Standard for Risk Management: Flexible Software for Supply Chain and Intralogistics

Backbone and Stability in Uncertain Times

PSI

EDITORIAL

Dear readers,

Although still heavily influencing reporting at the moment, we will move beyond the Corona pandemic in the medium term. Tackling climate change, on the other hand, requires different time frames. This edition of PRODUCTION manager focuses on the contribution made by modern software systems in optimizing and increasing efficiency against the backdrop of both the pandemic and the sustainable use of resources.

To mark World Environment Day on June 5th 2020, PSI Group published an information blog on the topic of green software with the same goal. A look back at our "GreenSoftwareMonth" shows the results. The editorial, as well as the article on sustainable planning options and the

background information on current innovations underline environmental concerns as a central aspect of product development in the PSI Group through increasing productivity and flexibility.

Additionally, two best-practice stories explain how companies with PSI software intelligently manage com-

plex production structures or use it as an integrated production management system to optimize processes from sales orders to final goods shipments. Fashion producer LPP S.A. reports on coping with the challenges of the corona virus using artificial intelligence algorithms.

Beyond that, you will also find informative and interesting articles from our production management areas on a variety of related and similar topics. We hope you enjoy reading them. And stay healthy!

Dr. Giovanni Prestifilippo and
Sascha Tepuric
Managing Directors of
PSI Logistics GmbH

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Backbone and Stability in Uncertain Times

In both supply chain network design and intralogistics, logistics processes after the corona virus pandemic will be strongly shaped by those IT systems that can offer maximum flexibility in securing supply chains and automated order production. This is because, specifically, the robustness of processes and supply chains creates the backbone for reliable logistics services and on-time production.

Against this backdrop, the current pandemic is testing German companies. According to the results of a survey jointly conducted in May by the Association of German Engineers (Verein Deutscher Ingenieure e.V. (VDI)) and agiplan GmbH, three-quarters of companies were able to cope well with the daily changes in logistics requirements.

Only three out of ten companies had to restructure their logistics processes—and in fact by doing so aiming to ensure process optimizations continue beyond the pandemic. "The

logistics operations of many participants therefore were evidently resilient even before the crisis," the authors conclude.

Need for action in supply chain management and digitalization

Nevertheless, the survey results also evidence a need for action. This affects both supply chain management and the degree of digitalization. Almost 70 percent of respondents said that digitalization will be given a higher priority in the future—and almost 80 percent hope to expand the digitalization of their processes.

In production and intralogistics, one in three companies is focusing on increasing efficiency and reducing throughput times, which 34 percent hope to address with an increased degree of automation. Almost 52 percent of respondents plan to launch new projects for the supply chain using their experience of the corona virus pandemic. The measures most pursued, accounting for just over half of companies, occur in the areas of supply failure risk analysis and the establishment of a reliable alternative supplier network for critical parts.

These results are in line with a survey by management consultancy Inverto, which found that nine out of ten supply chain managers expect risk management and supply chains to look different after the corona virus period. "This means that IT systems which offer users maximum flexibility in

supply chain network design as well as in the control of intralogistic processes will become standard systems for efficient risk management in the future," explains Dr. Giovanni Prestifilippo, Managing Director of PSI Logistics.

Software provides flexible support in extreme situations

"Modern software systems provide suitable tools with which to take precautions for extreme situations such as the current pandemic and for being able to react in a far-sighted and flexible manner. They offer support and stability in both supply chain network design and intralogistic processes, even in uncertain times." Reference in particular is given to analysis, planning and optimization system PSIglobal for supply chain network design from the PSI Logistics Suite. The system's integrated simulation and scenario technology provides a comprehensive range of solutions for logistics analysis, network planning, supply chain optimization and intelligent risk management and for other applications.

"Depending on requirements, access to the routes and timetables of the different modes of transport can be connected to the software via interfaces and updated continuously," explains Dr. Prestifilippo. "In the event of disruption to conventional transport chains, efficient and stable multimodal alternatives can therefore be designed and implemented automatically and in real time based on the current conditions at short notice. This increases the flexibility of companies in uncertain times."

PSIglobal enables successful and intelligent risk management.

For far-reaching risk management, this enables suitable models of alternative supply chains to be generated, reviewed and stored both in specific circumstances and in advance.

Sustainability is gaining in importance

Such holistically concerted structural and process optimizations require, however, the importing and intelligent analysis of data collected from different sources across the supply chain. As a meta-system for management analyses for optimizing the overall logistics system, PSIglobal selectively merges the heterogeneous data sets of all common formats and processes or converts them according to the application, without the need to harmonize the poly-structured data in additional intermediate steps. In an integrated model of the supply chain, the data can then be visualized transparently via maps, graphics, dashboards and Control Tower in order to implement optimized processes along the entire supply chain.

"This evaluation of the holistic data stock enables reliable forecasts, for example, about transport and storage resources required in the supply chain in future, within the scope of

Advanced Data Analytics," says Dr. Prestifilippo. "At the same time, PSIglobal offers systems for determining and reducing the carbon footprint of transport logistics." Climate protection and sustainability are becoming increasingly important in transport logistics. According to the current study "Trends and Strategies in Logistics and Supply Chain Management", recently published by BVL.digital GmbH and Prof. Wolfgang Kersten from the Institute of Logistics and Management at the Technical University of Hamburg, one in four of the logistics service providers surveyed now receives inquiries about more sustainable logistics "frequently" or more often—and the trend is rising. In terms of shipping agents, around a quarter of respondents also demand sustainability from their service providers when it comes to transport orders. According to a study published at the beginning of May 2020 by Logistik-Initiative Hamburg and the analysis company Appanion Labs, 45 percent of the logistics companies surveyed do not raise greenhouse gas emissions at all or only partially.

Optimized route guidance improves carbon footprint

In this context, PSIglobal enables the calculation and optimization of the CO_2 balance in addition to cost savings through improved capacity utilization, intelligently planned, multi-stage and multimodal logistics networks and optimized route guidance with an emissions calculator. The IT system thus determines the

energy consumption of transport services and reports the greenhouse gas emissions (CO_2 footprint) according to the EU standard DIN EN 16258 for forwarding and logistics service providers.

Efficiency, risk management and green logistics—PSIglobal covers nine out of ten of the top logistics trends identified by the study "Trends and Strategies in Logistics and Supply Chain Management" with the corresponding functional and performance scope. These range from the digitalization of business processes, transparency in supply chains, perceived cost pressure and cross-company data exchange, through the complexity of processes and the individualization of customer expectations, to automation, sustainability and business analytics. "The only thing PSIglobal cannot cover is the shortfall in qualified personnel—but it can at least mitigate this in certain areas with its optimization functions," emphasizes Dr. Prestifilippo.

Green Intelligence Cloud

The corona virus pandemic has brought to light similar requirements in intralogistics with respect to adaptability, efficiency improvements and process optimization. The IT systems which control these processes—such as the PSIwms Warehouse Management System—themselves guarantee flexibility in the warehouse. "The flexibility in IT-supported adaptation, control and optimization of pro-

cesses means enormous productivity gains for users," says Sascha Tepuric, Managing Director of PSI Logistics. "PSIwms allows users, by configuring processes and rules themselves, to continuously adapt to changing business processes and models, to cover these digitally, and to control and optimize such as required."

AI supports logistics processes

These include functionalities such as adaptive job start, which automatically reconciles a lot of warehouse key data according to configurable parameters using powerful artificial in-

Make your warehouse processes transparent and efficient with PSIwms.

telligence (AI) algorithms in process control, balancing peaks and thus automatically improving performance in the warehouse and energy use. The PSIwms function of dynamic resource planning also supports the flexibility and sustainably optimized use of equipment and employees.

The sustainability aspect is also fulfilled by cloud solutions, demand for which is currently increasing. With an extensive range of Application Management Services (AMS), PSI

Logistics is responsible for hosting PSIwms' complete cloud solutions in its own data center in Frankfurt, for example for customers such as the German Football Federation (DFB). At the beginning of the year, operation of the data center was switched to 100 percent green electricity from renewable sources, certified by TÜV SÜD. The PSI Logistics Green Intelligence Cloud was established. "In addition to efficiency benefits and cost-cutting potential, it offers users additional added value in improving their carbon footprint," Mr. Tepuric summarizes. These examples show that intelligent software systems offer comprehensive flexibility for robust processes and flexible coverage of volatile ordering situations—both seasonally and in view of the current pandemic—as well as the rapid "V-shaped" economic upward trend that is to be expected and predicted after the low point. "They offer maximum flexibility and process stability even in troubled times," sums up Dr. Prestifilippo. "Optimal prospects for successful ventures." 🔵

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User report: ERP + MES for a Global Production Company

Complex Production Structures Under Control

When a company grows, its informational structures and applications need to keep up. This is especially the case for expansions beyond national borders. Weber Kunststofftechnik started to introduce a comprehensive ERP system with the construction of a plant in Poland. This takes into account the requirements of a plant manufacturer and custom manufacturer as well as the company structures that span plants and countries.

Since its foundation in 1967, Gerhard Weber Kunststoff-Verarbeitung GmbH (Weber Kunststofftechnik) has specialized in the production of plastic containers and apparatus for the safe storage and handling of chemicals and aggressive media. The portfolio for container construction has grown large and ranges from round and rectangular containers to safety pallets and containment trays for the storage of hazardous materials, exhaust air cleaning systems, filling stations, dosing systems, to silos and peripheral equipment around components. Their common feature: These are almost exclusively customer-specific custom-made products.

Plastic containers and apparatus for safe storage and handling of chemicals and aggressive media.

ERP + MES from contact management to billing

The construction of another plant in Poland was also the starting point for the introduction of a comprehensive ERP system. "Up to this point, only Sales and Purchasing had actually worked with a smaller IT system solution," recalls Yvonne Grünewald, Head of Controlling at Weber Kunststofftechnik. This was simply no longer sufficient for the complex networking of the main plant in Minden with the new plant in Poland. The central requirements for the new system were therefore functionalities for plant construction and special production as well as for multi-plant control beyond site and national borders. The ERP standard PSIpenta was decided upon along with some integrated MES modules from Berlin-based ERP and MES specialist PSI Automotive & Industry. Since then, all 500 employees have been reporting their working hours via time recording. 210 users also work with the system every day. If Weber Kunststofftechnik receives a customer request, the ERP system creates a quotation based on a product design and price calculation. Before confirming the order, the integrated PSI control center determines a time and resource schedule, which in turn forms the basis for creating the production orders.

The ERP system receives the exact design plans from an integrated PDM system and initiates the next steps: The creation of the production parts lists, the activation and release of the production order, if necessary an outsourcing request to the sister plant in Poland via multi-site, and the start of production. Integrated operational data acquisition automatically reports back data relevant to production planning and control. In the final step, the system creates the required delivery notes and performs the invoicing as well as a target-actual evaluation.

Daily changes without any problems

For Weber Kunststofftechnik, the most important functions are those that support changes during the planning process. "Suppose we are producing a round container with a catch

Rectangular containers from Weber Kunststofftechnik.

pan. It's possible that the appearance of the cylinder would be determined very early on. The supports, on the other hand, would not yet be clearly defined. It makes sense of course to start with the wrapping of the cylinder," explains Yvonne Grünewald.

> " *Flexibility in order management is really incredibly important to us. We simply enter changes into the system. Other ERP solutions behave very rigidly in their processes, which means that a lot of effort is associated with subsequent changes if they are possible at all.*
>
> **Yvonne Grünewald**
> Head of Controlling at Weber Kunststofftechnik "

The ERP system supports this flexibility by means of indexing and "growing parts lists". "Flexibility in order management is really incredibly important to us. We simply enter changes into the system. Other ERP solutions behave very rigidly in their processes, which means that a lot of effort is associated with subsequent changes if they are possible at all," states Ms. Grünewald.

Multi-plant control creates company-wide transparency

Today, the plants in Poland and Minden are closely interlinked since each can fall back on the capacities of the other. "If we do not have any capacity available in Minden, we allocate production to Poland. Since the material is provided by Minden, extensive material movements are required here regularly," explains Head of IT Arne Bokemeyer.

This is exactly where the multi-plant control of PSIpenta Multisite comes into play, mapping these requirements in an original way, with both German and Polish interfaces. The PSI control center, through which the two plants were originally to be scheduled from Minden, also plays a special role in this regard. The rapid growth of the site in Poland meant that the plant soon had its own work preparation arrangements. However, the control center still has a—somewhat unusual—purpose. The plants use it for joint resource planning and scheduling.

Business figures are convincing

Thanks to the ERP-MES system, the complexity of the cross-plant planning and processes can now be managed. Success in this respect hinges on high quality data, the structures created and numerous interconnecting automations. These reduce not least the amount of work required. "Our material and production scheduling is much more accurate and efficient today. Ultimately, the business figures speak for themselves," says Ms. Grünewald. ◉

User Report: How Qinghai Loften Is Meeting New Customer and Market Requirements With PSImetals

Standards Inspire Improvements

Chinese aluminium processing enterprise Qinghai Loften has always believed that in addition to advanced technologies, a futureproof, robust and transparent production and quality management system is essential for the sustainable development of the company. Following many discussions, the company, founded in 2011, has decided to use PSImetals to support its production.

In 2018, PSImetals Production, Quality and Logistics went into operation at Qinghai Loften and were seamlessly integrated into all process control systems by the end of the year. Thanks to the standardized and harmonized management of the production processes, seamless material tracking and the standardized but still flexible quality management of PSImetals, product efficiency has been sustainably improved.

With prudence and solidarity toward a successful project

The entire process of solution selection and decision-making at Loften struck an ideal balance of prudence and solidarity. Prudence is embedded in the company's strategy and also in the division of the selection process into two stages: Firstly, the implementation of a preliminary consultation project for needs analysis and solution proposal, and secondly, the selection of a suitable supplier based on the proposed solution.

Solidarity means clearly and decisively choosing a configurable standard product instead of a non-standardized programming solution. Loften is committed to taking advantage of industry best practices and not project-specific developments.

Breaking down silos in production

Only by maintaining standard solutions can manufacturers move with the times and improve their profitability. Project-specific programming has many disadvantages, such as constant, lengthy troubleshooting, slower reactions to market changes and no ability to quickly implement new functionalities. Standard solutions also need to be managed, of course, since standard processes have to be set up and internal restrictions removed. But as they say: You can't make an omelet without breaking eggs. As soon as we get the standard solutions on track, the investment and the effort will be worthwhile.

In an interview, Wang Wei, IT director at Qinghai Loften, who was involved in the project from the outset, explains why a standard product is the best solution for the company.

The Qinghai Loften administration building.

"Our strategy is to define clear, firm rules."

Interview with Wang Wei, IT Director at Qinghai Loften

Which aspects did Qinghai Loften pay particular attention to when introducing modern IT systems?

Wang Wei: Qinghai Loften is a private company founded about 20 years ago. It has values that we can be proud of. However, there are also some company-specific conventions that do not comply with industry standards. We

entered manually. It took at least half a day to enter the data!

PSImetals, on the other hand, is an industry standard that helps us overcome our own limitations and compare ourselves to industry standards to fill gaps. Another attraction is that we are kept up to date, as the system receives regular, annual updates with new releases and features. This allows

Does PSImetals meet your expectations?

Wang Wei: I would describe PSImetals as follows: Integrated production processes, guaranteed quality and improved efficiency. Integrated production processes mean that the system actually controls the entire life cycle of our orders. This covers the entire

In 2018 PSImetals was put into operation at Qinghai Loften.

hope that we can break through this with a standardized solution and create opportunities for our development.

What does Loften like most about the PSImetals production management solution?

Wang Wei: First of all, a production management system is very important! We had some bad experiences at our factory in Qingdao. Back then we had only implemented an ERP but no MES. As a result, the production process could not be properly controlled and the correct data could not be efficiently transferred to the ERP system because the data was

us to react more quickly to new customer and market requirements.

There are challenges when using standard software because it may require changes to business processes. How did Qinghai Loften manage this?

Wang Wei: The standardized functions in the system are mature and reliable. But it is not easy to change existing habits. Our strategy is to define clear, firm rules. In reorganizing the business process, we want everyone to gradually learn about the new business practices and become fully committed to implementing them.

supply chain, including all material flows. The guaranteed quality forms a solid basis for the strict process and standards for quality improvement and also guarantees precise results during quality inspection. Improved efficiency is demonstrated by the fact that we achieved paperless production and electronic reporting less than six months after the system was introduced. ◉

Product Report: Triple Boost for Data Consistency and Increased User-Friendliness (Part 2 of 3)

Data input validation with Deep Qualicision AI

In the last issue of PRODUCTION manager, we discussed how auto-completion based on the Deep Qualicision AI Framework can achieve measurable improvements in data consistency and user friendliness during data collection using input forms. However, auto-completion does not yet fully guarantee correctness of an entire data set. This is because the entered data would be transferred to a database for further processing without additional verification. As a result, cells may be swapped or incorrect units interchanged. This is where data input validation based on the Deep Qualicision AI Framework is used to provide both syntactic and semantic validation of the data in a fully automated manner.

Data input forms, some with many available fields, are well known as an integral part of a wide range of business processes. Some fields are mandatory, whereas others are optional. In addition, syntax and semantics primarily depend on the respective context. Constantly keeping track of this during day-to-day work is a big challenge for those processing such forms. In the course of time, errors consequently can occur in entered data, which may have extensive consequences for subsequent processes.

## A practical example: Entering a sales contract

When entering a sales contract, the unit tons is selected for the agreed quantity instead of kilograms and the decimal point is moved one digit forward in the price. If the entered contract is later executed without previous data validation, far too large a quantity (1000x) is sold at much too low a price (0.1x).

As a result, most companies use control offices to check the correctness of entire forms before being transferred to a database. But this process takes a long time and is still error-prone for several reasons. It is therefore necessary to achieve the highest possible degree of automation in order to guarantee the accuracy of the data and thus minimize the risk of inconsistencies.

Validation of input data based on rules

The manual inspection of all entries by a control office is not economically feasible in most companies. The data sets of form entries to be checked must therefore be initially pre-filtered for auditors so that they
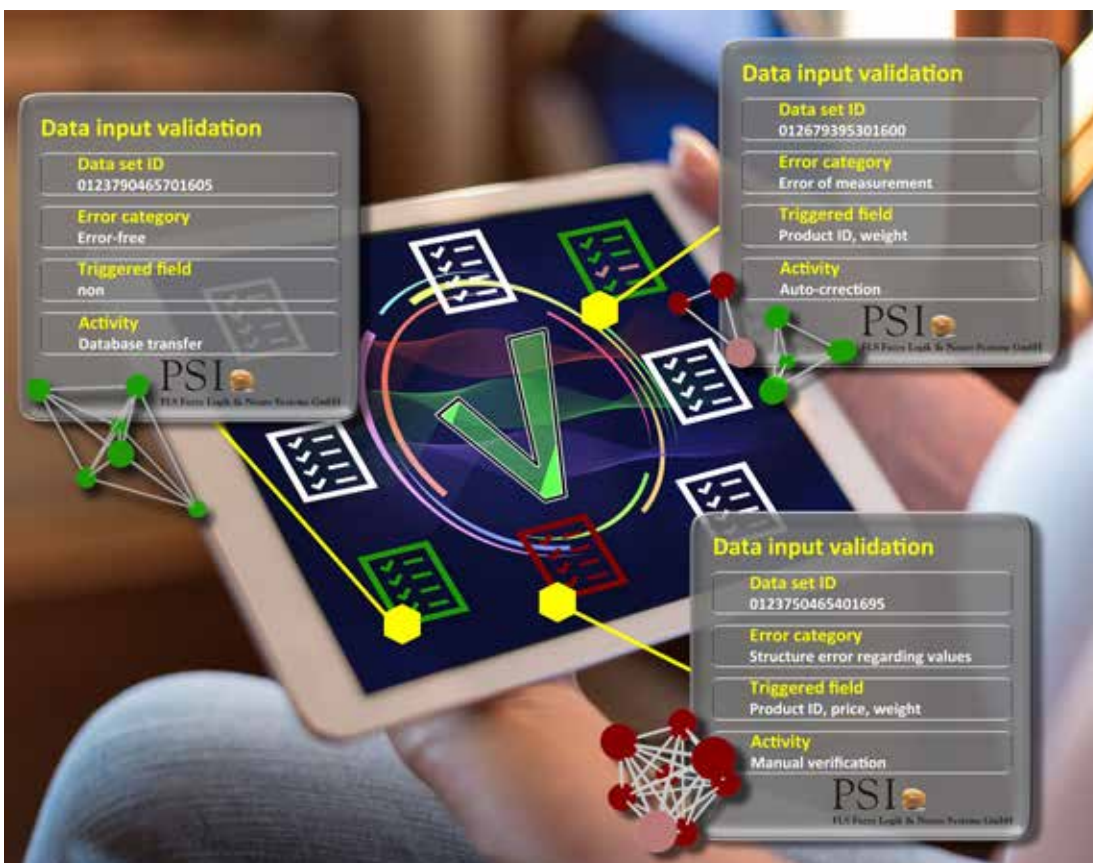
Data input validation with Deep Qualicision AI.

can focus on errors with potentially significant consequences. Rule-based systems are often used in this regard. They search for fixed anomalies in entry data sets, mostly by performing threshold checks. For example, if an entered weight exceeds the value of one ton, the control office will conduct a check of the input data.

This ensures that large orders are always checked for correctness. However, if there is no additional checking rule for the price, the extent of the damage can still be large if, for example, several hundred underpriced data sets are transferred to the database with a weight just under one ton, bypassing the control office. In addition, such strict control systems remain rigid in processes that change over time. The codebase must be continuously adapted by appropriately qualified developers in order to continue supplying the control office with relevant data sets. Rather, a mechanism is needed that automatically detects anomalies in the structures of the full data sets and continuously adapts to the current situation.

Data-driven input validation by means of Qualitative Labeling combined with machine learning

For most business processes with form-based data collection, there is already a broad basis of historicized data. By using Qualitative Labeling and machine learning from the Deep Qualicision AI Framework, process-specific structures in input data sets can be learned from past data. This can be done both universally and per user, in order to guarantee ideal adaptability to any process. Data-based approaches offer a wide range of benefits, especially for identifying multi-stage rela-

tions in data, such as a correct ratio between the entered weight and the reported price.

KPI-based self-learning input validation as part of a Deep Qualicision AI complete system

Qualitative Labeling along with a knowledge base of historicized data trained by machine learning form the basis for input validation adapted from the Deep Qualicision AI Framework. However, the connection to a control system should not be neglected, as these are still suitable for fixed dependencies between attributes. Deep Qualicision AI Framework also enables decision support by simply preferring different evaluation KPIs. In this way, significant deviations from forecasts can be evaluated in a comprehensible manner.

In addition, the control mechanism is kept constantly up to date as the knowledge base is continually adapted through fully automated learning of new data. A KPI-based, self-learning AI system such as this offers the ability to provide an automated system for continually monitoring the data acquisition process based on historicized data and a constantly growing knowledge base. This ensures that only those data sets that contain certain anomalies are filtered for manual reviews without determining on fixed properties such as a minimum weight.

Deep Qualicision-based data input validation as an extension of auto-completion

An auto-completion system that is already in operation can be fully extended with data input validation functionality using the common Deep Qualicision AI Framework. In this

+ Detection of input errors as anomalies in data collection

+ Automated validation of all data sets entered

+ Significant time savings in subsequent data processing

+ Consistency across the entire database

+ Qualitative standardization and plausibility analyses

+ Continuous learning of the knowledge base to sustain status up to date

way, a further measurable increase in user friendliness and data consistency can be achieved.

Automated duplicate detection as the final component of the AI complete system

If the syntax and semantics of the data sets have been learned from historicized data as well as during data input and validation, this can be used immediately to search for duplicates in existing databases. In the final step, a knowledge base expanded in this way serves to complete the AI system by supplementing it with automated duplicate recognition. This provides a further boost in data consistency and user friendliness based on the Deep Qualicision AI Framework (Part 3 continues in the next edition of PRODUCTION manager). ◉

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News: Warehouse Management System Optimizes LPP Distribution Center

AI-Based Algorithms for Order Processing

To achieve optimized process control during commissioning and order manufacturing with up to 1.8 million articles of clothing per day, PSI Polska Sp. z o.o has expanded the Warehouse Management System PSIwms in the central distribution center of Polish fashion company LPP S.A. to make use of artificial intelligence algorithms.

With an area of more than 90 000 square meters, the central LPP logistics and distribution center, near its headquarter in Gdansk, is considered one of the largest warehouses in Central and Eastern Europe. Every day, the employees there pick up to 1.8 million garments and accessories for daily shipping. For storage and order production, the building complex includes an 18-meter high automatic small parts warehouse (AKL) with more than one million container slots as well as manually operated block and rack storage. In addition, several kilometers of automatic conveyors, a picking warehouse with more than 56 000 pick positions,

Based on AI algorithms, PSIwms optimizes picking routes in the distribution center at LPP.

tems are installed. LPP has been using PSIwms from PSI Logistics Suite since 2007 for warehouse management, intelligent resource planning and coordinated process control.

In 2020, LPP finalized a second extension phase of the plant. The spe-

cial feature: PSIwms was designed to use artificial intelligence (AI) algorithms to further improve the order picking routes and the use of storage resources. With this optimization, LPP was able to make excellent use of the increasing shift in distribution channels toward online commerce, which was further accelerated by the Covid-19 pandemic. LPP processes around 11 million orders a year, of which 12 percent were placed through online sales last year. With the onset of the pandemic, the clothing manufacturer has seen a fourfold increase in this distribution channel.

> *The introduction of the AI algorithm-based solution significantly improves the efficiency of online order processing. Without the innovative IT system, our distribution center would not work.*
>
> **Mirosław Hoffmann**
> Head of Logistics IT Systems at LPP S.A.

four sorters with a total of 1200 target points, as well as several automatic carton handling units, integrated scanners and automatic weighing sys-

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News: Become a PSImetals Expert with PSImetals Academy/Online

Use the Time to Learn New Things

Inspired by the particular circumstances of the corona virus era, we have developed a new training product for all PSImetals users: Online classroom trainings with the PSImetals Academy/Online. The trainers provide insights into how users can work with PSImetals and map their business processes. This is done both by presenting the concepts of the individual components and by means of practical exercises—interactively and exclusively online! In an interview, Tim Brewer, one of the trainers, explains the benefits of online courses.

Scan the QR code to view the course overview on our website!

two and four hours, the courses are compact, informative and provide detailed knowledge of a particular

What is different with the courses of the PSImetals Academy/Online?

Tim Brewer: Our classic courses take place over several days and cover various topics and components of PSImetals. In the new online courses, the trainers deal with a specific topic live over a period of max. four hours and the customer can focus on a topic that interests him or her specifically.

How has your experience been so far?

Tim Brewer: Great! We have just run an advertising course for our existing maintenance customers and received a lot of positive feedback. We hope participants will share their experiences with their colleagues to encourage more people to participate in our online courses.

Why should users book online courses?

Online classroom training with the PSImetals Academy/Online—interactive and exclusively online!

Tim Brewer: Many of our customers are experiencing lost productivity or reduced working hours. Why not use this time to learn new skills or refresh knowledge? We believe that now is the perfect time to do this with PSImetals! Lasting between

topic. Prices range from 190 euro to 290 euro per course. ◉

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Product report: Optimizing Workflows and Processes With ERP

The Magic Triangles of Production Optimization

Optimization in itself simply means achieving the best possible result under the given circumstances. Of course, the company must be considered as a whole. The following, however, is about production and production planning in the actual sense.

Customers always expect agreed delivery dates to be met, consistently high quality and increasing levels of product customization. Experience shows that quality, cost and delivery targets can only be achieved through high process reliability and stability.

Optimizing workflows with ERP: quality—costs—delivery reliability

Asset management and adequate maintenance processes can contribute to this. It goes without saying that the repair and maintenance of machines, plants and tools directly influences the quality of products, in addition to availability.

Various strategies can be followed for this, from continuous Total Productive Maintenance (TPM) to predictive maintenance using machine, operating and quality data through to AI algorithms for determining sensible maintenance dates. The primary goal is to reduce disruptions in the production process. Achievable delivery reliability depends on the process reliability, because unstable processes can extend the throughput times and thus cause a build-up of stock to ensure the ability to deliver.

Respond to deviations early

The state of the production system and, in particular, the production progress must always be reflected in the planning system (ERP). This is the only way to react to deviations at an early stage. Operational and/or machine data acquisition provides a valuable service in this respect.

Today, companies often produce at several locations and supply relationships exist between them. Consequently, the entire supply chain must

Guidance for employees in the manufacturing process by means of employee information systems.

be taken into account. In addition to the company's own resources, manufacturing also relies on third-party resources and business partners. Horizontal integration has great potential for optimizing processes. Stable local production and reliable delivery processes guarantee a high level of delivery reliability. There are systems suitable for enabling JIT/JIS processes up to automatic reconciliation of demand and supply. Multi-site solutions are available for mapping complex corporate structures within the company.

Process optimization: product—process—resource

One of the key concepts of the digital factory is the product-process-resource model (PPR). The process connects the products with the resources to be used. All relevant information is available in digital form and is constantly updated. This is only possible with a close connection between PLM, ERP and MES.

A central element for controlling the processes on the shop floor is a powerful Manufacturing Execution System (MES). This plans the work sequences in detail based on the available resources. These processes are completely transparent for the higher-level planning level (ERP). As variability in the final product increases, efficient management is essential for the variety of manufacturing processes. This affects parameterization of the equipment and support for employees through provision of information. Flexible workflow control can be used in this respect.

The process models for the manufacture of a product must be constantly evaluated with regard to data quality. This is only possible if up-to-date in-

Workflow control in production.

formation is always collected. Planning quality can then be improved, which allows production to be stabilized. Machine-specific or quality-relevant data can also be recorded and used for quality management or maintenance.

The efficiency of the production processes and the effectiveness of continuous improvement measures (CIP) can be assessed using evaluation systems. Ultimately, this can also influence the production costs of a product.

Exploiting resources: people—machines—software

Even in an age of artificial intelligence (AI), human intelligence is the measure of all things. Users should therefore receive better and better support: Whether this be through direct influence on the processes or in decision-making. Employee guidance during the manufacturing process can be supported by assistance systems (employee information).

The machines and plants are designed for long operating times and

high reliability. As a result, it will be essential to make existing technology fit for today's requirements. Post-automation or equipping this production technology with sensors enables monitoring of plants up to the acquisition of process and operating data.

Software plays an increasingly important role in the age of Smart Factory and Industry 4.0. Be it the direct control systems of the machines and plants (PLC) or the operational application systems such as ERP, MES and PLM. Many tasks cannot be solved at all without these systems. This includes, for example, horizontal cross-company networking with business partners or the vertical integration of planning systems with the production process. This will greatly improve the efficiency of order processing. ◉

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Product report: A Look at PSImetals Release 5.20

Integrated Analytics

The new PSImetals Release 5.20 now enables users to integrate state-of-the-art BI dashboards (business intelligence) into PSImetals screens. This improves transparency and data-based decision support.

The dashboards are easy to edit and configure without the need for programming or advanced SQL knowledge. The embedding mechanism integrates the BI dashboards into the PSImetals application data model and synchronizes data transparently and online. Through special APIs and configuration of specific PSImetals functions, selected data can be exchanged between the BI dashboard and PSImetals. In addition to the in-memory data from the running PSImetals application, the embedded BI dashboards can also contain data from any other source, ensuring centralized visibility and transparency of all data.
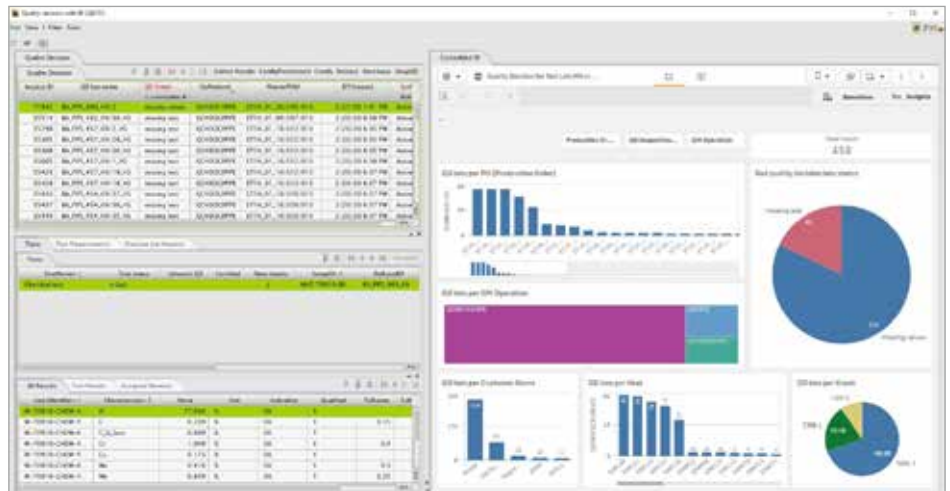

Fig. 2: Example of an integrated BI dashboard in PSImetals Quality.

leased master production plan as well as the actual production figures since the beginning of the current month (right side in Figure 1). Positive or negative deviations from the plan numbers are highlighted with a special color scheme at the product family level. Scheduled jobs

that correspond to a selected family (HCB_Wide_Thick) are automatically highlighted in the order planner Gantt chart on the left. For example, they can automatically receive a high priority status for the next planning preparation to minimize further production deviations from the master plan.

The BI dashboard in PSImetals Quality provides an overview of the test lots for quality decisions (Figure 2). From there, the user can view details, for example, to analyze quality issues per customer. Depending on the BI object selection, the status of the corresponding test lots is filtered and displayed in the PSImetals GUI. All new features will be available to all PSI Metals customers from August 28, 2020. Stay tuned! ◉
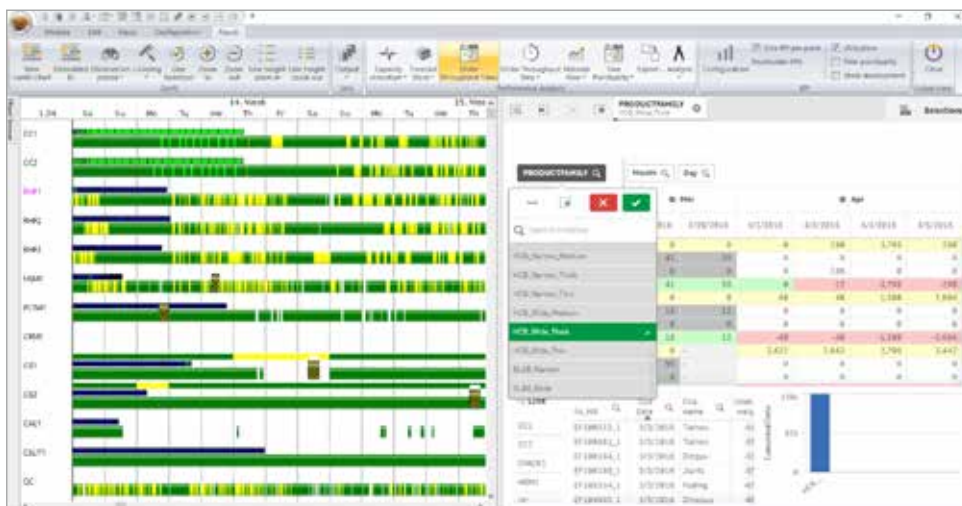

Fig. 1: Example of an integrated BI dashboard in PSImetals Planning.

Applications in planning and quality

The BI dashboard integrated into the PSImetals Order Scheduler shows the results of the most recently re-

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News: ERP Upgrade and New MES for Hobby-Wohnwagenwerk

Production Software From a Single Source

The Hobby-Wohnwagenwerk Ing. Harald Striewski GmbH has commissioned the PSI Automotive & Industry GmbH to migrate the existing ERP system PSIpenta to the current version 9.3. PSI is also supplying a new Manufacturing Execution System (MES) including shop floor scheduling. Hobby will receive the ERP and MES solutions based on the modern PSI platform from a single source.

The long-time PSI customer Hobby-Wohnwagenwerk has successfully used the ERP standard PSIpenta for its production control since 2001. In addition to further modules, the migration to the current version 9.3 also includes extensive project and consultancy services. Moreover, a new MES including shop floor scheduling, SCADA and operating data acquisition (ODA) stations will be installed and implemented in the production.

In the future, the new MES will optimize planning and transparency in production and production-related areas. With the new version, Hobby can increasingly use the standard functionalities and processes in the system and also replace the previous adjustments. "With the implementation of the ERP and MES solutions from a single source, we can maximize our potential in production," summarizes Stefan Schulz, Head of IT at Hobby-Wohnwagenwerk.

Hobby employs over 1200 people in its Fockbeker caravan plant near Rendsburg in Schleswig-Holstein. In one of the largest production sites for caravan and motorhome construction in Europe, vehicles of the highest quality are produced using the most modern systems.

Production hall in the Fockbeker caravan plant.

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PSI Webcasts

09/15/2020—PSIpenta Smart Planning & Analytics | Integrated Financial and Liquidity Planning
Together with our partner evidanza AG, in this webcast we present a software solution for planning the future earnings and liquidity situation of a company.
More information & registration: www.psi-automotive-industry.de/ifp

09/16/2020—Is your ERP ready for intelligent production?
Watch the webcast to learn about the future of ERP systems and how we can work together to make your production better.
More information & registration: www.psi-automotive-industry.de/intelligente-produktion

News: PSI Campaign GreenSoftwareMonth

Sustainable Production Planning of the Future

For more than 50 years, PSI software solutions have been helping the energy industry and energy-intensive sectors increase efficiency and make responsible use of energy, raw materials and labor. Particularly in the metals industry, we make a special contribution to sustainable production with our advanced products. Follow us on our journey into the future world of sustainable production planning.

For some time now, we have been helping steel producers reduce their CO_2 emissions and optimize their energy consumption. Even today, a plant employee can monitor and adjust the expected energy consumption and CO_2 emissions with PSImetals. The challenge, however, is that the business units in the plant environment have always been organized separately from each other.

Overcoming silo thinking

The steel plant is at the centre and the MES system has a direct, strong link to the production area of logistics and quality management. However, this also means that production planning works independently of the energy software. Consequently, the planning solution does not take into account energy prices, energy contracts, energy availability and vice versa.

What if...

...we broke the silos together and connected PSImetals to the energy exchange and the existing trading system within the plant environment? The system would then be able to monitor the energy position of the plant, manage the existing emission certificates and prepare the long-term demand forecast. By directly connecting to the plant's energy management system, the planning solution could trigger warnings if a production plan suddenly leads to an increase in energy costs. If the planning solution were to have access to the energy contract specifications in the contract management system, it could recommend the best time for the consumption of additional energy, propose early energy procurement and reschedule production in line with the terms of the energy contracts.

There needs to be a transformation

Given current environmental developments, for many steel producers the status quo will not be enough to remain at the forefront. Global change requires a global community—we can only take this journey with you. Together.

This article is part of the PSI Group's "GreenSoftwareMonth" campaign. ◉

More interesting articles on sustainable software can be found on our blog.

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GREEN SOFTWARE
Imagine, and It Shall Be:
The Vision of Sustainable
Production Planning

#GreenSoftwareMonth

To break the silos, there must be a change—a transformation!

News: New MES System for Steel Pipe Manufacturer TMK

Digitalizing the Processes

The leading Russian steel pipe manufacturer TMK Group is implementing a project to automate its operational management system, including production planning and MES at its Russian divisions, together with PSI. The respective agreement was signed by the companies in February 2020.

TMK Group and PSI are realizing an integrated solution based on the PSImetals Production, Quality, Logistics, PSImetals Flow and Order Planning and PSImetals Scheduling modules. During the project's first phase, TMK will re-engineer and unify production processes across all of its plants. The second phase will see a rollout of the new system at pilot divisions of TMK's Volzhsky Pipe Plant, Seversky Pipe Plant, Sinarsky Pipe Plant and Taganrog Metallurgical Plant. The final phase will see the new system applied across all TMK production facilities. ◉

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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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EVENTS
www.psi.de/en/psi-pressevents/overview/

09.–10.09.2020	PSImetals Release 5.20 Highlights Webinar	PSI Metals
17.09.2020	BVL.digital Innovation Pitches: Supply Chain Management	PSI Logistics
22.09.2020	BVL.digital Innovation Pitches: Warehouse Management	PSI Logistics
08.10.2020	LOGISTIK HEUTE-Forum: Production logistics Munich, Germany	PSI Logistics
27.–28.10.2020	LOGISTIK HEUTE-Forum: E-commerce Berlin, Germany	PSI Logistics
24.–25.11.2020	LOGISTIK HEUTE-Forum: Food logistics Marburg, Germany	PSI Logistics
01.–02-12.2020	LOGISTIK HEUTE-Forum: Spare parts logistics Stuttgart, Germany	PSI Logistics

PRODUCTION
manager

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