

# PRODUCTION manager

Journal for logistics & production



Efficient order picking at Milavitsa

## Daily throughput increased by 50 percent

User report

**PSImetals** Logistics at  
Dillinger France in Dunkirk  
Logistical optimisation in  
heavy plate warehouse

User report

**PSIpenta** ERP system a key  
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competitive position

User report

**Tender management** at  
Hellmann Worldwide  
Logistics  
Transparent rate calculation  
with a minimum of effort

## EDITORIAL

Dear readers,

We are currently witnessing a lasting change in the technological landscape: the evolution towards autonomous mobility with decentralised control and intelligence. PSI Logistics is participating in this trend, with developments of mobile operations in logistics. The term “mobile operations” reflects the challenges faced by developers of software products. On one hand, developers need to take into account the integration of the mobile, self-organising, autonomous transport systems of the future (Cyber Physical Systems—PS) as these systems shape the projects of the future, including Industrial Internet and the Internet of Things. On the other hand, users require secure applications and user-friendly interfaces to allow mobile access to the required data in real time, as well as tracking and manipulating the processes of devices and systems.

With adaptive scenario management, a major step towards the self-configuring warehouse management system, and the development of new technology platforms such as the PSI Mobile Service Solution (MOSS), PSI Logistics has started to offer solutions to meet the requirements of the future. The



latest information on these developments can be found in this issue of production manager.

In an interview, Peter Dibbern sheds light on other aspects of Industrial Internet. You will also learn about the advantages that PSI system solutions offer companies in the industrial and logistics sectors. One report focuses on how Dillinger France is optimising

logistical processes in its heavy plate warehouse, while another looks at how Alfinig is safeguarding its leading competitive position thanks to the use of an ERP system. We also show how smart glasses can help you get a closer look at production. Last but not least, we discuss the latest results of several interesting research projects in which PSI is significantly involved. We hope you find it an informative read.

Regards,

*Prestifilippo*

*Dr Giovanni Prestifilippo*  
Managing Director  
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*Sascha Tepuric*  
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Efficient order picking at Milavitsa

## Daily throughput increased by 50 percent

**I**n the new distribution centre of the Belarusian garment manufacturer Milavitsa, the warehouse management system **PSIwms** from PSI Logistics enables end-to-end visibility and efficient order picking. Integrated sequencing strategies and control of the material flow technology directly from **PSIwms** enable highly efficient order picking and increase the level of service.

Investments in the logistics and distribution structures are the top priority for the decision-makers at Milavitsa. The company, with its headquarters in the Belarusian capital Minsk, produces garments including a swimwear range and belongs to the Silvano Fashion Group. In the last few decades, the company, which was founded in 1908, has developed into one of the largest producers of corsetry articles in Eastern Europe. The company now produces around 17 million high-quality items of clothing per year. Its annual sales growth is between 15 and 20 percent. The collections are exported

around the globe to some 30 countries. Milavitsa has a local presence in twelve countries, with almost 500 of its own branches.

### Restructuring of distribution

Given the company's continuously strong growth at the beginning of 2012, the decision was made to restructure and optimise the procurement and distribution structures with a focus on warehouse management. The company was able to call on the services of a provider of contract and distribution logistics from its own group—Minsk-based LLC Baltsped

Logistics Ltd., the fashion group's logistics subsidiary, which was founded in 2010. In 2013, the group merged the three existing warehouse locations to form a central high-tech distribution centre in Obchak, near Minsk. The logistics centre is connected directly to the local Milavitsa production plant. The garment manufacturer is the main customer at this facility with multi-client capabilities, operated by Baltsped Logistics. The logistics provider also played a leading role in the planning process for the intralogistics facilities at the distribution centre.

### Process automation is not the be-all and end-all

With a high-rack warehouse (HRW) that offers 4500 loading spaces as a replenishment depot, and the installation of a new conveyor system

with two sorter machines, processes at the centre have been automated. In the existing building, the high warehouse, measuring 9000 square metres, was also divided into four mezzanine floors for order picking. The shelf compartments on these floors offer a total of 63 000 loading spaces for order picking of individual items. “Together with the supplier of the system, we developed the sorter—an automated storage and distribution system that

and handling several value-added services”, Shakin explains.

### Consolidation with low-risk strategy

In addition, for warehouse consolidation and the integration of the new processes into PSImms, PSI Logistics developed a low-risk strategy for replacing the existing system while preserving Baltsped Logistics’ ability to deliver. In the first phase of the pro-

is designed to handle up to 100 000 stock receipts and issues per day. The deliveries are made directly from our own production facilities or, primarily in the case of semi-finished products, from external producers from Asia. In the goods received area, there are 15 work stations that handle sorting and initial quality control checks for all products. The approved items are registered in PSImms as goods received. The data collected is reconciled with the order and delivery data. In parallel, PSImms checks stored reservations and order data. On the basis of these checks, the relevant packaging and optimum in-plant transport routes for the storage, production supply and shipping of the goods are calculated by the system.

*The extensive functionality of the standard system and the testimonies from the Russian and Belarusian markets were the decisive factor in this decision.*

**Vyacheslav Shakin**  
Director of Baltsped Logistics

can deliver to up to 100 destinations simultaneously”, Vyacheslav Shakin, Director of Baltsped Logistics, proudly explains. “This is unique in Belarus.” “Process automation is not the be-all and end-all”, Shakin continues. “The complex processes require a powerful piece of software to control the automation processes, operating in the background to give us the highest level of transparency, efficiency and security of investment.” Following an international call for tenders, the contract was awarded to the warehouse management system PSImms from PSI Logistics in July 2012.

The IT system generates orders for in-plant transport, controls the two-kilometre-long conveyor systems, stock location assignment, inventory management, the consolidation stations and order production, and brings together all the required information on a redundant server. “In addition, PSImms supports us in expanding

ject, the stocks of the three existing warehouses were transferred directly into PSImms. With the quantities and item data, the warehouse management system was also able to generate the optimum stock locations in Minsk. This meant that, at the time of delivery from the old warehouses, the goods could be put into storage immediately. The second phase involved the integration of the conveyor technology and the two sorters that are now installed in the new logistics centre, as well as the automatic packing system including weighing machine connection and labelling, into the PSI system. Since September 2013, the new distribution centre has been in live operation. All processes are managed and controlled from PSImms. A Finite Capacity Scheduling cockpit ensures end-to-end visibility of capacity utilisation and order processing and permits short-term optimisation measures where necessary. The system

### Integrated multi-stage sequencing strategy

Before the items leave the goods received area, they are sorted according to colour and size, packed and labelled by automatic packing machines in line with these specifications for the various target markets and customers. Both the packing machines and the material flow components are controlled via integrated interfaces directly from PSImms. Full pallets for replenishing the picking stations are collected by forklift trucks in the goods received area, taken to the transfer areas in the HRW and stored in one of the 3 600 pallet bays by rack operating machines. Transport Control, the forklift truck guidance system available as standard in PSImms, ensures optimum utilisation of the industrial trucks and ensures that items are transported along the best possible route. The transport orders are transmitted via data radio to the mobile data terminals (MDTs) of

the trucks. The forklift truck drivers also use these terminals to confirm the correct transfer of the pallets.

Goods received that are intended for storage in the picking shelves are boxed at eight work stations after item packaging and passed to the conveyor system. By means of regular barcode scanning, the conveyor system guides the boxes directly to the floor specified by PSIwms, where employees store them in the defined loading spaces in the shelf compartments on the mezzanine floors. Just as for order picking, the necessary dialogues are conducted between PSIwms and the employees' MDTs.

The system sends the order picking specifications to the employees on the four picking floors. At Baltsped Logistics' logistics centre, the picking for Milavitsa takes place in several stages. First, the items are placed in transport containers. After order picking is completed, the conveyor system guides the containers to a consolidation buffer. It consists of 12 terminals, each with 20 container spaces. "One of the main challenges in tailoring PSIwms to this particular context was the integration of a multi-stage sequencing strategy", explains Slawomir Budzaj, project manager at PSI Logistics.

### Case calculation for 30 000 picks

On the one hand, the task involved treating items distributed over several floors as one order from an information perspective. Moreover, various parameters for storing items together had to be taken into account in the consolidation process. For example, PSIwms supports the provision of items according to their sensitivity: The more sensitive the items are, the later and higher up they are placed in the shipping boxes. In addition, PSIwms case calculation uses special algorithms to generate the optimum composition of the shipping pallets and the best possible utilisation of transport capacity. To do this, the WMS first brings together the transport containers on an order-by-order basis from the four floors at one of the 12 terminals. From here, the containers are automatically fed onto one of the two sorters. The sorters deliver to 60 and 40 packing stations. During the routing process, PSIwms guides the containers in a specific order so that the employees receive the heaviest items first and the most sensitive last. PSIwms works in the background to check the completeness of the order picking, via an automatic load cal-

ulation function and reconciliation with the target data.

At the work stations, the items are re-packed in shipping boxes. "The only manual processes we still need to carry out", says Shakin with a satisfied smile. Finally, the employees use PCs and printers to create the accompanying documents, place them into the boxes, seal and label the boxes and stack them for dispatch preparation on pallets. In addition to sequencing and case calculation, PSIwms ensures that the pallet composition is optimised in terms of routes and recipients.

The order pickers in Minsk process a total of 30 000 order lines in this way every day. "At full capacity, we will increase our daily throughput by more than 50 percent compared with the previous processes thanks to intelligent IT and automation", Shakin concludes. "We are highly satisfied with the flexibility and the gain in efficiency that PSIwms offers." 

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**32. DEUTSCHER  
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**Software for Logistics Industry Leaders**

**PSI** 

Research project: SMART FACE combines Industry, IT & Logistics

## Decentralised Production Control for the Automotive Industry

In the past, industrial production processes have generally been organised along hierarchical lines. Planning is carried out at the top levels of the organisational hierarchy. Decision-making involves a significant degree of freedom and a low level of detail. As a result, they are only networked from the top down, but not across hierarchy levels. The SMART FACE research project addresses this situation by working with companies from a range of industries to develop solution concepts.

The significance of process key performance indicators (KPIs) is subject to continuous reweighting. There will be a much greater need for self-organising adjustment of current objectives than is the case at present. The same is true for the planning and production process in the automotive industry, where no vehicle is the same as another these days. Optimisation will be based on changing KPIs with a much greater degree of self-organisation.

### Linking the Physical World and Virtual World

The principle of the Internet of Things (IoT) will advance the creation of new organisational structures. To acquire the necessary information, individual things—known as cyber-physical systems (CPSs)—will perceive their environment using sensors. Cameras, distance meters and other sensors will capture their surroundings. The resulting information will either be processed on-board or transmitted to software services. This enables the CPSs to autonomously make decisions, including those based on KPIs, and to organise themselves. Today's Internet is all about network-

ing humans and IT systems. Tiny IT systems with the capabilities of earlier desktop computers can now be almost invisibly attached to objects. This enables any objects to be equipped with the computing power that allows the objects to be networked with one another.

Objects and IT Systems merge together. Provided that decision algorithms can be executed in the IT systems, it is possible for the objects to have local decision-making capability. In future, production processes will involve networked working by humans, IT systems and objects. This networking will help resolve the apparent contradiction between the variety of production orders and efficient organisation of production processes.

### SMART FACE Combines Industry, IT and Logistics

To prove that this is not just fiction, a consortium made up of automotive manufacturers and suppliers, logistics and IT providers and institutions involved in applied and direct research has set up the SMART FACE project. SMART FACE is a research project that is part of „Autonomik 4.0“, a

technology program for autonomous systems backed by the German Ministry of Economic Affairs and Energy.

### The Thinking behind SMART FACE

In the past, the planning process in automotive production involved several hierarchy levels. First of all, annual planning defines the planned figures for annual sales. These are used to derive the annual requirements for the parts and components that can be determined from the bills of materials. At this point, the planning scope is extensive, but starts to reduce at this level of the decision-making hierarchy. Monthly planning sets out the long-term delivery contracts and the delivery quantities for suppliers. At the same time, rough-cut planning of resources is carried out in the ERP system. At this stage, the possible planning scope is reduced again, although there is still a relatively high degree of freedom.

The next step is to derive the weekly planning from the monthly planning. This involves preliminary planning of the production sequence on production lines. The delivery calls at sequence and time slot level are then passed on to suppliers. Changes are still possible, but the amount of work involved increases. In the daily planning, the resources are then specified and frozen. The sequence of orders is specified in terms of time and location within a shift. All supplier processes are precisely scheduled. Any fault or the need to change a sequence requires



*Production flow in the automotive industry.*

a great deal of work, which can lead to stoppages of the production process.

### Self-organising CPS

The aim of the SMART FACE project is to replace the scheduling from daily planning with a self-organising CPS. An order pool is processed autonomously within a time window. The result is a volume cycle (i.e. a production volume per time slice). This implements one of the key visions of Industrial Internet, namely „individualisation (batch size 1) with the economic conditions of a mass producer.“ The planning scope in the production process increases again.

### Multicriteria decision optimisation

Series production based on the Internet of Things principle no longer has any production lines. Production and assembly stations are set up „in the open.“ Supply vehicles transport the components or parts to be fitted from a warehouse to the production stations. Depending on the assembly progress, part-finished orders are either moved on self-transporting platforms or by a driverless transport system. The numerous decisions that the autonomous units have to make are calculated based on KPIs using multicriteria decision

optimisation. The current KPI values are taken into account and decisions are based not only on the perspective of the global objectives of the production process but also on a local order, component and part view. Humans act as cognitive all-rounders that monitor the process and guarantee the flexibility of the entire system. 

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User report: Tender management at Hellmann Worldwide Logistics

## Transparent rate calculation with a minimum of effort

Since autumn last year, Hellmann Worldwide Logistics has relied on the tender management system from PSI Logistics for customer-specific bid preparation. Extensive automation of the calculation processes and optimum data consolidation create maximum transparency during bid preparation. This reduces the amount of time required to a minimum, although all the necessary variables are into account.

agreements, and required the use of thick folders”, says Marco Nowak, Project Manager Business & IS Solutions at Hellmann in Osnabrück. “From 2002, a costing tool for standard rates assisted us with calculations for gen-

When Hellmann Worldwide Logistics GmbH & Co. KG, Osnabrück, submits a bid for a call to tender issued by a shipping agent, the bid is not only tailored precisely to the specific logistics requirements of the shipping agent. It is also optimally modelled to the logistics network of the service provider and precisely calculated on the basis of the respective cost blocks. What’s more, a large proportion of the necessary calculations and analyses are performed automatically, as the numbers are based on the intelligent Tender Management System from PSI



*Tender Management System user interface.*



*Transport at Hellmann Worldwide Logistics.*

Logistics. Hellmann went live with the IT system, programmed with a large number of enhancements for a transparent, cost-optimised design of bid rates, in September 2014. It has now been rolled out at all of the company’s German sites.

Since its foundation in 1871, Hellmann Worldwide Logistics has developed into one of the largest international logistics providers. The owner-managed company has 19 300 employees in its global network and is represented in 157 countries with 443 offices. “In the past, the rate quotations for calls to tender were calculated from rates and partnership

eral cargo. However, that had reached its limits, and many bids had to be calculated manually again. We were therefore looking for a new and more flexible system.” With the PSI Tender Management System tailored to Hellmann’s requirements, the service provider can determine, for example, in day-to-day use, how tenders can be processed with customer-specific relations in the standard network or external service providers. The IT system shows, among other things, what prime costs are to be expected for the tendered shipments or what full and marginal costs will arise for additional transports within the exist-

ing network according to a business approach. “A costing tool that we can use to cover almost all customer-specific variables, in addition to the standard and in-house rates”, explains Nowak.

## Bids based on actual data

The cost structures for the products are stored in the new costing tool. “This means that automated rate calculation is now possible

not only for national and international general cargo in goods received and issue as well as import and export, but also for direct load and the CEP segment”, says Nowak. In fact, Hellmann receives an increasing number of cross-product requests with a combination of different package types, different rates, additional receiving zones and the integration of ancillary costs. “The rate matrix is becoming increasingly extensive and complex”, says Nowak. “Automated costing processes represent a huge time saving.” The time needed for the costing of complex rates with large quantities of data was significantly reduced thanks to the Tender Management System—in extreme cases, from almost a day to 30 minutes. With the Tender Management System, Hellmann can create its bids on the basis of actual data, both from its own resources and logistical networks and from concrete actual data from the invitation to tender, such as shipment volumes. “The inclusion of specific figures not only saves time but in particular leads to transparent rate calculations on a realistic basis”, explains Matthias Woste, Project Manager at PSI Logistics.



Loading of containers.

## Intelligent modelling component

Hellmann can manage its data structure independently. In addition, the Tender Management System unifies the costing processes in the company throughout Germany on the basis of a single system, and therefore replaces

and logistics chains, simulate various initial situations and changing developments, construct different rate constellations and ultimately combine them to form concrete, optimum solutions. In these cases, the system also shows how planned or simulated changes in volume quantities or shipment structures have an impact on profitability. “Using this system, bids are generated

on the basis of realistic cost structures, taking varying distances, weights and surcharges into account”, explains Woste. “And this process is largely automated.” The continuous IT service process associated with the Tender Management System reduces the manual input required by a conventional bid generation for, among

*“The more complex the query, the more time we save with the Tender Management System. With the costing tool, the results are also clearly documented in a uniform, transparent and traceable way. This meets our requirements perfectly.”*

### Marco Nowak

Project Manager, Business & IS Solutions at Hellmann Worldwide Logistics

the many systems that were previously required. This simplifies the costing processes, increases their quality, puts an end to miscalculations due to imprecise figures, reduces the outlay and resources required for the preparation of bids, and leads to a transparent pricing policy.

At the heart of the Tender Management System is an intelligent modelling component. Users can apply this component to alter figures, resources

other things, verification, generation and billing, by more than half. Hellmann is currently determining concrete results as part of a longer-term analysis. 

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Reference: *PSImetals* Logistics at Dillinger France in Dunkirk

## Logistics Optimisation in Heavy Plate Yards

For heavy plate producers, the plate yard is the nerve centre of their supply chain, receiving heavy plates from the plate mill, coordinating treatment processes and preparing the delivery of the final goods. A state-of-the-art logistics solution is required to cope with a very competitive and demanding market. To achieve this Dillinger Hütte in France is using *PSImetals* Logistics.

**D**illinger France—a 100% subsidiary of Dillinger Hütte Group and located in Dunkirk, France—is specialised in the production of heavy plates meeting most stringent requirements by using TMCP or heat treatment.

To fulfill changing market requirements and to move into up-to-date software technologies Dillinger Hütte decided to implement *PSImetals* as logistics solution for its heavy plate facility in Dunkirk.

The solution should cover the finishing area including slow cooling, ultrasonic control, thermal treatment and flame cutting. Here Dillinger France expected to achieve the most significant effects to meet future demands while maintaining a cost advantage in production. Main targets were

- Location tracking of heavy plates within multiple areas, down to exact x, y and z positions within dynamic created stacks
- Optimisation of the material flow to improve processing time, avoid relocating for digging out plates and optimise crane movements
- Maximum utilisation of existing storage space
- Managing hot stacks in diffusion zones
- Automatically charging of the flame cutting line and the heat treatment furnace

### *PSImetals* Logistics Core Functions

To fulfill the targets of Dillinger France different service components have been selected:

#### SOLUTION AT A GLANCE

The overall solution is based on 3 pillars:

- PPA: Dillinger-own MES provides material data, calculated plate temperatures, cooling periods, line sequences, material events and production routes.
- Logistics: *PSImetals* Logistics manages the stock yard and transports within these yards including searching and finding the best positions for plates and informs PPA continuously about the actual state.
- CTS (crane tracking): Material location tracking using Symeos' local positioning radar technology; integrated via the standard CTS interface of *PSImetals* Logistics.

Destination Finding to configure the route of the plates through the finishing area and to find out the best possible storage location for a plate considering next production steps, material dimensions and others. At Dillinger

France it was decided only to configure restriction criteria to avoid storing material on less suitable locations. Restriction criteria are used e.g. to limit the height of a pile, the number of layers in a pile and especially to pre-sort plates in front of a line.

Dynamic Slot Management to utilise existing storage space in the best possible way. Sorting is a dynamic process and is done at Dillinger France by considering a particular material attribute, e.g. the range of thickness of a plate, the delivery week or the type of a plate. Yard slots will be created dynamically by storing the first material of a pile on the floor. Destination Finding automatically channels suitable plates in this direction. In the moment the last material will be lifted from this slot, it will be deleted again. The advantage: Occupied storage space always fits to material dimensions and piles with variable attributes can be stacked up and down dynamically.

Hot Stack Management to find an appropriate location for plates in diffusion zones, to stack plates as specified by PPA and to control the life cycle of the pile. Transport orders for the crane drivers are created in the correct sequence and with exact destination specification up to plate position in layer.

Transport Optimisation to optimise the execution of plate transports in 3 halls operated by altogether 7 cranes and other means of transport. A dynamic prioritisation of transport orders is also possible. *PSImetals* permanently checks all existing transport orders and recalculates their priorities considering the actual situation in

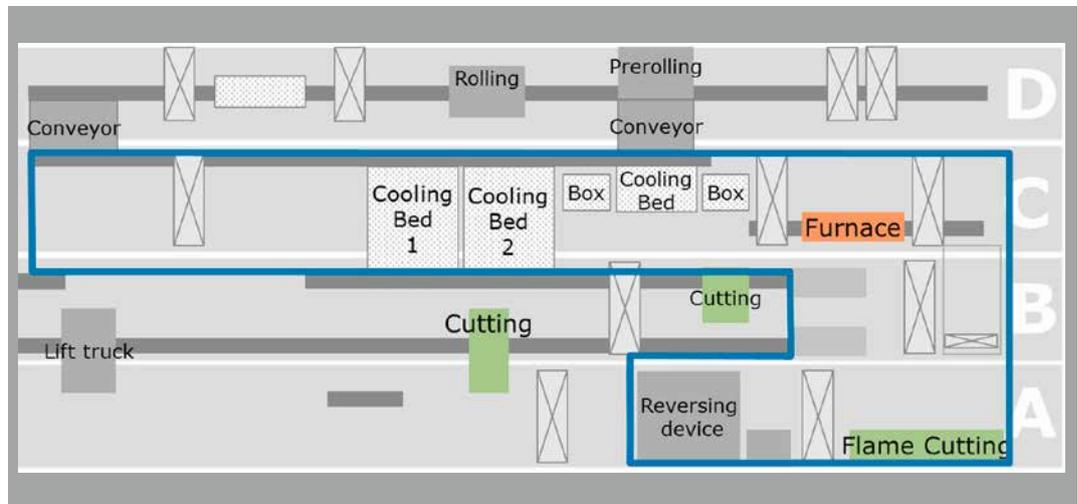
the stock yard and material attributes as for e.g. plate temperatures, space availability, customer priority and others.

## Increase Throughput for Heat Treatment

Due to the close integration of the 3 systems the workflow around the heat treatment furnace was improved significantly. Plates ready for “annealing” are first stored in the waiting zone sorted by range of thickness. PPA provides a furnace loading plan by considering their current location. PSImetals creates transport orders to stage the plates in front of the furnace according to the loading plan coming from PPA. A sorting zone is used as additional buffer for relocations. PSImetals automatically starts creation of trans-

charging; dependent of available inlet space transports are executable. If a

wherever they are stored by gathering X, Y and Z coordinates. The real time



The blue frame shows lines in finishing area covered by PSImetals.

port orders to the inlet of the furnace once staging is completed. PPA informs continuously about real furnace

plate comes out of the furnace, the discharging transport order will be created automatically.

## Enhanced Flame Cutting Productivity

With the main objective to keep the customer's time schedule plates in front of the Flame Cutting Line are sorted by PSImetals according to criteria as urgency and delivery week. The line sequence is created by PSImetals “on the fly” following physical characteristics. PPA continuously informs PSImetals about the space left on the loading bed of the FCL. Based on that information PSImetals looks for the next plate by considering criteria such as most urgent plate, thickness, length and accessibility in the stack. Transports from the staging area to the line can be executed faster due to the reduced number of relocations necessary for digging out the next suitable plate.

location tracking allows the monitoring of each movement. All movement data are historicised.

## Happy Crane Driver

Ergonomic and informative crane dialogs led to major improvements of the usability.

Real time instructions indicating the destination for each mother/daughter plate allow the crane operators to store them according to predefined rules.

Transport orders are prioritised by considering the urgency of the transport task and avoiding unnecessary crane movements.

Based on the achieved benefits Dillinger France will roll out the PSImetals solution in Dunkirk to the remaining finishing areas and the associated plate yards. 



Crane dialogs with optimised ergonomics.

port orders to the inlet of the furnace once staging is completed. PPA informs continuously about real furnace

## Complete Production Route Traceability

Starting with the arrival on entry table in hall 3 plates can be localised

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User report: PSIPenta ERP system a key to success at Alfing

## Safeguarding a leading competitive position

The mechanical engineering companies Alfing Kessler Sondermaschinen and Alfing Montagetechnik rely on PSIPenta. The ERP system has been in use for many years, and has become an important pillar of success.

The two mechanical engineering companies Alfing Kessler Sondermaschinen GmbH (AKS) and Alfing Montagetechnik GmbH (AMT) work closely together under the umbrella of a holding company. They have a joint technical and commercial management team and also share some of the key functional areas, such as Finance, Personnel, Purchasing and IT. The joint headquarters is located in Wasersaltingen in Baden-Württemberg, Germany. Together, AKS and AMT have approximately 500 employees.

AKS, a special-purpose machine manufacturer, has been using the ERP solution from the Berlin-based firm PSIPENTA Software Systems GmbH since 1996. The production control system PIUSS-O developed into PSIPenta in 2004 following a new invitation to tender.

### Reliable planning for large projects

The portfolio of AKS includes production lines and machining centres for almost all major automobile manufacturers and their suppliers. AKS is a leading global manufacturer of systems for the production of connecting rods and other components, as well as a technology leader in the fracture splitting of connecting

rods. “We handle our production via BOM planning—and PSIPenta supports this most effectively”, Dietmar Wieber says, explaining the reason for selecting PSIPenta. “But above all, AKS usually works on large orders with long lead times of nine to twelve months. In order to reliably estimate



With PSIPENTA, the plant manufacturer AKS handles its production via BOM planning and works reliably with PSIPenta project planning.

delivery times and required capacities as early as the bidding and planning phase, a powerful project planning solution is essential. After all, the promised end date is sacrosanct to those of us in the project business.” PSIPenta scores highly in this area, too: The project management tool PSIProfessional takes all necessary order data directly from the ERP system and, by means of a simulation, calculates run times, use of resources and necessary outsourcing for a project. “We have not found this functionality in other systems, particularly when it comes

to the integration of project management right down to the detail planning of the operations”, says Dietmar Wieber. “For me, this is one of the unique selling points of PSIPenta.”

### Rapid adjustment programming

In 2007, Alfing Montagetechnik GmbH, a supplier of technical solutions for the international automotive industry in the areas of screw technology, assembly systems and automation, made the decision to replace its outdated ERP system. “An important requirement for AMT, for example, is the settlement of repair orders”, explains Dietmar Wieber. “For this reason, it is important that the ERP system can handle serial numbers. When, for example, a crate of parts arrives unannounced at goods received with a request for repair, we use these numbers to see what type of part it is and in which system it was fitted for which customer. In addition, when the serial number

is entered, a repair order is created automatically and immediately. The repair department provides the necessary information for a quote, and the customer can accept or reject it. Via the serial number, we also obtain a repair history, which we can evaluate specifically in order to improve our products.” PSIPenta already fulfilled most of AMT’s requirements in its standard version and had already proved its worth for many years at AKS. In addition, PSIPENTA was willing to program additional functionalities quickly and without too

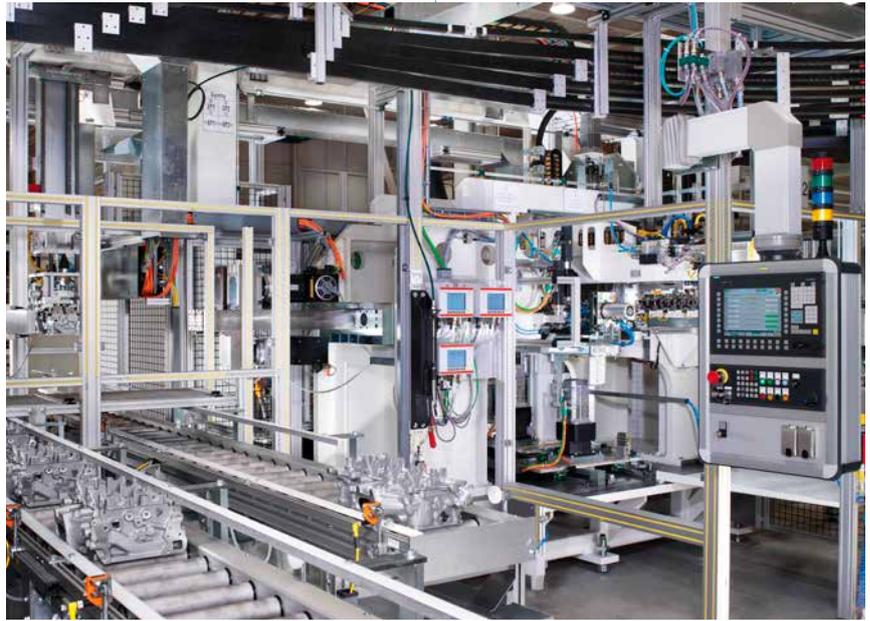
much red tape and integrate them into the standard version.

### One of the keys to success

PSI*penta* has now become an important key to success at the two Alfing companies. “Without PSI*penta*, we could not manage the incoming order volume with the existing staff. We now have standardised and optimised processes, and numerous manual actions have been replaced by automated processes”, says IT director Wieber. “Our performance has significantly increased and the error rates have fallen considerably in all areas.” The users appreciate the opportunity to define workflows simply and intuitively and exchange information between departments in an automated way.

### More transparency

The PSI*penta* installations in Wasseralfingen are being gradually expanded. Since May 2015, Alfing Kessler Sondermaschinen GmbH has also been using PSI*penta* Finite Capacity Scheduling. “Every day, approximately 6000 manufacturing operations will be rescheduled”, explains Dietmar Wieber. “Finite Capacity Scheduling helps us find the optimum order for processing these operations, identify bottlenecks



AMT as a supplier to the international automotive industry relies on PSI*penta* for handling its repair orders.

at an early stage and reschedule work orders more flexibly if necessary.”

The result of this is higher capacity utilisation and optimised mean lead times, which were reduced by 10 to 15 percent on average. “With PSI*penta*, we benefit from an unprecedented high level of transparency”, says Dietmar Wieber. “We now have reliable capacity information for manufacturing and project management.” One of the next targets is the ability to visualise project costs in Finite Capacity Scheduling. In addition, tablets

will be introduced for the warehouses, shipping and field staff in 2015. Mobile warehousing software is already being tested and other mobile solutions are currently being developed. After all, development does not stand still—it keeps getting better. 

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Event Review METEC, Düsseldorf Germany

## Data Driven Production

Today *PSImetals* solutions are already building the core of integrated software landscapes at metal production sites all over the world, connecting shop-floor systems with business software from various ERP vendors. The developments around Industrial Internet will have a huge impact on production control as we know it. Everything will communicate directly to each other: So-called cyber physical systems will merge production equipment with intelligence/software, production units will become smart and will communicate directly with smart products. At the recent Metec show in Düsseldorf, PSI presented an application using Google Glass. Detlef Schmitz, Managing Director PSI Metals, reports about the production management of the future.

**I**ndustrial Internet: In our vision, data in all its facets from generation to analysis will be the driver of future production. Finally the smart factory needs to achieve a status of wisdom. By that means, solutions could be “reached” before problems actually happen. That means we are the glue for vertical integration. Already today, horizontal integration even beyond company borders becomes important. Vendor-managed inventories are only one example we

have realised several times within recent months. We expect that the automation pyramid will be exchanged by a company-wide platform. This platform will connect every player like so-called ‘cyber physical systems’, products, software applications and finally, of course, human users.

### Augmented Reality in Production

PSI created a new generation of *PSImetals*, with a business-process-based and configurable human interface. With Google Glass we showed a next step. *PSImetals* is already capable of building a platform to integrate new devices or wearables. For our fair showcase we integrated the smart glass with our application and booth visitors were guided through typical tasks of a yard worker by com-

mands displayed on the glass. All actions were directly tracked and visualised in *PSImetals*. People were fascinated as we gave them a small outlook to the future. Some people asked whether this was just fun for our engineers or whether PSI sees a real application for such devices. We answer “Both”. Of course our engineers like to work with cool stuff. But it’s a proven technology in other industries today. As technology leader in our industry we wanted to test the feedback of our customer to such tools. Our assessment: Even the more conservative metal industry is quite open and some customers have actually stated their interest.

### Industrial Internet Next Steps

Currently we are working on the KPI-driven supply chain. That means that our planning modules will use KPIs as a basis for decisions. The plant/company will be steered by a few KPIs. Here we use ‘fuzzy logic’ technology to consider different situations at every plant. A pilot project is performing well. To understand the demands and future developments of cyber physical systems we are in close dialogue with leading plant builders as the ‘industrial internet’ is talking about the merger of equipment with software. We invite all producers to join our journey towards the future of smart production, using PSI as a reliable and dedicated travel guide. 



Detlef Schmitz, Managing Director PSI Metals, at METEC 2015.

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News: PSImetals for Scheduling at new integrated steel plant in Kalinganagar

## Leading steel producer Tata Steel decides for PSI

PSI receives an order from Tata Steel India, one of the global leading steel producers, to provide PSImetals Scheduling solution to optimise the production programs at the new Tata plant in Kalinganagar. The target is to optimise the utilisation of the new capacities together with a maximum degree of customer service.

The growth strategy of Tata Steel in India with its plant in Jamshedpur foresees an increase of production capacity from 9.7 MioTpA to 23 MioTpA. As part of this initiative, the newly built integrated steel plant in Kalinganagar will produce 6 MioTpA of high quality flat steel. The standard software PSImetals with its compo-

nents Online Heat Scheduler, Caster Scheduler und Line Scheduler will support Tata Steel to schedule the steel melt shop, continuous casting and hot rolling. The extension of the PSI solution to an envisaged cold roll-

ing mill and other plant extensions are already part of the initial concept. During the installation of PSImetals the special requirements of a green field implementation like the learn-



The plant in Kalinganagar—still under construction—is Tata's second integrated steel plant in India.

ing curve of the planning staff or the continuous development of the product mix will be considered. PSI experts on-site will be supported by the integration partner Tata Consulting & Services (TCS). To reach a cli-

mate of mutual understanding and team spirit all partners (Tata Steel IT and Planning, TCS and PSI) will have a joint workshop for several weeks. The workshop objective is a first working version of the final solution. Due to an annual production of more than 30 million tons of crude steel, Tata Steel Group is amongst the top 10 of global steel producers. With production facilities in 26 coun-

tries, offices in more than 50 countries and 80000 employees spread over 5 continents Tata Steel is one of the major global players of this industry. 

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## Welcome to PSImetals UserGroup 2015!

Data Driven Production—Industrial Internet in Metal Production



Our customer BGH Edelstahl Freital GmbH and PSI Metals invite all customers to our annual UserGroup.



**Date:** 3<sup>rd</sup> & 4<sup>th</sup> December 2015

**Venue:** Hotel Westin Bellevue Dresden, Germany

**Plant visit** at BGH Edelstahl Freital

Registration for PSImetals customers via our website. Please scan the QR-code.



Interview: Industrial Internet—The digitisation of German factories

## Evolution, not revolution

The digitisation of German factories is fully under way, but there is still a long way to go. According to a representative survey (<http://tiny.cc/Bit4umfrage>) conducted by the digital association Bitkom, around one quarter of companies are not yet focusing any attention on Industrial Internet. Almost 80 percent of businesses believe their own industry is too hesitant when it comes to the implementation of Industrial Internet. At 83 percent, this figure is highest in mechanical and plant engineering. According to the survey, the investment costs are the main obstacle. We spoke to Mr Peter Dibbern, Head of Business Development at PSIPENTA, about his view of the situation.

**M**r Dibbern, what do you think? Is it really the investment costs being too high or the fact that the return on investment cannot easily be presented or communicated that is causing this reticence among companies?

P. Dibbern: First of all, I must say that the main thing I took from the Bitkom study is that the glass is three quarters full, not a quarter empty. It always depends on your perspective. But it is also true that, particularly in one of the main pillars of the German economy—mechanical and plant engineering—there is a lot of catching up to do.

*“Businesses don’t start on a greenfield site. They need to become a digital factory first.”*

However, this reticence is certainly not due to the high investment costs alone. Ultimately, businesses do not start on a greenfield site. They need to become a digital factory first.

This is why we should not be talking about an industrial revolution—I think the term itself is a hindrance anyway. We should be talking about evolution. What we call Industrial Internet in Germany is called “Made in China 2025” in China—there, its significance is clear.

**Can you give a practical example to illustrate this concept of evolution in more concrete terms?**

P. Dibbern: Practical evidence of this idea of evolution can be found in the German automotive supply industry, a pioneer when it comes to digitisation. The difference from other industries is that medium-sized suppliers have already been part of closely inte-

grated supply chains for a number of years and have to operate in a correspondingly flexible way. Intra-company and inter-company networking across locations and national borders was an important topic here before the hype around Industrial Internet started. In this way, they are markedly different from most medium-sized mechanical and plant



*Peter Dibbern, Head of Business Development at PSIPENTA.*

engineering firms. But automotive companies are now undergoing this process of transformation and are setting out on the road towards implementing the smart factory, albeit with different conditions.

**Do you think, then, that companies are simply hesitant to start such a long process?**

P. Dibbern: Essentially, yes. And after all, we must not forget that the smart factory is not just a piece of software—it’s primarily about hard-

ware. In the factory of the future, production machines and facilities will exchange information with one another and also with the workpieces, and report to the planning and control systems. This means that businesses will have to put more software into their own products and deliver them with a technical integration concept. Once again, it becomes clear that Industrial Internet is not a product or a technical innovation that can be forced through. Instead, it is a new idea, a new philosophy, that will change our process landscape. A big bang is not the right way to go about this change, and it wouldn't be financeable or feasible. The journey is actually the destination. Only the sum of many innovative steps makes the vision of Industrial Internet economically justifiable.

**And how do you see your role as a software provider on this journey towards creating a smart factory?**

P. Dibbern: As a software supplier, our task is to offer the customer pragmatic "tasters" of further process au-

*“Only the sum of many innovative steps makes the vision of Industrial Internet economically justifiable.”*

tomation. Machinery and software vendors must draw closer together, and possibly even formulate offers for the end customer together, to ensure that systems are compatible. This should not put businesses off, either in terms of investment costs or the extent of the associated changes to processes. Instead, we want to demonstrate what you can do today to start

the digitisation process. IT & Business in Stuttgart also provides a good opportunity to learn more about our ideas on the implementation of the smart factory. There, we will present various application scenarios for the smart factory. This offering led to us being included in the official ERP 2020 Guided Tour of the VDMA. These tours are also a good way to learn about how software can support businesses in the process of digitisation.

**Thank you very much for talking to us.** 

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**News: Enhancing logistics solutions**

## IT platform for mobile service solutions

**PSI Logistics GmbH is expanding its IT platform for mobile service solutions (MOSS) to applications for the Internet of Things (IoT). The newly developed applications extend the functionality of the PSIlwms warehouse management system, the PSItms transport management system and airport solutions. They are based on modular hardware components from Round Solutions GmbH & Co. KG, Neu-Isenburg.**

The integration of IoT chips allows logistics processes to be improved beyond established scanner and telematics solutions and built-in components. The IoT chips do not simply provide end-to-end tracking of containers and loading equipment. With the new MOSS applications, suitably equipped containers

can identify status points, for example, and can autonomously control handling and delivery processes, as well as their routing through logistical networks.

“PSI Logistics sees IoT technologies as being ‘enabling technologies’ for intelligent logistics networks”, explains Dr Giovanni Prestifilippo,

Managing Director of PSI Logistics, when asked about the company's focus on applications in this area. “The early involvement of the new hardware components in the IT systems opens up wide-ranging potential for optimisation and enhances the future viability of the IT systems.” 

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Event: Meeting of the “International” working group of PSIPenta users (IPA)

## International production processes with PSIPenta

On 8 July 2015, PSIPENTA customers discussed their experiences with the use and application of PSIPenta software in foreign markets. Among other things, they covered the issue of paying VAT according to Chinese tax law.

For the third time, the “International” working group of the IPA met at the exhibition centre in Stuttgart. Around 30 participants discussed current issues concerning international business. The now annual event offers PSIPENTA customers the opportunity to exchange opinions on modules and application areas in the area of manufacturing in an international context.

Gebr. Müller Apparatebau GmbH & Co. KG presented the recently implemented Golden Tax System software. When paying value added tax, Chinese tax law prescribes a specific form for all sales invoices. Alternative invoice formats are not permitted. GEMÜ gave a live demonstration of how the sales invoices from the PSIPenta ERP system could

be exported into the software system of the government-certified provider Aision. After the value added tax is registered, the software fills in a template specified under the Golden Tax System and sends it to the printer. Since this process is compulsory in China for all companies in the manufacturing industry, a lively discussion took place among the participants.

### Cross-plant communication

The presentation from hotset Heizpatronen und Zubehör GmbH was also of great interest. The manufacturer of electrical heating elements presented its international roll-out in the United States, China and Malta. The PSIPenta multisite installation deployed during the roll-out allows hotset to achieve cross-plant com-

munication across different sites and countries. This enables the Distribution, Purchasing and Cost Accounting departments of the individual plants to make use of common central divisions.

For the first time, the new sales partner of PSIPENTA, Portolan, presented its own modules in the field of accounting. The software is available in 25 country-specific versions and is a particularly attractive prospect for internationalisation processes. Dr Michal Wisniewski, head of the R&D department at PSI Poland, presented the new PSIlscada solution for production management. Based on the Java framework, the application enables advanced communication between machine and users. 

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Research Project: FIAixEnergy—Energy platform

## Optimised use and marketing of industrial energy flexibility

PSI has been awarded the contract for a research project for the optimised inclusion of “smart industrial customers” in an energy platform for the marketing of energy flexibilities.

The research project will be implemented as a prototype in the Aachen region and is being sponsored by the Federal Ministry for Economic Affairs

and Energy. The project was commenced on 1 August 2015 and run for three years.

The core element of the platform is a mechanism that assesses the flex-

ibility of the smart industrial customer and therefore allows them to participate on the energy spot market and the balancing energy market. In general, this will establish a preference for local balancing in the distribution network over cross-regional balancing in transmission networks. Along with partners from the scien-

tific and industrial communities, PSI is participating in the research project with its subsidiaries PSI Energy Markets, PSI Metals und PSIPENTA. PSI Energy Markets is heading the sub-project Smart Services, which will pursue the design and expansion of portfolio management for the compensation, marketing and optimisation of the flexibility of industrial customers, energy generation and storage. The PSIPENTA sub-project is aimed at the development of methods and procedures for the prognosis of consumption, planning and control for smart industrial customers in discreet production. In their sub-project, PSI Metals and PSIPENTA will jointly develop energy-flexible planning and controlling processes. Furthermore, a process for the determination of an energy fingerprint will be designed that describes the consumption prognosis and flexibil-

ities of the industrial customers. For PSI Metals, the focus will be on the steel and aluminium industries that, in addition to the classical criteria deadline and capacity, also takes the flexible use of energy into consideration in the planning. An additional



focus is on the development of standard interfaces for manufacturing execution systems (MES).

As one of few providers, PSI has in-depth knowledge in both the energy sector as well as the production and metals industry and sophisticated algorithms and processes for increasing the efficiency of the use of energy. With the FLAixEnergy research project, PSI is further expanding its strong position in industrial energy management and in the field of vir-

tual power plants. Beyond that, the research project is making a contribution to an economical and environmentally tolerant energy supply while simultaneously increasing the security of supply. 

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## EVENTS

[www.psi.de/en/events](http://www.psi.de/en/events)



25.09.2015	SWISS MECHATRONICS BREAKFAST: Industrie 4.0 am Zug Landquart, Switzerland	PSI   Rhätische Bahn
29.09.–01.10.2015	IT & Business 2015 Stuttgart, Germany	PSIPENTA   F/L/S Hall 1, Stand D33
06.10.–09.10.2015	inter airport europe Munich, Germany	PSI Logistics Hall B5, Stand 1180
28.10.–30.10.2015	32. Deutscher Logistik-Kongress Berlin, Germany	PSI Logistics PSI Havanna Lounge
12.11.–14.11.2015	IPA Jahrestagung Essen, Germany	PSIPENTA
03.12.–04.12.2015	PSI <i>metals</i> UserGroup 2015 Dresden, Germany	PSI Metals

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