

MPDV NEWS

Edition 46 | September 2019



ON THE WAY TO THE PAPERLESS FACTORY

Sulzer Applicator Systems
in Switzerland

FACTORY COLLABORATION HUB

For the automated communication
between systems

HYDRA IN USE

How VT Garment in Thailand is a step
ahead of its competitors

NEW TECHNOLOGIES

Why artificial intelligence is
pioneering production



Snapshot

MPDV IN THE USA

Just 30 minutes from Chicago you will find Orland Park in Illinois, USA. From there, MPDV successfully serves its customers from Canada to Costa Rica.

Learn more starting page 32



Dear readers,

We all strive for success. But what does it take in manufacturing to be even more successful and to take advantage of the opportunities offered by digitalisation? From our many years of practical experience, we know what matters. With our partner PerfectPattern we have therefore set us out on our way to develop new software components for Artificial Intelligence in production. With the acquisition of the Felten Group, we are also strengthening our position in the field of process manufacturing and expanding our range to include digital solutions for weighing and mixing processes in the Pharmaceutica, Cosmetics and Chemical industry. Furthermore, in this issue we show you how Sulzer Applicator Systems has successfully set out on the road to a paperless factory with our Manufacturing Execution System (MES) HYDRA. In addition you will learn how our new Factory Collaboration HUB automates the exchange of information between systems. Read our new series "A question to" and find out what is special about our Manufacturing Integration Platform (MIP) compared to other platforms.

In the section Panorama we introduce Johannes Schäfer, who leads our teams to success in the robot competition First Lego League. We hope you enjoy reading and browsing this magazine.

Yours sincerely,
Jürgen Kletti

Prof. Dr.-Ing. Jürgen Kletti, CEO MPDV

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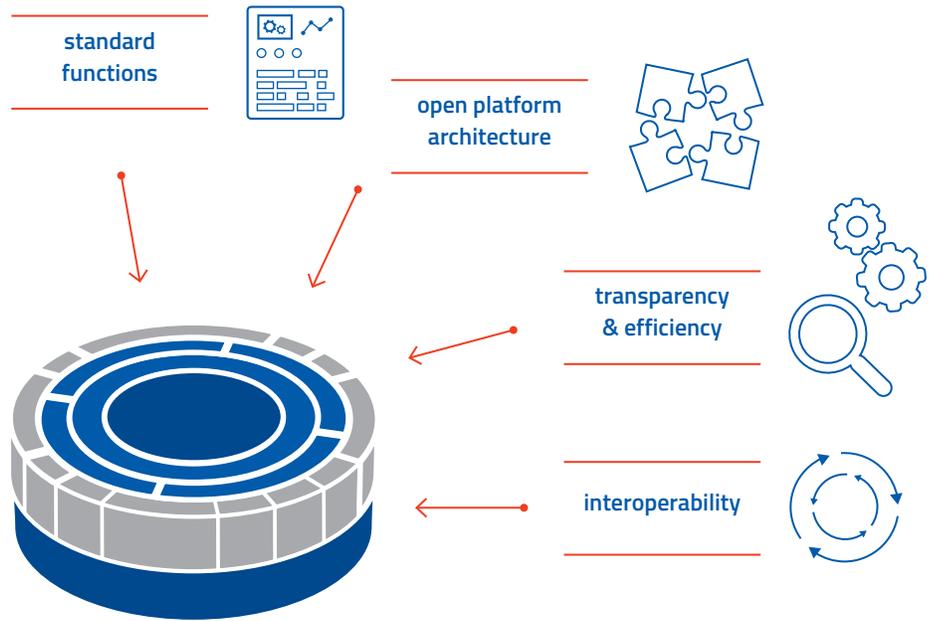
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MPDV NEWS

The eco system of the MIP continues to grow

Ecosystems such as the Manufacturing Integration Platform (MIP) thrive on the diversity of partners and available applications. MPDV offers manufacturers, software developers, engineering companies, and system integrators the opportunity to integrate their own apps into the MIP ecosystem, use existing apps and combine them as they wish.

The Berlin-based company Lana Labs is now connecting its Process Mining application for the analysis of potential cost savings in manufacturing to the MIP. In addition Aucobo is offering an Manufacturing App (mApp) for the reporting of current information on Smartwatches. For the first time, users have the ability to receive real-time information from the production on their Smartwatch. Arkide is also developing an application for the MIP to efficiently execute order picking and assembly work.



MPDV also offers mApps for the ecosystem. This includes a flexible information dashboard, various analysis tools for quality assurance, and the mApp Digital Production Meeting, which enables the user to digitalize the planning, execution, and documentation of meetings in the production environment.

The spectrum of available applications is extensive and ranges from data collection, visualization and analysis to the integration of other platforms.

mpdv.info/mipdetails



MPDV Customer Forum

More than 160 participants took part in this year's MPDV customer forums in Hamm and Rain, Germany. Some traveled even from abroad. In addition to the news about the MPDV Group, the team gave an update on the digitalization of the assembly lines. The highlight of the MPDV Customer Forum in Rain was a factory tour through the production of Degro.

Information Dashboard

All information at a glance



With the new Information Dashboard from MPDV, MES HYDRA users now have all relevant evaluations at a glance and can immediately see, if for example, a machine produces an unusually large amount of rejects, poor quality level or if new complaints have been received. The Information Dashboard is available for both tablets and PCs and is therefore an ideal companion for the Digital production meeting application. The dashboard can be used for all products and enables the parallel display of evaluations from manufacturing, quality management and human resources. Each user can configure their own dashboard according to their individual requirements.

9 000 000

measured values can be processed by the HYDRA module Process Data daily. This is how the system makes even complex production processes transparent right down to the smallest detail. Particularly in the electronics production when testing printed circuit boards, data volumes of this magnitude are generated. The HYDRA Process Data module supports manufacturing experts in quickly recognizing critical deviations from the target and if necessary take counter measures. For this reason, the module contains online monitoring functions, flexible evaluations and diagrams. In addition, HYDRA process data can be used to store and archive all recorded values for documentation purposes.

MPDV NEWS

MES-Weaver 4.0 Platform Enabler

Milestone in Production IT

With the MES-Weaver 4.0 Platform Enabler (MW 4.0 PE) MPDV launches the first connection module between the Manufacturing Execution System (MES) HYDRA and the Manufacturing Integration Platform (MIP). The MW 4.0 PE enables HYDRA users to access open platform applications and thereby provides access to the ecosystem of the MIP with all its functionalities. MW 4.0 PE allows the users to exploit various Manufacturing Apps (mApps) from the MIP and can flexibly develop their own applications.

In addition to the interoperability with the MIP, MW 4.0 PE also provides functional extensions to the HYDRA infrastructure. The Factory Collaboration Hub automatically communicates dynamic data from

HYDRA to third-party systems. For example, a connected conveyor belt always receives information when a pallet on the machine is full. Thanks to the continuous exchange of information, the third-party system is always kept at the same level of knowledge as HYDRA and can react immediately if necessary – in this case to take away the pallet.

New monitoring functions

The MW 4.0 PE also extends the monitoring functions. Sensors integrated into the software help IT administrators to continuously monitor the status and performance of the HYDRA system and take appropriate action if necessary. For example, the administrator can allocate more

server capacity if performance bottlenecks accumulate.

Furthermore, the support of new hardware and operating system platforms ensures long-term compatibility with the company's IT landscape. This makes the MW 4.0 PE an important milestone for production IT on the way to the Smart Factory in many respects.



Users exchange ideas and experiences

The MPDV USA Customer Day & Industrial IoT Forum 2019 at the Hyatt Lodge in Oak Brook, USA, focused on the exchange of experiences between HYDRA users from all over North America. Users reported about the introduction of the system and how HYDRA can be integrated into your own production environment. They also discussed topics such as automatic control station planning.

MES webinar series

Get your production ready for the future!

You want to produce efficiently and are looking for innovative IT solutions? Then sign up now for MPDV's free MES webinar series and learn how to identify manufacturing inefficiencies, shorten lead times or optimize machine utilization.

mpdv.info/registration



READY FOR THE SMART FACTORY?

Where is our company on the way to the Smart Factory? What requirements do we already meet? Where can we optimize? The new Readiness Check by MPDV provides answers to these questions. Our shop floor experts from MPDV check all production components, from the workplace to the machine to the control system, and analyze to what degree they already meet the requirements of a Smart Factory. The result is an action plan with precise recommendations for action and innovative solutions that supports manufacturing companies in making their own production fit for Industry 4.0.

Contact: info@mpdv.com



MPDV in the social media

Listen up! Take a look behind the scenes at MPDV and follow us on [LinkedIn](#), [Xing](#), [Facebook](#) and [YouTube](#). Read exciting reports on our users, new White Papers or find out where you can meet us personally. Stay up to date and know what is going on in the MPDV group.

Our series HYDRA Basics regularly presents one of the modules of our MES HYDRA, in particular where you can use it and what advantages it provides. Find all articles of the series in social media using hashtag [#HYDRAbasics](#). Come and see us! We look forward to a lively exchange with you.

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ON THE WAY TO THE PAPERLESS FACTORY

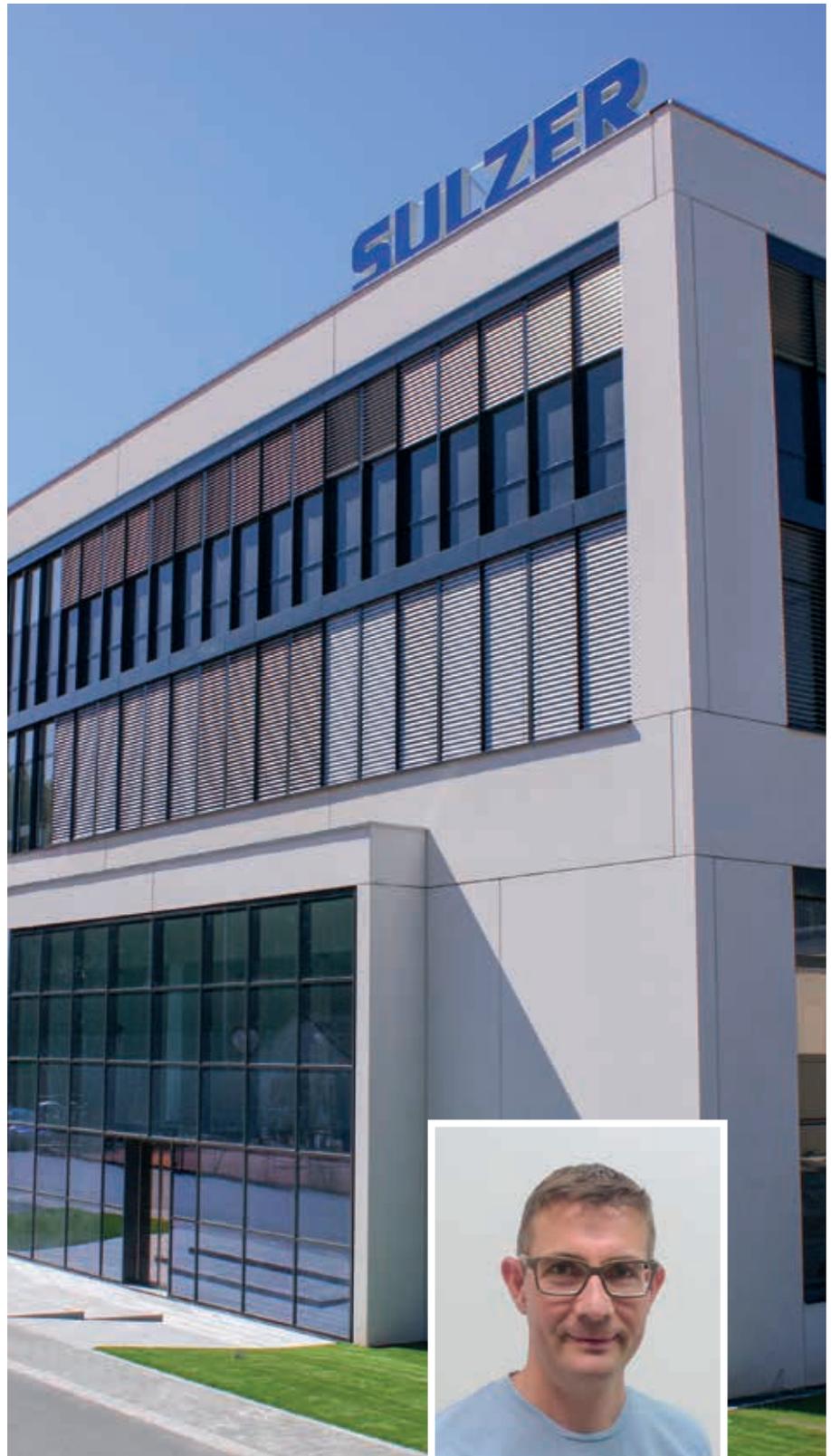
Sulzer Applicator Systems produces **four billion plastic parts** per year by injection molding. A look at Sulzer's production facilities in Haag, Switzerland, reveals how this can be achieved and how this can lead to an increase in productivity of more than ten percent.

If you regularly visit your dentist, you have certainly come into contact with the products of Sulzer Applicator Systems (APS) – in the best sense of the word. After all, the syringes and cannulas in which contain pastes, jellies and fillings for the preservation of the teeth are from Sulzer. The company is the world market leader in the production and distribution of products for dispensing, exact mixing and precise application. High-precision solutions are used in medicine, healthcare and beauty as well as in industry and construction.

„By digitizing our production, we can now reduce downtimes to a minimum or even avoid them altogether. Because process steps such as planning, procurement, the setup of machines, operation, maintenance and quality control can be perfectly coordinated.“

Ronny Graf, Head of Injection Molding Department at Sulzer Applicator Systems

So that these products are absolutely safe and function reliably, all parts must be manufactured with attention to detail. A high expectation on the manufacturing process. Critical parameters such as the composition of raw materials, homogeneity of the material mixtures, temperatures, pressure in the injection mold along with the quality of the mold and the cooling process must be precisely coordinated. Because error means stopping the machine, sort out the faulty parts and reset the system. That costs a lot of time and money. "By digitizing our production, we can now reduce such downtimes to a minimum or even avoid them altogether. Because process steps such as planning, procurement, the setup of machines, operation, maintenance and quality control can be perfectly coordinated," says Ronny Graf, Head of Injection-Molding Department at the Haag production site in Switzerland.



Ronny Graf is Head of Injection Molding at Sulzer Applicator Systems site in Haag, Switzerland. As project manager he has overseen the implementation of the MES HYDRA from the very beginning.



MES HYDRA beats competitors

As early as 2013, Graf and his team of six introduced the Manufacturing Execution System (MES) HYDRA from MPDV at Sulzer. Even then, it was clear to everyone involved that they needed a solution that would make the manufacturing process transparent and not only collect data, but also analyze and control it. "We therefore discussed many options in advance and looked at various providers. But with MPDV, the overall package was just perfect," says Graf. It was particularly important to the team that the solution could be connected to the SAP system via standardized interfaces and that it offered sophisticated planning functions. Another requirement was that the MES was easy to use and that the company winning the contract should have subsidiaries in Asia. "This was particularly important to us in view of a later deployment in China," says Graf. MPDV fulfilled all these criteria and so the decision for HYDRA was made.

„It's simply brilliant what we've achieved over the last few years. The MES has highlighted weak points which we have improved, and we are on the best way to a paperless factory. I am very proud of what we've accomplished together with MPDV.“

Ronny Graf

The introduction ran smoothly – and quickly – right from the start. Only nine months passed from kick-off to go-live at the beginning of 2013. Mr. Graf and the team introduced the single modules step by step. In phase one, they first implemented the three modules Shop Floor Scheduling (HLS), Shop Floor Data (BDE)

and the Tool and Resource Management (WRM) at their headquarters Haag, Switzerland. The module Machine Data (MDE) was added in a second phase. Meanwhile, 120 injection molding machines and 42 automatic assembly machines are connected to HYDRA at the Haag location. Since 2014 the location in Shanghai and since 2018 the location in Wroclaw, Poland have also been using HYDRA. "It's simply brilliant what we've achieved over the last few years. I am very proud of what we accomplished together with MPDV. The MES has highlighted weak points which we have improved, and we are on the best way to a paperless factory," says Graf, who made a key contribution to success as project manager.

More transparency, improved delivery times

Especially the excellent communication between the ERP system and HYDRA has a number of benefits. After all, the planning department can transmit production orders directly to production and react



If a machine breaks down, Sulzer Applicator Systems employees can immediately spot it at their terminals and take targeted action.

quickly to changes. The MES in turn reports back the number of parts actually produced and the status of the machine. If the output of a machine is lower than planned, orders are distributed quickly to other machines and delivery deadlines are met as planned. Previously, employees had to record the quantities produced per machine in Excel lists. It took a lot of time and if a machine failed, there was a lack of flexibility. "With HYDRA we have improved our on-time delivery tremendously. We can now deliver around 98 percent of orders as planned, and our customers are satisfied," says Graf.

Not only the customers, but also the employees quickly learned to appreciate the advantages of the MES. Thanks to the HLS, BDE and MDE modules, they can record and compare different production

"With HYDRA we have improved our on-time delivery tremendously. We can now deliver around 98 percent of orders as planned, and our customers are satisfied."

Ronny Graf

figures such as rejects or quantities in real time via a machine terminal. Also, the HYDRA-HLS module provides a 360° view of all required resources. For example, production can be proactively controlled with the Shop Floor Scheduling module and planned down to the smallest detail. This means that the employee always has

an eye on all important resources and operators can react quickly to a failure of a machine.

Higher production capacity

Another advantage of HYDRA is the overall increased productivity of the machines. It can be measured using Overall Equipment Effectiveness (OEE), which can be calculated from the factors availability, performance and quality. Via a traffic light system – green means okay, yellow warns and red means take action – the status of each machine is displayed to the employee. "This is how we can operate all 160 injection molding machines at optimum load. This has resulted in a total productivity gain of twelve percent in the first three years. We can therefore say that customers, employees and the company

„The introduction of HYDRA has enabled us to increase productivity by twelve percent in the first three years. Our big goal is now a paperless factory. The digital Shop Floor Board makes the collected data immediately available and we can react quickly to problems and make the right decision.“

Ronny Graf



Highest precision is required when manufacturing products for the medical, healthcare and beauty sectors.

itself all benefit from the MES," says Graf with a smile.

The 45-year-old is now a real expert on MES. He pushed the system implementation in the company from the beginning and accompanied every step. He now supports his colleagues worldwide in the use of

HYDRA and answers technical questions. This task will become increasingly important in the future, as it is planned to roll out the MES in other countries. General development is also progressing at the site in Haag. New modules like Process Data for maintaining production parameters like temperature, pressure or flow velocity are

to follow. Furthermore, Sulzer plans to equip every machine with its own terminal. Graf's big goal is the paperless factory. The MES with its many applications is the final piece in the puzzle.

ABOUT SULZER

Applicator Systems (APS) is one of four divisions of the Sulzer Corporation and was created in 2017 from the merger of the business unit Sulzer Mixpac Systems and the newly acquired businesses of Geka and PC Cox.

APS develops cartridges, mixers and dispensers for the dental, adhesives and construction industries. APS also manufactures brushes, applicators and packaging systems for the cosmetics industry.

The company has a total of 16 sales and production sites worldwide, including the USA, South America, Asia and Europe.

Most of the products are manufactured at their headquarters in Haag, Switzerland. The plant at this location receives around 11,000 orders per year and produces 6,700 product variants using 2,600 tools. Five dedicated employees carry out the planning using the HLS module. In addition, 65 terminals have been set up where 150 production employees log on and book orders.

Another 140 users of the HYDRA Office Client monitor the processes and handle reporting and master data. So far, there are three key users and two system administrators at this location.

www.sulzer.com

A question for Bernd Berres

WHAT DISTINGUISHES THE MIP FROM OTHER PLATFORMS?

There are many successful platforms around. Think about Airbnb, Uber or Amazon. No matter what industry we are looking at, business with platforms is booming. Why not apply the same concept to production and use the benefits?

This is the way we at MPDV have chosen to go with our Manufacturing Integration Platform (MIP). Not a simple task. After all, there are estimates of more than 500 platforms for production alone. How to stand out from the crowd?

Interfaces are yesterday's paper

The platforms most frequently used in production are IoT platforms. These platforms are used to collect, store and evaluate large amounts of data. The difference between IoT platforms and MPDV's Manufacturing Integration Platform is already evident in the name.

The MIP integrates all production systems. This is vital for the survival in the age of Industry 4.0, where the number of systems is constantly growing. Only if sensors and controllers can automatically exchange information and speak a common language, the vision of a Smart Factory becomes reality.

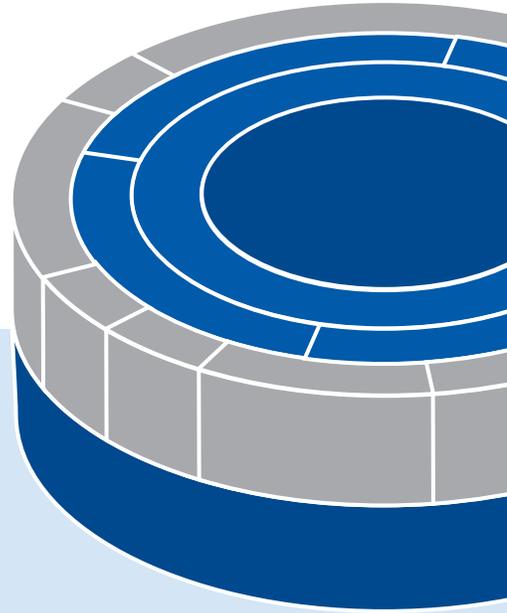
The crux of the matter is that with an increasing number of systems the number of interfaces also rises.

The MIP enables the integration of all systems without having to integrate countless interfaces.

This allows systems from different manufacturers to interact with each other without having to customize it or without knowing each other. The same principle is used when retrieving emails from different clients.

Content matters

Today, we can access our emails via Outlook on a laptop, smartphone or on the provider's website. When I write an email, it is available in all three outbox clients. The standardization of the Internet Message Access Protocol is the reason why it is possible. This means that different providers of mail clients can communicate



with each other and exchange information. This principle was applied to the MIP.

Applications from different providers can share information with each other via the standardized object model of the MIP. Details on specific objects like machine, tool or material are stored. All MIP applications access it and have therefore the same database and information level.

This is another distinguishing feature to an IoT platform. Typically, IoT platforms are technology platforms. That means, these platforms are some sort of operating system to write applications on.

MIP is a semantic platform. The focus here is not on technology but on content.

Applications cooperate

A good example for such a technology platform is the smartphone with all its apps. All apps run on the same operating system and use the same technology. Not many applications interact with each other. They are simply installed independently on the smartphone and co-exist, but do not cooperate. This is the difference to the MIP. There are many applications in the shop that do not use the same technology, but work on the same data model and exchange information.

The enlisted systems can differ substantially. It can be software, a sensor or a machine control. They do not share the technology, because they run on another hardware or operating system. They share the semantically defined data model.

The data model contains all production objects including their attributes and relationships. For example, we have an object Person. The Person includes attributes like first name, surname, company, department or cost center. The relationship between the objects is also specified. All systems connected to the MIP are always up to date and can interact with each other to ensure a smooth production process.

Communication with MIP takes place via REST Services, a standard protocol customary on the market.

— More on MIP at
 — mpdv.info/mipdetails

BERND BERRES

is Principal for the Product Management at MPDV and responsible for product strategy and product marketing. He was the project leader for the realization of the MIP and is now Product Manager for the platform. Mr. Berres has been working for MPDV for more than 30 years. After finishing college, he started in the development and consulting at MPDV.



Factory Collaboration Hub

ROLE CHANGE IN THE SYSTEM COMMUNICATION



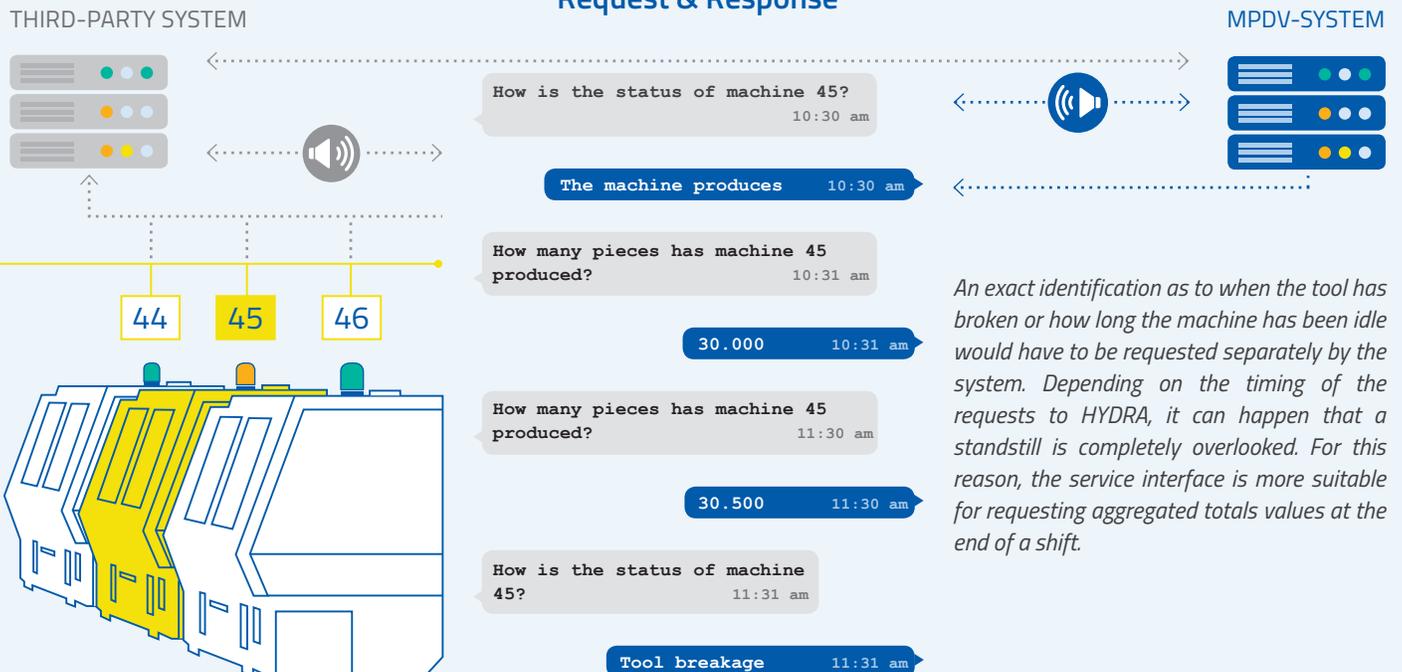
The new Factory Collaboration Hub is now available for communication between third-party systems and MPDV systems. The messaging service enables an automated exchange of information.

A large number of systems is used in production. Those who previously wanted to exchange information between the MES HYDRA and its third-party systems used the MPDV Service Interface.

The Service Interface works according to the Request & Response principle which means that the third-party system puts down a question and the MPDV system answers. That enables users to request the

status of a machine or to inform themselves on the order progress. With the new Factory Collaboration Hub from MPDV, the third-party system now receives this information automatically.

Service interface according to the principle Request & Response



All systems on one level of knowledge

The Factory Collaboration Hub works according to the Publish & Subscribe principle. This means that the third-party system subscribes to the message channel of the MPDV system and receives all information from this point in time without having to send a request.

The advantage: thanks to the continuous exchange of information, the third-party system is always kept at the same level of knowledge as HYDRA and can react immediately if necessary. The Factory Collaboration Hub is particularly suitable for automation control in production, for connecting information displays that show the status of production in real time, or for operating several MES systems.



TWO WAYS, ONE GOAL

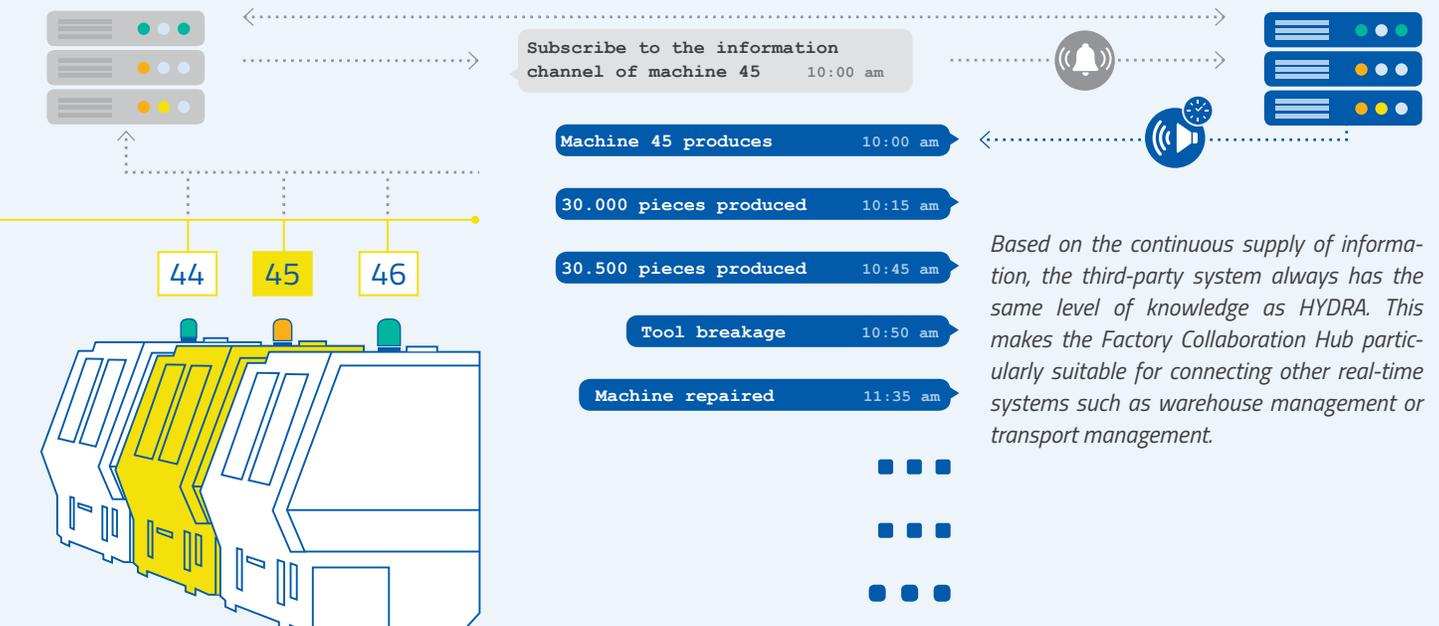
Both solutions fulfill their task to supply third-party systems with information. Depending on the application, one or the other communication strategy may be more suitable. Always focused on how up-to-date the information required by the third-party system needs to be. The key factor here is whether information from the third-party system should also be fed into the MPDV system. If so, then the service interface is more suitable, as only one system supports communication in both directions. Both options can also be combined.

MPDV offers both the Service Interface and the Factory Collaboration Hub for the MES HYDRA and the Manufacturing Integration Platform (MIP). Both functions underline the openness of MPDV's IT solutions.

Factory Collaboration Hub according to the principle Publish & Subscribe

THIRD-PARTY SYSTEM

MPDV-SYSTEM



Based on the continuous supply of information, the third-party system always has the same level of knowledge as HYDRA. This makes the Factory Collaboration Hub particularly suitable for connecting other real-time systems such as warehouse management or transport management.



Production IT for the Medical Technology

PRODUCE EFFICIENTLY AND ADHERE TO RULES

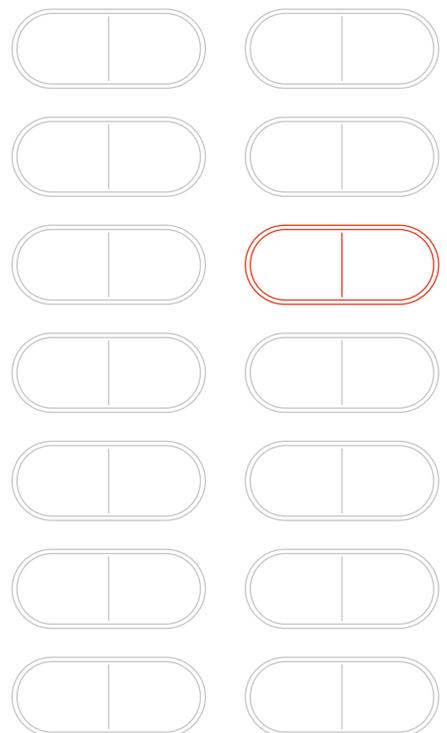
The regulatory requirements in medical technology present production companies with considerable challenges. The following application examples show how the industrial solution HYDRA for Life Science from MPDV supports companies in fulfilling these requirements.

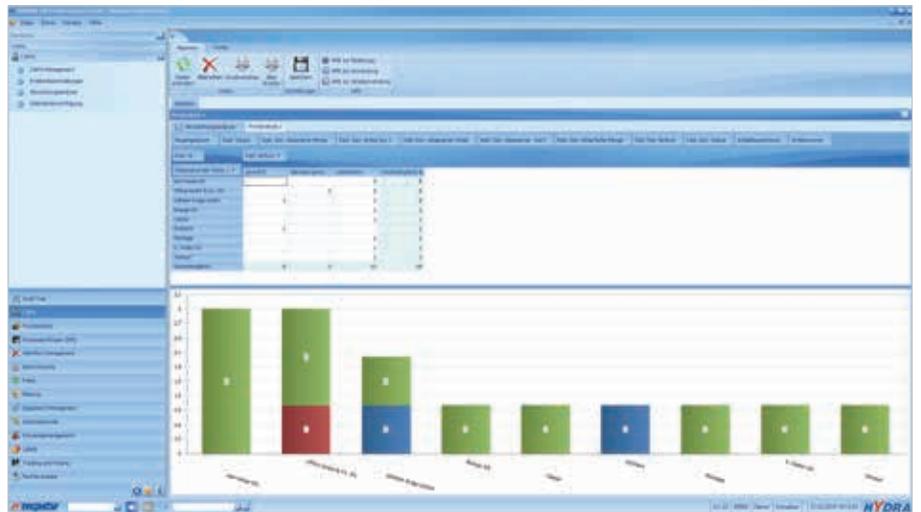
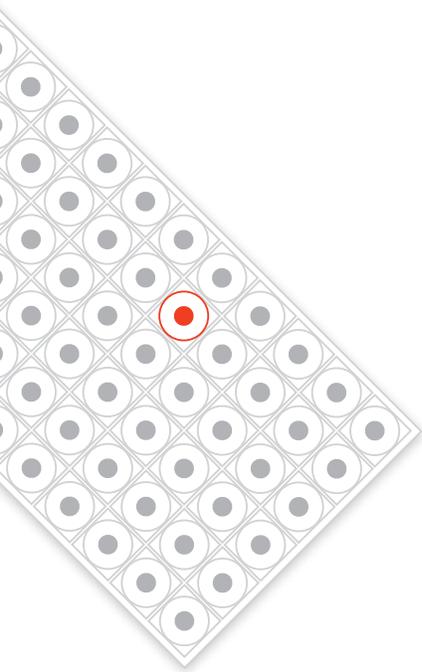
At first glance, most medical technology producers and suppliers function like normal manufacturing companies. They process plastics, metal, paper and other raw materials to products with the highest quality standards. However, the regulatory requirements in the medical sector are enormous and present companies with the challenge of identifying and solving problems in the production process in time.

Inspectors and auditors of the regulatory authorities pay attention to whether companies use a CAPA process (Corrective Action/Preventive Action) to identify, analyze, correct and eliminate quality problems in the long run.

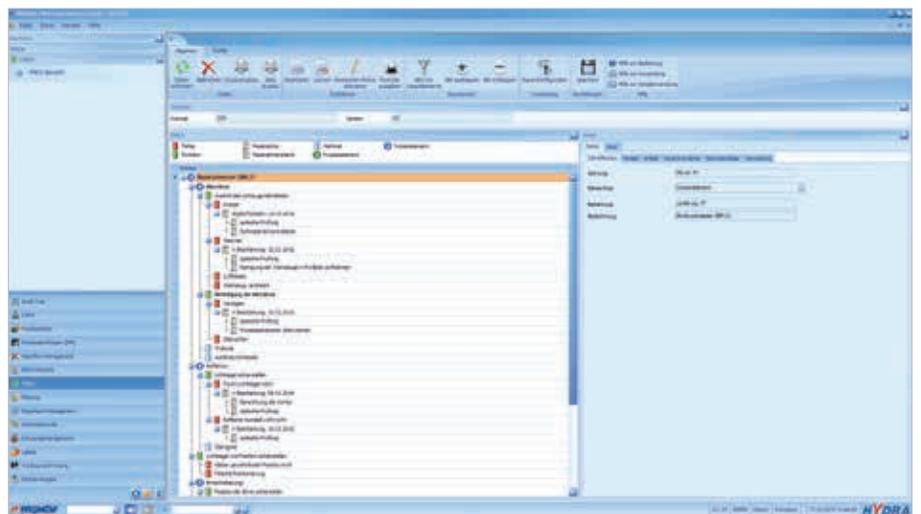
Adhere to quality standards

MPDV's HYDRA for Life Science Manufacturing Execution System (MES) CAPA management enables users to record all types of deviations in detail. In-depth analyses visualize problem areas in order for the employees to take measures.





Extensive analysis of failures with HYDRA for Life Science.

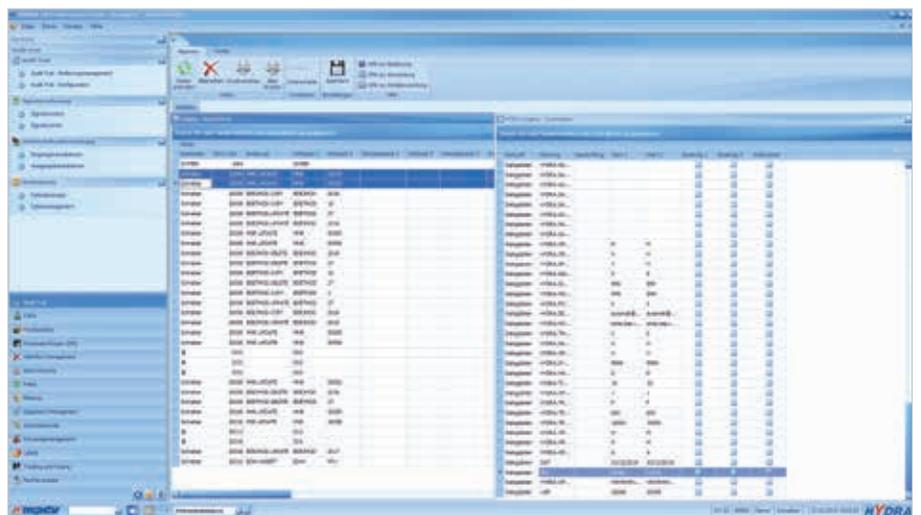


Quality Risk Management with FMEA in HYDRA for Life Science

Compliance with quality standards can be achieved with the help of HYDRA for Life Science's Failure Mode and Effects Analysis (FMEA). With this module, users can detect failures at an early stage. The risks arising from the failures can be assessed using key figures: the severity of the failure sequence, the occurrence probability of the cause and the probability of detection of a failure. In addition, countermeasures can be defined and traced.

Isolate error causes

There are strict requirements in the medical industry for the documentation of production processes. HYDRA for Life Science collects numerous data during a production run. This allows to answer the following questions: Which jobs and machines were involved in the production? Who carried out the inspection step? How many pieces were produced? What material batches and which parts with which serial numbers were used?



Audit Trail in HYDRA for Life Science supports data integrity.

The collected data is used to document production processes based on the electronic Device History Record (eDHR) or the electronic Batch Record (eBR). These records contain all the information about a specific product or batch that the manufacturer can use in case of customer complaints or to isolate the cause of error. Functions from our HYDRA Machine Data module (MDE) supports the user to automatically collect data from the production sites.

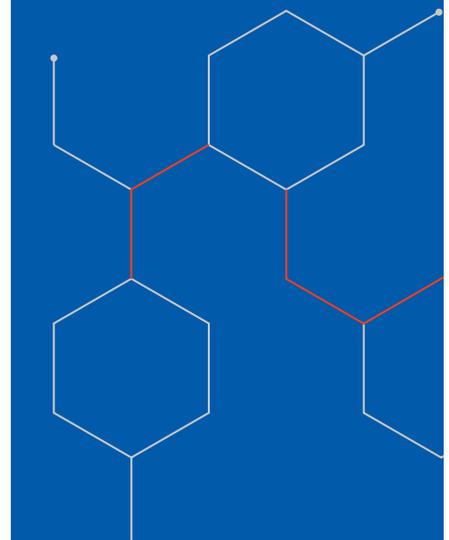
With an audit trail, inspectors or auditors can track all actions that have led to the occurrence of a particular problem. Any intentional or unintentional alterations must be discernible. HYDRA for Life Science records and stores who modified which data and when.

ONE SYSTEM, PLENTY OF APPLICATIONS

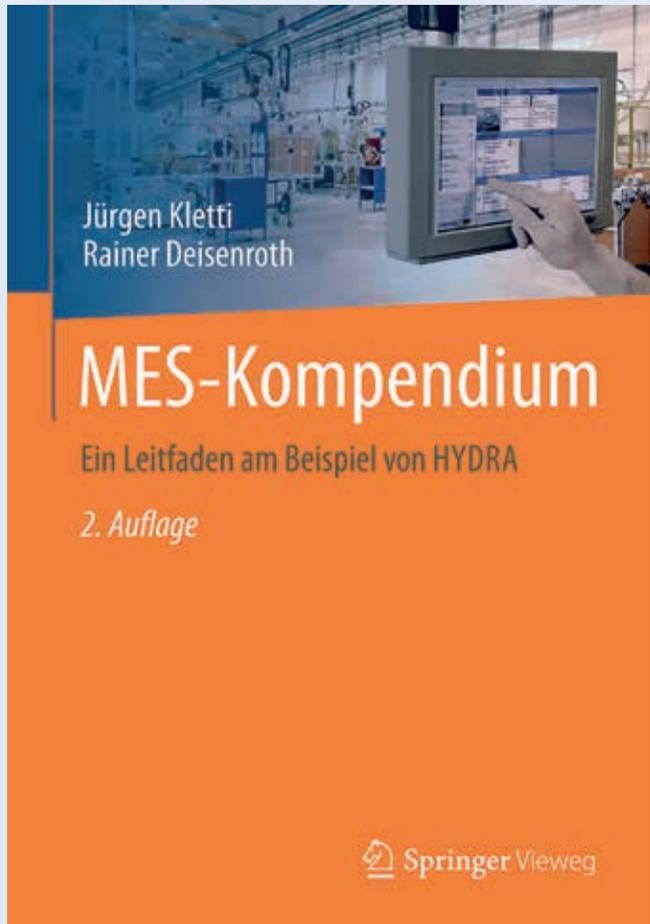
In addition to the functions configured specifically for the regulated market, HYDRA for Life Science offers a wide range of applications in accordance with the VDI guideline 5600 which are now used by over 1250 companies worldwide in a variety of combinations. The functional portfolio ranges from data collection in the shop floor to detailed evaluations of all kinds and the planning of orders, resources and personnel deployment. The documentation of the complete manufacturing process in line with traceability is also part of the standard range of functions. Complemented by applications for quality assurance and personnel management, HYDRA for Life Science makes an enormous contribution to more transparency and efficiency in the shop floor. HYDRA for Life Science enables the medical technology manufacturers to not only meet the regulatory requirements, but also to produce efficiently.



With 20 standard modules, HYDRA is the most widely deployed Manufacturing Execution System on the market. The specific solution HYDRA for Life Science factors in all special requirements from the medical technology and pharmaceutical sector.



KNOWLEDGE IS POWER



Now you can read in our second edition of our new technical book MES-Kompendium, published by Springer Verlag, how Manufacturing Execution Systems help to uncover weak points, wastes and quality problems in production.

mpdv.info/publikationen

Other publications



These reference books are available as eBooks and partly also in English language.

Expanding the Portfolio and Market Access

MPDV TAKES OVER THE FELTEN GROUP



With the Felten Group, MPDV acquires a specialist for software solutions in the field of process manufacturing and expands its portfolio by an important component. However, the Felten Group will remain an independent subsidiary.

The customers of the Felten Group include well-known companies such as Henkel, Beiersdorf, Boehringer Ingelheim, Symrise and Döhler. The software solutions of the family-owned company are mainly used in the process industry for weighing and mixing processes. For example, the MES PILOT Suite can be used to precisely mon-

itor the recipe during the production of medicines or foods. The system can also be used to carry out order- or raw material-related weighing in a fully automated process. With the acquisition of the Felten Group, MPDV strengthens its portfolio in the field of process manufacturing." So far we have been mainly strong in the

FELTEN

Member of the MPDV Group

discrete production production. With the integration of the Felten Group, we are expanding our product portfolio and gain access to the rapidly evolving market of process manufacturing. Besides, we want to use as many synergy effects as possible", says Nathalie Kletti, member of the management board of MPDV.

„So far we have been mainly strong in the discrete production. With the integration of the Felten Group, we are expanding our product portfolio and gain access to the rapidly evolving market of process manufacturing. Besides, we want to use as many synergy effects as possible.“

Nathalie Kletti,
Member of the management board of MPDV

Concentrated expertise

As a 100% subsidiary, Felten remains an independent company. Nathalie Kletti is appointed to the management of Felten, a position previously held by the founder Werner Felten alone.

"In times of accelerating innovation cycles and a fast advancing digitalization, it makes sense to consolidate our know-how in order to strengthen our joint market presence. As part of the MPDV Group, we benefit on the one hand from the experience of MPDV and on the other hand bring



The PILOT Suite by Felten includes a broad range of applications for the production management and the required interfaces.

in our expertise from over 30 years in the process industry", says Werner Felten, founder and managing director of the Felten Group.

It started all with customized solutions

30 years ago, Werner Felten founded the family-run company headquartered in Serrig,

Germany. It all started at the time with customized database solutions. Since 2006, Felten provides with the PILOT Suite a standard solution for production companies. Felten currently employs 50 people at three locations in Germany and Luxemburg.

Did you know?

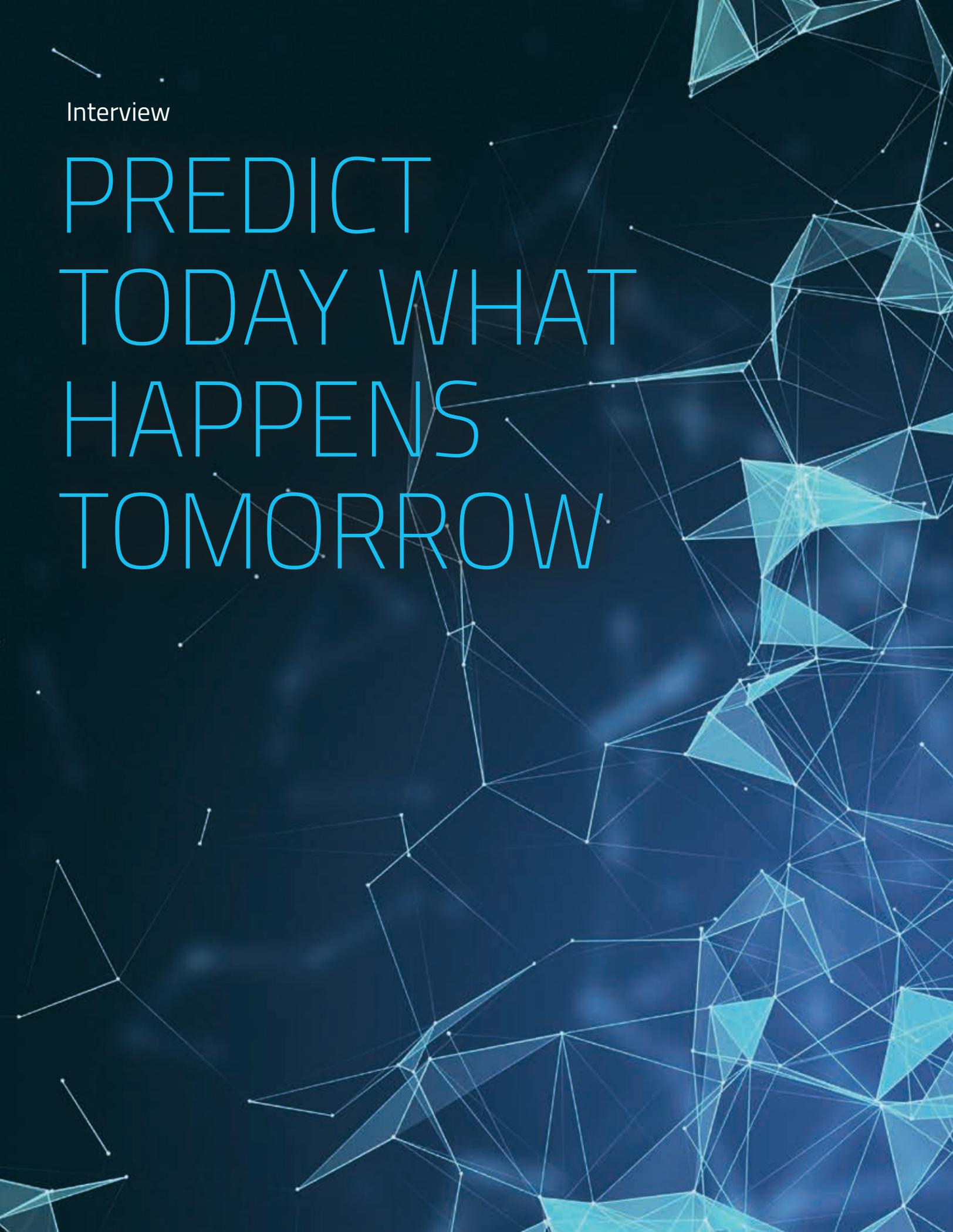
Production, especially in the process industry, is subject to a variety of **legal requirements**. In order to guarantee product safety, quality and occupational safety, manufacturing companies must comply with defined standards, guidelines and work instructions. This requires regular internal controls and also external inspections due to legal or certificate-related requirements. For example, in the food industry it must be ensured that guidelines such as Good Manufacturing Practice (GMP), the International Food Standard (IFS) or Hazard Analysis and Critical Control Points (HACCP) are complied with.

So far employees are usually collecting this information manually. A time consuming process. The solution PILOT:CPO **reduces significantly these efforts**. Users can now take counter readings or even inspect products with tablets or smartphones. PILOT:CPO also supports employees to create and process automated inspection plans. The inspection plans can be used in different production areas, for example for attributive inspections, process controls, as checklists for the start and end of an order, for plant inspections, monitoring or for inbound and outbound material inspections.

ABOUT FELTEN

With 50 employees and locations in Germany and Luxemburg, Felten has implemented production management projects in around three dozen countries around the world. After incorporating the Felten Group into the MPDV Group, they will continue to exist as an independent entity and a 100% subsidiary. Nathalie Kletti is appointed to the management of Felten, a position previously held by the founder Werner Felten alone.

www.felten-group.com



Interview

PREDICT TODAY WHAT HAPPENS TOMORROW

Together with PerfectPattern MPDV has founded the subsidiary AIMES. The objective of AIMES is to develop software components for Artificial Intelligence (AI) in production and bring them to the market. In the interview Thorsten Strebel, Vice President Products & Consulting at MPDV and Managing Director of AIMES, and Fabian Rüchardt, CEO of PerfectPattern, talk about the cooperation and why AI is pioneering manufacturing.

How did the cooperation between PerfectPattern and MPDV come about?

Mr. Rüchardt: Actually, it was kind of a blind date. We have decided internally that we want to bring our solutions to a wider market. So far we have mainly been active in the printing industry. Therefore, I started to look for a partner in LinkedIn and found MPDV. Without thinking long, I wrote to a member of the product management team and in the next moment I was sitting in the meeting room at MPDV in Mosbach.

Very interesting. And what happened next?

Mr. Strebel: During the discussions, we soon realized how well our products complement each other. PerfectPattern has the know-how and algorithms to analyze production data and predict events. We know the manufacturing IT market, have customers in all industries, and have the data collection systems PerfectPattern needs to predict future production events. So it was obvious that we have to form a partnership.

What are the objectives from AIMES?

Mr. Strebel: Our objective is to bring AI solutions to manufacturing companies and support them on their way to the Smart Factory. Whether chemical, plastic or metal: companies from all industries benefit from AI. With our solutions, we want to make a significant contribution to this.

What can manufacturing companies achieve with AI?

Mr. Rüchardt: IT systems make the production transparent. For example, they

show which system produces too much waste or which machine requires maintenance in the near future. Then humans can make decisions based on this information. With AI, we are in the position to make reliable predictions about future events. Soon-to-be, systems will automatically deliver proposals for decisions using AI and then carry out the action independently.

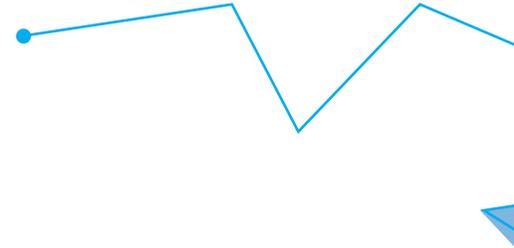
Mr. Strebel: I would like to outline an example from daily working life. There are a lot of processing steps when producing a part. Let's say, an engine block being cast. There are quite a few parameters to monitor



Together, they are driving the development of Artificial Intelligence in manufacturing: Thorsten Strebel (left), Vice President Products & Consulting at MPDV and now also Managing Director of AIMES, and Fabian Rüchardt, CEO of PerfectPattern.

aimes

ARTIFICIAL INTELLIGENCE FOR
MANUFACTURING EXCELLENCE SOLUTIONS



during the casting process. However, it still happens that the engine shows defects after numerous other processing steps. By analyzing these effect chains with AI, I can already predict during casting and based on experience that the block will be highly likely to be scrap based on experience. This means that I can decide at an early stage whether to terminate the production process, which saves me time and money.

What do you see as AI?

Mr. Röchardt: AI is the ability to solve unknown problems. By this we mean the ability to adapt to a changing environment, to draw conclusions independently and to make decisions. To automate this as a whole enables us to react during the process. That's the difference with AI.

Mr. Strebel: The AI based IT will replace the classical IT in the long run. The increasing level of detail and the gigantic amounts of data can no longer be processed using conventional methods. We need self-learning systems to master the masses of data we have in production and to draw the right conclusions.

What are the challenges for AIMES?

Mr. Strebel: First of all we have to generate public acceptance for the subject. Because with AI in production it is like with driver-

less cars: people are skeptical. Does it work reliably? Can I trust technology?

Mr. Röchardt: Exactly. It is therefore our task to explain and clarify what the machines do and what improvements can be achieved with AI.

What is the AIMES team currently working on?

Röchardt: We are working on technologies to analyze historical data for the control and planning of production processes. This includes machine data or status data. We analyze what is produced when, where and in what quality and, on this basis, identify insights into relationships, dependencies and causes. We do not do this by pushing information back and forth manually, but at the click of a button. We automate the data analysis. A predictive planning is possible based on this information and therefore, processes can be optimized and costs can be reduced.

Mr. Strebel: First tests have shown that you can improve lead times by up to 25 percent. Currently, we are integrating the solution by PerfectPattern into MPDV's software. We will present the first results at our HUG user conference in September and the first applications will be available by the end of the year.

What do you expect that the future brings?

Mr. Strebel: AI is a crucial success factor for companies on the way to the Smart Factory. We would like to shed light on the subject and create awareness. That's why everything we do revolves around customer benefits.

Mr. Röchardt: Our goal is to be an innovation driver and to use AI to put manufacturing companies on the right track to the Smart Factory so that they can shape their future profitably.



ABOUT PERFECTPATTERN

PerfectPattern, the technology and software company based in Munich, was founded in 2012. The company develops software solutions that combine mathematical algorithms for process optimizations with Artificial Intelligence. Their solutions enable automatic planning of any production process in real time. This makes the smart factory a reality. Three basic objectives are pursued: Flexibility, on-time delivery and reduction of production costs.

With PYTHIA and CORTEX PerfectPattern has developed two revolutionary AI technologies. PYTHIA is a platform product for pattern recognition, time-series prediction and anomaly detection in real-time data streams. Through the innovative combination of methods, including deep learning, stochastics and quantum field theory, it independently finds even the most hidden patterns. CORTEX is a decision-making technology, which makes decisions based on the global objective functions by means of reinforcement learning.

www.perfectpattern.de

HYDRA in Use

FAITH IN TECHNOLOGY PAYS OFF

If you want to be successful in the textile industry, you have to be one step ahead of your competitors. Chalumpon Lotharukpong, Managing Director of the sportswear manufacturer VT Garment in Thailand, knows this very well. That's why he and his team set out on the way to the Smart Factory.



Managing Director
Chalumpon Lotharukpong



Even as a child, Chalumporn Lotharukpong was fascinated by walking through VT Garment's huge production halls in Bangkok, Thailand. "I'm still impressed today to see how the vast amount of cut fabric parts will one day become sports jackets for big brands like Adidas or Jack Wolfskin", says the 36-year-old.

Since then, Mr. Lotharukpong has become Managing Director of VT Garment and is successfully leading the company that his father founded almost 40 years ago into the future. "My job is to promote digitalization in our production and find solutions that will enable us to produce even more efficiently."

KPIs available in real-time

As a first step, Mr. Lotharukpong introduced three years ago the Manufacturing Execution System (MES) HYDRA by MPDV. Today HYDRA is in operation with the modules Machine Data (MDE) and Shop Floor Data (BDE) where once employees manually recorded figures to calculate the overall plant effectiveness (OEE). "If we previously wanted to know the OEE of a machine, it took us almost a day to compile all the information. Our MES collects all information automatically and in real-time. This way, we see right away if something is not running smoothly and can take immediate action."

Up to now, the team has together with MPDV connected 20 machines to HYDRA. These include cutting machines and equipment for spreading fabrics. Currently, VT Garment are introducing the Shop Floor Data Scheduling module (HLS). According to Mr. Lotharukpong, this is a crucial step towards an even more efficient production. "We can monitor with this module our complete process. All is now transparent and we can see exactly where the problem lies. After all, simply because one machine produces efficiently does not mean that our entire process is efficient," says the chemical engineer.

Tradition meets the modern age

For Mr. Lotharukpong the textile industry is one of the most traditional branches. In his view, this is also the main reason why so far only a few companies in Asia have invested in the digitalization of their production.



Training VT Garment staff on MES HYDRA.

"Many don't even use an ERP system. In this respect, we are among the pioneers with our MES."

2000 employees work for VT Garment at its headquarters in Bangkok. The company employs around 1000 people in Myanmar. So far, the team has only implemented HYDRA at their site in Bangkok. But as soon as they have gained enough experience with the system, the MES will also be introduced in Myanmar.

"I believe in technology and German engineering. For this reason, we decided to go for HYDRA. We also need short lead times

in the textile industry. How are we to achieve this other than by digitalizing our processes?"

If you ask Mr. Lotharukpong how far his company is on the way to the Smart Factory, he smiles and says: "We're even further away from that, but we have made a start and we have still a long way to go. Industry 4.0 has so much to offer and I'm looking forward to taking it further in our company."

HUG-CONFERENCE 2019

At the HUG conference, the annual MPDV user meeting, Chalumporn Lotharukpong reports on his experiences with the MES HYDRA and provides exciting insights into the textile industry.

When: September 18 to 19, 2019

Where: Stadthalle Hockenheim, Germany

mpdv.info/hug2019

Portrait MPDV USA

MUCH MORE THAN JUST AN OFFICE

MPDV continues to grow in the USA. Over the past three years, the number of employees has doubled and sales have quadrupled. Reason enough to take a closer look at the location.



The USA is considered the land of opportunities. With its 50 states, endless expanses and diverse cultural influences, the country is a true melting pot. When Stefan Loelkes came to the USA three years ago from Germany, he was welcomed at the Chicago office by twelve employees who were about to make the Manufacturing Execution System (MES) HYDRA known in this vast country. At that time the team consisted mainly of Germans who had dared to cross the Atlantic. In the meantime, MPDV employs twice as many people in the USA and the team is a diverse mix.

„We are currently expanding our location and opening up new markets. After all we want to continue to grow.“

Stefan Loelkes, CSO MPDV USA



In 2016 Stefan Loelkes and his family ventured across the pond and went to the USA for MPDV. He is responsible in his position as CSO for sales and marketing.



The man with experience – RON ESMAO

Ron Esmao has been living in Chicago for the last 36 years. He moved from the Philippines when he was a small boy. Whether architecture, sport or good food, art Chicago has a little bit of everything on offer. I am never bored in Chicago", says Ron. He enjoys taking his daughter and his wife to the city to try new restaurants and to watch Chicago Cubs baseball games.

The 42-year-old is Account Manager Sales at MPDV, USA, where he is responsible for acquiring new customers and supporting existing customers in using

the MES HYDRA. He has been with the company for six years. He has been working for the company since 2013. His colleagues like to call him "the old man from the office" because he is one of the longest serving MPDV employees in the United States. "When I started to work for MPDV, we were only four people. Today we are 24 and I found it very impressive how fast we've grown."

The wide spectrum covered by HYDRA left a lasting impression on him right from the start. "What you can do with the system and how everything is so carefully thought through." The quality of the product was also one of the reasons why he chose MPDV as his employer.



The White Sox fan

COURTNEY LOFGREN

When you enter the MPDV premises in the USA, you first meet Courtney Lofgren. The pleasant 28-year-old works as an Administrative Assistant Customer Services and has her office right next to the entrance. "My door is always open. Everybody has to say hello when first arriving in the office," says Courtney and laughs.

Courtney is a true girl from Chicago. She grew up in the south suburbs of Chicago. On weekends, she enjoys going out to eat and watching Chicago White Sox

baseball games with her family and friends. "Most people that grow up in the south suburbs are fans of the White Sox. It was inevitable for me, especially with my husband being such a huge fan," she says.

She has been with MPDV for almost two years. Courtney coordinates the trainings, manages the incoming customer orders, and handles some of the accounting responsibilities. What she particularly appreciates is the company's friendly atmosphere. "It's easy to tell that we're a family-owned business. Everybody is helpful and if I have a question, I can go and ask my colleagues at any time."

„We've got Americans, Mexicans, and Germans on board. Our American employees come from all different kinds of ethnicities. That's a good thing. After all, our customers are spread from Canada across the whole US to Mexico and Costa Rica," says Loelkes, who as CSO is responsible for sales and marketing for MPDV in the USA.

Together with COO Keith Spayth, Mr. Loelkes manages the business in the USA. The two form an American-German leadership alliance to drive the business forward.

As COO, Spayth is responsible for the operational business and for consulting, project management, support, the training center and finance. He is with MPDV since 2016 and has introduced new organizational structures and shaped the team. "It was an exciting time during which we have achieved a lot. We have made a concerted effort to further develop our project management and consulting teams", says Mr. Spayth.

More than 110 HYDRA installations

MPDV's customers in the USA include automotive suppliers such as Allgaier, manufacturers of connectivity and sensor solutions like TE Connectivity, cardboard wall manufacturers up to a huge installation at a gambling machine manufacturer. "The market here is huge and the need for

software solutions to digitize manufacturing is growing steadily," explains Mr. Spayth.

"Keith and I complement each other very well. He, as an American, knows exactly what our customers value and I bring in the German perspective and have an eye for the market."

Stefan Loelkes

The MPDV team has already implemented more than 110 HYDRA installations in the USA. Over the past three years, turnover has quadrupled. The small field office in Chicago has become a fully developed location that covers the entire spectrum. In addition to its own support team, project managers and a training center, from next year on developers will also join the team in the USA in order to meet specific customer requirements and to implement customizations. "This makes us even more flexible and enables us to react directly on site," says Mr. Spayth.

It all began with one employee

MPDV opened an office in Chicago eleven years ago. Company founder Prof. Dr.-Ing. Jürgen Kletti decided in favor of the city because a large part of the industry is located here and he considered Chicago as one of the most beautiful cities in the USA.

The activities started with an American sales representative and in 2010 the first official office was opened in Orland Park. "I can still remember when we moved into the premises. At that time the team was fairly small and consisted mainly of German employees. It was only gradually that more employees joined and expanded the business," says Prof. Dr.-Ing Kletti. The first customers were from Chicago. Substantial orders from well-known companies followed in 2011.

Cultural surprise effect

"We are currently expanding our location and opening up new markets. After all we want to continue to grow," says Loelkes, who lives with his family in the north of Chicago.

In the meantime, the German has become accustomed to cultural differences. Today he greets his American colleagues with a friendly "How are you?" in the morning and reaps surprised looks every now and then.

After all, Americans don't expect that from a German.

However, he is still not used to the cold winters in Chicago with temperatures as low as minus 30 degrees Celsius. All the more reason for him to enjoy the warm summer months in the city and explore the most beautiful corners of Chicago with his two children and his wife.

Orland Park is home for Mr. Spayth. He grew up and also attended high school in the area. "I know every nook and cranny here and I like to take my own restored vintage cars for a spin around the city." In his spare time he helps old Camaros to new splendor.

„The market here is huge and the need for software solutions to digitize manufacturing is growing steadily.“

Keith Spayth, COO MPDV USA



Keith Spayth is the COO for the MPDV in the USA. He is responsible for the operational business, for consulting, project management, support and the training center.



The globetrotter

MANUEL MARTINEZ

Manuel Martinez is on the move again. He has to catch a flight. A customer in Louisiana has booked a training session and wishes to know how best to apply the HYDRA Tool and Resource Management module. The flight from Chicago takes four hours. This is routine for one of the Manufacturing Process Engineers of MPDV. Manuel travels for most of the year across the USA. Occasionally, he also works with customers in Europe.

A few years ago, Manuel would never have thought that he would one-day work in the manufacturing industry. He studied in Florida and specialized in programming video games. When he saw MPDV's job advertisement, motivation gripped him. "I wanted to learn more about HYDRA software and the system itself. I also liked the fact that MPDV is a German company," says Manuel.

Portrait of Johannes Schäfer

THE TEAM PLAYER



LEGO and technology have been fascinating Johannes Schäfer ever since he has been a child. The 23-year-old supervises for MPDV the teams competing in the FIRST LEGO League robot contest. He supports his little protégés with his heart and soul on their way to success.

At the age of eleven, Johannes Schäfer took part for the first time in the research and robot contest the FIRST LEGO League (FLL). At that time he was still a pupil at the secondary school in Obrigheim and wore a yellow T-shirt with the sponsor's logo MPDV on his back during the tournament. Today, he is 23 years old and works as a commissioning engineer for MPDV and supervises the FLL's own company teams. "It's funny to see how things can change. In the past I presented our self-built robot together with my classmates at the FLL. Today, I cheer on my protégés from the sidelines and keep my fingers crossed that everything runs smoothly," says Johannes.

Three teams with children of MPDV employees started this year at the FLL. For six months they met in the run-up at regular intervals to prepare for the competition. Johannes helped the teams during the construction of the robot, set deadlines and organized the training units.

MPDV is like my second family

Johannes has been working for MPDV since 2012. After he completed secondary school, he did an apprenticeship as an IT specialist. That was the logical choice, because technology has always fascinated him. As a commissioning engineer, he installs the MES HYDRA at customers, holds training courses, carries out version changes and advises users on the connection of machines. MPDV is for him like a second family. "I am very comfortable here and I found lots of new friends. This is when work becomes fun", says Johannes.

For his protégés at the FLL he is committed with a lot of engagement. It can happen that he puts in a night shift to solve a programming problem with the robot.

However, for Johannes, the competition is not so much about winning, but he likes to introduce the boys and girls to the company and show what an attractive employer MPDV is. "When I see how committed they are to the cause and how real friendships develop in the process, then my heart leaps," says Johannes.

Preparations are in full swing

Preparations for the FLL 2020 have already started. Johannes has by now put the teams together. He took special care to ensure that the children were of a similar age and that boys and girls competed in mixed groups. Also, the first meetings have taken place. "This time it is all about Construction in the Future and I am keen to see what our team is making of it", says Johannes who cannot wait to get started.

INSPIRING CHILDREN AND YOUNG PEOPLE

- The aim of the FIRST LEGO League (FLL) research and robot competition is to introduce children and young people to science and technology in a fun atmosphere.
- Those responsible want to encourage these kids to get into scientific subjects and engineering or careers in IT.
- Furthermore, they should learn to master complex tasks with creative solutions.
- MPDV has been sponsoring this competition for many years. For two years now, the company has been setting up its own teams with children of employees.

Visiting Laura Kirstätter

AT HOME IN THE DEEP OCEAN

Laura Kirstätter has been working for two years as Manager Research & Education at MPDV in Mosbach, Germany, and is responsible for the expansion of the university cooperation. In her free time she likes to immerse herself and explore the oceans.

When Laura Kirstätter goes diving off the coast of New Zealand, she feels like a tiny particle in a huge ocean. Diving into the depths of the oceans means pure relaxation for the manager of Research & Education at MPDV.

So the first thing she did after the severe earthquake in New Zealand in 2013 was to pack her equipment and take the boat out to sea. All day long the ground trembled under her feet and she was afraid for her life. When Laura was in the water, all her fear vanished. "When I dive I feel free and enjoy the moment. Even if a sting ray swims past me, I stay calm and admire nature," says the 29-year old.

More research for more benefits

Keeping calm and concentrating on the task in hand are important skills that help Laura at work. At MPDV she is responsible for the development of the university cooperation. It is her task to advise universities on the introduction of MES HYDRA in research laboratories and to bring the subject of production IT to lecture halls.

"Our mission is to introduce students to the subject of MES at an early age. At the same time, we support universities in researching and further optimizing the possible

applications and benefits of an MES," says Laura.

Network grows steadily

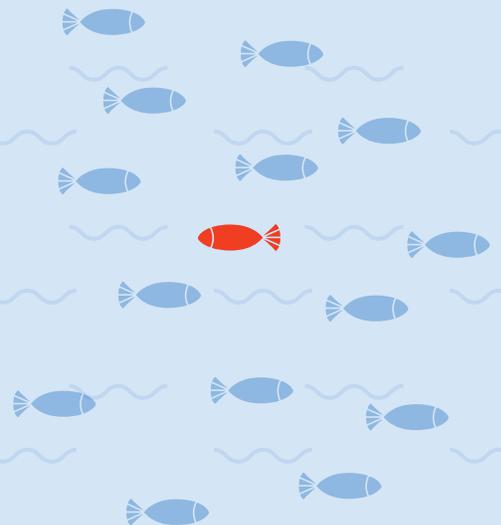
MPDV cooperates with more than 30 universities worldwide and the network is increasing. This year MPDV held a school competition for the first time on the subject of MES. Laura was involved from the conception of the competition to the organization and moderation. During the preparations she put herself in the role of the young person and prepared the complex subjects in a way that was easy to understand. "I enjoy passing on my knowledge to young people and accompanying them on their way."

Laura has a degree in business administration with a focus on marketing and media management. During her studies, she already knew that she wanted to work in an innovative company where she could be open-minded and future-oriented. She found just that at MPDV.

Back home for the job

Two years ago, Laura returned from Stuttgart to her native Mosbach for the job, where she grew up and went to school. She appreciates the short distances from her home to work – she only needs ten minutes.

But no matter how much she loves her home country: If you talk to her about her dives in New Zealand, she gets the urge to travel. "Even as a child I was fascinated by the country and its people. I lived in New Zealand for almost a year and started diving. As strenuous as this sport is physically, the underwater world is simply fascinating and breathtaking."

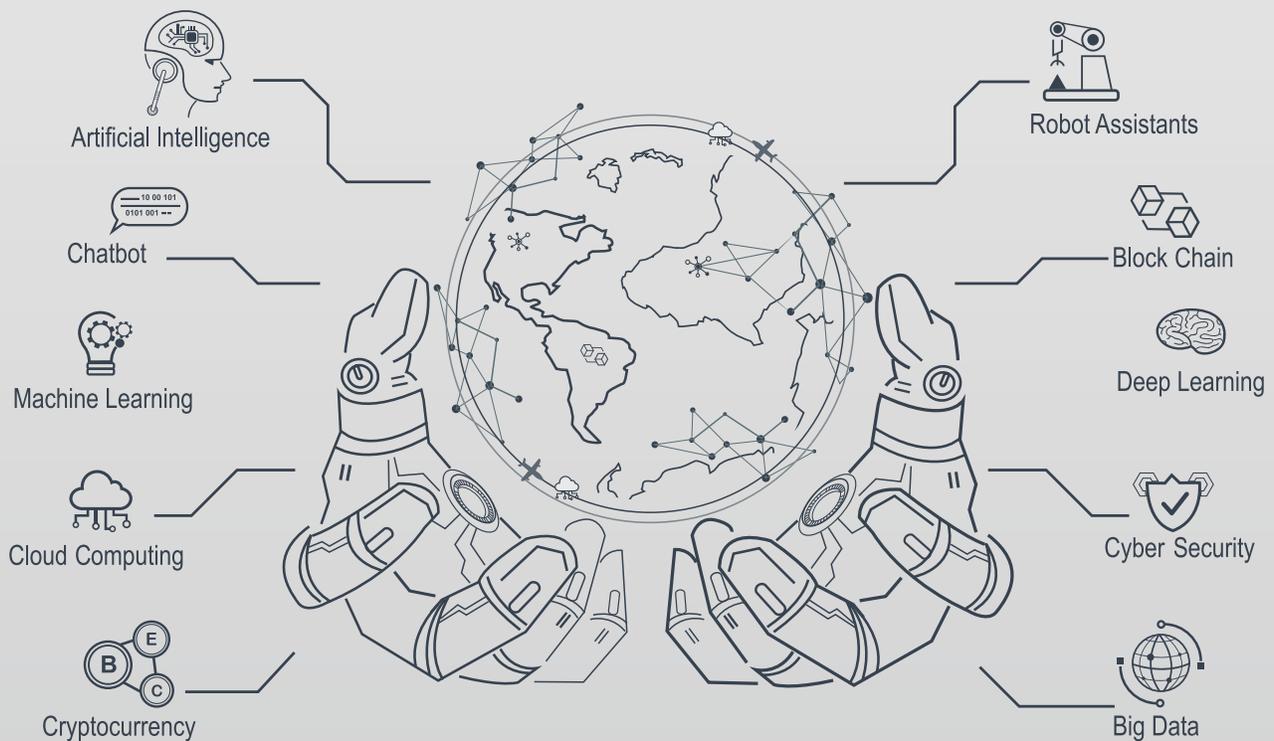




Column

AI – A CHANCE FOR PRODUCTION

Artificial Intelligence (AI) is the talk about town. But what role does AI really play in production, where do companies currently find themselves today and what is in store for the future? 3975 characters provides a short answer.



Let us outline the key point first, which is independent of Bitkom studies and numerous other surveys:

Besides innovative production technologies such as electro mobility or 3D printing, two digital drivers will significantly change the nature of production. One crucial driver is an increase in networking and integration of systems. The other one is a surge in artificial intelligence. Both factors will elevate efficiencies and effectiveness to a level never seen before. Especially, AI will be a main driver for the new productivity.

I would like to explain that with a classic example: Predictive Maintenance. Today, most systems only show losses if a machine is idle or production processes are delayed. With AI, digital networking, modern sensor technology and intelligent data analysis, malfunctions can be reduced and unplanned downtime can be predicted before they even occur. Besides, you can optimize maintenance intervals and detect hidden areas for improvements. Autonomous robots and other autonomous systems are also relevant applications for AI in manufacturing. This allows a reorganization of manufacturing processes and at the same time optimizes previous manufacturing techniques in terms of efficiency.

A new mindset in manufacturing

For manufacturing companies, networking and AI are a twofold opportunity to develop solutions in these areas in a leading and global role and at the same time strengthen their position in the market.

It is therefore all the more surprising that, according to a survey by the industry association Bitkom, only 12 percent of manufacturing companies currently use AI. At the same time, nearly 40 percent of respondents see Predictive Maintenance as one of the most important benefits of Industry 4.0 and nearly 50 percent believe that AI changes business models and boosts productivity.

Granted, that sounds somewhat schizophrenic. However, even though only 12 percent currently use AI, the 50 percent of respondents who are convinced

that AI increases productivity show that in the long run the subject will play a major role in the rethinking of modern production and for new business models. At the same time, we will soon leave specific fields of application, but not in order to lose sovereignty to a superior AI or pri-



Dr. Winfried Felser

marily to create a semi-artificial superhuman (cyborg) with an AI chip, as suggested by AI insiders. There is a different, much larger scenario. Here, I would like to share my personal hypothesis.

An unbeatable team

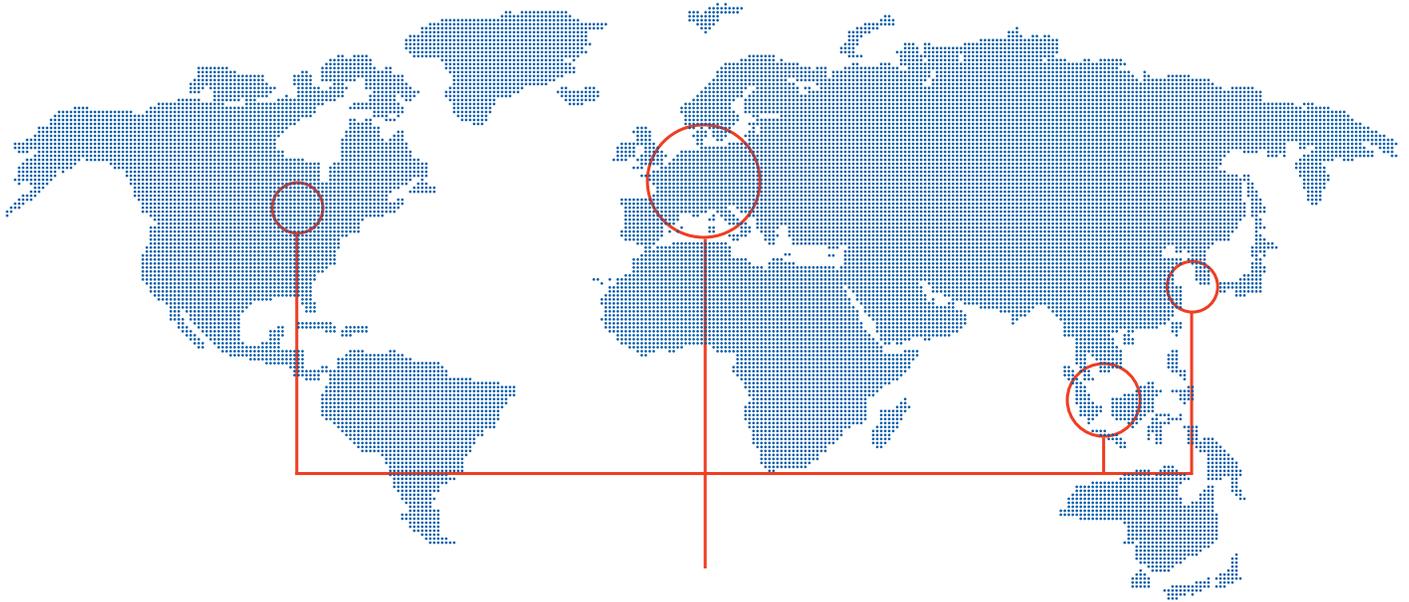
On the basis of AI, the empowerment of humans through intelligent assistance systems and the like, as well as through intelligent artificial agents, will by no means lead to a new competition of intellects, but rather to a superior collaboration of humans and machines in a common collaborative-cognitive ecosystem that perfectly combines the strengths of both agents. A perfect collaborative intelligence will only occur if human intelligence and AI are networked.

I don't know where you stand, but I am sure that in the long and medium term, the subject of AI in production is a crucial success factor for maintaining your position in the market. It is particularly important to bear in mind that the introduction of AI costs time and money due to the high technical complexities. Some time will pass though until companies will see benefits. Companies should acquire an understanding of the technology and its applications at all management levels and develop an AI strategy and the sooner they get going, the better.

After all, one thing is certain: anyone who relies on AI in production is more likely to be on the winning side. Those who miss the trend, on the other hand, are likely to disappear from the map in the medium term due to the competitive disadvantages.

ABOUT DR. WINFRIED FELSER

Since 2000, Dr. Winfried Felser has operated the Competence Site, a network of several thousand experts from science and industry who focus on the digital transformation for management, IT and technology sectors. He is editor of the Competence Report and Books and author for the Huffington Post, LinkedIn Pulse, The European, Absatzwirtschaft and other specialist media.



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