and always structured differently, for example due to continuously changing order mixes and process states, which must be continuously relearned.

classes of data patterns (see Figure 1). These are launched to users for confirmation or correction (see Figure 2).

Easy introduction to Qualitative Labeling of business process data

Due to the universality of the process, any existing PSI software based on the treatment of KPIs can be used as a KPI labeling engine. First and foremost is the Qualitative Labeling of business process data with KPI evaluations. The input for the software essentially consists of two main components: Firstly, data streams of the business process to be analyzed are recorded and automatically converted into time series using timestamps (see Figure 2, top graph). Secondly, key performance indicators (KPIs) and their value ranges, which are to be used to analyze the business process in question, are agreed with the process owner.

In addition, the value ranges of the KPIs are divided into desired and undesired value ranges. In the example figure 2, the green labels stand for desirable or good signal ranges, while red labels connote areas that are critical, i.e. undesirable from a process perspective.

If, for example, the different transformer voltages are considered as KPIs for a utility company's plant

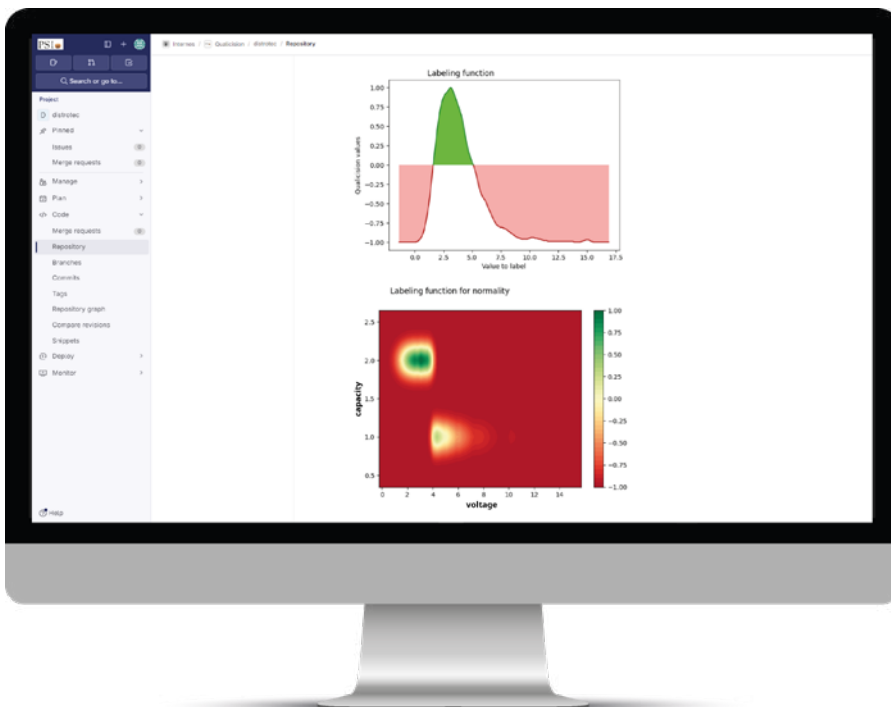


Figure 1: Qualicision Qualitative Labeling Tool—self-calculated classes of data patterns.

automated derivation of qualitative labels is so important for the application of AI methods to business process data because business process data changes continuously with the dynamics of business processes.

This can only be done automatically using software. Qualitative Labeling is one such method. It allows interactions to be automatically identified in historicized and current data by means of goal conflict analysis—in the form of self-calculated

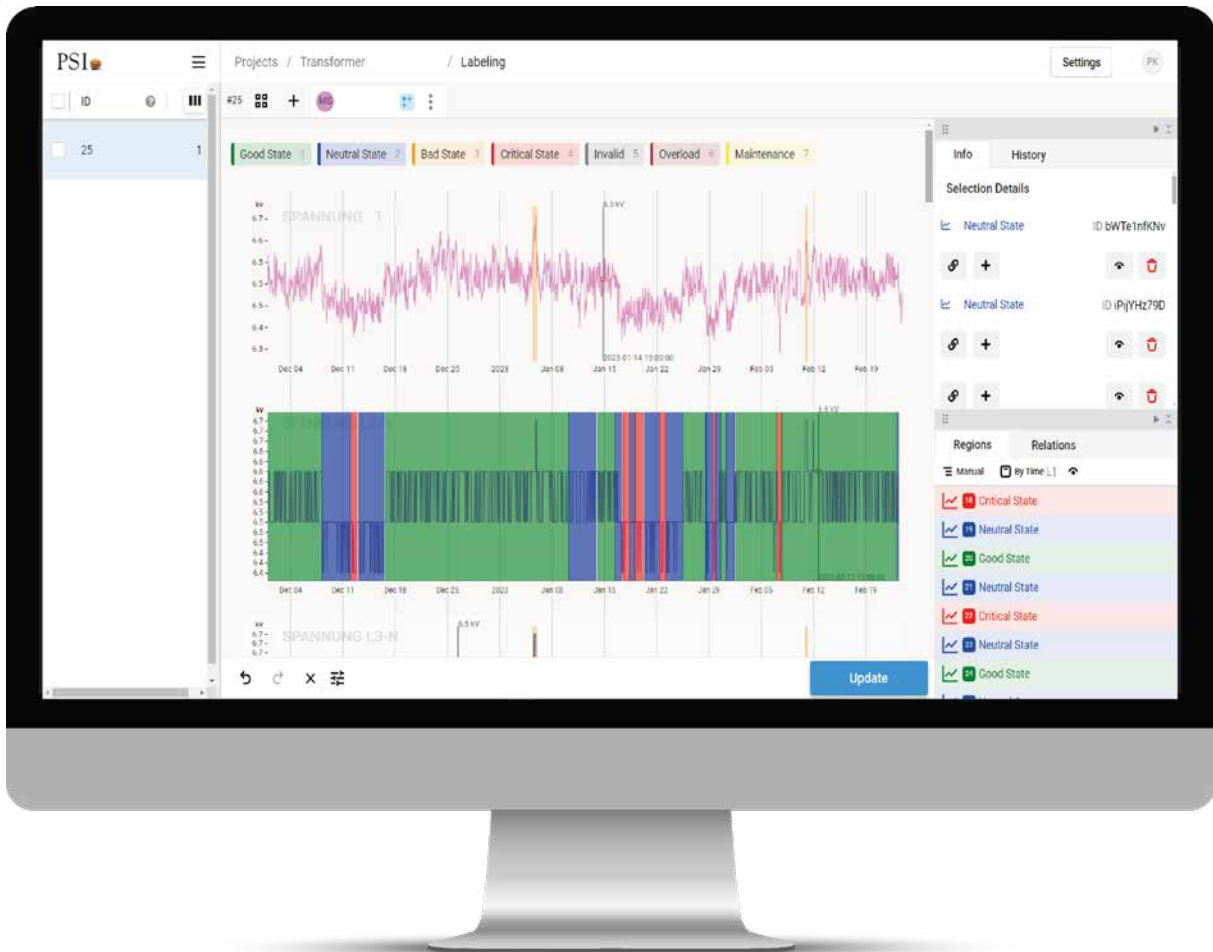


Figure 2: Qualicision Qualitative Labeling Tool—interactive Qualitative Labels.

according to their capacity utilization, a percentage value greater than 85% can be defined as desirable and positive for the capacity utilization. Values below 85 percent, on the other hand, are negative and are considered increasingly unfavorable the further they deviate from this minimum target value. A process owner can carry out this evaluation of positive, not desirable and neutral (blue labels) areas even without in-depth knowledge of AI, as these correspond to their everyday evaluation of process flows.


In this way, raw business process data can be evaluated with regard to the defined KPIs and the data can be completed with a suitable number of qualitative labels. The labeled business process data created in this way is much easier to use for AI procedures. The calculated qualitative

labels also improve the traceability and explainability of the AI results. In many cases, the qualitative labels are used to bring about the self-adjustment of optimization algorithms, so that learning optimization processes are created from classic optimizations. From the customer's perspective, it is therefore very easy to start using Qualitative Labeling with the help of the Qualicision Qualitative Labeling Tool.

Machine learning for all PSI software tools

Qualitative Labeling is used as an extended functionality of a switchable machine learning process as part of a Qualicision-based, multi-criteria optimization in order to equip already running PSI applications with learning self-adjustments. This allows the optimization to react to relevant changes in the

business process data as well as not requiring the user to do so.

The process can be transferred to any software application via the associated framework. This means that Qualitative Labeling of business process data is available in principle for preparing the use of machine learning methods for all group-wide PSI products that use Qualicision AI technology. 

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New Process and Data Quality

90000 active articles, 40000 parts lists and vehicles with up to 3500 parts list items: Anyone dealing with data of this size needs well thought-out and well-managed business processes. For this reason, GHH Fahrzeuge introduced PSIPenta/ERP including Industrial Apps.

For over 50 years, GHH Fahrzeuge GmbH (GHH), located in Gelsenkirchen, has been developing and manufacturing special vehicles for underground mining and tunnel construction. The loaders, dump trucks and recovery trucks are real heavyweights, weighing up to 60 tons. However, they are used all over the world, especially in India, Germany, South Africa, South America and the USA. Moreover, as different as the mountains are in each location, so are the vehicles. Each one is unique. Although there are similarities in terms of functionality and performance class, all the rest is precisely adapted to the respective conditions, for example to a hard or soft type of rock or to the required heights and widths.



Warehouse management at GHH.

High demands on processes and data management

As a classic assembly company, GHH covers only a small vertical depth of production. “However, the orchestration of development, supplier management, logistics and assembly places even greater demands on our processes and data

management,” explains Lars Barnewold, Head of Digital Operations & IT at GHH. The special vehicle manufacturer was looking to improve and aiming to increase data quality particularly with the implementation of PSIPenta/ERP and the PSIPenta/Industrial apps.

For Lars Barnewold, the most important functions of the standard ERP system include the mapping of growing parts lists and the pre-control of components. This is more than reasonable considering the up to 3500 parts list items per vehicle and delivery times of around 14 months: “The functions of the ERP system enable us to start ordering, production and assembly while adjustments and changes are still being made in development.”

Employees record information without a time lag

Finally, GHH must deliver all the parts required for a vehicle to the assembly station on time and neatly packed. Therefore, correctly maintained parts lists and a precisely managed warehouse that is seamlessly mapped in the ERP system provide the basis for this. Both are dependent on information being properly booked through.

“This is exactly where we had to improve. There were still a lot of paper forms in interaction with production, particularly in goods receiving and in the warehouse, resulting in delays and inaccuracies in the system.

Advantages of mobile ERP processes

- ✓ Accurate recording of data
- ✓ Improvement in data quality
- ✓ Increase in data transparency
- ✓ Acceleration of company processes
- ✓ Fine-grained visualization of processing statuses
- ✓ Integration of more employees into the ERP system
- ✓ Reduction of anxiety when using the ERP system through process focus
- ✓ Greater awareness of employees' responsibility and role in company processes
- ✓ Increase in employee satisfaction

The same applied to shipping,” explains the IT manager. For example, employees filled out delivery bills by hand and only handed them over to the internal warehouse service after some time, which then only entered the information into the system afterwards. Errors were particularly common when manually transferring production numbers or goods receipt documents. “Sometimes the numbers were transposed, often the writing was smeared or illegible,” says Barnewold.

By introducing the PSIPenta/Industrial apps, the company has closed these digital gaps. With the help of scanners, the responsible employees record goods receipts as well as stock movements and mate-

rial write-offs directly in the system without any time delay. Input errors are virtually eliminated.

Precisely adapted app dialogs ensure high acceptance

For the IT manager, the new data and process quality is linked not least to the consistent minimization of operations in the apps. The reason: basically, the apps can map all standard operations from the PSIpenta/ERP client. At the same time, they allow user companies to break down the functions and dialogs visible on the user interface to the essentials.

Lars Barnewold: "By reducing the apps or adapting them precisely to the respective physical process, we have taken away many colleagues' fear of using the ERP system. They are only asked for information from processes that they are really familiar with." The reactions of older and new employees in particular show that GHH has taken the right path: they accepted the new processes immediately and gave positive feedback.

New interim warehouse increases the system's informative value

The high level of data transparency as well as the accelerated processes and greater informative value of the system are due not least to the cre-

ation of a production and interim warehouse in conjunction with a route-optimized list.

A look back: Before the introduction of PSIpenta/ERP, material removed for production was simply booked out. This meant that the workers could neither see which material

should already be at their workstation nor where it was located. It also meant that the production department only booked unused material back into the system once a vehicle had been completed.

Today, the warehouse staff remove the material from the warehouse in a route-optimized manner using the parts lists, book the components into the new production warehouse and immediately print QR codes in order to be able to physically assign the component to a production order. Only the production employees can finally book out material. "This has created another level of information that is very valuable to us. For example, we can refer to the production warehouse when in doubt in the event of urgent spare parts inquiries from customers—after all, this always involves critical infrastructure. This was not possible before, as we only ever knew what was installed in a vehicle and what was not at the end of a project," explains Barnewold.


Integrating more employees into the ERP system via PSIpenta Industrial Apps

For Lars Barnewold, there are three main advantages from



Every GHH vehicle is unique.

which GHH benefits in particular following the digital integration of mobile processes: a massive increase in data quality, the ability to retrieve significantly more information and the integration of more people into the ERP system: "On the one hand, this increases their responsibility to transfer data cleanly into the system, but at the same time it also increases their understanding of how they contribute to the information content. The team is very proud of the fact that they are so close to the system wherever they can already see the results after just a few months."

With this in mind, GHH has already made plans for the coming years. At the top of the to-do list is further convergence with the standard. "There is a lot of expertise and experience in these processes, and we are convinced that we will be able to leverage even more potential here," says Barnewold. 

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New data and process quality at GHH thanks to PSIpenta/ERP.

Highly Flexible and AI-Supported

While driving off on vacation in an autonomous car is still a vision, driverless transport systems have long since made their way into automotive production. Along optimized routes, car bodies are navigated between modular, fully networked production stations, planned and controlled by AI-supported IT solutions.

Hardly any other industry is as closely associated with the assembly line as automotive production. Continuously, the distribution and logistical supply of the various production steps on the assembly line has been optimized—right up to the just-in-sequence principle.

The latter stands for the stockless procurement logistics, production planning and control of automotive assembly line production. Components are made available for the exact model that is currently passing the assembly line in a vehicle-related and assembly sequence. It is the further development of just-in-

time production, which took into account an ever-increasing variety of vehicle types and variants.

The limits of assembly line production

However, in recent decades, the limits of this bead chain principle and the physical restrictions of assembly line production have become increasingly apparent. These include the ability to adapt to fluctuating demand or disruptions to individual links in the chain. Automated systems, which are designed for series or specific assembly volumes, are very efficient at high capacity utilization. Yet the retooling costs are

extremely high and hardly economically viable.

Orders are paving their way

Even before the supply chain crisis and in the context of Industry 4.0 projects, initial attempts were made to implement modularized production, which requires significantly fewer fixed costs and is considerably more flexible. The idea: orders move independently through freely arranged production stations and storage areas rather than along an assembly or production line. On the one hand, driverless means of transport are used and, on the other, AI-supported sequencing solutions



AI-supported software enables more flexible production.




Quality assurance more accurate and time-saving thanks to AI.

that calculate optimized, highly flexible production sequences for both assembly line and cycle production. The interaction between the workflow-based ERP system PSIpenta and the PSIqualicision decision tool has already been proven.

of astronomical dimensions can result. The software optimizes and visualizes the production orders as well as the occupancy of the individual production cells and the freely moving transport systems. Consequently, proven approaches

scheduling. In simple terms, the system continuously calculates and optimizes which production station should carry out which operation in which order. This means that several production stations can perform the same operation for two different orders at the same time.

Fulfilling individual customer requirements economically

Automotive manufacturers will only be able to fulfill customers' individual wishes in future if this is economical. This also applies to reacting flexibly to changes in the market or in the supply chain. All this requires the implementation of significantly more flexible forms of production, with end-to-end, digitalized production planning and control at their heart—enhanced by powerful AI components. 

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Customized adjustments are economically unproblematic.

Same operations at the same time

According to individually definable criteria (Key Performance Indicators, KPIs), a combinatorial variety

to sequence optimization, the use of flexible resources in the sense of swarm production and KPI-oriented planning and control of production orders are combined for

Efficient and Optimized Warehouse Processes with AI

At this year's LogiMAT in Stuttgart from March 19 to 21, 2024, PSI Logistics presented innovative developments in the field of intralogistics. The focus was on the presentation of PSiWms AI, a further development of the Warehouse Management System PSiWms, which supports the efficiency and optimization of warehouse processes through the use of artificial intelligence (AI). For the first time, the AI-based platform was presented to a broader audience.

From a pilot project with the Polish fashion group LPP S.A., the results showed that the use of PSiWms AI increased the efficiency of the picking process by more than 20 percent.

Another focus of the presentation was the automated test procedure within PSiWms, which enables full configurability without extensive programming knowledge. This function allows process changes in the warehouse to be efficiently simulated and adapted, which simplifies the handling and optimization of warehouse management.

Furthermore, other software solutions were presented which aim to optimize supply chains, including PSiGlobal for the support of supply chain network designs and PSiTms for the planning and control of transport services. In addition, the latest version of the ERP system PSiPenta/ERP 10 was launched, which offers new functions for production process optimization.

Sascha Tepuric, Managing Director of PSI Logistics, summarizes the trade fair participation positively: "As every year, the LogiMAT was an important event for us to launch our

current projects and developments for intralogistics solutions. The discussions with a wide range of trade visitors will have shown that there is solid interest in our solutions, even if the path to full integration and optimization still poses challenges for many companies."

The next LogiMAT will take place from March 11 to 13, 2025. [👉](#)

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The PSI Logistics booth at LogiMAT 2024.

Digitalization of Steel Production in India

India is experiencing rapid growth in steel production, which is expected to reach around 300 million tons by the end of 2030. This represents a tenfold increase compared to production in 2000. Therefore, existing plant capacities need to be increased and new plants need to be built at various locations. To support this expansion, the production processes need to be digitalized. Software solutions such as PSImetals can provide crucial support.

In December 2023, PSI Metals opened a new office in Pune, India. In a short interview, the Production manager asked the management team of PSI Metals India, Manish Lunge, Fernando Guerra and Ram Chandra Chakraborty, how they plan to expand their team to support customers in their digital transformation projects.

What is the current state of the steel industry in India?

Fernando Guerra: The Indian government has set itself the ambitious target of producing around 300 million tons of steel by 2030. Currently, India produces 140 million tons per year. To achieve this target, steel manufacturers have to build new plants and upgrade old ones with state-of-the-art equipment. However, it is not easy to scale up steel production capacity without process digitalization and optimization. Plants need to be equipped with modern digital framework and solutions to control production efficiently.

How can PSI Metals support manufacturers with their growth targets?



The PSI Metals India management team (from left to right) Ram Chandra Chakraborty, Manish Lunge and Fernando Guerra.

Ram Chandra Chakraborty: A special characteristic of the Indian steel industry is its geographical situation. The steel plants are located far away from each other. Despite this situation, manufacturers need to integrate and centralize their production planning. The PSImetals Planning solutions are very well suited for this project, offering great support for customers due to their stability. On the other hand, large-scale productions need to be checked for quality in order to increase the rate of first time right. This is catered for with PSImetals Quality. With these requirements, PSI Metals is supporting the industry by providing the latest generation of software solutions that optimize production processes, save energy cost and minimize downgrades.

At the same time, we are expanding our team to grow from



The PSI Metals India team at the opening of the new office in Pune in December 2023

19 to 50 experts by the end of 2024. For this reason, we opened a new office in Pune in December 2023. In addition, we are working with other international PSI Metals teams to support us in the smooth implementation of projects in India and Southeast Asia.

What is your message to young talents who are interested in working at PSI Metals?

Manish Lunge: The vision of PSI Metals India is to support our Indian customers in the implementation of their projects and to be the technical hub that drives international projects across the globe with our expertise. This also opens up the opportunity for our team to work at locations of their choice—even outside India.

Since PSI Metals is a fully-built solution, we have the advantage that we only have to configure our solutions to meet the specific customer requirements with minimal or no coding. Therefore, we want to build a team, consisting not only of software developers but also of experts and consultants, who are ideally placed to assist our customers in optimizing their processes. Thus, PSI Metals India offers young professionals the opportunity to improve their knowledge and technical skills in the steel industry and also opens up global opportunities for them. 🌐

PSI Metals

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Event: PSI presented “Industrial Software Powered by AI” at the Hannover Messe 2024

Sustainable Processes with Artificial Intelligence

At this year’s Hannover Messe, the PSI Group presented software products for utilities and industrial companies under the motto “Industrial Software Powered by AI” from April 22 to 26, 2024. The focus was on AI-based applications for the sustainable optimization of processes in production and logistics as well as in the metals industry and energy trading. It was also demonstrated how AI supports the control and monitoring of electricity and industrial networks as well as the maintenance and servicing and optimized charging of electric buses.

The PSI Group is driving AI as a key technology in the industry and is pooling its expertise in a group-wide specialist working group. Over the past two decades, PSI’s software solution for decision support and optimization has been horizontally integrated into a large number of established industry-specific PSI products. Alongside other benefits, this helps to increase the efficiency of business processes and significantly reduce CO₂ emissions.

Within this framework, PSI took part in the daily guided tour “Artificial Intelligence” organized by the Hannover Messe. Another highlight was an exhibit on which interested visitors could actively gen-



The PSI booth at the Hannover Fair 2024.

erate energy by moving on kinetic glass-ceramic tiles, which was visualized by the movement of virtual wind turbines. 🌐

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PSIpenta for Plant Construction

PSI Automotive & Industry GmbH has been awarded by F.A.T. Förder- und Anlagentechnik GmbH with the implementation of the ERP system PSpenta 9.4 for around 50 users. The delivery includes integrated modules for service management and storage location management as well as an extended shipping module. It also includes PSI Industrial Apps for mobile feedback processes from production.

In a pre-selection process carried out by the Fraunhofer Institute for Material Flow and Logistics (IML), PSpenta/ERP 9.4 convinced with its functional strengths for plant engineering. With PSpenta, F.A.T. Förder- und Anlagentechnik will be able to implement interlocking processes from design to materials, production and warehouse management through to integrated service management. These are also supported by an integrated contact management system for customers and suppliers.

In addition, individual adaptations and configurations of the user interfaces are simple and convenient with PSI Click Design. Mobile applications can also be used to effectively manage parts of materials management with the PSI Industrial Apps and allow mobile feedback processes from production.

F.A.T. Förder- und Anlagentechnik GmbH, based in Niederfischbach near Siegen, has been developing and implementing conveyor systems for bulk materials technology and systems for foundry operations with 65 employees since 1973. The company opted for PSpenta due to the high level of fulfillment of the specific requirements for plant construction and the reference companies typical of the industry.

With this order, PSI has gained another important customer from the mechanical and plant-engineering sector. 

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The PSI blog features more interesting and in-depth articles on production, logistics, AI, energy and mobility.



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