The Transportation Man-a-ment System PSIems of PSI Logistics is the IT basis of the “Efficient Load” research pro-ject. The focus is on tour planning and freight hold optimization. The development of a new optimization method is intended to cut transport performance (ton-kilometers) by 15 to 20%.

During the last months, existing PSIems customers were particularly interested in the issues of planning and controlling with integrated feedback of production data. This way the solution was able to show its strengths as a planning module as well.

 PSI was given the task of delivering and introducing the PSIems production management system by ThyssenKrupp Stainless USA. PSIems is to be used as a cross-platform system for optimizing the production sequences at both the steel mill and the cold rolling mill in the future.

Tailor-made suit for engine fitters

Within the scope of this year's "ERP user satis-faction" survey, carried out by the Aachen-based company Trovarit AG, more than 400 companies from the field of machine and plant construction delivered their judgements. The basic market judgment was quite a good one. The differences are in the details, but that's exactly where the wheat is separated from the chaff.

If you take the users' statements as a basis, then classic providers such as Abas, SAP, PSIPENTA, AMS, Hinrichs & Müller and Proalpha are among the leading companies, having many years of experience, especially in the field of machine construction for medium-sized companies. “Not surprising to us,” says Alfred M. Keseberg, managing director of PSIPENTA, “since these are exactly the names we often have to compete with.”

Companies react in a sensitive way to a change of ownership structures, a fact one can see with different product providers lead by corporations which often reckon with the end user after several takeovers and strategy changes. Poor communication, vague pro-duct and maintenance strategies, heavy support service cuts, and many changes regarding custo-

User satisfaction in detail - Peer group "Medium-sized industrial enterprises" (Source: Trovarit AG - the IT-Matchmaker © 2008)
New method for combined tour planning and freight hold optimization

The Transportation Management System PStms of PSI Logistics is the IT basis of the "Efficient Load" research project. The development of a new optimization method is intended to cut transport performance (ton-kilometers) by 15 to 20%.

Green logistics has long become more than just a mere ecological creed to loaders and service providers, but an economic necessity. This is not due solely to rising energy prices. Many analyses and recent surveys show that the logistics and transport sector will have to face more environmentally and politically motivated climate-protection measures in the future. This is why PSI Logistics participated in the "Efficient Load" research project. The target of this project is efficiency increase with the disposition of transports. The focus is on tour planning and freight hold optimization. The project target of "Efficient Load" is to cut transport performance (ton-kilometers) by 15 to 20%.

"Efficient Load" is supported by the Federal Ministry of Economics and Technology within the scope of the innovative offensive "Intelligent logistics in freight and commercial transport". Project partners are the paper manufacturers of M-real Corporation Transport & Distribution, Bergisch-Gladbach, Gefco Deutschland GmbH logistics service providers, Mönfelden Walldorf, VCE Verkehrskon- gundistik Consulting & Engineering GmbH underwriters, Dortmund, the traffic logistics department at the Fraunhofer Institute for Material flow and Logistics (IML), Dortmund, and – as an IT supplier – PSI Logistics. Since the beginning of the year, practice partners, scientists and the IT specialist on the project have been working together to find an efficient solution for a higher vehicle workload and reduction of transport performance (ton-kilometers).

To achieve this, the consortium is breaking totally new ground, since in real-life methods for freight hold optimization and tour planning are used separately. Through their uncoupled and sequential usage they are only able to produce local optimums at the moment. The result is that optimization of coupled orders distributed on tours and vehicles are usually ineffective, since the vehicle workload is then planned differently. With "Efficient Load" both optimization parameters are coordinated and carried out in a single step. The intelligent coupling of freight hold optimization and tour planning algorithms is supposed to achieve a maximum vehicle workload.

After all, a total optimum can only be used through the integrated usage of freight hold and tour optimization. "Efficient Load" is just such a method. It will result in significant cost reductions in the field of procurement and distribution logistics.

The basis for this new method is the PStms Transportation Management System. With functions regarding location-spanning and item-precise production supply, as well as the supply of sales points in shops, multi-site PStms is particularly focused on applying contract logistics and in acting within the loader environment. Apart from this, the system is able to productively consider the new driving personnel regulations, valid since January, with its expansion of general regulations concerning driving and rest periods in compliance with European law. That way, freight costs can be reduced by more than 10% using the PStms Transportation Management System, as the results of reference projects with well-known market leaders suggest.

"Efficient Load" cuts transport performance costs (ton-kilometers) and reduces energy consumption and environmental pollution, lowers toll and personnel costs, and increases overall competitiveness. With this new method, PSI Logistics will be able to make another state-of-the-art logistics solution available to the market.

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Continued from page 1:

new ERP solution, as well as its maintenance during running business operations. As a result, user companies complain about severe delays during the introduction phase, costs increasing beyond budget, and a heavy workload for project teams. This way some users point out the negative side of continuous IT support: "ERP systems which cover all areas of a business organization have become so complex that clear management can become impossible." Those ERP providers which focus on the needs of one specific industry are able to collect brownie points, on the other hand. While smaller machine constructors prefer solutions such as Abas or am.s.erp, the IT department heads of larger medium-sized companies praise the advantages of low adjustment requirements with industry specific solutions such as PSItms, which cover a wide range already with the standard software.

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Maximum vehicle workload through intelligent tour planning algorithms
New: The PSI-control center even displays material availability

PSI customers are still as interested in issues of production planning and control as ever. Thus, together with active customers from the user group, the MES performance range was once more expanded in the field of visualization. The planning module especially now provides strong new functions which, apart from optimization rules, also display current production data at shop floor level.

These customer projects have led to many new functions. The focus of development was on expanding functions dealing with material resources in the PSIleitstand the Finite Capacity Scheduler.

For the user, the system provides the option to display overviews of material bill positions in the single view of a production task based on real data from the PPS system. For each material list item, the required material's current stocks are displayed. Where not otherwise specified by the PPS system, all material list items are required for the first process step in the production task, thus also displayed in its separate view. If there is a special "reference process step" specified with the material list item, this material list item is only required for this specific process step.

The user can have the inputs and outputs of a specific item displayed in the separate views in a capacity chart. The user now has the option to consider these inputs and outputs with the automatic planning, so that material availability, specified through the current item inputs and outputs, is always guaranteed.

A second option would be to not use this restriction with the automatic planning and to use the capacity chart as a source of information, in order to take countermeasures due to a lack of material availability. The available day order rules or the bicolored depiction of process steps can be chosen to be displayed in the Gantt view to attract the user's attention to problems with material availability by using "traffic lights", so that the user may take countermeasures manually.

These new functions enable to visualize the dependencies of material availabilities and to incorporate them into the planning process. This is how the resource and process optimization can be directly connected with the ERP business models.

The PSI control center allows for quick and flexible just-in-time production – and all this with separate and/or continuous batch production. PSIleitstand provides answers to everyday questions such as:
- How can an order delay be prevented?
- Are all orders able to meet their specific deadlines?
- How can changeover times be reduced?
- How can a disruption or breakdown be compensated for?
- Can a (rush) order be dispatched by the desired deadline, and what consequences might this have?
- How can an order delay be prevented?

The PSIleitstand detail planning and enforcement tool is the executive unit for an ERP system. The production tasks cleared by the ERP are taken over and incorporated in the planning of the process steps/follow-up process level due to their processing time under consideration of the actual availability of resources as well as the current process states in due time, place and with the right quantity.

Loading luggage efficiently

Luggage loading errors are annoying. Both for the passenger and for the airline. While the first has done without his or her personal luggage at the target destination, at least for a while, the airlines suffer from a dramatic increase in transportation costs for a passenger if this kind of error needs to be corrected.

Although most large airports have automated systems for luggage transport and sorting, recording the separate suitcases usually ends as soon as the suitcase leaves the system. Still, errors while loading the luggage in the containers or during transport to the aircraft might still occur on the tarmac.

The “Baggage Reconciliation System” PSIairportBRS, installed by PSI at several German airports, now also in Hamburg, closes this gap. The loading of all relevant objects is controlled and documented in detail through mobile handheld units without slowing down the work process in this time-critical environment. After a successful trial run lasting several weeks, Hamburg airport is going to monitor its dispatch processes with PSIairportBRS from December 1, 2008 onwards. The system supports the employee through clear visual and audio signals, and loading errors are thus spotted and prevented at an early stage. At the same time, the emerging data are transmitted to the airline online, so the latter is able to promptly inform its flight passenger of the status of his or her luggage, e.g. by SMS.

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Overview of current stocks in the material warehouse using the PSI control center

Overviews of production tasks displayed in the PSI control center

Traffic light logic displays material availability.
Solutions

Combining production planning and business objectives

New PSI metals APS release with holistic stock management

The current financial crisis and its impact on the steel industry show the importance of the ability to coordinate business objectives flexibly and on short notice. No matter whether the objectives are for less/more throughput, better customer service or cost optimization, within the PSI metals product family the Advanced Planning & Scheduling (APS) functions support our customers in optimizing the supply chain.

As you know, companies’ sub-goals to be optimized (and especially those of the different production areas) often contradict each other. A typical example would be the conflict between meeting deadlines as accurately as possible and aiming at maximizing the throughput ratio. A single optimization of the job order regarding the agreed deadlines results in a large product variation within the day’s program. This product variation can be produced on time through frequent re-equipping (e.g. reducing the sequence lengths at the steel mill), provided the negative consequences of a reduced facility workload and the impact on the whole supply chain in form of a reduced added value are accepted. This way, missing throughput at the beginning of the process chain (e.g. at the continuous casting facilities) can lead to follow-up problems in the form of a gap in the supply with primary material or poorly implemented of stock structures for the downstream facilities.

This clearly shows that targets and KPIs for production planning need to be subject to a holistic approach. Stock management plays a key role in the steel and aluminum producing industries, which are known for their complexity.

Stocks: Result or precondition?

Stock levels and structures are the proved key figures for coordinating the cross-sequence material flow in nearly all planning offices within the metal primary material industry.

Apart from minimizing stocks as an objective, especially the demand-driven range control of stocks plays a crucial role here in order to guarantee deadline-oriented material flow across the whole supply chain.

Hence, stocks must not only be the result of optimization processes, but stock specifications need to be definable as side conditions in the form of quantities and structures. The workload can then be optimized regarding deadlines and throughput ratios within the “tolerance” specified here.

New release closes market gap

Looking at the market for metal-specific planning software, the topic described here has only been taken into consideration quite poorly. PSI BT closes this gap by releasing the new PSI metals APS, and provides all the benefits of optimized planning, along with additional parallel specification of structured stocks objectives.

The cross-sequence rejection of orders is now possible, adhering to minimum and maximum target stocks.

This way scheduling results are avoided which are not based on practice-oriented stocks levels and structures. The new stocks management is an integrated component of the PSI metals APS optimization model, and combines complex algorithmic methods with the planners’ practical experience in controlling their production facilities.

The new KPI board can also check whether the operative main business objectives have been realized or not. Indicators forecast future stock development (stock per product), adherence to deadlines and workload. Deviations from the objectives are indicated via alert messages. Objectives and their limits can be freely configured and thus enable flexible decision support, able to gear the arrangement of production plans towards current business objectives at any time.

Talking with PSI metals customers from all over the world

The focus of this year’s UserGroup is our customer Rasselstein GmbH with its headquarters in Andernach.

CIO Ralf Damitz reports about Rasselstein’s IT strategy. In addition, Winfried Vomland showed the deployment possibilities of PSI metals with Rasselstein, starting off with cross-section planning down to specific issues such as coil remainder optimization. The management of the Andernach plant wrapped up the report about and by Rasselstein. The direction PSI metals takes in the future was shown in a speech about the next-generation of PSI metals APS (see article above), as well as Felix König from the Technical University Berlin talking about the potential of complex re-equipping time optimization.

The real-life report from other PSI metals customers attracted a lot of attention as well. Joachim Lehner from voestalpine Stahl talked about the very positive experiences using PSI metals as a quality control tool in the field of melting metallurgy, Günter Sube gave insights into how production is controlled with online key figures at Thyssen-Krupp Steel’s plant in Bochum.

Interesting conversations and speeches, an impressive plant tour and a great atmosphere in beautiful surroundings - this is, summed up, the feedback given by participants. Our Thanks go out to Rasselstein for supporting the organization and staging of the event.

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We were allowed to welcome more than 60 participants from Germany, Austria, France, Brazil, Russia and China at the 6th PSI metals UserGroup, staged with our customer Rasselstein in Andernach as well as at the nearby Maria Laach lake hotel.

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Specifications about the machine working in the metal industry are needed to make the process of metal production more efficient. The primary material manufacturer’s IT structure has only been partly used throughout the company even further, so that the pre-financed materials can be kept as long as possible. Moreover, the delay in production planning could hardly be avoided, since the production planning used to work mainly with manually prepared lists on paper. The new system was supposed to automate these processes and thus increase transparency and reliability. Dr. Karsten Neumann, project manager at Schwermetall, explains: “Our focus while choosing a product was to make sure that the background knowledge from the very beginning. “The simple representation of our processes confirmed our selection strategy. Order-related documents are a thing of the past now,” Neumann declares, looking back. Since the implementation of the MES by 4Production, the deadline is now the standard reference variable for all organizational departments. In order to be able to plan and respond on short notice and more quickly, all machinery and facilities are equipped with at least one computer and a control monitor for a visual display of the current state. Transparency of processes is the most significant change. This also is reflected in our response times. Erwin Bronk, 4Production AG manager, says, “It’s not about generating as much data as possible. We provide real-time scheduling, which means controlling via real-time data.” This is what makes integration from planning within the management down to the machinery effective in the first place. The preparation phase benefits most from this, since current information about the machine workload, material management and procurement data (PIDA) are always available. After the IT solution was introduced within around 18 months to the core areas while the production was still running, with the whole company going to be connected to this new infrastructure during the next three years, the measure is proving successful already. Project manager Neumann says, “We already have noticeable improvements regarding the three target variables increase in response ability, reduction of throughput times and stocks.” Generated data are able to be transferred directly into organizational processes, since optimization potentials can now be spotted immediately, which allows us to arrange all production processes in an optimal manner. The fact that 4Production has just joined a variety of basic allows leave the company every day, ownership of the plant being shared between Nord-deutsche Affinerie/Prysmetal and Wieland-Werke with 50% each. 

In order to keep pre-financed materials within the company for a minimum amount of time, processes need to be optimized.
Group net result increases by 237 percent to 2.8 million euros

The PSI Group increased its EBIT to 4.2 million euros. The pre-tax profit increased to 3.4 million euros, the Group net result to 2.8 million euros. Group sales increased to 92.0 million euros. Adjusted for the sale of the government business in mid-2007 and the acquisition of E/L/S GmbH and the 4Production AG in the second and third quarters of 2008 the sales grew by just under 8 percent compared to the same period for the previous year. The volume of new orders increased by 16 percent to 119 million euros and the order book volume increased by 24 percent to 105 million euros.

The Energy Management segment (electricity, gas, oil, heat) obtained sales of 39.3 million euros. The EBIT was increased by 59 percent to 2.5 million euros. In the German-speaking market PSI was awarded numerous important contracts from large electricity and gas suppliers. In the field of electrical energy an important pilot contract for a Russian high-voltage grid region was obtained. In the coming quarters PSI expects additional important contracts from domestic and export markets in this segment.

Sales in the Production Management segment (industry, logistics) were, with 41.9 million euros, 12 percent above that of the level for the previous year. The EBIT doubled compared to the previous year by 1.7 million euros. Here, the Metals unit could further expand its market position with important international orders and the integration of the 4Production AG. The areas of logistics and mechanical engineering also profited from increased investments in the efficiency of industrial added-value processes.

In Infrastructure Management (traffic, safety, telecommunications) sales decreased as a result of the lower hardware portion and the sale of the government business to 10.8 million euros. The EBIT was, with 0.2 million euros slightly below the value of the previous year.

The number of employees increased as of 30 Sept. 2008 to 1,109 as a result of the acquisitions and targeted recruitment with an emphasis on export. Liquid funds on 30 Sept. 2008 were, with 21.6 million euros above the value of the previous year. The cash-flow from operating activities improved to 2.7 million euros.

PSI records growing efficiency investments of the heavy industry and the energy sector in Germany and export markets. As a consequence of the continuing concentration on the growing economies in Eastern Europe and Asia, PSI is profiting from the continuing investments in the improvement of national and industrial infrastructures in these countries.

The long-term cost-reduction programs for platform convergence and the right-sourcing will continue to improve the margin. With the record order book volume of 105 million euros and the well-filled sales pipeline PSI foresees a continuation of the good business in 2009 and beyond. The management reiterated the annual targets of about 130 million euros in sales and about 6 million euros for the EBIT and the cash-flow from operations.

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PSI continues successful internationalisation

PSI has been charged by ThyssenKrupp Stainless USA with the delivery and implementation of the production management system PSImetals for the stainless steel plant being built in Alabama, USA. The new plant will consist of, amongst other things, an electro-steel mill and cold rolling mill including the finishing line for the production of high-quality stainless steels. In the future, it is intended that PSImetals, serving as the comprehensive system, will optimise the production processes in the steel mill and cold rolling mill. The initial phase of the solution consists of the functional segments Advanced Planning and Scheduling (APS) and Advanced Line Sequencing (ALS). “With the introduction of PSImetals at the Alabama site, ThyssenKrupp Stainless is continuing the proven IT strategy”, explains Klemens Beamsöller, CIO ThyssenKrupp Stainless and ThyssenKrupp Nirosta in Germany. “PSI solutions have been running successfully for more than five years at the steel and cold rolling mills in our German plants. The PSImetals roll-out for the Shanghai Knupp Stainless cold rolling mill in China reinforces the decision to introduce the solution at ThyssenKrupp Stainless USA as well.”

The ThyssenKrupp Stainless USA order is, following orders from France, Brazil, China, Canada and Russia, already the sixth major international order from steel producers this year. With this order, PSI is continuing the growth of its steel software subsidiary PSI BT GmbH on the North American continent and in the global steel industry.

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