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Spotlight:
GLOBALIZATION. WHAT'S NEXT?

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SECURITY
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ELECTRONIC SIGNATURE
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PREFACE

Dear readers,

Disruption. Two years ago, this concept was associated mainly with the disruptive power of innovation, as new products and, frequently, new technologies replaced old business models with new ones. Today, when we talk about disruption, other associations come to mind. The COVID-19 pandemic and its effects have rattled both our personal lives and global economies. Our spotlight looks at the shocks to global business that continue to be felt, and we hope we can inspire you with insights into digitalization, modular production and interdisciplinary networking to emerge stronger from this disruptive time.

zenon has been firmly anchored in modern power generation and distribution for many years – so far primarily in renewable energy generation, energy storage in the smart grid and the digitalization of substations. So it makes sense for us to also support electromobility. With zenon 10, our software platform provides users with an integrated OCCP extension designed to efficiently manage the charging infrastructure for electric vehicles.

Disruptive trends have not spared the otherwise stable pharmaceutical industry. The ability of global vaccine production facilities to respond has demonstrated impressively how agile and efficient global players in the pharmaceutical industry can react. zenon supports security and quality by means of digitalization – as part of a comprehensive platform for compliant, efficient and economical production. The latest functional enhancements for the digitalization of processes in pharmaceutical production can be found on pages 54ff.

With all this in mind, we must look for the opportunities created by this disruptive period. Let's work together to make the best of them by focusing on innovation – in processes, products and business models.

Be inspired!

THOMAS PUNZENBERGER, CEO

GLOBALIZATION. WHAT'S NEXT?

BUSINESS IN THE 21ST CENTURY

Manufacturing in a post-globalized world

Globalization has been a powerful driver of economic growth since the 1970s and 1980s. However, after the 2007–2008 financial crisis, the idea of steadily accelerating global trade began to be questioned more seriously. In the years that followed, recovery was achieved through economic and fiscal policy reforms. Today, the COVID-19 pandemic and the increasing impact of the climate crisis are necessitating a change of course in terms of global trade. And digitalization will very likely play a key role in this process.

ROBERT KOREC,
PR & COMMUNICATIONS CONSULTANT

PROSPERITY AND EFFICIENCY THROUGH GLOBALIZATION

The term "globalization" originated in the 1960s and became popular in the middle of 1980s. Since the early 1990s, it has been shaping the debate about increasingly accelerating global trade. It describes one of the most important drivers of the global economy. The benefits of a division of labor spanning several countries and continents are based on the different general conditions. Legal, environmental and social standards are also decision criteria, as well as raw material deposits, the connection to transport routes, the availability of sufficiently qualified workers and a modern infrastructure.

FORCED REORIENTATION DUE TO COVID-19

Neither the coronavirus crisis nor climate change will end the global division of labor and global trade. However, these events are resulting in a reorientation. The past year has revealed their weaknesses to global players and demonstrated that over-reliance on individual suppliers and global supply chains can be major weaknesses. An interruption to supply chains can have significant consequences.

CREATIVITY IN TIMES OF CRISIS

It isn't only the coronavirus that shows how disruptions due to epidemics, protectionism, natural disasters or political uncertainties in far-off regions can have a major impact on a company's production operations. Yet, at the same time, social and economic history tells us that the effort to overcome global crises always unleashes tremendous creative potential.

Many companies have realized that their supply chains are not sufficiently resilient. One of the lessons from the pandemic is that delivery capabilities will have to be more assured in the future. And companies will have to be capable of manufacturing products in different production facilities, on different continents and in different countries using the same processes and equipment.

Supply chains will need to be realigned and diversified to overcome trade barriers and redesigned through smart options for digitalization.

From a business perspective, it still has to be determined to what degree the established sourcing and location decisions that have proven themselves in recent years can be adapted to the changing conditions.

It is very likely that production will become more regional again and supply and value chains will be shorter. This will reduce the risk of disruption to supply chains. Another new insight is that crisis security is more important today than the small price benefits gained from manufacturing in low-wage countries.

TRANSPARENCY CREATES SECURITY

Transparency along the supply chain is becoming increasingly important. Companies need to analyze their supply base to avoid risks on the supplier side in a geographic region. The decision to develop multiple sources of supply will also result in additional costs, as the discounts when ordering from a single supplier will be sacrificed to improve distribution of risk. In the short term, this will also increase the complexity of the supply chain but, in the long term, it is important to be flexible and resilient enough to emerge stronger from future crises.

REGIONALIZATION

Regionalization is one potential solution to making supply chains short and not too complex despite diversification. It does not mean bringing the entire production process back into your own country, rather manufacturing where it is best to do so, taking into account supply chain security. In addition, it makes sense to integrate regional economic cycles within the global network. Economic areas such as the European Union have a particular benefit in that there are no trade barriers, and the geographical and cultural proximity facilitates cooperation. What's more, there are environmental aspects related to shorter transport routes, which can also have a positive effect on a company's reputation in terms of a better CO_2 footprint.

SUPPLIERS WITH SINGLE-SOURCE PRODUCTION ONLY

One result of the COVID-19 crisis is that ensuring deliverability will become even more important in the future, even when this is not always possible on a cost-neutral basis. Suppliers with single-source production will therefore have to be avoided to minimize the risk of stoppages.

HARMONIZATION

One strategy could be to carry out manufacturing at different production sites, in different countries and on different continents using the same machines and processes. Another possibility would be to focus on compliance with quality standards and process monitoring. Here, heterogeneous environments could be allowed, but to get this complexity under control, the highest possible degree of transparency would be required. To achieve this, you need comparable, uniform data and higher-level processes that support a decentralized manufacturing system. Companies that want to create sustainable and future-proof structures for supply, trade and production networks will inevitably have to exploit the potential of digitalization as part of this restructuring.

DIGITALIZATION PROMOTES FLEXIBILITY

The coronavirus crisis has clearly given digitalization a boost. It has highlighted new ways of collaborating more efficiently, regardless of location and regardless of whether between employees working from home or on international teams. The basis for this is a shared common language (or effective translations), as well as access to a shared technology infrastructure.

Digitalization also enables different machines to communicate through common interfaces. Entire production facilities can be connected regionally or across national borders as connected factories, to manage and monitor systems and processes transparently. This means that production can run at those sites where security of supply and flexibility are best ensured.

Antiquity: trade routes between Asia and the Mediterranean, campaigns of conquest

Silk Road

Middle Ages: peaceful trade relations with other states

German Hanseatic League

Early stages (up to 1500)

16th century

Colonization

Global silver trading network

Northwest European trading companies

Globally active networks

17th century

18th century

Mercantilism

Boston Tea Party

Global European dominance

First multinationals

Industrialization

19th century

20th century

Great Depression (1929)

Bretton Woods monetary system

Founding of GATT/WTO (1947)

Outsourcing and offshoring

Digitalization/World Wide Web

Financial crisis (2007–2008)

COVID-19 pandemic

Climate crisis

21st century/ today

STRATEGIES TO INCREASE RESILIENCE AND AGILITY IN A GLOBAL CONTEXT

Tackling uncertainty

There are many strategies that can be used to respond to uncertainties affecting global trade – lobbying, contractual strategies, or financial activities such as managing currency risks, to name just a few. We will be focusing here on the areas of activity relating to production and the energy industry, where software like zenon can help to ensure success in volatile global systems.
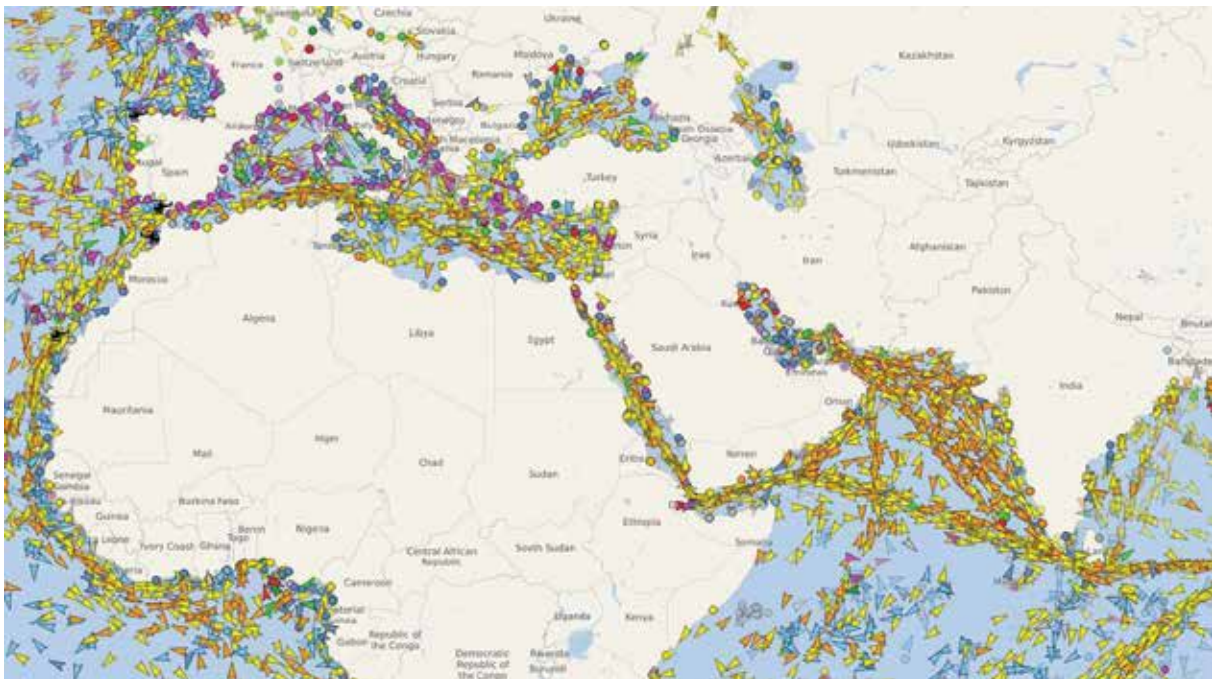
According to historians, the globalisation of industrial production and the worldwide division of labour began in the early 16th century. Between the fall of the Berlin Wall at the end of 1989 and the global financial crisis in 2007, globalisation – also known as hyperglobalisation during this period – accelerated at an unprecedented rate. However, during the economic crisis that followed the financial crisis, the situation changed, and we have to consider and mitigate the risks of a more volatile world order in our production strategies.

The accidental obstruction of the Suez Canal, natural disasters such as the eruption of the tongue-twisting Eyjafjallajökull volcano that grounded air traffic for weeks in 2010, China's growing economic strength and its ambition to overtake the USA as the world's strongest economic power. These events and developments, together with the global COVID-19 pandemic and its as-yet-uncertain consequences for the global economic fabric, have shaken – and continue to shake – the decades-old foundations of our world order. And these are just some examples of the uncertainties that we face on a day-to-day basis.

The uncertainties affecting global trade pose the following specific risks for production companies:
– Availability of raw materials
– Availability of components and bought-in parts
– Price fluctuations affecting raw materials or components
– Delays in logistics
– Politically motivated trade barriers
– Loss of personnel

Since society nowadays is networked by its very nature, virtually every company is now part of the global system – even if a company only manufactures products at one site and does not depend on any suppliers.

40 (in percent)

World US EU China
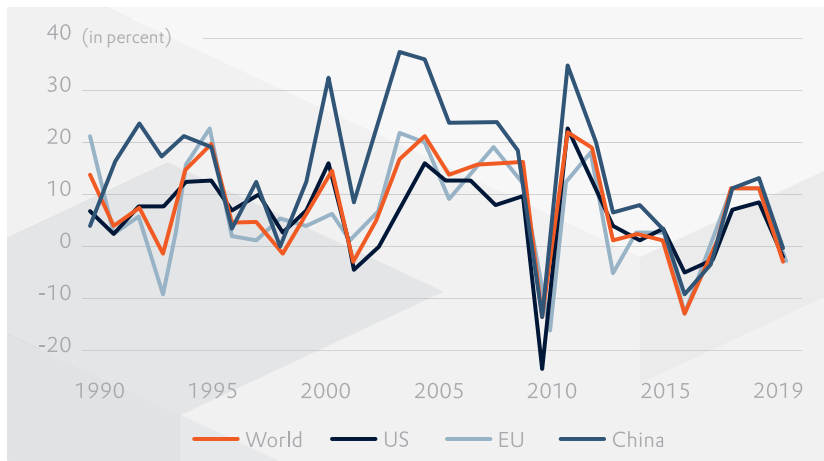
Growth rates of world trade in goods (annual percentage change). Even if certain outliers can be attributed to currency effects (2015), the fluctuations in global trade since 1990 are clearly visible.
Source: International Monetary Fund

Robot density in the manufacturing industry in 2019
Robots installed per 10,000 employees (2019)

918 Singapore
868 Rep. of Korea
364 Japan
346 Germany
187 China
113 World avg.
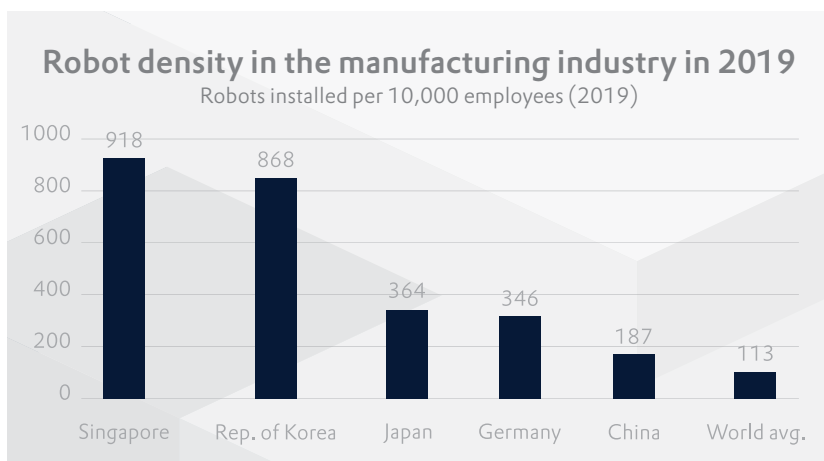
A high level of automation enables competitive production even in high-wage countries – as demonstrated here using the example of robot density.
Source: IFR – International Federation of Robotics

Eventually, whether it is in the context of raw material procurement or sales, the company's links with the global system will become evident.

It is extremely difficult, if not impossible, to have any direct impact on these risks. However, by using clever strategies in digitalisation and automation, we have the opportunity to protect ourselves more effectively against the risks described above.

IN THIS CONTEXT, WE WOULD LIKE TO HIGHLIGHT THREE FIELDS OF ACTION.

1. USING DIGITALISATION AND AUTOMATION TO ENABLE EFFICIENT PRODUCTION WITHOUT BEING DEPENDENT ON LOCAL CONDITIONS

There are many factors that come into play when selecting a location. One important factor is the availability of suitable workers. Both the availability of qualified personnel and the wage level often narrow down the choice of location considerably.

Digitalisation and automation can help to reduce dependency on personnel. One indicator of automation levels is the use of robots. For example, Singapore, South Korea, Japan and Germany – all high-wage countries – are at the top of the rankings when it comes to the number of industrial robots per 10,000 employees. And China, where the average wage is growing dynamically, is also seeing an increase in the use of robots.

The fields of action for enhancing efficiency through automation extend far beyond robotics and are extremely diverse. Some examples of how zenon can help are provided below:
– Automated creation of evaluations and reports.
  Quality and conformity reports, for example, can

be created automatically at the end of each batch – reducing the manual work required to almost zero.

– Machine parameters can be set automatically to dramatically reduce the time and work involved in retooling machines. In addition, smart, context-sensitive checklists can be used to guide personnel through the remaining manual steps by means of an efficient, error-free process. As a result, retooling processes involve significantly less work.

– Integrated digitalisation of different disciplines, as well as the interdisciplinary evaluation and optimisation of key performance indicators, can help to unlock latent efficiency potential. For example, production and energy supply can be synchronised to ensure energy-efficient manufacturing processes. Or auxiliary systems can be used to integrate core areas of production into one cohesive whole.

2. FLEXIBLE AND MODULAR PRODUCTION FOR REDUCED RISK AND GREATER INDEPENDENCE

For decades, there was a trend towards production patterns that focused on the sometimes highly specialised production of certain products at only one site or a small number of sites worldwide. However, the benefits of the resulting economies of scale are at odds with the call for increasingly highly customized production with shorter delivery times (also see 'batch size of 1' as defined in Industry 4.0). They are also regarded as a risk in an increasingly unstable global trade structure.

How can this location dependency be gradually reduced without having to completely recreate existing structures? One approach is to move towards more modularity in production. The flexible manufacture of different products at the same site requires modular digitalisation alongside modular equipment. Software enables flexible use of the modular equipment parts for different production tasks. At the same time, it can also guide the user through the modified production tasks on a context-sensitive basis.

3. NETWORKING AND INTEGRATION ON AN INTERDISCIPLINARY BASIS ALONG THE VALUE CHAIN UNLOCKS NEW POTENTIAL

When problems arise in the overall system, due to the likes of disrupted supply chains, a rapid response is absolutely essential.

The actions of isolated system participants – either within a company or along the value chain – can often be difficult to coordinate at short notice. Things are much easier if systems that can be adapted modularly are networked across different sites and capacity can be freed up and used flexibly to produce missing components, for example.
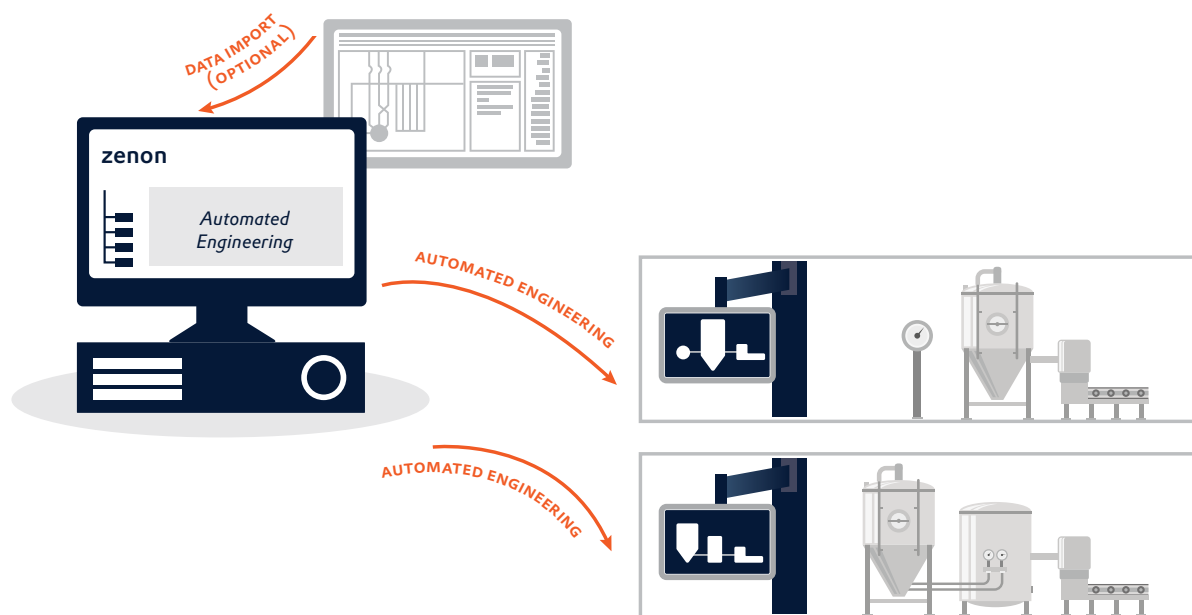
The zenon software platform supports the digitalisation of modular production equipment.
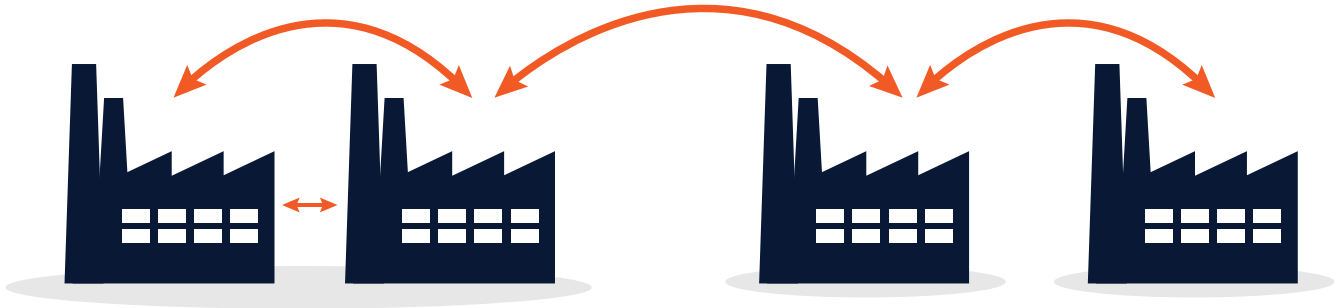
The zenon software platform enables networking, communication and integration to overcome silos and open up new courses of action.

The journey from a company's current position to where it wants to be does not need to be completed in one go. If it is broken down into a continuous series of small steps, it becomes much more manageable from a financial and organisational perspective. For example, the first step might be the comprehensive replacement of individual key parameters. Bit by bit, the depth of communication and interaction will increase.

The face of globalisation will continue to change in the coming years, and the multitude of influencing factors – from politics to financial systems to nature – makes it difficult to make reliable predictions. But the way that companies deal with this uncertainty provides an opportunity to secure a competitive advantage in a global economic system. Those companies that manage to develop both resilience and agility will come out on top when the global economic conditions are next shaken up – whether the shake-up involves short-term, disruptive changes or consequences that play out over the medium term.

Use the opportunities afforded by digitalisation with the zenon software platform to strengthen your global production strategy. zenon helps you to improve your resilience and agility in a volatile world.

PHILLIP WERR
Chief Marketing and
Operations Officer

As a member of the Executive Board, Phillip Werr is responsible for the Marketing and Operations divisions. Before he joined COPA-DATA in the role of Product Marketer in 2010, he ran a production plant as an independent entrepreneur. The ongoing development of customer benefits, as well as the topics of business model development, production efficiency and optimised resource utilisation, are particularly close to his heart. He holds a degree in Management and Economics from the Free University of Bozen-Bolzano in Italy.

LinkedIn: phillipwerr

zenon
10

PRODUCTS
&
SERVICES

The zenon software platform and digital transformation

At the Hannover fair in 2011 the term "Industry 4.0" was first introduced to the public. The term was coined to kick-start the next industrial revolution. Unlike previous industrial revolutions, it was the first time a revolution was articulated before it happened.
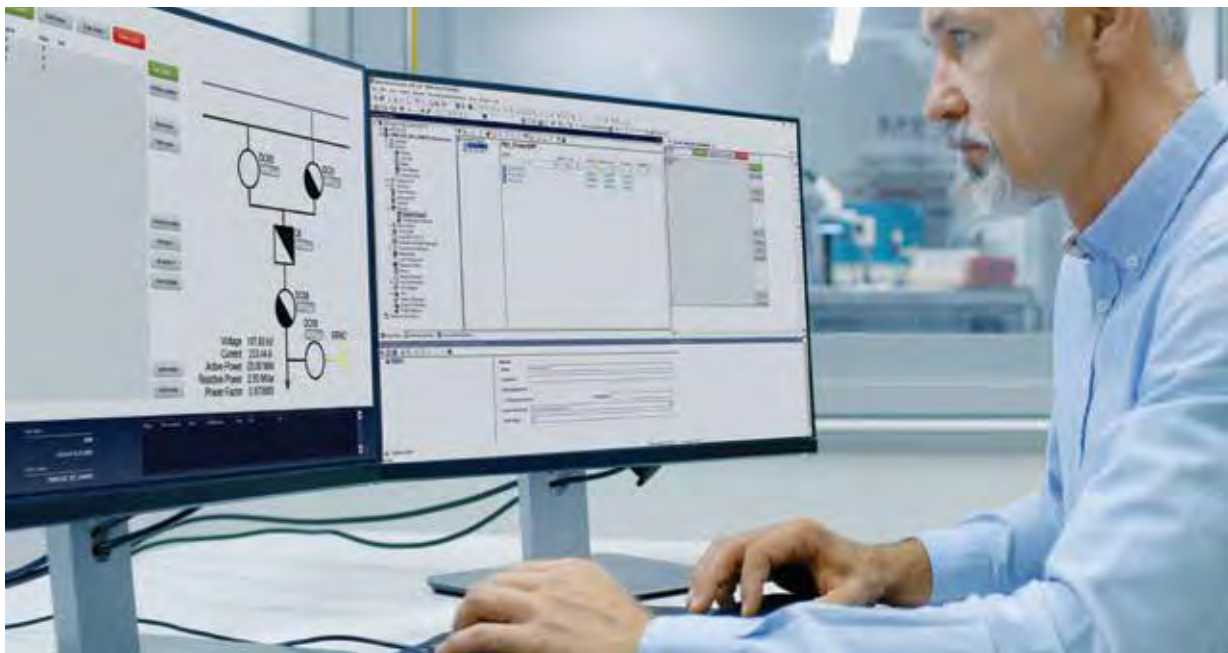
For quite a long time after 2011, industry discussed what this revolution might look like and what it would require. Now, in 2021, the fourth industrial revolution is in its implementation phase. With it comes ongoing digital transformation. Firms are completely rethinking how they work. Through increased automation, improved communication, self-monitoring, and the production of smart machines that can analyze and diagnose issues without the need for human intervention, the world of industrial automation is changing.

Increased automation brings more complexity and extra security demands. Software vendors must not only provide software products, they also need to be partners who help their clients to ramp up their solution rapidly. For that reason, service-oriented solutions are needed, impacting how software is developed and consumed.

The new complexity has many sources. One source of complexity is the communication between different applications. This makes it necessary for IT departments to have a full overview of their IT landscape. They decide on the right product together with the business. As a result, IT departments are now becoming the decision-makers for industrial automation software systems. This OT/IT fusion will be further supported by zenon in the future.

The development of the zenon Software Platform continues to reduce complexity and it makes the engineering and operation of industrial automation software applications easier. To make that possible, we are rethinking existing assets. The zenon Editor and Runtime, zenon Analyzer and zenon Service Grid are becoming one deeper, more seamlessly integrated pro-duct. zenon of the future will be service-oriented, including local and cloud-based services. Most of the under-the-hood work has already been completed, but it will be necessary to make adaptations to the naming of components to prepare for further steps.

**HERE'S A QUICK OVERVIEW ABOUT THE MAJOR RENAMING
CHANGES THAT ARE HAPPENING WITH ZENON 10:**

UNTIL ZENON 8.20	AS OF ZENON 10
zenon Editor	**zenon Engineering Studio**
zenon Runtime	**zenon Service Engine**
zenon Logic Workbench	**zenon Logic Studio**
zenon Logic Runtime	**zenon Logic Service**
zenon Analyzer	**zenon Report Engine**
zenon Analyzer Management Studio	**zenon Reporting Studio**
zenon Analyzer Server	**zenon Report Engine Server**
zenon Report Launcher	**zenon Report Launcher**
zenon Service Grid	**zenon Service Grid**
---	**zenon Service Grid Studio**
zenon Web Server	**zenon Smart Server**
zenon Web Client	**zenon Smart Client**

Here is a quick overview about the major renaming changes that are happening with zenon 10: These name changes do not influence the LTS product life-cycle plan. We will continue to provide product maintenance for current zenon versions for many years. The main advantage: there will be no need to verify and fix industrial applications every time there is a Windows update or new firmware version for a device using zenon. Beyond naming adaptations, we have rebuilt our deployment mechanisms to fulfil the requirements of IT. zenon applications can be seamlessly integrated with our cloud-based solution – the zenon Service Grid. This is continuously released every quarter with new features and, of course, security enhancements.

Our work is not done yet. We are already heavily investing in zenon 11 so that it can be run on Linux as a cloud service to further enhance our service-oriented approach. Stay tuned!

GERALD LOCHNER
Head of Product Management

Gerald Lochner has been part of the COPA-DATA team in Salzburg, Austria since September 2014. The former software developer is responsible for product management for the zenon Software Platform and is passionate about making sure that it is fit for the future.

gerald.lochner@copadata.com

A COMPREHENSIVE OT/IT PLATFORM

UNDER THE HOOD OF ZENON 10

Perfectly harmonizing OT and IT – that was the ambitious goal our developers set for this major release in 2021. With a new look & feel and plenty of new features, zenon 10 now offers zenon users even more options for efficiently implementing a wide variety of scenarios across multiple disciplines. This reduces the project engineering effort and shortens the time it takes for applications to go live.

With the 2021 release, zenon has now fully evolved to an end-to-end software platform. With zenon 10, a fully integrated software platform is available for users in the energy & infrastructure, food & beverage, pharmaceutical and automotive sectors. The new solution has been designed specially to meet the needs and requirements of these industries. More than 158 new features were added during this product development cycle.

ONE SETUP –
ONE SOFTWARE PLATFORM

With the release of version 10, all platform components are installed via the zenon Software Platform Manager. This new workload-oriented deployment tool enables out-of-the-box component selection to meet your needs for the most common application cases. It offers both a validation and a clear presentation of the system requirements, which are checked during the installation process to give users the opportunity to make changes to the system, if necessary. At the same time, it allows users to fine-tune the individual workloads and the components selected.

The demands on industrial automation software are increasing. Flexible access, including remotely, is a key factor for future-proof systems and processes. For this reason, the capabilities of the web engine have been expanded extensively with zenon 10. In addition to support

for Docker container technology, it is now possible to comment on alarms and events. Together with performance improvements in the compiler and the use of Gantt charts in Extended Trend, zenon is taking the next logical step in the direction of web-based visualization. Smart objects, available since zenon 8.20, have also been developed further. With zenon 10, the reusable modules support recipes, recipe groups and import/export using XML.

UPDATE TO SQL SERVER 2019

The various components of the platform have been adapted to use the same (i.e. latest) version of SQL Server, version 2019. This means that the latest functions are available and that it also meets all current security requirements. The update to the latest version has extended the lifecycle of SQL functionality to 2030.

SERVICE ENGINE IN DOCKER

Version 8.20 of the zenon Service Engine – previously known as Runtime – is available for the first time on Docker. With the help of the supplied Docker image, users can create containerized applications with Service Engine. In order to offer a solution for brownfield scenarios as well, Docker images for earlier versions of Service Engine will also be released with the release of version 10. Using these newly deployed images for previous versions saves resources and, in most cases, does not require invasive changes to the application.

OUT-OF-THE-BOX AUTHENTICATION

Authentication and authorization are critical components in IT and OT systems. Users must be authenticated correctly to ensure that only authorized persons can access and use the systems. To do so, zenon relies on out-of-the-box user management that is directly integrated in zenon Service Engine. This makes it ideal for small, local, stand-alone installations. Existing user management systems such as Microsoft Active Directory or Radius can be used to implement larger and more complex installations. They are also suitable solutions when multiple zenon Service Engines are deployed. Users can log on to each one with the same access data.

SERVICE GRID IDENTITY SERVICE

zenon Service Grid Identity Service takes user administration one step further. In the long term, the Identity Service will be used as a central user management system throughout the entire zenon software platform. It is responsible for the authentication of users, zenon services and third-party applications that connect to the zenon software platform. As of zenon 10, Identity Service can already be used by all Service Grid Services and Service Engines. This provides a zenon-wide system

for user login that users can access from across different geographic locations.

FUNCTIONALITY: The Identity Service user interface allows users to manage user accounts and user groups. Access authorizations can be defined for this. Existing user management systems, or identity providers, can also be integrated. And, last but not least, the access rights for any third-party applications can be managed and authenticated using the OAuth2 authentication tool.

This is useful, for example, when Microsoft Active Directory or Radius is deployed for user authentication. Employees then have the option of logging on to zenon Service Engine using this login data.

SMART OBJECTS UPDATE

An alternative approach to setting up a project faster and more efficiently is the use of small encapsulated units, or Smart Objects, which were first introduced in zenon 8.20. Smart Objects are ready-made components, the content of which is defined in templates. As standardized functional units, Smart Objects contain all module functions and settings that are required to map any process component. Related elements, such as icons, variables or functions, can thus be reused.

MORE INDEPENDENCE THROUGH DEFINED FRAMES: Frames can now be defined directly on the Smart Object template. This makes engineering more flexible and independent of project content. Standard frames and frames with user-defined shapes can be created in the same way as in a project. To do this, users do not need any additional content from the project itself The frames will be available at the project only once no matter how many Smart Objects will be created out of the same Smart Object Template.

SUPPORT FOR RECIPES AND RECIPE GROUPS

With the integration of standard recipes and recipe groups in the Smart Object templates, it is now possible to define screens or functions for recipes or recipe groups. These can also be displayed and used visually in the Service Engine. Standard recipes and recipe groups that come from Smart Objects are locked in the zenon Engineering Studio and in the zenon Service Engine.

EASY IMPORT AND EXPORT OF ELEMENTS

Another new feature in zenon 10 is the export of content via XML. Content can either come from a project or a Smart Object Template and later be imported into another Smart Object template. Apart from drivers and user-defined files, all Smart Object template content can be exported and imported via XML. In this way, a new set of Smart Object

templates can be created step by step from an existing project without having to redefine everything from scratch.

ZENON WEB ENGINE UPDATE

Zenon 10 provides extensions to the Alarm Message List and Event List. Users can now enter a comment for each entry in the list, for example, to specify a reason why an alarm was deleted. In addition to comments, users can link a cause to each alarm. By clicking on the "Alarm Cause" button created in the AML screen, users can select one of the predefined alarm causes from a dialog. Depending on the configuration, it can be made mandatory to select an alarm cause or add a comment before an alarm can be acknowledged.

The AML and CEL screens now offer additional columns for alarm/event groups, classes and areas with symbol, ID and name in order to get a better overview of which part of the system the alarm originated from. This information can also be filtered.

The Equipment Model screen is another new feature designed to assist users. On this screen, users can display the device model together with the aggregated alarms from the device groups and run the related functions. In addition, the selected device model can also be used to filter an open AML/CEL screen. This filter option is also available directly in the AML/CEL screen toggle function outside the screen.

VISUALIZE DATA IN A GANTT CHART

In Extended Trend, zenon users can visualize data, e.g. machine statuses that are now also displayed in a Gantt diagram above the line diagram. This gives you an even better overview of your systems.

SUPPORT FOR MOVABLE FRAMES

In order to make a web-based HMI even more dynamic, zenon now supports movable frames. In addition, frames can be configured so that they open relative to the mouse or element position and always stay on top or close when the focus shifts.

IMPROVED WEB ENGINE PERFORMANCE

To speed up the development process, further improvements have been made to the Web Engine Compiler. We have succeeded in reducing the compile time by two-thirds. This has made engineering with zenon even more efficient. Because the Web Engine is now also available as a Docker image, it can be used virtually anywhere.

CONSISTENT DATA

One frequently expressed customer request was to save alarms and events not just locally in the Service Engine, but also on an SQL server in order to ensure data consistency and a high level of data security. The new Smart Data Storage feature in zenon now provides this functionality: alarms and events can now be saved locally or in an SQL server and data can be reloaded in zenon and used just as if it was stored locally. It is also possible to export data to a SQL server in a contextualized format that can be read by third-party systems. The unique thing about Smart Data Storage is how it works: alarms and events are saved immediately as they occur. So there is no need to set a time filter or trigger a function. Together with a fail-safe buffer mechanism and redundancy capability, the completeness and consistency of data is thus ensured.

BREAKING THE LANGUAGE BARRIER

As part of the internationalization process, it can often make sense to switch the language of alarm and event reports. In earlier versions of zenon, the reports always used the language defined by the Service Engine. This can sometimes be a problem if, for example, a service engineer traveled from another country and did not speak the local language. With zenon 10, users can now select the language used in the reports directly in Report Launcher. When creating the report, not only are alarms and events translated but the entire report, including table headers and filters, is now localized. "With Report Engine, the language barrier becomes less of a hurdle. The option to select the language of the report directly during creation and to translate the report online into the desired language is a major step forward in internationalization for companies," says Thomas Lehrer, Product Manager.

INDUSTRY HIGHLIGHTS

ENERGY

The energy sector is marked by security, networking and the global shift in power generation and supply to renewable energy sources. In response to this trend, a new, integrated process gateway is now available in zenon. This allows the interaction of industry-relevant protocols to be configured quickly and easily. This has started with the protocol gateways DNP3-Outstation and MODBUS, with others to soon follow.

zenon 10 delivers numerous gateway expansions. For example, the ICCP process gateway in zenon 10 supports coupling with different Distribution Management Systems based on TLS encryption according to the IEC 62351 safety standard. The important IEC 61850 protocol standard for the automation of substations has also been expanded extensively. For example, there is a new OCPP (Charge Point Protocol driver). This means that zenon can be used as a management system for charging stations (CSMS). This enables the smart connection of several charging stations for e-vehicles in one integrated application. For example, intelligent load and energy management can also

be implemented in conjunction with PV systems so that the available charging power can be distributed optimally to all the vehicles that need to be charged.

zenon provides additional new features that support IoT applications in the energy sector. The GenericNet driver now makes it easier to handle important IoT protocols such as MQTT, AMQP or REST web services. Third-party protocols can be implemented easily and securely using the .NET API of the GenericNet driver. Since zenon now also supports authentication via RADIUS, a seamlessly integrated authentication infrastructure can be implemented.

Based on the latest zenon release, COPA-DATA also regularly publishes new application sets. These packages, which are geared towards a specific application, include demo applications, prepared smart objects and templates. This means that an application can be configured as quickly as possible. The application sets for Substation HMI and Solar PV SCADA are available already.

FOOD AND BEVERAGE

Quality and flexibility in production ensure competitiveness in the food & beverage industry. zenon supports this with new features on several levels. Due to the large number of machine manufacturers and system components used, the connectivity of zenon has been upgraded further. The S7-TIA driver now also supports TIA16 in order to guarantee the latest iteration of the TIA portal for the integration of the most important Siemens devices. B&R PVI drivers and many others have also been improved.

When it comes to integrating system databases, zenon 10 now provides even more support for data collection, contextualization and archiving. In particular, the improved SQL connection expands the options for analyzing data. The growing demand for connectivity of applications, systems or entire plants, including across locations, can be met with zenon Service Grid as an IIoT architecture. Fully compatible with the features in

zenon 10 Engineering Studio, Smart Object Templates, Behälter
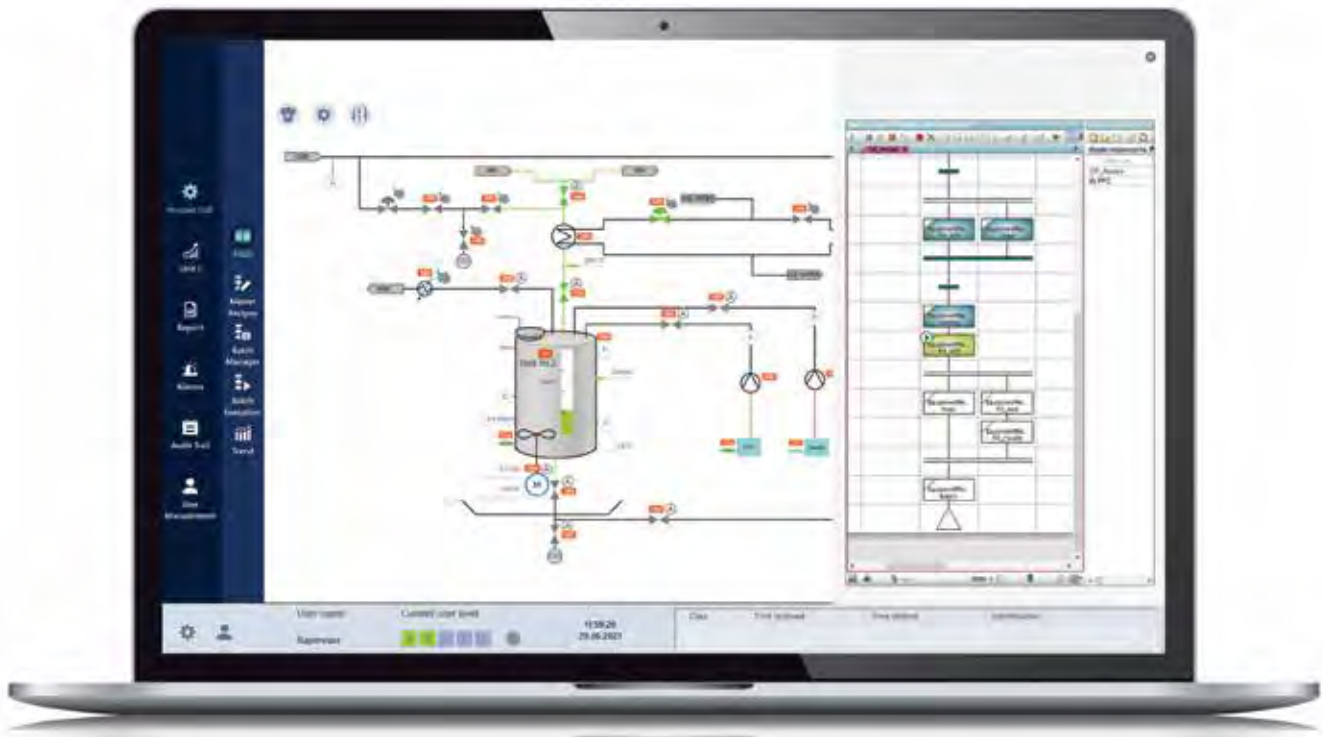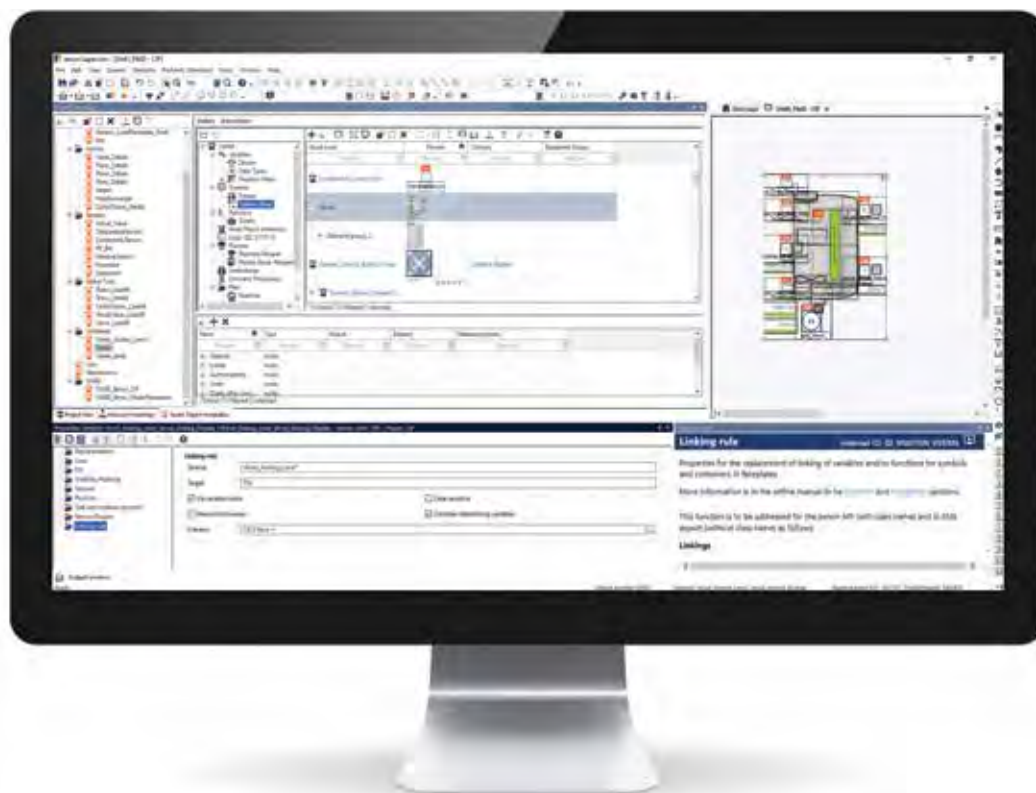
zenon 10 Service Engine, R&I-Fließschema eines Clean-in-Place- (CIP-)Prozesses auf
Basis von Smart Objects inkl. eines Batch-Control-Systems nach ISA-88

zenon, it means central dashboards, data storage or even control rooms for multiple factories can be created with minimal time and expense. Cloud-based, hybrid or on-premise scenarios can also be implemented.

In addition, the increasingly important HTML5 functionalities for the food & beverage industry were expanded. This provides more usable data to production teams, no matter where they are and what device they are using. Using this data, production and maintenance can be optimized and the overall equipment effectiveness (OEE) can be steadily improved. Further enhancements have been made with regard to how Smart Objects are used to promote efficient engineering, based on advances made prior to zenon 10. Modular, template-based and reusable components accelerate project configuration. Smart Objects are now more powerful and, thanks to XML import and export functionality, can be used to further automate engineering activities.

PHARMACEUTICAL

Strict compliance with regulations and maintaining absolute data integrity are major challenges in the life sciences industry, and zenon provides new features for users in this sector. zenon has long stood out for its batch control according to ISA-88, simple compliance with FDA 21 CFR Part 11, approaches for continuous production, modern HMI options for mechanical engineers and software solutions that are compatible with GAMP5 Category 4. With zenon 10, further improvements have been made in all of these areas.

eSignature functionalities have been improved in order to provide better data integrity in GMP-regulated environments. zenon eSignature strictly follows the ALCOA principle, according to which documented data must be classifiable, readable, timely, original and stored properly. With eSignature, authorizations can be carried out in one, two or three steps. For example, changes made by an operator on a machine can first have to be verified by another person and then approved by a third person with a higher user level. Only then will a change be accepted

by the system. All these steps are documented seamlessly and are classifiable in the audit trail with clear signature registration. eSignature can also be integrated flexibly into the various zenon applications in a shorter two-step mode – for example, to change a variable with confirmation by another person. This is easy to configure in the zenon Engineering Studio – learn how in the „eSignature" article by industry manager Bernhard Korten on page 54).

In order to centrally save and manage the raw and original data from a manufacturing process, zenon 10 provides Smart Data Storage. Alarms, events and historical process values are saved in a central database. The integrity of the GMP-relevant data is ensured thanks to the security mechanisms of SQL and the internal data storage of the zenon Service Grid. The central repository satisfies IT managers, ensures ease of administration and reduces the maintenance effort through backup and restore features. The database server can run in a virtual environment and can also support secure connections to third-party applications.

AUTOMOTIVE

The transition to new types of drives and changing business requirements are increasingly reflected in the production systems of the automotive industry. As a pioneer in networked production with smart factory designs, the industry relies on innovative solutions such as those offered by zenon. In particular, the powerful connectivity provided by zenon using its many native drivers helps greatly in this context. The TIA driver for S7 1200 and 1500 controllers, which many vehicle manufacturers use, has been expanded further for zenon 10. In addition to the support of TIA version 16, the processing of symbol names has been optimized. This allows the drivers to be used even more flexibly.

Docker container technology supports a highly flexible infrastructure. With zenon 10, an additional zenon Docker container was released. The zenon Web Engine can now run in Docker and be used to set up a zenon HTML5 network. The containers offer more flexibility for the infrastructure and network topology in a production line of vehicles, where large displays, dashboards or Andon boards are used, for example, to show the live status of the current production operations.

The improved smart objects in zenon can contribute to today's basic standardization of production processes. In vehicle manufacturing, the key is the standardization of hardware components as well as project engineering and development. Smart Objects in zenon combine symbol libraries, picture templates, data types and much more. This enables encapsulated objects to be defined, which can then be used in a standardized way. With this technology, engineering in the automotive industry can be streamlined and made more efficient.

zenon 10

Highlights at a glance
▸ New look & feel in zenon Engineering Studio
▸ eSignature
▸ Continuous export of alarms and events into an SQL database

Connectivity
▸ OCPP driver
▸ Upgrade of IEC 61850 and DNP3 drivers
▸ Process Gateways are configurable offline in the Engineering Studio
▸ S7TIA: support for TIA16
▸ AccessDNP3_SG: various upgrades to improve the ability to use the DNP3 process gateway as a DNP3 outstation and RTU replacement

HTML5 Web Engine
▸ Full support for global projects
▸ Support of alarm causes and comments in the AML
▸ Gantt charts in Extended Trend
▸ Docker image for the Web Engine

Smart Objects
▸ Variable mapping
▸ Complete upgrade of Smart Object templates (Frames, Smart Object APIs)
▸ Support for recipes and recipe groups

zenon Report Engine (formerly Analyzer)
▸ Integration in the Startup tool
▸ Translatable alarm and event reports

FAQS – TIPS, TRICKS AND MUCH MORE FOR THE NEW ONLINE HELP

HOW THE NEW ZENON HELP MAKES YOUR LIFE EASIER

The online help for the zenon software platform provides many new features and enhancements designed to help you solve tasks quickly and easily using self-serve resources. You'll find an even wider range of content. Plus, you can retrieve help topics in a variety of ways, including from within the application, using zenon Help Navigator or via a video tutorial on YouTube. Here, we answer some frequently asked questions about our help.
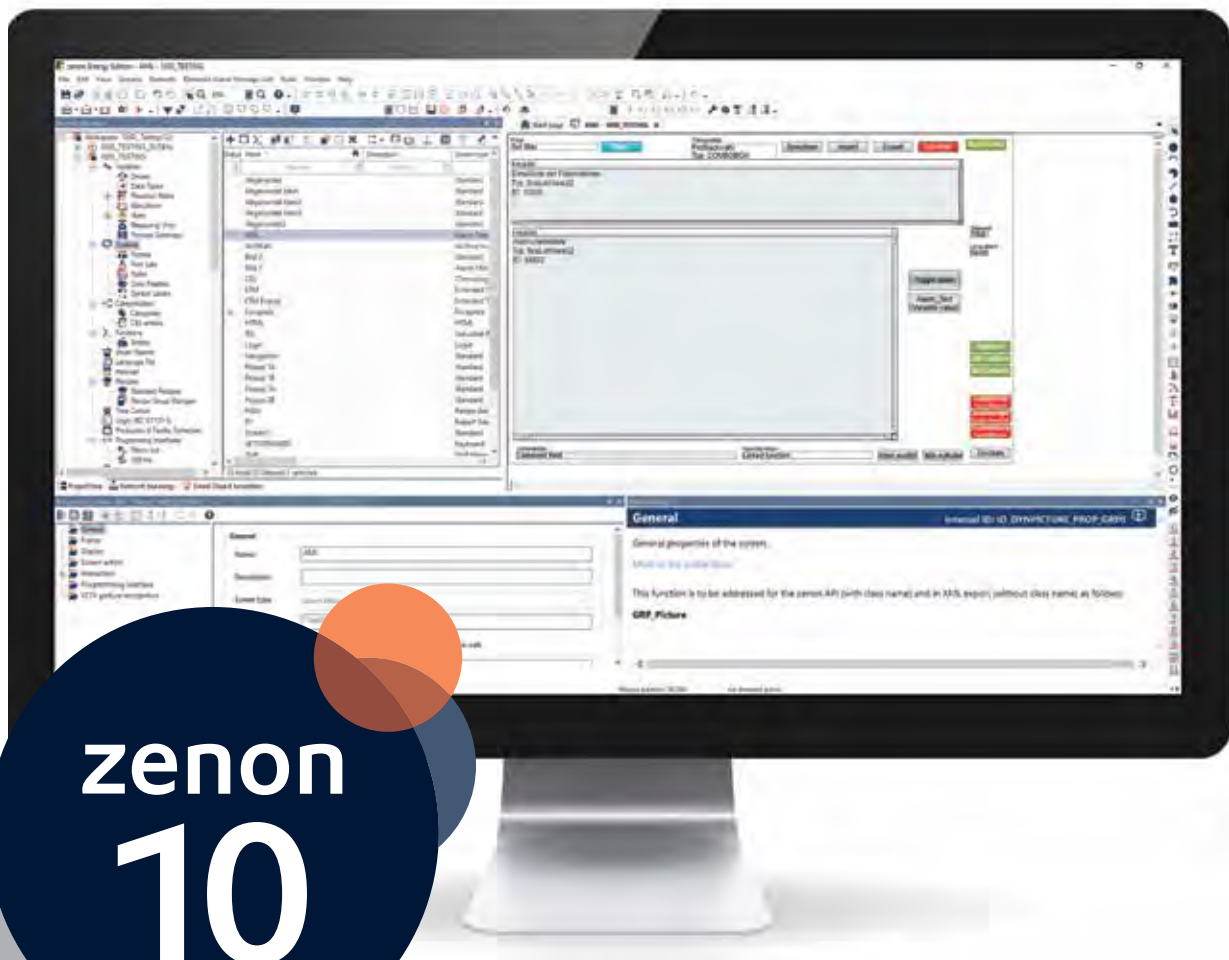
WHAT NEW FEATURES WILL USERS FIND IN THE ONLINE HELP?

One completely new feature is the unrestricted access to zenon online help, which you can open at the following link: https://onlinehelp.copadata.com
Internet access is all you need to always have the latest advice available.

TIP: If you cannot access help content from this link, please refresh your browser.

Content that was previously available only in zenon Help Navigator can now also be accessed on the go. Neither registration nor a password is required. This is particularly useful if you need access when you're not in your office, because you can search for the relevant content quickly and easily. It's great for on-call service engineers because you can look up something quickly on a mobile device to get an overview wherever you are. Plus, it also means that you can access documentation for service engine systems that are not running on the engineering PC.

TIP: *Click on the zenon icon at the upper left of the screen to return to the main help page and see the various help options.*

WHERE CAN I FIND A QUICK MAP OF THE NEW PRODUCT NAMES?

Changes always take some time to take hold. If you're not yet familiar with the new zenon names such as Engineering Studio (formerly zenon Editor) and Logic Service (formerly zenon Logic Runtime) you can refer to the online help to see a table that lists all the changed terms and product names. To see this, in zenon Help Navigator select "New in version 10" and "General" and open the chapter "New names in the zenon software platform". Here, you will see a table listing the old product names mapped to the new names, including their short and long forms. There is an icon for the print function at the end of the chapter, so you can print out the table and use it for reference until you become more familiar with the new product names.

TIP: *In the online help, the short forms of the product names are used throughout so the help texts are easier to read.*

HOW CAN I FIND OUT ABOUT NEW FEATURES OF THE ZENON SOFTWARE PLATFORM?

For the first time, the release notes ("New in Version 10") can be found in the online help. The descriptions of new features can be accessed both from Engineering Studio and via the Internet. As usual, the new features are summarized in chapters organized by topic. Functionalities that are no longer supported and other important information, such as tips for the conversion of projects, are also listed. In addition to a clear and concise description of the development, the section heading also contains a combination of a letter and a multi-digit number, for example, F 232304. You can refer to this number if you have further questions about individual pieces of development. And, because this help is displayed in zenon Help Navigator, all the benefits of using that tool are now applicable to the release notes. You can navigate as you wish using the tree structure or by scrolling in the document.

WHAT CHANGES WILL I FIND IN ZENON LOGIC HELP?

Also new is the integration of the entire zenon Logic help in zenon Help Navigator. You now have all the benefits of Help Navigator when looking for help about this topic. The content has also been expanded. In addition to descriptions of the new functions, the updates to the individual driver descriptions provide far more detailed information, particularly under the section "Driver – Fieldbus configuration". All driver documentation will be recreated as part of a larger project to itemize help information using a standard structure. These will be published successively over the course of the project. Screenshots of the individual dialogs, including descriptions of all properties, round out the documentation to make configuration easier.

TIP: *Certain terms or concepts are linked to the glossary. This is indicated by the ⓘ symbol. If you click on the blue colored text, you will be taken directly to the definition of the term.*

HOW CAN I GET A QUICK OVERVIEW OF NEW TOPICS?

The numerous video tutorials on the COPA-DATA YouTube channel, to which we are continually adding new content, offer you further valuable help. Over 1.2 million views indicate a high demand for this format. The tutorials not only provide a quick overview, but also give very specific instructions to individual configuration examples. In compact subject blocks, you can learn more about particular tasks and shortcuts which you can easily apply or adapt to fit your own set of requirements. Thanks to the subtitles, the video can be stopped and restarted at any time without the flow of information being interrupted. This makes it easier for you to understand each configuration.

It is also possible to open these video tutorials from within zenon Engineering Studio. To do this, simply click on "Help" in the menu bar of the Engineering Studio and then on the "zenon video tutorials" context menu item.

TIP: *You can search for the videos by clicking on the monitor symbol in the blue bar of the property help in Engineering Studio. This launches an Internet browser so you can search for the desired videos.*

WILL MY PERSONAL PREFERENCES BE TAKEN INTO ACCOUNT WHEN VIEWING THE CONTENT?

Every user has different preferences, questions and needs, and these are reflected in the help content provided by the zenon software platform. With embedded help, the focus is on context sensitivity. The same applies to information accessed via the mouse-over functionality. The contents of the online help enable you to always retrieve the most up-to-date documentation available. This is particularly helpful for products with short release cycles.

It's now really easy to access information in the format that suits you. zenon Help Navigator delivers a wide range of information and instructions with a high level of granularity. Datasheets give you a quick overview of detailed technical information. Video tutorials are ideal for showing context or for showcasing a deep dive into particular tasks or applications.

WHAT TECHNOLOGIES AND TOOLS ARE AVAILABLE?

There are different ways of accessing the help content and these can be used in parallel when using the zenon software platform. We try to ensure multiple formats per topic. The online help is provided to you in various formats: as online help on the internet, in the zenon Help Navigator, and as embedded help in the software GUI. In addition, there is mouse-over functionality and links to the glossary. Plus, you can open the internet browser from the Engineering Studio and search for video tutorials on our YouTube channel. Users can update the help content in the Engineering Studio, as in the past, using the Documentation Download Tool (see point 9). This also applies retroactively to earlier versions of zenon.

DOES THE ONLINE HELP RETAIN POPULAR FEATURES FROM PREVIOUS VERSIONS?

Help has evolved in two ways: first, the technologies and media used for communication: second, the content.

We've already touched on some of the new technologies and media. The zenon Help Navigator has been available since version 8.20. In addition to its advanced search functionality, it also enables users to switch languages during operation and at the push of a button.

Of course, the content has also been expanded. The user documentation is continually revised as new features and products are added. For example, the documentation for the HTML Web Engine was expanded to include new Docker content, several separate release note descriptions were merged, products across the entire documentation were renamed, and screenshots were updated to match the look of the current user interface.

WHAT CAN THE DOCUMENTATION DOWNLOAD TOOL DO FOR ME?

This tool is certainly always useful for users of the Engineering Studio because it enables you to update the documentation for the zenon software platform with just a few clicks. Simply select the language of the help content you want to download and start the update. This is particularly helpful when it comes to the availability of the language releases. If the selection made for the download already corresponds to the version in the Engineering Studio, this is indicated by a pop-up.

Of course, you can also use the tool to download the documentation for previous versions, and thus quickly and easily update the help content.

To use the Documentation Download Tool in zenon Engineering Studio: in the menu bar, select "Update documentation" then choose "Help".

IS THERE A FEATURE FOR CHANGING THE LANGUAGE?

In Engineering Studio, you can use the familiar language switching function to switch texts, graphics and fonts to other languages in Service Engine (formerly zenon Runtime). This is a major benefit, particularly when implementing international projects, because, for example, a project can be rolled out in different languages or a system can be run on a multilingual basis. The ability to adapt to the respective national language is also useful for global access to central services. You can create the language switch in a local or a global project. If the keywords for triggering the language switch are the same in the local and global project, the entries from the higher-level global project are used in Service Engine. To configure the language switch, a file with the desired text content must be created in Engineering Studio in the "Language file" node in the language table.

TIP: *You can find detailed information about this in the "Language Switch" manual.*

HOW CAN I ADD MISSING INFORMATION IN THE HELP?

We're always looking for ways to improve our help resources. But everyone's needs are different: what is sufficiently described for user A, user B would have liked to have explained in more detail. This is taken into account in zenon Help Navigator. At the end of each chapter, alongside the icons for printing and bookmarks, you will find one for feedback. Click on the feedback icon to open an email to the zenon documentation mailbox. The email opens with a unique number in the subject line to automatically identify the section and the section name. All you need to do is describe the addition or change request and click "Send". The emails received in

the mailbox are prioritized and processed by the technical writers. While changes in the help would previously only happen at the next release, the editorial team can now update the online help in response to requests and in the event of major new features.

WHAT'S NEW IN THE API DOCUMENTATION?

The API documentation is now available as part of the online help at https://onlinehelp.copadata.com. Select the desired version and type (COM or Add-In) and off you go. In addition to descriptions of classes, including their properties and methods, you will also find numerous C# code snippets here. You can easily use these helpful programming examples and adapt them to your requirements with little effort. In this way, you can quickly and easily expand zenon with additional functionalities and your own automation mechanisms. This saves time and money. zenon Help Navigator opens the API documentation in the national language set on the PC (if available), and allows users to quickly find chapters that have already been marked using the bookmark functionality.

TIP: *You can also return to the start page by clicking on the zenon icon at the upper left of the screen.*

CAN I ADD MY OWN HELP TOPICS FOR SERVICE ENGINE?

In zenon, it is really easy to add information about project-specific topics not included in the general help. For example, you can describe details about a machine in use. Create a *.CHM file with the desired data and content in advance. Then load this file into the help folder in the project tree of Engineering Studio under the "Files" node. To call it up in Service Engine, a button is required that is linked to the CHM file via a "Call Help" function. The help chapter to be opened is defined with the following syntax: Chapter Name.htm and then, for example, Variable3.htm. so you can define exactly which content you want to jump to. Just like the rest of the zenon software platform, our online help is guided by the motto "There is always an easier way." With these expansions to the online help, we hope to make it even easier for you to find it.

JOSEF RIES
Technical Editor

As technical editor, Josef Ries is involved in creating and expanding the online help for the zenon software platform. In addition to managing various engineering teams, he is responsible for zenon Logic documentation.

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SERIES: EFFICIENT ENGINEERING WITH ZENON – PART 3

MORE THAN PICS: REUSING SCREENS AND SYMBOLS

In the second part of this series, you learned about the efficient use of data types, symbols and links, as well as the new possibilities with Smart Objects. Building on links and linking rules, you will now discover how you can make your work easier with symbols and screens by replacing links and indices, and by using Faceplates and limit values.

Remember, in our previous article, you created a "Motor" structure data type with the "Temperature", "Speed", and "State" structure elements, as well as appropriate variables with the names "Motor_Band1" (...2, ...3). You can now continue working with this.

Last time, you learned how to reuse symbols by replacing the variables using linking rules, among other things. We will now explore another option for this using hierarchical names.

HOW TO USE HIERARCHICAL NAMES WITH SYMBOLS

Create a new symbol with labeling and value displays for temperature and speed. However, with the individual elements, do not link the variables directly. Instead, just enter "Temperature" and "Speed". In the symbol editor, you will now see the element with a blue cross and without a value preview, which is OK for now.

Next, drag the symbol onto a screen. The familiar dialog for replacing the links will appear. However, do not enter any rules here. Instead, check the "Hierarchical names" checkbox and press "OK" to close the dialog. Then change the element ID to "Motor_Band1" in the property window under the "General" node. The variables will be correctly linked automatically. They therefore combine the element ID of the symbol on the screen with the name given manually beforehand using a dot (".") to generate the actual variable name: for example, "Motor_Band1. Temperature".

HOW TO REPLACE LINKS IN THE SCREEN SWITCH FUNCTION

As with the symbols, the screens also give you the option of replacing links. In the screen switch function, you will be able to see the "Replace links" and "Replace indices" tabs, as long as there are replaceable elements on the screen. With both of these methods, you can replace variables (including interlocks used on the screen), functions and Automatic Line Coloring (ALC) aliases on the screen. As a result, you can reuse the same screen as often as you want instead of having to duplicate it again and again.

WITH A SINGLE CLICK

As with the symbols, you can enter a source and a target for the linking rule in both input fields. When you click on "Apply", this will be applied directly, unlike with the symbols. In the list below the input fields, you will immediately see the result of the replacement. If individual entries were not recorded by the replacement rule or if they are meant to be edited manually, select the entry and click on "Variable/function". When you double-click, you will also be taken directly to the entry.

In addition, you can also navigate within the target column using the cursor buttons to enter the target directly.

HOW TO REPLACE INDICES IN THE SCREEN SWITCH FUNCTION

You can also replace content in screens very flexibly using the "Replace indices" tab. Here you can link up to 99 variables and use them in several replacement rules. By doing so, you can amend the configured screen switch function in zenon Service Engine as you wish using the current system status.

If you have lots of these detail screens, you don't need to write the set value to countless scripts and configure screen switch functions. Instead, you can simply use the "Parameter for substitution" property, which is available with the button, combined element and combo/listbox screen elements. You can use the value for this parameter in the "Replace indices" tab with the {PARAM} keyword, either on its own or in combination with other links.

TIP:
zenon makes it easier to work with large numbers of similar elements. However, for this, the elements need to be named consistently (variables, functions, etc.). We therefore recommend defining a company-wide naming structure in advance, particularly if several people are working on the same project.

HOW TO USE ZENON FACEPLATES EFFICIENTLY

To date, it has been assumed in the example that only current variable values should be displayed. But what if you want to give the operator at the machine more information? For example, the temperature trend since switch-on, the Alarm Message List from this period, or simply a data sheet for the motor? Then, all you need to do is use the Faceplate screen type. The Faceplate allows you to display several screens of different types on the same screen and configure them collectively using a screen switch function.

THE FACEPLATE CURRENTLY SUPPORTS THE FOLLOWING SCREEN TYPES:
– Alarm Message List (AML)
– AML filter
– Equipment model
– Chronological Event List (CEL)
– CEL filter

- Extended Trend (ETM)
- HTML
- Report Generator
- Report Viewer
- Default filter
- Time/Lot/Shift filter

HOW TO WORK WITH FACEPLATES

First, generate the individual screens in the correct size. Then create a screen of the Faceplate type, in which the individual screens (e.g. AML, ETM, HTML) are linked in screen containers.

Next, create a new screen switch for this screen and configure it. In the upper part of the dialogue, the filters that have been used are displayed (default: none). In the lower part, the screen containers that have been created and the linked screen types are listed.

To start with, click on the "New" button below the filter list. In the selection dialogue, all filter types that match the screen types you have used are displayed. In this case, you need the "Time" filter under "General filters" and the "Alarm Message List (general)", "Extended Trend (general)", and "HTML (general)" filters under "Screen type-specific filters". Then link the filters you have just created with the individual screen containers. In the selection dialogue, you will then only be offered the suitable filters, all of which you must apply and then configure appropriately. In "Alarm Message List (general) 1", enter a filter at "Variable name" "Motor_Band1*". In "Extended Trend (general) 1", link the variables and in "HTML (general) 1", add a link to the motor data sheet.

EXAMPLE: COMPARING TIMEFRAMES

As you can see, the Faceplate is very flexible when it comes to combining different screen types. For example, if you want to compare a parameter in two timeframes and give the user the option of changing the timeframes in zenon Service Engine, you can also implement this. To do so, you need two "Extended Trend" screens and two "Time/Lot/Shift filter" screens in the screen containers. In the screen switch, create two separate time filters, link them and configure the filters of both screen containers for the time filter so that they each work on an ETM screen.

ALL SYMBOLS FOLLOW YOUR COMMAND

For the example, create a new reaction matrix of the "Numeric" type and link it with the three variables "Motor_Band1.Temperature", (...2...), and (...3...). In the configuration dialogue, create a new condition and set "Greater 80" under "Value". In the "AML/CEL" area, check the "In Alarm Message List" checkbox. Under "Additional attributes", set "Orange" as the limit value

colour. In the motor symbol, link the variable "Motor_Band1.Temperature" to the icon in the "Fill" – "Fill colour dynamic" node. This variable is automatically recorded by the replacement rule defined at the start. From now on, all motor symbols will be filled in when you reach the relevant limit value.

HOW TO DEFINE AND LINK LIMIT VALUES

In zenon, limit values can respond to changes to the variable values, give them a meaning and lead to actions.

Suppose that you want to generate an alarm at temperatures greater than 80 degrees, indicate this to the user and fill a screen element orange.

THERE ARE SEVERAL OPTIONS FOR DEFINING LIMIT VALUES FOR VARIABLES IN ZENON:
- Directly at the variable.
- At the data type (see part 2 of the series).
- Centrally using a reaction matrix.

THE REACTION MATRIX OFFERS SOME ADVANTAGES COMPARED TO THE OTHER TWO WAYS:
- It can be used for any number of variables, as well as different data types.
- It is available for Boolean, numerical and string variables.
- It offers analysis options, such as value ranges, threshold values, status analysis, status ranking, etc.
- It forms the basis of the Gantt display in the Extended Trend (ETM).

MORE FASCINATING INSIGHTS COMING SOON!

In this part of the series, you have learned how to use advanced options when replacing links and indices, bring data into context with the help of zenon Faceplates and give variable changes a meaning in a simple and central way, thereby triggering an action. In the next part of the series, you will discover the steps required to implement a modern visualization.

GERO GRUBER
Product Manager

As Product Manager and Product Owner for the zenon software platform, Gero Gruber particularly focuses on the user interface, the interaction design for the platform as a whole and the graphic visualization in the zenon runtime.

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DEMILITARIZED ZONE WITH ZENON SERVICE GRID

WHEN THE BROWNFIELD BECOMES A MINEFIELD

Recent events haverevealed just how vulnerable industrial plants and their digital processes really are. For example, the hacker attack on the operator of the largest pipeline in the US recently resulted in weeks of downtime. With zenon Service Grid, you'll have a powerful tool to fend off such attacks. Read on to find out how you can use this component to increase your cybersecurity.
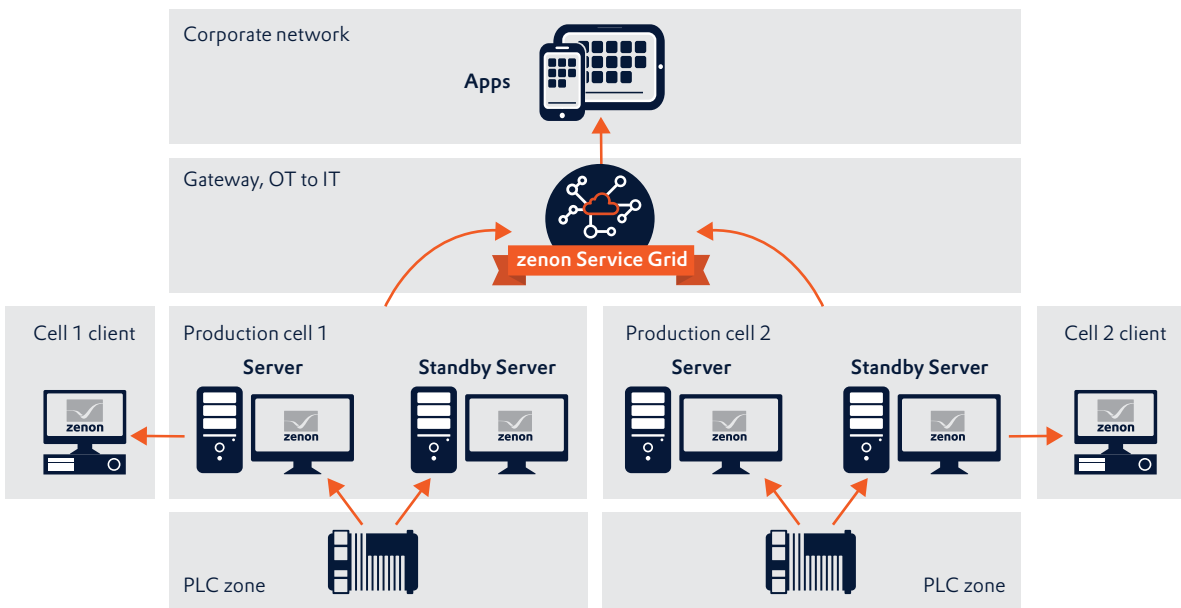
zenon Service Grid connects the OT with the IT, and is breaking new ground in terms of security.

Industrial infrastructure usually refers to "brownfield applications" or, in other words, existing infrastructure that has mostly been in operation for many years. The high uptime requirements and the high investment costs mean that modernization or replacement – as typically takes place for standard IT components – is not financially feasible for this infrastructure.

In contrast, new technologies and increased computing and storage capacities enable optimized operation of the infrastructure. It is absolutely essential to be able to access plant data. It is even better if sites and technologies are networked across the board and data is collected and optimized using models or simulations.

Such a virtual representation of a plant or a process is called a "digital twin".

But you don't have to completely overhaul your infrastructure if you want to benefit from the digitalizing your operational technology (OT). There are alternatives.

SERVICE GRID CAN DO MORE
At COPA-DATA, we asked ourselves exactly this question and developed a solution based on zenon Service Grid. Initially, we followed approaches in IEC 62443, and in other standards, too, such as those found in NIST guidelines, all of which revolve around cybersecurity.

The components of Service Grid

These standards set out some basic requirements for networking OT components. At the beginning of every project, a risk analysis should be carried out to identify critical components or processes. It is important to protect these assets as much as possible. In other words, direct external access to these critical assets through the likes of web or remote access must be fundamentally out of the question.

To nevertheless create a digital infrastructure that permits, at a minimum, read access for process data, you must define zones or segments in the network. The critical assets should be given special consideration and placed as far away from the external access point as possible. The operator has to ensure that the most profitable targets, from an attacker's point of view, are hidden behind as many technical obstacles as possible.

CRITICAL TRANSITION POINTS

Even at this level, zenon features its own encrypted network and completely flexible multi-project management. Projects can be nested as deeply as desired and operated on different data servers. The bandwidth ranges from purely "faceless" operated data gateways (zenon Service Engine as a Service) to full-fledged interactive user interfaces.

To meet the requirements of state-of-the-art security, more than just good segmentation and distribution of the data flows is required. If you want to share and network data, experience has shown that it is important to define special transition points through which data exchange takes place exclusively. The term "edge" is often used for these encrypted transfer points, especially in connection with services from the cloud.

From your point of view, as the person responsible for production or processes, this is a critical component because it opens the door to the outside world. A simple, poorly maintained web server is unlikely to be the ideal component. This is precisely the point where zenon comes into play with Service Grid. This component enables you to implement a demilitarized zone (DMZ) for a secure data transfer point to or from production.

DEMILITARIZED ZONES PROVIDE SECURITY

A DMZ is a separate area of the network through which the entire data exchange between industrial OT and external networks is routed. The same principle applies here too: direct connections should be avoided at all costs, especially to analog production equipment. Within the DMZ, only those communication channels or relationships

that are required for maintaining or optimizing operation of your system are permitted. That's less than you think. And every additional connection is an added security risk.

If you follow these basic principles, a DMZ can ensure that cyberattackers are confronted with an additional insurmountable obstacle and that you create efficient protection for your production network.

THE ESSENTIALS OF CROSS-SITE NETWORKING

Applications in the Wide Area Network (WAN) seem to be easy to implement at first glance. There are many technical solutions on the market. And you can easily set up a Virtual Private Network (VPN) that allows only authenticated access to all data. Or could you be overlooking something?

All of these solutions require a stable network connection. The connection between the communication participants must be reliable and provide a high bandwidth. Longer interruptions in connectivity, as can occur with an internet connection, usually lead to data loss during the ongoing transmission. The network connection must be protected physically against unauthorized access. However, many communication protocols in the industrial sector are not secured, or are only insufficiently secured. They are less suitable for data transmission in public networks because the information is transmitted in plain text.

zenon Service Grid allows you to overcome these constraints. You can integrate geographically remote subsidiaries into an internal company network. Conventional internet connections between sites are all you need. Service Grid's architecture supports encrypted and secure data transmission, even over public networks. Temporary interruptions to connectivity are compensated for because Service Grid uses buffers to ensure that no data is lost.

ZENON SERVICE GRID AT A GLANCE

zenon Service Grid essentially consists of several platform-independent software services. Service Grid extends both the functionality and the connectivity of the zenon platform. It links a large number of applications, services and devices with one another. Service Grid also supports several installation options, ranging from a native Windows installation on a local computer to a flexibly scalable container installation in the cloud (e.g. Docker).

Historical and live data from the existing infrastructure is transferred via zenon Service Hub to a control center and optionally to central data storage. As standard, Service Grid ensures that secure architectures are developed through certificate-encrypted TLS connections, integrated authentication and authorization mechanisms, as well as individually definable read, write or configuration rights in alignment with theequipment operator's individual security requirements.

SECURITY-TESTED BY TÜV

From the drawing board to the production line, zenon Service Grid has been designed and tested in accordance with "Security by Design" principles. The entire development process for zenon Service Grid has been certified by TÜV Süd and complies with IEC 62443-4-1.

Using the zenon Software Platform as a basis, you can set up a secure infrastructure to meet the requirements of current standards, particularly for brownfield applications, without any need to modify analog machines and processes.

REINHARD MAYR
Head of Information Security and Research Operations, Strategic Projects

Reinhard Mayr has been part of the team for almost 20 years. During the last decade, he has been responsible for product management. In his current role, he is responsible for all data and information security associated with topics for the organization, and he continues to coordinate research-related activities together with universities and independent research partners.

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HOW TO AVOID THE HYPE

You haven't heard of AIoT?

The industrial digitalisation process is in full swing, and kicking up a lot of dust in the process. So much dust that it's sometimes hard to see the way forward to our ultimate goal. Couldn't it all be simpler? You haven't heard of AIoT?! But you must know IIoT, right? OK, but you can, at least, define exactly how a neural network works? And how knowledgeable are you when it comes to the cloud?

Anyone who spends their professional life in automation technology will inevitably be confronted with a wide range of different technologies over the years. Some of them will be relevant to us, but others less so. Some are genuinely transformative, while others have their fifteen minutes of fame before being replaced – anyone remember ActiveX? This is part of our jobs. Many, including myself, have chosen a career in the technical field because of the constant change we get to experience. Progress makes our everyday lives interesting and varied. It allows us to solve the technical challenges in increasingly elegant ways, and sometimes opens up brand-new business models.

However, this progress can come at a cost. It forces us to continuously keep our toolbox up to date and to invest time in understanding new technologies and evaluating how important they are to us. "A rolling stone gathers no moss!" This certainly couldn't be more true than in the technical field. However, the information age has brought about something that makes evaluating new technologies more difficult for all of us, and that something is hype!

We operate in an industry dominated by tech-savvy people. This clientèle in particular is easy to impress with exaggerated technical fantasies. Or, to put it another way, if you spent your youth rooting for Geordi La Forge to reinitialise the USS Enterprise's dilithium matrix to increase the efficiency of the warp core, today you will be keen to see AI algorithms in the Internet of Things enhance manufacturing efficiency.

Our affinity for technology and the possibilities it opens up to us creates a perfect breeding ground for hype. We are seeing increasingly often that technology trends are overloaded with unrealistic expectations. The terms mentioned at the beginning of the article, such as IoT, machine learning and the cloud, are great examples of this. A quote from Dan Ariely of Duke University resonates well here: "Big data is like teenage sex: everyone talks about it, nobody really knows how to do it, everyone thinks everyone else is doing it, so everyone claims they are doing it…" The hype surrounding digitalisation is so strong that virtually every company in our industry feels compelled to talk about it.

LET'S PLAY BUZZWORD BINGO!

Buzzword bingo is ingrained in very few industries to the extent it is in ours. Take a look at the agendas of corporate events, association events or trade show meetings. You'll be hard pressed to find a single presentation title that doesn't include at least one buzzword.

I'm not blaming anyone for this, and I'm not an innocent bystander myself. My job title itself is basically a buzzword. I deal a lot with topics like IoT, AI and the cloud – although, ultimately, it is my job to separate the hype from reality. Buzzword bingo only works as long as there is a mismatch in expertise between the sender and the receiver of communication. If I tell you that a polynomial regression is usually not suited to anomaly detection in time series data, then how impressed you are by this will be greatly based on your own level of expertise in this domain. This statement is quite trivial, as long as you can interpret the terms.

It is precisely because of this mismatch in expertise that our industry is currently very susceptible to buzzword bingo. Automation technology is changing. We all talk about digitalisation, a process in which technologies and expertise are moving from the IT world to the OT world. However, this expertise is currently still unevenly distributed, and this is precisely what opens the door to hype.

Companies like COPA-DATA that are close to IT technologies can quickly build up this expertise. These companies face temptation every day to "spice up" their communications with some complexity and hype so they look more competent. To a certain extent, we do the same. After all, you can't compete if you don't turn up. This is especially true in marketing, because it's hard to make yourself heard in today's noisy, attention-grabbing B2B communication.

WHY WE NEED TO PAY ATTENTION TO OUR COMMUNICATION

To some extent, there's nothing wrong with buzzword bingo and hype. They stir our emotions and testify to our enthusiasm for certain topics. It's good that we have this enthusiasm, because it makes us better engineers. However, these forms of communication can come with unintended effects – namely, complexity and uncertainty.

Almost every day, I come across competent engineers and technicians among our customers, who find topics such as IoT, the cloud, analytics or machine learning interesting, but keep a respectful distance. The topics seem so complex and hazy due to over-hyped public communication that people simply don't trust themselves to get started.

THERE MUST BE AN EASIER WAY!

Ultimately, hyped-up communication results in the opposite of what we want to achieve. In our enthusiasm, we are slowing down the spread of these technologies and concepts. The idea that "There is always an easier way" is deeply ingrained in COPA-DATA's corporate culture. It is this idea that motivated Thomas Punzenberger to found the company over 30 years ago. Today, it is more relevant than ever. In a time when it is no longer the available technology that defines the limit of what is possible, but our ability to use this technology correctly, the most important competence is cutting complexity. Only once we are able to reduce the complexity of our challenges and tools to the point where we understand both completely, can we use the tools efficiently.

COPA-DATA's mission, which is more important than any feature, new driver or any step towards web visualization, is to make things simple. My appeal to all my colleagues in our industry: demonstrate your expertise by presenting complex issues as simply as possible. Without buzzwords, new acronyms or terminology that whomever you're speaking to won't understand. You'll be surprised how much trust you'll gain.

This is what COPA-DATA has always offered... even in the 20 years before anyone had thought of IoT or digital transformation. We simplify the challenges and the tools of automation technology. We happen to do that with software. But there are many other ways to do this, and we invite you to join us on this mission.

In case you are still wondering what AIoT actually is: Artificial Intelligence of Things is the combination of methods from the field of artificial intelligence with the concepts of IoT. Some of our customers already use exactly this combination - mostly without ever having heard the term AIoT.

"The information age has brought about something that makes evaluating new technologies more difficult for all of us, and that something is hype."

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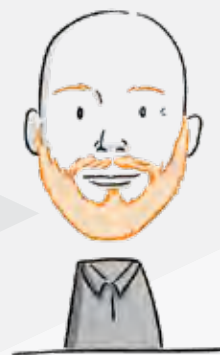
INDUSTRIES
&
SOLUTIONS

FOOD & BEVERAGE

ENERGY & INFRASTRUCTURE

AUTOMOTIVE

PHARMACEUTICAL

The command center with zenon

Centralising applications for controlling and monitoring individual machines or even entire enterprises is hugely beneficial for companies. Discover how you can make your employees' work easier while you save money and reduce downtime.

WHY OPERATING EQUIPMENT LOCALLY IS NO LONGER ENOUGH

In many food production companies, applications for line management, the monitoring of auxiliary equipment, process control, the individual HMIs and the like are still considered to be isolated from one another and are operated and run as such. This causes major challenges.

Employees often have to dig really deep to be able to get an overview of and operate the various systems. What's more, the resulting data is not centralized and analysed collectively, meaning that a huge amount of potential is still being wasted, especially now.

The ability to control and monitor equipment and applications centrally is becoming increasingly important.

Many companies need to deploy their employees more efficiently – and not just for financial reasons. The fewer employees required on site at any one time, the better – not only to meet legal requirements, but also to make sure employees are available in the event of any crises.

THE PROBLEM WITH EMERGENCY SOLUTIONS

Backup and emergency solutions, such as remote desktop technology or similar approaches, give companies a remote operation option, but this often results in more stumbling blocks. In any case, this does not resolve the problem of data standardisation. It would be possible to save the data from the various systems in a common
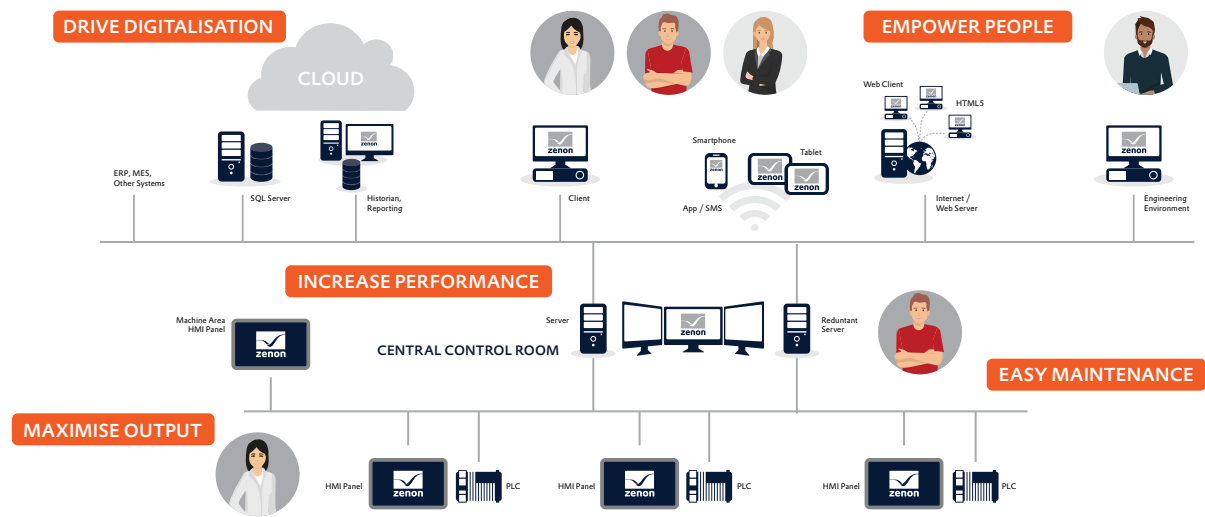
Central control room in a traditional zenon network

database designed and developed in-house. However, a great deal of thought would need to go into designing, developing and maintaining this. In addition, the corresponding systems would all need to have an interface to the database.

Even with all this in place, you would still be unable to use and process the data further in a sensible way or extract valuable information from a database like this – you would need additional solutions. Thinking about this reveals the advantages of a standardised solution.

This is especially true when several systems, such as line management, energy data management and auxiliary equipment monitoring, need to communicate with one another and exchange data, often via infrastructure in separate locations.

Communication with other, higher-level systems, such as business applications like SAP, is another challenge. If applications are isolated, each of them will need a separate interface to the MES or ERP systems. And these interfaces will also need to be maintained.

SOFTWARE TECHNOLOGY FOR CHECKS AT A SAFE DISTANCE

For a long time now, the zenon software platform has provided the option of implementing redundant central architectures via the zenon network. The combination of servers and clients is ideal for linking different subsets of applications from different areas together and for

enabling collaborative work. As well as supporting a central control room, the applications can also run locally – at the line, for instance – taking on the server role. The concepts of "central" and "distributed" may appear to be different at first, but they actually go hand in hand here – depending on the architecture and the way you look at it.

There are various development levels for a central control room with zenon. If a single production area is being automated or there are networks that must be strictly separate, the requirements are different to those of implementing a central control room for an entire site, for one that extends across sites, or even across the entire company.

A central control room and the option of operating equipment and processes remotely can be generated at every level of the equipment and company hierarchy. The technology is always centralized and does not require anyone to be present at the machine.

The zenon software platform's networking capabilities and multitude of functionalities also make it possible to implement a wide range of different applications, including line management, energy data management, process control and much more.

A wall of monitors, which is configured using zenon Multi-Monitor Administration, provides the necessary overview in the control room. Mobile devices such as tablets and smartphones can supplement the fixed screens.
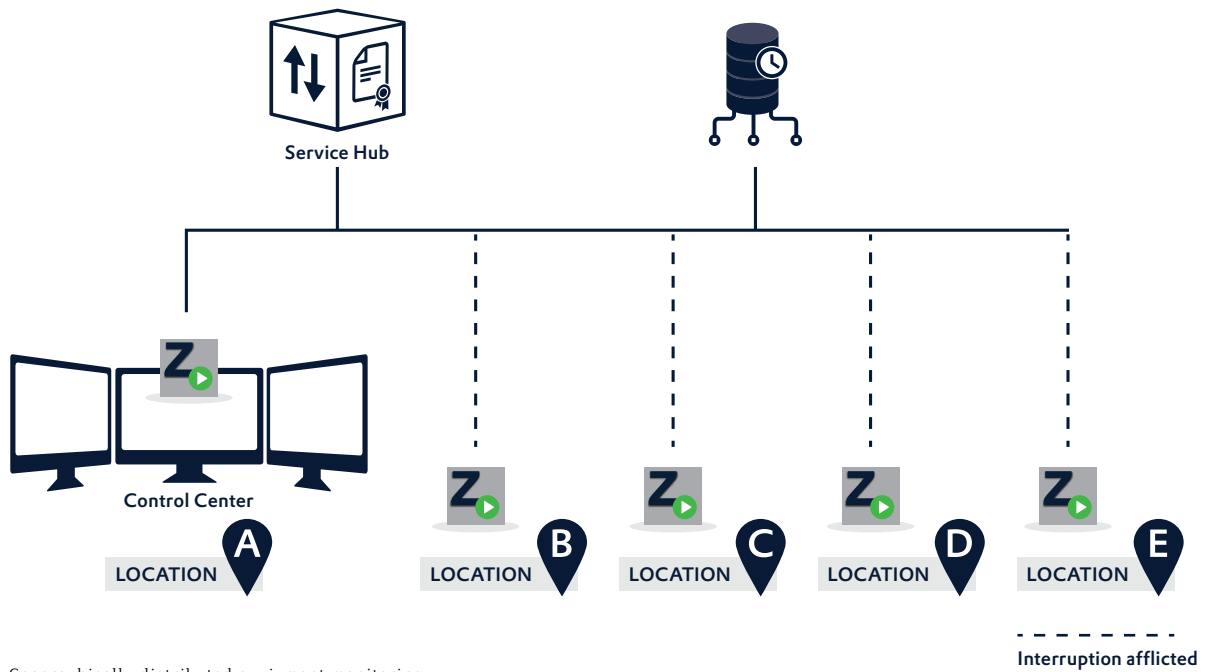
Geographically distributed equipment monitoring

The combination of the range of applications and the tried-and-tested, verified zenon network provides the ideal foundations for a central control view – implemented with zenon.

Of course, not all applications can be planned and implemented with zenon from their inception. There may be applications already in place that cannot be replaced just like that. However, with the multitude of connection options that zenon has to offer, this is not a problem. Existing systems can be connected and their data collected and standardised in zenon. The data from the various applications, whether they have been implemented with zenon or not, can be processed, archived and analysed in a standardised format. Analysing, processing and archiving of the various applications' data can take place in real time, including pulling historical data, no matter if they are implemented with zenon or not. Even more flexibly with zenon Service Grid.

As one of the most recent additions to the zenon software platform, zenon Service Grid is the perfect extension for implementing a central control room.

With the Service Hub data broker at its core and services such as Data Storage, Identity & Policy Service and the Application Programming Interface (API) for third-party applications, it is possible to establish flexible architectures. These can be restricted to the company network or extend to the cloud – either public cloud services or private clouds.

zenon Service Grid enables preparation of information for mobile clients on web browsers anywhere in the world through the zenon HTML5 Web Engine.

Customers or integrators don't need to ask themselves whether the traditional zenon network or Service Grid is most suitable to deploy. Both technologies complement one another perfectly when they are used together. However, we tend to say that, as soon as the zenon software platform architecture is being applied across networks, it would be advantageous to use zenon Service Grid.

OPTIMISED WORK ROUTINE FOR PRODUCTION TEAMS

A control centre with zenon brings many advantages for users: improved monitoring, more control and cost savings.

All events and alarms are collected at a central location and can be filtered and analysed there. Gathering them in this way is ideal when it comes to generating statistics and reports – not just about alarms and events, but also KPIs and data. By centralising the data, comprehensive analyses can be performed to locate problems with the equipment even faster and avoid downtime.

If action is required quickly when analysing the data and events centrally, it is possible to allow an intervention from a central location, depending on the configuration. Of course, you may not want to be able to carry out this sort of monitoring or intervention from a remote location, in which case you can block it explicitly. However, it is often useful to be able to support local maintenance technicians from a central location or to perform remote maintenance on the equipment.

MORE EFFICIENT EMPLOYEES

With a central control room, problems can be identified quickly. This prevents further damage. As a result, operators can deploy employees more efficiently. It is generally possible to monitor and control more machines and systems from a central control room than at different machines on premises. The low background noise levels in a control room make it easier to concentrate and communication across departments and divisions is simpler thanks to the shared workplace.

In distributed zenon network structures, zenon Service Grid can be used as a layer that prevents downward commands to the automation network. This is particularly important in connected OT and IT networks to protect the critical, operational infrastructure from attack. In addition, you no longer need to use VPN hardware with zenon Service Grid. Communication is designed to accommodate networks that are prone to failure. This means that no data is lost, even at sites with a poorer connection. The data transmission is secure and guaranteed.

BENEFICIAL, EVEN IF THERE'S A PROBLEM

Conversations with customers have made us aware of additional advantages of a central control room. It is easier for IT employees to create and manage backups for the different systems if they are available bundled in one place. For example, when a fault occurred with the interaction between several systems, a customer could use their central control room for troubleshooting purposes. They could access all of the different on-site systems. As a result, all of the experts were easily able to work together to identify the fault, recreate a certain system status using backups and then resolve the fault – all from afar.

Would you like to centralise the applications in your company using our zenon technologies? You'll simultaneously enhance efficiency and meet the increasingly pressing requirements for remote monitoring, operation and maintenance. We're happy to provide more detailed information and look forward to hearing from you.

ANDREAS GRÜN
Food & Beverage Industry Specialist

Andreas Grün has been part of the COPA-DATA team in Salzburg since 2012. After spending many years as a Special Solutions Developer, he has been part of the Industry Management team since 2019 with a focus on applications in the food and beverage industry. He has worked on many different customer applications and supported projects globally in these roles.

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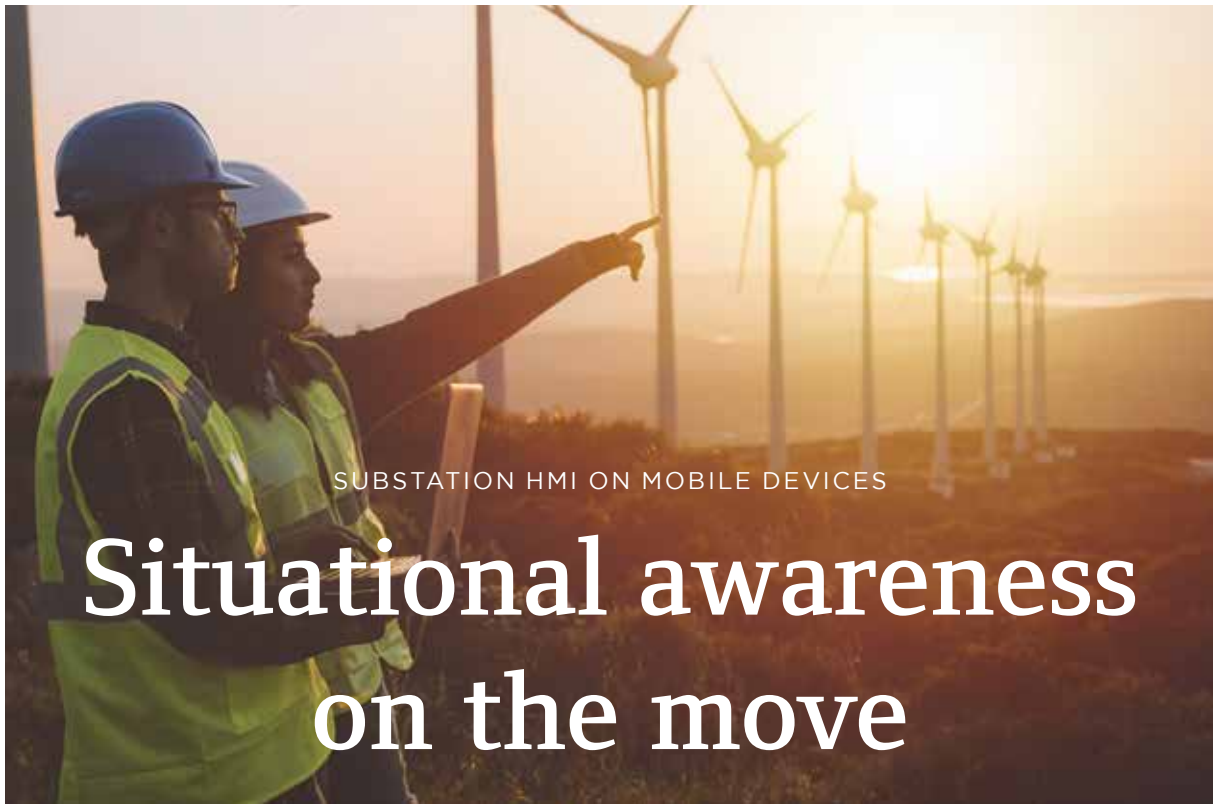
SUBSTATION HMI ON MOBILE DEVICES

Situational awareness on the move

In our day-to-day lives, we draw from a diverse ecosystem of mobile web applications, which we can call up nearly anywhere and at nearly any time. Web standards like HTML5, JavaScript and many others ensure that we can do this with all kinds of mobile device. As users, we move around freely but still enjoy the advantages of constant access to information tailored to our requirements or the challenges we are facing. But how can our customers in critical environments benefit from these technological advantages? The following example demonstrates how substation HMI very much has a place on mobile devices.

THE LEGACY OF CRITICAL INFRASTRUCTURE

With critical infrastructure, its defining characteristic is in the name – it is critical. This means that, whatever you do, you must never jeopardise the integrity of the process. For equipment in the energy industry, a failure can obviously have very serious consequences.

The high level of criticality results – quite understandably – in extremely strict solution architectures. The (absolutely critical) process level is clearly separated from the station control technology or the overlying grid control technology. When it comes to operating the systems, there are also stringent systematics in place at all levels to secure them. It must not be possible to gain unauthorised access to the

equipment, whether as a result of a simple operating error, negligence or by malicious intent. Incorrect operation can lead to immediate power failures for many customers, not to mention very quickly to considerable damage to the affected equipment. What's more, employees sometimes have to get inside the equipment to inspect or maintain components. This is where another sensitive aspect emerges: being in and working in critical infrastructure equipment, such as substations, is challenging and dangerous and requires the utmost levels of concentration from those involved. They need to maintain an overview of a wealth of important information to ensure the safety of the equipment as well as their own personal safety.

Anything that provides guidance and ensures safety for maintenance technicians in a simple way is, therefore, very much welcome.

GREATER SITUATIONAL AWARENESS IN THE FIELD WITH THE HELP OF WEB TECHNOLOGIES

An application based on current web technologies such as HTML5, CSS or JavaScript offers an interesting advantage. It can be used on practically any mobile device. There is no need to install specific client software, a special app or a plugin.

Our maintenance technicians could use a simple tablet or their own smartphone to find out about the current status on site or further afield:

What can the control system view tell me about how the grid is configured? Which areas are in use? Which switches are selected or locked? Are there any faults? Are the key measurement values within the tolerances? Is the communication with the protection relays intact? What events and interactions have been registered recently? Am I actually in the right section, where the switch settings need to be updated, based on my phone call with my colleague?

As these considerations show, it can be really useful every now and again to be able to observe the control room from afar.

ZENON YIN AND YANG: PROTECT WHAT WORKS, OPEN UP NEW POSSIBILITIES

As we have already established, we need to be very careful with our equipment. A slight softening of the critical solution architecture, minor changes around the station control technology or undesirable external influences must be avoided at all costs. On the other hand, the engineering and maintenance work required for a solution of this kind must be minimal to make it attractive in economic terms.

With the HTML Web Engine, the zenon software platform offers a flexible and secure solution for providing process data based on the HTML5 standard. It can, therefore, be used on all kinds of end devices. Access to process data can be secured in multiple ways if necessary. A read-only version for HMI access can already be specified in the installation phase for the web visualization service.

Compact view of the grid configuration in the single-line diagram; additional indicators increase clarity.

closed   open   selected   in revision   blocked
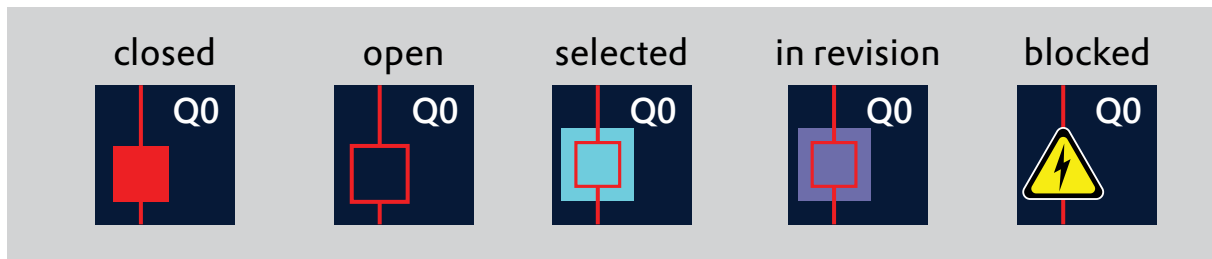
Evaluating the status bits makes it possible to display precise status information for switching elements.

380 KV DIR 182	220KV DIR737	110KV DIR318
380 KV DIR 206	220KV DIR747	110KV DIR319
380 KV DIR 208	220KV DIR777	110KV DIR320
	220KV DIR787	110KV DIR321

The colouring of the alarm indicators indicates whether there are any messages, warnings or alarms for the branch in question.

The flexible network architecture in zenon makes it possible to encrypt communication and monitor interfaces. What's more, the gateway used by the process data prevents any unwanted retroactive effects. As a result, the critical application remains well protected behind a range of security measures.

PORTABLE ADDED VALUE IN THE HANDS OF MAINTENANCE TECHNICIANS

How can we use the HTML5 visualization service resources in zenon to help maintenance technicians? Here are a few ideas:

The equipment's single-line diagram can form the core area of a mobile visualization of a substation, as in the native model in the control room. As the figure below shows, this can be done in a compact and clear way – for example, by splitting the substation into its voltage levels or individual branches.

The single-line diagram provides information about the current configuration of the grid from the view of the control room. The settings and additional selection states for switches and actuators – or even entire branches – can be mapped ergonomically in the web-based visualization.

However, it is still up to the maintenance technician on site or the operator in the control room to perform specific switching operations.

To obtain the best possible overview, it is possible to highlight key parameters for the area shown. Graphical widgets ensure that the information is displayed intuitively. This means the maintenance technician can tell at a glance whether the system is working properly or whether they need to perform a more in-depth investigation.

A virtual alarm indicator can provide a simple overview of the areas of the equipment where there are messages, warnings or alarms. The alarm/event class and area modelling in zenon form the basis of this.

Alarm and event messages also generally play a key role when it comes to evaluating the status of the equipment: which switching operations have been performed recently and by whom? When and by whom was a switch locked? Have any of the values been exceeded recently in this branch? When exactly did the communication fault with the protection relay occur? How many seconds after confirmation of the switching process did the feedback come from the switch?

To make the Alarm Message Lists easier to analyse, they can be listed on the web client for different parts of the equipment, message categories or timeframes, based on your preferences. Alarms can generally be acknowledged, as long as the configuration and user permissions allow this. Mobile users can also enter a text comment when they acknowledge the alarm.

Trend charts form an important part of HMIs for equipment operation and maintenance, so it goes without saying that these are included in the web visualization services in zenon. The operator can use them to check value trends, to determine any anomalies and analyse them in greater depth.

MOBILE VISUALIZATION AS AN INTEGRAL COMPONENT

It is easy to prepare a mobile visualization service in zenon, either in the form of a standalone project or as an addition to an existing zenon project. The HTML5 visualization uses the same project resources – screens, symbols, functions – as the native visualization of a zenon client. Visualization content for both technologies can therefore be created or modified centrally. There is no additional work required

to prepare the process data. In short, the technology uses the known functions and elements in zenon Engineering Studio. You do not need any specific specialist knowledge of HTML5 web technologies, JavaScript programming or similar resources, as zenon ensures that the visualization application is prepared in an HTML5-compliant manner.

The consistent integration of central functions also provides essential added value for the use and maintenance of the overall solution. This is particularly apparent when we look at the example of user administration. Even if the HTML web server can be reached over a restricted and protected network, an authentication (who are you?) and authorization (what are you allowed to do?) system must protect access to the visualization and process data. The zenon software platform supports the use of a central user administration system to deliver identity and policy

The Alarm Message List and Sequence of Events List (SoE) provide detailed information about all processes and equipment.

Value trends displayed in a detailed trend chart.

services across all zenon services. Standards such as Active Directory® or RADIUS remote authentication dial-in user service, which allow central user administration, are supported. This means that a user can log into different IT and OT systems with a single user account. What's more, the validity and permissions of this user are managed at a central location. This simplifies user administration and helps to avoid security vulnerabilities.

DOING MORE WITH ONLY A FEW CLICKS?

Even though it's not usually part of the maintenance technician's job to investigate whether the network infrastructure is working, they are able to do this when they have zenon to hand.

Many control technology applications use the option to extensively integrate network monitoring technologies in zenon. As a result, the zenon software platform can function to "monitor" network infrastructure using the SNMP protocol as a basis, for example. zenon can also provide detailed status information for communication protocols such as IEC 61850, DNP3 and IEC 60870. Forwarding this to the mobile web client takes just a couple of clicks.

Having direct and integrated access to this information provides valuable advantages in practice. The technician in the field can get a direct insight during commissioning or

maintenance and check that everything is working properly. In the event of a fault, they can provide information about what's going on in the network from their perspective and get in touch with the relevant experts from their company directly. This prevents them from having to go back and forth with different people, saves valuable time and makes everything safer.

More detailed information can be provided for the mobile technician through flexible web links to the web visualization.

OT THAT IS PRACTICALLY IT

The zenon software platform has been automating critical energy infrastructure equipment with the highest levels of reliability for decades now. What's more, the flexible zenon architecture also allows systematic integration with adjacent application domains in the IT and web sphere. For example, interdivisional user administration or the creation of a central system monitoring option using SNMP or syslog are key enablers for consistent solution architecture where performance is not interrupted when moving between IT and OT systems, as would be the case traditionally.

The zenon architecture prepares process data for an HTML5 web visualization using services and interfaces.
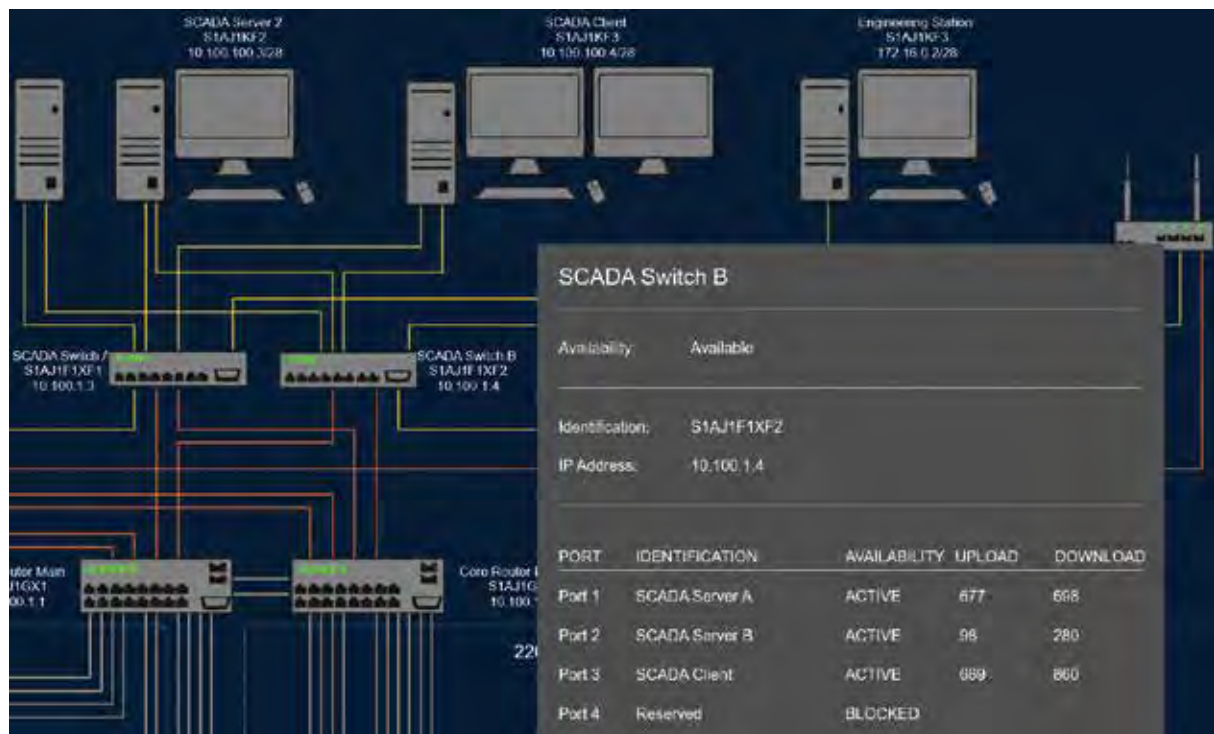
A network monitoring dashboard shows the status of the basic
networking technology and network components.

These are strictly separate from the live system. Repercussions that might affect the critical process, as a result of data queries or Command Processing, for example, are systematically prevented when using the mobile client. Web visualization services can be provided and managed using modern hosting technologies, such as containerisation using Docker and Kubernetes. This is equally possible both within the company's own server infrastructure and using commercial cloud infrastructure products. The important thing is – and will always be – ensuring that running these services does not impair the live system. It is possible to tailor the content of the web-based HMI or prepare further visualization services at any time.

WHAT CAN WE TAKE AWAY FROM THIS?

With zenon, it is possible to provide an HTML5-based web visualization with minimal effort. Nevertheless, mobile users at the equipment still have most of the information from the control room at their fingertips. This direct access to status information through the process and also through the process-oriented communication technology provides additional guidance and therefore increases the safety of activities in the field. As structured information is provided through an easily accessible, mobile visualization option, the technicians in the field can be assisted in their work in a targeted manner and further insight can be offered, resulting in new, more efficient ways of working.

STEFAN HUFNAGL
Energy Industry Expert

Stefan Hufnagl has been part of the COPA-DATA team since 2013. With several years' experience in the fields of industrial control and drive technology, as well as robotics, he now focuses closely on trends in the energy and infrastructure industry. He uses his expertise mainly to support colleagues in sales-related departments.

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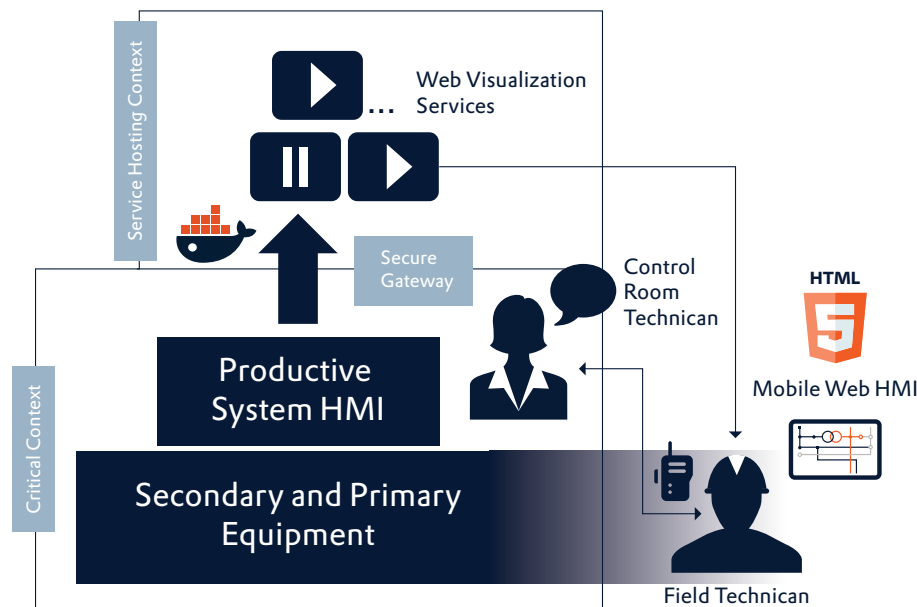
The flexible zenon architecture protects the critical process and enables integration with modern IT and cloud technologies at the same time.

Setting standards, using standards

As it seeks to optimise its processes, modern vehicle production has been using standards successfully for many years. This standardisation applies to all areas: planning, installation, hardware components, vehicle components, software and workflows. With its various functionalities, the zenon software platform is the perfect tool for defining, managing and using standardized objects.

When multiple parties are working together, the use of standards offers numerous benefits for everyone involved. Manufacturer-specific standards have been well-established in the automotive industry for many years for this very reason. These standards were defined by experts and undergo continuous optimisation to take account of new technical developments. One example is the definition of all hardware components that can be used when designing new assembly lines. A hardware standard of this kind makes it easier to select appropriate devices when planning new equipment. When the standard is defined, care is taken to ensure that the selected "standardised" components support the relevant manufacturing requirements as effectively as possible. As the standards are then rolled out across different factories and for the production of different vehicles, purchasing conditions can be optimised and subsequent storage can be minimised.

Thanks to the continuous development of the zenon software platform, numerous practical functionalities have been integrated over time. These functions range from cross-project definitions in global projects to the fine-tuned definition of styles. Specific data types can be defined and a central library of functional objects – known as Smart Objects – can be implemented.
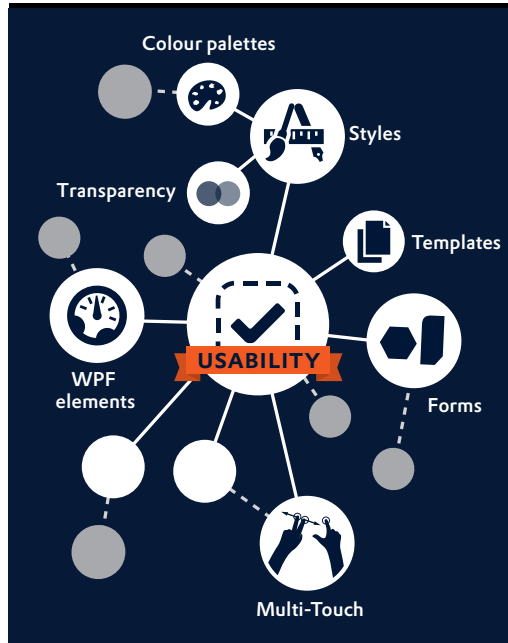
The use of a standardised user interface means that staff can be deployed flexibly. Training requirements are reduced because all stations have the same look and feel and are navigated in the same way. This means that staff can operate varied equipment without requiring additional training. The company's corporate identity can be displayed in the operating screens for aligning a smooth staff experience with the company strategy. Experts from the production area can work together with usability specialists to define the user interface, resulting in optimised templates and well-considered libraries for practical use.

SOFTWARE STANDARDS PROVIDE BENEFITS

Software used to control and monitor production is also subject to standards – for example, those defining standardised methods and function modules for PLCs. When it comes to the operating and display functions for production machines, the displays and the underlying functionalities and calculations are defined centrally and apply to all machines. Dashboards and reports are identical in all related production areas. This results in a number of benefits. The predefined features allow the equipment to be commissioned more quickly. Operating personnel can be deployed more flexibly because the production areas look the same and are navigated in the same way at all stations. The standardised reports make it easy to interpret key performance indicators and to compare different areas of the plant.

OPTIMISED TEMPLATES

The zenon software platform provides a wide range of functionalities that help users to implement the relevant company standards. The engineer is free to choose the method that is best suited to the particular use case.

CROSS-DOMAIN COLLABORATION

The standards defined in zenon are suitable for interdisciplinary use. This results in a broad application spectrum and links together the different domains within a company – from media utility supply to building automation, and from product development to multi-technology production. Using standardised zenon objects makes it possible to harness synergies with regard to cross-domain collaboration.

ZENON GLOBAL PROJECT

The first port of call when defining cross-project features is a zenon global project. This project type includes numerous parameters that are used in all projects within a workspace. For example, central texts can be defined for online language switching so that they are identical in all linked projects. Not only does this standardise the engineering and translation work; it also makes it easier for subsequent users to work on international projects.

Smart Object

Smart Object Template

Smart Object Instance ONE

Smart Object Instance TWO
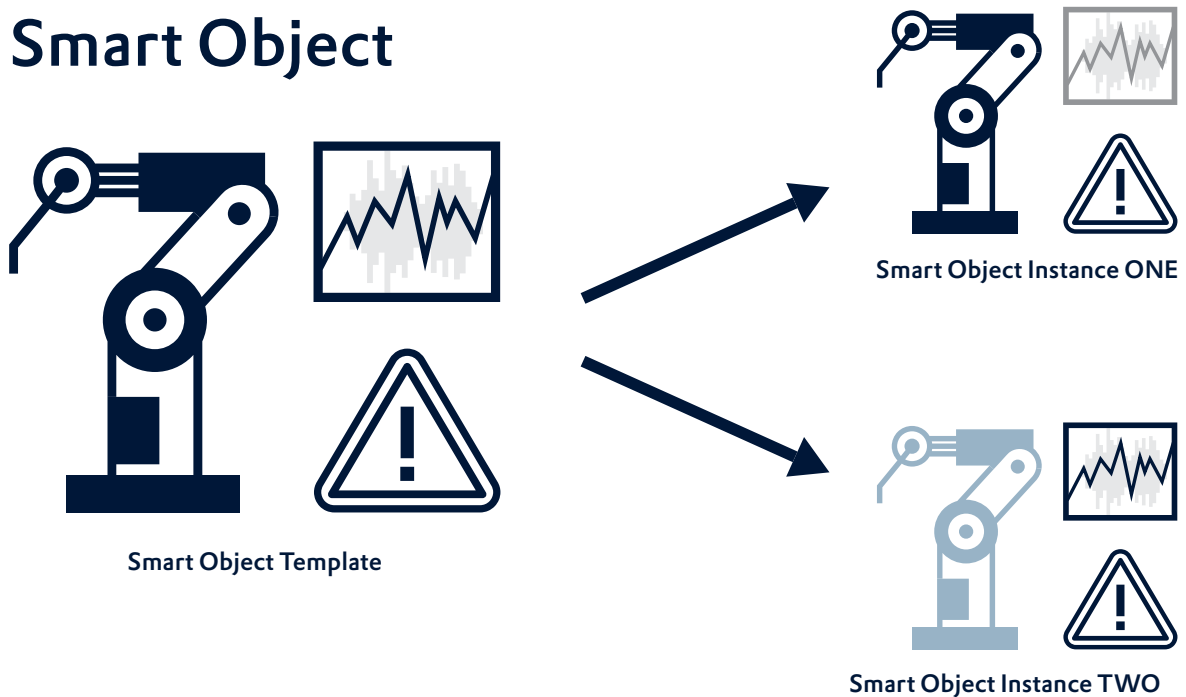
With zenon Smart Objects, templates for different applications can be reused over and over again, since the entire configuration content is not collected in one object.

A QUESTION OF STYLE

 zenon styles are used for defining visual characteristics. A style contains abstract information such as line thickness, fill colour and text properties. A text style can therefore be used to define the standardised font, font size, colour and format to be used. A style of this kind is then linked with the screen elements and relays the centrally defined properties. This link means that subsequent adjustments to the style definition are automatically passed on to all related screen elements.

STANDARDISATION PREVENTS ERRORS

Software standardisation applies to all areas. The function modules that are used for control undergo extensive testing in advance. This minimises errors as well as subsequent commissioning work. When exchanging data, the modules always provide an identical interface with the information that lies beyond. This interface can be used to access and further process the data using different target systems. In zenon, these interfaces are represented with structured data types, which are perfectly tailored to the function modules and serve as the basis for the linked zenon variables. These correspond to the individual instances of the control modules. This enables interface variables to be created quickly and without error. Any subsequent changes or additions to the standard interface on the control side can be implemented quickly by means of the central definition in the zenon data type. The linking mechanism applies here as well. Changes to the information base are automatically passed on to the variables, thus shortening the time required for engineering.

MAKING WORK EASIER – MORE THAN JUST A SYMBOL

The graphical counterpart of the data type is the zenon screen symbol, which is defined centrally and stored in a symbol library. When the symbol is used on multiple screens, the principle of substitution is employed based on of a substitution rule derived from the data type description. With the use of this rule, subsequent changes

to the information base – both in the data type and in the screen information – are automatically passed on to the screen symbols. The zenon Engineering Studio does this automatically and without error to help the project engineer with their work.

While a zenon symbol represents a recurring element within a screen, the engineer can also create entire screens as templates and store them centrally. Project engineers can use these screen templates to create the project in line with the relevant requirements. The templates are managed based on the specific screen type, i.e. for alarm screens, functionalities of the Alarm Message List are available and can be used according to the design requirements.

FUNCTIONAL OBJECTS IN ZENON: SMART OBJECTS

zenon Smart Objects can be used to define libraries for standard technological elements. A Smart Object groups together different zenon functionalities into one unit, making it easy to maintain multiple encapsulated and separate objects. The Smart Object is engineered by the relevant process expert, ensuring that the relevant expertise is incorporated into the object to optimise the result. Any subsequent user of this Smart Object does not need any detailed knowledge of the internal structure; they can simply transfer the objects into their application. The expert preselects the properties to be configured at the development stage, thus cutting the complexity for the user.

A Smart Object can be considered an encapsulated part of a project in zenon. It contains all of the information that the object requires for its functionality, e.g. interface variables for the process, formulas for necessary calculations or recipes. The Smart Object can be given a version number once it has been defined. It makes it possible to provide a comprehensive description for subsequent users.

ZENON RESULTS IN POSITIVE SCALING EFFECTS

The methods described in this article demonstrate just a few of the possibilities that the software platform has to offer when it comes to standardising objects, which can be combined and used in different ways, depending on the requirements in question. The user's experience is always the top priority. The creation of templates leads to cost savings later. The standard objects are created by process experts and undergo central quality checks, after which they can be used as often as is required. These standards can be either integrated into existing equipment or used in greenfield projects.

Standardisation also offers advantages during the subsequent use of the equipment. Not only does the fact that the operating screens are identical benefit the user; it also makes things easier for IT personnel when carrying out system maintenance and providing assistance. The standardised software modules facilitate technical support. Encapsulating standard objects optimises functional updates for elements grouped in this way. The consequences of subsequent functional expansions for the overall system are less critical.

The zenon software platform fulfils the requirements for standardised applications in all phases, from engineering and operation to maintenance and updates. When designing these functionalities, the COPA-DATA development team maintained constant dialogue with our users to create a solution that meets real-world needs.

BERND WIMMER
Automotive Industry Manager

Bernd Wimmer has been Automotive Industry Manager at COPA-DATA Germany since 2002. Previously, he worked as a central control technology specialist for TaurusMediaTechnik GmbH. He lives with his wife, two children and their cat in beautiful Bavaria.

bernd.wimmer@copadata.de

Electronic signature

Data integrity regulations from regulatory authorities, such as the FDA, EU or MHRA, require that only authorised individuals are able to change critical process values. The electronic signature (eSig) helps to create a more secure application, especially in a GMP-regulated environment.

INTRODUCTION TO THE ELECTRONIC SIGNATURE

According to data integrity guidelines for the pharmaceutical industry, data must meet the Attributable, Legible, Contemporaneous, Original and Accurate principle - ALCOA for short. In the case of an electronic signature, the user needs to 'sign' (by entering their username and password) if they are to make critical changes.

In this way, we satisfy the 'Attributable' principle. The change is then permanently stored in an audit trail database with a timestamp (Contemporaneously recorded) and the value information (Original and Accurate). Furthermore, actions can be retrieved for a review by quality assurance (QA) or an inspector (thereby fulfilling the requirement for the information to be Legible). Electronic signatures uniquely identify the user making the change and, as an option, another person may be required to electronically sign to verify the change.

An application within a GMP-regulated environment typically contains critical parameters. They are called critical process parameters (CPP) or GMP-relevant parameters. To translate this into the language that zenon speaks: they are select process variables. A critical parameter is, by definition, a variable that can have direct impact on a patient's health.

A two-step signature can also be enforced. In such a use case, if an operator wants to change a CPP, the system will notify them that a user with supervisory status is required to perform the change. Additionally, a third user with QA status may be required to verify the change. In such an example, all users would need to type in their user credentials and add a comment. An electronic record of each of the steps is created in the audit trail.

This means that operating personnel no longer need to use pen and paper to record and sign for their actions. Using electronic signing, the potential to lose or damage such paper-based records is eliminated.

As documentation is a requirement, all user actions are stored in a central database. Using easy filtering mechanisms, a comprehensive audit trail or signature

registry reveals the history of the process. This can be used for reporting, e.g. electronic batch reports.

Here, an electronic signature provides greater flexibility than paper trails. The data can be queried and analysed quickly and easily. In this way, record tracking by electronic signature increases security around process and parameter changes.

A digital signature is another frequently used term in this context. What is the difference between a digital signature and an electronic signature?

In general, both are computer generated and legally binding equivalents of handwritten signatures. They uniquely identify the individual(s) responsible for an action.

Digital signature: a document (e.g. a PDF file) has to be signed using a digital signature or another trusted authentication method. The digital signature links a 'fingerprint' of the document to your identity.

A digital certificate is permanently embedded in the document. Typically, a trusted third party, known as a certificate authority (CA), is responsible for verifying your identity.

Electronic signature: within a running application, users controlled by an identity service must sign to execute critical process changes or actions. Typically, in GMP applications, according to FDA 21 CFR Part 11 and EU Annex 11, the electronic signature is used.

ZENON FULLY SUPPORTS REGULATORY REQUIREMENTS

We take our customers' feedback seriously and use it to influence the development of new features that enhance our zenon Software Platform year by year. In zenon version 10, we have developed many new features to support our customers in GMP-regulated environments.

According to the regulation, all electronic records and signatures, paperless records and reporting procedures related to the manufactured product must be captured and stored securely in GMP-regulated environments. Protection, accuracy and the rapid retrieval of all records are all mandatory. Secure, computer-generated, time-stamped audit trails are a must to independently record the date and time of any user or operator actions that modified the manufacturing process.

Regulated industries that fail to meet the likes of, 21 CFR Part 11 compliance will risk the possibility of inspectional observations (483s), warning letters or an authorised shutdown of production. The electronic signature option included in zenon enables you to get your application ready for compliance with the demands set out in these regulations with ease. The paperless environment that results from using this feature delivers additional benefits, including faster information exchange, easy integration and a reduction in the number of errors.

FIVE TYPES OF SIGNING OPTION

The existing zenon 'Signature' feature has been extended to include a more advanced electronic signature functionality. This feature is available as an option. It includes the ability to configure an authorization process of up to three steps. It is fully configurable within the zenon Engineering Studio. The new electronic signature provides additional new functionalities

– It provides a more secure mechanism.
– First the value is changed, then the signature dialogue is opened. The value change is read only within the dialogue to avoid any tampering prior to signing.
– Up to three signature steps are configurable (perform, verify and approve).
– eSig screens are fully customizable.
– Detailed and customizable logging within the audit trail.
– Dedicated categories for eSig allow easy filtering within the audit trail.
– The following e-signature options are available as of zenon version 10, so you can choose the most appropriate solution for the level of security you require.

SIGNATURE WITHOUT PASSWORD

This legacy function provides the option of requiring a reason for a change. This is useful, for example, if a set value change of a non-GMP-critical parameter requires a comment to be added. The function is configured at the element or variable level within the zenon Engineering Studio. The signature text is logged within the chronological event list (CEL) or audit trail.

SIGNATURE WITH PASSWORD

In this option, if a comment is required, the user may be required to provide repeated authentication, even though they are already logged in. The function is configured at the element or variable level within the

Default eSignature screen for perform and verify.

zenon Engineering Studio. The signature text is logged within the CEL or audit trail.

ELECTRONIC SIGNATURE PERFORM

This option provides a one-step authorization process for an electronic signature. Only a defined user or user group is allowed to perform a critical process change. The "performer" who initiated the action must electronically sign for that action and leave a comment.

ELECTRONIC SIGNATURE - PERFORM AND VERIFY

This option extends the one-step authorization process to include an additional user. A second individual is required to authenticate and to validate the action undertaken by the first user. The action is not initiated until both signatures are entered.

Example: a user from the supervisor user group (the "performer") is allowed to initiate an action. The user authenticates using their username and password. To execute the triggered action, another user from the quality assurance user group (the "verifier") is required to validate this action. The action will be successfully executed only if both users have signed with the correct credentials.

NOTE: The person who performs the action cannot be the same person as the user who verifies that action.

ELECTRONIC SIGNATURE – PERFORM, VERIFY AND APPROVE

The fifth possible signing option offers a three-step approval procedure. In addition to the "performer" and the "verifier", a third individual is required to authenticate and finally approve the action requested by the performer. The action is not initiated until all three signatures are entered correctly.

NOTE: Three different people are required to complete the three-step electronic signature process.

### CENTRALIZED AND SIMPLE CONFIGURATION IN ZENON

The electronic signature is fully integrated as a standard module within the zenon Software Platform and is available as an option. As a GAMP5 Category 4-classified product, zenon offers out-of-the-box configuration within the zenon Engineering Studio. The parameterization to specify whether a signature is required or not has been moved to a central level. Data types or variables are configured directly as critical, so the electronic signature is set at this level too. This ensures that whenever a variable defined as critical is used, the electronic signature is active by default. To provide optimum flexibility, there is an option to change the signature requirement at the element level at a later point.

For global project configuration, a separate group of settings called "eSignature" has been created. This allows for the central configuration of all relevant settings, such as customized signature screens for different action types and flexible administration of logging information for the audit trail.

WHERE CAN IT BE USED?

The new electronic signature covers the following scenarios:
–   Modify parameters: the electronic signature is available for dynamic elements, variables, data types and menus. Protecting a CPP using eSig is configurable centrally at variable level or through the dynamic element or menus.
–   Execute functions: starting a new process can be controlled by an eSig mechanism too, e.g. starting a new batch production requires an operator's electronic signature.
–   Recipe changes: the recipe value list of the zenon Recipe Group Manager can also be verified using an electronic signature. The eSignature is adopted from the central configuration at variable or data type level.

Example of a customized signature screen for perform and verify.
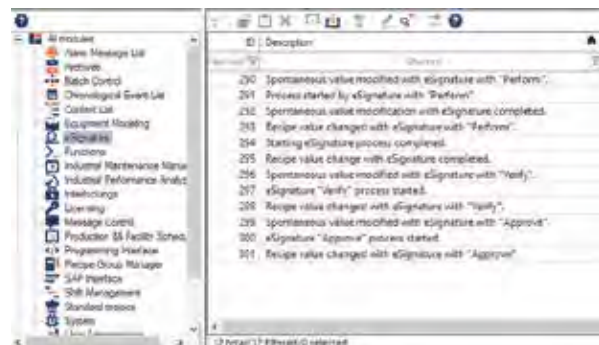
Categorization of electronic signature records within the zenon Engineering Studio.

Time received	Text	Variable name	Value	User Full name	Category
25.05.2021 18:04:50	User 'Operator - Operator' logged in			Operator	Variables; Audit Trail
25.05.2021 18:04:59	User 'Supervisor - Supervisor' logged in			Supervisor	Variables; Audit Trail
25.05.2021 18:07:22	Value change: Old: (0) New: (22) - Signed for "Perform" Comment: Test	CPP_test[1]	22	Supervisor	Audit Trail; eSignature
25.05.2021 18:07:31	Value change: Old: (0) New: (22) - Signed for "Verify" Comment: Test ok	CPP_test[1]	22	Quality Assurance	Audit Trail; eSignature
25.05.2021 18:07:31	Value change: Old: (0) New: (22) - eSignature complete Comment: Test ok	CPP_test[1]	22	Quality Assurance	Audit Trail; eSignature
25.05.2021 18:07:31	Value change: Old: (0) New: (22)	CPP_test[1]	22	Supervisor	Variables; Audit Trail

Audit trail messages showing all the steps of
a two-step electronic signature process.

TRACKING OF ELECTRONIC SIGNATURES

All steps initiated using a process that requires an electronic signature are thoroughly documented in the audit trail in zenon. Each time a user signs for an action, a detailed electronic record is created. This includes:

- A secure, time-stamped, permanent record of user actions.
- User-names and full names of all signing and verifying parties.
- Comments entered by all signing parties during the signature process.
- Data is stored safely in a central data repository or locally as binary data.
- Separate categories for easy filtering of electronic signature entries in the audit trail
.

CUSTOMIZATION OF MESSAGES

The messages displayed within the audit trail are completely customizable. The text shown, the content and the order of information are easily changeable within the zenon Engineering Studio. Dynamic placeholders are used to configure the content and order of the message. For international use, the displayed text supports language translation or the use of customized texts.

The following example shows an electronic record documenting a two-step electronic signature process within the audit trail. Every user and comment are stored beside a timestamp. Here, we can see the Supervisor user performed a value change for the parameter CPP_test[1]. The action was verified by the Quality Assurance user and finally executed by showing "eSignature complete". As a result, the parameter (variable) was changed from 0 to 22 (the old and new values are included).

EASY FILTERING OF GMP-CRITICAL DATA

To relieve headaches when finding the right messages within a long audit trail log, every single type of message in an electronic signature process is linked to its own category. The system makes it possible to show messages pertaining to the electronic signature in a single click. In this way, GMP-relevant data can easily be included in an electronic batch report.

HOW CAN I TEST IT?

Contact us for the demo version and a personal conversation about this feature by emailing:
pharmaceutical@copadata.com.

BERNHARD KORTEN
Industry Manager Pharmaceutical

Since 2008, Bernhard Korten has been a member of the COPA-DATA team in Salzburg, Austria. As a volunteer paramedic, Bernhard always has the right pill at hand, especially for software solutions in the life sciences industry.

AROUND THE WORLD

INDUSTRY, EDUCATION, RESEARCH

Into the future with Gold Partner FH Salzburg

COPA-DATA and the Information Technology & Systems Management (ITS) degree program at Salzburg University of Applied Sciences (FH Salzburg) have been working together intensively for almost two decades. Now, FH Salzburg has become a certified Gold Partner – an accolade that highlights the strength of this partnership and heralds even greater strategic cooperation in the future.

Gold Partner: Reinhard Mayr, Head of Research Operations at COPA-DATA, and Simon Kranzer, Senior Lecturer in Information Technology & Systems Management at FH Salzburg.

COPA-DATA has awarded Salzburg University of Applied Sciences its highest possible partner status. It is the first educational institution in the world to become a Gold Partner in the COPA-DATA Partner Community. FH Salzburg, and particularly the Information Technology & Systems Management degree program led by Prof Gerhard Jöchtl, has enjoyed a long and successful partnership with COPA-DATA, both in terms of research and teaching.

BOOST FOR SALZBURG AS A TECHNOLOGY HUB

By working together, the two partners are striving to provide a real boost to Salzburg's status as a technology hub. "Long-term partnerships are essential for the stable exchange of ideas and experience between education and industry. The partnership with COPA-DATA is an outstanding example of successful knowledge transfer. COPA-DATA benefits from access to future IT talent. The degree program benefits from exciting ideas and valuable input from business and industry contacts who bring their practical experience to the university. Over the years, our partnership has turned into friendship," explained Simon Kranzer, Senior Lecturer in Information Technology & Systems Management.

The clear strengths of universities of applied sciences are the practical relevance and the proximity to industry and the working world. FH Salzburg and COPA-DATA have been linked for over 18 years now. "A good third of our Salzburg team have attended the lecture halls, seminar rooms and labs at FH Salzburg. Some of them even teach at the university now," said Reinhard Mayr, who, as Head of Research Operations and Security, is responsible for research collaboration at COPA-DATA. What's more, he is a visiting lecturer and alumnus of FH Salzburg.

PARTNERS SINCE 2013

Since 2002, dozens of projects have stood as testament to the success of the cooperative relationship between COPA-DATA and FH Salzburg. As a result, joining the COPA-DATA Partner Community in 2013 was a logical step for the university. It helped to make the partnership more visible. Simon Kranzer, Senior Lecturer in the Information Technology & Systems Management degree program, sees the Partner Community as an exceptionally valuable platform for encouraging interaction between companies and universities. He remarked, 'The multitude of Partner Community networking opportunities enables us to give students valuable insights into the latest technical developments and bring them closer to application domains and research questions from the world of automation in a practical manner.'

From the outset, COPA-DATA and the degree program have focused on joint initiatives to enable young technicians to pursue a career in IT and to subsequently support them in their studies. As a result, students acquire access to the very latest, state-of-the-art products. At the same time, the company is able to benefit from the university's research work. COPA-DATA really values the collaborative research that has driven many of its innovations. The two partners have started and established numerous projects and initiatives together – including those supporting young talent. What's more, zenon isn't just used to teaching students – it also controls the entire university building!

ENDURING COLLABORATION IN DYNAMIC TIMES

Especially during times of transformational change, it is increasingly important for educational institutions and industry to share their technology and knowledge. Strong partnerships are key when it comes to facing the challenges of the years ahead. "Joint projects lead to innovations. This creates a competitive edge and advances Salzburg as an IT hub. The exchange of ideas with colleagues from the University of Applied Sciences is inspiring for both sides. With the Gold partnership, we will be continuing on this successful path," enthused Reinhard Mayr.

Close contact with technology companies is extremely important to FH Salzburg. Dr Doris Walter and Raimund Ribitsch from the university's leadership team believe that working with the business is a key success factor for education: "We are therefore thrilled to be the first university in the world to be awarded Gold partnership status by COPA-DATA."

WHO IS WHO
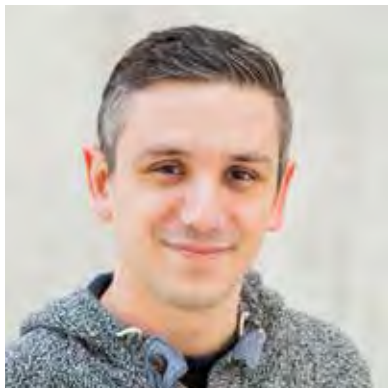
Reimar Klammer

SOFTWARE ARCHITECT FOR SERVICE GRID

COPA-DATA HEADQUARTERS

AT COPA-DATA SINCE: 2016
RESPONSIBILITIES:
I work on zenon Service Grid developments together with our fantastic development teams. Alongside my role as a developer, as a software architect I coordinate technical and architectural decisions to deliver the best possible product to our customers. To do this, I always need to look beyond the obvious to identify the new technologies we need and implement them in the product.
I GET MY INSPIRATION FROM ...
doing things with my friends. If I have time, I go hiking in the mountains in summer and on ski trips in winter.
IT IS MY DREAM ...
to one day look back and be able to say that I didn't miss out on anything and have no regrets.

You can reach me on:
reimar.klammer@copadata.com

SunMi ("Sunny") Kim

MARKETING MANAGER

COPA-DATA KOREA

AT COPA-DATA SINCE: 2019
RESPONSIBILITIES:
As Marketing Manager at COPA-DATA Korea, I'm looking for the best way to strengthen COPA-DATA's brand on the Korean industrial automation market. I create buzz by releasing local content and PR and attract the attention of potential zenon customers to zenon by creating landing pages and improving SEO. I support my sales colleagues in their efforts to increase revenue.
I GET MY INSPIRATION FROM...
questioning, critical thinking and marketing books. When I see a leaflet or a store window, a lot of questions pop into my head: why the brand chose the colors it did, what is the meaning behind the advertising slogan, who would like the product, etc. I also read books about successful brand marketing to inspire my own work and broaden my marketing horizons.
IT IS MY DREAM...
to travel worldwide, to gain new and diverse experiences, to appreciate new cultures, to discover new places, and to share my life with true friends and a partner.

You can reach me on:
sunmi.kim@copadata.com

Ray Giffen

MANAGING DIRECTOR

COPA-DATA US

AT COPA-DATA SINCE: 2019
RESPONSIBILITIES:
To facilitate zenon's growth in the Americas by guiding the team's sales and technical support efforts. And to maintain the COPA-DATA US corporate structure so it aligns with COPA DATA's values, vision and strategies.
I GET MY INSPIRATION FROM...
helping people to discover and grow their untapped potential.
IT IS MY DREAM...
set my children on a successful path and to travel often with my wife.

You can reach me on:
the left lane of the freeway @90 mph or at raymond.giffen@copadata.com

WHO IS WHO

Philipp Schmidt

TECHNOLOGY SCOUTING AND
PROTOTYPING MANAGER

COPA-DATA HEADQUARTERS

AT COPA-DATA SINCE: 2010
RESPONSIBILITIES:
Investigating new technologies and
solutions. Developing and supporting
prototypes and pilot projects. Close
collaboration with our product and
industry management team to get these
solutions into use at an early stage.
I GET MY INSPIRATION FROM...
visionaries, forward-thinkers and self-
starters... people who have achieved great
things and have made the world a better
place.
IT IS MY DREAM...
to perhaps also be able to make a small
contribution to improving the lives of the
people around me.

You can reach me on:
philipp.schmidt@copadata.com

Anna Wedl

TRANSLATION COORDINATOR

COPA-DATA HEADQUARTERS

AT COPA-DATA SINCE: 2018
RESPONSIBILITIES:
If you're reading this text, I've managed
to find time between deadlines, target
files, translation tools and questions
about context to describe what it is that I
do. I localize content – such as marketing
texts, software documentation, user
interfaces and training materials – in
many different languages for the COPA-
DATA Group and make sure that it gets
translated. This enables our users to use
the zenon Software Platform in whatever
language they prefer.
I GET MY INSPIRATION FROM...
standing on a mountain top (or on a
beach) with the sun shining on my face
and a light breeze blowing through my
hair, looking out into the distance. But
sometimes a nice cup of tea on the terrace
is enough.
IT IS MY DREAM...
to travel the world and make music, meet
people from different cultures and enjoy
the beauty of nature.

You can reach me on:
anna.wedl@copadata.com

Markus Wintersteller

TECHNOLOGY EXCELLENCE MANAGER

COPA-DATA HEADQUARTERS

AT COPA-DATA SINCE: 2002
RESPONSIBILITIES:
Since the start of 2020, I have been
managing the Technology Excellence
Team. We support our colleagues with
technical issues related to zenon. My
role as team leader is to create and
maintain the best conditions for the
team for their very varied activity.
I GET MY INSPIRATION FROM...
a lot of different places. I am very
inquisitive and love reading reference
books from all kinds of different fields of
science and technology. I'm often amazed
at just how many connections there are
between different disciplines. I can really
switch off during my cycle to work and, if
I have a lot I want to think over, I like to
go on longer bike rides. Playing the double
bass also helps me to clear my head, and
I can really recharge my batteries by
practicing aikido.
IT IS MY DREAM...
to always have dreams that will help me
hold on to the zest for life I've always had.

You can reach me on:
markusw@copadata.com

PARTNER COMMUNITY WORLD CAFÉ

CERTIFIED PARTNERS LETTING THEIR PROJECTS SHINE WITH ZENON

3P Innovation	BooYoung A&V	SDEL Contrôle Commande

UNITED KINGDOM

SOUTH KOREA

FRANCE

ABOUT US:

3P innovation is a world-class life sciences engineering and process automation company. We are passionate about helping clients to develop and industrialise new products through designing, manufacturing and supporting production equipment. Based in a brand-new purpose-built facility in Warwick, UK, the business employs over 80 people. We service a multi-national customer base with machines installed worldwide.

OUR SOLUTIONS WITH ZENON:

As a committed partner of COPA-DATA, 3P innovation uses zenon to reduce engineering time when delivering tailored solutions with proven, robust technologies. Because we operate in the pharmaceutical sector, compliance is essential. This is made easy using zenon's built-in recipe management, audit trails, user administration functionality and report generator.

OUR CUSTOMER PROMISE:

3P offers a powerful combination of proven, standard technologies and machine platforms with custom automation skills and methodologies that help customers develop and commercialize new products faster, at lower cost and with lower risk. 3P designs and manufactures high-end, scalable production solutions – from labscale to clinical and full-scale production systems across the inhalation, parenteral, OSD and diagnostic sectors.

www.3pinnovation.com

ABOUT US:

BooYoung A&V specializes in production equipment, manufacturing support facilities, computer system validation and automation system construction in the pharmaceutical and life science industries. With 20 years of experience in validation, we deliver control system and life science process operations logic design. We undertake consulting tasks for GMP plant projects.

OUR SOLUTIONS WITH ZENON:

The SCADA solution zenon meets the data integrity requirements of the pharmaceutical and life science industry. It minimises the difficulties and risks when establishing data integrity for quality control laboratory work and in regulatory due diligence. zenon enables tracking management, data integrity verification and unified data management and analysis for batch operation and batch quality. We implement these solutions on a GMP certification and Smart Factory basis.

OUR CUSTOMER PROMISE:

We strive to accurately understand the needs of our clients in the pharmaceutical and life science industries, suggesting new ways to move forward in the era of Pharma 4.0 while mitigating data integrity risks. In addition, we are committed to playing an important role with our partners, strengthening integrity with shared commitment and trust.

www.byanv.com

ABOUT US:

SDEL Contrôle Commande is a medium-sized company with more than 50 years of experience in working with electrical substations and control systems – from design and production to commissioning. We offer a complete range of services, including expert engineering of substation automation and protection systems.

OUR SOLUTIONS WITH ZENON:

SDEL Contrôle Commande deploys zenon Energy Edition as a substation automation solution for its key customers. Our zenon-based solutions serve as control systems, HMI visualization in the control room, SCADA and as Gateways using energy protocols, including IEC 61850, IEC 60870-5-104/101, ModBUS, etc. Our expertise includes zenon Logic for programming control automation.

OUR CUSTOMER PROMISE:

SDEL Contrôle Commande focuses on making its customers' projects successful. We provide reliable and secure zenon solutions to meet all requirements. A demonstration platform helps our customers to visualize the solutions that we offer and enables continuous in-house training for our certified zenon engineering team.

www.sdelcc.fr

PARTNER COMMUNITY WORLD CAFÉ

CERTIFIED PARTNERS LETTING THEIR PROJECTS SHINE WITH ZENON

ROBUR Automation

ROBUR AUTOMATION

GERMANY

2013 · SILVER

ABOUT US:

The whole world of automation from a single source.

For more than 20 years, we have been developing automation solutions for our customers with passion and dedication. Whether individual machines, series machines, special machines or complex systems in equipment engineering – we always stay up to date with the latest technology and create forward-looking process optimizations to ensure a constant competitive advantage for our customers. Our other business areas of technical IT, documentation and translation round off our portfolio so that we can offer our customers everything from a single source.

OUR SOLUTIONS WITH ZENON:

In recent years, we have been able to establish an increasingly strong presence for zenon in pharmaceutical environments. In addition to the standard SCADA functions, ROBUR AUTOMATION uses redundancy, historical archives and the zenon Recipegroup Manager. Our other 'specialist subjects' are automated engineering and solutions relating to the VSTA/Add-In interface.

OUR CUSTOMER PROMISE:

Our customers benefit from our extensive automation expertise. From machines to office PCs, we can provide innovative and sustainable solutions. Our service team helps us to guarantee support for the systems, even long after project completion.

www.robur-automation.com

Saturn Electric

SATURN ELECTRIC

SERBIA

2017 · SILVER

ABOUT US:

Saturn Electric is an agile engineering and consulting firm specializing in the delivery of complete solutions for power systems, transmission and distribution utilities and industrial facilities. As a company, we are well recognised for our dedication and flexibility in all segments of our engagement. There is only one exception for our flexibility: we never compromise on quality.

OUR SOLUTIONS WITH ZENON:

We deploy the zenon platform for substation SCADA, automation and industrial automation projects. Our solutions span substations that need a fully IEC 61850-compliant solution and retrofits that include devices requiring multiple communication protocols. We create industrial applications for process control and monitoring. In all these instances and more, we are able to deliver efficient and state-of-the-art solutions using zenon.

OUR CUSTOMER PROMISE:

We are committed to providing services of the highest quality. Our business is built on long-term relationships with our partners and customers. We listen, we work hard to earn our customers' trust and confidence, and we collaborate with our customers to deliver the very best. By fostering a partnership with our clients, we continuously offer quality, safe, reliable and efficient solutions that bring new value to their businesses.

www.saturnelectric-sr.com
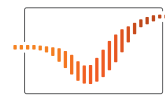
COPA-DATA
Partner Community

FAST FACTS

318 Members Worldwide

6 Gold Partners
44 Silver Partners
192 Bronze Partners
76 Listed Members

58 Countries

COPA-DATA partners are present in 58 countries worldwide

Partner Categories

Systems Integrators, OEMs, Machine Builders, Educational Institutions and Research Facilities

Figures as of July 2021

Entry Year   **Partner Level**

Industry Focus:

Cross-Industry   Pharmaceutical

Automotive   Food & Beverage

Energy & Infrastructure   Educational Insts. & Research Facilities

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