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PRODUCTION manager

Magazine for logistics & production

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EDITORIAL

Dear Reader,

While the world is still recovering from the effects of a global pandemic, we are dealing with a new crisis of major proportions caused by the war in Ukraine and the instability it has brought. Our first thought is of the human tragedy and unspeakable suffering brought on by the war. I am very proud of the response of PSI and our colleagues in the company who have donated money and time to help those suffering.

The war has had two major impacts on the economy: further disrupting already strained supply chains across all industries and highlighting our dependence on fossil fuels. There were already good reasons to invest in sustainability and reducing fossil fuel use, but it is clear that the war has accelerated this trend.

There is no question that we need to optimize the use of available resources and understand the energy requirements for production. At PSI Metals, we have invested in our tools to enable our customers to do just that. We believe it is possible to improve sustainability by increasing production efficiency. We achieve this by using advanced planning and scheduling tools with optimization models that take into account energy requirements.

Sustainability is an issue close to my heart, and I am pleased to work in a place that is doing its part directly—through the collective action we take to reduce CO_2 emissions in our offices and on our travels—and indirectly, by helping our customers reduce their emissions through the use of our solutions.

Kind regards,

Fernando Guerra
Head of the New Markets Department
PSI Metals

You can also read the Production manager online: www.psi.de/en/psi-pressevents/customer-magazines/

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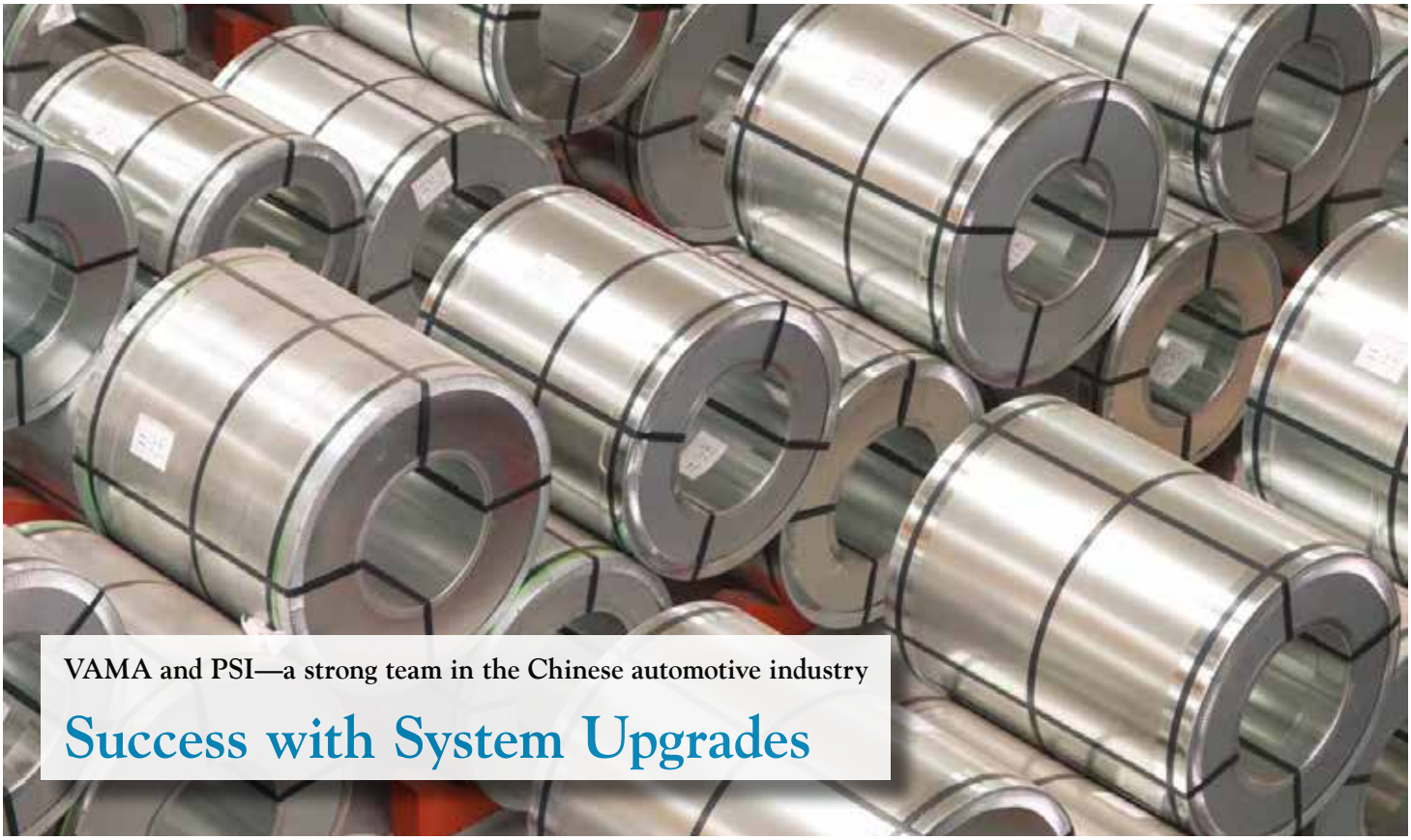

VAMA and PSI—a strong team in the Chinese automotive industry

Success with System Upgrades

There are few industries in which technology is challenged as much as it is in steel production. It is therefore all the more important that existing systems are always up to date and meet customers' current requirements. This can be remedied by product releases that are accompanied by higher performance without necessarily having to buy a new product. The Chinese automotive steel manufacturer Valin ArcelorMittal Automotive Steel Co., Ltd. (VAMA) also thought so and quickly updated its five-year-old PSImetals solution to the latest version.

As early as November 2019, the VAMA IT and PSI teams began discussing the feasibility of the PSImetals system upgrade. The contract was then signed in September 2020 and the project went live in August 2021.

Valin ArcelorMittal Automotive Steel Co., Ltd., a joint venture of Valin Steel and ArcelorMittal Group, produces steel for Chinese automotive manufacturers. In 2013, VAMA chose PSImetals as the production management system for its new plant in Loudi, Hunan Province, China. The project started in May 2013 and successfully went live in April 2014 after a one-year implementation phase.

After five years of use, the PSImetals solution was upgraded to a new version and has since delivered even more impressive results.

PSImetals has been in use at VAMA since 2014.

Higher system performance and security through an upgrade

For users, the interface of the new system version has been optimized and made more user-friendly. There have also been improvements in the system functions, which are now significantly faster. In particular, the new functions such as 3D storage location management or the extended quality management are appreciated.

The IT Department now has better opportunities to maintain the new version and respond more quickly to the needs of end users. The overall higher system performance can be seen in the faster download of planning system data, smoother message exchange between interfaces and a significant acceleration of the JAVA GUI.

In addition, the system can be updated more easily and is thus better "release-ready". In terms of system security, several benefits have been achieved with the system upgrade. For example, the IT department can better monitor and verify operations with user authorization.

Prospects and joint project

In 2022, VAMA will add one new galvanizing production line to help VAMA increase the annual design production capacity of 450,000 tons of high-quality, high-strength automotive steel, and the company's overall designed production capacity will reach 2 million tons. PSI will also supply the MES system for the phase 2 project, which will start at the end of 2021. After the design phase, the system is scheduled to go into operation in October 2022 and support the production of the three new lines.

Interview with Mr. Hu Hua, Deputy IT Manager at VAMA

"It's better when IT takes the initiative and actively updates systems to new features!"

Mr. Hu, many companies are having a hard time with digital transformation. What do you think is the reason for this?

Mr. Hu: From my personal point of view, digitalization goes hand in hand with more responsibility. In order to increase productivity, metals manufacturers need a system that supports their production more efficiently. This means that they themselves have to take a closer look at their production processes and how the system can be used more efficiently. I think this is a big challenge for any company that wants to go down this path.

What are the key factors helping VAMA to effectively drive digital transformation?

Mr. Hu: The steel industry has a traditional character. During the digital transformation, it is of course very important that the management provides sufficient support. The company must standardize its processes more strongly from the top management during the digital transformation. This will not work without the support of the management. The corporate culture also plays a very important role here, because it has to be open to the change.

Mr. Hu Hua in an interview with PSI Metals.

How do the special requirements of the automotive industry influence the production process and product development at VAMA?

Mr. Hu: In the past, the goal was to sell as many cars as possible: quantity was what mattered. However, that has changed. China has developed very quickly. Production volume is still high, but quality has also improved because the market now expects customization. VAMA, for example, is good at producing high-pressure steel. In the future, however, it may no longer be sufficient to supply the automotive industry with this type of steel. Other types of steel may be required and it may of course be that

this type of product is not yet included in VAMA's product range.
This is a challenge for product design, because a product has to be developed that is suitable for smaller batches and more individual requirements. This also applies to the production process itself. It has to change and so does the IT system. This is where the concept of soft, flexible production comes into play.

You mentioned the trend toward individualization and personalization of the product. What other trends are there on the market?

Mr. Hu: In my opinion, the Internet of Things and Big Data will be very important. And there will be a trend toward self-driving cars in the future. However, in order for these self-driving cars to be possible at all, important elements such as environmental protection, sustainability and safety must be taken into account.

Green steel and sustainable production are a big topic in Europe. What's the situation in China?

Mr. Hu: The Chinese government attaches great importance to environmentally friendly steel and sustainability. There are two important key figures to control production and make it more environmentally friendly. The first is a CO_2 emission quota that must not be exceeded. Secondly, we have to control exhaust gases during production and reduce them as much as possible. So essentially, the consumption of unnecessary energy for production must be reduced.

You have recently updated PSImetals to version 5.20. How important are these software releases for VAMA?

Mr. Hu: The new version includes many new features and customization. If you don't upgrade, you're left out of the new culture, theory, best practices and modern culture. Users drive improvements. However, it is better if IT takes the initiative and actively upgrades systems to new features.

You mentioned the special requirements of the automotive industry with regard to steel products. You use PSImetals Quality at your sites. What do you particularly appreciate about this solution?

Mr. Hu: As we speak, we are in the process of setting up a data exchange system (EDI system) with all automobile manufacturers. Of course, they would like to get the production data from steel raw material suppliers like VAMA. They would like to have answers to questions such as: "What is your raw material and what are the important KPIs in the production process, especially in terms of quality"? PSImetals Quality supports us very well here and offers our customers this kind of data.

Which PSImetals function is the most innovative on the market?

Mr. Hu: I think one of the most innovative products of PSI Metals is Order Dressing—a dynamic order dressing that can calculate the production parameters and production steps based on the derivation table.

How does working with technology partners like PSI Metals fit with your vision of digital transformation?

Mr. Hu: When working with a technology partner, the most important factor is trust in the people and the technology they deliver. For example, we recently signed a FAT for PSImetals upgrade in Beijing. As a result, we have not only upgraded the software, but also solved problems that arose in the past. Working closely with a technology partner and building a strong, trusted relationship goes a long way. Trusting the software and understanding it better through close collaboration also helps us make certain custom configurations to PSImetals locally and not escalate them all the way to Europe. This of course speeds up the whole project and is possible only for the reasons just described.

You have mentioned the FAT. Congratulations! And now what are the next steps for the company?

Mr. Hu: VAMA is currently building new finishing plants and the PSImetals solution will be implemented in the new plants. The challenge now is how we bring together and integrate IT, plants and automation. When production starts, IT, automation and plants must work together. The other challenge is how we make progress on "Industry 4.0"—there are already initiatives in place at VAMA to do this.

Mr. Hu, thank you very much for the exciting interview and all the best for the future cooperation with PSI Metals.

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Product report: When scheduling and capacity are not enough

KI in detailed planning

Detailed planning systems, also known as "control stations", are widely used in the manufacturing industry. Such a MES component is considered particularly valuable if it can also be supplemented with AI-based methods if required. This is because it also makes it possible to handle planning tasks that cannot be solved by classic aspects such as scheduling and capacity alone.

The task of detailed planning systems is to put the production orders or operations in an optimal sequence. The system takes into account the actual capacity of resources. In planning, they primarily include information such as available capacity and capacity requirements, deadlines to be met (earliest start or latest end) or priorities. However, if other aspects are relevant for planning scenarios, this classic approach reaches its limits.

Optimize planning options—Utilization

A practical example illustrates the planning possibilities. Companies that use coating or annealing processes in production must strive for optimum furnace utilization in view of high energy costs. However, this does not simply mean when the furnace is occupied and when it is not—that would be a classic planning task. Rather, the decisive question is which components can be combined for optimum kiln loading. The task would thus be: from the totality of all components to be annealed, selected those that can be packed together on a transport rack and annealed.

The following considerations regarding this selection can be included in the AI-supported optimization with PSIpenta/ASM:

1. Design and size of the components:

The volume to be filled (e.g. of the transport rack) must be optimally occupied. The components can have a wide variety of shapes and sizes. These components must optimally fill the available volume in a three-dimensional nesting process.

2. Weights

When using suspended transport racks or goods carriers, permissible total weights must not be exceeded. The weight distribution within the transport rack must be as even as possible.

3. Process parameters

For each component, there are process specifications with which the ther-

Cluster analysis (see monitor) and PSIpenta/ASM with scenario consideration by PSI Deep Qualicision (see laptop).

Not so the PSIpenta/ASM control station. The modern Java-based architecture makes it possible to flexibly supplement the existing classic planning rules with the AI-based methods of PSI Deep Qualicision with two differ-

mal treatment must be carried out. This concerns temperatures, annealing times or temperature curves that must be run. Thus, components may be combined only if they have overlapping value ranges in their permissible process specifications.

4. Deadlines

Deadline restrictions must be observed for all components involved: these components may also require further processing or delivery to the customer. These deadlines also limit the possibilities for combining.

5. Material availability

The inclusion of components in the transport rack for filling makes sense only if the components themselves are also available at the planned time. The availability information comes from material receipt dates (planned receipt from procurement process or from internal prefabrication).

If necessary, further criteria could be included. As a result of the optimization, the worker can see at his workstation which parts must be packed onto the transport rack and in which form.

Combinable sequencing

Another planning task follows. The planning system PSIpenta/ASM can also address this task in conjunction with PSI Deep Qualicision: in which sequence can the filled transport racks now best be annealed?

Especially for production areas that manufacture in a line, AI-supported sequencing offers a high optimization potential. For the production sequences of devices or vehicles, the respective equipment features, among other factors, play an essential role.

PSIpenta/ASM with scenario consideration with PSI Deep Qualicision.

The sequence must "balance" them in such a way that there is an even "flow" in the line. In addition to the equipment characteristics, other criteria such as deadlines, inflow of components from a prefabrication or delivery dates of material can also be included in the sequencing calculation.

Detailed planning solution with multi-criteria optimization

Optimized production planning does not always get by with the consideration of criteria such as capacity and time. Often it is necessary to balance numerous individual criteria (multi-criteria optimization) to an overall optimum. PSIpenta/ASM in conjunction with PSI Deep Qualicision is one of the few detailed planning solutions on the market that can do just that.

> *Particularly for production areas that manufacture in a line, AI-supported sequencing offers a high optimization potential.*
>
> **Stephan Klaas**
> Key Account Manager PSI Automotive & Industry GmbH

Read the full article here:

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Product report: Warehouse management systems support multichannel distribution

Preconfigured WMS cloud solution for e-commerce

Warehouse management systems offer a wide range of functionalities and helpful tools to meet the challenges of multichannel distribution. With an industry-specific preconfigured e-commerce solution from the cloud, PSI Logistics has created a best-practice complete package that also helps smaller online retailers to take the step into digital transformation.

Online retail is booming—and the pandemic has once again accelerated the development. With a 19 percent increase in sales, goods worth 99.1 billion euros were sold via the internet last year, according to calculations by industry association BEVH [Bundesverband E-Commerce und Versandhandel Deutschland e.V. (German E-Commerce and Distance Selling Trade Association)]. For this year, the association expects a further increase of 12 percent and 111 billion euros in sales. At the same time, almost every one of the approximately 37 000 online retailers in Germany has to deal with a significant returns rate, as several recent studies have shown. Depending on the product group and survey method, an average of one in eight to one in five parcels ordered online in Germany is returned.

WMS solution covers e-commerce requirements

These figures illustrate the challenges and the need for action for online retailers. From an economic and ecological point of view, the logistics processes of warehousing and picking must be optimally designed for fast shipping.

In addition to fast shipping, the rate of returns should be reduced to a minimum through suitable measures such as secure packaging, picking quality with checks for completeness, and assortment streamlining. Warehouse management systems such as PSIwms are an important tool for meeting these requirements.

Volume-optimized packing at the packing station with PSIwms.

"When compared with WMS functionalities, it becomes apparent that functionally tailored systems cover the majority of the required measures per se," explains Rüdiger Stauch, Head of Sales at PSI Logistics. "In this context, an intelligent analysis of the existing data material opens up notable optimization potentials."

Basis for ABC analyses and assortment streamlining

This starts with batch and/or serial number management for continuous traceability of all incoming goods in the logistics center and extends to the labeling of returns with a separate advice class. The information obtained is used to optimize the web store, for example. In addition, the data provides a reliable basis for ABC analyses together with the corresponding assortment adjustment and maintenance of the customer and address files.

"With its process control and optimization functions, PSIwms focuses on the most important goals of every shipper: ensuring picking quality, completeness of order production and efficient control of intralogistics processes for fast shipment provision," emphasizes Stauch. "Moreover, when it comes to packaging, the aspects of security, cost reductions and sustainability are brought together."

The software has an integrated case calculation function. Based on the stored article master data, it determines the safest volume-optimized packaging size and gives the employees at the packing stations the corresponding specifications via an on-screen dialog. This ensures that shipments and goods reach their recipients undamaged and reduces ship-

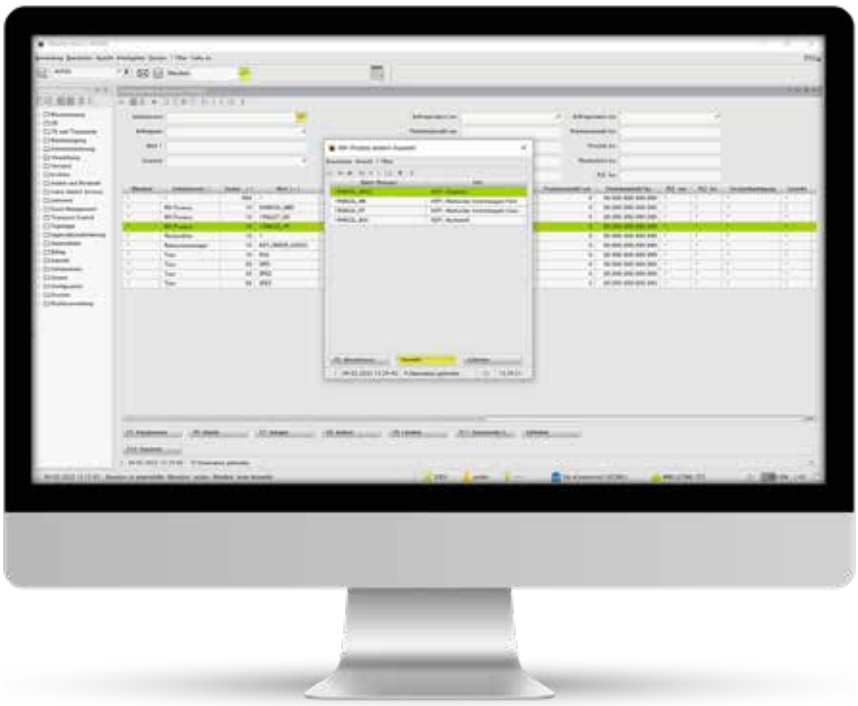
ping costs as well as the returns rate and the resulting CO_2 emissions.

Shortest implementation times without additional programming effort

However, in the area of conflict between assortment width, item quantity and throughput, smaller mail order companies are often reluctant to invest in more complex warehouse management systems. Against this background, PSIwms was launched as an industry-specific preconfigured e-commerce solution. The best-practice complete package is precisely aligned to the processes and work requirements relevant for e-commerce and omnichannel. Thus, work dialogs, user guidance and the most important processes, such as returns processing, batch formation and pick & pack as well as order production and mixed pallet handling are already preconfigured.

As a cloud-based industry solution, the template also enables short implementation times and requires no additional programming effort. This means that even smaller mail order companies have access to efficient intralogistics processes and proactive returns management. The best-practice complete package has already proven its stability and performance in initial reference applications.

Picking via pick-by-light with PSIwms.



E-commerce industry solution as preconfigured PSIwms.

Entering the future of IT systems

The WMS of the future does not end with a digitized warehouse—it begins with it. It must be continuously adapted to current market requirements in terms of its functionalities and technological design. "PSIwms will be available for download centrally in the PSI App Store in the future," Stauch emphasizes the development trend. "With the upgrade-as-a-service, which is also established, customers will participate in the latest developments and always work with the current release."

In this way, the digital transformation in the warehouse can be implemented in continuous process steps, while the software always remains state-of-the-art. "As a preconfigured and smart solution, PSIwms thus offers users maximum flexibility and maximum future viability," concludes Stauch.

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Product report: With AI from predictive maintenance to a predictive asset management strategy

Holistic Maintenance with Qualicision AI

Ensuring high plant availability and minimizing maintenance costs at the same time is a balancing act. The complexity of this area of tension grows with the size of the plant network and the resulting increase in the number of combined, in some cases contradictory, influencing factors. Against this background, more and more companies rely on predictive asset management, which has the goal of making optimized decisions, e.g., on maintenance and repair. In practice, such approaches are limited to solving individual aspects. However, only holistic system solutions that consider all involved processes and surrounding software integratively together, from maintenance recommendations to concrete planning to feedback, offer added value with the implementation of predictive and automated maintenance and servicing and thus create the basis for a successful predictive asset management strategy.

When planning maintenance and repair, there are various challenges that have to be reconciled on a daily basis. If a machine is at a standstill, it devours money every minute. However, it is also clear that over-maintenance causes unnecessary costs due to strict maintenance cycles. Consequently, it is necessary to balance high availability with minimum maintenance requirements. This challenge becomes greater the more machines are in operation. This is because the number of influencing factors increases with each plant, some of which are mutually dependent or mutually exclusive (multicriticality). In this balancing act, many companies rely on a forward-looking strategy in which optimized maintenance and servicing decisions are made by continuously monitoring the condition of the machines. Solutions that not only take into account technical data, e.g., pressure, temperature, or hours worked since the last maintenance, but also include business aspects such as adherence to schedules, utilization of resources, state of depreciation, or need for modernization in the decision-making process—in a cumulative and balanced manner—have proven particularly successful. Due to the volume of data and complex interactions, this is achieved primarily by AI-based methods.

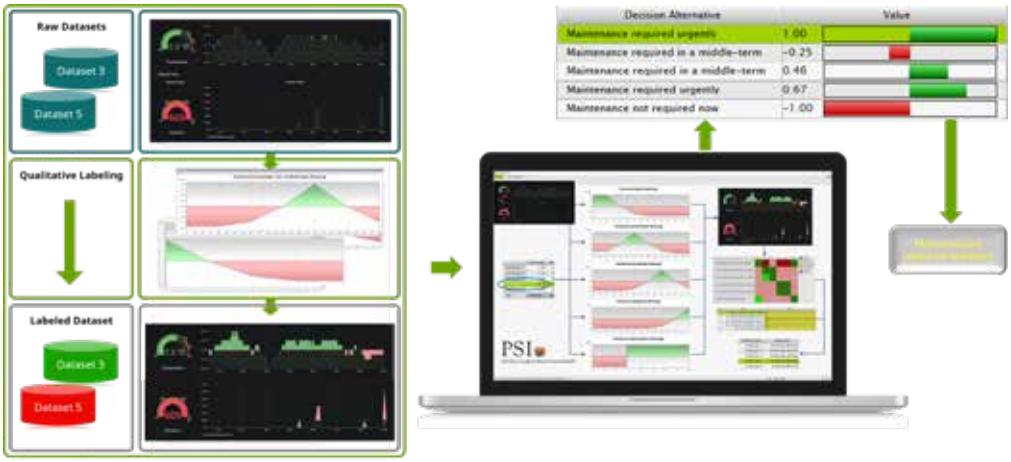

Figure 1: Process of Qualitative Labeling of machine data in predictive maintenance.

Flexible scalability thanks to labeling algorithm

Qualicision's field-proven AI-based, self-learning decision support and optimization continuously evaluates different assets on the basis of qualitatively labeled plant data—flexibly scalable and thus suitable for predictive maintenance of a single plant as well as for predictive asset management for geographically distributed plant networks. This creates an additional, AI-independent explanation layer whose simple visualization makes the system's decisions comprehensible and usable even for non-data analysts. The basis is provided by Qualitative Labeling (see Figure 1). Using a corresponding labeling function, the software observes, for example, which temperature ranges of the sensor data provided indicate a need for maintenance and differentiates between positive, i.e. more desirable, machine states and negative value ranges, i.e. undesirable machine states. It then assigns positive and negative connotations—the so-called labels—to the corresponding sensor data.

Understandable visualizations

The software establishes interactions between the determined labels and

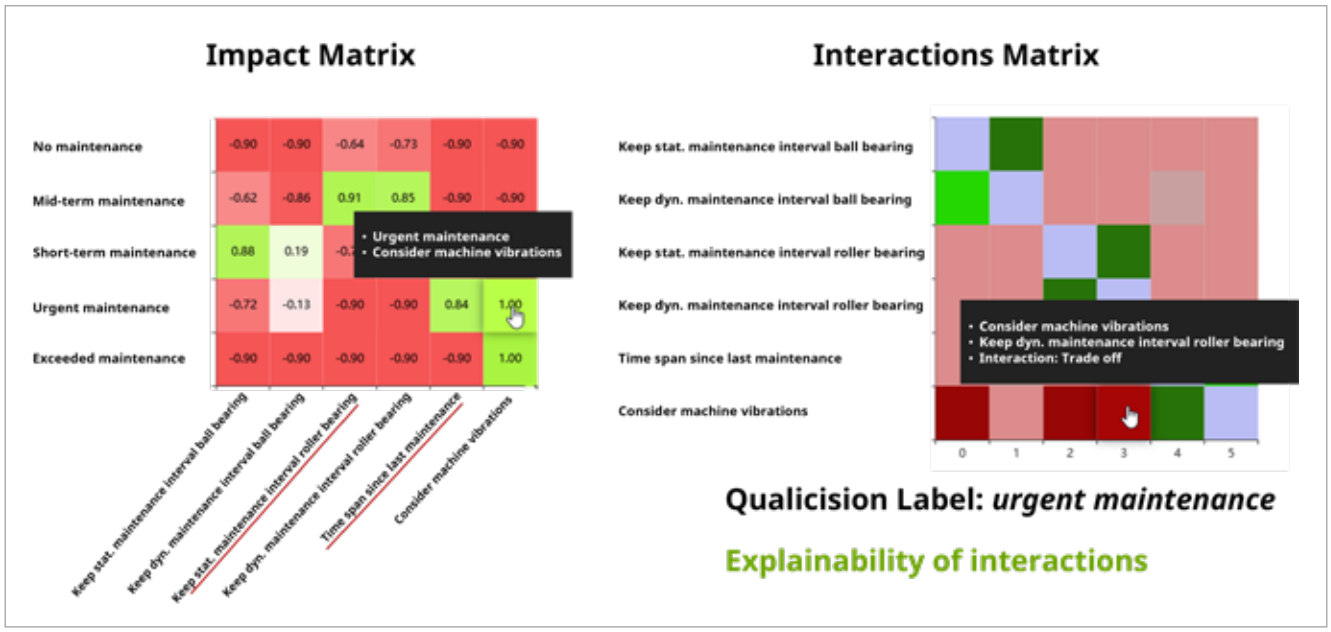

Figure 2: Impact and Interactions Matrix—AI-learned Qualitative Labels with Interactions.

recognizes patterns in them, from which it derives short-, medium- or long-term maintenance recommendations (maintenance labels). Once defined, the labeling functions process and connote any signal sequences. By visualizing the labeled data in impact and interactions matrices, the software allows users to easily understand the derivation of recommended actions and interactively operate the system. For the machine observed in Figure 2, for example, the system recommends urgent maintenance. It can also be seen that the software has taken vibration data into account for this purpose, as well as the dynamic maintenance interval to be observed. The difference to common methods lies less in the results of the forecasts than in the form of their presentation, which enables users without AI expertise to understand and evaluate the basis for decision-making. Thus, users can confirm or reject the recommendations or adjust the sensitivity of the labels via sliders. From this feedback, a stored learning algorithm in turn derives further patterns and learns continuously via an integrated machine learning process.

Step by step to a predictive asset management strategy

Anyone who operates machinery or plant parks must find a good balance between the highest possible availability and the lowest possible maintenance costs. This can be achieved by holistic and consolidated asset management. Optimized, the relevant interactions can be managed by using artificial intelligence methods, especially if these show those people in charge of the process recommendations for action, the evaluation of which does not require any knowledge of AI. Software solutions for optimized maintenance and repair management are also practical if, in addition to suitable scaling options, such solutions can also map the entire process from maintenance recommendations and concrete planning of maintenance operations to continuous monitoring of the processes (Figure 3, left), e.g., by means of messages on the process-

Figure 3: PSIjscada/Qualicision dashboard for Predictive Asset Management and PSIcommand/Qualicision.

ing status of maintenance and repair operations, and are therefore suitable for both predictive maintenance and predictive asset management scenarios. In the example, this is done by taking into account other influencing factors that are processed using the same systematics and the principle of Qualitative Labeling. Likewise, the learning logic that can be used in the background can learn interactions and systematics at a high scaling level. Consequently, the only change concerns scaling, e.g., with regard to the use of databases and further maintenance management tools such as PSIcommand. On this basis, companies can also gradually approach predictive asset management with predictive maintenance for individual machines and plants and implement a holistic strategy for asset management (Figure 3, right) in the sense of a rolling intelligent process.

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R&D: Process for AI-based online traffic optimization in the research project KIBO-NUM

Sustainable urban mobility

After two years, the KIBO-NUM research project for AI-based online traffic optimization for sustainable urban mobility, has been successfully completed. The project was funded within the R&D program "Information and Communication Technology" of the Bavarian Ministry of Economic Affairs, Regional Development and Energy, partners were Urban Mobility Innovations, PSI FLS Fuzzy Logik & Neuro Systeme GmbH and the City of Rosenheim as associated partner.

The goal of the KIBO-NUM project was the collaborative creation of a cloud-based service for the sustainable management of traffic flows of cities and municipalities, to manage current and future challenges of urban traffic with the consistent data-driven approach and using AI technologies.

CO_2 dashboard for urban traffic managers and planners.

New opportunities for smaller and medium-sized cities

Traditional traffic management systems can only be operated by large cities due to the cost and manpower involved. In smaller cities, traffic signal control systems are usually not operated by the city itself, but by the higher-level state authority, or are configured statically. Thus, it is not possible to intervene directly in the current traffic and mobility in order to independently manage pollution caused by emissions and noise or to carry out short- or long-term planning of traffic-related decisions. Therefore, one concern of the project was to show that digital technologies can create new opportunities for smaller and medium-sized cities to manage their traffic problems.

With the support of the methods used, data on the current traffic situation was collected and consolidated; and forecasts for further developments in the next minutes and hours were derived. On this data basis, collective measures for traffic flow optimization, as well as proposals for individual trips, were identified and evaluated with PSI's own decision and optimization software Qualicision based on multi-criteria. Information and communication technology, and in particular the application of artificial intelligence based on increasingly available "Urban Big Data", offer the opportunity to achieve an objective balance of the interests of road users, citizens and the environment. This contributes significantly to the reduction of CO_2 emissions and creates the basis for an overall compatible, sustainable and flexible mobility offer of the future.

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News: ERP System PSIpenta with comprehensive new functions in release 9.4

Many Highlights in Framework and Applications

PSI Automotive & Industry provides extensive new functions in the new Release 9.4 of the ERP system PSIpenta. These include support for export processing, optimized text management and embedded standard reports in the client as well as multi-language documents. In addition, new features enable customized order, production and personnel schedules.

In order to support export processes, the new release offers, for example, the possibility to map delivery embargoes, to specially mark and handle dual-use goods, and to store export lists and export licenses in the system. In addition, embedded standard reports can be visualized directly in the client and authorization controls can be set.

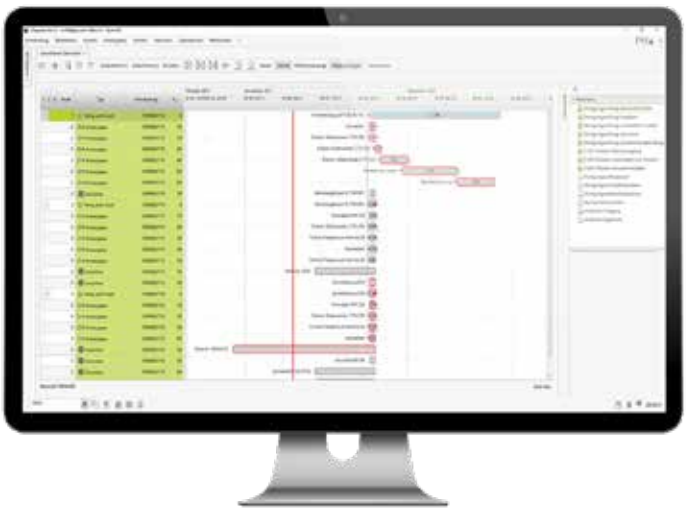
Generation of multilingual documents

A central administration of label designations and their translations allows the generation of multilingual documents. A dynamic and international address display with multi-line field is also available.

For wage and outward allocation, it is also possible to display the capacity utilization in order to recognize an overload of personnel and suppliers at an early stage. Furthermore, average actual times can be determined and used to update the target times in the work schedules.

Industrial Apps to support individual service processes

The service management has been enhanced with additional industrial apps to support individual service processes. Along with the output, an import of ZUGFeRD and XInvoices is also possible. This enables the calculation of manufacturing costs on the basis of subsequently generated manufacturing networks across warehouse levels.



Graphical visualization of the complete production order structure as Gantt visualization.

PSIpenta V9.4 displays standard reports directly in the client (embedded).

Complete integration into the client

Gantt diagrams supplement the previous visualization of complex production structures in table format. Additionally, new filters are available for the determination of delays. Due to the complete integration into the client, the critical path is marked and progress is monitored via level indicators.

Please, find more information here:

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Product article: Sustainable steel production with PSImetals

Let's Pick the Low-Hanging Fruits

Steel is a vital material for a modern, industrialized economy and the backbone of global sustainable initiatives. But the steel industry is also one of the world's most energy-intensive industries, responsible for around 8 % of global carbon dioxide emissions. Steelmakers are increasingly making decarbonization of production their global priority. And if the producers reach into the Industry 4.0 toolbox they can discover some low-hanging fruits that can be implemented quickly and cost-effectively to improve production efficiency and thus contribute to decarbonization.

Often steelmakers face the dilemma of whether to invest in "going green" or in production efficiency. But why should it even be a contradiction? Most of the efficiency improvements that can be achieved through Industry 4.0 initiatives also have measurable environmental benefits!

Improve Material Handling Within the Steel Plant

By optimizing warehouse management, steelmakers can avoid unnecessary piling and unpiling of materials, as well as the transfer of materials between yards due to process inefficiency. Not only will this significantly reduce CO_2 emissions, it will increase the efficiency of the processes in your plant.

Invest in Better Quality Tools

Generally, improving quality tracking and genealogy can increase 'first time right' rates by up to 20%, considerably decreasing the need for rework, and thus reducing energy consumption for reprocessing materials. Advanced functionality for quality tracking, can also lead to the elimination of customer claims.

Die meisten Effizienzsteigerungen, die über Industrie 4.0-Initiativen erzielt werden können, haben gleichzeitig messbare Umweltvorteile.

Integrate Energy Forecast Models Into Planning Tools

By far the greatest potential for avoiding energy and utility waste we see is in the introduction and implementation of energy forecasting models into existing planning & scheduling tools. Steelmakers can basically see how their energy and utilities consumption will behave in the future while creating the production schedule. They can make adjustments to their schedule considering their limitations of supply and best practices.

Let's Pick the Low Hanging Fruits Together!

Just by introducing or improving optimization tools and digital initiatives, we see the potential to reduce CO_2 emissions by up to 40 000 tons per year, with an annual production of 1 million tons in an integrated plant.

Would you like to read the full article? Then scan the QR code!

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News: PSI Metals and ArcelorMittal Europe strengthen cooperation

PSImetals Supports CO_2-Neutral Steel Production

PSI Metals and ArcelorMittal Europe signed an addendum at the end of 2021 to strengthen their partnership in the areas of Manufacturing Execution System (MES) and production management solutions.

In 2014, ArcelorMittal Group and PSI Metals concluded a Master Agreement for the global implementation of the PSImetals solution at ArcelorMittal plants. Meanwhile, the software covers important functional areas such as planning, quality, logistics and production at ArcelorMittal sites in Europe, America and Asia.

With the contractual addition, both companies are accelerating the further implementation of PSImetals at the European sites for flat and long products. Thus, ArcelorMittal can benefit from an increase in production efficiency, improvement of product quality and lean customer service. This optimization can support ArcelorMittal's decarbonization goals of reducing CO_2 emissions by 35 percent in Europe by 2030 and achieving carbon neutrality by 2050.

> *PSI will provide an MES digitization platform developed specifically for this industry. It can be implemented by the ArcelorMittal Center-of-Excellence, PSI Metals consultants or third party system integrators.*
>
> **Thomas Quinet**
> Managing Director PSI Metals

Thomas Quinet, Managing Director of PSI Metals, states: "We are proud to have served one of the world's leading steel manufacturers, ArcelorMittal, for more than 20 years. This renewed agreement, which strategically aligns the interests of both companies, comes at a time when the steel industry is entering the next stage of digitalization and decarbonization."

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Interview: Dr. Herbert Hadler talks about sustainable design of production with IT

Shoulder-to-shoulder with the climate

How can we succeed in making present-day production sustainable? This question has taken on another dimension in a dramatic way in recent weeks: independence from fossil fuels. Dr. Herbert Hadler, Managing Director of PSI Automotive & Industry, explains the key role that IT and software solutions such as ERP and MES already play in this today.

Dr. Herbert Hadler is one of the thought leaders of Industry 4.0 and Smart Factory in Germany.

Dr. Hadler, the topic of sustainability in industrial production is not entirely new. Where exactly do you start?

You're correct: the manufacturing industry has always been resource-intensive. Since industrialization, companies have been struggling to increase their energy and material efficiency. However, our understanding of sustainability in the 21st century goes much further.
Against the backdrop of increasingly noticeable climate change, the aim is to establish a regenerative circular economy in which the use of environmentally friendly types of energy is just as natural as the reuse of resources. The aim is to reduce global CO_2 emissions and to recycle raw materials carefully.

Why is the establishment of a regenerative circular economy so important in this context?

In addition to mere compliance with legal regulations, a new mindset is required in which corporate social responsibility is inseparable from transparent, ambitious sustainability management. This also includes re-evaluating the entire information technology under sustainability aspects. In this context, software for production planning and execution in particular can make a big difference. There reasons are two-fold: it helps manufacturing companies achieve "green metrics" and it reduces their carbon footprint.

How can manufacturing companies achieve their sustainability goals even faster?

Companies no longer have to start on a greenfield. For example, our software solution PSIpenta ERP and MES can already be extended by intelligent algorithms. This allows quantities and deadlines to be determined, especially with regard to environmental aspects. Sequences can be optimized and resources can be used in the best possible way.
The same basic technology is also used to implement environmentally conscious maintenance strategies. After all, the maintenance status of a production plant has an immense influence not only on the quality of the products, but also on the conservation of resources. AI-supported predictive maintenance strategies strike a balance between high availability, optimum operating condition and minimum maintenance costs.

What does an optimal "environmentally conscious" software solution look like?

In many production halls and warehouses, as well as in the field, there are still pieces of paper and stacks of multi-page paper. These media breaks are prone to errors; dragged-out processes are certainly not sustainable. Our customers demonstrate how easy it is to close gaps like these by using browser-based PSI Industrial Apps. With them, all ERP and MES functions can be brought into the periphery in an individually configurable manner and the data can be recorded directly at the location of the event.

To what extent do cloud services allow for sustainable savings potentials?

The increasing spread of cloud services in the industry will create economies of scale that will significantly reduce

energy consumption in data centers. Because cloud offerings also aim to break down the large, resource-guzzling applications of the past into smaller functional blocks and focus on what is really necessary, they have further "green savings" potential. Cloud capability and nativity have therefore long been basic requirements in PSI's development departments.

In your opinion, can something like a "green vision" be derived from this?

Yes, learning from nature for nature—this could be the motto of a vision, which is about the cooperative union of many smaller, supposedly weaker players with the aim of increasing the chances of survival, saving forces and making better decisions. What is meant is swarm formation or, transferred to industry, swarm production. Companies join together to form a network that is managed via a virtual production hall. In this network, companies reserve capacities and time slots exactly according to their respective needs and thus save considerable resources.

Are there any specific areas of application for the "virtual production hall" you just mentioned?

This is already being implemented to some extent in the automotive industry—primarily to break free from the physical restrictions of established assembly line production. However, initial evaluations suggest that there is great ecological potential as well as economic potential here.

How can economic and ecological potentials be exploited even better through software?

PSI provides a holistic software architecture for this, starting with order management, production control and detailed planning of production orders based on key figures, through to process visualization and automatically triggered fault clearance work by over-the-air programmed IoT sensors.

Mehr Nachhaltigkeit durch innovative Technologie.

The prerequisite is the PSI-wide Java platform technology, with which all business units access the same technological basis. This means that the various building blocks can be put together individually without media discontinuity. In addition, the PSI Group itself also saves resources and thus fits seamlessly into the overall picture of a society in which sustainability is a matter of course and is writ large everywhere.

What is your conclusion?

Social responsibility, economic performance and environmental protection are inseparable in the guiding principle of sustainable production. The completely green factory is indeed a long-term goal; concrete intermediate steps are anything but visionary. Companies are already using PSI software to pursue not only economic but also explicitly ecological goals and have long since set out on the path to closing ranks with the environment and climate.

Dr. Hadler, thank you very much for the very interesting and sustainable interview.

Read the detailed blog post.

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Events: PSI presented first Industrial App Store at Hanover Fair 2022

Sustainable Production and Energy Supply

Based on the PSI platform, the new multi-cloud app store is an online marketplace offering a globally unique range of software products and services from PSI. Customers and partners can discover, test, purchase or upgrade industry software and cross-sector solutions. After just a few clicks, the desired application is available for testing or unrestricted use.

Platform for intelligent production

In addition, a platform for intelligent production, which was developed specifically for manufacturing companies and includes Enterprise Resource Planning (ERP) and Manufacturing Execution System (MES), has been shown. Furthermore, important applications and methods such as Industrial Artificial Intelligence, Business Process Management (BPM), SCADA, Warehouse Management and Production Scheduling (ASM) will be covered.

AI-based decision support and optimization

Industrial AI methods for predictive decision support and optimization of production, energy and traffic flows have been presented in the form of software tools. Learning optimization with Deep Qualicision AI based on Extended Fuzzy Logic and machine learning methods enables sustainable efficiency improvements in Advanced Scheduling and Monitoring as well as in Predictive and holistic management of assets and maintenance processes.

PSI was again live at the Hannover Messe.

Sustainable energy supply

Moreover, software solutions for the reliable control of power grids have been presented. Besides the proven control system, these include the field force management system as well as the solution for integrating electrified public transport and the charging infrastructure of individual traffic into the power supply grid.

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News: Release change for PSIwms at Hettich Logistik

Upgrade as a Success Factor

Hettich Logistik Service GmbH & Co. KG has awarded PSI Logistics GmbH with a comprehensive release upgrade for the warehouse management system PSIwms, which runs processes in the logistics center. In addition, with the offer "Upgrade-as-a-Service" (UaaS), the manufacturer of furniture fittings plans to benefit through regular updates from further developments, maintenance and services.

Hettich logistics center.

Due to the intelligent system architecture of PSIwms, all individual configurations of the system will be retained during the release upgrade. "With the new release, our processes remain development and future-proof. This is an important tool for the success factor logistics at our company," explains Anja Sasse from the warehouse logistics management team at Hettich Logistik Service and adds, "Thanks to the multisite capability of the system, we could soon connect three external warehouses, among others, which would be managed and controlled directly from PSIwms."

The Hettich Group, for which Hettich Logistik Service acts as a service provider, is one of the world's leading manufacturers of furniture fittings. The product range in the logistics center in Kirchlengern/Bünde in Eastern Westphalia includes around 7000 articles. Since 2006, PSIwms has ensured transparent warehouse management and the control of intralogistics processes there. The software manages a ten-aisle automated high-bay warehouse with more than 27 000 pallet storage locations and 12 picking locations, as well as more than 3000 pallets per day for shipping in the manual storage areas.

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EVENTS

On our website you will find all current trade fair participations and conference offers.

www.psi.de/en/psi-pressevents/psi-events/

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

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