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EDITORIAL

Dear Readers,

AI applications are now being used very successfully in various application fields. However, they have so far tended to emerge as modules in specialized IT projects where data analysts and programmers create individually intelligent applications from AI libraries. Accordingly, existing frameworks are largely inaccessible to non-programmers, who nevertheless have valuable process knowledge.

In this issue, our cover story discusses the current development of the Deep Qualicision AI framework. It aims to make maintenance and further development as accessible as possible to non-programmers with process knowledge. The Deep Qualicision AI solution combines PSI's proven Qualicision decision engine with machine learning. It enables the control and parameterization of AI applications via KPIs by proven KPI-oriented modeling.

The common basis of underlying Algorithmic between the framework and any solutions creates the generic advantage of machine learning connectability to any already existing application in the PSI software tools. But also, existing legacy and black box systems can be enhanced and extended with AI using this framework.

As usual, we will also report on other exciting cross-production topics.

Sincerely yours,

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

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Complete AI Stack with Qualitative Labeling and Qualicision

Deep Qualicision AI Framework

We developed the Deep Qualicision AI Framework to make influencing and customizing AI applications possible for more than just data analysts. Both users with a wide-ranging knowledge of business processes—but without AI expertise—and, as usual, data analysts can use the new software product. The improved explainability of AI applications is another novel advantage of the framework.

What makes the Deep Qualicision AI Framework unique is a machine learning and decision-making process based on the automated detection of KPI goal conflicts in both input data and data generated by machine learning. Using the Qualicision decision engine's goal conflict analysis, this data is ordered and labeled automatically. The Deep Qualicision algorithm then independently identifies how to proceed in different situations so that decisions and predictions match the data patterns in the best possible and consistent way.

The framework includes the decision engine and a complete stack of standard AI techniques that can be combined with Qualicision. Using the KPI analysis mechanism, decisions, analyses, and predictions generated via standard AI processes can be given an explainability comprehensible at the application level. As a result, users, especially key users who have process knowledge but are not necessarily data analysts, can also operate and configure AI systems created using the framework.

Qualicision as an Automated KPI-based Explanation Machine

At the same time, any Qualicision solution can be used as a KPI labeling machine and for implementing

AI learning strategies. By systematically translating data into so-called impact matrices new perspectives emerge for the explainability of AI analyses and results and thus for a more understandable use of AI procedures in business processes.

Figure 1: GUI elements of user group 1.

Three Main User Groups

The framework distinguishes between three main user groups: Preconfigured systems provide KPI-oriented, comprehensibly prepared recommended actions for users who rely exclusively on process knowledge and can incorporate the results into their business processes and continue using them there. Accordingly, this first user group acts in the sense of system operators.

By confirming or modifying actions (Yes, No, Another, and with a value suggested by the user), the users of the first group already generate important feedback information for the AI application, which, logged as time series, represent input for the rolling application training. The application is continuously monitored and improved in a self-learning manner (see Figure 1).

The second user group can be described as key users who can also configure and parameterize the operated application, and modify and expand it on the process KPI level. For this user group, the explanation mechanisms are available with KPI impact analyses, with the visualization of KPI relations, and the compatible preference relations that can be automatically learned and derived from them (see Figure 2).

For example, the F9118 learning algorithm[1] enables the automated computation of consistent solution and decision alternatives that combine historicized data relations with current data situations. The decision options are prepared so that the user acts like a Java-based PSI click designer. He works in the framework by clicking and navigating selection menus and other graphically designed GUI elements. Nevertheless, the key user configures his AI application, adjusts the sensitivity of the procedures, and couples the results of the KPI analysis back into the design of the application. However, without working at the code level as a programmer.

This way of working is intended for the third user group of the Deep Qualicision AI Framework. This can be described as the user group of data analysts. This group is provided with a complete AI stack in the framework and is also provided with all Qualicision and Deep Qualicision functionalities via appropriate Python imports and Jupyter notebooks. This allows the group to access all user roles mentioned so far and also to implement new applications independently. In this context, the Qualicision explanation mechanisms provide crucial support, as they simplify the insight into how the results are obtained, even for data analysts (see Figure 3).

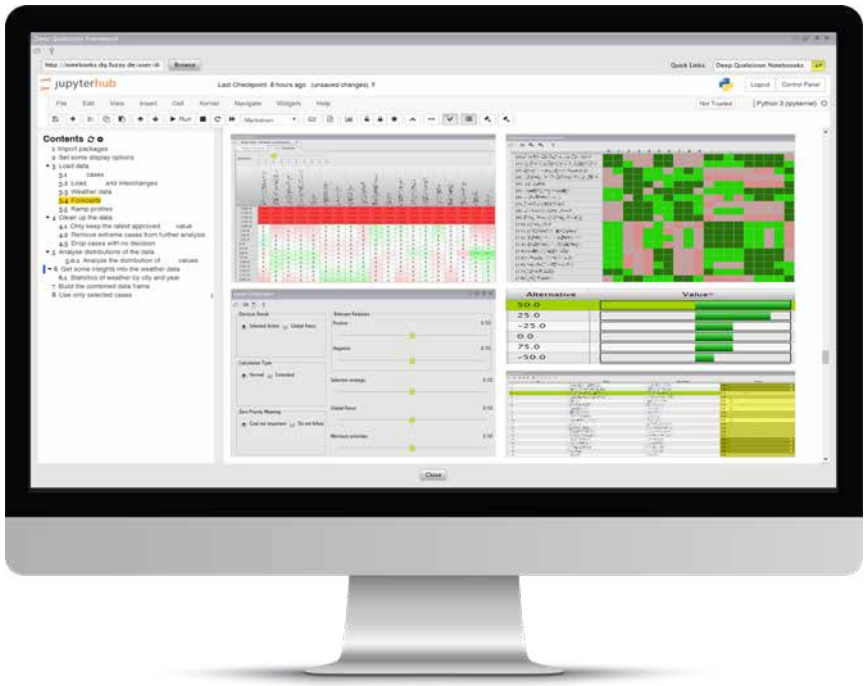

Figure 2: GUI elements of user group 2.

Easy Access

From the customer's perspective, getting started with the AI framework is as simple as can be. It usually begins with preconfigured applications and the support of experienced Qualicision experts. For example, suppose that in the first step an analysis of potential or feasibility is to be conducted. In that case, besides providing relevant data it is only necessary to specify the key performance indicators and criteria (KPIs) according to which the quality of the results is to be evaluated and, if necessary, optimized[2].

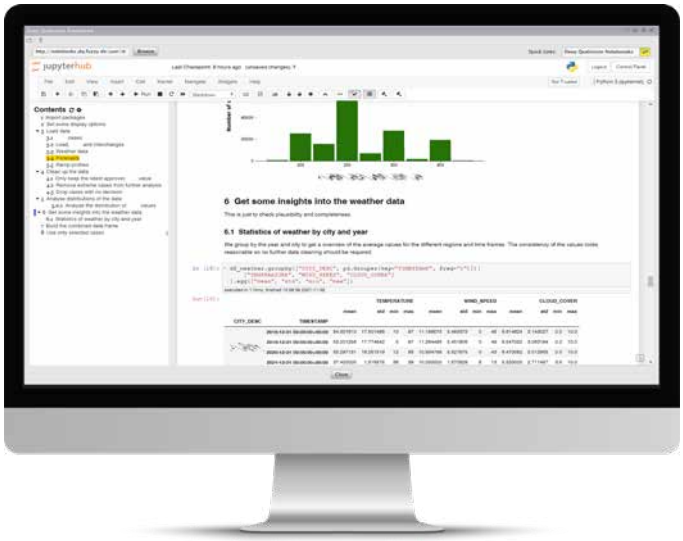

Figure 3: GUI elements of user group 3.

Framework Applicable to All Levels of Business Processes

Classic KPIs here are, for example, efficiency criteria such as deadline compliance, utilization of resources, or the availability of capacities and materials. In analysis and diagnosis scenarios, KPIs are used to evaluate the patterns in the business process data, for example, to describe out-of-spec criteria.

The framework can be used for all levels (Level 1 to Level 5) of business processes. In addition to classic data such as sensor or machine data, higher levels up to process planning and design as well as process or product quality features can be processed. Examples of data from higher process levels are KPI criteria such as employee satisfaction, homogeneity of resource utilization, or process stability. In addition, there are product variance assessments, order structure scattering, and the development of the KPIs above over time, also in terms of the usability of historicized data time series.

Business Process Data Enhanced by KPI Labels as Input

Deep Qualicision AI means that, in addition to the classic components of an AI stack, descriptions of KPIs are included that provide prediction business process-related qualifications of the raw data. If the raw data of the business process is then available, it is qualitatively labeled and thus processed and fed to further AI analyses. Qualitative Labeling and data handling can be performed in the framework depending on the user role.

The basic structure of the GUI elements and the components of the corresponding user roles are shown in Figures 1, 2, and 3. The GUI layouts show interface examples for the different user roles.

Predictor as Part of the Framework

Combining Qualicision with existing machine learning (ML) methods already improves the explainability of results of both ML and other AI applications.[3]

In addition, the Deep Qualicision AI Framework contains a new development, a special generic prediction algorithm that can be explained at the process level, the Qualicision Predictor (Q-Predictor). It is based on decisions made by the core algorithm using goal conflict analysis and modeling with impact matrices.

The Q-Predictor calculates prediction decisions in the same way as Qualicision calculates general decisions. Accordingly, the predictions can be visualized point by point in the respective composition of the prediction decisions via the user's GUI and are understandable from the perspective of the respective data points even for those familiar with the process knowledge at the business process level.

Compared to classical approaches such as Gradient Boosting, it delivers comparably good results. Still, it has clear advantages in terms of the explainability of the predictions and the ability to be influenced by the user. The decisions can be visualized and understood or even re-parameterized by key users. This means that they can directly influence the Q-Predictor without having to program as data analysts at the AI code level.

(1) Production Manager 1/2021
(2) Production Manager 4/2017
(3) Production Manager 1/2020

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User Report: PSImetals Supports ArcelorMittal in CO_2-neutral Steel Production

Impressive Results Through Software

ArcelorMittal Brazil and PSI Metals have been working together since 1998 and have successfully implemented numerous production planning and control systems. Both partner companies joined forces again in 2020 to work on objectives such as improving delivery performance and material yield, as well as reducing both stocks of slabs and internal logistics costs through the allocation of spare material in stock. PSImetals Material Allocator, one of the system's many planning tools, provided the perfect solution for this and has already delivered excellent results with key benefits.

ArcelorMittal Tubarão (AMT) belongs to the flat steel segment of ArcelorMittal Brazil and produces slabs and hot-rolled coils, with a maximum product capacity of 7.5 million tons per year.

Automatic and Interactive Material Allocation

In March 2021, PSI Metals and AMT implemented an automatic material allocation process and an interactive material allocation system at the plant in the sunny state of Espírito Santo in southeastern Brazil. Here, the automatic material allocation runs in batch mode or on-demand, taking into account the rules and filters defined in the algorithm configuration. The interactive system also allows product engineers and design team members to manage exceptions by manually defining specific allocation conditions.

This is supported by the system checking possible matches, displaying warning messages, or rejecting certain allocations. The joint project initially focused only on non-allocated slabs, as this material has a higher potential for order placement due to its early production stage and relatively low customization effort for customers.

The ArcelorMittal Tubarão plant is located in the sunny state of Espírito Santo in southeastern Brazil.

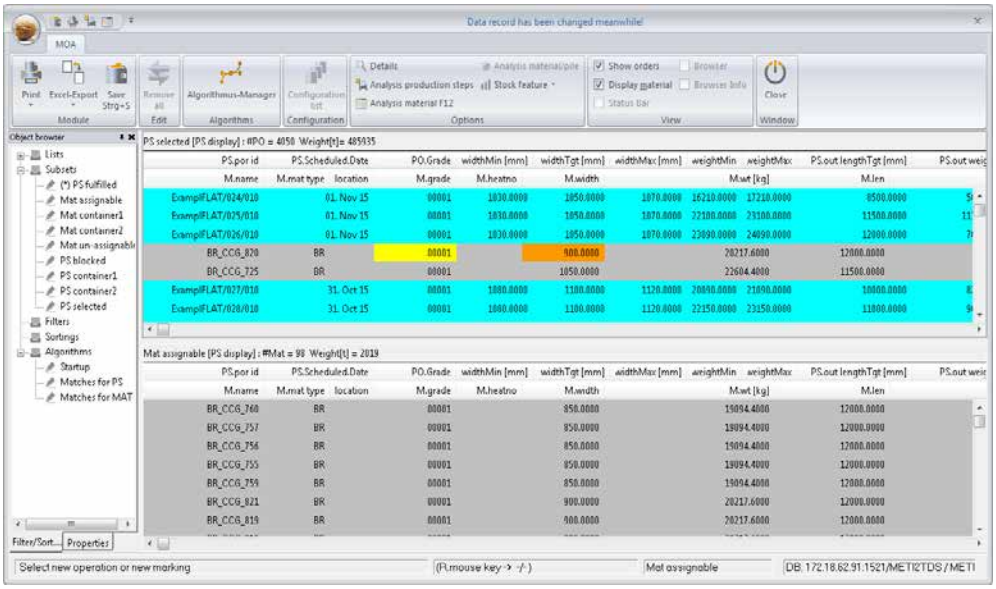
"The project aligns with the company's latest strategy, especially with our ambition to achieve CO_2-neutral steel production, reduce inventory and working capital, and improve customer service," says Ivo Novaes Abrahão, IT Manager AMT. He adds: "The team is using the latest digital technologies to optimize processes in the metallurgical sector."

> *The project aligns with the company's latest strategy, especially with our ambition to achieve CO_2-neutral steel production, reduce inventory and working capital, and improve customer service.*
>
> **Ivo Novaes Abrahão**
> IT Manager AMT

Better Performance and Shortened Lead Time

One of the project objectives achieved is a higher level of performance through shorter lead and cycle times, ensuring more reliable delivery performance. Accurate order allocation involves fewer production steps. Thus, more orders are fulfilled on time, and machine capacity is freed up for other requirements. Around 850 orders have benefited from the stock allocation in the three months since system intro-

duction. In addition to reduced cycle times, the OTIF delivery rate (complete and on-time delivery) has also been improved.



PSImetals Material Order Allocator.

Reduced Inventory and Warehousing Costs

The total cost of holding unnecessary inventory comprises operating costs such as warehousing, transportation, and handling. Since its implementation, the new allocation process has reduced the total stock of unallocated slabs by an average of 26 percent—10 percent of which consisted of slabs with quality deviations.

Lower Downgrading and Scrapping Costs

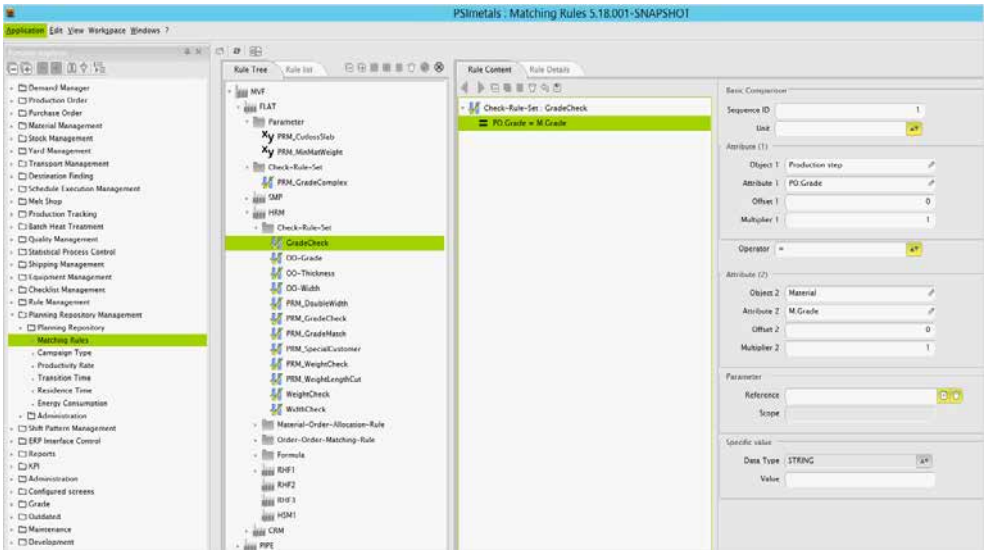
To avoid ongoing stock costs, steelmakers typically implement the following measures:

1. After a few days of aging, the unallocated slabs are offered on the market at lower prices (downgrade).
2. After further days of aging, the "unfit" orphaned slabs are recycled by converting them into scrap so that they can be returned to the steel production chain. This (final) resource measure is undesirable but often necessary.

Since system implementation at AMT, almost 245 slabs have been "saved" from downgrading and could be sold as prime material at regular prices. In addition, 54 slabs were "saved" from scrapping and could be used for actual customer demand.

Improved Quality Assurance and Team Efficiency

Another advantage of this system implementation is the certainty that human error—which can occur in a manual, i. e., non-system-oriented allocation process—is virtually eliminated! Thus, suitable slabs are always selected for given customer demand, both in terms of quality and quantity. The quality and planning teams, in turn, can focus mainly on defining rules and analyzing results, leaving the repetitive work to the system.



Rule creation for the planning repository management (PRM).

The Next Steps

Both companies plan to extend the system to the ArcelorMittal plant in Vega do Sul, including pickled, cold-rolled, annealed, and galvanized coils. Thus, in the future, all work steps and products of AM Flat Carbon LATAM will be covered by PSImetals Material Allocator.

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User Report: PSIpenta Used at Aequator AG

Coffee Machine Production on a New Level

The consumer world is constantly changing. This also applies to coffee machines, because the development is moving away from mass standards to exclusive solutions. Aequator AG from Switzerland has recognized this trend and focuses on producing multi-variant machines. The machine manufacturer benefits from its flexible ERP MES system.

The diversity of variants is associated with various challenges on the production side. In addition to the consistently high demands on quality, it is also necessary to continue to offer desired standard models from small series and, at the same time, to accommodate customer requests for unique machines and designs. Added to this is that the company manufactures exclusively on customer demand.

This is only possible with the support of a powerful IT system combined with increased automation. Aequator opted for the PSIpenta ERP MES solution to precisely control production and development with short cycle times and manage orders and desired variants. An integrated KANBAN system supports the software.

Digital Control System Supports Lean Production

The control center is a central element. "The control center helps us react very flexibly to customer requests and display the current capacity utilization situation for all employees clearly," says Chief Financial Officer (CFO) Andreas Alge, who is also appointed Head of Process Management at Aequator. The control center receives the customer orders via order management. It then configures production with the appropriate schedule.

At the same time, the system calculates the production period depending on the resource and visually displays the status of the various work steps. The employees can quickly check when the production of an order will be completed and whether this corresponds to the delivery date promised to the customer.

> *Thanks to our planning system, we produce everything up to batch size 1 without retooling in the line.*
>
> **Andreas Alge**
> CFO at Aequator AG

A look into Aequator's production hall.

Coffee machines are assembled in a "one-piece flow" in production lines. In contrast to conventional assembly line production, however, independent teamwork is made possible to a certain degree, and the exchange of employees across individual product groups is encouraged.

"In certain lines, we produce up to ten different machine variants, and there in turn to seven customer variants," explains Alge. "Consequently, the variety is huge. But thanks to our planning system, we produce everything up to batch size 1 without retooling in the line." The control center is also available directly in the production lines. Those responsible on-site can control the order sequence and intervene if necessary. After completion, the ERP system closes the order by posting the material and machine statuses. At the same time, it serves as an IT interface to Development and Accounting. Logistics transmits the resulting data to the Warehouse or Shipping department.

Aequator assembles its fully automatic coffee machines in separate lines per product category in the so-called "one-piece flow".

Agile Software for Motivated Employees

With all the automation and digital orientation, Aequator does not only focus on everyday usability but also on employee satisfaction. PSIpenta seems to be working entirely in the interests of the workforce here. "The system helps us a lot in our day-to-day work. Satisfaction is correspondingly high," confirms Andreas Alge. Consequently, the company is switching to version 9 this year to benefit from its PSI Click design. This design can be used to customize the user interfaces according to task and personal preferences. Another advantage of the new version is that the ERP system becomes even more flexible and easily adapts to changing circumstances. "We are changing our product range and adapting the organizational structure to our objectives to penetrate new markets. In this transition, we are also dependent on a reliable ERP system—as the data basis for the individual processes. This can only be achieved if the system itself is flexible enough to map and support new structures and processes," says the CFO with conviction.

Tradition meets Technology in Transition

Aequator has eighty employees and produces around 15 000 fully automatic machines and numerous private label machines per year. Founded in 1933, the family-owned company from Albon thus generates annual sales of 22 million Swiss francs. With the help of subsidiaries and distributors, the machines reach customers in Switzerland, Germany, the Benelux countries, Scandinavia, and Great Britain. At the same time, the use of coffee machines has constantly expanded. While commercial locations such as reception halls, bakeries, hairdressers, and convenience stores were previously the focus in addition to gastronomy and the hotel industry, the "Office Coffee Service" sector is becoming increasingly important. More and more companies want to provide their employees with high-quality coffee.

Lasting Success in Sight

The conclusion for Aequator AG can be summarized: With the PSIpenta ERP MES solution, the company has software available that meets the high demands on production and quality. The agile system enables the Swiss company to react flexibly to future processes, control them in a shaping way, and thus continue their success on the market.

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Product Report: Digital Inventory Management Improves Data Quality and Accelerates Processes

Time is Money

Transparent inventory management is a crucial success factor for manufacturing companies. End-to-end digital processes are decisive here. The integrated warehouse management module and special apps are available in the ERP system PSIpenta for this purpose.

Warehousing and logistics tie up considerable resources and are significant cost factors in the manufacturing industry. Consequently, it is more important than ever to manage with the smallest possible storage areas, low capital commitment, and little personnel expenditure. This is not the only reason why warehouse management is of particular importance for competitiveness and thus the company's success. Its central task is to ensure a smooth production process by controlling the flow of funds or providing raw materials, products, or spare parts. This is the only way to achieve the short delivery times required in globalized markets. "Time is Money" is therefore the motto.

Straightforward Configuration Options for Individual Requirements

Enormous potential can be leveraged through end-to-end digital mapping of all processes associated with warehouse management in the leading ERP system. This speeds up the processes considerably, drastically simplifies the posting effort, and significantly minimizes the errors caused by numerous manual steps, handwritten notes, and media breaks.

Since the requirements of the companies vary significantly in their specific characteristics, the software should also provide individual processes through simple configuration options for inventory strategy and disposition.

Basic Requirements for a Warehouse Management System

Core requirements include options for defining different warehouse structures such as tray, shelf, or area

Industrial apps can be used to map all warehouse and logistics processes end-to-end.

storage. Since non-chaotic warehousing, i. e., the strict assignment of items to storage compartments, causes high costs and usually requires large and thus expensive areas, a modern warehouse management system should also support chaotic warehousing. PSIpenta calculates optimized storage locations according to freely definable storage and retrieval strategies, minimum article stocks, or storage areas (front, center, back), and saves the time-consuming search for the correct articles during retrievals by automatic warehouse movement suggestions.

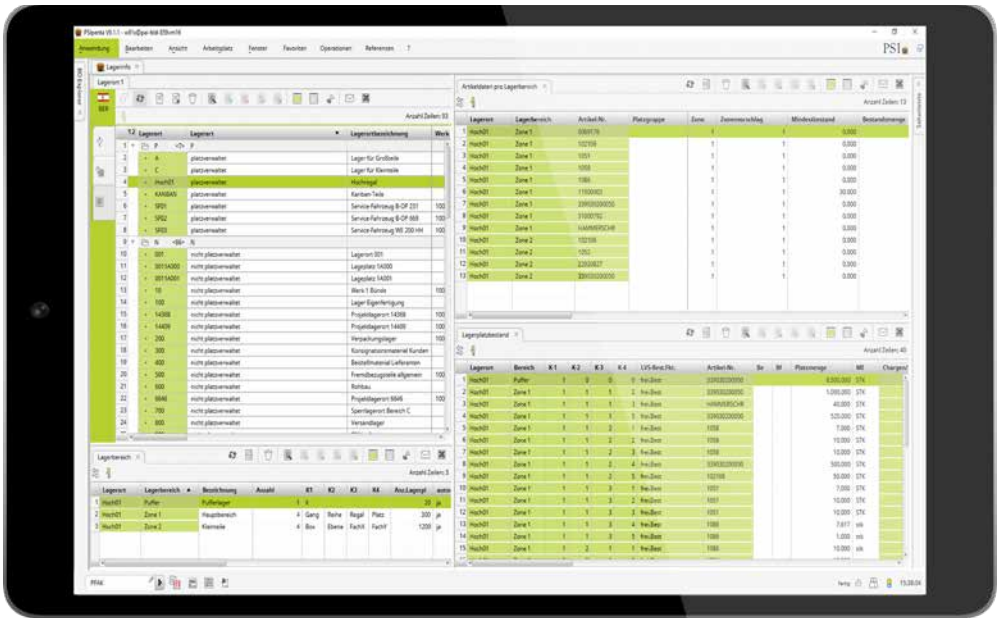
In addition, requirements in product tracking (track and trace) are becoming increasingly important. For example, the origin and use of batches or serial numbers must be quickly and conclusively traceable in the context of complaints. PSIpenta supports these requirements with appropriate posting options and logging. For example, batch or serial numbers can be posted in production, which in turn can be recorded in the warehouse as a stock-dividing characteristic. The same applies to logging the change statuses of an article.

In the meantime, the correct commercial allocation and monitoring of warehouse stocks have also become especially important in production companies. A warehouse management system should also support these functionalities. This includes, for example, the management of consignment stocks, materials provided by suppliers and customers, blocked stocks, and unrepaired and repaired stocks from the service area.

Last but not least, the comprehensive mapping of these processes on mobile devices and via industrial apps opens up a considerable digitalization potential—including the integration of peripheral devices such as scanners or cameras. At the same time, this significantly improves the ERP data's actuality and the frequency of errors due to data entry errors.

CHECKLIST FOR THE ERP WAREHOUSE MANAGEMENT MODULE FOR PRODUCTION COMPANIES

- Definition of different warehouse structures such as tray, shelf, or area storage
- Support of chaotic and non-chaotic warehousing
- Traceability of batches and serial numbers
- Tracking of change statuses
- Commercial allocation and monitoring of warehouse stocks, e. g., consignment stocks, provisions, blocked stocks as well as unrepaired and repaired stocks
- Comprehensive mapping of all processes on mobile devices, including integration of peripheral devices



Managing all processes and stock movements with bin management.

Well-Equipped for Globalized Markets

With its warehouse management module and the industrial apps, the PSIpenta ERP system maps a production company's warehouse and logistics processes end-to-end. The accelerated processes ensure a high level of efficiency, equipping companies well for the requirements of globalized markets.

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News: PSIwms Warehouse Management System—Upgrade at Weiss Chemie + Technik

Improved Processes in the Production Warehouse

PSI Logistics has delivered a new upgrade for the PSIwms warehouse management system to the adhesives manufacturer Weiss Chemie + Technik GmbH & Co. KG. The functionalities provided with the current release improve the ergonomics, efficiency, and process analysis in the production warehouse at the company's headquarters in Haige near Siegen.

In the production warehouse Weiss Chemie + Technik produces more than 6300 tons of adhesives, 950 tons of cleaning agents, and 650000 square meters of sandwich panels per year. PSIwms, which was implemented in 2000, controls the processes (among other things) through dynamic storage bin conversion with several pallets on a 3-euro pallet storage location, route-optimized order picking, and demand-oriented material provision, and on-time removal of the finished goods.

Dashboard PSIwms Release 2021.

Weiss Chemie + Technik received new modules and expanded functionalities with the second upgrade. The current PSIwms 2021 version optimizes the options for incoming goods processing and storage transports of mixed pallets.

Preconfigured processes are available for small orders. Activity tracking enables extended activity logging in the warehouse for recording process times and for process optimization, based on key figures.

Maximum Flexibility for Individual Design with PSI Click Design

PSI Click Design ensures maximum flexibility in the individual design of user interfaces. In addition, the dashboard improves ergonomics on mobile touch devices, which can be used to visualize warehouse information from the cloud on all common end devices.

Cross-site Management

The cross-site management tool in PSIwms also maps the multi-level processes of the production stations, including staging areas and corresponding stocks in production and combines them on one server.

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News: elobau Puts PSIwms Warehouse Management System into Operation

Unified IT Infrastructure Offers New Options

The sensor and control element manufacturer elobau GmbH & Co. KG, founded in 1972 and based in Leutkirch in the Allgäu, fully commissioned the PSIwms warehouse management system in August. This increases efficiency and transparency in warehousing for production supply and shipping.

Thanks to the close functional networking with the PSIpenta ERP system already implemented at elobau, the integrated IT infrastructure offers further optimization options. elobau is one of the leading international providers of contactless sensor technology and operating elements in machine engineering. Around 1400 pallet storage locations are managed in the logistics center in Leutkirch for on-time production supply and processing of shipping orders. The company also uses a state-of-the-art AutoStore cube with 30000 container storage spaces as its central automation system.

Customizing user interfaces using PSI Click Design.

Significant Increase in System Performance

The direct connection of the PLC to PSIwms and new processes optimized for AutoStore ensure a significant increase in system performance and efficiency of up to 20 percent compared to the old system. In addition, the solution's multi-site capability integrates an external warehouse into warehouse management and process control in the system.

> *This results in a sustainably improved and significantly more efficient workflow with a high level of process transparency.*
>
> **Matthias Gromer**
> Head of Logistics at elobau

PSIwms controls the management of incoming goods and storage bins, the precise picking, and, via a transport Kanban consisting of AutoStore system and high-bay warehouse, the needs-based provision of components in production. "This results in a sustainably improved and significantly more efficient workflow with a high level of process transparency. Furthermore, PSI Click Design can optimally adapt user interfaces to individual requirements. "Despite the complex processes, we benefit from a clearly structured IT infrastructure," sums up Matthias Gromer, Head of Logistics at elobau.

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User Report: Hamburg Airport Relies on AI-based Airport Systems from PSI

Neural Network for AutoID

Integrating artificial intelligence (AI) methods and procedures opens up extensive optimization potentials for both the control and the archiving and documentation functions of the luggage handling system at Hamburg Airport.

Once the previous volume level is reached again after the pandemic has subsided, around 17.5 million passengers will use Hamburg Airport for their vacation and business trips every year. The airport relies on an end-to-end IT infrastructure from PSI Logistics for controlling the coordinated and efficient processes involved in luggage handling. "The PSI airport systems support all interfaces associated with luggage handling systems and control the areas involved in the process," summarizes Angela Lipinski, Project Manager for Passenger and Baggage Logistics at Flughafen Hamburg GmbH.

In a pilot project, the implemented IT infrastructure was further optimized by integrating artificial intelligence methods and processes. The solution can be easily transferred to process optimization in the context of control as well as archiving and documentation functions of intralogistics conveyor systems.

During regular operation, the conveyor belts of the sorting and conveying system in airport terminals 1 and 2 transport up to 30 000 suitcases per day. After luggage has been checked in and fed into the sorting system by the conveyor belts, 200 high-resolution cameras on the conveyor and sorting line frequently record the luggage linked to the flight and passenger data. "We continuously expand and optimize monitoring and luggage tracking," says Lipinski. "PSI software is used to relay the interfaces to the control level of the system. The AI application enables real-time processing of the camera images."

Aerial view of Hamburg Airport.

All Relevant Information in One Coherent Data Set

This is based on sophisticated deep learning programming. The neural network was "fed" with more than 2000 images of luggage in different positions and from different perspectives.

Based on this, the software "recognizes" all other types of luggage in a fully automated manner—including their individual characteristics. This deep learning step is now fully automated in real-time.

The installed Ultra HD cameras track and monitor the transport of each piece of luggage. At all reporting points, triggers from each HD camera are used to cut up to five images from the video stream and store them in the sorting control computer's database. The automated real-time analysis starts at the same time.

Thanks to their high resolution, the HD cameras even capture the luggage's barcode, which is still done by scanner gates. "The medium-term goal is to use the AI solution to condition PSIairport/CCTV so that these barcodes at the reporting points are reliably captured and relayed via the cameras only," explains André Beck, Senior Project Manager at PSI Logistics.

The software solution links the images of the individual pieces of luggage with the barcode information, verifies the pieces of luggage as such, and controls their path on the conveyor system. All relevant luggage data is merged within the sorting control computer, linked with the images, and results in a coherent data record.

Beyond that, the videos or images from PSIairport/CCTV can also be used for fault monitoring and message activation. The new integrated idle detection also saves a lot of storage space and extends the archiving period used for searches and analyses. In addition, the processing times are shortened, and the response times are significantly improved.

Capturing a piece of luggage at Hamburg Airport.

Self-learning and Self-determining Intelligence

"The advantages are obvious and can also be transferred to process control applications in logistics centers," says Jörg Ruhnau, Department Manager PSIairport at PSI Logistics. Investments in additional scanner technology are no longer necessary and the error rate drops. Resources for post-processing, which in conventional airport processes can account for up to ten percent of the luggage volume, are no longer tied up unnecessarily and the service level increases.

Furthermore, luggage handling and the condition of suitcases can be seamlessly documented and archived. In addition, the AI solution detects any damage to the luggage, automatically reports any changes and helps determine the cause.

"The integration of AI methods and processes in the functional range of IT systems, and consequently the further automation of functional processes based on self-learning and self-determining intelligence, opens up significant potential for optimization," summarizes Ruhnau. "Among other things, PSI is already working on AI solutions for a wide variety of packaged items and luggage as well as the integration of voice-based applications. In the case of container detection and support for quality assurance applications, the deep learning efforts are already justifiable. "

PSI has already developed a live showcase for optional AI/CCTV solution applications in intralogistics. Interested parties can see multiple advantages of the application directly on-site in their system via a cloud application. "We are currently developing further options for the multi-criteria optimization of logistics networks," summarizes Ruhnau. "The development of our software systems is in a fascinating phase."

> *The integration of AI methods and processes in the function range of IT systems, and consequently the further automation of functional processes based on self-learning and self-determining intelligence, opens up significant potential for optimization.*
>
> **Jörg Ruhnau**
> Department Manager PSIairport at PSI Logistics

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News: K-FLEX POLSKA optimizes production processes with PSIasm

Optimized Production Processes

The PSI subsidiary PSI Polska Sp. z o.o. has been commissioned by K-FLEX POLSKA to implement the PSIasm (Advanced Planning and Monitoring) platform. This enables the optimized planning and control of the production processes at the expanded production plant in Wielenin-Kolonia in Poland.

K-FLEX POLSKA is a manufacturer of flexible thermal and acoustic insulation products and part of the international K-FLEX Group. After the latest expansion, the production plant in Wielenin-Kolonia covers an area of more than 50 000 square meters. Due to the dynamic growth, the existing systems could no longer meet the increasing demands for effective planning and control of production processes.

Therefore, K-FLEX decided to use the PSIasm platform. As part of this, the APS module supports the planning of orders and work processes based on the current status and actual production capacities. The complementary MES module ensures continuous monitoring of the production efficiency, e. g. of KPIs (Key Performance Indicator) such as OEE (Overall Equipment Effectiveness) and OLE (Overall Labor Effectiveness).

"As we operate globally, we were looking for a solution that could also be used in all our plants. PSIasm offers functionalities that meet our current and future requirements. Plus, PSI also supports the roll-out of the system from the Polish plant to the other K-FLEX Group sites. With PSIasm, we can offer our customers even more benefits through more efficient production," emphasizes Bartłomiej Gröbner, Managing Directorat K-FLEX POLSKA.

Due to the chosen agile implementation method, which starts with the most important standard functions of PSIasm, project costs can be optimized and the system can be implemented comparably twice as fast.

Production site of K-FLEX in Poland.

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Product Report: PSImetals Release 5.22—Precision by Adaptive Workflows and Multi-Cloud Installation

The Journey Continues

Under the motto "Precision by Adaptive Workflows," new functions have been added to the current PSImetals Release 5.22 following the company's roadmap. The first services based on the Service Platform (SP) were already introduced in Release 5.20. This journey is now continued with 5.22.

In PSImetals Quality, the Quality Decision Service for SP is the first migration step. Despite currently having the Quality Decision functions running fully integrated in the Quality Execution application, our customers can expect a future deployment of an autonomous service. Therefore, it will come with its data domain and be independent from Oracle Instance. It remains connected to existing PSImetals environments via the PSIbus and Business Process Modelling (PSIbpm) component but can also be used with any other MES or QMS.

In PSImetals Production for Melt Shops, the Online Heat Scheduler was transferred to the SP. The new service also uses PSI Qualicision and thus enables self-learning parameterization of the optimization logic.

Seamless Transitions and Continuous Connectivity

In PSImetals Planning, PSI remains consistent in executing the fully SP-managed workflow of the Order-Promising process. The new component for PSIbpm supports the flexible orchestration of the demand confirmation process and inquiry lifecycle management. This includes an end-to-end workflow from the initial order feasibility check to sales quota management and CTP controls based on the fully dressed orders.

In addition, the latest version of the Demand Management component is now equipped with highly optimized functions in the Web GUI.

A Step Towards Multi-Cloud Installation

A significant step towards multi-cloud deployment has also been taken. PSImetals Release 5.22 supports a fully containerized implementation in all common cloud environments, including Kubernetes-based application services management. This means that PSImetals is also ideally prepared in the IT infrastructure area to support customers on their way to digital transformation.

Would you like to learn more about PSImetals 5.22? Please scan the QR code!

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Event: Review of the PSImetals UserGroup and Release Day 2021 & 10 Years of PSI Metals in the USA

Two Become One

This year's PSImetals UserGroup was held for the first time together with the previously internal PSImetals Release Days in a modern hybrid format under the motto "The Architecture of Digitalization." In addition to more than 80 remote participants, over 200 customers and colleagues gathered in Brussels to celebrate the new Release 5.22 as the next step into the future of production management. One week later, the first PSImetals UserGroup was held in the USA. The 10th anniversary of PSI Metals in North America was celebrated with customers.

The successfully launched hybrid era allowed numerous attendees to follow the discussions, keynotes, presentations, specials, and workshops, even if they could not travel to Brussels for the main event. "It has been far too long since we communicated face-to-face with our customers at in-person events," says Harald Henning, President of PSI Metals North America, Inc. "Everything we are showing here on our Release Day was originally intended for our employees. But it is just as exciting for our customers. And I think we managed the mix very well!"

Smiling participants at this year's User Group.

> *It has been far too long since we communicated face-to-face with our customers at in-person events.*
>
> **Harald Henning**
> President of PSI Metals North America, Inc.

This year's PSImetals UserGroup once again offered unique impulses on a wide range of topics in the metals industry. Exciting customer, partner, and PSI presentations guaranteed an exchange at the highest level!

10 Years PSI Metals North America

In a less formal atmosphere than the event in Brussels, PSI colleagues celebrated the 10th anniversary of PSI Metals in North America with around 30 customers on-site in Pittsburgh and 40 customers remotely. In two days full of exciting presentations, renowned customers, including SSAB, Gränges, Ternium, and ArcelorMittal Dofasco, spoke about their experiences with PSImetals.

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News: PSIpenta recognized for multi-variant serial production

ERP System of the Year 2021

The PSI Automotive & Industry GmbH has been recognized by the Center for Enterprise Research at the Faculty of Business Informatics, Processes and Systems at Potsdam University as "ERP system of the year 2021" in the category of "multi-variant serial production," which the jury describes as an all-rounder among ERP systems. The award was presented on October 27, 2021 within the scope of the ERP Congress 2021 in Frankfurt am Main.

With 35 suppliers submitting extensive written applications, this year's contest recorded a new all-time high in terms of participants. In the final, the best applications were evaluated by a jury of ten representing the areas of science, specialist media and consulting, whereby the criteria of implementation methodology, customer benefits, ergonomics, technology and integration scope, industry sector suitability, customer communication and sales marketing as well as research and development were assessed. The jury was particularly impressed by the fact that PSIpenta masters both multi-level variant configuration and combined push/pull methods for supply.

PSIpenta serves as a central data hub at GEMÜ

The PSI application focused on the GEMÜ Group, a German hidden champion operating worldwide. GEMÜ is one of the world's leading manufacturers of valve, metering and control systems and is also the world market leader in the area of solutions for sterile processes. GEMÜ uses the PSIpenta ERP system extended to include adaptive modules as a central data hub in the IT landscape.

Award for PSIpenta.

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EVENTS

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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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