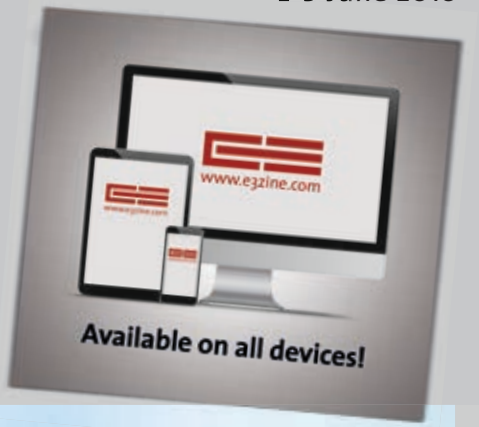
Independent SAP Trends, Analyses, Strategies and in-depth Reports from Business and IT



Visualization

3D Variant Configuration for Sales and Services

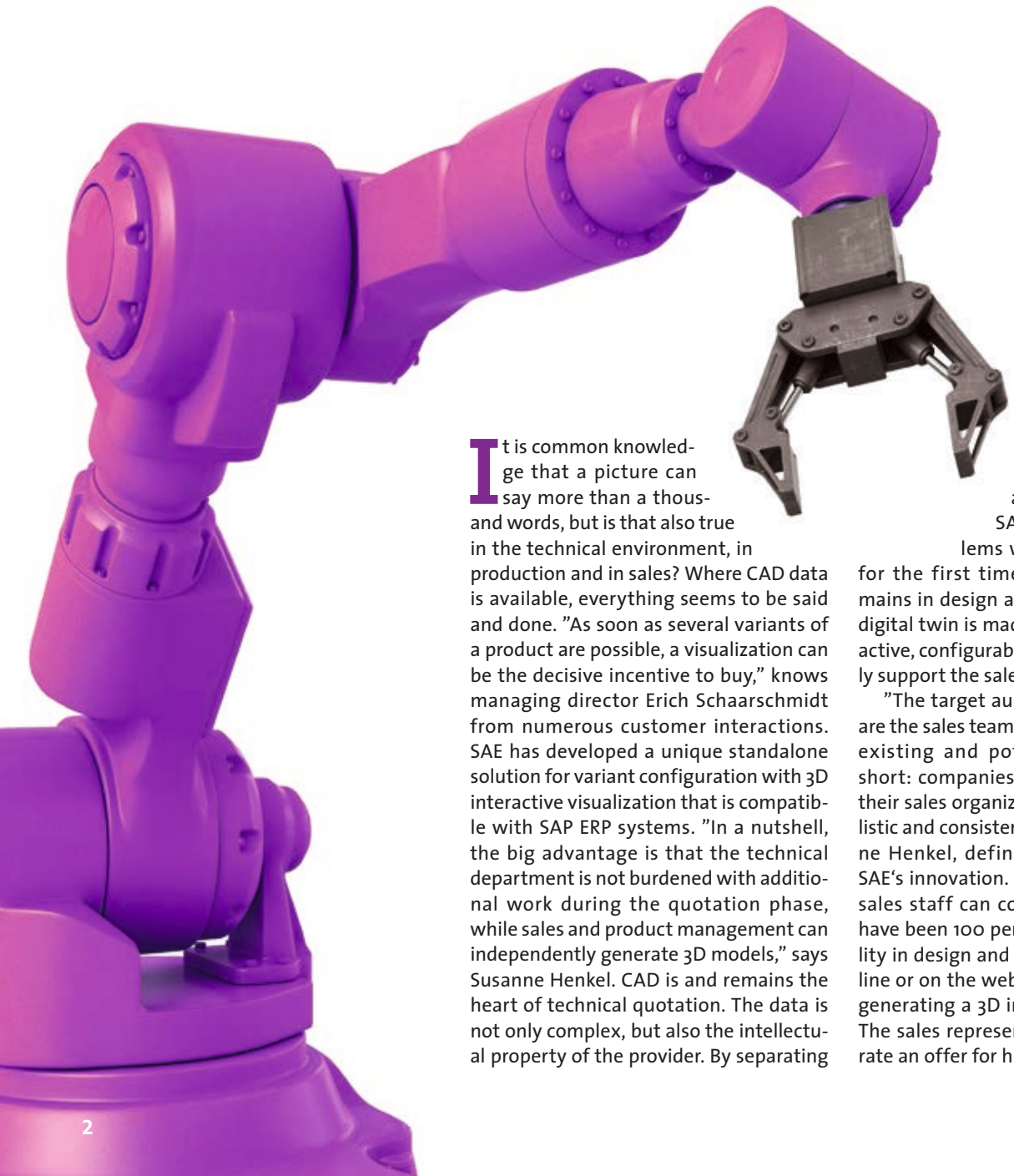
Susanne Henkel and Erich Schaarschmidt, Managing Directors of SAE, and their team have managed to develop a globally unique solution for variant configuration in 3D and in concert with SAP ERP.

Variant Configuration, plus B2B Interactive Virtual Reality

Visualization

for Sales and Services

CAD data is the foundation. Variant configuration means that individual offers to the customer and in addition, good relationship management and pricing are a must. Until an ERP system becomes a satisfactory system for supply and sales however, many adaptations are needed. SAP partner SAE has managed to bridge the gap. Peter M. Faerbinger, E-3 Magazine, spoke with the managing directors Susanne Henkel and Erich Schaarschmidt.



It is common knowledge that a picture can say more than a thousand words, but is that also true in the technical environment, in production and in sales? Where CAD data is available, everything seems to be said and done. "As soon as several variants of a product are possible, a visualization can be the decisive incentive to buy," knows managing director Erich Schaarschmidt from numerous customer interactions. SAE has developed a unique standalone solution for variant configuration with 3D interactive visualization that is compatible with SAP ERP systems. "In a nutshell, the big advantage is that the technical department is not burdened with additional work during the quotation phase, while sales and product management can independently generate 3D models," says Susanne Henkel. CAD is and remains the heart of technical quotation. The data is not only complex, but also the intellectual property of the provider. By separating design knowledge, variant configuration and 3D visualization, SAE solves several problems with a single approach for the first time worldwide: CAD remains in design and production, while a digital twin is made available as an interactive, configurable 3D model to optimally support the sales process.

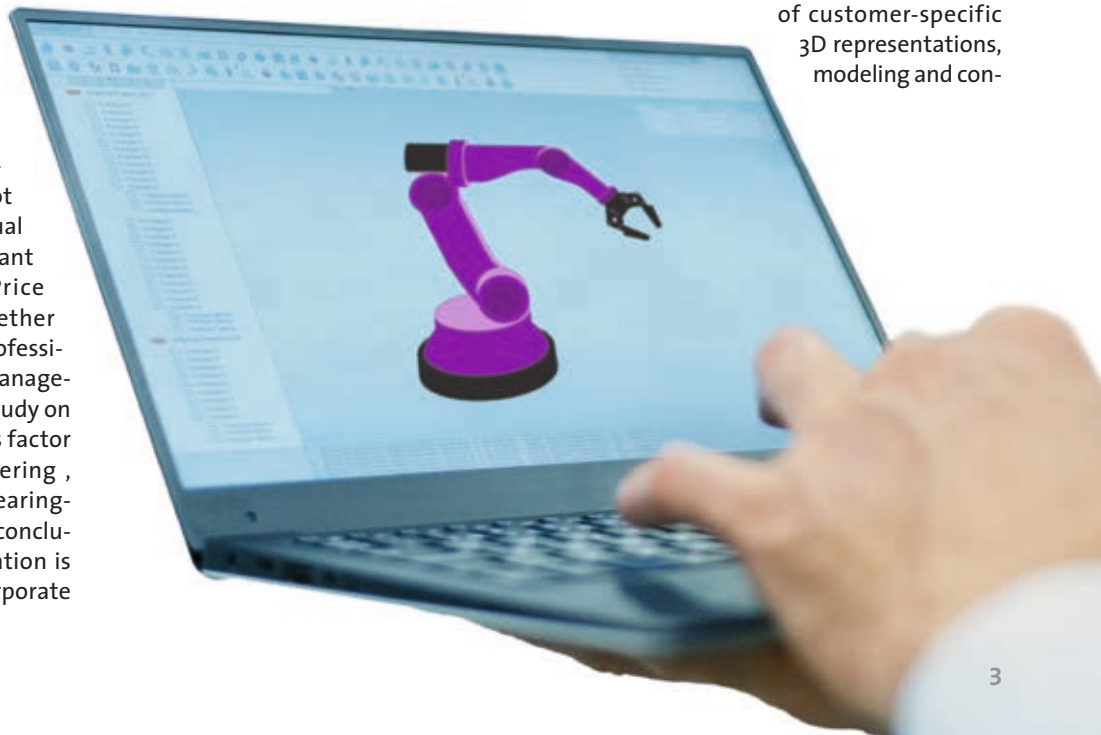
"The target audience for our solution are the sales team as well as a businesses' existing and potential customers. In short: companies that want to position their sales organization perfectly in a holistic and consistent manner," says Susanne Henkel, defining the addressees of SAE's innovation. "With just a few clicks, sales staff can configure products that have been 100 percent tested for feasibility in design and production offline, online or on the web, while simultaneously generating a 3D interactive digital twin. The sales representative can then generate an offer for his customer at the push

of a button. Change requests are dealt with via automatic real-time changes to the 3D model including transfer to the ERP system (SAP ERP/ECC 6.0, S/4 and other ERPs). In the E-3 interview, Susanne Heinkel adds, "Depending on the complexity of the offer, customers can independently configure their product or machine on e-commerce platforms, familiarize themselves with the product. The customer can even make a pre-selection that can be passed on to sales for sorting out the details to the specification in a second step."

"CAD systems are used for technical product design, our system has been developed for holistic, visual, customer-specific product presentations," explains Erich Schaarschmidt. In practice, product development is specific to design groups. An overall portfolio of possible variations and accessories, which is important in the sales process, is usually missing or not necessary in classical product development. That is why Erich Schaarschmidt puts emphasis on how unique the interactive operating concept of the SAE Interactive Motion Engine really is. "Without any knowledge in CAD, a sales representative can explain complex products in a transparent and comprehensible way for the customer. Interactive means: As soon as there is an interaction with an object in the digital twin, the user gets a visual indication of whether he can change the object, and if so, how. With the Interactive Motion Engine, a sales employee is now simply able to change, customize and arrange complex machinery. "Another advantage is the automatic integration of the SAE IME application into our sales documentation," emphasizes Erich Schaarschmidt. All selected and designed 3D objects are recorded as documentation items, so no option is at risk of being forgotten. The items then serve as the foundation for pricing and print control with corresponding text management. However, the innovation of SAP partner SAE does not stop at 3D visualization (with Virtual Reality). In combination with variant management and Configure Price Quote software, they bring together variant professionals and sales professionals, both in terms of business management and organization. A recent study on product configuration as a success factor in mechanical and plant engineering , carried out by consulting firm Bearingpoint, comes to exactly the same conclusion: Although product configuration is increasingly seen as critical for corporate success, practical application remains opportunistic for the most part. That in turn means strategic sales potential remains largely untapped because of differing guiding principles: Variant professionals usually worry about how to configure a product, while sales professionals think about what to configure. Despite that, SAE has now succeeded for the first time in reconciling the two worlds by using the SAE Interactive Motion Engine based on a backoffice SAP ERP system.

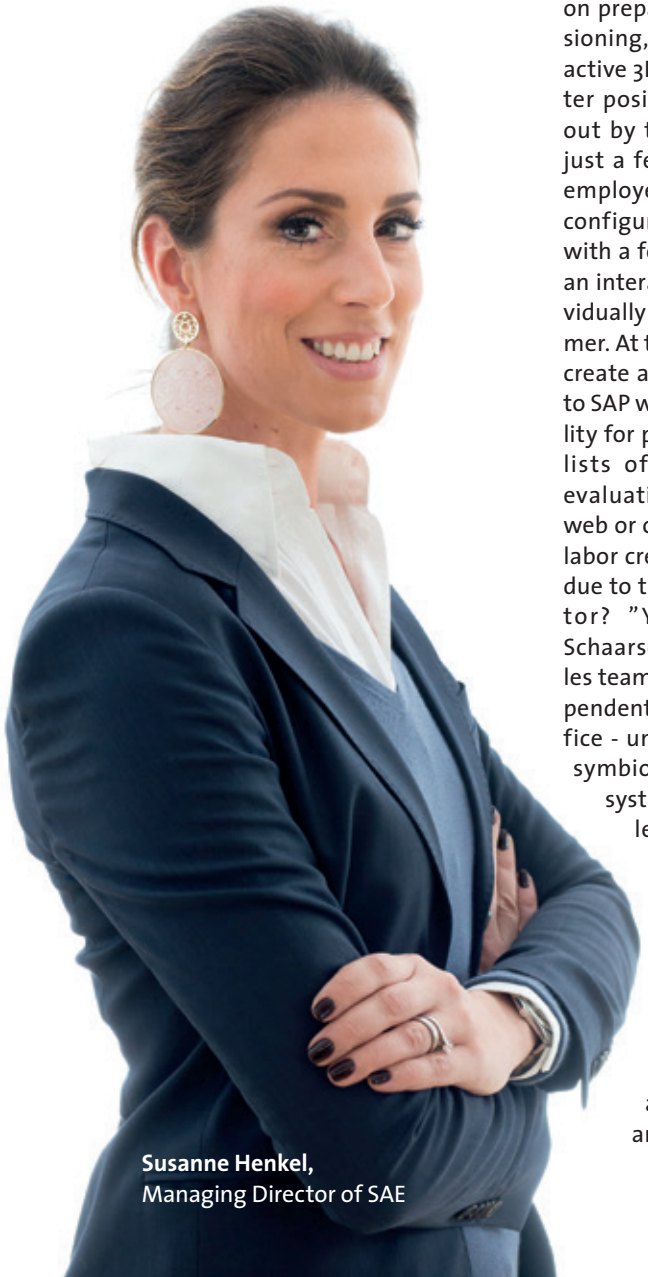
Success factor product configuration

The results of the Bearingpoint study show, that 80 percent of industrial companies increasingly see product configuration as a success factor for their industrial business. On average, 58 percent of a company's products are configurable. Another 25 percent are planned and tailored specifically to customer requirements and only 17 percent are standardized. Companies however focus their product configuration more on technical possibilities and less on a clear sales and product strategy. R&D is usually responsible for product models which thus are leaning towards being technically oriented correspondingly. That is the conclusion from Bearingpoint's work so far. Already at this point, SAE follows a different philosophy. "Visualizing CAD data - that's too limited of a scope for our innovation," Susanne Henkel explains the alternative approach. "It is rather about bringing products and industrial plants to life." SAE Interactive Motion Engine is the only available application for creating digital twins. Size ratio and functionality become clear at a glance with the 3D visualization of the digital twin. Customers and interested parties can identify with the offered product within a few seconds. What is also new is that these 3D models can be moved freely and that the models are bound to the object dependencies of variant configuration. "The consistency achieved by combining these applications in one solution brings about enormous and significant benefits. SAE applications can be used independently and in symbiosis with SAP ECC or S/4," emphasizes Susanne Henkel. Customers and sales can make changes to specifications in the configuration and quotation process directly on the product or system - with the Interactive Motion Engine, users can see the changes and results in real time and can move, (re-)position and execute functions in the digital twin. However, as Bearingpoint states in the current study, there is yet another factor to consider: The goals pursued in product configuration are largely operational, e.g. reducing errors in order processing in the sense of a feasibility check. Strategic goals, such as increasing the Win-Rate or differentiated pricing, are hardly ever pursued by most participants. The possible potential for digitization remains largely untapped. There are no 3D previews of the product, nor are there product recommendations or suggestions for suitable options and packages by the configuration systems. The possibility of using an interactive digital twin to provide data from individual configuration right up to customer service (equipment information) also remains unused. SAP partner SAE has now integrated all of this unused potential into a single solution and with the new software version, the system is ready for operational use. SAE has been in the business of customer-specific 3D representations, modeling and con-



figuration of complex products in the worldwide sales process for more than twelve years," explains Erich Schaarschmidt. "Our goal, or rather that of SAE customers, is that the further forward in the sales process we can present complex products in a customer-oriented manner, i.e. according to individual specifications, the more successful our customers are. Most companies in the DACH region for instance use SAP and need applications that optimally support this powerful ERP solution. A requirement many years ago was to configure SAP's variant configuration and material master (LO-VC) offline, while being able to adjust pricing in SAP down to the smallest detail. For some years now, the new challenge has been to be able to perform LO-VC on the web. SAE can do all this with its applications. "Unfortunately, we often noticed that our customers are too slow through no fault of their own, that their systems are overloaded, that a customer's change request ends up getting lost and that there are enormous processing costs involved. Therefore the change request is not welcome and thus processing times for offers are too long," says Susanne Henkel about the situation more than ten years ago.

"That was the biggest question," remembers Henkel in the E-3 interview. "How can we achieve a real competitive advantage and enable our customers to provide their sales team with an SAE application that allows them to easily configure their products in accordance with the predefined rule - based on the object knowledge with 100 percent LO-VC - with a few simple clicks in an appealing UI, on the web, offline or online with an automatic 3D representation of the product - from STEP files already available in the company? In a way that covers the entire process from product configuration based on object knowledge, quotation preparation, customer requests, versioning, technically sophisticated interactive 3D animation through to the printer position and all this can be carried out by the sales staff worldwide with just a few clicks." Today, a single sales employee with SAE software is able to configure technically complex products with a few clicks, SAP compatible and in an interactive 3D view, to show the individually configured product to the customer. At the same time, the employee can create an offer and hand over the order to SAP with one hundred percent feasibility for production and design, including lists of parts, prices, configuration evaluation etc. - and all of this on the web or offline. Does this new division of labor create new opportunities for sales due to the possibilities of the configurator? "Yes, definitely," says Erich Schaarschmidt. "Globally operating sales teams can do their work simply, independently and largely without a back office - unlocking enormous potential. In symbiosis, e.g. with the SAP C4C CRM system, a unique solution is available for worldwide sales." Another very important side effect, explains Managing Director Schaarschmidt, is the learning experience, or rather the product training of new sales employees, who can very quickly build up product know-how with the SAE Interactive Motion Engine. "You see and then remember, which parts can be combined," he emphasizes. The presentation, quality and above all, the certainty that the customer has really understood all the advantages of the product or complex solution in order to be able to make the right decision are considerably increased, which ultimately leads to more sales. Can everyone plan "everything" in the future or are there necessary limitations to this newfound freedom? "Every employee should be able to plan everything - within certain rules," says Erich Schaarschmidt. "Our variant engine makes sure that there is no nonsense happening." How does that look in practice? To begin with, another quote from the aforementioned Bearingpoint study might be helpful: "In the majority of companies, an opportunistic use of product configuration is noticeable in total. It is used where operational processes have to be mapped. Once a sales strategy is affected, most companies become more cautious." Is the market ready for the innovation of SAP partner SAE? To what extent are visualization and simulation in sales and service a matter of course? "Of course not yet," says Erich Schaarschmidt, "but when people see how well and easily they can design and model such applications without outside help, they are all immediately enthusiastic and get to work!"



Susanne Henkel,
Managing Director of SAE

Megatrend Virtual Reality

VR is currently in very high demand in the videogaming scene. Can the SAE innovation therefore be part of this megatrend? Erich Schaarschmidt says that qualified young employees who are hired today, definitely no longer play with model railways. For the younger generations, an increasingly digitalized world around them is quite natural. "The advantage of digital objects is that we can experience them even though they do not yet exist in reality. The classic example is product development with 3D CAD systems - now standard for all of us. Our goal is to exploit new technologies in new processes with enormous potential for the entire value chain." However, according to the Bearingpoint study, this philosophy has not yet found a way into offices around the globe: "In the trend analysis, many companies plan to professionalize their product configuration by optimizing their IT architecture. The investment in configuration software, the integration of product data management systems and the provision of digital data to customers are key topics. The integration of

Virtual Reality within the company

"According to Goldman Sachs surveys, global sales in the Virtual/Augmented Reality market are projected to rise to 80 billion US dollars by 2025. Against this background, it is not surprising that many companies, from start-ups to publicly traded companies, define Virtual/Augmented Reality (VR/AR) as a strategic priority for the upcoming years. In fact, there are already meaningful and technically feasible applications and business opportunities in use in many industries. Pioneers and innovators have recognized this potential and are testing innovative fields of application. "The new emotional and communicative experiences are in the foreground", Angelika Huber-Straßer, Divisional Director Corporates at KPMG, states in her introduction to the study on the potential of AR/VR in companies, entitled "New Dimensions of Reality". Together with VR/AR specialist, the B2B area in particular was examined as early as 2016. According to KPMG, the market for VR/AR applications will develop very dynamically in the medium and long term, as complementary technologies will fuel far-reaching innovations. Additionally, in light of the digital transformation in the business sector, it can be assumed that players will initially have the optimization of the current value chain in mind. Moreover, according to the analysts, successful companies are already preparing for it today. Great potential (52 percent) was identified in marketing and sales in general and in sales support in particular.

the supply chain or the integration of product configuration in digital manufacturing structures (e.g. Industry 4.0) is seen as a trend only to a lesser extent. Digital trends such as Augmented Reality and VR solutions are generally not seen as relevant and will therefore continue to represent untapped digital potential in the future." SAE has obviously managed to exploit this potential.

A digital twin in a few clicks

The world will change. "Design and product development are considerably relieved, since the creation and recurring changes to site plans and manual, customer-specific adjustments are not necessary anymore with the SAE solution. Adjustments in the sales phase are largely eliminated," says Erich Schaarschmidt, recalling his experience from many successful projects. "The fact is that existing CAD files can be converted into an Interactive Motion Engine file format with a single click, so that configurations can be set up in a very short time with the SAE Developer. If configurations already exist – e.g. SAP LO-VC – a digital twin can be created on the web or offline with just a few clicks," Susanne Henkel once again describes the potential in detail. The Bearingpoint study also confirms that rigid viewers, films or 3D CAD images are a matter of course already. "What is new," says Henkel, "and only the SAE Interactive Motion Engine can do, is that the different versions and configurations can be displayed directly in the interactive 3D model. It is very important to note however, that it is not only about the 3D representation of the products. Our solution is about the holistic, integrated approach to a global supply management system - whether offline or on the web. As already mentioned, the SAE quotation management system allows the sales team to configure offers without the support of the technical department, to work out digital twins in 3D arrangement layouts and to make product changes in real time at the customer. "As a result, sales are self-sufficient, quotations are prepared more quickly and changes are made closer to the customer," recalls Henkel from her practical work in the projects. Can the SAE offering be seen as part of a larger, digital transformation? "Absolutely," Henkel replied quickly. "It is an absolutely novelty to provide the sales department with a complete solution with which they can configure products 100 percent rule-based and thus very quickly make offers, including customer-specific requests without requiring the support of their design or engineering colleagues." Digitally mapping products and technical know-how in the form of relational object knowledge is necessary in order to be able to successfully meet the requirements of global markets and be better than the competition in the future. "Topping an offer off with digital twins is the royal class and something really special at the moment - we believe it will become a matter of course in just five years' time," Henkel concludes. (pmf)

Erich Schaarschmidt, Managing Director of SAE

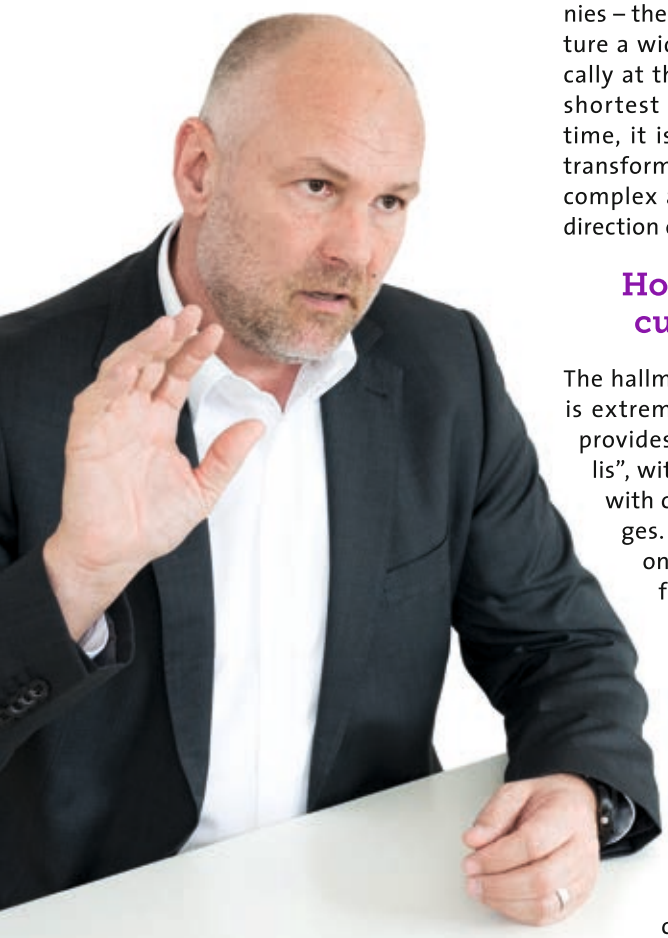
The future will be dominated by virtual and interactive product configuration

Interactive Virtual Reality in the CPQ-Process

Industry 4.0 initiatives support the trend towards customized product variants and the sale of machine and plant systems. Thus, sales become a digitization driver: new, innovative next-generation CPQ (Configure Price Quote) software, the symbiosis of ERP master data and object dependencies with an interactive Virtual Reality configuration and simulation display, is required.

By Erich Schaarschmidt, SAE

The growth in sales and market share of machinery and industrial plant manufacturers is largely due to the fact that products or entire product system solutions can be globally offered in ever more varied forms. This ability becomes a decisive success factor for the future of companies. As digitization progresses, companies will continue to be successful if they come to terms with the disruptive character of this development and open up to meaningful new possibilities and technologies. Not only will this transformation continue, but it will further pick up the pace as the number of options available to digitize increase. Industry 4.0 offensives including IoT, networking of digitizable products, a considerably higher degree of automation, even faster development cycles or the use of business solutions such as S/4 as a "digital core" are popular in manufacturing companies – the goal is to be able to manufacture a wide variety of products practically at the push of a button or in the shortest possible time. At the same time, it is also essential to expand or transform the distribution and sales of complex and versatile products in the direction of 4.0.



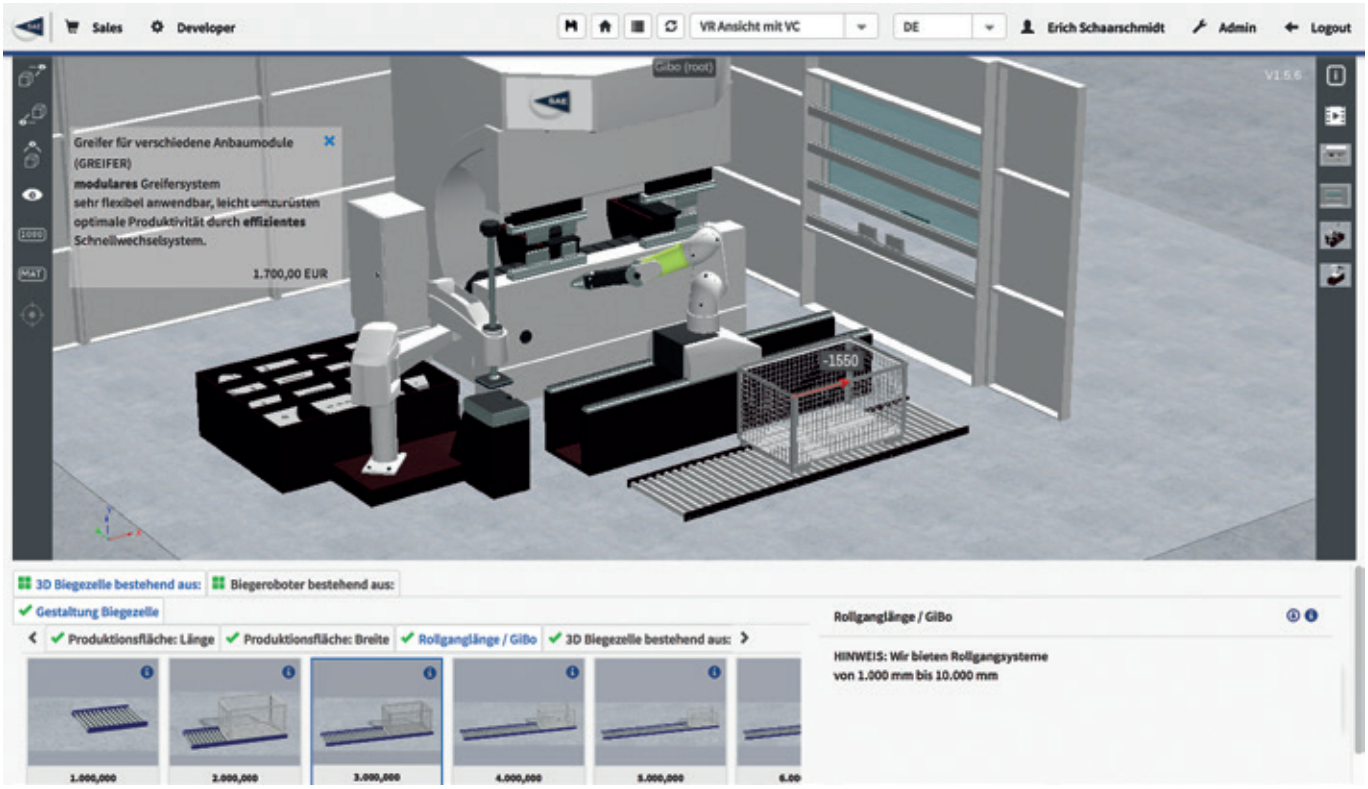
Erich Schaarschmidt is Managing Director of SAE Schaarschmidt Analytic Engineering.

Homo Digitalis and customer journey

The hallmark of current sales activities is extreme global competition, which provides the buyer, as "Homo digitalis", with a large number of suppliers with customer-specific product ranges. A high degree of identification with the product and successful presentation of the USPs (unique selling propositions and competitive advantages) during the sales process are decisive for a successful bidding process. Virtual Reality can ensure success in this scenario. Speed is equally important, i.e. the time in which an appealing and correct offer, also for complex products and plant systems, can be submitted. Successful order generation and booking aside, ensuring an error-free configuration with correct pricing is of decisive importance to the manufacturer. Another important factor for a lucrative order is the cost of preparing a quotation, which means that unneeded internal coordination for technical feasibility checks or the redesign of layout plans must be avoided. The sales department itself must be in a position to carry out these necessary checks and adjustments within the framework of predefined rules - firstly, to be able to get the offer out quickly and secondly without additional internal cost. In addition, changes in customer behavior in the decision-making process are to be expected: interested customers will have to be able to access offers digitally on their own initiative in the future – which means making use of Virtual Reality technologies. From a customer's perspective, a large part of the bidding process, the so-called customer journey, has already been completed with the request for quotations from the supplier. The customer then expects fast, competent and tailor-made offers. These requirements can only be fulfilled through a symbiotic use of ERP and CAD data within the CPQ process.

Sales and service 4.0

Identifying new customer needs and market developments quickly and reacting to them better than the competition are key competitive factors in the age of digitization. The next level for the bidding process means that even greater external digitization is taking place. With the use of so-called digital twins, product data from the design and ERP environment are transferred to new digital fields of application. Preparing products for Virtual Reality, for example,



Virtual Reality in the CPQ process. An example of a 3D configuration created with SAE Interactive Motion Engine.

makes it possible to experience the USPs of a product hands-on. Further value is added, for example, in service, since Virtual Reality instructions can be generated for each customer-specific system. At the same time, digitization is also taking place internally, for example through automated and comprehensive re-import of customer-specific order data into CAD systems and, of course, into ERP solutions.

Bridging the gap

Configure Price Quote software solutions have long supported sales teams effectively in the bidding processes. While the focus always is on complex products, numerous variations and a large number of individual features, CPQ systems significantly simplify and accelerate existing configuration processes. At the core, they contain a product configurator and they can be linked to or extended with CRM systems (Customer Relationship Management). At the same time, for example, they create a connection to an ERP system, ERP/ECC 6.0 or S/4 (LO-VC), to ensure the exchange of relational data. CPQ software is also able to generate production orders (e.g. with material requirements or bills of materials) or can trigger the production of a product (following internal checks or simulations).

Agility and Virtual Reality

SAE has implemented the principles of a process-integrated, virtual and interactive product configurator in the new and already tested next generation CPQ software solution SAE Sales and SAE Interactive Motion Engine (SAE IME). Product variations as well as machine and plant systems can thus be configured in an interactive Virtual Reality. In tandem with SAE Sales, the SAE application for quotation management and the data management tool SAE Developer, an integrated system is created for every company. The most important point: IT or CAD expertise is not a requirement for sales teams when using SAE IME. The application generates interactive digital twins in a separate data format ("IME datafile"), at the push of a button. The sales department thus remains anchored in its core competence, while the innovative SAE solutions provide all the support the sales staff needs. Furthermore, SAE IME is based on SAE's many years of experience in the field of CPQ software using ERP systems (SAP ERP, SAP S/4 Hana) and on its expertise in the field of 3D configuration.

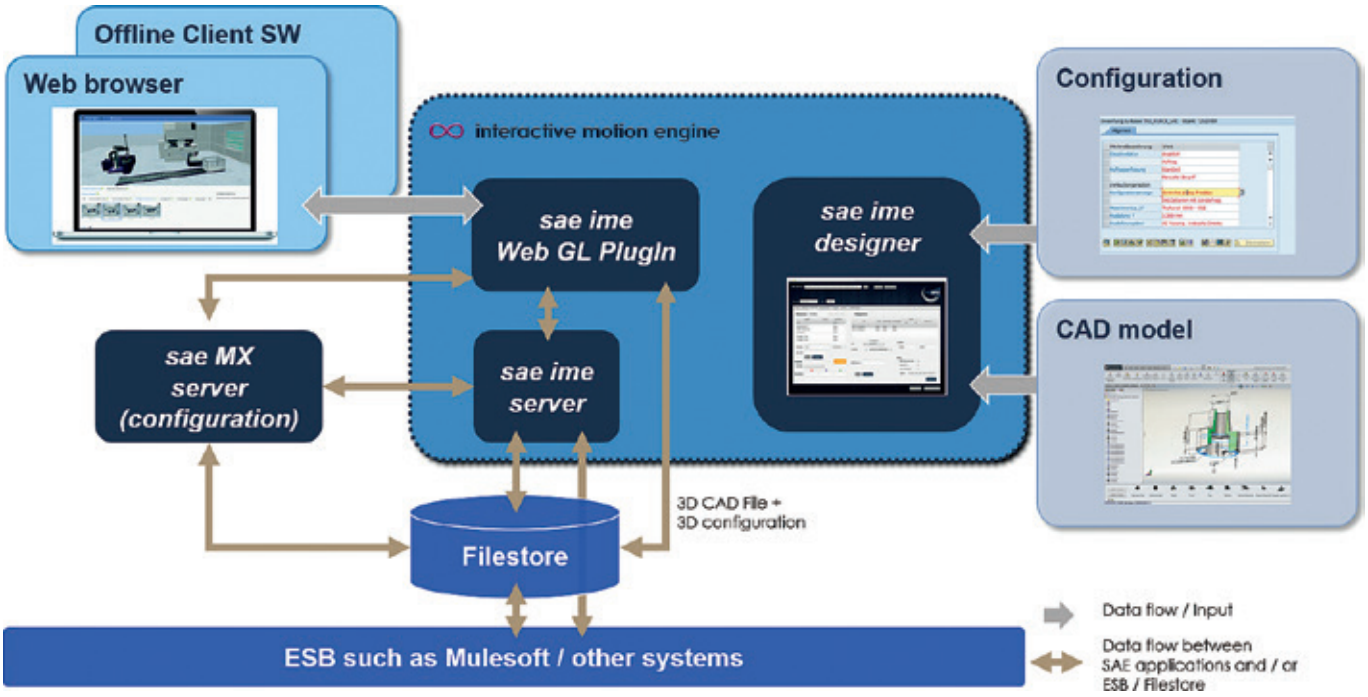
Digital twin

Functioning through a symbiosis of ERP master data, design data, configuration, pricing and Virtual Reality, the Interactive Motion Engine (IME) is in fact the only solution of its kind worldwide. The aim is to generate a digital core, which is vital to all 4.0 activities. In practice, the digital twin is a virtual image of the configured product that accompanies the entire product life cycle as the digital core of that specific product. This valuable source of data is also used for efficient after-sales management, such as technical service and maintenance.

CAD and 3D Visualizer

The core of the SAE Interactive Motion Engine is a so-called digital twin, which is automatically generated in the SAE application from the CAD design data. The file is cloud-ready and comes in a separate data format (IME-format). Product Management only has to create the variants and functions of the product in a customization process.

The high level of customizability of SAE Interactive Motion Engine ensures that the sales process is agile. Regarding performance and protection of intellectual property, it is important to make clear that the digital twin of a complex CAD model in the IME-format only consists of the relevant sales data. After separate object dependencies and technical rules are added in the application, the 3D model can firstly be operated and configured by laymen and secondly en-



Overview of the architecture and integration of SAE Interactive Motion Engine.

sures your intellectual property, like sensitive construction data, is protected, since these are only handled internally. It should be expressly pointed out that the SAE Interactive Motion Engine is neither a classic 3D visualizer, nor a generator of complex individual models. Object dependencies from ERP systems are stored in the SAE Interactive Motion Engine. What's more, there is complete process integration in CRM, PIM or SAP systems. The SAE data format enables the data for web use - both CAD data and variant master data, for example. Put into practice, that means relevant SAP ERP LO-VC data also has the (necessary) web capability. The advantage: IME can also be used as a cloud solution around the globe. SAE solutions have always been designed for international use (with country- specific pricing). As a result, international sales teams with IME are able to configure and present offers live and in an interactive manner. With the creation of interactive Virtual Reality models and without CAD knowledge, the sales team now can deliver a completely new and motivating sales experience. For the buyer, but also for the seller.

SAE Interactive Motion Engine

- Real-time interactivity between configuration and 3D movable model.
- Configure complex machinery without CAD know-how.
- Control based on degrees of freedom and based on stored technical rules.
- Characteristics evaluation directly in the model or in the configuration overview.
- Configuration options and model behavior easily and comfortably customizable.
- Fully dynamic motion simulation and interactive layout planning.
- Highest data security: Database without technical CAD data.
- Data transfer to ERP systems e. g. SAP S/4Hana or CRM systems like C4C or Salesforce.
- Complete cloud capability.

Speedy offers and cost effectiveness

It is important to note that all SAE applications operate in conjunction with ERP and CRM systems. The generated SAE data format enables all design and sales data from the respective systems for web use.

In SAE applications, for example, relevant SAP ERP LO-VC data can be made web-enabled and is then usable in a Virtual Reality environment. As an additional advantage, the SAE applications have always been designed for international use, i.e. with specific country pricing and also offer document management for the sales process. They are already in use in over 50 countries. A new feature for sales teams is the ability to use SAE IME as a CPQ component to carry out characteristics evaluations together with customers directly on the model, namely as fully dynamic, interactive Virtual Reality motion simulations as part of the quotation process – with ERP integration. Control is ensured using predefined degrees of freedom and existing object dependencies. It is also relevant that no specific technical and sensitive CAD data with design details or development know-how is used in the cloud. Cross your heart: Who would really be willing to make his design data publicly available? Be it via changing sales staff as over-secure data connections. The digital twins only contain necessary information for the sales process. Thanks to SAE IME, sales teams can generate complex product models and variants in VR on site - but without having to burden a (CAD) development department at a company headquarters again and again for quotation purposes. On top of this, queries often made between sales and development may simply become obsolete. The benefit of the CPQ solution is obvious: bidding processes are accelerated significantly and bidding costs are noticably reduced in a lot of cases.

DIGI plus Video: SAE Interactive Motion Engine and Virtual Reality

Process-integrated optical configuration with real-time interactions including VR

Virtual Reality and CPQ Software

3D visualization is already in use today in the CPQ environment. In the future, process-integrated, interactive configurators enable sales departments to carry out individual characteristics evaluations directly on complex products using VR.

By Sven Vorreiter, SAE

The technology of product configuration is used in many ways to point out and correctly select and evaluate product variations. Product configuration is used in web applications, e.g. in online shops in the B2C sector, on B2B online portals of companies, but also in offline and online sales applications in the CPQ process.

Different approaches to solutions have different performance characteristics, some of which have different suitability profiles and are often associated with media discontinuities.

Sven Vorreiter is Head of Sales Intralogistic at SAE Schaarschmidt Analytic Engineering.

paring quotations for more complex products, such as a machinery and plant systems that need to be offered based on a factory-specific layout and in combination with a production process, sales teams want a powerful application that is more than just a product configurator. Existing solutions lack visual real-time interaction based on ERP and CAD data. 3D visualization options are usually rigid visualizations that are simply stored individually for special variations. I contrast, Virtual Reality configuration and supply systems are the next-generation applications that will dominate the market within a few years.

More than product configurators

In and of itself, many product configurators belong more into the category of process-integrated technical configurators plus finder. These support the development of a product finder in ERP systems of industrial plants and offer significantly better possibilities to meet sales requirements than process-integrated technical configurators without product finder. Purely process-integrated technology configurators use only the object dependencies that are stored in ERP systems such as ERP/ECC 6.0 or S/4. They can also offer simple process integration in CRM or PIM (Process Integration Management) or the possibility of offering products tested for feasibility. They furthermore allow orders to be placed immediately at the industrial site. Sales configurators on the other hand, which generally use price lists as a basis for creating a configurator, offer different but limited options.

More than sales configurators

Although sales configurators can be implemented relatively quickly and can sometimes be an inexpensive solution, they function completely independently of production sites. Construction feasibility or plausibility checks (with ERP recourse/connection) are hardly doable. Characteristics evaluations directly on a 3D CAD model cannot be carried out either. SAE Sales including the SAE Interactive Motion Engine is assigned to a new category of process-integrated virtual and interactive product configurators with VR use, enabling simulations directly on the 3D model. They bring Virtual Reality into the sales process and ensure significant increases in efficiency in production plants while simultaneously increasing sales. At the same time, they are designed to reduce complexity and still offer, for example, quotation processes with ERP integration. Furthermore, they complement CRM systems well.

On the speed of innovation with Configure Price Quote (CPQ) software

Variant Configuration and Quotation plus SAP

The speed of innovation in Configure Price Quote software has always been high. Numerous medium sized enterprises and large companies benefit from the constant innovations and further developments.

By Susanne Henkel, SAE

The start was a simple use case presented at a trade fair many years ago - but it caused visible astonishment among the expert community in attendance: the aim was to quickly and simply create, respectively develop, a variant configuration with the direct transition to the quotation and order process. A 3D ladder was configured live (with real-time CAD display) with automatic SAP-compliant pricing. The creation of a production order including material requirements planning, bill of materials (BOM) creation, plausibility and availability checks were triggered automatically by the system. A subsequent automatic transfer of the order to SAP ERP took place at the push of a button and was fed directly to machine control. The production of the ladder on a scale of 1:20 was initiated automatically and a small production line started. What we demonstrated was a finished process from model creation and configuration to order transfer and automated machine control in concert with SAP ERP - and all this using the example of a very simple product whose characteristics can nevertheless be varied manifold in terms of length, material used, width of the rungs, spacing between them or the placement of the first rung. Industry 4.0 in 2003.

Susanne Henkel is Managing Director of SAE Schaarschmidt Analytic Engineering.

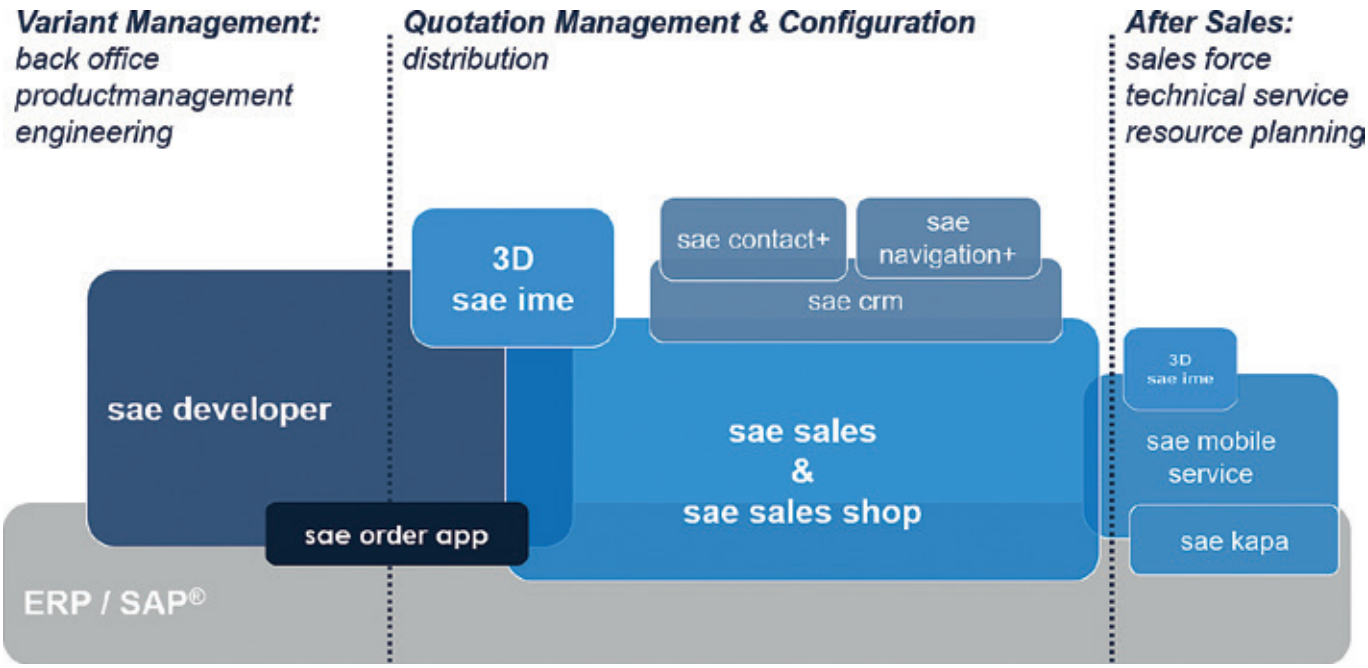
Back then, this tangible and clear use case was demonstrated at the SAE booth by using the SAE applications SAE Developer, the CPQ application SAE Sales including CAD and various SAE-designed Abap solutions. That the presentation resulted in many contracts and customer relationships with some well-known global companies was not planned, but an all the more pleasing result. Today, companies of different sizes deploy SAE applications in over 50 countries worldwide, including global key players with sales figures well in the billions. Once founded as a management consultancy for logistics processes specializing in variant configuration and the efficient mapping of all internal company processes within the SAP standard, SAE operates as an owner-managed company with SAP certifications. The SAE team has a wide range of SAP module expertise, CAD know-how from various providers and excellent software development experience, even in the latest technologies. For more than 15 years SAE has been developing its own software applications such as the above-mentioned SAE Developer and SAE Sales.

S/4 interfaces

The independent sales management system from the CPQ environment has integrated interfaces to ERP/ECC 6.0 and S/4. Many years of experience with SAP as well as the web capability of the software solutions enable SAE to successfully serve a wide range of different customers.

Neutral database

Let u stake a look at the SAE Developer: It enables outstanding sales data management based on SAP ERP or SD data, including complete SAP LO-VC objects with object dependencies. The SAE solution generates native data from the existing ERP data, i.e. a completely neutral database. All data objects necessary for quotation or order creation are created, prepared and transported using the SAE Developer. Complex pricing data, perfectly formatted texts and the most sophisticated document customizing allow individual print services. SAP configuration data can then be comprehensively enriched, revised, verified and prepared for further sales processing. All desired sales data can also be built or modeled independently in the SAE Developer. On the flipside, the solution also supports the essential core of the value chain. Customers will find an efficient variant management in a demand-driven and optimal manner, the use of a distinctive structuring platform for variants, the visualization and simulation of object dependencies and configurations with country- and distribution channel-specific versions, the enhancement of techni-



An overview of the SAE product portfolio in the field of CPQ software for SAP.

cal configurators to sales-optimized configurators, the use of an office work flow for quotation and order processing, the use of a central database and communication platform for subsidiaries and sales companies through to the use of a central control platform for the relevant CAD models. Other highlights include: cross-instantiation between subordinate objects, BOM processing over several levels, editing and checking object dependencies with automatic code and syntax suggestions. The SAE Developer is used by large and medium-sized companies in mechanical and plant engineering. Due to the modular structure and the customizable functions, company-specific requirements and goals can be taken into account in a highly efficient and tailored manner as needed. With the SAE Developer, functions and applications are available that go far beyond the standard of an ERP solution. For customers, the SAE solution is used in the sense of functionally-enhanced middleware for the preparation of the SAP configuration, sales options and sales prices (for both master list prices and sales prices of subsidiaries) for the CPQ process – and as a web solution. As an example, the solution can support the data transfer from SAP and the product database, the structure of country price lists, the country-specific product characteristics and the marketing-oriented enhancement of the sales configurations. The transfer of relevant CAD data for the sales configurations or other applications is realized via the SAE MX Developer.

A tight grip on the sales process

Now let us shift the focus on the SAE sales solution, which represents an offline and web sales application and effectively supports sales teams in all phases of the quotation and sales process with interfaces and functions designed in line with practical sales requirements. A flexibly implementable quotation configuration, quotation pricing including the filing of quotation documents, sales-oriented CRM solution management, comprehensive text and document management, Outlook integration, 3D model creation and automated data transfer/ transfer to SAP systems are only a small part of the functions. SAE Sales can be used both as an online and offline system. A major advantage is that technically sophisticated products and their variations are presented in a clear and customer-oriented manner with SAE Sales.

As mentioned, the SAE solution has its own CRM module with a quotation-specific workflow. The sales process and thus the field service are supported in an ideal way. The Outlook integration as well as the upload and download functions at the push of a button to an SAP system are SAE standard functionality. It is also possible to connect existing CRM systems (such as Salesforce or C4C). SAE Sales enables a highly efficient and error-free workflow in the quotation and sales process, further enhancing profitability. Processing times are reduced, processing is greatly simplified for all staff involved in the workflow and at the same time the cost of the sales process is reduced overall. Quotations created offline or on the web from the SAE Sales application are transferred one-to-one to SAP within the workflow process via the SAE SAP interface.

Interactive Motion Engine

With the Interactive Motion Engine, SAE sees itself as a pioneer in the global CPQ software market and sets new standards. For the first time, the SAE Interactive Motion Engine enables the display of variant products up to complex plant systems individually in 3D on the basis of Virtual Reality technologies and to ”move” them interactively (by generating a computer-generated reality). The result can be a high-quality offer with individual images and customer-specific prices within SAE Sales. It can also be used in other native applications. An essential component of a future-proof solution for the visualization of configuration on different platforms is the uniform data basis in the form of a digital core. The SAE Interactive Motion engine generates this data foundation and data format accordingly. The final twist: Configurations from the leading ERP systems (SAP ERP or SAP S/4 Hana) can be combined with existing CAD data (which can be converted at the push of a button) to create added value.

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