Software and Digitalization

VDMA

Added Value by
Software

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Contents

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Digitalization opens the door to innovation solutions and new business models

Software solutions and services will continue to become increasingly significant in 2019 as digitalization makes further inroads into the engineering sector. The distribution of standards is generating further progress in the integration of machinery and systems, with technologies such as the digital twin opening up additional potential in terms of value creation.

The use of agile development methods and consistent user orientation such as Design Thinking concepts improves both acceptance and value contribution for the customer while clearly accelerating the time to market. The catchphrase „product- service system" also offers great innovation and business potential as a combination of the conventional software product with corresponding services. Clever combinations here can result in new business models, which can be particularly worthwhile for SME companies.

However, user companies face the challenge involved in democratizing the utilization of systems and equipment, given the current skills shortage in the overall context of demographic change.

Application support concepts enable staff to operate the machines. The increasing maturity of augmented reality combined with machine learning will in future generate new concepts for user guidance. This is just one of the options for companies to deal with the skills shortage.

In future, the ongoing development of digitalization will offer great innovation potential and new business possibilities for providers and users alike. VDMA Software and Digitalization gives its member companies guidance in taking up the emerging market chances and supports the companies in transferring corresponding developments into proprietary solutions and applications.

The directory provides an overview of the digitalization solutions by members of the VDMA Software and Digitalization Association.

We hope you enjoy reading this issue!

Matthias Dietel
Member of the board, VDMA Software and Digitalization
Manager IBM Client Experience Center Focal Point Industrie 4.0

Matthias Dietel

The engineering sector boosts digitalization projects

Guido Reimann, VDMA Software and Digitalization

Digitalization continues to make good progress in the engineering sector, as revealed by the large share of corresponding investment projects in the VDMA IT Report 2018 to 2020. Other hot topics such as IoT platforms, virtual reality, Big Data or machine learning have also become increasingly significant.

However, companies urgently need a formulated digitalization strategy to drive their digital transformation forward in a targeted fashion. It is good to see that increasing numbers of engineering firms have become aware of this. In 2016, only one in five companies had a digitalization strategy, compared to 40 percent today. However, there are still great differences according to the size of a company. Even so, the investment budgets for the period through to 2020 give rise to optimism.

Companies often differ greatly when it comes to apportioning responsibility for planning and steering their digital transformation. Chief Digital Officers (CDO) have not yet become an established feature. Only 12 percent of the engineering firms have appointed a CDO for this task. At the moment, the corresponding responsibility lies either with the management or with the head of IT. But it makes sense for these areas to work together closely.
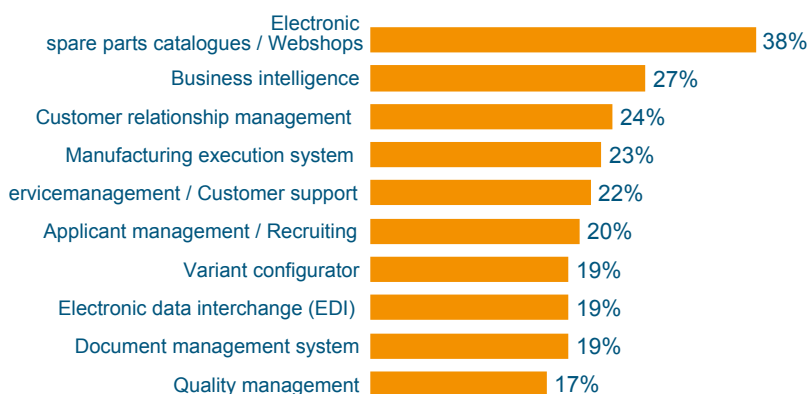
IT investment focus on sales and production
Some engineering firms have shifted focus with their current investment budgets through to 2020. Webshops and digital parts catalogues have been among the top 10 investment projects in the industry already since 2014. This year, they made it to the top of the investment budget with an outstanding 38 percent. Other IT systems ranking high among the investment projects include support for sales and customer-loyalty processes such as customer relationship management, variant configurators or service management solutions. Similarly, the next few years will also see a greater focus on the digitalization of production-related processes. Manufacturing execution systems, quality management solutions and concepts for exchanging data with suppliers and customers can be found in the investment budget for nearly every fifth company.

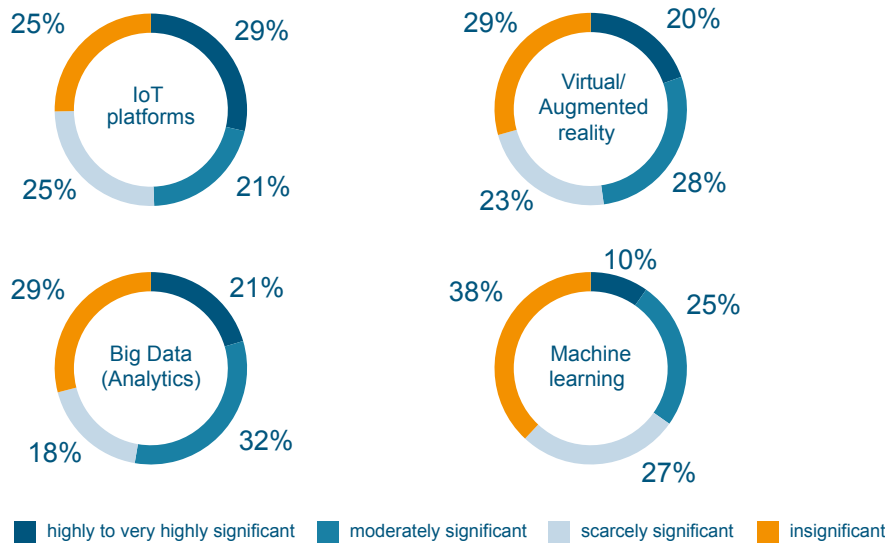**IoT platforms in the fast lane**
IoT platforms are registering what is practically a real leap in significance for the engineering sector. In the IT report for 2016, more than 60 percent of the companies indicated that the topic was not known to them or not relevant to their company. Today the situation is quite different.

The 10 main areas for IT investment in the engineering sector 2018 to 2020

Category	%
Electronic spare parts catalogues / Webshops	38%
Business intelligence	27%
Customer relationship management	24%
Manufacturing execution system	23%
ervicemanagement / Customer support	22%
Applicant management / Recruiting	20%
Variant configurator	19%
Electronic data interchange (EDI)	19%
Document management system	19%
Quality management	17%

Source: VDMA IT Report 2018 to 2020; N=93

Significance of IT hot topics for a company's IT

25%   29%
IoT platforms
25%   21%

29%   20%
Virtual/ Augmented reality
23%   28%

29%   21%
Big Data (Analytics)
18%   32%

10%
38%   25%
Machine learning
27%

■ highly to very highly significant   ■ moderately significant   ■ scarcely significant   ■ insignificant

Source: VDMA IT Report 2018 to 2020; N=91 to 93

Platforms are meanwhile significant for three quarters of the companies, with corresponding solutions being used by nearly 30 percent already. Service takes the lead in terms of application areas where it accounts for 22 percent, followed by production (13 percent) and sales (12 percent). Every second company wants to be using IoT platforms by 2020.

Virtual reality takes over the engineering sector
Virtual and augmented reality are now also very significant for the engineering sector, being relevant for around 70 percent of the companies. At the moment, 20 percent of the companies already use corresponding solutions and this should grow to altogether 45 percent by 2020. The main focus at the moment is in service (20 percent), sales (11 percent) and product development (11 percent). Other areas such as marketing, production or logistics tend to be less involved at present.

Big Data applications taking root
Big Data has meanwhile also acquired significance for around 70 percent of the interviewed companies compared to just 45 percent two years ago. There has therefore also been a clear increase in the number of applications.

One in five companies is currently using Big Data solutions. The main area of application in the companies is still service and maintenance (17 percent), followed by production (12 percent), marketing (11 percent) and logistics (10 percent). A clear increase can be expected here over the next few years, with nearly half of the companies intending to use Big Data Analytics by 2020.

Machine learning still at the beginning
Numerous companies have started looking at machine learning in the context of their own products and product-support services. Around 60 percent of the interviewed companies saw machine learning as being relevant to their own company processes, but at the moment it is mainly the larger firms (with more than 1,000 employees) that are really coming to terms with the topic. Even if the share of currently implemented applications is rather small at just 9 percent compared to other hot topics, there are clear signs of strong growth here for the next few years. 30 percent of the companies want to use corresponding solutions based on machine learning by 2020.

A summary of the main results and other VDMA reports on digitalization can be found at: **sud.vdma.org/reports**

Image analysis with neural networks

Dr. Giovanni Prestifilippo, PSI Logistics GmbH

Companies are making progress with digitalization. Artificial intelligence (AI) is playing an increasingly significant role in the digitalization process for implementing Industrie 4.0. Tying in with automation of the operative processes, targeted analysis and processing of the recorded data opens up new aspects and potential for optimization, also of the operative processes.

Integrative software is the key basis here. The integration of artificial intelligence methods with self-learning meanwhile makes IT systems completely autonomous in deciding how to act/react. They use deep learning and neural networks to save information as empirical values. New unknown data are then processed with a self-learning approach, thus providing the basis for completely autonomous decisions. Corresponding applications are already available. PSI Logistics has provided a "proof of concept" for an application to be used in automated baggage handling at Hamburg Airport, using artificial intelligence to indicate a series of optimization effects for conventional system controls.

The application uses experience gained with fuzzy logic for mathematical interpretation of fuzzy variables, together with neural networks. 200 high-resolution cameras installed at the airport's baggage conveyors track the transport of the individual items of baggage. The high-resolution cameras register the barcode, a job previously done by separate scanners. The software links the images of the baggage with the barcode information, verifies the items of baggage as such and steers them through the conveyor system. All data relevant to the item of baggage are received and pooled by a communication box, in conjunction with the digitized images from the CCTV at the baggage conveyor. The box converts and links the various bits of information which are then sent in real time to the overriding software system for further networking.

In this application, the neural network for deep learning was initially "fed" with more than 2,000 images of items of baggage in various positions and from different perspectives. This acts as the basis for the software working with the neural network to recognize all further variations of items of baggage, including their individual features, thus ensuring smooth workflows in the complex logistics structures. The installed airport software combines documentation and tracking using processes and methods of artificial intelligence in the neural network for the CCTV system. There is no need to invest in additional scanner systems, there is a decrease in the error rate, no resources are needed for postprocessing and the service level improves.

Platform economy: central element in the digital revolution

Volkmar Eich, Microsoft Deutschland
Sebastian Seutter, Microsoft Deutschland

The platform economy is seen by many as a central element in the digital revolution. Besides many B2C examples, the platform economy also plays a central role in many B2B aspects. A common feature shared by both B2C and B2B platform economies is that they need security, trust and rules to become established in the long-term.

Data security and protection is therefore always an essential factor. Data also have a significant economic value particularly in the B2B environment. At the same time, the platform should also provide the intended advantages and associated openness for the operators, partners and customers coming together on a platform.

Our many years of experience with very similar challenges put us in a position to consider these important prerequisites in the concept and operation of Microsoft Azure. Microsoft Azure provides the necessary basic services for a platform economy.

Safeguarding and updating the components

Elements of a platform in the industrial setting may possibly also act directly with the operating environment of the stakeholders and not just on neutral ground. Component security and updating possibilities must therefore be included in the concept for a platform and its individual parts.

Communication and access security

Another aspect needed by a platform consists in a standard, central access and rights system that also safeguards communication between the participating components. These systems ensure that only authorized participants have access to "their" part of the data present on the platform.

Data protection and data security

Besides the global obligation to comply with statutory regulations, such as the General Data Protection Regulation, central importance is also attributed to redundant back-up processes for all the data involved. Due attention also has to be paid to warranting that the system is fail-safe.

As the operator of a global cloud platform, Microsoft gives central significance to the security and integrity of customer data. We even support so-called "bring your own key" processes where the data of our customers are stored in encrypted fashion in the domains managed by Microsoft so that in each case, only the specific customers have the key to their respective data.

Successful digitalization with Security by Design

Matthias Ochs, genua GmbH

In industry, digitization is in full swing: machines and entire production areas are networked, large amounts of data are generated and collected in the cloud. Analytics generates important information from questions such as what condition are the machines in, when would be the best time for maintenance, which workflows need further improvement?

Industry will have to make massive investment in IT security to benefit from the advantages of digitalization in the long run. Data communication needs reliable security in fully networked production units and above all with external clouds via the internet, to prevent infiltration by attackers together with espionage and sabotage with high consequential costs.

The machine/internet interface is the critical point in the cloud connection. If attackers manage to infiltrate here, they gain direct access to sensitive systems such as machine controls, for example. To protect this interface, manufacturers of IT security solutions offer convenient edge gateways, to provide security at this point and also proceed with initial analysis tasks so that it is not necessary to send the entire raw data to the cloud.

Edge gateways are therefore crucial elements in successful digitalization. A strong security performance deserves special attention when selecting these systems. Gateways conceived with the security-by-design principle guarantee a high level of security, as security aspects define the basic structure of the system. Analysis applications that speak with the machine are strictly separated from the security systems that protect the interface vis-à-vis the cloud. The separated areas each have their own operating systems and hardware resources, without any overlaps.

The advantage: only the hardened security systems are visible on the outside toward the cloud. These are constantly updated and equipped to withstand all current threats. Behind this strong protective screen, the analysis applications poerate with a direct link to the machine without updates and patches causing constant interruptions. This rules out interference in the coordinated workflows.

Service and maintenance in the engineering sector: branch-specific CRM tackles the challenges

Frank Kullmann, ADITO Software GmbH
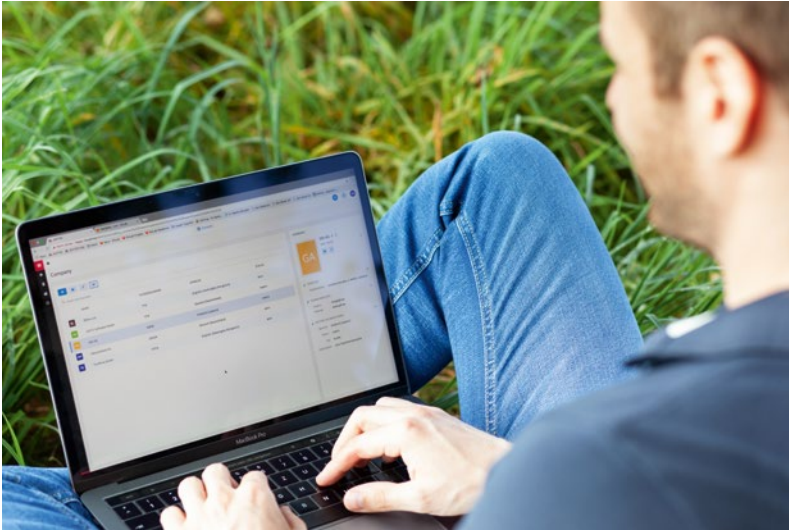
Companies in the engineering sector are facing the challenge of how to connect man, machine and product. The answer is to have all processes running on a platform. This ensures information is available to every member of staff in real time, whether they work in marketing, sales or service.

The right CRM equips engineering firms to cope with the challenges facing the industry, particularly when it comes to mobile maintenance and field service. A CRM brings together data from across various applications in a central location and also permits transparent opportunity management, continuous service, automated processes and efficient route planning.

Mobile solutions make data available even when out en route, and are becoming increasingly important particularly where service is concerned. For example, a deployment planning app shows service technicians their assignments and jobs on a smart phone or tablet and lets them enter reports of customer visits directly in the CRM before leaving the site.

Where maintenance is concerned, customers benefit from faster processing of their enquiries. Implementing a CRM is worthwhile and has a positive effect on customer satisfaction. Despite the practical advantages, only few companies have opted for mobile services up to now.

Better overview for maintenance

A branch-optimized CRM also has a central platform for service and maintenance. The right system lets a company visualize important maintenance work, including, among others:

- **Automatic recording of error messages:** a machine reports an error code. The CRM reacts and triggers a service case or sends a message to a machine operator who remedies the problem, for example.
- **Predictive maintenance:** the CRM draws attention to the fact that maintenance work is due after a stipulated quantity of products has been made.
- **Unscheduled maintenance:** in the case of machine failure, the system helps to make capacities available as soon as possible and sends a suitable technician to the customer. It is thus possible for companies to comply with contractually stipulated times for restoring the original status.

A CRM solution geared specifically to the engineering sector is a useful tool for optimizing a company's processes, boosting customer satisfaction and also improving the bottom line in the long term.

Simulating and planning connected production

Heike Wilson, DUALIS GmbH IT Solution

Today's market expects manufacturing companies to be highly innovative as well as capable of changing and acting quickly. All manufacturing processes and parameters must therefore function smoothly with holistic evaluation and optimization. Furthermore, all parts of the production process need realistic visualization, simulation and planning in order to make the connected factory predictable.

German industry is being defined by digitalization: this is what sets the pace. Connectivity and automation dictate the way forward for anyone who wants to keep up with the new framework conditions and the new speed of things. This is new ground for many companies so that they need good planning.

3D simulation platforms such as Visual Components can be used to visualize, test and optimize systems and machinery together with concatenated production workflows both before these are put into practice and also during ongoing operation. Simulation enhances efficiency and planning certainty in the digitally connected factory.

All parts need to be considered in the simulation, particularly with a view to Industrie 4.0 where machines and products communicate with each other. It is therefore advisable to use simulation tools that combine robot, multi-resource and material flow simulation on one platform. This not only depicts the logic of a robot but also the behaviour of other system-relevant components, how they work together and interact with over-riding control systems.

Moreover, the production and logistics processes should also be planned accordingly during on-going operation, using advanced planning and scheduling systems (APS) for example. Fine planning tools like this make complex manufacturing processes calculable by ensuring precise coordination of orders and the needed resources, tooling times and delivery times.

The increasingly connected and digitalized factory is bringing production planners and managers into contact with processes, systems and technologies that they were not familiar with up to now. In other words, they need tools for simulating, planning and controlling the production-relevant parameters such as staff, material and scheduling.

The smart factory also includes servitization

Stefan Gesele, IFS Deutschland GmbH & Co KG

The pressure of competition is growing, and so are customer expectations. For industrial companies, there is no getting around the need for new service initiatives.

Modern digitalization technologies such as the Internet of Things open the doors for industrial companies not just to smart automation. They also facilitate "servitization". In addition to their products, companies can also offer smart services or even set up completely new service-oriented business models.

An engineering firm for instance then no longer sells machines but machine run time or operating results, such as a certain number of processed workpieces. The necessary data or times from operation of the machines are registered by sensors and sent back automatically by an IoT link.

Servitization offers industrial companies an opportunity for generating additional sales and thus for further growth. But it is also steadily becoming more crucial. In times when products increasingly resemble each other while market competition gets tougher all the time, services are turning into the key factor for customer loyalty. Indeed, companies also often find they have simply no other choice than to accept the need for new services. Their customers are naturally aware of the new technological possibilities and tend to take corresponding services for granted.

And so basically, industrial companies are no longer just manufacturers. To an ever greater extent they find themselves in the role of service provider, which nearly always means having to deal with a new line of business. The business software used in industrial companies plays a central role in how they react to these changes. As a rule, the business software will be the core element of their IT landscape. It therefore has to be able to support the new tasks as quickly as possible.

The best way to do this is by simply upgrading the existing installation with the components needed to depict the additional processes. Configuration to new workflows could then also make it possible for example to implement use-oriented billing models without complex modifications to the source code. To automate necessary communication with customers, it should preferably have open, easily configured interfaces for electronic data interchange or even already an IoT connector.

Optimizing and automating processes: edge computing applications as the key to higher productivity

Dr. Oliver Trinchera, KINEXON Industries GmbH

Horizontal edge computing platforms like KINEXON RIoT overcome these obstacles. They have standardized, open interfaces for connecting any sensors, devices and applications of all makes with minimum latency. The real-time capability is achieved among others by an elastic edge architecture with high-performance stream processing based on machine learning and artificial intelligence. Increasingly, details regarding the pure status data of an object is also enriched by information about its location and movement. Adding the location context results in a completely new kind of intelligence. It decides in a fraction of a second on the best way for objects to interact, thus avoiding errors before they even occur. This not only makes factory processes transparent but also optimizes and automates them.

For example, a screwing process is blocked as soon as there's a faulty screwing connection. Forklifts detect automatically which asset has to be loaded or unloaded at which point. Fleets of driverless transport robots are connected with the corresponding goods and sent on the most efficient route. The result consists in significant productivity jumps due to full transparency as well as real-time optimization and automation of industrial processes thus boosting companies in their competitive ability.

When we talk about the industrial Internet of Things, we assume that in future the things will communicate and interact fully automatically with each other. To make that vision come true, we need to know the exact location and status of the relevant objects within the supply chain. Moreover, we need to connect the things and enrich them by a new form of real-time intelligence that makes them interact in the fastest and smartest way for more productivity.

There are two central obstacles that have to be overcome here: firstly, the predominantly vertical IT structures. Today there is practically no interoperability between sensors, devices and applications of different makes. Already existing connectivity was created more by customizing, rather than taking a systematic approach. Valuable insights resulting from connecting objects thus remain undiscovered. On the other hand there are major challenges in connecting up the millions of sensors to the cloud in real-time, because the bandwidth for data transfer is limited and the way to the cloud and back is usually associated with high latencies.

Augmented reality: the new HMI?

Hans-Jürgen Kraatz, Rockwell Automation

In recent years, the ongoing development of various information technologies has reached a point where both software and service-oriented business models play an increasingly significant role for the engineering sector. Corresponding technologies include augmented and virtual reality, IIoT (Industrial Internet of Things) platforms, agile software development methods and also machine learning algorithms and aspects of artificial intelligence. Without doubt, some of these technologies can be potentially disruptive, but will result at least in significant changes in the industry.

One of the most interesting developments of recent years consists in IIoT platforms in combination with augmented reality (AR) functionality. A recent study by the Aberdeen Group revealed that companies are facing a disruptive threat generated by the rapid pace of the global market, digital change and the growing skills shortage. It also showed that companies investing in AR are giving themselves a clear competitive advantage.

In corporate use, augmented reality enables workers to understand and interact with the physical and digital world, acquiring new skills with reduced induction times and costs. It also lets them take informed decisions more quickly. The result for the company is higher productivity with more effective induction, production and service.

Augmented and virtual reality (VR) are nothing new: the solutions have been on the market for many years. But two particular developments have led to the current level of maturity in terms of practical suitability. On the one hand, this refers to currently available hardware for 3D visualization, together with the meanwhile drastically reduced cost of producing AR applications, a-k-a- experiences. Leading AR tools develop even complex applications in just a few days. The technology is therefore interesting not just for complex applications in areas such as simulation for reducing engineering and commissioning times. AR is meanwhile increasingly being used to visualize work and repair instructions as well as training manuals. It is also an ideal means of demonstrating complex technical processes in the sales context.

Wearing 3D headsets, plant operators and machine users can see process and system values directly in their line of vision, together with further explanations and manual information when the need arises. Augmented reality can also include technical documentation, purchase orders for spare parts or consulting maintenance staff. It opens up many new possibilities for operating and observing machines, processes and plants. The traditional control panel is being replaced by the new HMI (Human Machine Interface).

Augmented reality has the potential of completely revolutionizing the whole HMI issue.

Digitalization in the die and mould sector: practical added value

Dr. Daniel Dünnebacke, oneIDentity+ GmbH

Digitization is THE management catchphrase in engineering. The main question facing companies is how their own analogue products can be integrated in the new digital world - a process that might not always be voluntary but is certainly necessary to ensure future requirements can be fulfilled and to uphold or even expand a company's competitive ability.

In 2017, the Ceratizit Group, a leading manufacturer of precision tools, asked exactly the same question. Initially, the answer was amazingly simple: "Unique product marking was and is the basis that we need for connecting up with every kind of digital and mobile services. For us, this is the logical first step on the way to the smart product", explains Jochen Metschke, Project Manager Industrie 4.0 at Ceratizit.

With the aim of enhancing efficacy and efficiency as well as assisting their own processes and those of customers and service providers, a process was established for unique marking of the drills, milling cutters etc. Since then, tools are lasered with a two-dimensional GS1 data matrix code for unique identification, also linking the tool with specific data, processes and services.

Working together with oneIDentity+ GmbH, Ceratizit used the serialized marking as the basis for devising and implementing various services which were then made available to the stakeholders in the value adding chain. Here oneIDentity+ offers a cloud service platform for digital management of products, together with flexible, role-based orchestration of various services. The provision of serialized numbers via standardized interfaces or comprehensive reports via scans for analyzing the flow of goods are just two of the many other functionalities provided by the platform.

Since 2018, it is now also possible for instance to call up product data with a smart phone app; records can be kept of regrinding processes and test reports can be linked in digitally, all on the basis of a dedicated rights and role system with one central access point: oneIDentity+. Product digitalization opens up possibilities for optimizing many business processes and models in the future.

This is just one first step towards digitalization. Many more are sure to follow at Ceratizit.

Pull-oriented supply chain digitalization – cost-benefit assessment

Dr. Christian Wittleder, datura manufacturing AG

The digitalization of supply chain processes with appropriate automation can result in considerable cost reductions. It all depends on the demand-related organization of order processing in administration, production and logistics in accordance with the value flow.

Process digitalization should always be preceded by corresponding optimization based on lean principles to avoid waste in the company. Only the digitization of value-adding processes assures the comparative advantages of higher profitability and greater cash flow. The cash flow itself depends on the order/information workflow. Lean accounting methods analyse these workflow relationships based on lean measures and their financial impacts on turnover, costs and cash flow.

Widespread cost accounting systems fail to provide adequate support for lean accounting. The way cost centres are viewed, the redistribution of fixed costs to individual products as well as the general definition of personnel costs as variable result in production and stock planning decisions that counteract lean methods and fail to indicate any achieved waste prevention.

Lean accounting integrates the benefit of pull production systems and its digitalization in a cash flow-oriented assessment of production and the related processes. Production in Kanban cycles or time buckets in case of make to order manufacturing results in demand driven sequencing of the complete supply chain. Pull-oriented processes in logistics, production and administration result in significant improvements regarding lead time, inventory reduction and on time delivery. Digitalization furthermore results in considerable cost reductions even in case of an increasing number of transactions at the same time.

Benefit analysis of digitalization in the lean philosophy consists of a cash flow-oriented assessment of transactions in sales, production scheduling and purchasing. The use of intelligent dash buttons on the shop floor leads to a complete automation of logistic and administration processes through digitalization. This also applies to shop floor management with special PPS systems that explicitly support pull organization, such as E Kanban or work cycle oriented order management.

Platform Economy –
vast potential for new business models

Volker Schnittler

Internet-based product and service platforms have become well-established in the consumer and service sector. Now, this business model for tapping new sales potential and improving customer loyalty is finding its way into the capital goods industry.

The concept is so successful because it focuses on the benefits for the user. A platform can only create added value that generates customer loyalty if the user finds a broad range available that encompasses most of the products and services needed on a daily basis. And so companies that advocate platforms are turning from being the traditional product supplier into part of a value-added network that extends beyond their traditional product range. On the one hand, they work in partnership with others to provide products and services, while on the other hand facing up to market competition with a deliberate, open approach.

In this context, management is transforming from the traditional role of running departments or divisions into collaboratively orchestrating ecosystems around platforms over and beyond company frontiers. The aim is to generate data- and service-based business models that create added value for all the partners involved, thus enhancing the whole ecosystem and sustainably positioning the individual company.

On the internal level, this paradigm shift demands in particularly great attention and deliberate team management. In contrast to the past, bringing the product to market is a team achievement with the involvement of many areas that previously just provided support within the actual value creation process. Staff must be taken along and integrated with the processes, thus making collaborative leadership indispensable.

Connectivity and interoperability are basic prerequisites for the success of connected business models. But this affects more than just the technical structure of the networks. Connectivity itself begins with the people, with the staff involved. Staff are taken along, knowledge is shared, every employee must know what is happening with digitalization in the company and in the value-creation network beyond it. The stakeholders must understand how processes function to optimize their own contribution and suggest possible improvements.

With regard to the platform economy, the VDMA offers its member companies support as a network platform and with information about the topic.

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IoT-Platforms

IoT Infrastructure Provider

AIT	www.aitgmbh.de	Körber	www.koerber.de
ams.Solution	www.ams-erp.com	logi.cals	www.logicals.com
Configit	www.configit.com	logi.cals automation solutions & services	www.logicals.com
generic.de	www.generic.de	Q-loud	www.q-loud.de
HighConsulting	www.crsm.biz	Siemens Industry Software	www.siemens.com/plm
IBM Deutschland	www.ibm.de	symmedia	www.symmedia.de
INFORM	www.inform-software.de	Trebing & Himstedt Prozessautomation	www.t-h.de
INNEO Solutions	www.inneo.de	Voith	www.voith.com
Janz Tec	www.janztec.com		

IoT Platform supplier

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accessec	www.accessec.com	M&M Software	www.mm-software.com
AIT	www.aitgmbh.de	Membrain	www.membrain-it.com
ClassiX Software	www.classix.de	MPDV Mikrolab	www.mpdv.com
compacer	www.compacer.com	MPDV Mikrolab Niederlassung Heidelberg	www.mpdv.com
Configit	www.configit.com	Q-loud	www.q-loud.de
COSMO CONSULT	www.cosmoconsult.com	SAE schaarschmidt analytic engineering	www.sae-portal.de
Fischer Information Technology	www.fischer-information.com	SAP Deutschland	www.sap.com/germany
FORCAM	www.forcam.de	Siemens Industry Software	www.siemens.com/plm
GE Intelligent Platforms	www.ge.com/digital	SMS group	www.sms-group.com
generic.de	www.generic.de	Software Factory	www.sf.com
HighConsulting	www.crsm.biz	Sybit	www.sybit.de
IBM Deutschland	www.ibm.de	Topcom Kommunikationssysteme	www.topcom-group.de
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Machine learning

Guido Reimann

Everyone is talking about machine learning (ML) and artificial intelligence (AI). These technologies and their tools are going through continuous further development, overlapping into the industrial sector and thus also into engineering.

Machine learning is an important aspect of computer science and artificial intelligence. Computer programs based on machine learning use algorithms to automatically find solutions for new and unknown problems. The artificial system "recognizes" patterns and rules in the learning data it receives. Tools already established on the market help find the algorithms. New frameworks and platforms support the broad application of these topics in everyday project work. The technology offers many new, exciting approaches particularly for the engineering sector. Machine learning ensures that software and information technology are increasingly becoming the key factor driving innovation in engineering.

A topic for the future

Machine learning lets technical systems learn from experience, something that was hitherto reserved for natural beings. ML algorithms learn patterns and structures based on example data provided by people. They then apply this new knowledge to new, unknown cases. In many sectors of industry, the increasing interchangeability of individual machines means that in future, companies will be selling not just the machine but above all, supplementary services, thus bringing about a major shift in the business principles for the engineering sector. This explains why machine learning is increasingly featured on the agenda for management teams and individual departments of engineering firms.

VDMA Software and Digitalization helps companies to be successful in pursuing machine learning. The Association's network includes many members with acquired machine learning know-how. This knowledge should be put to profitable use for the engineering sector.

Machine Learning Quick Guide

The Association has produced the Machine Learning Quick Guide to help all members assess the business relevance of machine learning so that they can devise their own approach and define a corresponding strategy. It is intended to facilitate a structured view of the corresponding chances, benefits and risks.

The "Machine Learning" expert group brings together more than 30 experts from the engineering sector, automation firms and software companies. It is responsible for machine learning within the VDMA, constantly drawing up additional use cases with future relevance for the engineering sector.

You can find the Quick Guide online at sud.vdma.org

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Agile product development

Guido Reimann

Agility is based on working in small intervals, taking into account different group dynamic processes and thriving from the support of specialist, non-technical stakeholders. The goal of agile software development is to make the software development process leaner and more flexible than in conventional models. In essence, agile product development is all about feedback processes and cyclical (iterative) procedures on all levels, in programming, in the team and with the management. Agile software development is a counter movement to conventional software development, which is often regarded as heavyweight and bureaucratic. Agility is worthwhile if a project is subject to many plan-relevant changes during its lifecycle.

Cohesion in the development team

Modern software development is a remarkably dynamic process based on human interaction. Being a service provider in software development means carrying out a project with a team at the customer's site. The team takes centre stage in agile product development, with a focus on close, interdisciplinary collaboration. Agile methods support sharing, there is no top-down hierarchy and the collaboration of all employees is expressly desired. This helps bind the team even closer together.

Competitive edge and high-quality work

The most important elements for the customer, i.e. the elements which generate the highest business value, are always completed first. Large parts of the new software are already implemented in a productive manner long before the whole project is completed. This cyclical approach allows individual measurements to be implemented for the respective project, enabling each member of the development team to learn directly from their experiences and thus ensuring a realistic idea of the actual development speed.

Intensive communication with the customer: flexibility and shorter development times

Agile development processes are characterized by close and constant communication with the customer. This direct communication not only helps developers better understand what software the users actually require, but the users will be more understanding should an estimation by the developers need to be corrected.

The VDMA "Agile Software Development and Agile Project Management" expert group focuses on collecting and evaluating experiences and best practices, and making them applicable for the engineering industry. The expert group's main focus is on management tasks.

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Smart devices and mobile apps

Thomas Riegler

Cropping up at ever shorter intervals, innovations in the information technology sector prompt new developments in engineering that have an immense effect on products, production and the companies themselves. This trend is hardly new. Technology carriers, such as smart devices or wearables, are making their way from the consumer market to the industrial sector. Their widespread use is increasingly shaping users' expectations in terms of the operation and design of applications. Here, mobility is a crucial factor in tapping new mobile overall strategies which also result in changes to work processes.

Systematic analysis of the mobility potential

Many companies are faced with the question of which tasks and people within the company can actually be supported by mobile apps. Mobility serves to optimize business processes. The supported tasks can influence the company goals in many different ways. For example, the maintenance of a machine can be shortened, a wider range of employees can be involved in tasks, and hitherto manual tasks can be automated. Many companies already have numerous ideas for supporting various tasks. However, these should be systematically analyzed in order to make a sensible decision as to which apps are to be developed.

Simple application

App technologies are focused on creating a positive user experience which results from the actual and expected use of an interactive system or service. Apps should therefore be intuitive and easy to use, motivate the user and make using the app fun. The positive effects are obvious: fewer operating errors, quicker reactions thanks to clear information, as well as less downtime in production.

Employees are absolutely indispensable

Without the help of expert knowledge, it is virtually impossible to design interfaces with considerably higher user experience, even with the most advanced smart devices. The collaboration of many different experts is therefore essential in order to develop technically sound software that appeals to customers.

Particularly in the case of mobile apps and smart devices, companies need to muster courage to challenge established processes and to embrace new business models that will enable them to discover the real treasure hidden in these new technologies. VDMA Software and Digitalization offers support by providing a checklist for new business models for smart devices and mobile apps.

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Usability and user experience in the engineering industry

Thomas Riegler

Technology can be both easy and fun to use. This holds true for more than just the current smart phone and tablet generations for consumers. Many engineering companies have realized that functionality isn't everything. The products also have to be accepted by the users. More and more producers are therefore focusing on usability. This refers to the goal of making the operation of interactive products intuitive and easy to understand and thus more efficient.

Producers are meanwhile taking things to the next level: even the human machine interface (HMI) is to be fun, motivate users and give them a good feeling. The technical term for this is user experience, which describes the positive experience a user is to have when using the product.

VDMA Software and Digitalization supports its members and provides them with expert advice on the state-of-the-art design of HMIs from amongst their own ranks. This includes services such as information events, conferences and seminars.

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Software Development (Consulting & Individual Development)

Machine Learning

ADVES	www.adves.one	Intera	www.intera.de
AIT	www.aitgmbh.de	IPKS	www.ipks.de
andrena objects	www.andrena.de	iT Engineering Software Innovations	www.ite-si.de
ARNOLD IT Systems	www.arnold-it.com	IT Vision Technology	www.itvt.de
Balluff	www.balluff.com	Jungheinrich	www.jungheinrich.de
BEUMER Maschinenfabrik	www.beumergroup.com	Konica Minolta IT Solutions	www.konicaminolta.de/it
birkle IT	www.birkle-it.com	Körber	www.koerber.de
compacer	www.compacer.com	M&M Software	www.mm-software.com
Configit	www.configit.com	MODUS Consult	www.modusconsult.de
Consort IT	www.consort-it.de	N+P Informationssysteme	www.nupis.de
COSMO CONSULT	www.cosmoconsult.com	NewTec	www.newtec.de
DIENES Apparatebau	www.dienes.net	ORBIS	www.orbis.de
DOCUFY	www.docufy.de	PIKON Deutschland	www.pikon.com
e-GITS	www.e-gits.com	PSI Technics	www.psi-technics.com
Eckelmann	www.eckelmann.de	REINHOLZ Software & Technology	www.reinholz-sat.de
ERGOSIGN	www.ergosign.de	SAP Deutschland	www.sap.com/germany
ERNI (Deutschland)	www.betterjoin.erni	schrempp edv	www.schrempp-edv.de
ETABO	www.eta-bochum.de	Siemens Industry Software	www.siemens.com/plm
FAUDE Automatisierungstechnik	www.faude.de	SMS group	www.sms-group.com
GAL Digital	www.gal-digital.de	Software Factory	www.sf.com
GE Intelligent Platforms	www.ge.com/digital	Sybit	www.sybit.de
SC Gemini CAD Systems SRL	www.geminicad.com	toolbox Software	www.toolbox-software.com
generic.de	www.generic.de	UNITY	www.unity.de
GFOS	www.gfos.com	User Interface Design	www.uid.com
IBM Deutschland	www.ibm.de	USU Software Niederlassung Karlsruhe	www.usu.de/de
in-tech	www.in-tech.com	XITASO	www.xitaso.com
Industrie Reply	www.reply.com	XITASO Engineering	www.xitaso.com
INFORM	www.inform-software.de		

Requirements Engineering

abilis	www.abilis.de	GODYO Business Solutions	www.godyo.com
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AIT	www.aitgmbh.de	HEITEC	www.heitec.de
andrena objects	www.andrena.de	IBM Deutschland	www.ibm.de
Balluff	www.balluff.com	IMS Maschinen- u. Anlagenbau	www.ims-deutschland.com
BEOS Beratung & Software	www.beos-software.de	in-tech	www.in-tech.com
birkle IT	www.birkle-it.com	Industrie Reply	www.reply.com
Centigrade	www.centigrade.de	induux international	www.lightwerk.de
ClassiX Software	www.classix.de	Infor (Deutschland)	www.infor.com
COMTRI	www.comtri.de	INFORM	www.inform-software.de
Configit	www.configit.com	INNEO Solutions	www.inneo.de
Consort IT	www.consort-it.de	Intera	www.intera.de
CONTACT Software	www.contact.de	iT Engineering Software Innovations	www.ite-si.de
COSMO CONSULT	www.cosmoconsult.com	IT Vision Technology	www.itvt.de
Dassault Systemes Deutschland	www.3ds.com	ITQ	www.itq.de
DOCUFY	www.docufy.de	Janz Tec	www.janztec.com
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EAS	www.eas-solutions.de	Konica Minolta IT Solutions	www.konicaminolta.de/it
Eckelmann	www.eckelmann.de	Körber	www.koerber.de
eEvolution	www.eevolution.de	Lino	www.lino.de
ERGOSIGN	www.ergosign.de	M&M Software	www.mm-software.com
ERNI (Deutschland)	www.betterjoin.erni	macio	www.macio.de
ETABO	www.eta-bochum.de	Dr.-Ing. Helmut Maier CSS	www.maiercss.de
Ferrocontrol Steuerungssysteme	www.ferrocontrol.de	MODUS Consult	www.modusconsult.de
Freudenberg IT	www.freudenberg-it.com	NewTec	www.newtec.de
GAL Digital	www.gal-digital.de	ondeso	www.ondeso.com
generic.de	www.generic.de	Opdenhoff Technologie	www.opdenhoff.de

Requirements Engineering

ORISA Software	www.orisa.de	Siemens Industry Software	www.siemens.com/plm
oxaion	www.oxaion.de	Software Factory	www.sf.com
PDTec	www.pdtec.de	Sybit	www.sybit.de
PIKON Deutschland	www.pikon.com	syscon	www.syscon-online.com
PLATO	www.plato.de	TechniaTranscat	www.techniatranscat.com
POWERCASE FORMULA CRM	www.formulacrm.de	Techniciency Consulting	www.techniciency.de
proCtec	www.proctec.de	toolbox Software	www.toolbox-software.com
PROFIT SYSTEMHAUS	www.profit-systemhaus.de	TopM Software	www.topm.de
PSI Automotive & Industry	www.psi-automotive-industry.de	UNITY	www.unity.de
Qualysoft	www.qualysoft.com/de	User Interface Design	www.uid.com
Reichhardt	www.reichhardt.com	WSCAD	www.wscad.de
REINHOLZ Software & Technology	www.reinholz-sat.de	XITASO	www.xitaso.com
S & P Computersysteme	www.sup-logistik.de	XITASO Engineering	www.xitaso.com
Schneider Electric Software Germany	www.wonderware.de	Your Expert Cluster	www.yourexpertcluster.de
schrempp edv	www.schrempp-edv.de	znt	www.znt-richter.com
Schubert & Salzer Data	www.data-systems.info	Zühlke Engineering	www.zuehlke.com

Software quality

accessec	www.accessec.com	Intera	www.intera.de
ADVES	www.adves.one	iT Engineering Software Innovations	www.ite-si.de
AIT	www.aitgmbh.de	IT Vision Technology	www.itvt.de
ams.Solution	www.ams-erp.com	ITQ	www.itq.de
andrena objects	www.andrena.de	Janz Tec	www.janztec.com
Balluff	www.balluff.com	Jungheinrich	www.jungheinrich.de
BEOS Beratung & Software	www.beos-software.de	Konica Minolta IT Solutions	www.konicaminolta.de/it
birkle IT	www.birkle-it.com	Körber	www.koerber.de
Centigrade	www.centigrade.de	logi.cals	www.logicals.com
COMTRI	www.comtri.de	logi.cals automation solutions & services	www.logicals.com
Configit	www.configit.com	M&M Software	www.mm-software.com
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DCC global	www.dcc-global.com	MODUS Consult	www.modusconsult.de
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eEvolution	www.eevolution.de	PIKON Deutschland	www.pikon.com
ERGOSIGN	www.ergosign.de	PLANWARE Beratung & Software	www.planware.de
ERNI (Deutschland)	www.betterjoin.erni	PROFIT SYSTEMHAUS	www.profit-systemhaus.de
ETABO	www.eta-bochum.de	PSI Technics	www.psi-technics.com
FAUDE Automatisierungstechnik	www.faude.de	Qualysoft	www.qualysoft.com/de
Ferrocontrol Steuerungssysteme	www.ferrocontrol.de	REINHOLZ Software & Technology	www.reinholz-sat.de
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generic.de	www.generic.de	Siemens Industry Software	www.siemens.com/plm
GODYO Business Solutions	www.godyo.com	STAR Deutschland	www.star-group.net
HALO-electronic	www.inteos.com	TechniaTranscat	www.techniatranscat.com
HEISAB	www.heisab.de	User Interface Design	www.uid.com
HEITEC	www.heitec.de	viastore SOFTWARE	www.viastoresoftware.de
IBM Deutschland	www.ibm.de	WIBU-SYSTEMS	www.wibu.com
IMS Maschinen- u. Anlagenbau	www.ims-deutschland.com	XITASO	www.xitaso.com
in-tech	www.in-tech.com	XITASO Engineering	www.xitaso.com
Industrie Reply	www.reply.com	Your Expert Cluster	www.yourexpertcluster.de
induux international	www.lightwerk.de	znt	www.znt-richter.com
Infor (Deutschland)	www.infor.com	Zühlke Engineering	www.zuehlke.com
INFORM	www.inform-software.de		

Usability / Human Machine Interface / User Experience

3D Interaction Technologies	www.3dit.de	Körber	www.koerber.de
accelcon	www.accelcon.de	Kothes	www.kothes.de
ADVES	www.adves.one	Lino	www.lino.de
AIT	www.aitgmbh.de	logi.cals automation solutions & services	www.logicals.com
Balluff	www.balluff.com	M&M Software	www.mm-software.com
Beckhoff Automation	www.beckhoff.de	macio	www.macio.de
birkle IT	www.birkle-it.com	mlp	www.mlpgmbh.com
CaderaDesign	www.caderadesign.de	MODUS Consult	www.modusconsult.de
Centigrade	www.centigrade.de	NewTec	www.newtec.de
cognitas.	www.cognitas.de	Opdenhoff Technologie	www.opdenhoff.de
Configit	www.configit.com	OPTIMUM datamanagement solutions	www.optimum-gmbh.de
Consort IT	www.consort-it.de	ORBIS	www.orbis.de
COPA-DATA	www.copadata.de	ORISA Software	www.orisa.de
DCC global	www.dcc-global.com	oxaion	www.oxaion.de
DIENES Apparatebau	www.dienes.net	Perspectix	www.perspectix.com
DOCUFY	www.docufy.de	PIKON Deutschland	www.pikon.com
e-GITS	www.e-gits.com	PLANWARE Beratung & Software	www.planware.de
Eckelmann	www.eckelmann.de	POWERCASE FORMULA CRM	www.formulacrm.de
eEvolution	www.eevolution.de	proCtec	www.proctec.de
ERGOSIGN	www.ergosign.de	PROFIT SYSTEMHAUS	www.profit-systemhaus.de
ERNI (Deutschland)	www.betterjoin.erni	PSI Automotive & Industry	www.psi-automotive-industry.de
ESI ITI	www.simulationx.de	PSI Technics	www.psi-technics.com
ESSERT	www.essert.com	Qualysoft	www.qualysoft.com/de
ETABO	www.eta-bochum.de	Reichhardt	www.reichhardt.com
Ferrocontrol Steuerungssysteme	www.ferrocontrol.de	REINHOLZ Software & Technology	www.reinholz-sat.de
GAL Digital	www.gal-digital.de	S & P Computersysteme	www.sup-logistik.de
GE Intelligent Platforms	www.ge.com/digital	SAP Deutschland	www.sap.com/germany
generic.de	www.generic.de	Schneider Electric Software Germany	www.wonderware.de
GLAESS Software & Automation	www.glaess-software.de	schrempp edv	www.schrempp-edv.de
GODYO Business Solutions	www.godyo.com	Sedo Treepoint	www.sedo-treepoint.com
HALO-electronic	www.inteos.com	SETEX	www.setex-germany.com
HEISAB	www.heisab.de	Siemens Industry Software	www.siemens.com/plm
HEITEC	www.heitec.de	Smart HMI	www.smart-hmi.de
IBM Deutschland	www.ibm.de	SMS group	www.sms-group.com
ICONICS Germany	www.iconics.com	Software Factory	www.sf.com
IMS Maschinen- u. Anlagenbau	www.ims-deutschland.com	STAR Deutschland	www.star-group.net
in-tech	www.in-tech.com	Sybit	www.sybit.de
Industrie Reply	www.reply.com	TEDATA	www.tedata.de
induux international	www.lightwerk.de	Topcom Kommunikationssysteme	www.topcom-group.de
Infor (Deutschland)	www.infor.com	User Interface Design	www.uid.com
INFORM	www.inform-software.de	viastore SOFTWARE	www.viastoresoftware.de
INTER CONTROL	www.intercontrol.de	VÖLKEL Mikroelektronik	www.voelkel.de
Intera	www.intera.de	XITASO	www.xitaso.com
iT Engineering Software Innovations	www.ite-si.de	XITASO Engineering	www.xitaso.com
IT Vision Technology	www.itvt.de	Your Expert Cluster	www.yourexpertcluster.de
Janz Tec	www.janztec.com	znt	www.znt-richter.com
Jungheinrich	www.jungheinrich.de	Zühlke Engineering	www.zuehlke.com
Konica Minolta IT Solutions	www.konicaminolta.de/it		

Process Improvement

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abilis	www.abilis.de	ClassiX Software	www.classix.de
accelcon	www.accelcon.de	compacer	www.compacer.com
ADITO Software	www.adito.de	Configit	www.configit.com
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ams.Solution	www.ams-erp.com	DCC global	www.dcc-global.com
andrena objects	www.andrena.de	DIENES Apparatebau	www.dienes.net
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GAL Digital	www.gal-digital.de	PSI Technics	www.psi-technics.com
GE Intelligent Platforms	www.ge.com/digital	Qualysoft	www.qualysoft.com/de
SC Gemini CAD Systems SRL	www.geminicad.com	REINHOLZ Software & Technology	www.reinholz-sat.de
generic.de	www.generic.de	Rockwell Automation	www.rockwellautomation.de
GFOS	www.gfos.com	S & P Computersysteme	www.sup-logistik.de
GLAESS Software & Automation	www.glaess-software.de	Scheer	www.scheer-group.com
HEISAB	www.heisab.de	schrempp edv	www.schrempp-edv.de
HEITEC	www.heitec.de	Schubert & Salzer Data	www.data-systems.info
IBM Deutschland	www.ibm.de	SETEX	www.setex-germany.com
in-tech	www.in-tech.com	Siemens Industry Software	www.siemens.com/plm
Industrie Reply	www.reply.com	Software Factory	www.sf.com
INFORM	www.inform-software.de	STAR Deutschland	www.star-group.net
INNEO Solutions	www.inneo.de	Sybit	www.sybit.de
Intera	www.intera.de	symmedia	www.symmedia.de
iT Engineering Software Innovations	www.ite-si.de	syscon	www.syscon-online.com
IT Vision Technology	www.itvt.de	Techniciency Consulting	www.techniciency.de
Janz Tec	www.janztec.com	toolbox Software	www.toolbox-software.com
Jungheinrich	www.jungheinrich.de	Topcom Kommunikationssysteme	www.topcom-group.de
Konica Minolta IT Solutions	www.konicaminolta.de/it	User Interface Design	www.uid.com
Körber	www.koerber.de	WIBU-SYSTEMS	www.wibu.com
Lino	www.lino.de	WSCAD	www.wscad.de
M&M Software	www.mm-software.com	XITASO	www.xitaso.com
macio	www.macio.de	XITASO Engineering	www.xitaso.com
mlp	www.mlpgmbh.com	Your Expert Cluster	www.yourexpertcluster.de
MODUS Consult	www.modusconsult.de	Zuken E3	www.zuken.com
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Agile Development Methods

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accessec	www.accessec.com	HEISAB	www.heisab.de
ADITO Software	www.adito.de	HEITEC	www.heitec.de
ADVES	www.adves.one	IBM Deutschland	www.ibm.de
AIT	www.aitgmbh.de	in-tech	www.in-tech.com
ams.Solution	www.ams-erp.com	Industrie Reply	www.reply.com
andrena objects	www.andrena.de	INFORM	www.inform-software.de
Balluff	www.balluff.com	INNEO Solutions	www.inneo.de
BEUMER Maschinenfabrik	www.beumergroup.com	Intera	www.intera.de
birkle IT	www.birkle-it.com	IPKS	www.ipks.de
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ClassiX Software	www.classix.de	IT Vision Technology	www.itvt.de
Configit	www.configit.com	Janz Tec	www.janztec.com
Consort IT	www.consort-it.de	Jungheinrich	www.jungheinrich.de
COSMO CONSULT	www.cosmoconsult.com	kommunikationsoptimierer.de	www.kommunikationsoptimierer.de
DOCUFY	www.docufy.de	Konica Minolta IT Solutions	www.konicaminolta.de/it
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Eckelmann	www.eckelmann.de	logi.cals	www.logicals.com
eEvolution	www.eevolution.de	logi.cals automation solutions & services	www.logicals.com
ERGOSIGN	www.ergosign.de	M&M Software	www.mm-software.com
ERNI (Deutschland)	www.betterjoin.erni	macio	www.macio.de
ETABO	www.eta-bochum.de	Dr.-Ing. Helmut Maier CSS	www.maiercss.de
GE Intelligent Platforms	www.ge.com/digital	MODUS Consult	www.modusconsult.de

Agile Development Methods

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oxaion	www.oxaion.de	Techniciency Consulting	www.techniciency.de
Perspectix	www.perspectix.com	toolbox Software	www.toolbox-software.com
PIKON Deutschland	www.pikon.com	Topcom Kommunikationssysteme	www.topcom-group.de
PLANWARE Beratung & Software	www.planware.de	TopM Software	www.topm.de
POWERCASE FORMULA CRM	www.formulacrm.de	UNITY	www.unity.de
PSI Technics	www.psi-technics.com	User Interface Design	www.uid.com
Qualysoft	www.qualysoft.com/de	viastore SOFTWARE	www.viastoresoftware.de
REINHOLZ Software & Technology	www.reinholz-sat.de	WSCAD	www.wscad.de
schrempp edv	www.schrempp-edv.de	XITASO	www.xitaso.com
Siemens Industry Software	www.siemens.com/plm	XITASO Engineering	www.xitaso.com
SMS group	www.sms-group.com		

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ACAM Engineering	www.acam.at	IPKS	www.ipks.de
accelcon	www.accelcon.de	iT Engineering Software Innovations	www.ite-si.de
accessec	www.accessec.com	IT Vision Technology	www.itvt.de
ADITO Software	www.adito.de	Janz Tec	www.janztec.com
ADVES	www.adves.one	kommunikationsoptimierer.de	www.kommunikationsoptimierer.de
AIT	www.aitgmbh.de	Konica Minolta IT Solutions	www.konicaminolta.de/it
andrena objects	www.andrena.de	Körber	www.koerber.de
ARC Solutions	www.arcsolutions.de	Lino	www.lino.de
ARNOLD IT Systems	www.arnold-it.com	M&M Software	www.mm-software.com
Balluff	www.balluff.com	macio	www.macio.de
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cognitas.	www.cognitas.de	NewTec	www.newtec.de
Configit	www.configit.com	ofischer communication	www.ofischer.com
Consort IT	www.consort-it.de	ORBIS	www.orbis.de
COPA-DATA	www.copadata.de	ORISA Software	www.orisa.de
COSMO CONSULT	www.cosmoconsult.com	oxaion	www.oxaion.de
DIENES Apparatebau	www.dienes.net	PIKON Deutschland	www.pikon.com
DOCUFY	www.docufy.de	POWERCASE FORMULA CRM	www.formulacrm.de
e-GITS	www.e-gits.com	PSI Technics	www.psi-technics.com
Empolis Information Management	www.empolis.com	Qualysoft	www.qualysoft.com/de
entergon	www.entergon.de	salesforce.com Germany	www.salesforce.com
ERGOSIGN	www.ergosign.de	Scheer	www.scheer-group.com
ERNI (Deutschland)	www.betterjoin.erni	schrempp edv	www.schrempp-edv.de
ESSERT	www.essert.com	Schubert & Salzer Data	www.data-systems.info
ETABO	www.eta-bochum.de	Siemens Industry Software	www.siemens.com/plm
FAUSER	www.fauser.ag	Smart HMI	www.smart-hmi.de
GAL Digital	www.gal-digital.de	SMS group	www.sms-group.com
GE Intelligent Platforms	www.ge.com/digital	Software Factory	www.sf.com
generic.de	www.generic.de	STAR Deutschland	www.star-group.net
GFOS	www.gfos.com	Sybit	www.sybit.de
GLAESS Software & Automation	www.glaess-software.de	TEDATA	www.tedata.de
HALO-electronic	www.inteos.com	toolbox Software	www.toolbox-software.com
HEISAB	www.heisab.de	TopM Software	www.topm.de
HEITEC	www.heitec.de	User Interface Design	www.uid.com
IBM Deutschland	www.ibm.de	VÖLKEL Mikroelektronik	www.voelkel.de
in-tech	www.in-tech.com	XITASO	www.xitaso.com
Industrie Reply	www.reply.com	XITASO Engineering	www.xitaso.com
INFORM	www.inform-software.de	znt	www.znt-richter.com
INNEO Solutions	www.inneo.de		

Industrial Security –
security in the digital future

Industrial security protects industrial communications and production systems to ensure that industry can produce safely and reliably. The engineering sector assumes a dual role in this context. As a system operator, it aims to digitalize production processes, while as an integrator it focuses on developing new machines, systems, services and business models for its customers within the framework of Industrie 4.0. The engineering firm thus has great responsibility when defining security requirements and developing, implementing and updating measures based on these requirements.

The engineering sector must ensure confidentiality so that no-one else can provide the service. This means that companies face the challenge of having to ensure integrity, availability and confidentiality over the entire duration of the service – starting out with the planning of the service on to the provision of the machine and finally the permanent operation. At the same time, companies need to embed their existing, often self-sufficient and statistical systems in agile communication structures. The machines and systems are not made for that purpose and frequently upgraded or converted under time pressure, without corresponding adjustments to the legally and technically necessary requirements of standards and data security.

Compiling knowledge instead of actionism

The earlier that companies integrate knowledge about potential threats, necessary measures and useful sources of information into the product life cycle, the more sustainable and reliable the implementation measures will be. The "Guideline Industrie 4.0 Security" published by VDMA provides key recommendations for the integration of security in products and systems.

Further information can be found at industrialsecurity.vdma.org

Information Security / Know-how Protection

Industrial Security – solutions for manufacturing / products

@-yet	www.add-yet.de
ads-tec	www.ads-tec.de
Balluff	www.balluff.com
birkle IT	www.birkle-it.com
Bosch Rexroth	www.boschrexroth.com/de/de
COMTRI	www.comtri.de
Consort IT	www.consort-it.de
COPA-DATA	www.copadata.de
Docware	www.docware.de
GE Intelligent Platforms	www.ge.com/digital
genua	www.genua.de
GFOS	www.gfos.com
GODYO Business Solutions	www.godyo.com
HEITEC	www.heitec.de
HighConsulting	www.crsm.biz
HiSolutions	www.hisolutions.com
IBM Deutschland	www.ibm.de
INNEO Solutions	www.inneo.de
Intera	www.intera.de
IT Vision Technology	www.itvt.de
itelligence	www.itelligence.de
Janz Tec	www.janztec.com
Konica Minolta IT Solutions	www.konicaminolta.de/it
Körber	www.koerber.de
MODUS Consult	www.modusconsult.de
NewTec	www.newtec.de
ondeso	www.ondeso.com
Phoenix Contact Cyber Security	www.phoenixcontact-software.com
PROFIT SYSTEMHAUS	www.profit-systemhaus.de
PROSTEP	www.prostep.com
REINHOLZ Software & Technology	www.reinholz-sat.de
Rhebo	www.rhebo.com
Rockwell Automation	www.rockwellautomation.de
Securikett Ulrich & Horn	www.securikett.com
SEEBURGER	www.seeburger.de
SMS group	www.sms-group.com
Software Factory	www.sf.com
symmedia	www.symmedia.de
TechniaTranscat	www.techniatranscat.com
Voith	www.voith.com
WIBU-SYSTEMS	www.wibu.com
XITASO	www.xitaso.com
XITASO Engineering	www.xitaso.com

IT Security – solutions for office applications

Abass	www.abass.de
@-yet	www.add-yet.de
birkle IT	www.birkle-it.com
Bosch Rexroth	www.boschrexroth.com/de/de
Brainloop	www.brainloop.com
COMTRI	www.comtri.de
Consort IT	www.consort-it.de
Docware	www.docware.de
eEvolution	www.eevolution.de
genua	www.genua.de
GFOS	www.gfos.com
GODYO Business Solutions	www.godyo.com
HighConsulting	www.crsm.biz
HiSolutions	www.hisolutions.com
IBM Deutschland	www.ibm.de
IMS Maschinen- u. Anlagenbau	www.ims-deutschland.com
INNEO Solutions	www.inneo.de
Intera	www.intera.de
ISAP	www.isap.de
IT Vision Technology	www.itvt.de
Konica Minolta IT Solutions	www.konicaminolta.de/it
MODUS Consult	www.modusconsult.de
NewTec	www.newtec.de
Phoenix Contact Cyber Security	www.phoenixcontact-software.com
PROFIT SYSTEMHAUS	www.profit-systemhaus.de
SAP Deutschland	www.sap.com/germany
Voith	www.voith.com
WIBU-SYSTEMS	www.wibu.com

Product independent consulting

accessec	www.accessec.com
@-yet	www.add-yet.de
All for One Steeb	www.all-for-one.com
ARC Solutions	www.arcsolutions.de
birkle IT	www.birkle-it.com
Computer System	www.cs-ilmenau.de
Consort IT	www.consort-it.de
ERNI (Deutschland)	www.betterjoin.erni
Freudenberg IT	www.freudenberg-it.com
GE Intelligent Platforms	www.ge.com/digital
genua	www.genua.de
GFOS	www.gfos.com
HiSolutions	www.hisolutions.com
ID-Consult	www.id-consult.com
induux international	www.lightwerk.de
Intera	www.intera.de
Janz Tec	www.janztec.com
Konica Minolta IT Solutions	www.konicaminolta.de/it
M&M Software	www.mm-software.com
MODUS Consult	www.modusconsult.de
NewTec	www.newtec.de
ondeso	www.ondeso.com
proCtec	www.proctec.de
PROSTEP	www.prostep.com
REINHOLZ Software & Technology	www.reinholz-sat.de
Software Factory	www.sf.com
syscon	www.syscon-online.com
UNITY	www.unity.de
valantic Supply Chain Excellence	www.valantic.com
Voith	www.voith.com
XITASO	www.xitaso.com
XITASO Engineering	www.xitaso.com
znt	www.znt-richter.com
Zühlke Engineering	www.zuehlke.com

Virtual and augmented reality

Thomas Riegler

The growing need for skilled qualified workers and the increasing requirements that are being made of technology are boosting the demand for technical support in the various departments of engineering firms.

This explains the huge increase in demand for augmented and virtual reality solutions where computers extend the perception of reality with visual transmission of information. Football broadcasts already use this approach, supplementing reality with a circle or line to show the distances involved in a free kick, for example.

Industrial applications use mobile devices such as tablets, smart phones and above all, so-called smart glasses. Smart glasses not only show virtual reality but are also equipped with a camera, mike and headphones for interaction with other people. Teams can thus work together to solve difficult tasks even when not all the experts and necessary information are on the spot.

The VDMA IT Report 2018 to 2020 clearly shows that virtual/augmented and mixed reality is meanwhile important for around 70 percent of the respondents. Every fifth company is already using corresponding solutions, and this should increase to around 45 percent by 2020. The trend is being driven above all by medium-sized and larger companies. Up to now, the main applications for these solutions have been in customer service, sales and development. Other possible uses include training, simulation, production and installation as well as logistics.

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Virtual / Augmented / Mixed Reality

Solutions for customer service

3D Interaction Technologies	www.3dit.de	M&M Software	www.mm-software.com
BEUMER Maschinenfabrik	www.beumergroup.com	macio	www.macio.de
Blauhut & Partner Informationssysteme	www.procos.de	mobileX	www.mobilexag.de
Bosch Rexroth	www.boschrexroth.com/de/de	N+P Informationssysteme	www.nupis.de
cognitas.	www.cognitas.de	SAE schaarschmidt analytic engineering	www.sae-portal.de
Configit	www.configit.com	Scheer	www.scheer-group.com
COSMO CONSULT	www.cosmoconsult.com	schrempp edv	www.schrempp-edv.de
DATACOPY publishing solutions	www.datacopy.de	Siemens Industry Software	www.siemens.com/plm
ERGOSIGN	www.ergosign.de	SMS group	www.sms-group.com
ERNI (Deutschland)	www.betterjoin.erni	Software Factory	www.sf.com
Fischer Information Technology	www.fischer-information.com	Sybit	www.sybit.de
HEITEC	www.heitec.de	symmedia	www.symmedia.de
IFS Deutschland	www.ifsworld.com/de	User Interface Design	www.uid.com
INNEO Solutions	www.inneo.de	USU Software	www.usu.de/de
iT Engineering Software Innovations	www.ite-si.de	viastore SOFTWARE	www.viastoresoftware.de
Körber	www.koerber.de	Voith	www.voith.com
Kothes	www.kothes.de	WSCAD	www.wscad.de
Lino	www.lino.de	XITASO Engineering	www.xitaso.com

Solutions for marketing and sales

3D Interaction Technologies	www.3dit.de	Lino	www.lino.de
ACATEC Software	www.acatec.de	M&M Software	www.mm-software.com
camos Software und Beratung	www.camos.de	Perspectix	www.perspectix.com
cognitas.	www.cognitas.de	Qualysoft	www.qualysoft.com/de
Configit	www.configit.com	SAE schaarschmidt analytic engineering	www.sae-portal.de
COSMO CONSULT	www.cosmoconsult.com	Scheer	www.scheer-group.com
Eckelmann	www.eckelmann.de	Siemens Industry Software	www.siemens.com/plm
ERGOSIGN	www.ergosign.de	SMS group	www.sms-group.com
ERNI (Deutschland)	www.betterjoin.erni	Software Factory	www.sf.com
Fischer Information Technology	www.fischer-information.com	Sybit	www.sybit.de
IBM Deutschland	www.ibm.de	User Interface Design	www.uid.com
INNEO Solutions	www.inneo.de	viastore SOFTWARE	www.viastoresoftware.de
Körber	www.koerber.de	XITASO Engineering	www.xitaso.com

Solutions for further fields of application

3D Interaction Technologies	www.3dit.de
ACATEC Software	www.acatec.de
ERGOSIGN	www.ergosign.de
ERNI (Deutschland)	www.betterjoin.erni
Fischer Information Technology	www.fischer-information.com
SC Gemini CAD Systems SRL	www.geminicad.com
IBM Deutschland	www.ibm.de
INNEO Solutions	www.inneo.de
Körber	www.koerber.de
Lino	www.lino.de
M&M Software	www.mm-software.com
SAE schaarschmidt analytic engineering	www.sae-portal.de
Scheer	www.scheer-group.com
schrempp edv	www.schrempp-edv.de
Siemens Industry Software	www.siemens.com/plm
SMS group	www.sms-group.com
Software Factory	www.sf.com
User Interface Design	www.uid.com
Voith	www.voith.com
XITASO Engineering	www.xitaso.com

Product independent consulting

DATACOPY publishing solutions	www.datacopy.de
ERGOSIGN	www.ergosign.de
ERNI (Deutschland)	www.betterjoin.erni
ETABO	www.eta-bochum.de
GFOS	www.gfos.com
HEITEC	www.heitec.de
kommunikationsoptimierer.de	www.kommunikationsoptimierer.de
Lino	www.lino.de
M&M Software	www.mm-software.com
N+P Informationssysteme	www.nupis.de
Qualysoft	www.qualysoft.com/de
Scheer	www.scheer-group.com
schrempp edv	www.schrempp-edv.de
syscon	www.syscon-online.com
UNITY	www.unity.de
User Interface Design	www.uid.com
valantic Supply Chain Excellence	www.valantic.com
XITASO Engineering	www.xitaso.com

Customer relationship management and service management

In all change processes related to digitalization, the focus remains on the customer. This begins in sales and extends to the service department. Proper interaction with customers in all business areas makes a significant contribution to the success of a business. Systems which manage all customer activities are required to maintain and optimize existing customer relations.

Thomas Riegler

CRM systems and service management systems map the individual processes involved here. Increasingly, these systems are being merged into one – a sensible development, as information from sales is indispensable for the service department and vice versa.

All information about the customers and the installed basis is combined in one system, making data redundancy and discontinuities a thing of the past. Systematic design of all relations and interactions with existing and potential customers creates transparency, reduces reaction times and enhances customer loyalty. Other business units such as the development and design departments also benefit from these systems.

Digitalization is accompanied by ever increasing connectivity of both machines and employees, with the latter using mobile devices such as smartphones, tablets and smart glasses.

For 20 years, the Remote Service user forum in VDMA has been analyzing solutions which provide services via telecommunication systems.

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Customer Relationship Management (CRM)

Part of ERP

abas Software	www.abas-erp.com	HALO-electronic	www.inteos.com
ACBIS	www.acbis.de	HEISAB	www.heisab.de
All for One Steeb	www.all-for-one.com	HEITEC	www.heitec.de
alltrotec	www.alltrotec.de	HUMAN SOLUTIONS	www.human-solutions.de
ams.Solution	www.ams-erp.com	IFS Deutschland	www.ifsworld.com/de
Asseco Solutions	www.asseco.de/ap	Infor (Deutschland)	www.infor.com
ASSYST	www.assyst.de	Isah	www.isah.com
AVISTA ERP Software	www.avista-erp.de	itelligence	www.itelligence.de
BEOS	www.beos-software.de	Körber	www.koerber.de
birkle IT	www.birkle-it.com	KUMAVISION	www.kumavision.de
Blauhut & Partner Informationssysteme	www.procos.de	MODUS Consult	www.modusconsult.de
CATUNO	www.catuno.de	Opdenhoff Technologie	www.opdenhoff.de
ClassiX Software	www.classix.de	ORBIS	www.orbis.de
COMTRI	www.comtri.de	oxaion	www.oxaion.de
Configit	www.configit.com	proALPHA Business Solutions	www.proalpha.de
COSMO CONSULT	www.cosmoconsult.com	PROFIT SYSTEMHAUS	www.profit-systemhaus.de
CSS	www.css.de	PSI Automotive & Industry	www.psi-automotive-industry.de
datura manufacturing	www.swissdynamics.net	Sage	www.sage.de/mittelstand
DSC Software	www.dscsag.com	SAP Deutschland	www.sap.com/germany
eEvolution	www.eevolution.de	schrempp edv	www.schrempp-edv.de
FAUSER	www.fauser.ag	TopM Software	www.topm.de
Freudenberg IT	www.freudenberg-it.com	valantic Supply Chain Excellence	www.valantic.com
Geovision	www.geovision.de	WIBU-SYSTEMS	www.wibu.com
GODYO Business Solutions	www.godyo.com		

Stand-alone CRM / customer service solution

ACBIS	www.acbis.de	Konica Minolta IT Solutions	www.konicaminolta.de/it
ADITO Software	www.adito.de	Körber	www.koerber.de
ams.Solution	www.ams-erp.com	KUMAVISION	www.kumavision.de
BEOS Beratung & Software	www.beos-software.de	MODUS Consult	www.modusconsult.de
BEUMER Maschinenfabrik	www.beumergroup.com	ofischer communication	www.ofischer.com
Bosch Rexroth	www.boschrexroth.com/de/de	ORBIS	www.orbis.de
CAS Software	www.cas.de	ORISA Software	www.orisa.de
ClassiX Software	www.classix.de	Perspectix	www.perspectix.com
Configit	www.configit.com	PIKON Deutschland	www.pikon.com
Consort IT	www.consort-it.de	PiSA sales	www.pisasales.de
COSMO CONSULT	www.cosmoconsult.com	POWERCASE FORMULA CRM	www.formulacrm.de
CSS	www.css.de	PROFIT SYSTEMHAUS	www.profit-systemhaus.de
Docware	www.docware.de	PSI Automotive & Industry	www.psi-automotive-industry.de
entergon	www.entergon.de	SAE schaarschmidt analytic engineering	www.sae-portal.de
ETABO	www.eta-bochum.de	Sage	www.sage.de/mittelstand
HEISAB	www.heisab.de	salesforce.com Germany	www.salesforce.com
HEITEC	www.heitec.de	SAP Deutschland	www.sap.com/germany
IBM Deutschland	www.ibm.de	Sofon Deutschland	www.sofon.com
IFS Deutschland	www.ifsworld.com/de	Sybit	www.sybit.de
INNOSOFT	www.innosoft.de	Topcom Kommunikationssysteme	www.topcom-group.de
INTENSIO Software und Consulting	www.intensio.de	untersee	www.untersee.com
IT Vision Technology	www.itvt.de	valantic Supply Chain Excellence	www.valantic.com
itelligence	www.itelligence.de		

Remote Service solution provider

ams.Solution	www.ams-erp.com
CAS Software	www.cas.de
ClassiX Software	www.classix.de
Docware	www.docware.de
HighConsulting	www.crsm.biz
IBM Deutschland	www.ibm.de
IFS Deutschland	www.ifsworld.com/de
Körber	www.koerber.de
Topcom Kommunikationssysteme	www.topcom-group.de

Product independent consulting

accelcon	www.accelcon.de
birkle IT	www.birkle-it.com
Centigrade	www.centigrade.de
entergon	www.entergon.de
ERNI (Deutschland)	www.betterjoin.erni
ITQ	www.itq.de
kommunikationsoptimierer.de	www.kommunikationsoptimierer.de
Dr.-Ing. Helmut Maier CSS	www.maiercss.de
MODUS Consult	www.modusconsult.de
MQ result consulting	www.mqresult.com
Opdenhoff Technologie	www.opdenhoff.de
ORBIS	www.orbis.de
Plan Software Beratung und Entwicklung	www.plansoft.de
POWERCASE FORMULA CRM	www.formulacrm.de
proCtec	www.proctec.de
Qualysoft	www.qualysoft.com/de
Scheer	www.scheer-group.com
schrempp edv	www.schrempp-edv.de
Sofon Deutschland	www.sofon.com
syscon	www.syscon-online.com
TROVARIT	www.trovarit.com
UNITY	www.unity.de
Zühlke Engineering	www.zuehlke.com

Digital spare parts catalogues in industry

Thomas Riegler

Spare parts continue to be the most important driver of turnover in the service sector. Digital spare parts catalogues are now increasingly used to provide customers, service technicians and business partners with quick support and optimum order processing. Digital catalogues give the respective users access to complex information about spare parts and services.

In addition, companies that introduce digital spare parts catalogues often pursue the following objectives:

- Reducing process costs
- Avoiding incorrect purchase orders
- Accelerating the compilation of product catalogues
- Improving availability
- Increasing sales

The internet offers numerous advantages

The internet offers a wide range of options for implementation and support. Exploded-view drawings for example make it easier to identify parts, while customer-specific prices can be obtained from the ERP system online. Information on bills of materials can be made available, while order processing can be automated right through to delivery and invoicing by linking the digital spare parts catalogue to other data sources.

Up-to-date data and documents relevant for service, maintenance, repair and spare parts sale are made available efficiently, regardless of location and time. Companies also benefit from significantly easier updating of relevant data and provide information in a wider variety of languages, which is a substantial prerequisite given the high percentage of exports in the industry. It takes the catalogue users no more than a few mouse clicks to find the necessary information or to order spare parts. This significantly optimizes the provision of information and parts to the service staff: being equipped with the right parts, tools and information not only reduces the costs for deploying service staff but also shortens the response times in customer service. The overall result is significantly higher machine availability and customer satisfaction.

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Webshop / Digital Spare Parts Catalogue / E-Commerce

Part of ERP, CRM ...

A+W Software	www.a-w.de	ASSYST	www.assyst.de
abas Software	www.abas-erp.com	AVISTA ERP Software	www.avista-erp.de
ACBIS	www.acbis.de	BEOS Beratung & Software	www.beos-software.de
All for One Steeb	www.all-for-one.com	CATUNO	www.catuno.de
alltrotec	www.alltrotec.de	ClassiX Software	www.classix.de
Asseco Solutions	www.asseco.de/ap	Configit	www.configit.com

Part of ERP, CRM ...

COSMO CONSULT	www.cosmoconsult.com	itelligence	www.itelligence.de
datura manufacturing	www.swissdynamics.net	Körber	www.koerber.de
eEvolution	www.eevolution.de	ORBIS	www.orbis.de
EURO-LOG	www.eurolog.com	POWERCASE FORMULA CRM	www.formulacrm.de
Geovision	www.geovision.de	proALPHA Business Solutions	www.proalpha.de
GS1 Germany	www.gs1-germany.de	Proclane Integration GmbH	www.honico-ebusiness.com
HALO-electronic	www.inteos.com	PROFIT SYSTEMHAUS	www.profit-systemhaus.de
HEISAB	www.heisab.de	PSI Automotive & Industry	www.psi-automotive-industry.de
HEITEC	www.heitec.de	Sage	www.sage.de/mittelstand
HUMAN SOLUTIONS	www.human-solutions.de	SAP Deutschland	www.sap.com/germany
IFS Deutschland	www.ifsworld.com/de	TopM Software	www.topm.de
Intera	www.intera.de	valantic Supply Chain Excellence	www.valantic.com
IT Vision Technology	www.itvt.de	WERKBLiQ	www.werkbliq.de

Stand-alone Webshop / Digital Spare Parts Catalogue / E-Commerce

A+W Software	www.a-w.de	ORBIS	www.orbis.de
ACBIS	www.acbis.de	oxaion	www.oxaion.de
BEOS Beratung & Software	www.beos-software.de	Paradigma Software	www.paradigma-software.de
Bosch Rexroth	www.boschrexroth.com/de/de	Perspectix	www.perspectix.com
CIMSOURCE	www.cimsource.com	Plan Software Beratung und Entwicklung	www.plansoft.de
ClassiX Software	www.classix.de	Proclane Integration GmbH	www.honico-ebusiness.com
cognitas.	www.cognitas.de	PROFIT SYSTEMHAUS	www.profit-systemhaus.de
Configit	www.configit.com	PROSTEP	www.prostep.com
Consort IT	www.consort-it.de	Rockwell Automation	www.rockwellautomation.de
COSMO CONSULT	www.cosmoconsult.com	SAE schaarschmidt analytic engineering	www.sae-portal.de
DATACOPY publishing solutions	www.datacopy.de	salesforce.com Germany	www.salesforce.com
DLP Engineers	www.dlp-engineers.de	SALT Solutions	www.salt-solutions.de
Docware	www.docware.de	Siemens Industry Software	www.siemens.com/plm
Fischer Information Technology	www.fischer-information.com	SL innovativ	www.sl-i.de
GAL Digital	www.gal-digital.de	SMS group	www.sms-group.com
HEISAB	www.heisab.de	Software Factory	www.sf.com
IBM Deutschland	www.ibm.de	STAR Deutschland	www.star-group.net
Infor (Deutschland)	www.infor.com	Sybit	www.sybit.de
Intera	www.intera.de	symmedia	www.symmedia.de
itelligence	www.itelligence.de	TID Informatik	www.tid-informatik.de
Konica Minolta IT Solutions	www.konicaminolta.de/it	Topcom Kommunikationssysteme	www.topcom-group.de
Körber	www.koerber.de	untersee	www.untersee.com
KUMAVISION	www.kumavision.de	valantic Supply Chain Excellence	www.valantic.com
Lino	www.lino.de	Voith	www.voith.com
Noxum	www.noxum.com		

Product independent consulting

ACBIS	www.acbis.de	MODUS Consult	www.modusconsult.de
accessec	www.accessec.com	MQ result consulting	www.mqresult.com
ARC Solutions	www.arcsolutions.de	Proclane Integration GmbH	www.honico-ebusiness.com
birkle IT	www.birkle-it.com	proCtec	www.proctec.de
Centigrade	www.centigrade.de	PROSTEP	www.prostep.com
DATACOPY publishing solutions	www.datacopy.de	Qualysoft	www.qualysoft.com/de
DLP Engineers	www.dlp-engineers.de	Scheer	www.scheer-group.com
ERNI (Deutschland)	www.betterjoin.erni	SL innovativ	www.sl-i.de
FAUSER	www.fauser.ag	syscon	www.syscon-online.com
Freudenberg IT	www.freudenberg-it.com	TROVARIT	www.trovarit.com
GODYO Business Solutions	www.godyo.com	UNITY	www.unity.de
Ingenieurbüro Dr. Grahl - KAIROS Partner	www.kairospartners.de	XITASO	www.xitaso.com
induux international	www.lightwerk.de	XITASO Engineering	www.xitaso.com
Intera	www.intera.de		

Enterprise resource planning – The future of the corporate information centre

Volker Schnittler

For more than three decades now, the VDMA has been supporting its members when it comes to enterprise resource planning (ERP). Numerous tools have been developed over the years that provide effective assistance when searching for the suitable ERP solution. These tools are available to VDMA members at no cost.

Standard process description

ERP selection is based on in-depth knowledge of internal business processes and corresponding requirements for a supporting IT solution. This is not a case of sticking strictly to the standard presented by an ERP solution. Rather, the main thing is to ensure that the strengths of a company can be clearly highlighted in the value-added process. The VDMA method for process description facilitates a structured, comprehensive description of a company's core processes involved in value creation.

ERP reference list

References of successful ERP projects are the most important decision-making criterion for selecting an ERP system. This is why the VDMA provides its members with a sector-oriented ERP reference list, featuring more than 27 products from 23 providers with roughly 800 references in the capital goods industry. Each reference includes information about the provider, product, user companies and the number of system users. Companies looking for a new solution can thus make a targeted preselection based on the experiences that other companies have had with the product.

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Enterprise Resource Planning (ERP)

ERP solutions

A+W Software	www.a-w.de	HEISAB	www.heisab.de
abas Software	www.abas-erp.com	HEITEC	www.heitec.de
All for One Steeb	www.all-for-one.com	HUMAN SOLUTIONS	www.human-solutions.de
alltrotec	www.alltrotec.de	IFS Deutschland	www.ifsworld.com/de
ams.Solution	www.ams-erp.com	Infor (Deutschland)	www.infor.com
Asseco Solutions	www.asseco.de/ap	Isah	www.isah.com
ASSYST	www.assyst.de	itelligence	www.itelligence.de
AVISTA ERP Software	www.avista-erp.de	Konica Minolta IT Solutions	www.konicaminolta.de/it
BEOS Beratung & Software	www.beos-software.de	Körber	www.koerber.de
birkle IT	www.birkle-it.com	KUMAVISION	www.kumavision.de
Blauhut & Partner Informationssysteme	www.procos.de	MODUS Consult	www.modusconsult.de
Bosch Rexroth	www.boschrexroth.com/de/de	N+P Informationssysteme	www.nupis.de
CADCABEL	www.cadcabel.com	Opdenhoff Technologie	www.opdenhoff.de
CATUNO	www.catuno.de	ORBIS	www.orbis.de
ClassiX Software	www.classix.de	oxaion	www.oxaion.de
COMTRI	www.comtri.de	PIKON Deutschland	www.pikon.com
COSMO CONSULT	www.cosmoconsult.com	proALPHA Business Solutions	www.proalpha.de
CSS	www.css.de	PSI Automotive & Industry	www.psi-automotive-industry.de
datura manufacturing	www.swissdynamics.net	Sage	www.sage.de/mittelstand
DPS Software	www.dps-software.de	Sage bäurer	www.sage.de
DSC Software	www.dscsag.com	SALT Solutions	www.salt-solutions.de
eEvolution	www.eevolution.de	SAP Deutschland	www.sap.com/germany
EURO-LOG	www.eurolog.com	schrempp edv	www.schrempp-edv.de
FAUSER	www.fauser.ag	Schubert & Salzer Data	www.data-systems.info
Freudenberg IT	www.freudenberg-it.com	Sedo Treepoint	www.sedo-treepoint.com
Geovision	www.geovision.de	TopM Software	www.topm.de
GODYO Business Solutions	www.godyo.com	untersee	www.untersee.com
HALO-electronic	www.inteos.com		

Product independent consulting

Abass	www.abass.de	MQ result consulting	www.mqresult.com
accelcon	www.accelcon.de	Opdenhoff Technologie	www.opdenhoff.de
ams.Solution	www.ams-erp.com	ORBIS	www.orbis.de
ARC Solutions	www.arcsolutions.de	Perfect Production	www.perfect-production.de
birkle IT	www.birkle-it.com	PROFIT SYSTEMHAUS	www.profit-systemhaus.de
Centigrade	www.centigrade.de	SALT Solutions	www.salt-solutions.de
DLP Engineers	www.dlp-engineers.de	Scheer	www.scheer-group.com
ERNI (Deutschland)	www.betterjoin.erni	schrempp edv	www.schrempp-edv.de
GAL Digital	www.gal-digital.de	syscon	www.syscon-online.com
GE Intelligent Platforms	www.ge.com/digital	TROVARIT	www.trovarit.com
HEITEC	www.heitec.de	UNITY	www.unity.de
IBM Deutschland	www.ibm.de	XITASO Engineering	www.xitaso.com
ITQ	www.itq.de	znt	www.znt-richter.com
Janz Tec	www.janztec.com	Zühlke Engineering	www.zuehlke.com

Smart Data – Turning data into gold

Thomas Riegler

The buzzword big data refers to more than just large quantities of data. But big data is too complex, too short-lived or its structure too weak to evaluate it with conventional data processing methods. In fact, data users have to filter the data and process it intelligently. Only then is big data turned into valuable smart data. Companies can use this data, for example, to optimize logistics and production processes. When they know how to make use of the potential offered by large quantities of data and how to translate big data into smart data, companies are then able to develop new business models.

Digitalization in production facilities means that companies interconnect their machines, logistics systems and products. They do this to reduce costs, become more competitive and shorten their lead times. Companies are looking to identify and prevent disruptions and production losses at an early point in the process by analyzing the data collected by sensors and control systems. Smart data analysis lets companies identify optimization potential in production as well as in marketing, engineering and service. The challenge of translating big data into smart data lies in evaluating the steadily growing flood of data and turning it into intelligent information, so that companies can proceed with beneficial and profitable evaluations.

Image transformation

It's not difficult to imagine a time when the engineering sector sells the production capacity of its plants rather than the machines themselves. This idea is based on a pay-per-use business model. It is crucial for manufacturers to collect and evaluate all plant data in order to react promptly to failures or downtimes. This is the only way to ensure optimum, efficient operation of machines at different sites. The data paves the way for mechanical and plant engineering companies to tap innovative and successful business fields through the use of analytical processes.

Data security is an important topic

But companies must not lose sight of data security. The more devices and plants that are connected, the more important the topic of security becomes. Hackers may steal important production data or upload malware, thus causing production downtimes and machine failure. Investments in smart data are often quite expensive, and the return on investment is not always measurable. However, companies in the engineering sector do not want to invest just so that they can merely go with the flow: the investment also needs to be worthwhile.

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Business Intelligence (BI) / Big Data Analytics

Part of another software system (ERP, CRM ...)

abas Software	www.abas-erp.com	HSi	www.hsi4m.com
Across Systems	www.across.net	HUMAN SOLUTIONS	www.human-solutions.de
All for One Steeb	www.all-for-one.com	IBM Deutschland	www.ibm.de
alltrotec	www.alltrotec.de	IFS Deutschland	www.ifsworld.com/de
ams.Solution	www.ams-erp.com	Infor (Deutschland)	www.infor.com
Asseco Solutions	www.asseco.de/ap	INNOSOFT	www.innosoft.de
ASSYST	www.assyst.de	Intera	www.intera.de
AVISTA ERP Software	www.avista-erp.de	Isah	www.isah.com
BEOS Beratung & Software	www.beos-software.de	IT Vision Technology	www.itvt.de
birkle IT	www.birkle-it.com	itelligence	www.itelligence.de
Blauhut & Partner Informationssysteme	www.procos.de	Konica Minolta IT Solutions	www.konicaminolta.de/it
Bosch Rexroth	www.boschrexroth.com/de/de	Körber	www.koerber.de
CATUNO	www.catuno.de	KUMAVISION	www.kumavision.de
CIMSOURCE	www.cimsource.com	MODUS Consult	www.modusconsult.de
ClassiX Software	www.classix.de	ORBIS	www.orbis.de
COMTRI	www.comtri.de	oxaion	www.oxaion.de
Configit	www.configit.com	PIKON Deutschland	www.pikon.com
COSMO CONSULT	www.cosmoconsult.com	POWERCASE FORMULA CRM	www.formulacrm.de
CSS	www.css.de	proALPHA Business Solutions	www.proalpha.de
Dassault Systemes Deutschland	www.3ds.com	PROFIT SYSTEMHAUS	www.profit-systemhaus.de
DOCUFY	www.docufy.de	PSI Automotive & Industry	www.psi-automotive-industry.de
DPS Software	www.dps-software.de	Sage	www.sage.de/mittelstand
DSC Software	www.dscsag.com	salesforce.com Germany	www.salesforce.com
eEvolution	www.eevolution.de	SALT Solutions	www.salt-solutions.de
ETABO	www.eta-bochum.de	SAP Deutschland	www.sap.com/germany
EURO-LOG	www.eurolog.com	schrempp edv	www.schrempp-edv.de
FAUSER	www.fauser.ag	Sybit	www.sybit.de
Freudenberg IT	www.freudenberg-it.com	untersee	www.untersee.com
Geovision	www.geovision.de	valantic Supply Chain Excellence	www.valantic.com
GFOS	www.gfos.com	Werum IT Solutions	www.werum.com
HALO-electronic	www.inteos.com	WIBU-SYSTEMS	www.wibu.com
HEISAB	www.heisab.de	znt	www.znt-richter.com
HEITEC	www.heitec.de		

Stand-alone Business Intelligence solutions

A+W Software	www.a-w.de	Intera	www.intera.de
ams.Solution	www.ams-erp.com	itelligence	www.itelligence.de
AZO	www.azo.com	Konica Minolta IT Solutions	www.konicaminolta.de/it
becos	www.becos.de	Körber	www.koerber.de
BEOS Beratung & Software	www.beos-software.de	KUMAVISION	www.kumavision.de
BEUMER Maschinenfabrik	www.beumergroup.com	M&M Software	www.mm-software.com
birkle IT	www.birkle-it.com	MODUS Consult	www.modusconsult.de
Bosch Rexroth	www.boschrexroth.com/de/de	oxaion	www.oxaion.de
ClassiX Software	www.classix.de	PROFIT SYSTEMHAUS	www.profit-systemhaus.de
Configit	www.configit.com	PSI Automotive & Industry	www.psi-automotive-industry.de
Consort IT	www.consort-it.de	Rockwell Automation	www.rockwellautomation.de
COPA-DATA	www.copadata.de	SALT Solutions	www.salt-solutions.de
COSMO CONSULT	www.cosmoconsult.com	SAP Deutschland	www.sap.com/germany
CSS	www.css.de	Schneider Electric Software Germany	www.wonderware.de
Dassault Systemes Deutschland	www.3ds.com	schrempp edv	www.schrempp-edv.de
datura manufacturing	www.swissdynamics.net	SMS group	www.sms-group.com
GODYO Business Solutions	www.godyo.com	syscon	www.syscon-online.com
GTT	www.gtt-online.de	Topcom Kommunikationssysteme	www.topcom-group.de
humanIT Software	www.humanit.de	USU Software	www.usu.de/de
IBM Deutschland	www.ibm.de	USU Software Niederlassung Karlsruhe	www.usu.de/de
ICONICS Germany	www.iconics.com	WERKBLiQ	www.werkbliq.de
Industrie Informatik	www.industrieinformatik.com		
INTENSIO Software und Consulting	www.intensio.de		

Stand-alone Big Data Analytics solutions

A+W Software	www.a-w.de
ams.Solution	www.ams-erp.com
AZO	www.azo.com
Balluff	www.balluff.com
Beckhoff Automation	www.beckhoff.de
BEUMER Maschinenfabrik	www.beumergroup.com
birkle IT	www.birkle-it.com
compacer	www.compacer.com
Consort IT	www.consort-it.de
COPA-DATA	www.copadata.de
COSMO CONSULT	www.cosmoconsult.com
Dassault Systemes Deutschland	www.3ds.com
Elabo	www.elabo.de
Empolis Information Management	www.empolis.com
ETABO	www.eta-bochum.de
Fischer Information Technology	www.fischer-information.com
GE Intelligent Platforms	www.ge.com/digital
IBM Deutschland	www.ibm.de
IFS Deutschland	www.ifsworld.com/de
Industrie Informatik	www.industrieinformatik.com
INFORM	www.inform-software.de
INNEO Solutions	www.inneo.de
Intera	www.intera.de
itelligence	www.itelligence.de
Konica Minolta IT Solutions	www.konicaminolta.de/it
Körber	www.koerber.de
M&M Software	www.mm-software.com
mlp	www.mlpgmbh.com
MODUS Consult	www.modusconsult.de
Odego	www.odego.de
PIKON Deutschland	www.pikon.com
ProLeiT	www.proleit.de
PROXIA Software	www.proxia.com
Rockwell Automation	www.rockwellautomation.de
SAP Deutschland	www.sap.com/germany
Siemens Industry Software	www.siemens.com/plm
SMS group	www.sms-group.com
Software Factory	www.sf.com
symmedia	www.symmedia.de
syscon	www.syscon-online.com
USU Software Niederlassung Karlsruhe	www.usu.de/de
viastore SOFTWARE	www.viastoresoftware.de
Voith	www.voith.com
Werum IT Solutions	www.werum.com

Product independent consulting

accelcon	www.accelcon.de
AZO	www.azo.com
birkle IT	www.birkle-it.com
Centigrade	www.centigrade.de
COSMO CONSULT	www.cosmoconsult.com
Empolis Information Management	www.empolis.com
ERNI (Deutschland)	www.betterjoin.erni
ETABO	www.eta-bochum.de
GE Intelligent Platforms	www.ge.com/digital
Ingenieurbüro Dr. Grahl - KAIROS Partner	www.kairospartners.de
INFORM	www.inform-software.de
INNEO Solutions	www.inneo.de
Intera	www.intera.de
ITQ	www.itq.de
Janz Tec	www.janztec.com
Konica Minolta IT Solutions	www.konicaminolta.de/it
M&M Software	www.mm-software.com
MODUS Consult	www.modusconsult.de
MQ result consulting	www.mqresult.com
Odego	www.odego.de
ORBIS	www.orbis.de
POWERCASE FORMULA CRM	www.formulacrm.de
proCtec	www.proctec.de
ProLeiT	www.proleit.de
PROSTEP	www.prostep.com
PROXIA Software	www.proxia.com
Qualysoft	www.qualysoft.com/de
Scheer	www.scheer-group.com
schrempp edv	www.schrempp-edv.de
Software Factory	www.sf.com
syscon	www.syscon-online.com
TROVARIT	www.trovarit.com
UNITY	www.unity.de
USU Software Niederlassung Karlsruhe	www.usu.de/de
XITASO	www.xitaso.com
XITASO Engineering	www.xitaso.com
znt	www.znt-richter.com
Zühlke Engineering	www.zuehlke.com

Manufacturing Execution System

The performance of an MES (manufacturing execution system) is best illustrated by the key indicators generated by process-oriented production management and operational control systems. The most common MES indicators are summarized and explained in VDMA Specification 66412-1.

Volker Schnittler

The MES indicators described here refer to data accrued in production. They are used to evaluate and determine the target specifications of manufacturing processes. The indicators are determined on the basis of operating data (ODA), machine data (MDA), quality data (CAQ) and personnel time data (TNA).

Other VDMA Specifications on the MES indicators go into detail on topics such as the "Kennzahlenwirkmodell" (Indicator effectiveness model – 66412-2), "Ablaufbeschreibung zur Datenerfassung" (Process description for data acquisition – 66412-3), "Kennzahlen für das Energiemanagement" (Indicators for energy management – 66412-4), as well as "Daten für Fertigungskennzahlen" (Data for manufacturing indicators – 66412-10). VDMA has been working on the topic of MES solutions for over a decade and provides support and consultation for companies that are planning to implement such a system.

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Manufacturing Execution System (MES) / Production Control Centre / Production Data Acquisition (PDA) / Machine Data Acquisition (MDA)

Part of ERP			
A+W Software	www.a-w.de	IFS Deutschland	www.ifsworld.com/de
All for One Steeb	www.all-for-one.com	IPKS	www.ipks.de
alltrotec	www.alltrotec.de	Isah	www.isah.com
ams.Solution	www.ams-erp.com	itelligence	www.itelligence.de
Asseco Solutions	www.asseco.de/ap	Konica Minolta IT Solutions	www.konicaminolta.de/it
ASSYST	www.assyst.de	Körber	www.koerber.de
AVISTA ERP Software	www.avista-erp.de	Membrain	www.membrain-it.com
BEOS Beratung & Software	www.beos-software.de	MODUS Consult	www.modusconsult.de
Blauhut & Partner Informationssysteme	www.procos.de	N+P Informationssysteme	www.nupis.de
CATUNO	www.catuno.de	Opdenhoff Technologie	www.opdenhoff.de
ClassiX Software	www.classix.de	oxaion	www.oxaion.de
COSMO CONSULT	www.cosmoconsult.com	proALPHA Business Solutions	www.proalpha.de
Dassault Systemes Deutschland	www.3ds.com	PROFIT SYSTEMHAUS	www.profit-systemhaus.de
DSC Software	www.dscsag.com	PSI Automotive & Industry	www.psi-automotive-industry.de
DUALIS	www.dualis-it.de	Sage	www.sage.de/mittelstand
eEvolution	www.eevolution.de	SALT Solutions	www.salt-solutions.de
Freudenberg IT	www.freudenberg-it.com	SAP Deutschland	www.sap.com/germany
Geovision	www.geovision.de	schrempp edv	www.schrempp-edv.de
GODYO Business Solutions	www.godyo.com	Schubert & Salzer Data	www.data-systems.info
GS1 Germany	www.gs1-germany.de	Sedo Treepoint	www.sedo-treepoint.com
HALO-electronic	www.inteos.com	TopM Software	www.topm.de
HEISAB	www.heisab.de	untersee	www.untersee.com
HEITEC	www.heitec.de	valantic Supply Chain Excellence	www.valantic.com
HUMAN SOLUTIONS	www.human-solutions.de	WIBU-SYSTEMS	www.wibu.com

Stand-alone MES software

A+W Software	www.a-w.de	INNEO Solutions	www.inneo.de
ACAM Engineering	www.acam.at	IPKS	www.ipks.de
ARC Solutions	www.arcsolutions.de	iT Engineering Software Innovations	www.ite-si.de
AZO	www.azo.com	itelligence	www.itelligence.de
becos	www.becos.de	Konica Minolta IT Solutions	www.konicaminolta.de/it
BEOS Beratung & Software	www.beos-software.de	Körber	www.koerber.de
Bosch Rexroth	www.boschrexroth.com/de/de	LF CONSULT	www.lfconsult.de
Carl Zeiss MES Solutions	www.guardus.de	Miprotek	www.miprotek.de
Consort IT	www.consort-it.de	MPDV Mikrolab	www.mpdv.com
Dassault Systemes Deutschland	www.3ds.com	MPDV Mikrolab Niederlassung Heidelberg	www.mpdv.com
datura manufacturing	www.swissdynamics.net	N+P Informationssysteme	www.nupis.de
Eckelmann	www.eckelmann.de	Opdenhoff Technologie	www.opdenhoff.de
FAUSER	www.fauser.ag	ORBIS	www.orbis.de
FORCAM	www.forcam.de	ProLeiT	www.proleit.de
Freudenberg IT	www.freudenberg-it.com	PROXIA Software	www.proxia.com
gbo datacomp	www.gbo-datacomp.de	PSI Automotive & Industry	www.psi-automotive-industry.de
GE Intelligent Platforms	www.ge.com/digital	Rockwell Automation	www.rockwellautomation.de
Geovision	www.geovision.de	SAP Deutschland	www.sap.com/germany
GFOS	www.gfos.com	Sedo Treepoint	www.sedo-treepoint.com
GODYO Business Solutions	www.godyo.com	SETEX	www.setex-germany.com
GTT	www.gtt-online.de	Siemens Industry Software	www.siemens.com/plm
HALO-electronic	www.inteos.com	SMS group	www.sms-group.com
HEISAB	www.heisab.de	Software Factory	www.sf.com
HSi	www.hsi4m.com	Trebing & Himstedt Prozessautomation	www.t-h.de
ICONICS Germany	www.iconics.com	valantic Supply Chain Excellence	www.valantic.com
INCLUDIS	www.includis.com	WERKBLiQ	www.werkbliq.de
Industrie Informatik	www.industrieinformatik.com	Werum IT Solutions	www.werum.com
Industrie Reply	www.reply.com	znt	www.znt-richter.com
INFORM	www.inform-software.de		

Stand-alone PDA / MDA software

A+W Software	www.a-w.de	HEISAB	www.heisab.de
ACAM Engineering	www.acam.at	ICONICS Germany	www.iconics.com
accelcon	www.accelcon.de	in-tech	www.in-tech.com
ads-tec	www.ads-tec.de	INCLUDIS	www.includis.com
alltrotec	www.alltrotec.de	Industrie Informatik	www.industrieinformatik.com
ams.Solution	www.ams-erp.com	Infor (Deutschland)	www.infor.com
AZO	www.azo.com	INFORM	www.inform-software.de
B&R Industrie-Elektronik	www.br-automation.com	INNEO Solutions	www.inneo.de
becos	www.becos.de	IPKS	www.ipks.de
BEUMER Maschinenfabrik	www.beumergroup.com	iT Engineering Software Innovations	www.ite-si.de
ClassiX Software	www.classix.de	itelligence	www.itelligence.de
Consort IT	www.consort-it.de	Konica Minolta IT Solutions	www.konicaminolta.de/it
COPA-DATA	www.copadata.de	Körber	www.koerber.de
COSMO CONSULT	www.cosmoconsult.com	KUMAVISION	www.kumavision.de
datura manufacturing	www.swissdynamics.net	Membrain	www.membrain-it.com
DIENES Apparatebau	www.dienes.net	mlp	www.mlpgmbh.com
Eckelmann	www.eckelmann.de	MODUS Consult	www.modusconsult.de
Elabo	www.elabo.de	N+P Informationssysteme	www.nupis.de
FAUSER	www.fauser.ag	Opdenhoff Technologie	www.opdenhoff.de
FORCAM	www.forcam.de	ORBIS	www.orbis.de
Freudenberg IT	www.freudenberg-it.com	PROFIT SYSTEMHAUS	www.profit-systemhaus.de
gbo datacomp	www.gbo-datacomp.de	PROXIA Software	www.proxia.com
GE Intelligent Platforms	www.ge.com/digital	PSI Automotive & Industry	www.psi-automotive-industry.de
Geovision	www.geovision.de	Rockwell Automation	www.rockwellautomation.de
GFOS	www.gfos.com	S & P Computersysteme	www.sup-logistik.de
GTT	www.gtt-online.de	SAE schaarschmidt analytic engineering	www.sae-portal.de
HALO-electronic	www.inteos.com	SALT Solutions	www.salt-solutions.de

Stand-alone PDA / MDA software

Schneider Electric Software Germany	www.wonderware.de	Topcom Kommunikationssysteme	www.topcom-group.de
Sedo Treepoint	www.sedo-treepoint.com	Trebing & Himstedt Prozessautomation	www.t-h.de
SETEX	www.setex-germany.com	VÖLKEL Mikroelektronik	www.voelkel.de
Siemens Industry Software	www.siemens.com/plm	Voith	www.voith.com
SMS group	www.sms-group.com	Werum IT Solutions	www.werum.com
Software Factory	www.sf.com	XITASO Engineering	www.xitaso.com
symmedia	www.symmedia.de	znt	www.znt-richter.com

Product independent consulting

accelcon	www.accelcon.de	Opdenhoff Technologie	www.opdenhoff.de
ARC Solutions	www.arcsolutions.de	Perfect Production	www.perfect-production.de
AZO	www.azo.com	proCtec	www.proctec.de
Centigrade	www.centigrade.de	ProLeiT	www.proleit.de
DUALIS	www.dualis-it.de	PROXIA Software	www.proxia.com
ERNI (Deutschland)	www.betterjoin.erni	REINHOLZ Software & Technology	www.reinholz-sat.de
FAUSER	www.fauser.ag	Scheer	www.scheer-group.com
GE Intelligent Platforms	www.ge.com/digital	schrempp edv	www.schrempp-edv.de
HEISAB	www.heisab.de	Software Factory	www.sf.com
HEITEC	www.heitec.de	syscon	www.syscon-online.com
ITQ	www.itq.de	TROVARIT	www.trovarit.com
Janz Tec	www.janztec.com	UNITY	www.unity.de
M&M Software	www.mm-software.com	XITASO	www.xitaso.com
MODUS Consult	www.modusconsult.de	XITASO Engineering	www.xitaso.com
MQ result consulting	www.mqresult.com	Your Expert Cluster	www.yourexpertcluster.de
N+P Informationssysteme	www.nupis.de	znt	www.znt-richter.com
NewTec	www.newtec.de	Zühlke Engineering	www.zuehlke.com

Variant management

Volker Schnittler

The major challenges facing Germany's engineering industry include globalization, increasingly dynamic markets and individual customer wishes. Those who want to succeed on the global market need to meet market demands with products that are characterized by competitive prices and technology.

The changing market situation and the transformation of corporate structures over the last decade has forced companies to bolster their innovative strength. The new buzzword is customer-orientation, which means that product variants are now tailored to the customers' specific needs. The increasingly complex product structures go hand in hand with a rise in costs, making it more and more difficult for companies to manage complexity.

For this reason, managing product diversity and product costs has become one of the most important tasks for engineering companies. Measures for reducing and managing product and process complexity are summarized under the term "variant management". Both companies with serial production and those making customer-specific, unique products, such as those needed in plant engineering, face the challenge of introducing an effective variant management system. More often, the former are required to provide systematic product variants on the market, while plant engineering companies need to reduce the costs caused by modular product concepts.

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Variant Management

Part of ERP, CRM …

A+W Software	www.a-w.de	HUMAN SOLUTIONS	www.human-solutions.de
abas Software	www.abas-erp.com	IFS Deutschland	www.ifsworld.com/de
ACBIS	www.acbis.de	Infor (Deutschland)	www.infor.com
All for One Steeb	www.all-for-one.com	Intera	www.intera.de
alltrotec	www.alltrotec.de	Isah	www.isah.com
ams.Solution	www.ams-erp.com	itelligence	www.itelligence.de
ARC Solutions	www.arcsolutions.de	Konica Minolta IT Solutions	www.konicaminolta.de/it
Asseco Solutions	www.asseco.de/ap	Körber	www.koerber.de
ASSYST	www.assyst.de	KUMAVISION	www.kumavision.de
AVISTA ERP Software	www.avista-erp.de	Lino	www.lino.de
BEOS Beratung & Software	www.beos-software.de	MODUS Consult	www.modusconsult.de
Bosch Rexroth	www.boschrexroth.com/de/de	Opdenhoff Technologie	www.opdenhoff.de
CAS Software	www.cas.de	ORBIS	www.orbis.de
CATUNO	www.catuno.de	ORISA Software	www.orisa.de
ClassiX Software	www.classix.de	oxaion	www.oxaion.de
COMTRI	www.comtri.de	PIKON Deutschland	www.pikon.com
Configit	www.configit.com	POWERCASE FORMULA CRM	www.formulacrm.de
COSMO CONSULT	www.cosmoconsult.com	proALPHA Business Solutions	www.proalpha.de
Dassault Systemes Deutschland	www.3ds.com	PROFIT SYSTEMHAUS	www.profit-systemhaus.de
datura manufacturing	www.swissdynamics.net	PSI Automotive & Industry	www.psi-automotive-industry.de
DLP Engineers	www.dlp-engineers.de	Sage	www.sage.de/mittelstand
DOCUFY	www.docufy.de	SALT Solutions	www.salt-solutions.de
DPS Software	www.dps-software.de	SAP Deutschland	www.sap.com/germany
DSC Software	www.dscsag.com	schrempp edv	www.schrempp-edv.de
eEvolution	www.eevolution.de	Schubert & Salzer Data	www.data-systems.info
encoway	www.encoway.de	Siemens Industry Software	www.siemens.com/plm
FAUSER	www.fauser.ag	Sybit	www.sybit.de
Freudenberg IT	www.freudenberg-it.com	TopM Software	www.topm.de
HALO-electronic	www.inteos.com	untersee	www.untersee.com
HEISAB	www.heisab.de	WIBU-SYSTEMS	www.wibu.com
HEITEC	www.heitec.de	znt	www.znt-richter.com

Stand-alone Variant Management / Configure Price Quote

3D Interaction Technologies	www.3dit.de	itelligence	www.itelligence.de
abilis	www.abilis.de	Lino	www.lino.de
ACATEC Software	www.acatec.de	Dr.-Ing. Helmut Maier CSS	www.maiercss.de
ACBIS	www.acbis.de	MODUS Consult	www.modusconsult.de
ams.Solution	www.ams-erp.com	Odego	www.odego.de
ARC Solutions	www.arcsolutions.de	ORBIS	www.orbis.de
Bosch Rexroth	www.boschrexroth.com/de/de	ORISA Software	www.orisa.de
camos Software und Beratung	www.camos.de	Perspectix	www.perspectix.com
CAS Software	www.cas.de	Plan Software Beratung und Entwicklung	www.plansoft.de
ClassiX Software	www.classix.de	PLANWARE Beratung & Software	www.planware.de
Configit	www.configit.com	PLATO	www.plato.de
Consort IT	www.consort-it.de	PROFIT SYSTEMHAUS	www.profit-systemhaus.de
Dassault Systemes Deutschland	www.3ds.com	SAE schaarschmidt analytic engineering	www.sae-portal.de
DLP Engineers	www.dlp-engineers.de	salesforce.com Germany	www.salesforce.com
EAS	www.eas-solutions.de	SAP Deutschland	www.sap.com/germany
Elabo	www.elabo.de	Siemens Industry Software	www.siemens.com/plm
encoway	www.encoway.de	Sofon Deutschland	www.sofon.com
Fischer Information Technology	www.fischer-information.com	Software Factory	www.sf.com
GODYO Business Solutions	www.godyo.com	Topcom Kommunikationssysteme	www.topcom-group.de
IBM Deutschland	www.ibm.de	untersee	www.untersee.com
INNEO Solutions	www.inneo.de	Werum IT Solutions	www.werum.com
Intera	www.intera.de	XITASO Engineering	www.xitaso.com
ISAP	www.isap.de	Zuken E3	www.zuken.com

Product independent consulting

ACBIS	www.acbis.de	proCtec	www.proctec.de
accelcon	www.accelcon.de	PROSTEP	www.prostep.com
ARC Solutions	www.arcsolutions.de	Qualysoft	www.qualysoft.com/de
birkle IT	www.birkle-it.com	Scheer	www.scheer-group.com
DLP Engineers	www.dlp-engineers.de	schrempp edv	www.schrempp-edv.de
encoway	www.encoway.de	SL innovativ	www.sl-i.de
ERNI (Deutschland)	www.betterjoin.erni	Sofon Deutschland	www.sofon.com
ETABO	www.eta-bochum.de	Software Factory	www.sf.com
Ingenieurbüro Dr. Grahl - KAIROS Partner	www.kairospartners.de	syscon	www.syscon-online.com
Intera	www.intera.de	Techniciency Consulting	www.techniciency.de
ITQ	www.itq.de	TROVARIT	www.trovarit.com
Körber	www.koerber.de	UNITY	www.unity.de
Lino	www.lino.de	valantic Supply Chain Excellence	www.valantic.com
MODUS Consult	www.modusconsult.de	XITASO	www.xitaso.com
NTI Kailer	www.nti-kailer.de	XITASO Engineering	www.xitaso.com
Odego	www.odego.de	Your Expert Cluster	www.yourexpertcluster.de
Opdenhoff Technologie	www.opdenhoff.de	znt	www.znt-richter.com
POWERCASE FORMULA CRM	www.formulacrm.de		

Driving digitalization in logistics

Guido Reimann

In recent years, new developments and products focusing on digitalization and Industrie 4.0 have been launched on the market. However, in terms of practical engineering applications, these developments and products are not yet widely used. This situation becomes apparent in current logistics processes. How can this be changed?

Digitalization of the logistics processes must be adapted step by step. Industrie 4.0 will not work without corresponding improvements in logistics processes that support internal production and serve as the direct external link to the customer. The development of efficient value chains within the company serves to standardize processes, making these independent of other influencing factors such as time or persons. Standardization is thus a central cornerstone for the digitalization of company-related processes.

When the logistics process is freed from all inefficient elements, the next step is to select the suitable digital tool and connect it to the other processes. But this does not mean that logistics employees always need "smart assistants" such as smartphones or tablets. Handheld scanners, for example, have the same effect when it comes to collecting data promptly in a first step so it can be transferred to existing IT systems. Additional equipment such as scales or 3D scanners can also significantly increase data quality in the process, for example by comparing actual values such as weight, dimensions, temperature, etc. with the target values in the system and adapting these values, or by recording status information. The preparation of automated processes, in which the product becomes the key player and controls the entire logistics process, requires high-quality data, transparency and standardization.

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Warehouse Logistics / Production logistics / Supply Chain Management (SCM)

Part of ERP

A+W Software	www.a-w.de	Infor (Deutschland)	www.infor.com
abas Software	www.abas-erp.com	IPKS	www.ipks.de
abilis	www.abilis.de	Isah	www.isah.com
All for One Steeb	www.all-for-one.com	itelligence	www.itelligence.de
alltrotec	www.alltrotec.de	Konica Minolta IT Solutions	www.konicaminolta.de/it
Asseco Solutions	www.asseco.de/ap	Körber	www.koerber.de
ASSYST	www.assyst.de	KUMAVISION	www.kumavision.de
BEOS Beratung & Software	www.beos-software.de	Membrain	www.membrain-it.com
Blauhut & Partner Informationssysteme	www.procos.de	MODUS Consult	www.modusconsult.de
Bosch Rexroth	www.boschrexroth.com/de/de	N+P Informationssysteme	www.nupis.de
CATUNO	www.catuno.de	ORBIS	www.orbis.de
ClassiX Software	www.classix.de	oxaion	www.oxaion.de
COMTRI	www.comtri.de	PIKON Deutschland	www.pikon.com
COSMO CONSULT	www.cosmoconsult.com	proALPHA Business Solutions	www.proalpha.de
Dassault Systemes Deutschland	www.3ds.com	PROFIT SYSTEMHAUS	www.profit-systemhaus.de
datura manufacturing	www.swissdynamics.net	PSI Automotive & Industry	www.psi-automotive-industry.de
DPS Software	www.dps-software.de	Sage	www.sage.de/mittelstand
DSC Software	www.dscsag.com	SALT Solutions	www.salt-solutions.de
eEvolution	www.eevolution.de	SAP Deutschland	www.sap.com/germany
FAUSER	www.fauser.ag	schrempp edv	www.schrempp-edv.de
Freudenberg IT	www.freudenberg-it.com	Schubert & Salzer Data	www.data-systems.info
Geovision	www.geovision.de	TopM Software	www.topm.de
GODYO Business Solutions	www.godyo.com	untersee	www.untersee.com
GS1 Germany	www.gs1-germany.de	valantic Supply Chain Excellence	www.valantic.com
HALO-electronic	www.inteos.com	viastore SYSTEMS	www.viastore.de
HEISAB	www.heisab.de	WIBU-SYSTEMS	www.wibu.com
HUMAN SOLUTIONS	www.human-solutions.de	znt	www.znt-richter.com
IFS Deutschland	www.ifsworld.com/de		

Stand-alone Warehouse Management solution

ads-tec	www.ads-tec.de	itelligence	www.itelligence.de
becos	www.becos.de	Jungheinrich	www.jungheinrich.de
BEUMER Maschinenfabrik	www.beumergroup.com	Konica Minolta IT Solutions	www.konicaminolta.de/it
Blauhut & Partner Informationssysteme	www.procos.de	Körber	www.koerber.de
Bosch Rexroth	www.boschrexroth.com/de/de	N+P Informationssysteme	www.nupis.de
ClassiX Software	www.classix.de	PROXIA Software	www.proxia.com
Consort IT	www.consort-it.de	PSI Automotive & Industry	www.psi-automotive-industry.de
Dassault Systemes Deutschland	www.3ds.com	PSI Technics	www.psi-technics.com
Dematic	www.dematic.com	S & P Computersysteme	www.sup-logistik.de
Ferrocontrol Steuerungssysteme	www.ferrocontrol.de	SALT Solutions	www.salt-solutions.de
GFOS	www.gfos.com	SMS group	www.sms-group.com
HEISAB	www.heisab.de	SSI Schäfer Automation	www.ssi-schaefer.de
IBM Deutschland	www.ibm.de	toolbox Software	www.toolbox-software.com
Industrie Informatik	www.industrieinformatik.com	viastore SOFTWARE	www.viastoresoftware.de
Industrie Reply	www.reply.com	viastore SYSTEMS	www.viastore.de
INNOSOFT	www.innosoft.de	Werum IT Solutions	www.werum.com
IPKS	www.ipks.de		

Stand-alone Advanced Planning and Scheduling (APS)- / SCM Solution

Dassault Systemes Deutschland	www.3ds.com	N+P Informationssysteme	www.nupis.de
Eckelmann	www.eckelmann.de	ORBIS	www.orbis.de
FAUSER	www.fauser.ag	PROXIA Software	www.proxia.com
Geovision	www.geovision.de	SAE schaarschmidt analytic engineering	www.sae-portal.de
IBM Deutschland	www.ibm.de	SAP Deutschland	www.sap.com/germany
Industrie Informatik	www.industrieinformatik.com	Securikett Ulrich & Horn	www.securikett.com
INFORM	www.inform-software.de	SMS group	www.sms-group.com
IPKS	www.ipks.de	Software Factory	www.sf.com
Jungheinrich	www.jungheinrich.de	SSI Schäfer Automation	www.ssi-schaefer.de
Körber	www.koerber.de	toolbox Software	www.toolbox-software.com
Dr.-Ing. Helmut Maier CSS	www.maiercss.de	valantic Supply Chain Excellence	www.valantic.com
MODUS Consult	www.modusconsult.de	XITASO Engineering	www.xitaso.com

Product independent consulting

accelcon	www.accelcon.de	PROSTEP	www.prostep.com
AZO	www.azo.com	PROXIA Software	www.proxia.com
birkle IT	www.birkle-it.com	S & P Computersysteme	www.sup-logistik.de
Centigrade	www.centigrade.de	Scheer	www.scheer-group.com
ERNI (Deutschland)	www.betterjoin.erni	schrempp edv	www.schrempp-edv.de
Ingenieurbüro Dr. Grahl - KAIROS Partner	www.kairospartners.de	SSI Schäfer Automation	www.ssi-schaefer.de
Industrie Reply	www.reply.com	syscon	www.syscon-online.com
IPKS	www.ipks.de	toolbox Software	www.toolbox-software.com
Janz Tec	www.janztec.com	TROVARIT	www.trovarit.com
Jungheinrich	www.jungheinrich.de	UNITY	www.unity.de
MODUS Consult	www.modusconsult.de	viastore SOFTWARE	www.viastoresoftware.de
MQ result consulting	www.mqresult.com	viastore SYSTEMS	www.viastore.de
N+P Informationssysteme	www.nupis.de	XITASO Engineering	www.xitaso.com
ORBIS	www.orbis.de	Your Expert Cluster	www.yourexpertcluster.de
proCtec	www.proctec.de	znt	www.znt-richter.com

Traceability in the value creation network

The digitalization of products and processes in the engineering sector has added considerable significance to traceability. Combinations with product protection technologies facilitate clear identification and also authenticity verification. In the value creation network, this generates the degree of trust that is crucial for Industrie 4.0 so that new business models can be established, offering customized and product-related added-value services.

Guido Reimann

In order to achieve the required level of traceability, it is necessary to leave "identifiable traces" that remain visible to all process participants for an adequate amount of time. The type of marking used on products or packaging and the duration for which this information is available depends on the individual application and the general conditions. The wide-scale use of consistent marking proves beneficial not only in logistics processes, but also in other areas of the company, such as in production, quality management or in service.

Global databases as networking partners

Cross-company databases also provide a quick and easy option for supplying relevant information to other participants in the value creation network, such as customers, suppliers or service providers. This allows for quicker data sharing and, ideally, global use of this data, independent of the in-house IT infrastructure. Where small and medium-sized companies are concerned, the latter aspect is of particular importance for implementing a global traceability solution. It simplifies the incoming goods process for products, significantly improves process efficiency and provides customers with transparent shipment tracking in real time. For serialized products, such as safety-related components, the resulting clear identification also paves the way for additional, customized added-value services. Ideally, clear product labelling is based on globally valid, established standards.

Additional solution modules are necessary to ensure that data and products are not tampered with, and to prevent counterfeit products from infiltrating the value creation or distribution network. Various options (physical, chemical, digital etc.) are available for product authentication.

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Traceability

Product component of ERP, MES ...

A+W Software	www.a-w.de	IFS Deutschland	www.ifsworld.com/de
abas Software	www.abas-erp.com	Industrie Informatik	www.industrieinformatik.com
ams.Solution	www.ams-erp.com	Körber	www.koerber.de
AZO	www.azo.com	KUMAVISION	www.kumavision.de
Carl Zeiss MES Solutions	www.guardus.de	Membrain	www.membrain-it.com
ClassiX Software	www.classix.de	MPDV Mikrolab	www.mpdv.com
COSMO CONSULT	www.cosmoconsult.com	MPDV Mikrolab Niederlassung Heidelberg	www.mpdv.com
FAUSER	www.fauser.ag	oxaion	www.oxaion.de
FORCAM	www.forcam.de	proALPHA Business Solutions	www.proalpha.de
GE Intelligent Platforms	www.ge.com/digital	SAP Deutschland	www.sap.com/germany
GFOS	www.gfos.com	schrempp edv	www.schrempp-edv.de
GS1 Germany	www.gs1-germany.de	SETEX	www.setex-germany.com
HEISAB	www.heisab.de	Siemens Industry Software	www.siemens.com/plm
HEITEC	www.heitec.de	Trebing & Himstedt Prozessautomation	www.t-h.de

Stand-alone Traceability solution

A+W Software	www.a-w.de
ams.Solution	www.ams-erp.com
AZO	www.azo.com
Balluff	www.balluff.com
Bosch Rexroth	www.boschrexroth.com/de/de
compacer	www.compacer.com
datura manufacturing	www.swissdynamics.net
FORCAM	www.forcam.de
GE Intelligent Platforms	www.ge.com/digital
SC Gemini CAD Systems SRL	www.geminicad.com
IBM Deutschland	www.ibm.de
Körber	www.koerber.de
mlp	www.mlpgmbh.com
Q-loud	www.q-loud.de
SAP Deutschland	www.sap.com/germany
Siemens Industry Software	www.siemens.com/plm
SMS group	www.sms-group.com
Software Factory	www.sf.com
valantic Supply Chain Excellence	www.valantic.com
Werum IT Solutions	www.werum.com
XITASO Engineering	www.xitaso.com

Product independent consulting

Abass	www.abass.de
accelcon	www.accelcon.de
accessec	www.accessec.com
ams.Solution	www.ams-erp.com
birkle IT	www.birkle-it.com
DLP Engineers	www.dlp-engineers.de
ERNI (Deutschland)	www.betterjoin.erni
GE Intelligent Platforms	www.ge.com/digital
HEITEC	www.heitec.de
Janz Tec	www.janztec.com
Perfect Production	www.perfect-production.de
Scheer	www.scheer-group.com
schrempp edv	www.schrempp-edv.de
Software Factory	www.sf.com
syscon	www.syscon-online.com
UNITY	www.unity.de

Technical product documentation

Technical product documentation is an asset for the value chain and enhances acceptance of the products supplied. Editorial systems are an integral part of the overall process from product development to product delivery.

Expectations made of product documentation have grown significantly in recent years. Multimedia content is embedded and provided so that users can quickly familiarize themselves with the product. This is indispensable in light of the increasing product complexity and the growing range of machine features. In addition to textual descriptions, machine operators are also helped by videos, animations, interactive graphics and apps, along with augmented and virtual reality applications.

Mechanical engineering companies have come to master these challenges with ease by using computer systems for documentation creation. The results speak for themselves:

- Reduced costs for documentation creation
- Shorter production time for the documents
- Enhanced quality thanks to the repeated use of modules
- Added value through use in various areas such as service, internal and external training, support of sales

Product documentation goes through further development as part of cross-departmental information and project management, with information being added at every stage of the product development process. The document management system records, manages, stores, and versions all types of information generated during this process and makes it available in its original form. It assists employees in their daily work. The benefits are tangible in terms of quality, while also resulting in quantitative advantages thanks to material cost savings and increased cash discount income through reduced lead time.

VDMA has published guidelines on both these topics. The guidelines show how to implement such systems, how to use them for your goals and how to integrate them with other IT systems in the company.

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Technical Product Documentation

Part of ERP

abas Software	www.abas-erp.com	GS1 Germany	www.gs1-germany.de
All for One Steeb	www.all-for-one.com	HALO-electronic	www.inteos.com
alltrotec	www.alltrotec.de	HEISAB	www.heisab.de
ams.Solution	www.ams-erp.com	HEITEC	www.heitec.de
Asseco Solutions	www.asseco.de/ap	HUMAN SOLUTIONS	www.human-solutions.de
ASSYST	www.assyst.de	Intera	www.intera.de
BEOS Beratung & Software	www.beos-software.de	Körber	www.koerber.de
birkle IT	www.birkle-it.com	Kothes	www.kothes.de
ClassiX Software	www.classix.de	proALPHA Business Solutions	www.proalpha.de
COMTRI	www.comtri.de	PROFIT SYSTEMHAUS	www.profit-systemhaus.de
COSMO CONSULT	www.cosmoconsult.com	Sage	www.sage.de/mittelstand
DSC Software	www.dscsag.com	SAP Deutschland	www.sap.com/germany
eEvolution	www.eevolution.de	schrempp edv	www.schrempp-edv.de
Fischer Information Technology	www.fischer-information.com	untersee	www.untersee.com
Freudenberg IT	www.freudenberg-it.com	WIBU-SYSTEMS	www.wibu.com
GODYO Business Solutions	www.godyo.com	znt	www.znt-richter.com

Stand-alone software for product documentation / CMS

3D Interaction Technologies	www.3dit.de	Konica Minolta IT Solutions	www.konicaminolta.de/it
ACAM Engineering	www.acam.at	Körber	www.koerber.de
ARC Solutions	www.arcsolutions.de	Kothes	www.kothes.de
BEUMER Maschinenfabrik	www.beumergroup.com	Lino	www.lino.de
Bosch Rexroth	www.boschrexroth.com/de/de	logi.cals	www.logicals.com
Consort IT	www.consort-it.de	logi.cals automation solutions & services	www.logicals.com
COSMO CONSULT	www.cosmoconsult.com	MODUS Consult	www.modusconsult.de
DATACOPY publishing solutions	www.datacopy.de	ondeso	www.ondeso.com
DOCUFY	www.docufy.de	Perspectix	www.perspectix.com
Docware	www.docware.de	PROSTEP	www.prostep.com
Elabo	www.elabo.de	Qualysoft	www.qualysoft.com/de
Empolis Information Management	www.empolis.com	SCHEMA Consulting	www.schema.de
Fischer Information Technology	www.fischer-information.com	Securikett Ulrich & Horn	www.securikett.com
gds	www.gds.eu	Siemens Industry Software	www.siemens.com/plm
HEISAB	www.heisab.de	STAR Deutschland	www.star-group.net
HEITEC	www.heitec.de	TEDATA	www.tedata.de
IBM Deutschland	www.ibm.de	WSCAD	www.wscad.de
INNEO Solutions	www.inneo.de	Zuken E3	www.zuken.com
Intera	www.intera.de		

Stand-alone software for translation management

Across Systems	www.across.net	Kothes	www.kothes.de
ClassiX Software	www.classix.de	Perspectix	www.perspectix.com
Consort IT	www.consort-it.de	SDL Multilingual Services	www.sdl.com
EAS	www.eas-solutions.de	SL innovativ	www.sl-i.de
Fischer Information Technology	www.fischer-information.com	STAR Deutschland	www.star-group.net
IMS Maschinen- u. Anlagenbau	www.ims-deutschland.com	WSCAD	www.wscad.de
itelligence	www.itelligence.de		

Product independent consulting

Abass	www.abass.de	PROSTEP	www.prostep.com
ARC Solutions	www.arcsolutions.de	Qualysoft	www.qualysoft.com/de
birkle IT	www.birkle-it.com	Dr. Rieland Technische Dokumentation	www.rieland-doku.com
Centigrade	www.centigrade.de	schrempp edv	www.schrempp-edv.de
cognitas.	www.cognitas.de	SL innovativ	www.sl-i.de
Computer System	www.cs-ilmenau.de	syscon	www.syscon-online.com
DATACOPY publishing solutions	www.datacopy.de	tecteam	www.tecteam.de
ERNI (Deutschland)	www.betterjoin.erni	Topcom Kommunikationssysteme	www.topcom-group.de
FAUSER	www.fauser.ag	UNITY	www.unity.de
GODYO Business Solutions	www.godyo.com	valantic Supply Chain Excellence	www.valantic.com
Intera	www.intera.de	XITASO Engineering	www.xitaso.com
Kothes	www.kothes.de	Your Expert Cluster	www.yourexpertcluster.de
MODUS Consult	www.modusconsult.de	ZINDEL	www.zindel.de
MQ result consulting	www.mqresult.com	znt	www.znt-richter.com
NewTec	www.newtec.de		

Document Management System (DMS) / Enterprise Content Management (ECM)

Part of ERP, CRM, DMS, PDM

A+W Software	www.a-w.de	HUMAN SOLUTIONS	www.human-solutions.de
abas Software	www.abas-erp.com	IFS Deutschland	www.ifsworld.com/de
ADITO Software	www.adito.de	Infor (Deutschland)	www.infor.com
All for One Steeb	www.all-for-one.com	Intera	www.intera.de
alltrotec	www.alltrotec.de	Isah	www.isah.com
ams.Solution	www.ams-erp.com	IT Vision Technology	www.itvt.de
ARC Solutions	www.arcsolutions.de	itelligence	www.itelligence.de
Asseco Solutions	www.asseco.de/ap	Konica Minolta IT Solutions	www.konicaminolta.de/it
ASSYST	www.assyst.de	Körber	www.koerber.de
AVISTA ERP Software	www.avista-erp.de	Kothes	www.kothes.de
BEOS Beratung & Software	www.beos-software.de	KUMAVISION	www.kumavision.de
birkle IT	www.birkle-it.com	MODUS Consult	www.modusconsult.de
CAS Software	www.cas.de	ORISA Software	www.orisa.de
CATUNO	www.catuno.de	oxaion	www.oxaion.de
ClassiX Software	www.classix.de	PIKON Deutschland	www.pikon.com
COI	www.coi.de	POWERCASE FORMULA CRM	www.formulacrm.de
COSMO CONSULT	www.cosmoconsult.com	proALPHA Business Solutions	www.proalpha.de
CSS	www.css.de	PROFIT SYSTEMHAUS	www.profit-systemhaus.de
Dassault Systemes Deutschland	www.3ds.com	Qualysoft	www.qualysoft.com/de
datura manufacturing	www.swissdynamics.net	Sage	www.sage.de/mittelstand
DOCUFY	www.docufy.de	SAP Deutschland	www.sap.com/germany
DSC Software	www.dscsag.com	schrempp edv	www.schrempp-edv.de
Freudenberg IT	www.freudenberg-it.com	Schubert & Salzer Data	www.data-systems.info
Geovision	www.geovision.de	Siemens Industry Software	www.siemens.com/plm
GODYO Business Solutions	www.godyo.com	Sybit	www.sybit.de
GS1 Germany	www.gs1-germany.de	TopM Software	www.topm.de
HALO-electronic	www.inteos.com	WIBU-SYSTEMS	www.wibu.com
HEISAB	www.heisab.de	znt	www.znt-richter.com

Stand-alone Document Management / ECM

A+W Software	www.a-w.de	Infor (Deutschland)	www.infor.com
ams.Solution	www.ams-erp.com	INGTechnik	www.ingtechnik.de
ARC Solutions	www.arcsolutions.de	INNEO Solutions	www.inneo.de
BEOS Beratung & Software	www.beos-software.de	INTENSIO Software und Consulting	www.intensio.de
BEUMER Maschinenfabrik	www.beumergroup.com	Intera	www.intera.de
birkle IT	www.birkle-it.com	ISAP	www.isap.de
Blauhut & Partner Informationssysteme	www.procos.de	itelligence	www.itelligence.de
Bosch Rexroth	www.boschrexroth.com/de/de	Konica Minolta IT Solutions	www.konicaminolta.de/it
Brainloop	www.brainloop.com	KUMAVISION	www.kumavision.de
COI	www.coi.de	Dr.-Ing. Helmut Maier CSS	www.maiercss.de
Consort IT	www.consort-it.de	MODUS Consult	www.modusconsult.de
CONTACT Software	www.contact.de	Noxum	www.noxum.com
COSMO CONSULT	www.cosmoconsult.com	PLATO	www.plato.de
CSS	www.css.de	PROCAD	www.procad.de
Dassault Systemes Deutschland	www.3ds.com	PROFIT SYSTEMHAUS	www.profit-systemhaus.de
DATACOPY publishing solutions	www.datacopy.de	PSI Automotive & Industry	www.psi-automotive-industry.de
DOCUFY	www.docufy.de	Qualysoft	www.qualysoft.com/de
EAS	www.eas-solutions.de	Rockwell Automation	www.rockwellautomation.de
eEvolution	www.eevolution.de	SCHEMA Consulting	www.schema.de
Elabo	www.elabo.de	Siemens Industry Software	www.siemens.com/plm
Empolis Information Management	www.empolis.com	SL innovativ	www.sl-i.de
Fischer Information Technology	www.fischer-information.com	Topcom Kommunikationssysteme	www.topcom-group.de
Geovision	www.geovision.de	USU Software Niederlassung Karlsruhe	www.usu.de/de
GODYO Business Solutions	www.godyo.com	WERKBLiQ	www.werkbliq.de
HEISAB	www.heisab.de	Zuken E3	www.zuken.com
IBM Deutschland	www.ibm.de		

Product independent consulting

Abass	www.abass.de	Intera	www.intera.de
accelcon	www.accelcon.de	Kothes	www.kothes.de
ARC Solutions	www.arcsolutions.de	Dr.-Ing. Helmut Maier CSS	www.maiercss.de
birkle IT	www.birkle-it.com	MODUS Consult	www.modusconsult.de
Centigrade	www.centigrade.de	MQ result consulting	www.mqresult.com
cognitas.	www.cognitas.de	ORBIS	www.orbis.de
COI	www.coi.de	Qualysoft	www.qualysoft.com/de
DATACOPY publishing solutions	www.datacopy.de	schrempp edv	www.schrempp-edv.de
DLP Engineers	www.dlp-engineers.de	syscon	www.syscon-online.com
ERNI (Deutschland)	www.betterjoin.erni	TROVARIT	www.trovarit.com
FAUSER	www.fauser.ag	UNITY	www.unity.de
Ingenieurbüro Dr. Grahl - KAIROS Partner	www.kairospartners.de	valantic Supply Chain Excellence	www.valantic.com
induux international	www.lightwerk.de	Your Expert Cluster	www.yourexpertcluster.de
INGTechnik	www.ingtechnik.de	znt	www.znt-richter.com

Simulation in the product development process

Engineering firms are increasingly using simulation tools to improve and accelerate their product development process, with a special focus on increasing quality, reducing costs and enhancing customer satisfaction.

Digital simulation in all its various shapes and sizes is becoming an integral part of the entire product development process. It is used in virtually all phases of the product life cycle. Based on the relevant technologies such as the finite element method in construction, collision testing in process engineering, process simulation in production, visualization in virtual commissioning processes, and AR and VR applications in service, simulation contributes significantly to making production more efficient and sustainable.

The VDMA founded the "Simulation and Visualization in the Product Life Cycle" working group as a means to support this development. The aim of the working group is to motivate small and medium-sized companies to use these technologies. Beginning in the early stages of product development – still in a digital format – findings can be included directly in the development, thus increasing product and production quality and reducing the development time.

The VDMA publication "Simulation and Visualization in the Product Life Cycle" contains 15 use cases showing the benefit of digital simulation tools. Here companies from different sectors describe the benefits they have generated with these systems, and the savings and improvements they have achieved. Compilation of the results highlights the fact that all companies need to address the use of such technologies to satisfy customer demands and reach the respective markets on time, while not losing sight of costs and quality.

The members of the "Simulation and Visualization in the Product Life Cycle" working group have set out to cover and address all relevant aspects and facets relating to simulation.

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Product Lifecycle Management / Product Engineering

Mechanical CAD

A+W Software	www.a-w.de	IMS Maschinen- u. Anlagenbau	www.ims-deutschland.com
ACAM Engineering	www.acam.at	INNEO Solutions	www.inneo.de
ams.Solution	www.ams-erp.com	Isah	www.isah.com
ARC Solutions	www.arcsolutions.de	ISAP	www.isap.de
ARNOLD IT Systems	www.arnold-it.com	ISG	www.isg-stuttgart.de
BCT Technology	www.bct-technology.com	itelligence	www.itelligence.de
BEUMER Maschinenfabrik	www.beumergroup.com	Körber	www.koerber.de
Bosch Rexroth	www.boschrexroth.com/de/de	Lino	www.lino.de
CADCABEL	www.cadcabel.com	Dr.-Ing. Helmut Maier CSS	www.maiercss.de
Dassault Systemes Deutschland	www.3ds.com	NTI Kailer	www.nti-kailer.de
data M Sheet Metal Solutions	www.datam.de	schrempp edv	www.schrempp-edv.de
DLP Engineers	www.dlp-engineers.de	Siemens Industry Software	www.siemens.com/plm
DPS Software	www.dps-software.de	SIMERICS	www.simerics.de
DSC Software	www.dscsag.com	SMS group	www.sms-group.com
eEvolution	www.eevolution.de	Software Factory	www.sf.com
Famic Technologies	www.famictech.com	TechniaTranscat	www.techniatranscat.com
FAUDE Automatisierungstechnik	www.faude.de		

Electrical CAD

ams.Solution	www.ams-erp.com	INNEO Solutions	www.inneo.de
AUCOTEC	www.aucotec.com	Isah	www.isah.com
BEUMER Maschinenfabrik	www.beumergroup.com	ISG	www.isg-stuttgart.de
Bosch Rexroth	www.boschrexroth.com/de/de	itelligence	www.itelligence.de
CADCABEL	www.cadcabel.com	Körber	www.koerber.de
Dassault Systemes Deutschland	www.3ds.com	Dr.-Ing. Helmut Maier CSS	www.maiercss.de
DLP Engineers	www.dlp-engineers.de	OPEN MIND Technologies	www.openmind-tech.com
DPS Software	www.dps-software.de	schrempp edv	www.schrempp-edv.de
DSC Software	www.dscsag.com	Siemens Industry Software	www.siemens.com/plm
EPLAN	www.eplan.de	SIMERICS	www.simerics.de
Famic Technologies	www.famictech.com	TechniaTranscat	www.techniatranscat.com
FAUDE Automatisierungstechnik	www.faude.de	WSCAD	www.wscad.de
IMS Maschinen- u. Anlagenbau	www.ims-deutschland.com	Zuken E3	www.zuken.com

Computer Aided Manufacturing (CAM)

A+W Software	www.a-w.de	INNEO Solutions	www.inneo.de
ACAM Engineering	www.acam.at	ISG	www.isg-stuttgart.de
ARC Solutions	www.arcsolutions.de	Körber	www.koerber.de
ARNOLD IT Systems	www.arnold-it.com	Lino	www.lino.de
BCT Technology	www.bct-technology.com	Dr.-Ing. Helmut Maier CSS	www.maiercss.de
CGTech Deutschland	www.vericut.de	NTI Kailer	www.nti-kailer.de
Dassault Systemes Deutschland	www.3ds.com	OPEN MIND Technologies	www.openmind-tech.com
DIENES Apparatebau	www.dienes.net	schrempp edv	www.schrempp-edv.de
DPS Software	www.dps-software.de	Siemens Industry Software	www.siemens.com/plm
DSC Software	www.dscsag.com	SIMERICS	www.simerics.de
Eckelmann	www.eckelmann.de	SMS group	www.sms-group.com
esco	www.esco-aachen.de	Software Factory	www.sf.com
SC Gemini CAD Systems SRL	www.geminicad.com	SPRING Technologies	www.ncsimul.com
Geovision	www.geovision.de	TechniaTranscat	www.techniatranscat.com
IFS Deutschland	www.ifsworld.com/de	Zuken E3	www.zuken.com
Infor (Deutschland)	www.infor.com		

Simulation solution

3D Interaction Technologies	www.3dit.de	HEISAB	www.heisab.de
ACAM Engineering	www.acam.at	HEITEC	www.heitec.de
Altair Engineering	www.altair.de	HUMAN SOLUTIONS	www.human-solutions.de
ARC Solutions	www.arcsolutions.de	INFORM	www.inform-software.de
ARNOLD IT Systems	www.arnold-it.com	INNEO Solutions	www.inneo.de
ASSYST	www.assyst.de	ISG	www.isg-stuttgart.de
AZO	www.azo.com	Lino	www.lino.de
BCT Technology	www.bct-technology.com	Dr.-Ing. Helmut Maier CSS	www.maiercss.de
BEUMER Maschinenfabrik	www.beumergroup.com	MESHPARTS	www.meshparts.de
CADFEM	www.cadfem.de	NTI Kailer	www.nti-kailer.de
Centigrade	www.centigrade.de	OPEN MIND Technologies	www.openmind-tech.com
CGTech Deutschland	www.vericut.de	REINHOLZ Software & Technology	www.reinholz-sat.de
COPA-DATA	www.copadata.de	Rockwell Automation	www.rockwellautomation.de
Dassault Systemes Deutschland	www.3ds.com	SAE schaarschmidt analytic engineering	www.sae-portal.de
DLP Engineers	www.dlp-engineers.de	Siemens Industry Software	www.siemens.com/plm
DOCUFY	www.docufy.de	SIMERICS	www.simerics.de
DPS Software	www.dps-software.de	SMS group	www.sms-group.com
DSC Software	www.dscsag.com	SPRING Technologies	www.ncsimul.com
Eckelmann	www.eckelmann.de	STAR Deutschland	www.star-group.net
ESI ITI	www.simulationx.de	TechniaTranscat	www.techniatranscat.com
ESSERT	www.essert.com	TEDATA	www.tedata.de
Famic Technologies	www.famictech.com		
GAL Digital	www.gal-digital.de		

Product Data Management (PDM)

All for One Steeb	www.all-for-one.com	Körber	www.koerber.de
ams.Solution	www.ams-erp.com	Lino	www.lino.de
ARC Solutions	www.arcsolutions.de	Dr.-Ing. Helmut Maier CSS	www.maiercss.de
ARNOLD IT Systems	www.arnold-it.com	MODUS Consult	www.modusconsult.de
BCT Technology	www.bct-technology.com	N+P Informationssysteme	www.nupis.de
CE-CON	www.ce-con.de	NTI Kailer	www.nti-kailer.de
Configit	www.configit.com	ORBIS	www.orbis.de
CONTACT Software	www.contact.de	ORISA Software	www.orisa.de
COSMO CONSULT	www.cosmoconsult.com	Paradigma Software	www.paradigma-software.de
Dassault Systemes Deutschland	www.3ds.com	PDTec	www.pdtec.de
DIENES Apparatebau	www.dienes.net	proALPHA Business Solutions	www.proalpha.de
DLP Engineers	www.dlp-engineers.de	PROCAD	www.procad.de
DOCUFY	www.docufy.de	PROFIT SYSTEMHAUS	www.profit-systemhaus.de
DPS Software	www.dps-software.de	PROSTEP	www.prostep.com
DSC Software	www.dscsag.com	SAP Deutschland	www.sap.com/germany
Elabo	www.elabo.de	SCHEMA Consulting	www.schema.de
Empolis Information Management	www.empolis.com	schrempp edv	www.schrempp-edv.de
Fischer Information Technology	www.fischer-information.com	SETEX	www.setex-germany.com
Freudenberg IT	www.freudenberg-it.com	Siemens Industry Software	www.siemens.com/plm
SC Gemini CAD Systems SRL	www.geminicad.com	SIMERICS	www.simerics.de
HALO-electronic	www.inteos.com	Software Factory	www.sf.com
IBM Deutschland	www.ibm.de	STAR Deutschland	www.star-group.net
IFS Deutschland	www.ifsworld.com/de	TechniaTranscat	www.techniatranscat.com
Infor (Deutschland)	www.infor.com	Topcom Kommunikationssysteme	www.topcom-group.de
INNEO Solutions	www.inneo.de	WERKBLiQ	www.werkbliq.de
Intera	www.intera.de	WSCAD	www.wscad.de
IPKS	www.ipks.de	znt	www.znt-richter.com
ISAP	www.isap.de	Zuken E3	www.zuken.com
itelligence	www.itelligence.de		
Konica Minolta IT Solutions	www.konicaminolta.de/it		

Product independent consulting

accelcon	www.accelcon.de	NTI Kailer	www.nti-kailer.de
accessec	www.accessec.com	proCtec	www.proctec.de
ARC Solutions	www.arcsolutions.de	PROSTEP	www.prostep.com
AZO	www.azo.com	REINHOLZ Software & Technology	www.reinholz-sat.de
DLP Engineers	www.dlp-engineers.de	Scheer	www.scheer-group.com
ERNI (Deutschland)	www.betterjoin.erni	SEEBURGER	www.seeburger.de
FAUDE Automatisierungstechnik	www.faude.de	SIMERICS	www.simerics.de
gds	www.gds.eu	SL innovativ	www.sl-i.de
GODYO Business Solutions	www.godyo.com	syscon	www.syscon-online.com
Ingenieurbüro Dr. Grahl - KAIROS Partner	www.kairospartners.de	Techniciency Consulting	www.techniciency.de
Intera	www.intera.de	TROVARIT	www.trovarit.com
ISG	www.isg-stuttgart.de	UNITY	www.unity.de
ITQ	www.itq.de	valantic Supply Chain Excellence	www.valantic.com
kommunikationsoptimierer.de	www.kommunikationsoptimierer.de	XITASO	www.xitaso.com
M&M Software	www.mm-software.com	Your Expert Cluster	www.yourexpertcluster.de
Dr.-Ing. Helmut Maier CSS	www.maiercss.de	znt	www.znt-richter.com
MODUS Consult	www.modusconsult.de	Zühlke Engineering	www.zuehlke.com
MQ result consulting	www.mqresult.com		

Project Management

Part of ERP, CRM ...

abas Software	www.abas-erp.com	IFS Deutschland	www.ifsworld.com/de
Across Systems	www.across.net	Infor (Deutschland)	www.infor.com
All for One Steeb	www.all-for-one.com	Intera	www.intera.de
alltrotec	www.alltrotec.de	Isah	www.isah.com
ams.Solution	www.ams-erp.com	IT Vision Technology	www.itvt.de
ARC Solutions	www.arcsolutions.de	itelligence	www.itelligence.de
Asseco Solutions	www.asseco.de/ap	Körber	www.koerber.de
ASSYST	www.assyst.de	Krehl & Partner	www.krehl.com
AVISTA ERP Software	www.avista-erp.de	KUMAVISION	www.kumavision.de
BEOS Beratung & Software	www.beos-software.de	MODUS Consult	www.modusconsult.de
birkle IT	www.birkle-it.com	ofischer communication	www.ofischer.com
Blauhut & Partner Informationssysteme	www.procos.de	Opdenhoff Technologie	www.opdenhoff.de
CAS Software	www.cas.de	ORBIS	www.orbis.de
CATUNO	www.catuno.de	oxaion	www.oxaion.de
ClassiX Software	www.classix.de	PIKON Deutschland	www.pikon.com
COMTRI	www.comtri.de	POWERCASE FORMULA CRM	www.formulacrm.de
COSMO CONSULT	www.cosmoconsult.com	proALPHA Business Solutions	www.proalpha.de
CSS	www.css.de	PROCAD	www.procad.de
Dassault Systemes Deutschland	www.3ds.com	PROFIT SYSTEMHAUS	www.profit-systemhaus.de
datura manufacturing	www.swissdynamics.net	PSI Automotive & Industry	www.psi-automotive-industry.de
DOCUFY	www.docufy.de	Qualysoft	www.qualysoft.com/de
DPS Software	www.dps-software.de	Sage	www.sage.de/mittelstand
DSC Software	www.dscsag.com	SALT Solutions	www.salt-solutions.de
eEvolution	www.eevolution.de	SAP Deutschland	www.sap.com/germany
FAUSER	www.fauser.ag	schrempp edv	www.schrempp-edv.de
Freudenberg IT	www.freudenberg-it.com	Siemens Industry Software	www.siemens.com/plm
Geovision	www.geovision.de	STAR Deutschland	www.star-group.net
GODYO Business Solutions	www.godyo.com	TopM Software	www.topm.de
HALO-electronic	www.inteos.com	untersee	www.untersee.com
HEISAB	www.heisab.de	WIBU-SYSTEMS	www.wibu.com
HEITEC	www.heitec.de		

Stand-alone Project Management software

abilis	www.abilis.de	INNOSOFT	www.innosoft.de
ams.Solution	www.ams-erp.com	Intera	www.intera.de
BEUMER Maschinenfabrik	www.beumergroup.com	Konica Minolta IT Solutions	www.konicaminolta.de/it
Bosch Rexroth	www.boschrexroth.com/de/de	Körber	www.koerber.de
CETECOM	www.cetecom.com	KUMAVISION	www.kumavision.de
COI	www.coi.de	LF CONSULT	www.lfconsult.de
Consort IT	www.consort-it.de	Dr.-Ing. Helmut Maier CSS	www.maiercss.de
CONTACT Software	www.contact.de	MODUS Consult	www.modusconsult.de
CSS	www.css.de	PROFIT SYSTEMHAUS	www.profit-systemhaus.de
Dassault Systemes Deutschland	www.3ds.com	PSI Automotive & Industry	www.psi-automotive-industry.de
EAS	www.eas-solutions.de	PSI Technics	www.psi-technics.com
Eleco Software	www.elecosoft.de	Siemens Industry Software	www.siemens.com/plm
ETABO	www.eta-bochum.de	Software Factory	www.sf.com
HEISAB	www.heisab.de	Techniciency Consulting	www.techniciency.de
IBM Deutschland	www.ibm.de	Topcom Kommunikationssysteme	www.topcom-group.de
INFORM	www.inform-software.de	valantic Supply Chain Excellence	www.valantic.com
INNEO Solutions	www.inneo.de	Zuken E3	www.zuken.com

Product independent consulting

accelcon	www.accelcon.de	ORBIS	www.orbis.de
ARC Solutions	www.arcsolutions.de	POWERCASE FORMULA CRM	www.formulacrm.de
birkle IT	www.birkle-it.com	proCtec	www.proctec.de
Centigrade	www.centigrade.de	ProLeiT	www.proleit.de
COI	www.coi.de	PROSTEP	www.prostep.com
DCC global	www.dcc-global.com	PSI Technics	www.psi-technics.com
ERNI (Deutschland)	www.betterjoin.erni	Qualysoft	www.qualysoft.com/de
Intera	www.intera.de	Scheer	www.scheer-group.com
ITQ	www.itq.de	schrempp edv	www.schrempp-edv.de
Körber	www.koerber.de	syscon	www.syscon-online.com
M&M Software	www.mm-software.com	Techniciency Consulting	www.techniciency.de
macio	www.macio.de	TROVARIT	www.trovarit.com
Dr.-Ing. Helmut Maier CSS	www.maiercss.de	UNITY	www.unity.de
MODUS Consult	www.modusconsult.de	XITASO	www.xitaso.com
MQ result consulting	www.mqresult.com	XITASO Engineering	www.xitaso.com
NewTec	www.newtec.de	Your Expert Cluster	www.yourexpertcluster.de
NTI Kailer	www.nti-kailer.de	Zühlke Engineering	www.zuehlke.com
Opdenhoff Technologie	www.opdenhoff.de		

Other IT Solution Provider and Consulting Firms

Consulting and other services

Abass	www.abass.de	Laetus	www.laetus.com
accelcon	www.accelcon.de	MegaPart	www.megapart.de
accessec	www.accessec.com	mip Consult	www.mip-consult.de
ams.Solution	www.ams-erp.com	ORANGE Engineering	www.orange-engineering.de
Balluff	www.balluff.com	OSB	www.osb-ag.de
Blauhut & Partner Informationssysteme	www.procos.de	Perfect Production	www.perfect-production.de
CETECOM	www.cetecom.com	PHOENIX CONTACT Software	www.innominate.com
CLS 4-Text	www.4-text.de	PIKON Deutschland	www.pikon.com
cognitas.	www.cognitas.de	PLATO	www.plato.de
datura manufacturing	www.swissdynamics.net	proALPHA Business Solutions	www.proalpha.de
DLP Engineers	www.dlp-engineers.de	REINHOLZ Software & Technology	www.reinholz-sat.de
ERNI (Deutschland)	www.betterjoin.erni	S & P Computersysteme	www.sup-logistik.de
FAUDE Automatisierungstechnik	www.faude.de	Scheer	www.scheer-group.com
FAUSER	www.fauser.ag	schrempp edv	www.schrempp-edv.de
gbo datacomp	www.gbo-datacomp.de	Siemens Industry Software	www.siemens.com/plm
gds	www.gds.eu	Smart HMI	www.smart-hmi.de
generic.de	www.generic.de	Software Factory	www.sf.com
GFOS	www.gfos.com	syscon	www.syscon-online.com
HiSolutions	www.hisolutions.com	Trebing & Himstedt Prozessautomation	www.t-h.de
IBM Deutschland	www.ibm.de	UNITY	www.unity.de
in-tech	www.in-tech.com	Vollmer & Scheffczyk	www.v-und-s.de
induux international	www.lightwerk.de	Weidmüller GTI Software	www.gti.de
Intera	www.intera.de	Martin Wiesend Die Kundendienst-Trainer	www.maiercss.de
iT Engineering Software Innovations	www.ite-si.de	WITTENSTEIN alpha	www.wittenstein-alpha.de
Janz Tec	www.janztec.com	WSCAD	www.wscad.de
kommunikationsoptimierer.de	www.kommunikationsoptimierer.de	XITASO Engineering	www.xitaso.com
Kothes	www.kothes.de		

Solution provider for commercial and technical processes

A+W Software	www.a-w.de	PHOENIX CONTACT Software	www.innominate.com
accelcon	www.accelcon.de	PSI Software	www.psi.de
ams.Solution	www.ams-erp.com	PSI Mines&Roads	www.psi-minesandroads.de
Blauhut & Partner Informationssysteme	www.procos.de	REINHOLZ Software & Technology	www.reinholz-sat.de
BridgingIT	www.bridging-it.de	S & P Computersysteme	www.sup-logistik.de
FACTON	www.facton.com	schrempp edv	www.schrempp-edv.de
gds	www.gds.eu	SEEBURGER	www.seeburger.de
SC Gemini CAD Systems SRL	www.geminicad.com	Siemens Industry Software	www.siemens.com/plm
GFOS	www.gfos.com	Syslog	www.syslog.de
IBM Deutschland	www.ibm.de	Topcom Kommunikationssysteme	www.topcom-group.de
INCLUDIS	www.includis.com	Vollmer & Scheffczyk	www.v-und-s.de
Intera	www.intera.de	Weidmüller GTI Software	www.gti.de
iT Engineering Software Innovations	www.ite-si.de	WSCAD	www.wscad.de
Janz Tec	www.janztec.com	XITASO Engineering	www.xitaso.com
Laetus	www.laetus.com	Zimmer & Kreim	www.zk-system.com
Membrain	www.membrain-it.com	znt	www.znt-richter.com

Special solutions

accelcon	www.accelcon.de	gds	www.gds.eu
ADITO Software	www.adito.de	generic.de	www.generic.de
AZO	www.azo.com	Gesellschaft für Sonder-EDV-Anlagen	www.gfs-hofheim.de
Balluff	www.balluff.com	IBM Deutschland	www.ibm.de
CETECOM	www.cetecom.com	in-tech	www.in-tech.com
CIMSOURCE	www.cimsource.com	INFORM	www.inform-software.de
COSMO CONSULT	www.cosmoconsult.com	iT Engineering Software Innovations	www.ite-si.de
DIENES Apparatebau	www.dienes.net	Janz Tec	www.janztec.com
DLP Engineers	www.dlp-engineers.de	Körber	www.koerber.de

Special solutions

Laetus	www.laetus.com	Siemens Industry Software	www.siemens.com/plm
micropsi industries	www.micropsi-industries.com	valantic Supply Chain Excellence	www.valantic.com
PHOENIX CONTACT Software	www.innominate.com	VÖLKEL Mikroelektronik	www.voelkel.de
Quentic	www.ecointense.de	WAGO Kontakttechnik	www.wago.com
REINHOLZ Software & Technology	www.reinholz-sat.de	Weidmüller GTI Software	www.gti.de
SAE schaarschmidt analytic engineering	www.sae-portal.de	WSCAD	www.wscad.de
schrempp edv	www.schrempp-edv.de	XITASO Engineering	www.xitaso.com
Schubert & Salzer Data	www.data-systems.info	znt	www.znt-richter.com

Solution provider for electrical automation

A+W Software	www.a-w.de	Janz Tec	www.janztec.com
ABB Automation Products	www.abb.com	Jungheinrich	www.jungheinrich.de
ACBIS	www.acbis.de	Laetus	www.laetus.com
ads-tec	www.ads-tec.de	logi.cals	www.logicals.com
ADVES	www.adves.one	logi.cals automation solutions & services	www.logicals.com
ARNOLD IT Systems	www.arnold-it.com	Membrain	www.membrain-it.com
AZO	www.azo.com	MERViSOFT	www.mervisoft-gmbh.de
B&R Industrie-Elektronik	www.br-automation.com	neogramm	www.neogramm.de
Bachmann electronic	www.bachmann.info	ontec automation	www.ontec.de
Balluff	www.balluff.com	Opdenhoff Technologie	www.opdenhoff.de
Beckhoff Automation	www.beckhoff.de	OPTIMUM datamanagement solutions	www.optimum-gmbh.de
BITZER Wiegetechnik	www.bitzer-waage.de	PHOENIX CONTACT Software	www.innominate.com
COPA-DATA	www.copadata.de	ProLeiT	www.proleit.de
Dematic	www.dematic.com	PSI Technics	www.psi-technics.com
DEOS	www.deos-ag.com	Reichhardt	www.reichhardt.com
DIENES Apparatebau	www.dienes.net	REINHOLZ Software & Technology	www.reinholz-sat.de
DLP Engineers	www.dlp-engineers.de	Rockwell Automation	www.rockwellautomation.de
DS Automotion	www.ds-automotion.com	Sarissa	www.sarissa.de
e-GITS	www.e-gits.com	SC-Networks	www.sc-networks.com
Eaton Industries	www.eaton.de	Schneider Electric	www.schneider-electric.de
EfA	www.efa-viersen.de	Siemens Industry Software	www.siemens.com/plm
ERNI (Deutschland)	www.betterjoin.erni	Softing Industrial Automation	www.industrial.softing.com
FAUDE Automatisierungstechnik	www.faude.de	Software Factory	www.sf.com
GE Intelligent Platforms	www.ge.com/digital	VMT	www.vmt-vision-technology.com
SC Gemini CAD Systems SRL	www.geminicad.com	VÖLKEL Mikroelektronik	www.voelkel.de
Gesellschaft für Sonder-EDV-Anlagen	www.gfs-hofheim.de	WAGO Kontakttechnik	www.wago.com
GETT	www.gett.de	Weidmüller GTI Software	www.gti.de
GFOS	www.gfos.com	WITTENSTEIN alpha	www.wittenstein-alpha.de
GLAESS Software & Automation	www.glaess-software.de	WSCAD	www.wscad.de
HEITEC	www.heitec.de	XITASO	www.xitaso.com
in-tech	www.in-tech.com	XITASO Engineering	www.xitaso.com
ISG	www.isg-stuttgart.de	znt	www.znt-richter.com
iT Engineering Software Innovations	www.ite-si.de		

Company Profiles

A+W: Software for Glass, Windows and Doors

A+W is the market leader for software in the flat-glass industry and window and door manufacturing. We develop ERP, PPS, and optimization software in order to make glass and window manufacturers more efficient. Our products are suitable for small, medium-sized, and large companies. We have been active on the market for more than 40 years and we sell our products around the world.

A+W creates open production environments in which the glass and window value creation chain consists of digitally networked, completely automatic, intelligent processes. People, production systems, and information technologies are increasingly coordinated online, in real time, and comprehensively. This enables our customers to finish glass and construction elements efficiently, creatively, and sustainably - and therefore also more profitably. State-of-the-art production environments are constantly networked systems of high-performance machines and intelligent industry software.

In the innovation network of glass processor or window manufacturer, machine manufacturer, and software provider, comprehensive solutions that are pioneering for the industry are frequently created from heterogeneous components, from practical experience for practical experience. This is why A+W, together with various equipment manufacturers, has always found the best solutions for its customers and changed the glass industry for the long term.

Examples are completely automatic online glass sorting and robot loading in the sequence that is desired at the end of the insulated glass line. We would like to make a contribution to making machine communication between different manufacturers' systems and superior systems fit for the future. Together with manufacturers of CNC production lines, we program and perfect intelligent bidirectional interfaces for completely automatic machine control – important cornerstones of any state-of-the-art production on the way to Industry 4.0. In addition, we work with our machine partners to develop common interface standards for the flat-glass industry. This is how we make production environments faster, more digital, and secure.

A+W

Software for Glass,
Windows & Doors

A+W Software GmbH • Am Pfahlgraben 4 - 10 • 35415 Pohlheim • Germany
Phone +49 6404 2051-0 • E-Mail info@a-w.com
Internet www.a-w.com

Launch your **CPQ** future with **3D** and **virtual reality**
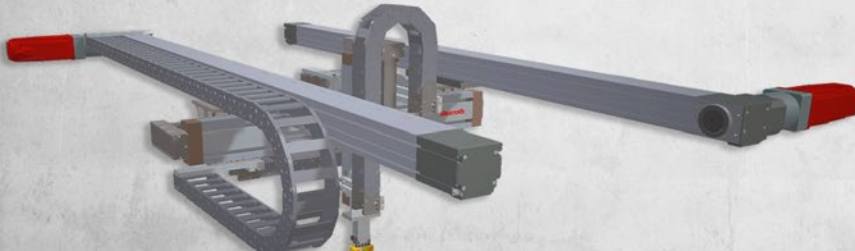
Product configuration from point-of-sale to order processing

speedmaxx® Enterprise – standard software for product configuration, pricing and quoting (CPQ). Using the product configurator, you can automate ERP, CAD and PDM systems in rule-based configuration processes and visualise configured products in 3D and VR. This is the future of CPQ.

With CAD automation for CPQE

The speedmaxx® product configurator brings consistency all the way through to engineering. CAD systems are integrated and automated from the sales process onwards. The finished CAD drawings are available with the quotation at runtime. All the data for order fulfilment are generated automatically when an order is placed. That's CPQE.

Cut lead times by an order of magnitude

With speedmaxx® you can slash the lead time of the entire business process by a factor of between 5 and 20. You provide your customers with valid information on their customised products at an early stage, while speeding up the entire process.

Visualisation on the web with no plug-in required

Impress your customers with a 3D interactive visualisation of the configured products. Or allow them to immerse themselves in virtual reality. Your configuration can run immediately in a browser using existing technology – without a plug-in or Flash Player.

These are just some of the customers who have successfully implemented speedmaxx®: Bosch Rexroth, KRONE, Magirus GmbH, MTU Onsite Energy, Würth, Zarges and ZF Friedrichshafen.

Configure　**P**rice　**Q**uote　**+**　**E**ngineer　→　**speedmaxx®**
weil's einfach geht

ACATEC®
We configure it.

ACATEC Software GmbH • Am Sehrteich 12 • 30989 Gehrden • Germany
Phone +49 5108 9159-0 • E-Mail info@acatec.de
Internet www.acatec.de

SELL SUCCESSFULLY

Selling versatile products success-
ful with the ACBIS B2B Web portal:
make complex product kno0wled-
ge easily available - and waste
less time with queries.

INNOVATIONSPREIS-IT
BEST OF
initiative **mittelstand**
MITTELSTAND

Easier. Quicker. Better.
Quoting and integrated product configuration from ACBIS

MASTERY OF
VARIED PRODUCTS

STANDARD SOLUTION
FOR E-BUSINESS

SIMPLE SPARE PARTS
ORDER
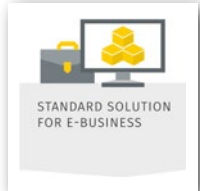
ACBIS provides advanced quoting with integrated product configuration (CPQ) and order processing solutions for business with customer-specific products and services. ACBIS solutions are designed in such a way that no IT specialists is needed: the development and maintenance of the rules can be done by product specialists.

Sales System/CPQ Quotation System

The "SalesManager Professional" sales system with integrated ePOS configurator supports sales from initial contact through to the quote and all the way up to the order. The core function of the SalesManager is the shopping cart, in which quote positions are sorted into a multilevel structure, similar to the printout of the quote. Positions in the shopping cart are known items, configuration items and new positions.

The SalesManager can be operated in the enter-prise network and offline on a notebook. Users have reported reductions in quote preparation costs of more than 80%.

B2B Web Portal/Web shop

The B2B Web Portal allows product selection, configuration and pricing for the preparation of quotes and orders on the web. Distributors, sales partners and customers worldwide can access the central product knowledge, prepare quotes and enter orders without any time restrictions. A web shop for spare parts and consumables strengthens customer loyalty and reduces the processing time and costs.

Product configuration integrated in the ERP System

The ePOS configurator, integrated into the ERP system, configures customer-specific products and services and generates the corresponding quote documents. During the order processing, the ePOS configurator creates parts lists, routings and further production documents.

Flexible solutions for an ideal customer service and lean processes

Since 1988 customers and partners appreciate ADITO as a software producer that considers every relationship to be unique. ADITO stands for this uniqueness and therefore manages to make its 800 customers successful.

Transparent opportunity management, continuous service, automatic processes, better networking – In machinery and plant engineering it is essential that you are always one step ahead of the competition. With ADITO you stand out from your competitors and guarantee exceptional service throughout the whole life cycle of your business relations. Organise your processes more efficiently and increase your productivity. Use ADITO to connect people, machinery and products more closely to each other.

Your benefits with ADITO as a platform for Marketing, Sales and Service

- Complete customer and machine folders
- Central opportunity management
- Efficient route planning

No matter which device you are using, no matter whether you are at the office, on the road or in the production hall: ADITO helps companies to

organise their daily tasks and control their business processes over one central platform. ADITO represents your plant and machinery ideally. In addition, the highly adaptable platform maps out all relations between your company and your customers, partners, employees or suppliers. The flexible software can be customized individually and is available as a cloud or in-house application.

Using our industry solution for machinery and plant engineering, you always access information on machine, plant, spare parts and resources transparently and immediately. Analytical tools, reports and analysis support your company to reach well-founded business decisions.

What ADITO for machinery and plant engineering has to offer

- Plant and machinery records with included maintenance intervals
- Transaction report for all your services as well as machines and plants
- Mobile access to all your data via the ADITO app
- Interfaces with external data bases like ERP or BI

ADITO Software GmbH • Konrad-Zuse-Str. 4 • 84144 Geisenhausen • Germany
Phone +49 8743 9664-0 • E-Mail info@adito.de
Internet www.adito.de
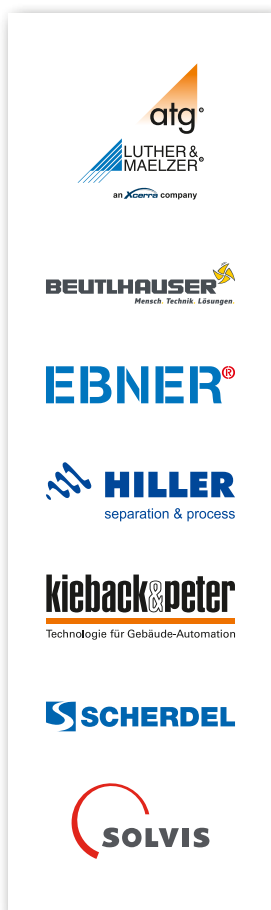
SOFTWARE ON TWO STRONG PILLARS –
Development and Consulting

More possibilities, more reliability: Software from AIT controls complex machinery parks around the world, provides access to the latest research results via a research portal, provides virtual product presentations via HoloLens and much more. AIT is the mountain guide who is at home in the digital landscape.

Our focus: to understand better

One thing shows up again and again – how good software is in the end is decided at the beginning of the project. That's why, as with AIT, the very beginning of development means that exactly what are your requirements and what do your customers expect? Only when we have understood you and your goals 100%, we start with the conception of the software.

Software also needs a building plan

Which architecture and which components are best suited for your needs? This is what we define together in the next step, before the actual software development begins: in the form of a joint team of your and our employees or, alternatively, with our managed nearshore developers.

The optimal process model

Agile or formal, SCRUM, CMMI or waterfall: Each model has its specific strengths. What is the most suitable option in your case depends on your wishes and your industry. And of course you can profit from our experience based on similar projects.

Know-how transfer to your employees

Because many technologies and processes will be new in the beginning, we familiarize your team with all the essential tools and techniques. Based on our extensive project experience, we have derived extremely practical training that gives your employees the knowledge they need to be able to do as much as possible themselves in the future.

Quality as the topmost principle

The faster a product gets to the market, the better for our customers. Despite ever shorter release cycles, the quality must not suffer. Therefore, we support you with best practices in the field of quality assurance and demonstrate with various test types (CodedUI test, unit test, automated tests ...), test methods or tools as well as with code reviews, such as high quality and quality assurance reliability requirements can be achieved despite enormous time pressure.

Project manager and idea supplier

As a mountain guide through the digital landscape, we have developed over time a look for new ways and opportunities. Wherever we see untapped potential, we point this out to our customers and contribute appropriate ideas for their development. In addition, we as the head of the joint project team also like to take on leadership responsibility.

Technology updates through coaching

The software world is constantly changing. To ensure that the long-term specialists and developers of our customers are always up to date, we accompany the software development with appropriate coaching. An additional advantage: the know-how provided will keep your team independent of external service providers.

Source:
Georgijevic / istock

Download „Industry 4.0: In small steps to platforms and network effects (german)"

Consulting and software company ams.Solution AG, a member of the ams.group, specialises in the project management requirements of make-to-order, assemble-to-order and variant manufacturers. In keeping with their motto "Understanding processes, creating transparency," their ams.erp software provides users with an industry-focused business solution that delivers optimal support throughout the entire value creation chain.

Exclusive. ERP for lot size 1+
Successful project management and total planning reliability
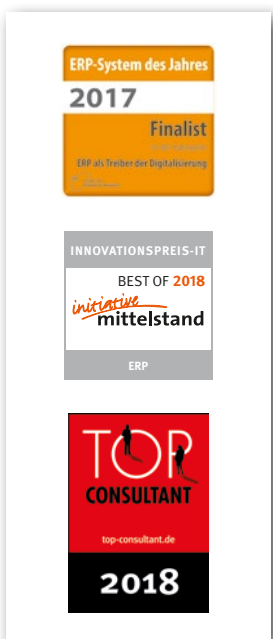
ams.erp provides complete process transparency – from the quotation stage to service management – and offers a wide range of application modules that can be combined to suit the needs of your specific company. Users thus obtain sleek ERP solutions that allow them to fully realise the strengths of their business. ams.erp synchronises all information in real time, allowing everyone involved in the project to work with a single set of data. And cross-order evaluations allow project manufacturers to reliably gauge the performance of their company at all times. The resulting process reliability is the key to ensuring the commercial success of your company.

Simply outstanding.
With know-how from more than 1,000 successful ERP projects, we have the perfect solution for companies in the fields of machinery, plant and apparatus engineering; tool and mould construction; steel, metal and turnkey construction; shipbuilding and the maritime industry; shopfitting and interior fitting; special-purpose vehicle construction; and contract manufacturing. Our portfolio includes consulting, training and service as

well as a comprehensive management consultancy. And with a large team of consultants, software developers and support representatives at locations in Germany, Austria and Switzerland, ams is never far from its customers. Distinctions such as "Top Consultant" in 2018 and finalist "ERP System of the Year" in 2017 prove that ams has worked successfully for over 30 years.

Benefits for the customer
- Multi-project planning
- End-to-end order referencing
- Consistent separation of order BOM and master BOM
- Items with/without item number
- Management of external production including material staging
- Preliminary, simultaneous and final costing
- Semi-finished product evaluation by order
- Sub final invoice

Solutions
ams.erp, CRM/XRM, Finance, T&A, PDC, HR, PLM, DMS, Export, Controlling/BI, Mobile, Materials + Shipping, Control Centre, Intercompany

ERP-System des Jahres
2017
Finalist
ERP als Treiber der Digitalisierung

INNOVATIONSPREIS-IT
BEST OF 2018
initiative mittelstand
ERP

TOP CONSULTANT
top-consultant.de
2018

Preparation of quotations for complex products and services while mastering the quotation process.

More efficient results with CPQ software

With camos Quotation and camos Configurator, camos Software und Beratung GmbH, based in Stuttgart, has developed one of the leading CPQ software solutions (Configure Price Quote) for preparing quotations and configuring products in the B2B market. camos is a competent partner for individual concepts, implementation, integration and introduction of CPQ solutions in sales and marketing departments. Reputable clients with complex technical products already use the software all over the world. With approx. 100,000 named users, especially in the mechanical and plant engineering industry, camos is the leading supplier within this segment in Europe.
The camos software solution enables you to prepare clearly arranged, complete quotations, determine correct prices and master your product configuration.

Our technologically advanced product configurator provides an important basis for successful sales and marketing of a diverse range of products. Exact prices can be determined using price lists and/or manufacturer's calculations. This enables sales staff, dealers and other persons involved in the process to prepare technically correct and precisely calculated quotations. camos CPQ can be used both as a mobile option for field service personnel and in-house for integration in ERP systems (e. g. SAP ERP). camos Develop is a tool which is easy to use for modelling and servicing product and relationship knowledge. Thanks to the graphical user interface complex rules can also be easily and clearly maintained.

camos Connect SAP are integration modules certified by SAP which can be used by camos CPQ for bi-directional integration in SAP ERP and CRM. The interface architecture guarantees continuous processes and consistent exchange of data.

Our satisfied customers include, for example:
- DEMAG
- DMG MORI
- Haver & Boecker
- HOMAG
- KONE
- KSB
- MAN
- VOITH

camos.

camos Software und Beratung GmbH
Friedrichstr. 14 • 70174 Stuttgart • Germany
Phone +49 711 78066-10 • E-Mail info@camos.de
Internet www.camos.de

Industry 4.0 for existing plants:
digital. integrated. connected. analyzed & evaluated.

compacer is a software provider in the field of integration and automation of business-critical processes. Our solutions "made in Germany" for a format-independent data exchange between IT systems, machines and devices ensure fast, reliable business processes and ensure that your (I)IoT project is running.

In many manufacturing plants, heterogeneous production environments and plants with a low degree of automation exist. The "old" world should now be integrated into the new, digital one. The mission: a connected and harmonized machine park where machine communication (M2M) is possible, so that data analyzes and evaluations can be made. You can meet this challenge with our **digital retrofit**, **condition monitoring and predictive maintenance** solutions that are specially focused on mechanical engineering.

Your advantages:
- Cost-effective (I)IoT retrofit of existing machines
- Improve predictions through more transparency
- Targeted increase of the plant availability through reduced machine downtimes and permanent monitoring
- Facilitated supply chain and ensuring the supply of spare parts
- Definition of KPIs based on your needs

We have made it our mission to respond flexibly to individual project requirements and to ensure that digitization projects can not only be developed safely but also future-oriented. For this reason, we are seen by our customers as an independent technology partner who optimizes their value chain by developing and expanding secure ecosystems.

IN JUST A FEW STEPS TO A SMART FACTORY

Make your machines and systems IoT-capable:

1. NEEDS ANALYSIS

We will check your analogue machines' existing capabilities. Do they generate any signals at all? Can we leverage existing signals or do we need to retrofit any sensors? Is there an integrated bus system that could make a retrofit unnecessary?

2. SELECTING SENSORS

Before installing them, all sensors must first be carefully selected to match your use case. Only then will you gain the information needed to effectively monitor your machine.

3. DEVELOPMENT OF YOUR PERSONAL RETROFIT STRATEGY

What kind of hardware and software will need to be installed to make sensor data available in a meaningful way?

4. RETROFITTING SENSORS

We will install any necessary sensors and a preprocessor agent to process and prepare theresulting sensor data. Once the retrofit is complete, your machine will be ready for data analysis.

5. NETWORKING

Our data integration platform **edbic** merges all collected machine and sensor data and analyses them in real-time according to predefined rules. This provides you with intelligent monitoring and controlling capabilities across the entire production environment and across all plants.

Further information about how to do retrofit and implement predictive maintenance in your company.
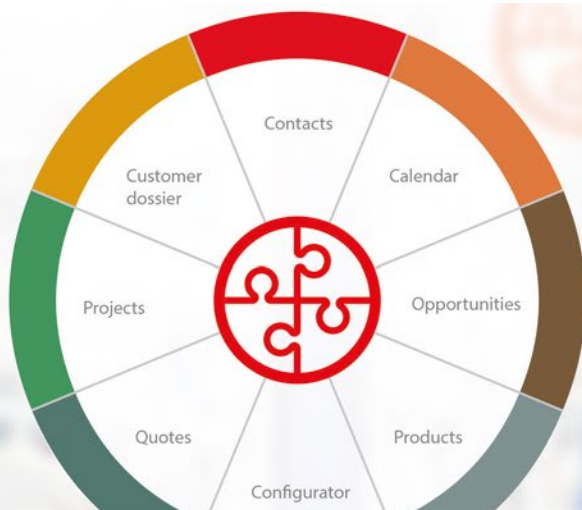
The perfect match:
CRM with integrated Product configuration

First-class customer service

CRM and product configuration work seamlessly together to strengthen your sales team, to enable effective sales management and to satisfy your customers.

The number one CRM software for SMEs gives you full control of your customer management throughout the whole sales process and entire customer lifecycle. Capture and manage your customer data within your entire company to add value, whether you are in the office or on the move using your smartphone or tablet.

With the integrated configurator you can quickly compile complex products and calculate the right offer without any error. You will shorten the sales process by up to 90%.

Thanks to efficient support you save a lot of time you can spend on your customers and their individual needs.

CRM + configurator = added value

- CRM solution professionalizes your customer management
- configurator compiles your products optimally
- tailor-made offers
- assembles the ideal product quickly, even for individual requests
- consistent sales and offer process
- release time for the important things – for sales and improved consulting
- happy customers
- long-term company success

Secure that vital competitive edge!

More than 400,000 users already trust in our multiple award-winning and market-leading CRM solutions.

We can guide you on your CRM journey to success. Contact us!

Mastering product complexity with CLM!
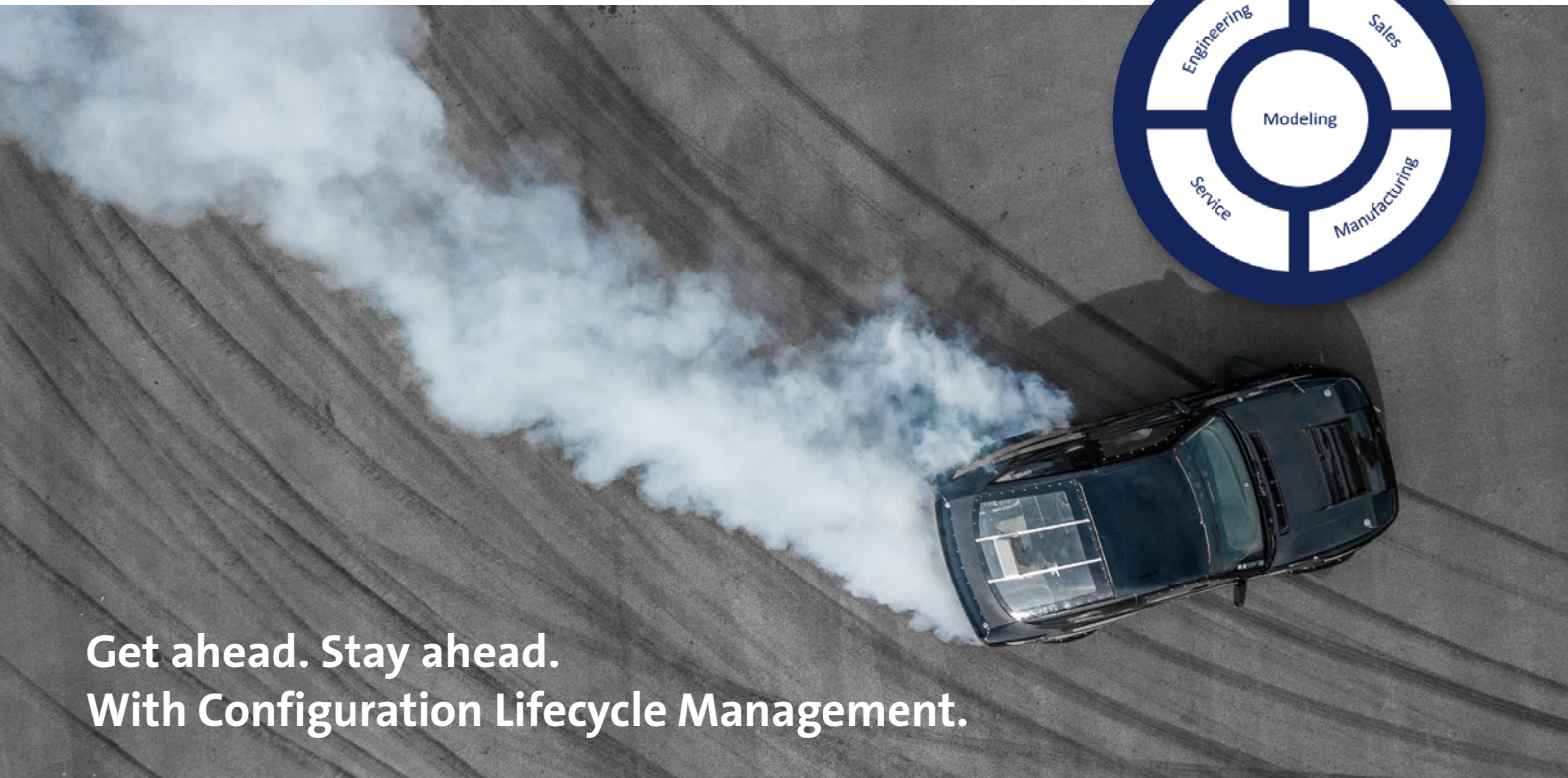
Get ahead. Stay ahead.
With Configuration Lifecycle Management.

Manufacturing companies with complex, multi-variant products are looking for new ways to increase the quality of their configuration processes:

- Avoid duplication of work and errors despite various BOMs
- Stay clear of misunderstandings by introducing a company-wide dictionary for product features
- Integrate specialists, skilled workers and knowledge carriers using collaborative tools

Configuration Lifecycle Management (CLM) is the centralized configuration management solution with a Single Source of Truth across the entire enterprise.

Every business function that touches configured products, from engineering to sales, manufacturing and service are integrated.

The joint management of relevant master data ensures an undistorted and non-redundant view of all product features and configuration rules. Company-wide.

Configuration technology for market leaders.
Unique. Proven. Reliable. Powerful.

Proven Solutions in the Field of SAP PLM – For Your Business Success
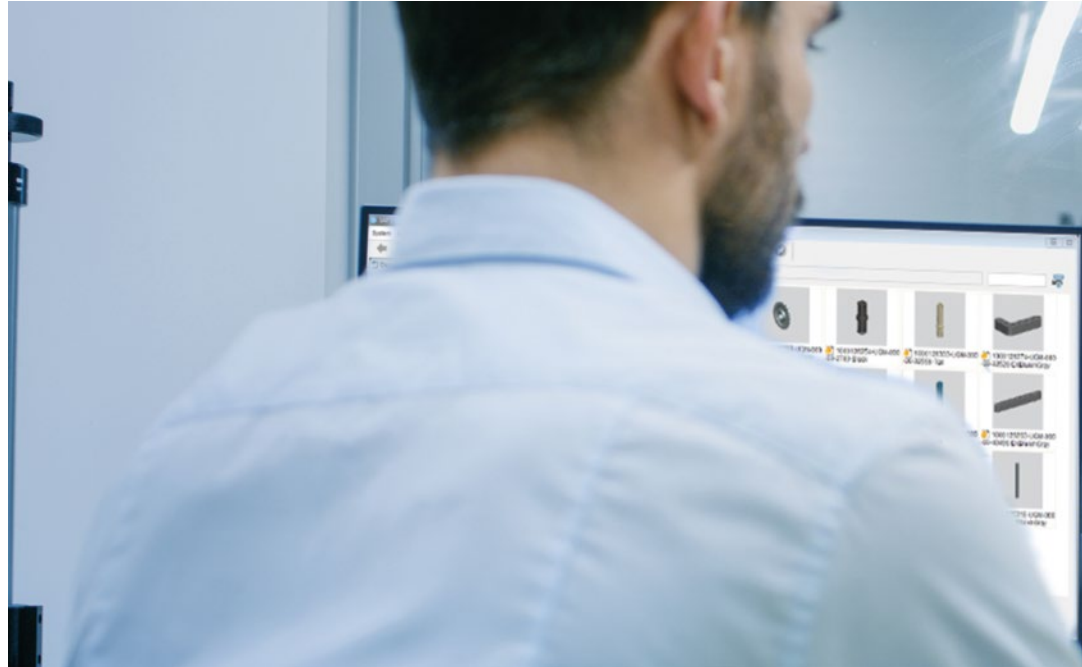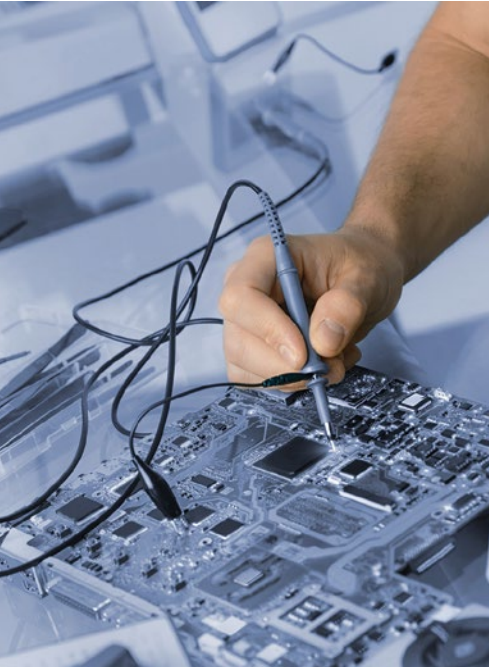
„Fascination with Integration" – True to this motto, the integration experts at DSC Software AG are making the use of SAP solutions in the technical environment easier and more profitable as never before. Founded in Karlsruhe in 1983 as a consulting company, we carried out the first SAP PLM projects in 1995. Since 2007, we have achieved internal success in the PLM market with our software solution Engineering Control Center, which has now been further developed into SAP Engineering Control Center. Apart from a lot of know-how and many years of experience in the design, implementation and support of comprehensive PLM projects, with a focus on the discrete industry, we concentrate mainly on strong customer orientation as well as a close partnership with SAP – meanwhile with platinum status.

All services for effective PLM from a single source
From multi-CAD integrations for mechatronics, electrics, electronics to software development tools and Smart Factory to product data and document management: our customers receive all services for effective Product Lifecycle Management from a single hand. Meanwhile, our solutions are in use with more than 400 prominent companies around the world – companies with the most varied requirements and areas of application. But they all have one thing in common: our software with its integrated processes gives them a decisive competitive edge. Precisely for this reason, our team devotes itself untiringly with great expertise and enormous enthusiasm – true to the motto "Fascination with Integration". So it's no coincidence that we are one of the top addresses as regards SAP integrations around SAP Product Lifecycle Management.

SAP Engineering Control Center –
Where the Digital Twin begins

The Digital Twin is an essential component of the modern digitization strategy. But in order to fully exploit its potential, seamless integration must be created. This means that all product data hast to be managed in a homogeneous and consistent system – from the first requirements sketch to ECAD and MCAD drawings to production and operating data. The prerequisite for this is a digital product life cycle on the basis of modern software solutions. The strategic integration platform SAP Engineering Control Center – SAP ECTR – together with SAP Product Lifecycle Management creates the best prerequisites for this.

With SAP ECTR, we integrate not only individual application programs, but entire company areas seamlessly into the SAP-supported PLM process. Direct interfaces are available for all common MCAD and ECAD systems, such as SAP Engineering Control Center interface to NX or SAP Engineering Control Center interface to ECAD. In this way, locally generated product data and documents become available company-wide and can be managed, classified, versioned and linked to SAP objects in a structured manner. An R&D cockpit with 2D/3D viewing provides development teams with all the information they need at a glance.
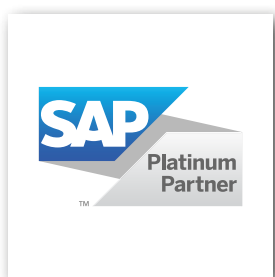
As a provider of Microsoft-based industry and business solutions for companies in the manufacturing, service and retail industries, we think entrepreneurially, act with foresight, and strive for holistic, practicable and useful solutions that can be implemented and maintained as simply, quickly and securely as possible. For us it is important that software is a tool that is made for people. And it is the people who determine the success of a company. In addition to implementation and system management, we offer a wide range of consulting services.

From left to right: Gerrit Schildder, Uwe Bergmann, Klaus Aschauer

Business software for people
... is the guiding principle of COSMO CONSULT

Microsoft Partner
Gold Enterprise Resource Planning
Gold Cloud Customer Relationship Management
Gold Collaboration and Content
Gold Data Analytics
Gold Cloud Platform

IT among equals

COSMO CONSULT has over 20 years of experience with the introduction and support of company solutions. In addition to ERP and industry solutions, our product spectrum includes a wide range of special solutions, business intelligence and CRM systems as well as Office and portal solutions. We see it as our task to digitally transform workplaces and business processes and do so with technology that is geared toward human beings. COSMO CONSULT relies on the pioneering technology of Microsoft Dynamics . In all of this, however, we never forget that IT services are first and foremost about partnership-based cooperation and solutions that you can rely on in the here and now.

New ideas for your digital company

The digital transformation is not only a trend for the future, but a process that already determines the future viability and competitiveness of companies. The digital transformation also involves a change of perspective - from single solutions for

separate tasks to holistic solutions, which intelligently support and link company processes. One example of this is COSMO CONSULT's "Industry 4.0" solution scenario, which was awarded the INNOVATIONSPREIS-IT prize, in which real-time data from machines, components and tools are synchronized directly with the ERP system via tags and sensors.

The path to the future

We would be happy to advise you about the many opportunities that are available to you through the use of modern business software solutions. Just contact us – we look forward to talking with you about how your company can benefit from pioneering software technologies.

Our software solution as a single application or a holistic digital plan!

COSMO CONSULT
Business-Software for People

The flexibly adaptable standard software LEEGOO BUILDER delivers consistent proposal and project engineering solutions, including product configuration, price and cost calculation, document generation and other powerful functional modules.

LEEGOO BUILDER – The coherent proposal solution with product configuration, proposal calculation and document generation

Application areas are sales, project engineering and calculation for companies of all sizes and markets in the investment goods industry.

Particularly engineering companies, suppliers of variant products, build-to-order (BTO) and engineer-to-order (ETO) manufacturers in the areas of mechanical, special machine and plant engineering benefit from our flexibly adaptable LEEGOO BUILDER standard software that enables a coherent, database-supported proposal process.

With LEEGOO BUILDER you ensure transparency and comprehensibility for the projected and calculated investment goods.

The worldwide applicable software supports different kinds of tasks and working methods. One of the key benefits is that all the work (e.g. building configurators) is done by the users themselves.

LEEGOO BUILDER supports the sales and project engineering process consistently from enquiry to proposal through to the creation of an order.

LEEGOO BUILDER focuses on proposal preparation, project engineering and calculation of complex and variant investment goods – from individual machines to plants through to large-scale turnkey projects.

EAS has gathered experience from more than 60 system implementations and has all competencies which are demanded for the conception, development and implementation of successful proposal solutions.

In the book LEEGOO BUILDER Applications you find numerous real-world examples (available free of charge from EAS).

Digitization has fundamentally changed customer service and its standards: Customers expect first-class service anytime, anywhere. Artificial intelligence technologies enable a entirely new level of service quality and customer approach.

Closing service cases faster
www.service.express

Service knowledge at the klick of a button

With the cloud-based solution Empolis Service Express, technical customer service is successfully digitized immediately, with no large investments. As a central cloud platform, Empolis Service Express provides global, scalable access to distributed service information for service personnel, partners, and customers. Empolis Service Express uniquely combines intelligent search and guided troubleshooting based on artificial intelligence.

Magical service moments are created with Empolis Service Express, therefore allowing service staff to deliver excellent customer service and become real service heroes. They have access to all relevant service information with a single action, distributed across a wide range of tools. They find the right information immediately, even in large documents. All employees share their experiences quickly and easily with their colleagues.

Integrated analytics tools instantly make it clear where problems exist, how customers can be assisted and taps into the potential for improvement. Thus, information quality is continuously enhanced.

Empolis Service Express is also available as a mobile service app for smartphone or tablet assistance for support field technicians as they conduct their service appointments. Since the app has full offline capability, all relevant information and the company's entire service knowledge can be accessed on site, at any time, without an internet connection. All of this, in an instant, free of tedious data input, simply by selecting options or via voice commands, supported by comprehensive ergonomic design and user guidance. The Empolis Service Express mobile app is available in the App-Store.

Better ask ERNI:
We believe in Swiss Software Engineering to
generate customer value. Our mission is to
boost people and businesses in the innovation
of software-based products and services. And
thus, to generate a business value.

Swiss Software Engineering – made in Germany

Fast-paced markets, increasing demands of customers, growing competition, digitalisation pressure: the demands for effectiveness and user-friendliness are growing day by day. Technology is the driver of all these developments and becomes the pacemaker.

We are a European IT service company with approximately 700 employees, technology & methodology consultants as well as software developers at 15 locations. From our German locations in Frankfurt and Munich, we also access our international colleagues in order to manage projects efficiently and further expand our customer base.

Our global platform for Swiss Software Engineering, coupled with a deep understanding of the market, creates the framework for customer success. Our crew masters complex projects, empowers people and delivers fast solutions – at good conditions. The Swiss mindset is deeply rooted in the ERNI culture. This includes the creation of consensus, pragmatism, integration, reliability and transparency. Together with our experienced employees they are the basis for successful software projects.

Trend topics like Agile Transformation, DevOps and VR/AR exactly like traditional software development are our daily business. We offer our customers real added value in digitalisation projects and together we develop further as partners.

Are you looking for a reliable partner with 25 years of experience in software and enterprise applications development in the fields of machine engineering, automotive or MedTech? And someone who knows and understands small and medium-sized enterprises? Better ask ERNI.

Would you like to know more?
www.betterask.erni

Insight with MES – Shortcut to Smart Factory

gbo datacomp is numbered among the pioneers of comprehensive MES Solutions for medium-sized manufacturing companies. As a full-service provider with more than 30 years projects experience in production environments, we know what we are talking about when the subject is implementation of Smart Factory. We know all about customer requirements and have incorporated them into our modular MES solutions.

Production data is recorded, visualized and optimized with bisoft MES in a wide variety of enterprise sectors and locations. This results in a noticeable increase in the quality of products and processes. Production data, maintenance data, batch data, messages and disruptions, operator intervention as also consumption are analysed, documented and made available promptly. This ensures the efficiency of swift reactions required under Industry 4.0. Online monitoring provides transparency and overview over all control and recording levels. Thus you always know exactly what is being produced where and are able to intervene immediately in order, for instance, to clear a disruption. This spot-on communication is an important prerequisite for a Smart Factory. Controlling and post-calculation as basis for operational key figure or control systems in bisoft MES are self-evident.

Your benefits at a glance:
- Increasing competitiveness
- Enhanced product and process quality
- Decreasing operational and staff costs

Our long-standing know-how is incorporated in the development of the VDMA Standard ruling 66412 "MES Key figures". To date more than 850 customers – about 14.500 users – in more than 12 countries at home and abroad operate our systems. Our business activities include:
- BDE (Production Data Recording)
- MDE (Machine Data Recording)
- Employee Time Recording
- Production Management
- Overall System Effectivity
- Energy Data Management
- Batch Tracking
- Quality Management
- Tool Management

bisoft is independent of systems and data bases and incorporates all current interfaces to PPS/ERP and HR systems.
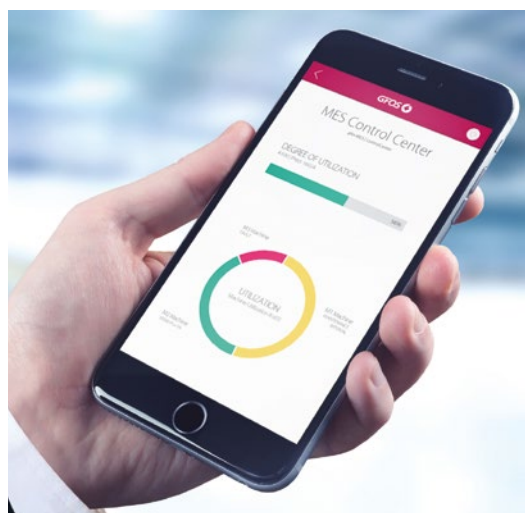
IT – inspired by you.
MES exactly tailored to your needs

**Industry 4.0 and the associated networking of the entire value chain are central topics in the German manufacturing industry.
MES is considered as one of the enablers for Industry 4.0 because the core of Industry 4.0 is the intelligent networking between people, objects and systems, which makes it possible to provide real-time information, to react dynamically and to carry out comprehensive optimization. And this is exactly where GFOS' Manufacturing Execution System comes in!**

Over 30 years of experience in manufacturing as a specialist for highly functional MES solutions speak for themselves. With our high-quality MES software, *gfos*.MES, and a comprehensive range of services, we offer innovative solutions for your manufacturing company.

Our MES solution streamlines production and optimizes processes and organization.

A largely paperless handling of many processes ensures effective production management in your industrial company. Thanks to the transparency thus achieved, the current status of the production equipment and orders can be accessed from anywhere at any time. The project planning level no longer has to deal with routine activities, and can thus concentrate on key tasks.

gfos – IT inspired by you

The modular structure of our software solution, *gfos*.MES, allows the use of individual needs-oriented solution components all the way up to the complete MES package. Whatever you need – our software is made for you!

"Machine data" dashboard and apps based on SAP Fiori user interface technology (Source: Heitec)

Connectivity as an opportunity for production

Industrie 4.0 means communication with people, machines, and motors throughout the production process, not just on the shop floor but also beyond — with management, customers, suppliers, and products. The Erlangen-based automation specialist HEITEC provides appropriate connectivity and networking to ensure that this process runs smoothly.

With HeiTPM (Total Productive Manufacturing), all product-related data can be retrieved from controllers, actuators, and sensors on the shop floor and seamlessly linked to and synchronized with the business management processes of ERP systems. HeiTPM can be quickly and flexibly integrated into various IT environments to map production in real time and provide end-to-end transparency and a 360-degree view of processes.

Production managers are able to design optimization strategies for the production process and manufacturing sequence using real-time information acquired from the actual plant during production and the information linked directly from the ERP system — including order, quality, and measurement data and all kinds of reports. Quality managers can evaluate quality data, while service managers can research the causes of faults and malfunctions and take targeted action. Business economists receive feedback on whether the production process is actually running according to plan or something needs to be changed and they can quickly and strategically identify optimization potential in all areas of logistics.

Apps using the new SAP Fiori UI technology provide the most frequently used SAP Business Suite functions individually to mobile terminals and to the various process participants for analysis and visualization purposes. Even more complex processes and scenarios that are defined through the interaction of multiple users benefit from context-based support. The connection to business management applications is manufacturer-independent across a variety of platforms, including Acron, SAP, and different cloud solutions like Mindsphere.

IFS™ develops and delivers enterprise software for customers around the world who manufacture and distribute goods, maintain assets, and manage service-focused operations. The industry expertise of our people and solutions, together with commitment to our customers, has made us a recognized leader and the most recommended supplier in our sector. Our team of 3,500 employees supports more than 10,000 customers worldwide from a network of local offices and through our growing ecosystem of partners.

IFS Applications™
Business Software – For the challengers

Mechanical and plant engineering has special requirements for business software. It must not only be able to map and combine complex processes, but also control customer service and offer solutions for predictive maintenance. IFS Applications™ - The business software for companies with highest demands on efficiency and flexibility offers optimized solutions for all business areas, combined with comprehensive industry expertise inter alia in machinery and plant engineering. The innovative IFS solutions are highly recommended by customers and analysts like Gartner and is a real alternative to other Tier 1 providers. IFS Applications meets the far-reaching requirements of project management, design, product data management, manufacturing, sales and service in a highly integrated environment. This allows you to optimally manage all business areas. The innovative, high-performance solutions feature an intuitive user interface, a unique overview of all company-wide activities and a simple implementation.

IFS Applications offers a high level of agility as it can be modified by configuration than programming. The operation is in 'evergreen' mode - so the solution is always up to date. Digitization and IoT initiatives can be implemented with little effort and realized with low risk inter alia with the IFS IoT Business Connector™. The various operating models - in the cloud as Managed Service, as Software as a Service (Saas) or On-Premise also provide the foundation for further optimizing processes and differentiating with innovative concepts from the competition.

Strengths of IFS
- Expert for the large international mid-size companies
- Profound knowledge of this industry
- Innovative Layered Architecture
- All necessary information and key figures at a glance in real time
- Maximum scalability and flexibility
- Long-term investment security
- Reliable support and comprehensive service

It is barely possible for companies to create added value using hardware alone. In particular due to the Internet of Things, software solutions are increasingly taking centre stage in industry. So how do medium-sized mechanical and plant engineering companies manage to offer compre-hensive software solutions for their products? With the help of Janz Tec. The company supports them with a complete IoT package: with this, the IoT Ecosystem unravels the complexity of IoT solutions.
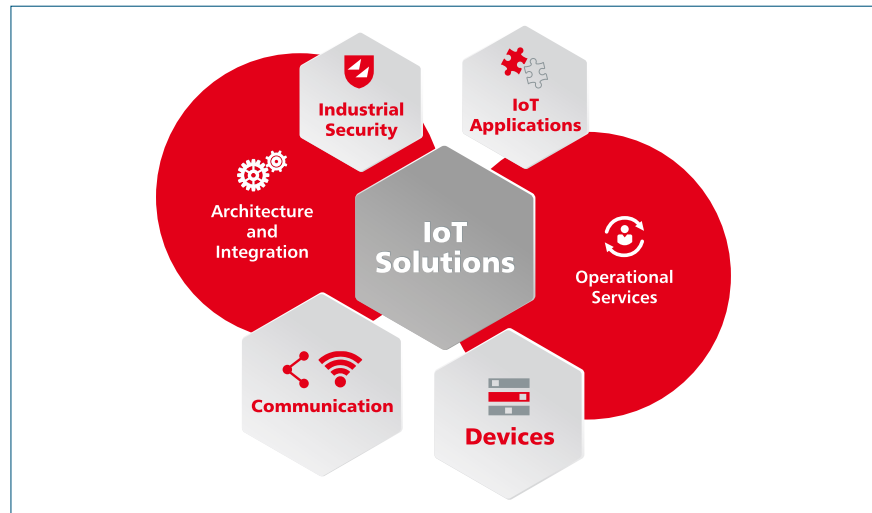
Added value through the IoT Ecosystem
Master complex IoT projects in a systematic way

Standard solutions are not enough

Today, medium-sized plant engineering companies know that IoT projects demand a great deal of expertise in a diverse range of new technologies. At the same time, however, they come to the sobering realisation that they themselves do not possess this expertise. The flow of information for automation, from control system to ERP, is no longer based on the classic automation pyramid. Instead, the architecture is now defined by agile communication in the cyber-physical system. This enables cross-process data brokering and roaming between people, machines and compa-nies. However, the polymorphic networking of numerous participants means that the envisaged IoT solution is very complex. On top of all this, it is not only the IoT providers in the market that are very diverse and numerous — customer requirements differ greatly too. As a result, there is no standard solution for every use case.

An open, dynamic IoT Ecosystem is the solution

To implement complex IoT projects, Janz Tec provides an open platform and open interfaces for IoT applications. Within the Janz Tec IoT Ecosystem, IoT solutions partners provide a solid framework for applications and services when implementing diverse use cases. This allows predictive maintenance and much more to be implemented individually: from data collection by the sensor to processing of big data by the artificial neural networks.

Janz Tec solves complex tasks with flexible solu-tions: from device design, through communication solutions and industrial security, all the way up to selected IoT applications. The dynamic system also comprises services for architecture and integration as well as operational services geared towards the long term, thus ensuring the success of your medium-sized company's IoT project.

They call it
more flexibility.

We call it the

KUMA
Effect!

Fit for Digital Transformation – with KUMAVISION ERP

Ready for Industry 4.0!

KUMAVISION's ERP software for the manufacturing industry makes your company a flexible player! Satisfy individual customer requests. Respond immediately to changes in the market. Provide innovative services. Link machines, customers, and products. Offer your services at competitive prices. Benefit from Industry 4.0 and IoT!

No matter if we talk about contract manufacturing, engineer-to-order, or series production: The integrated vertical industry software by KUMAVISION on the basis of Microsoft Dynamics 365 (NAV) creates efficient and transparent processes.

Optimum orientation towards the industry sector

The benefits of an integrated ERP software give you a true competitive edge in the sector of machine, plant, device, and equipment manufacturing or for prototype production. This enhances transparency, as with KUMAVISION, all data is readily available for evaluation at the push of a button. You get an overview of the actual costs and the exact time required for every production step. By presenting precise pre-calculations and realistic deadlines, you can submit reliable quotes

and achieve high customer satisfaction, while remaining flexible and able to meet customer requests from one-piece batches to series production. What is more, leverage consistent processes: From lead generation to delivery, from quote calculation to invoicing, from provisioning to production – KUMAVISION is your one-stop-shop!

Absolutely future-proof

The globally proven Microsoft Dynamics 365 (NAV) platform, the option to operate the application in the cloud, and the hands-on assistance on your way to Industry 4.0 are well suited to protect your investment.

Success through best practices

Our industry expertise is fueled by more than 1,600 projects implemented successfully in Germany and abroad and over 20 years of experience.

Customer focus and proximity

We employ more than 680 consultants and technology experts at 25 company sites in Germany, Austria, Switzerland and Italy. The result: Fast response times and short distances to our customers.

The Way To Remain On Schedule – 3Liter-PPS® 4.0
"Capacity Planning That Actually Works !"
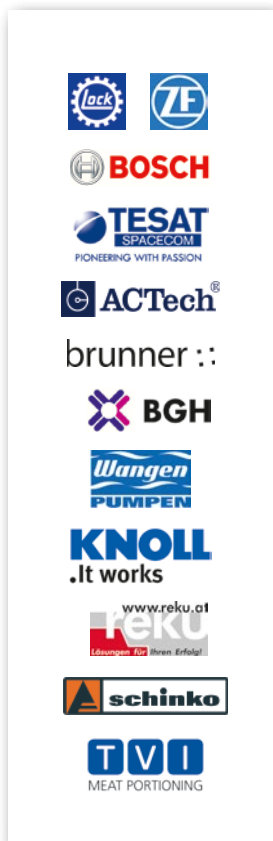
With »Takt Oriented Planning« method and planning software 3Liter-PPS®, LF Consult specializes on optimizing production for single item and small batch series manufacturers. Using the Takt Oriented Planning approach, capacity planning becomes feasible, ensuring transparency and realistic schedules.

In this age of control centers, companies try to get a grip on delivery dates and lead times by increasingly detailed planning – which fails in view of ever-growing disturbance variables. Lack of transparency, unrealistic deadlines and huge expenditure are frequent characteristics of planning disorders.

This is exactly where the LF Consult production system PiT® -Produzieren im Takt / Production with Ideal Timing comes into play. Following the Takt principle, work packages are synchronized across the respective company's resources.

3Liter-PPS® –
a brilliantly simple planning tool
Takt-based fixed periods are set within superordinate planning. Teams may then conduct sequence planning of your orders and respond to disruptions on their own responsibility within such fixed periods.

Many renowned companies have already successfully implemented Takt Planning through 3Liter-PPS®, thereby
- Reducing their order lead times by up to 50%,
- Increasing adherence to delivery dates to more than 98%, and
- Reducing their stocks by up to 30%.

Source: Fotolia

Industrial IoT and Industry 4.0
Innovative solutions for a smart connected world

We are your innovative partner for everything concerning IoT & Industry 4.0. Our many years of experience in the area of software development and consulting in combination with our industry expertise and our technology know-how will lead you into a successful future.

The industry experts
Our experts support you to help you reach your individual goals. Together we develop a software solution tailored to your needs to make your business successful and to prepare you for IoT & Industry 4.0.

Your advantage
From individual workshops to strategic product planning – we are available during all phases of your project. We develop your solutions in close cooperation with you as a team. Our processes are ISO-9001 certified and flexible at the same time. This allows us to put together a cost-optimized service package tailored to your project. In the end, you get a unique and market-ready software product.

About us
M&M Software is a technology and consulting company for software solutions in industrial automation. As a project partner for software development services, we are motivated to drive the success of our global customers and to realize their projects. With our software solutions, we pave the way for the future of a smart connected world. We are an independent subsidiary of WAGO Kontakttechnik GmbH & Co. KG, a leading manufacturer of components for electrical connections and electronic components for decentralized automation.

Globally acting teams at our locations in St. Georgen, Hanover and Suzhou in China offer surprisingly simple solutions and inspire with always new approaches and have done so for over 30 years.
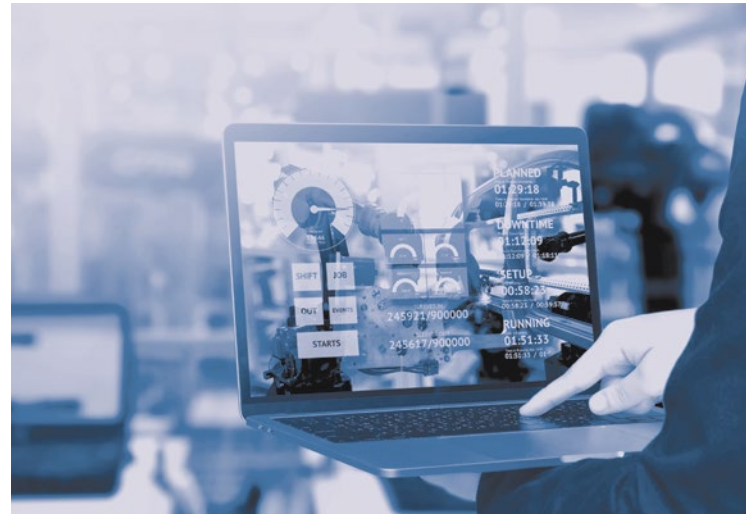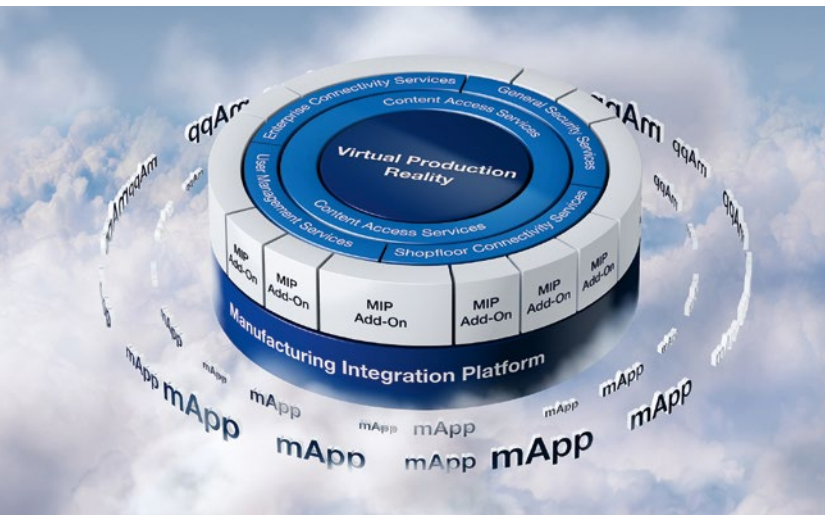
Software Solutions for the Smart Factory

MPDV headquartered in Mosbach, Germany, is the market leader of IT solutions for the manufacturing sector. With more than 40 years of project experience in the manufacturing environment, MPDV has extensive expertise and supports companies of all sizes on their way to the Smart Factory.

Products such as the Manufacturing Execution System (MES) HYDRA or the Manufacturing Integration Platform (MIP) enable manufacturing companies to streamline their production processes and stay one step ahead of the competition. The systems can be deployed to record and evaluate manufacturing-related data along the entire value chain in real time. If the production process is delayed, employees can immediately detect the problem and initiate targeted measures. 800 thousand people in 1,250 manufacturing companies worldwide use MPDV's innovative software solutions every day. These are renowned companies from all sectors. MPDV currently employs 420 people at eleven sites in Germany, China, Malaysia, Switzerland, Singapore and the USA.

The modular **MES HYDRA** meets the requirements of medium-sized manufacturing companies and international industrial groups in terms of scalability, flexibility, modularity, price/performance ratio and usability. Some HYDRA applications can be combined on a central MES database in line with requirements and without interfaces. As a result, HYDRA provides a 360° view of all Smart Factory resources and can seamlessly integrate comprehensive processes.

With its open platform architecture, the **Manufacturing Integration Platform** forms the basis for an ecosystem of standard functions and individual applications for targeted data analysis and production control. For this purpose, Manufacturing Apps (mApps) from different suppliers access a common digital image of the manufacturing process (Digital Twin). For machine manufacturers in particular, MIP is the ideal solution to exploit with their own software the ecosystem of the Smart Factory.

ORBIS supports medium-sized companies as well as international corporations in the digitization of their business processes: from the joint elaboration of the customized Big Pictures to the practical implementation of the project.

The digitization and automation of business processes along the entire value chain ensure the competitiveness of our customers.

ORBIS AG – Innovating your business processes

The process-related know-how and innovative flair of our 440 employees combined with the expertise gained from 30-plus years of successfully undertaking international projects in various sectors make us a competent partner.

ORBIS relies on the solutions and technologies of the partners SAP and Microsoft, whose portfolios are rounded off by ORBIS solutions. The focus is on SAP S/4HANA, customer engagement and the realization of the Smart Factory. Based on smart cloud technologies such as Machine Learning, Cognitive Services or the Internet of Things (IoT), ORBIS promotes the innovative power of customers in the development of innovative products, services and business models.

Our consulting services cover processes within Production, Logistics & Supply Chain Management, Sales, Service & Marketing, Finance & Controlling, Product Lifecycle Management and Human Resources.

With state-of-the-art business analytics methods, we support management and departments in the visualization, analysis and analysis of extensive data. ORBIS is also a reliable partner for worldwide rollouts.

Our own solutions for Industry 4.0 such as MES & Intralogistics, product cost calculation and variant management complete the service portfolio. On the Microsoft Dynamics 365 platform, ORBIS provides certified industry solutions and best practices, such as SAP integration and solutions for digitizing and automating customer and field service processes.

The ORBIS' expertise is the result of over 2000 customer projects for more than 500 customers in the automotive supply industry, construction supply industry, electrical and electronics industry, mechanical and plant engineering, logistics, metal industry, consumer goods industry and trade. Long-standing customers include the ZF Group, Hörmann, Hager Group, Rittal, Kraftverkehr Nagel, ArcelorMittal, Montblanc, Bahlsen and Sonepar.

The PIKON International Consulting Group is an internationally active IT-consultancy with headquarters in Saarbrücken. Alongside its national subsidiaries in Belgium and the UK, PIKON - with approx. 70 employees - advises its international customers in the areas of IT, business management and people. Through our process orientation, industry expertise in mechanical and plant engineering, interdisciplinary knowledge, IT competence and our 3-point approach which pays special attention to the user, we guarantee solutions which will not only fill you with enthusiasm, but which will work over the long term.

YOUR BUSINESS – OUR EXPERTISE
Shaping your digital future.

Our service portfolio comprises the fields of Management Consulting, ERP, BI and Custom Development. PIKON advises and accompanies you when it comes to developing your digital strategy, when re-launching and further developing your processes so as to optimise them individually, and when illustrating these processes in the ERP system (S/4HANA). We also support you in your planning and reporting and with our Data Science Lab. When it comes to points which are critical for competitiveness, we support you using our own software products.

Do you ask yourself questions such as:
- How can I make the ERP system—the digital backbone of the company—sustainable (with S/4HANA)?
- Quotation management—how can we draw up and manage the quote process during project discussions in a clever way?
- How can I avoid Non-Conformance-Costs in customer projects?
- Big Data—with help from Data Science, what potential can I extract from which business data?

Our expertise – your benefit:
- **Industry competence:** Thanks to our 20 years of experience in mechanical and plant engineering, we understand your processes and what you require from modern controlling.
- As an **experienced consulting partner and forward thinker,** we are always one step ahead. We already have testimonials about the implementation of **S/4HANA** at our disposal.
- **Process orientation is in our DNA,** which is why we develop stable and secure processes for you. We ensure that you continue to fulfil the wishes of your customers to the letter.
- **Network of partners:** No one can be the best at everything. We coordinate the use of competent partners for you in such a way that you receive the best from a single source.
- The **PIKON 3-point approach:** Digitisation is more than just the adaptation of processes and technology. In order to create sustainable solutions, we work together with you to mobilise the enthusiasm of your employees.
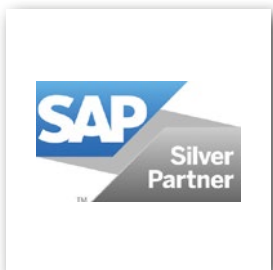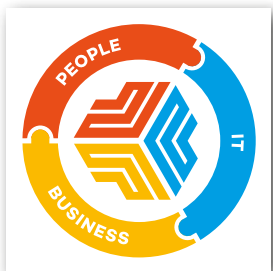
With more than 25 years of experience in the ERP market for small and mid-sized enterprises, proALPHA has designed concepts that offer a wide variety of functions for industries such as: Mechanical & Plant Engineering, Automotive & Supply, Electronics & High-Tech, Vehicle Construction, Wholesale, Plastics Industry, Medical Technology, Metal Processing, Furniture and Store Construction

Variant Management   Project Management   Materials Management
CRM   Financial Accounting   ERP from the
Network   Industry 4.0   Business Cloud
Purchasing   Human Resources   Predictive Maintenance
CAD-Integration   Digital Audit   Business Intelligence
Mobility   KPI and Early Warning System   Service

On the Premises or from the Cloud – ERP Solution for Mid-Sized Enterprises

Tailored to SMEs – Consistent Information Flows
Thanks to its deep integration, proALPHA not only serves as an information hub but also allows effortless implementation of special applications. It links all business divisions with seamless processes and facilitates communication with business partners, customers, and suppliers.

ERP – the Hub for Industry 4.0
ERP applications play a major role in the Industry 4.0 concept. The ERP system controls processes, implements changes on short notice and prepares production data to facilitate decision-making. This is the basis for innovative solutions for the smart factory that help businesses gain an edge over global competition. In collaborative research projects, new ideas can be tested thoroughly. proALPHA is involved in a number of collaborations on Industry 4.0 projects where research meets practice.

This includes SmartFactory KL, Smart Electronic Factory and Center Enterprise Resource Planning (CERP) on the campus of RWTH Aachen.

Best Practices – Users Help Users
With more than 410 member companies, the proALPHA User Group is unrivaled in the ERP sector. It not only provides a forum for networking but also gives impetus to software development. Since its foundation over 20 years ago, the User Group has become an exclusive association of highly skilled ERP and industry experts.

7 reasons to choose proALPHA:
- Integrated comprehensive solution
- A mid-sized partner for mid-sized enterprises
- Used by (hidden) champions
- In-depth knowledge of the industry
- Professional full service
- Close to our customers
- Accelerator of Industry 4.0

See for yourself!
www.proalpha.com/en/references
www.youtube.com/c/proALPHAERP

The digitalization of product development, manufacturing and service calls for efficient product lifecycle management. PLM is the backbone for the digital twin, without which neither Industry 4.0 nor new, service-oriented business models would work. As a vendor-neutral PLM consulting and software house, PROSTEP provides small and medium-sized customers in the field of mechanical and plant engineering with support for their digital transformation and makes them fit for the fourth industrial revolution.

PROSTEP – Your digitalization expert

PROSTEP is the leading PLM think tank with 25 years of experience in the market. Openness and neutrality are our hallmarks. We maintain close ties to all leading PLM vendors, renowned research institutes and major customers, who have been placing their trust in our services for years.

Our specialties include PLM strategy consulting and process optimization, system selection and implementation, PLM integration and migration, as well as secure data exchange and conversion. At PROSTEP, everything comes from a single source – from the initial concept through to the implementation and commissioning of your PLM solution.

OUR MAIN FOCAL POINTS:

Engineering:
Our PLM experts provide you with advice and support when creating a digital product development platform and integrating this platform in your existing PLM systems and processes. This includes the selection and implementation of new CAD and PLM systems and the migration of existing data.

Manufacturing:
We provide you with advice and support when it comes to ensuring end-to-end digitalization at the interface between product development and manufacturing, thus laying the foundation for digitalizing your production processes and implementing sustainable Industry 4.0 initiatives.

Aftersales:
We also provide you with advice and support for the end-to-end provision and exploitation of your digital product information in downstream business processes, e. g. for 3D assembly planning or the creation of 3D spare parts catalogs using 3D PDF or HTML5 technology.

Collaboration:
We provide you with advice and support when integrating partners and suppliers in your PLM systems and processes. We offer you a comprehensive portfolio of solutions for secure data exchange and cross-company collaboration, including a PLM-supported collaboration platform.

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© Phonlamai/thinkstock – processed by PSI Automotive & Industry

The complete ERP solution provider for SMEs

For over 30 years, PSI Automotive & Industry GmbH has been providing state-of-the-art solutions for the automotive and vehicle manufacturing, machinery and plant engineering as well as supply industries. The company's flagship product, PSIpenta, completely optimizes the value-added processes at every production and detailed planning level. In addition to traditional medium-sized companies, PSI assists companies that want to integrate a system into their existing IT landscape that increases production and / or maintenance process efficiency.

The solution portfolio – consisting of ERP, MES, WMS and SCADA components – incorporates new and completely modernized products based on PSI's Java-based framework. These solutions are complemented by an AI-based workforce management system and cover the entire value chain of manufacturing companies. In addition to classical production control (push / pull method), PSI offers complete optimization methods such

as short and medium-term sequencing. The company also offers proven automation systems – with AI support – for industrial use.

PSI Automotive & Industry GmbH has supplied their solutions to more than 30,000 users in over 500 of some of the world's leading industrial companies. With over 1,600 employees, the company generates more than € 175 million annually.

Industry 4.0: From research to practice

PSI provides their customers with integrated product components and conducts research on future implementation strategies with their partners from the scientific and industrial sectors. As consortium partner for trend-setting projects, the company works on solutions for horizontally and vertically integrated production processes as well as systems for versatile and adaptive production control. In cooperation with leading partners. The knowledge gained flows into our products and helps our customers transition from Industry 3.0 to the fourth industrial revolution.

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ERP-Systeme im Zufriedenheitsportfolio
„Anwenderzufriedenheit insgesamt"
Eine Studie der Trovarit AG

schrempp edv – seit 1980. Kontinuierlich auf Spitzenposition!

2012/13   2014/15   2016/17   2018/2019

Software development for production and commercial establishments: these are the competencies of schrempp edv. Founded in 1980, we currently employ over 75 employees with comprehensive know-how from project management to programming in the Oracle environment.
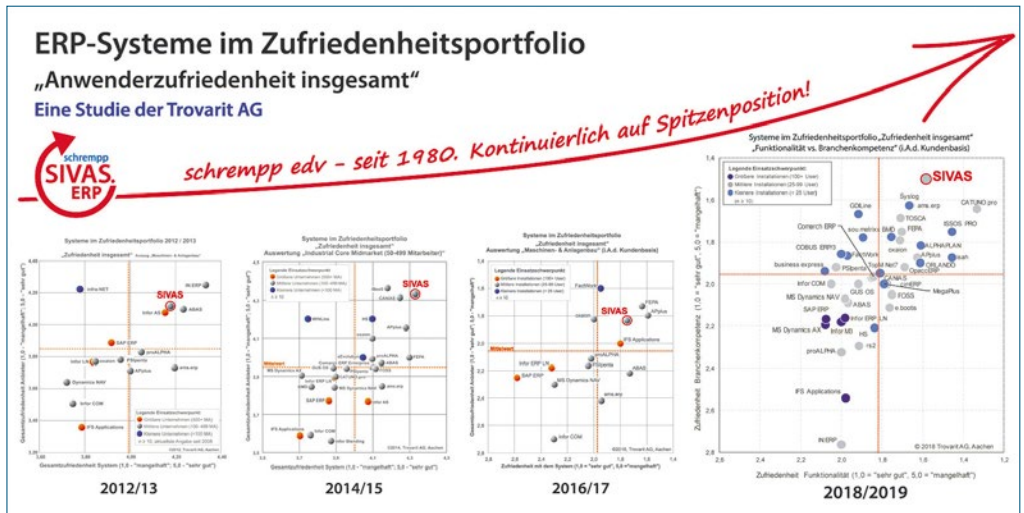
The ERP II software for one piece manufacturer, variant manufacturer and plant engineering. schrempp edv – your reliable partner!

SIVAS.ERP is a modern business complete software solution that highly integrates all relevant business processes. Core competencies are ERP applications for machine and plant engineering, for project controlling and for variant manufacturers from all sectors.

Usability made for the users
The patterned mask structure and the comprehensive authorization concept enables flexible and easy to learn user-related settings. The personal portal entry shows the user's workflow messages and appointment reminders and informs online on all concerning processes.

Customer order in focus
SIVAS.ERP manages your project holistically – from the initial request to the final costing. Lead times are significantly shortened. The core process is supported by the completely integrated product configurator as well as by extensive planning tools for scheduling and management of BOMs.

SIVAS.ERP modules
Workflow management, EDM (DMS), BDE / PZE, project management, costing, CRM / sales, service / spare parts management, variant configuration, technical order processing, gross / fine planning, materials administration / purchasing / warehouse, complaints management / QS, liquidity planning, BI. Analyzer.

SIVAS.Mobile
Lots of ERP content and features are also available on mobile devices with Apple, Android and Windows operating systems. Customers like to use our CRM, service and manufacturing apps. The content is written directly and without media breakage and in real time into the ERP system.
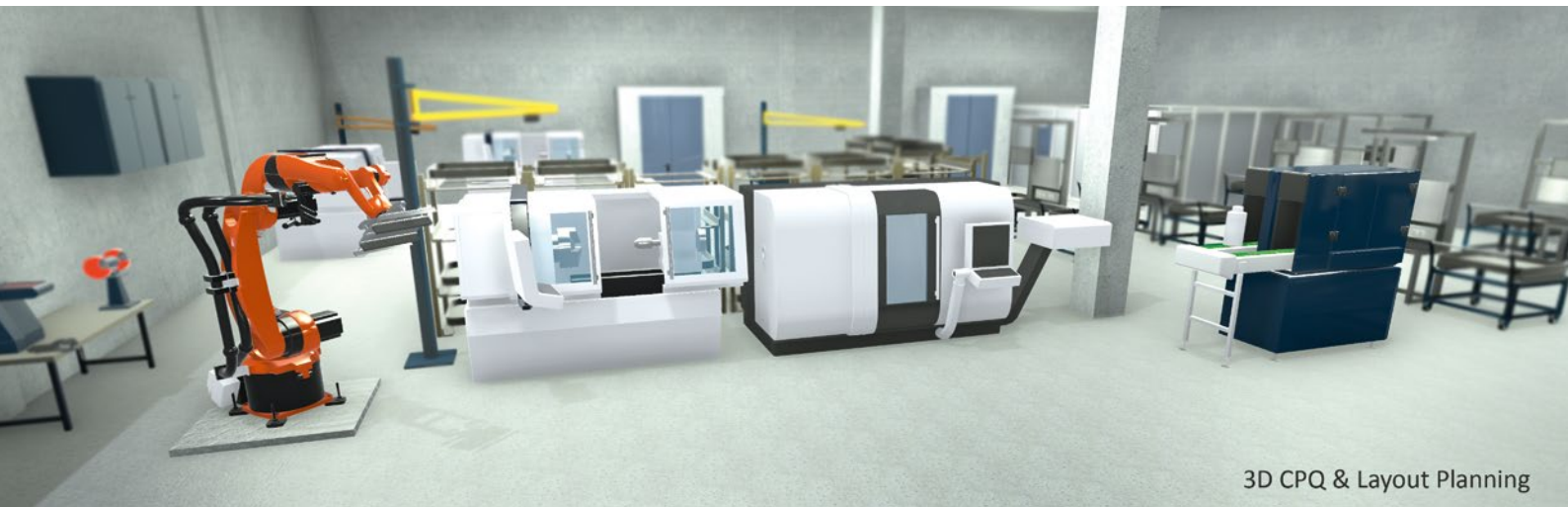
3D CPQ & Layout Planning

Digital transformation of Distribution

Offer process 3D VR CPQ:
A globally successful distribution requires the integration of relevant SAP variant data (VC/AVC) and CAD product data into a more intelligent CPQ application with convincing usability.
With the existing CAD data, SAE creates an optimized, zipped data format for sales and distribution based on object dependencies and makes it available to the product configurator.

Unique functionalities and possibilities
The SAE 3D VR CPQ application's functionality is unique, and completely incomparable to other viewer configurations. The digital 3D models are interactive and automatically include the entire configuration solution space based on object dependencies.

A significant advantage is that the maintenance of SAE 3D VR CPQ can be taken care of by the specialist departments and no additional developments or programming are required. The high standard functionality of the systems is similar to SAP customizing options.

Your benefit
Using SAE 3D VR CPQ, the bidding costs are reduced significantly. The system guarantees the technological feasibility, meaning that the technical office service does not have to be involved. The quality of supply increases substantially.

SAE 3D VR CPQ is available as on-premise (online and offline) or as cloud (with an offline component) application.

SAE Expertise
The profound know-how of specific requirements in the distribution of complex products is our specialty. Our CPQ solution connects all relevant system environments and data to a highly efficient and seamless distribution process. Specialist departments that have been isolated before are consequently all united in pursuing a common goal: maximizing business success. Our globally unique technologies and applications, we are operating in 70 countries worldwide. We are a SAP silver partner.

IoT capable product security with the cloud based platform CODIKETT®

We enable brand owners and consumers to identify original products, make distribution channels transparent and engage directly with customers. Our tailor made solutions have been tried and tested internationally and are in use worldwide. Combining our high-tech security labels with our proprietary cloud platform CODIKETT® permits us to provide each single product with a unique code, thus creating the basis for IoT.

Codes are printed as QR, data matrix or GS1 codes, and are also often saved in UHF-RFID or NFC-RFID. Connected to the CODIKETT® system they serve as transmitters and receivers of information:

- End consumers verify the authenticity of a product and retrieve further information by using the scanner of their smartphone.
- Inspectors retrieve current logistics data.
- New information is associated to the code throughout the packaging, dispatch, and logistics processes.
- Scanner, Apps and ERP-interfaces facilitate the integration into existing systems.

The collected data supports brand owners not only in internal and logistic processes, but also enables customer communication, product verification and other services. In addition, it helps to actively shape market monitoring. Consequently, product security with CODIKETT® delivers additional advantages for planning and sales.

We will gladly assist you to make your products ready for IoT. You will be supported in all aspects of planning and throughout operational implementation. Pilot applications can be implemented on short notice.

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Internet www.securikett.com
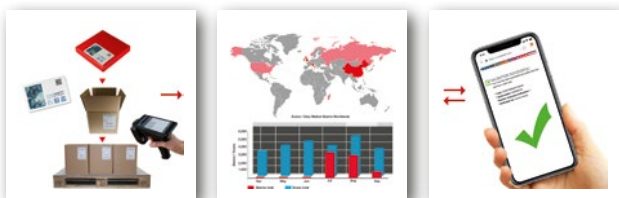
New technology innovation, fierce global competition and demanding customization require industrial machinery manufacturers to continuously innovate and optimize products.

Machinery manufacturers must employ advanced multidisciplinary and next-gen design techniques to improve machine performance, reliability and cost of ownership. Virtual simulation and manufacturing capabilities reduce time to delivery and commissioning.

Digitalization for Industrial Machinery

The digital twin in machine building

The digital twin is the precise virtual model of a machine or a production plant. It displays their development throughout the entire lifecycle and allows operators to predict behavior, optimizing performance, and implement insights from previous design and production experiences.

Our comprehensive concept of the digital twin consists of three forms: the digital twin of the product, the digital twin of production, and the digital twin of the performance of both product and production. Thanks to our comprehensive domain expertise and optimized tools, Siemens is the only company that offers this holistic approach and is able to create the closed-loop connection between the virtual world of product development and production planning with the physical world of production system and product performance. Through this connection actionable insight is gained from the physical world for informed decisions throughout the lifecycle of products and production operations.

A Holistic approach

To become a market leader, it is no longer enough to just optimize individual steps in the value chain. Instead, a holistic approach is necessary. Siemens has developed the right portfolio for this challenge: The Digital Enterprise Suite allows machine builders to integrate and digitalize their business processes end-to-end - including their suppliers. They can start at any point in their value chain, from the machine concept, machine engineering, commissioning and actual operation to services, and successively expand digitization.
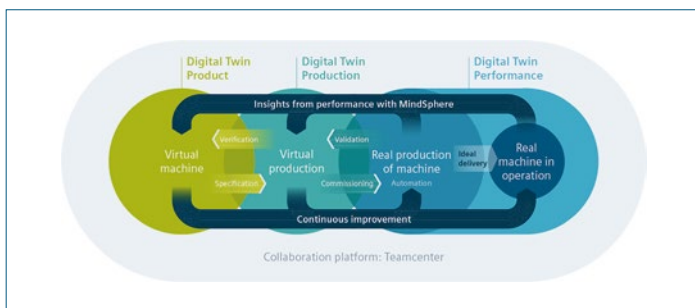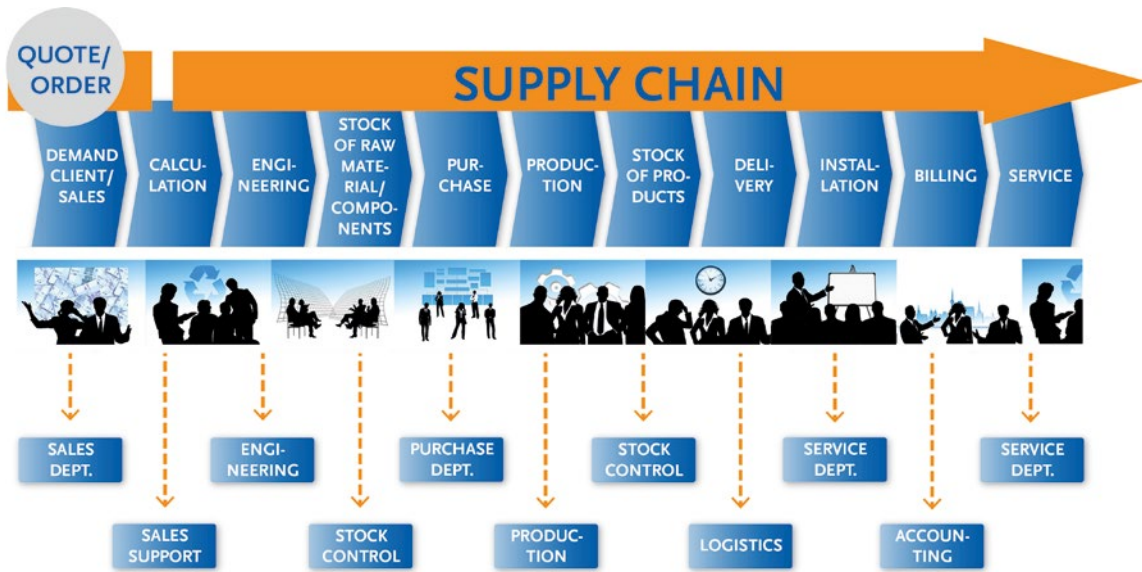
Click – And the offer becomes an order

SOLUTION

Fast, easy and error-free: Ideally, that's how the offer preparation phase should run. However, complex and lengthy internal reconciliation processes make it time- and resource-consuming. Not so with Sofon: Offers for custom products and services can be created in just a few clicks using the software-based Quote-to-Cash and CPQ solutions. They can even be converted into an order with a single click. This can also be done internationally, as Philips confirms: "Sofon is the only provider having a configurator that we could use on short notice worldwide."

Sofon stores all the necessary information about the business processes in models ranging from product selection, configuration, and costs to the generation of documents, bills of materials, and routings. A direct transfer of order data to the ERP system is also possible.

Guided solutions
Sofon uses the guided selling approach to assist merchants and sales personnel in performing their tasks. This approach integrates the expertise of all relevant departments of a company. Sales personnel can define the customer's specific requirements through a question and answer model, which are automatically implemented by other models in Sofon as a win-win solution. "With Sofon, the work is more fun for sales: they can focus on their main task, " declares Scansonic, a Sofon customer.

The benefits at a glance
• Standardized and error-free offers
• Optimized business processes
• Suitable for all industries

Sofon: The step to operational excellence!

QIS: Creating offers around the clock, anywhere in the world
Whether a sales representative, a dealer or a customer – Sofon enables everyone to submit offers in the same quality. Companies that operate internationally often use a dealer network. Sofon QIS enables dealers to offer and sell solutions independently.

The result: fast, error-free, and complete offers. And with Sofon Sales Configurator, customers can use a website to generate quotes and orders personally.

# Solutions for warehouse management and integrated material flows

viastore SOFTWARE is an international provider of software for warehouse management as well as integrated automated material flows in logistics and industrial production.

- **Consulting:**
  Software consulting, process consulting
- **Product:**
  Development of the standard software product viadat for warehouse management and material flow control/visualization
- **Service:**
  Implementation, project management, customer-specific adaptations, training, integration of subsystems
- **Hardware:**
  Order picking systems, IT system landscape and infrastructure, network, hardware
- **Support:**
  Hotline, system support, process improvement

The portfolio of viastore SOFTWARE includes the standard software product viadat, which can manage and control small warehouses with low turnover rates just as reliably as distribution centers and high-performance logistics systems with several hundred thousand order lines a day. viadat is intuitive to use, ergonomic, and has multi-warehouse capability. The software package can be implemented very quickly due to pre-configuration, is fully scalable in function and performance and highly effectual with over 2,500 standard logistics functions – which viastore extends and adjusts according to customer needs. The WMS therefore offers an integrated solution for networked material flows along the value chain: from the connection to ERP systems from various manufacturers via standardized interfaces, to the control of automated equipment such as conveyor systems, automated storage/retrieval systems, robots or packaging machines. It enables users to achieve lead time reductions, higher efficiency and process security as well as reduced inventories and the highest level of order picking quality.

As a technology leader in protection, licensing, and security, Wibu-Systems is building on its legacy of innovation to reimagine industrial practices for innovative processes and novel forms of monetization – the pillars of success in the connected world of Industrie 4.0.
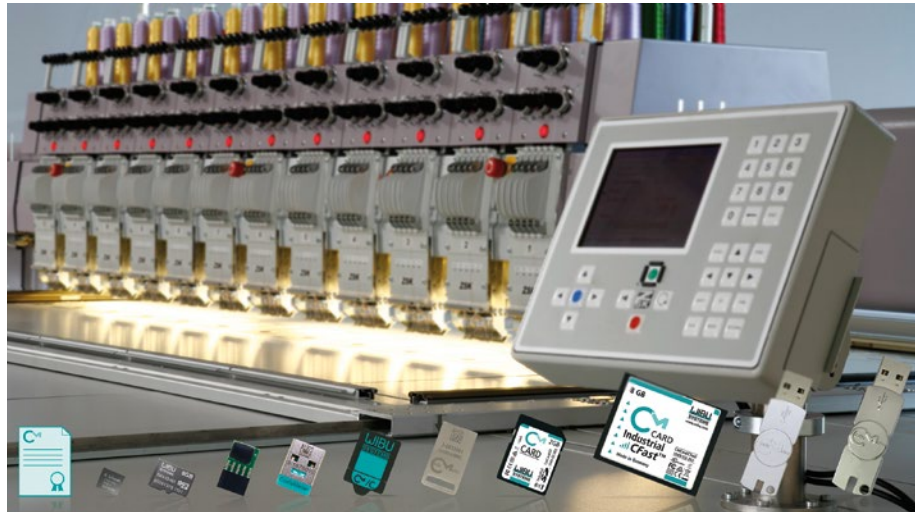
New Business Models for Digitization

Since the foundation of Wibu-Systems by Oliver Winzenried and Marcellus Buchheit in 1989, the company remains committed to its track record of almost three decades of innovation. It continues to upscale the arsenal in the fight against product piracy and cyber-crime with award-winning solutions like the groundbreaking and unbeaten Blurry Box® technology.

Wibu-Systems has teamed up with solution partners and industry associations to ensure perfect-fit solutions for the industrial world. From secure hardware designed for the tough conditions in manufacturing to Wibu-Systems' active integration in automation architectures and communication protocols, including OPC UA, its systems are made to fit seamlessly into the industrial and IIoT landscape.

CodeMeter®, the non-plus-ultra in security and licensing, gives device manufacturers the technology to secure and monetize the digital assets invested into their equipment, from manufacturing facilities to individual workstations, mobile devices, PLCs, or embedded systems to cloud or virtual solutions. Its license and entitlement management capabilities offer robust encryption, secure key storage, and a versatile range of license solutions including unit counters, pay-per-use, and subscription options for a choice that meets the need of any commercial scenario. Fully interoperable and integrated with many automation and most enterprise management and sales systems, CodeMeter streamlines commercial operations and offers the potential to leverage novel, license-based business models for future-proof and customer-centric monetization options.

Based in Karlsruhe, Germany, with a world-spanning network of subsidiaries and distributors, Wibu-Systems is spearheading the new industrial revolution with peerless protection and licensing technology that can revolutionize business models for all industry.

The CAD POINT online tool, the web based SIZING ASSISTANT and cymex® 5, our comprehensive sizing software – three different multilingual options from WITTENSTEIN alpha to support the selection and sizing of gearboxes and servo actuators which allow a quote to be requested immediately. All three tools convince with an enhanced user experience, offering several practical entry levels for configuring gearboxes, servo drives and drive trains.

Three software tools, one goal: The optimum drive solution

CAD POINT:
### Precise configuration with just a few clicks

CAD POINT is highly intuitive and targeted mainly at customers who already use drive solutions from WITTENSTEIN alpha and are familiar with the applications and benefits. Product information, data sheets and CAD data can be accessed precisely with just a few clicks. The configuration and gearbox selection process can either begin with a known gearbox type or a preferred size, or alternatively be based on the product overview or directly on the ordering code.
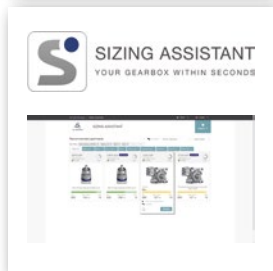
SIZING ASSISTANT:
The optimum gearbox within seconds

The web based SIZING ASSISTANT enables rapid, time saving sizing of gearboxes in secondary axes. This tool is designed for users searching for the quickest way to select the optimum gearbox for their servo drives or kinematics based on a specific motor or a predefined application. A few clicks are all it takes to give them a clearly structured overview not only of the smallest, most powerful and most energy efficient gearbox that can be realized but also of possible alternatives.
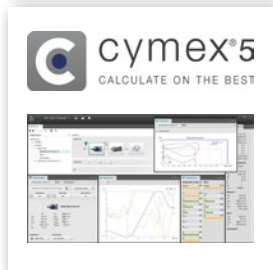
cymex® 5: Multifunctional software
for detailed drive design

When an individual, holistic perspective on drive trains is called for, our cymex® 5 sizing software provides the perfect functionality. This tool lets designers go into detail and simultaneously define any number of alternative designs. At the end of the sizing process, users can generate full drive train calculation documentation directly, create data sheets and display CAD component data.

CAD POINT, SIZING ASSISTANT, cymex® 5 – each in their own way, these three sizing tools permit efficient and functionally optimized sizing of gearboxes and servo actuators.

The direct way to our software tools

WITTENSTEIN | alpha

VDMA Software and Digitalization

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