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THE COPA-DATA MAGAZINE #40|2023

SPOTLIGHT

Sustainability, SDGs, and zenon

PREFACE

How can we make it as easy as possible for our users to achieve their strategic and operational objectives? This question has driven COPA-DATA from its earliest days. In the years ahead, all of our customers will share a common strategic objective: they want to do their part to create a sustainable and climate-neutral supply of energy, food, medicine, and mobility. In this issue of our magazine, we shine the spotlight on sustainability and we look particularly at the role that the zenon software platform can play in helping you to achieve your objectives related to sustainability and climate neutrality. Starting on page 16, you'll find several interesting examples showing how zenon can be used in a variety of applications to support you on your journey to greater sustainability.

Digitalization, networking, and OT/IT convergence introduce new challenges which zenon can help you solve as an integrated platform for automation and IoT. Starting in the Products & Services section on page 22, we also want to share exciting news and insights about data modeling, device management, and data analytics.

Connectivity and intelligent data exchange are fundamental strengths of zenon – and this now includes wall boxes for electric vehicles. On pages 42-43, Mark Clemens writes about connecting our OCPP driver to charging stations.

Lastly, Salzburg and Seoul are united by more than a love of classical music. Both cities also share a passion for great solutions with zenon. Congratulations to the COPA-DATA Korea team, which is celebrating its 10-year anniversary this year (see page 64). Many of the country's top companies, such as Samsung, LG, and Hyundai, already rely on zenon. zenon also plays an important role in the national energy supply. We look forward to many more exciting projects in South Korea.

Learn how we are helping businesses become sustainable – and successful – for the long term. Read on and be inspired!

Thomas Punzenberger

THOMAS PUNZENBERGER,
CEO

CONTENT

SPOTLIGHT
SUSTAINABILITY, SDGS, AND ZENON

AUTOMATING SUSTAINABILITY

It sounds highly promising – and it is – but can technology help us to meet and manage the challenges of the energy revolution? How can we take steps to achieve climate neutrality, quickly and efficiently? And have we overlooked anything?

ROBERT KOREC, PR & COMMUNICATIONS CONSULTANT

Technological progress makes it possible to improve the efficiency of processes. We already knew this before IIoT began its triumphal march through the world's production halls in the form of Industry 4.0. In fact, the first industrial revolution in the 19th century was only possible through a highly successful combination of technological progress and the requisite large-scale investments from both the state and the private sector.

However, improving efficiency is only part of the story when it comes to global energy savings. To successfully carry forward the energy revolution, we have to set sustainability goals that go far beyond reducing greenhouse gases and enable us to make progress step by step.

ENERGY REVOLUTION AND MORE

Sustainability and environmental action are often conflated in the current media and public debate.

However, the measures taken to combat climate change account for only a fraction of the 17 Sustainability Development Goals (SDGs) published by the United Nations in 2015. The full list, with its 169 sub-goals or targets, also covers important aspects such as high-quality education, peace and justice, and the reduction of inequalities and poverty. A one-sided focus on one aspect which neglects other aspects will doom the project to failure.

The individual SDGs influence each other positively in the long term. Blind spots, on the other hand, have a negative effect on overall development.

For example, those who neglect the fight against poverty (SDG 1) will find it difficult in the economies of the Global South to persuade the people affected to support additional investments in low-pollution production. The benefits that these regions have in terms of hours of sunshine and photovoltaics (SDG 7) compared to northern industrialized countries could, with appropriate planning, have a more than positive effect on people from different social classes in southern climates.

Likewise, those who do not recognize education (SDG 4) and gender equality (SDG 5) as desirable goals lose out on the opportunity and potential represented by these people, whose know-how is needed to enable technological progress at the scale needed to meet the challenges of the coming decades.

Anyone who accepts war as a proven means of expanding their own sphere of influence will very quickly recognize that not only is the human suffering caused immeasurable but the economic consequences for the parties involved is detrimental too. Plus, the scope for climate-friendly investments disappears (SDG 16). The extent of the destruction of buildings and infrastructure, the reconstruction, and the material used in warfare also have immense environmental consequences.

PLANT A TREE
The concept of sustainability originally comes from forestry and was coined as early as the 18th century. Even then, people who worked in forest management recognized that it is necessary to think ahead for several generations. Hardly any other industry is better suited as a model for how we need to think about the concept of sustainability today. The trees that are planted today might only benefit the generation of our grandchildren or great-grandchildren.

FAMILY BUSINESSES THINK IN TERMS OF GENERATIONS
Doing business sustainably means acting for the future and not sacrificing long-term goals for short-term profits. The modern use of "sustainability" as a term in our political discourse began in the second half of the 20th century. In the 1980s it prompted the UN definition which posits sustainability as based on three pillars: the environment, social affairs, and the economy. Lasting, healthy growth can only be ensured if all three aspects are taken into account.

IT'S THE ECONOMY, STUPID
The slogan that Bill Clinton coined during the 1992 US presidential election campaign, encapsulating the premise that citizens can only be happy as long as the economy runs smoothly, has not lost its relevance. However, in light of the impending climate catastrophe, a one-sided focus on the purely economic perspective might not go far enough.

Thirty years after Bill Clinton's election victory, one might be tempted to say "It's the environment, stupid!" Yet this would overlook the powerful economic aspect to climate change – and not only in terms of its impact. An environmental turnaround can only be achieved successfully if made viable economically. Only in this way will it be accepted socially.

SOCIAL AND ECONOMIC UPHEAVALS
It is in our hands whether or not the global energy revolution succeeds. Clearly, in the coming decades we will see global upheavals rarely experienced in the history of humankind.

These changes are distributed unevenly. For example, increases in temperature affect different regions of the world in different ways. The number used in the debate, such as the 1.5-degree target, is an average value that also includes the areas covered by water and thus does not allow a direct statement to be made about the heat in a specific region. Small changes can sometimes make areas uninhabitable and thus increase the migratory pressure on climate zones that remain temperate. This in turn could lead to social and political upheavals in the target countries.

Yet even a successful energy revolution will significantly shift the commercial framework. As in the past, energy-intensive industries will be located in places where a relatively large amount of energy is available at favorable conditions and the transport routes to consumers are short. In the future, regions with sufficient hours of sunshine could benefit from this location advantage. As a result, energy-intensive heavy industry could shift, for example, from places near the German lignite mines to southern Europe, where new production centers could be established. The example of Iceland proves that well-developed, green power generation can also be successful in the north. There, 70 percent of the electricity required is generated from wind power and 30 percent is geothermal (source: www.greenbyiceland.com). These are the best conditions for the energy-intensive aluminum industry, which is increasingly located along these energy sources in order to reduce the carbon footprint of its products by using local renewable energies.

SPECTER OF A CONTROLLED ECONOMY
While the reduction targets can hardly be refuted scientifically, the path to implementation and the resulting measures are anything but predetermined. The perspectives and scenarios differ significantly depending on the point of view. The ▶

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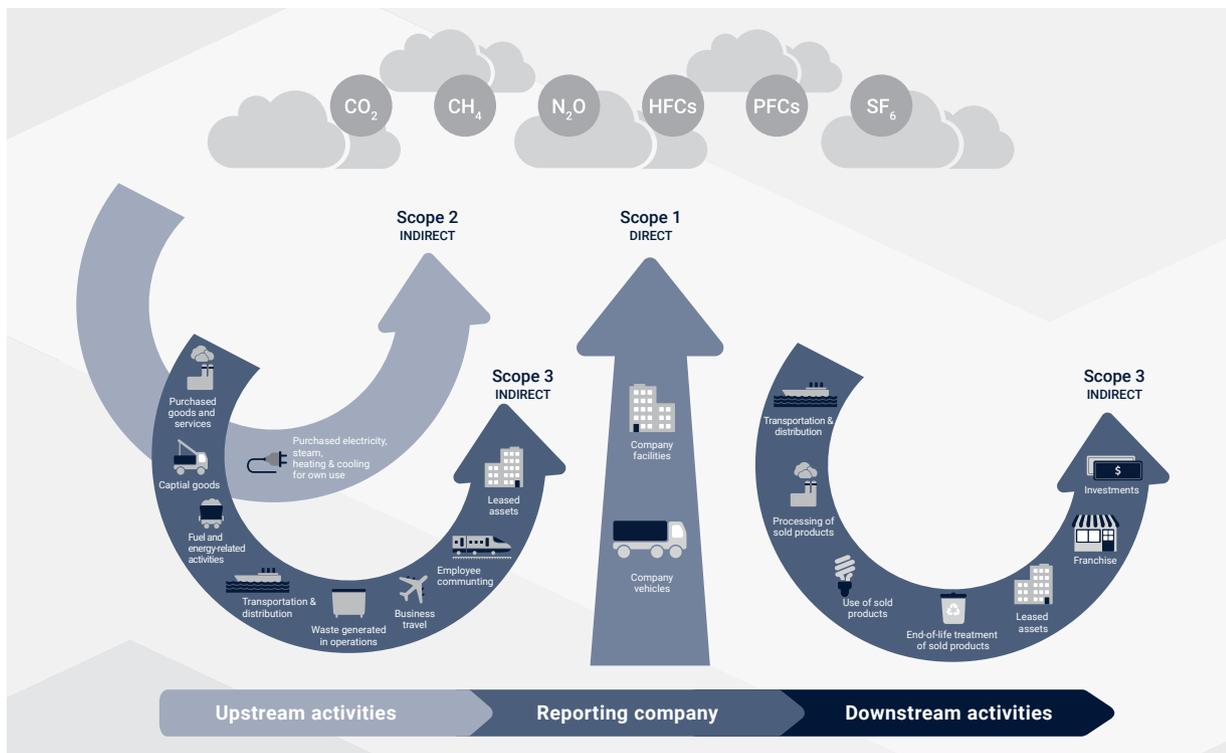
The GHG Protocol is one of the most important international standards for accounting for greenhouse gas emissions. It covers the entire value chain of a company or organization.

German historian and journalist Ulrike Herrmann, for example, calls for a complete realignment of our economic system in her latest book The End of Capitalism (ISBN 978-3462002553). She sees a state-controlled economy, modeled on the English wartime economy of 1940, as essential in order to have a chance to avert the impending climate collapse. In such a scenario, air travel as well as private transport, whether with electric or combustion engines, would soon be a thing of the past. However, it should be noted that the author recognizes the previous contribution that capitalism has made to the achievement of prosperity for broad sections of the population as very positive.

GREEN GROWTH

The majority of commentators, including many organizations such as the EU, see a system that is based on constant growth and requires more and more resources as having reached its natural limits. However, they believe that national and international acts of strength coupled with private investment can avert the worst. Progress that consumes increasing resources has to be translated into green growth, where business performance and environmental pollution are decoupled and the planet and its resources are respected.

MICROECONOMIC PERSPECTIVE

From the perspective of an individual company, the following questions have to be asked: what are the benefits of your own efforts to achieve global sustainability goals? What legal and regulatory requirements will your company be confronted with in the coming years? What else do you want to contribute as part of your own convictions? How does it help in marketing? And are sustainability criteria applied when new business relationships are established? Ultimately, you must have the business justification to implement your own values.

The pressure to get fast results is increasing year by year. Not only does the transition to more sustainable business have to be planned and implemented, but we also have to think about adjustments that are required due to the increasingly noticeable effects of global warming.

2025 – GOODBYE TO GREENWASHING?

More and more countries are passing legislation that reduces greenhouse gas emissions in order to combat climate change. Businesses are encouraged to reduce their emissions and meet repor-

ting requirements related to their climate impact.

For example, the EU Taxonomy Regulation obliges companies to evaluate and disclose their business activities according to sustainability criteria. From 2025, companies in the European Union with 250 or more employees or a revenue of more than EUR 40 million must submit an annual report on this topic.

Large corporations or companies with more than 500 employees are already obliged to provide comprehensive non-financial reporting by the EU Non-Financial Reporting Directive.

The Corporate Sustainability Reporting Directive defines the parameters that companies must make public, for example, in relation to social and environmental goals. The regulation is intended to create a standard classification of sustainable investments. These precisely defined parameters make it more difficult to greenwash one's own activities. The required transparency poses a challenge, since sustainability reporting sometimes differs significantly from traditional economic reports. Furthermore, experts who are not only trained in it but also have a certain amount of relevant professional experience are rare and currently in great demand. In addition, companies are encouraged to comply with certain minimum social standards and also to ensure that their supply chains offer fair working conditions and wages.

SUSTAINABLE PROCUREMENT

Apart from legal obligations, more companies are increasingly making sure in their procurement policies that their suppliers and business partners have developed strategies for sustainable management or are already implementing them. Such considerations can also be found in the Greenhouse Gas Protocol (GHG Protocol), an important international standard used to calculate greenhouse gas emissions. While Scope 1 describes the direct CO_2 emissions of an organization, Scope 2 also in-

cludes those emissions that are caused, for example, by purchased energy. Scope 3, the highest GHG level, also includes the CO_2 balance of purchased goods and also takes into account those climate-damaging effects caused by the use of our own products or the disposal of waste.

Among consumers, too, there is increasing demand for products for which production methods are demonstrably good for the environment. A positive brand perception based on this can help to strengthen customer trust and loyalty. As a result, B2B providers will also come under increased pressure. For more companies across a wide variety of industries, the commitment to production and procurement that is as sustainable as possible will provide an edge over competitors.

SUSTAINABILITY AS A COST BENEFIT

In addition to marketing and strategic aspects, more sustainable business leads to cost savings in times of rising raw material prices. By reducing waste, energy and resource consumption, companies can lower their operating costs and thereby become more competitive. The use of new technologies, processes, and products plays an important role for many companies committed to sustainability in developing innovative solutions and thus setting themselves apart from the competition.

REFLECTING CRITICALLY ON BUSINESS MODELS

You can only generate an efficient, reliable overview of energy consumption, for example, if you convert your systems at an early stage so that quick, automatic data queries are supported. Ultimately, it is not only about fulfilling disclosure requirements and saving resources, but about having the information you need to further develop your business model to ensure that the services and products offered stay competitive in the years ahead.

TWIN TRANSITION

Digitalization will play a key role in driving sustainable growth. With a twin transition approach, leaders can bring together the digital and sustainability agendas to future-proof their organizations. Measures to tackle the climate problem should be promoted from the top down at a company and supported throughout the business. This makes it possible to align digital and sustainability agendas and improve the agility of your organization.

NOT WITHOUT TRANSPARENCY

Unlike in the 19th century, the concept of green growth promises that increases in efficiency do not necessarily have to go hand in hand with a greater consumption of natural resources. Digitalization and automation not only mean generating more in the same period of time, but also identifying those efficiency disruptions and energy guzzlers that cause energy to go to waste unnecessarily. Transparency in processes is the prerequisite for fully exploiting the savings potential. This is the only way to make the right decisions based on solid data. The financial resources that are freed up by the resources saved can be used for further transformation processes.

IT DEPENDS ON YOUR OWN STRENGTHS

The changes we all face are extremely complex, both economically and environmentally. In a global economy based on the division of labor, one cannot be a model student in all areas. Pursuing all of the sustainability goals laid down by the UN with the same level of commitment is unrealistic for individuals and individual companies. However, everyone can make their own contribution to saving the planet. Those who act will make mistakes and will be vulnerable. Making your contribution means recognizing which strengths you can contribute yourself, how you can develop these strengths fur-

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ther, and which experience and skills you can lean into from partners to further strengthen joint sustainability efforts. Sustainability cannot be automated. However, successfully meeting climate and sustainability goals can only be achieved with the extensive use of automation and digitalization.

COPA-DATA, TRANSPARENCY, EFFICIENCY, RENEWABLES

At COPA-DATA, we have developed decades of expertise in the field of process optimization in industry. Transparency, efficiency, and the integration of renewables are our strengths. In other areas, we look forward to learning from and together with partners. The energy revolution can only succeed if all aspects of sustainability are taken into account. It is becoming increasingly clear that digitalization is one of the keys to achieving the energy revolution, especially in the context of industrial production.

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With the decision on the 17 Sustainable Development Goals (SDGs), the United Nations launched the largest planning and consultation process in its history. Source: https://sdgs.un.org/goals

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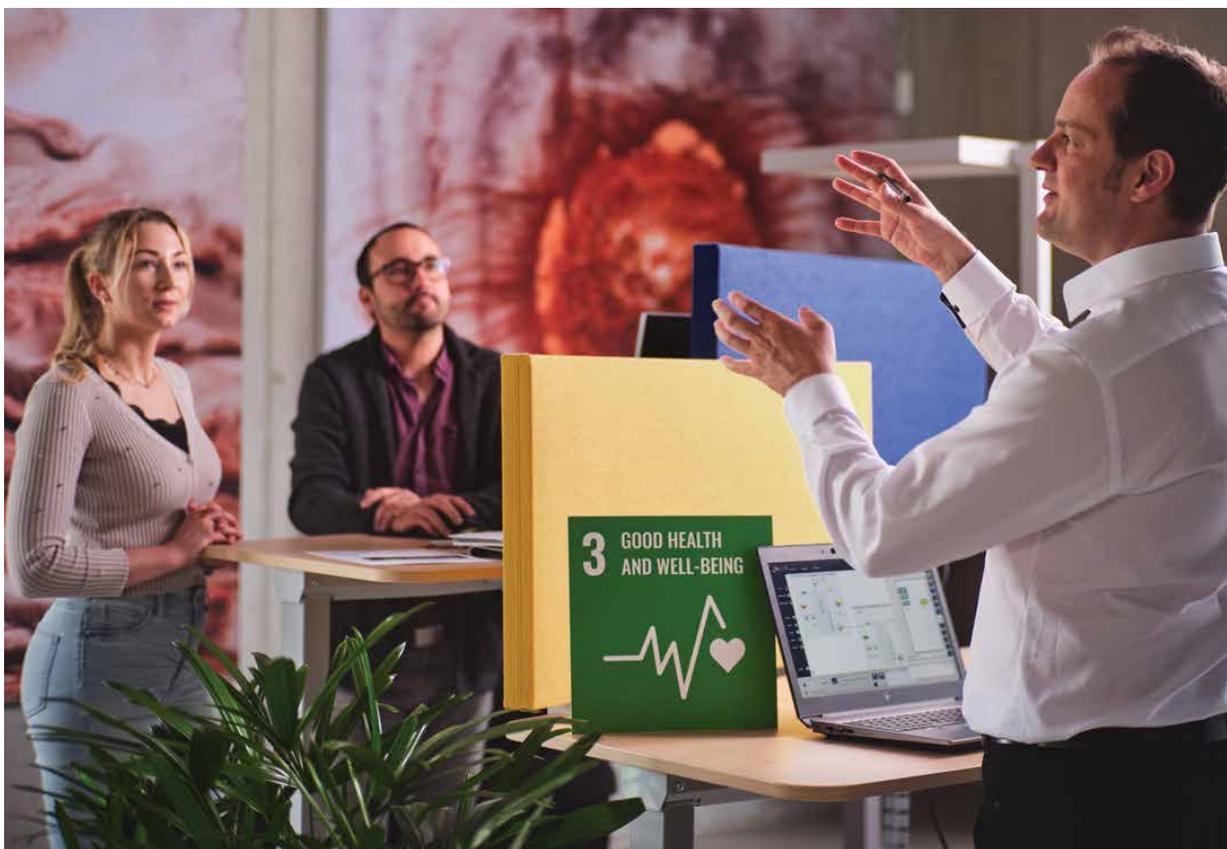
SUSTAINABLE AS A BUSINESS – COPA-DATA AND THE SDGS

A major challenge for businesses today is to manage the environmental and social impacts of their commercial activities. Businesses need to walk the talk – and put their words into action. This is nothing new for us. We do it not because it is currently required – but because it has always been part of our company's DNA.

CLAUDIA MERKEL

Strategic sustainability management is the systematic integration of social, environmental, and economic aspects into business management. This is intended not only to minimize any negative impact from a company's operations but also to ensure that it makes positive contributions to the sustainable development of the economy and society as a whole. One example of this is the development of technologies that can help us to achieve climate goals.

The management of the environmental and social impact of own activities is one of the major challenges for companies in all sectors in the long term. Due to the increasing societal awareness of social and environmental issues, the needs are changing for customers, employees, and the talent that needs to be recruited. Companies have to back up their words with actions. These actions must have real, tangible, and concrete impact when we adopt a strong position and take action on key social and environmental issues.

ENVIRONMENTAL SUSTAINABILITY

Calculate, reduce, offset – this is crucial for climate protection as defined by the Paris Agreement. COPA-DATA's goal is to gradual-

Global Innovators: Stefan Reuther, CSO at COPA-DATA, and Verena Kuhn,
Head of Innovator Communities at World Economic Forum, in January 2023 at the summit in Davos.

ly reduce and compensate for the emissions caused by our business activities over the coming years. Reporting on carbon footprint makes it possible to identify prevention and reduction potential, to set reduction targets, and to develop and implement the relevant activities. In subsequent years, the report can be used to check whether the goals set have been achieved, the areas where progress has been made, and where emissions should be reduced further.

CO2 NEUTRAL BY 2023

Our ambitious goal is for COPA-DATA and all its subsidiaries worldwide to become CO_2 neutral by 2023. The Headquarters in Salzburg have been CO_2 neutral since 2022.

Following the SDGs announced by the UN, companies in the EU above a certain size or revenue and number of employees must demonstrate what contribution they are making toward achieving climate goals in line with the CSR directive in a sustainability report. Dealing with this is definitely in your own interest, because customer demands around sustainability are increasing continually.

COPA-DATA will publish its first comprehensive Sustainability Report in 2023.

Environmental sustainability has long been important to company founder and CEO Thomas Punzenberger. COPA-DATA has been using 100-percent green electricity for years. He states: "Our basic attitude is the driving force behind our commitment. What we do, we do with conviction – and usually earlier than everyone else."

In 2022, the expansion of the Headquarters in Salzburg was completed. Like the head office, the energy efficiency and sustainability of the building are designed to meet the demands of the future. We reported on this in detail in the previous IU.

BUILDING AUTOMATION SMART AND EASY

With the zenon application for buildings – Building Automation Smart and Easy (BASE) – the generation, purchase, and consumption of energy can be prioritized, distributed, and monitored, as necessary.

The greatest possible energy independence, efficiency, and sustainability are important to COPA-

DATA. The company also wants to make this knowledge available to its customers.

"With our Smart Building application based on our zenon software platform, we provide our own best-practice example for our own power generation, load management, and the targeted prioritization of charging capacities for electric cars," states Thomas Punzenberger.

COPA-DATA also plants trees for reasons beyond CO_2 offset. We consider it an important contribution to social sustainability. With the trees we plant, we support nature and also help small farmers to finance their families' livelihoods. The farmers can cultivate the trees independently and self-sufficiently, which benefits local people. They diversify their income, increase their long-term productivity, and can even set up micro-enterprises. This creates the financial foundation that brings social benefits to local communities.

SOCIAL SUSTAINABILITY / FINANCIAL SUSTAINABILITY

We see it this way: social sustainability and economic sustainability belong together, not only when it comes to "our" forest. Because no company today can afford to do business on the back of its stakeholders, regardless of whether they are employees, customers, or other partners. This is quite apart from the fact that sustainable companies also have a critical advantage when it comes to talent.

It is important to COPA-DATA to be an excellent employer for our employees and to ensure a fair, respectful, and healthy working environment. Fair remuneration is a given; there is no gender pay gap at COPA-DATA – but unfortunately there are still too few women in IT, in general. That is why we are also involved with various campaigns – such as ICT Austria – to get girls and women interested in IT. Apprenticeship training is a matter of course; if you want skilled workers, you have to do something for them. In 2022, we trained ten apprentices.

SDG 4: Research collaborations are seen by the company as an equally important contribution to making the future better for everyone. Among other initiatives, the long-standing research partnership with Salzburg University of Applied Sciences and Vorarlberg University of Applied Sciences should be mentioned here. The latest lighthouse project with the Josef Ressel Research Center for basic research in the fields of system architectures, artificial intelligence, and cybersecurity at Salzburg University of Applied Sciences spans many research projects in the field of smart buildings, cybersecurity, artificial intelligence, human interfaces, energy technology, and self-adapting data transmission. These are the fruits of successful partnership.

In addition, the zenon software platform is an important driver in terms of climate neutrality across all industries: we support our users in achieving their sustainability goals in addition to their financial goals

COPA-DATA AT THE 2023 WORLD ECONOMIC FORUM

The simple yet transformative fact that automation of industrial processes can contribute to achieving climate neutrality has arrived on the big stage: COPA-DATA was invited to Davos to the World Economic Forum to contribute its expertise to the committees as a global innovator. Stefan Reuther from the management board took part in this year's summit inDavos.

CONCENTRATED INNOVATIVE STRENGTH

In the Global Innovators Community of the WEF, more than 400 of the world's most innovative tech companies met to discuss what contribution companies can make to solving global challenges.

The buzzwords "carbon neutrality" and "net zero" are increasingly appearing in connection with production ("net zero manufacturing"). This was one of the main topics at the WEF. That's because, alongside the energy sector, the manufacturing of goods is an area where the automation of processes can quickly make great strides towards sustainability. This is urgent given that global manufacturing sectors are responsible for 20 percent of carbon emissions and consume 54 percent of the world's energy sources.

6TH IPCC ASSESSMENT REPORT ON CLIMATE CHANGE MITIGATION
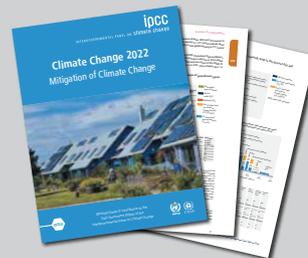
The 2258-page UN assessment report on the environmental and social impacts of a warming world is the most important and comprehensive document on the current state of knowledge on climate change. It is worthwhile for policymakers to read selected chapters and not just the summary.
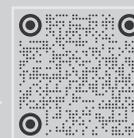
YOU CAN READ AND DOWNLOAD THE CLIMATE REPORT HERE

15

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[1] Source: Reducing the carbon footprint of the manufacturing industry through data sharing | World Economic Forum (weforum.org)

DOES ZENON STRENGTHEN SUSTAINABILITY?

Can the sustainability goals of the United Nations be achieved remain competitive? Read how zenon can help you navigate the digital transformation and ready your business for a more sustainable future.

AUTHOR: STEFAN EDER, PRODUCT MARKETING MANAGER

In an ecosystem, everything is connected and all the elements influence each other. The same applies in the globalized economy, where many processes are intertwined and have an impact on one another. Cross-border supply chains have become essential, but they back up or come to a standstill as soon as one link in the chain falls behind the beat. The war in Ukraine, in addition to its human and political tragedies, has shone a light on these global dependencies. In addition, it has also brought with it the realization that energy is finite after all.

THE CLIMATE CRISIS IS A GLOBAL PROBLEM

Since the oil crisis in the 1970s, we've been talking about sustainability. Unfortunately, it doesn't seem to be on everyone's mind yet. A sustainable and careful use of natural resources is essential. The current IPCC report also conveys this assessment in the following statement:

"It is clear that human impact has warmed the atmosphere, oceans and land. Widespread and rapid changes have occurred in the atmosphere, ocean, cryosphere, and biosphere. " (IPCC, 2021)

This quote on the current state of "patient earth" emphasizes that the time for talking is over. It is now a matter of actively tackling and implementing measures and solutions.

Digital technologies and industrial automation are crucial to building the industry of tomorrow. In this future world, cost optimization, transparency, and the ability to understand our own process data will become new essential business competencies. We are convinced that in this intersection of sustainability and digitalization, a scalable software solution like zenon will help you to become more competitive – and more sustainable. Net zero is often spoken about in connection with climate protection goals. The main aim is to reduce harmful greenhouse gases – above all CO_2 – to net zero emissions.

ZENON IN ACTION

Empowerment: zenon supports users in the transparency and traceability of existing processes. This makes data and energy flows visible. Paper-intensive structures are digitalized and processed automatically. As a result, employees are relieved of analog, often monotonous paperwork. zenon also supports you in calculating your carbon footprint in order to help you obtain subsidies or meet legal requirements.

Increase in efficiency: With zenon, you can use existing resources efficiently and plan ahead. This enables you to increase productivity in environmental and commercial terms. You can also identify potential energy and material savings and implement targeted reduction measures. Implementing energy data management systems enables you to monitor and adjust energy consumption to reduce costs and minimize environmental impact.

Renewable energy: Technologies for phasing out fossil fuels can be implemented more quickly with zenon. On the way to integrated production using photovoltaics or wind power, you can become more autonomous by being your own energy supplier. zenon supports you, for example, as an energy data management system.

WHICH SUSTAINABILITY GOALS DOES ZENON SUPPORT?

As a software platform, zenon makes a significant contribution to digitalization in industry. zenon supports you in day-to-day business with versatility as well as high connectivity and scalability. For example, digital twins can minimize the effort involved in costly small-series production and thereby streamline development processes. In addition, you reduce setup times and can also produce small batches efficiently – down to "batch size 1". This is great for new production lines, but it can also be used to retrofit existing systems and production lines to be equipped with zenon.

BEST-PRACTICE APPROACH

On the COPA-DATA website you will find success stories from companies that are already using zenon. These success stories reflect the flexibility and versatility of zenon. They also confirm our claim to ▸

make the lives of our users easier. In addition, the stories also demonstrate that the topic of sustainability has been part of the zenon story for many years. We see the topic of sustainability as an ongoing process that can and must be kept going through cooperation.

The successful symbiosis between software and industry – i.e. between the digital and real world – is on display in our success stories, a few of which we would like to share briefly. The projects listed here are just an excerpt. You can find many more success stories by scanning the associated QR codes.

GOAL 3: GOOD HEALTH AND WELL-BEING

Ensure healthy lives and promote well-being for all at all ages.

In the chemical and pharmaceutical industry, product lifecycles are becoming shorter and shorter. Merck KGaA was looking for a new solution to easily create and update system configurations and enable rapid upscaling from laboratory to production. With zenon, the technology company was able to roll out modularization according to MTP standards in a higher-level Process Orchestration Layer (POL). This flexible application of modules is accelerating time to market considerably.

GOAL 6: CLEAN WATER AND SANITATION

Ensure access to water and sanitation for all and promote sustainable management of water and sanitary facilities as well as wastewater treatment.

The name Bodensee-Wasserversorgung stands for the highest standards in safety and quality: the association supplies drinking water to four million people in Baden-Württemberg every day. This is done on the basis of optimally designed, state-of-the-art transport and processing systems. Bodensee-Wasserversorgung relies on zenon for visualization and monitoring of their technical equipment.

GOAL 7: AFFORDABLE AND CLEAN ENERGY

Ensure access to affordable, reliable, sustainable and modern energy for all.

The energy provider Azienda Elettrica Ticinese (AET) operates power plants and electricity grids in the canton of Ticino in Switzerland. Using the watercourse of the Leventina Valley, it manages more than a third of the developed hydropower in Ticino. As a network operator and wholesaler, it also supplies the municipal electricity supply companies (EVU) and takes care of the operation, maintenance, and renovation of the regional networks of customers such as Swissgrid, ASTRA, and the Swiss Federal Railways (SBB). AET also operates a network of charging stations for e-cars along the A2 highway.

GOAL 9: INDUSTRY, INNOVATION AND INFRASTRUCTURE

Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.

The independent Greek electricity transmission system operator IPTO S.A. was faced with the challenge of constructing a 400/150 kV air-insulated substation in Megalopolis, Greece, and modernizing some of its older high-voltage substations. Megalopolis is a central node for the national electricity grid and therefore an important location in southern Greece for power generation.

Recycling machines from EREMA return used plastic products to the production cycle, helping customers develop a sustainable circular economy and reduce plastic waste. With comprehensive control system and visualization functions based on zenon, customers benefit from the greatest possible efficiency in engineering and operations.

GOAL 11: SUSTAINABLE CITIES AND COMMUNITIES

Make cities and communities more inclusive, safe, resilient and sustainable.

A visualization system based on the zenon software platform from COPA-DATA is enabling the W.E.I.Z. Innovation Center to better keep its energy footprint in check. The expandability of the system makes it possible to integrate all of Weiz's municipal organizations. The system also extends to external customers by offering energy data management as a service.

GOAL 12: RESPONSIBLE CONSUMPTION AND PRODUCTION

Ensure sustainable consumption and production patterns.

200,000 tons of grain are processed by the mills at GoodMills Austria for flour, semolina and brown-bread mixes. At two locations, the control systems based on zenon ensures ergonomics, robustness, and energy efficiency in manufacturing. Installed in 2003, the system remains futureproof, thanks to ongoing further development. It also supports its users in ensuring and expanding their competitiveness. In 2009, a photovoltaic system was added to the end-to-end, zenon automation solution.

GOAL 13: CLIMATE ACTION

Take urgent action to combat climate change and its impacts

Together towards sustainability: Carlsberg Serbia is using innovative technology and resource-saving processes to continuously improve production processes. Thanks to zenon, a comprehensive utility management system for energy data analytics and cost control was rolled out to optimize energy and resource consumption and to foster sustainability. Consequently, the implemented energy data management system (EDMS) contributes directly to the active reduction of greenhouse gas emissions.

A SUMMARY OF THE SUCCESS STORIES

The projects show the versatility of the zenon software platform. It should be emphasized that all stories are based on a successful collaboration with users. The aspect of trust characterizes the interaction between the digital software and the real environment. Interacting with each other is an essential element of the values of COPA-DATA. In addition, we are firmly convinced that the industrial transformation that is already underway will continue and intensify in the years and decades to come. Digital technologies will play a key role in this process and provide the backbone businesses need to succeed. COPA-DATA is ready to team up with you on this path of transformation.

The selection of the projects pre-sented also reveals a focus on energy issues. One of zenon's greatest strengths in terms of sustainability is certainly in the energy supply sector. From our vantage point, this is also where the greatest leverage lies to support our customers.

Finally, I would like to leave you with an idea to illustrate the potential of using zenon.

Just imagine what savings would be possible, for example, at a global player in the manufacturing industry, if the annual energy consumption were reduced by just one percent. However, the full potential would not yet be exhausted if you were to reduce energy consumption at one location. Instead, savings projects can also be launched and monitored across the various locations of the company. This poten-tial for upscaling is a game-changer, and it can help to bring a business actively and directly in line with the specifications of the GHG Protocol. In Scope 1, for example, measures are evaluated that companies can implement directly.

In addition, we assume that this reduction can continue in the following years. It is clear that small steps lead to significant reductions in consumption over the years. And the environment will thank you.

Whatever goals you set for your sustainability practices, COPA-DATA is your reliable partner in the areas of efficiency, empowerment, and developing renewable energies. We are looking forward to new and exciting projects resulting from successful partnerships and satisfied users.

19

IU

3 GOOD HEALTH AND WELL-BEING — Merck modularizes its process development (Germany)
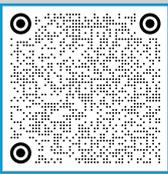
6 CLEAN WATER AND SANITATION — Drinking water for millions with zenon – Bodensee-Wasserversorgung (Germany)
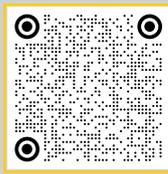
7 AFFORDABLE AND CLEAN ENERGY — Azienda Elettrica Ticinese ensures future-proof power supply (Switzerland)

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE — Substation automation systems for Greek operator IPTO (Greece)

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE — Make it new: How EREMA is giving plastics a second life (Austria)

11 SUSTAINABLE CITIES AND COMMUNITIES — Weiz: Energizing the city (Austria)
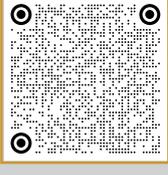
12 RESPONSIBLE CONSUMPTION AND PRODUCTION — Ergonomically monitored and efficiently controlled flour production at GoodMills (Austria)
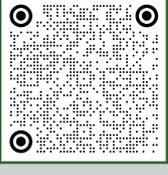
13 CLIMATE ACTION — Together towards sustainability at Carlsberg Srbija (Serbia)

SUSTAINABLE DEVELOPMENT GOALS

PRODUCTS & SERVICES

This image was created using A.I. based on the instruction: "Teddy bears doing data modeling."

DATA MODELING IN OT ENVIRONMENTS

The digitalization of industry has led to a vast increase of data. However, the challenges of using this data are not due to its quantity, but rather to its heterogeneity. Data models can help us to standardize heterogeneous data and make it usable.

Automation specialists, like ourselves, have been working with heterogeneous data from the OT world for decades. These are the bits and bytes that we are constantly processing in data blocks for our PLCs: process variables, sensor readings, set points, actual values, and so on. We collect this data from a variety of machines and processes and use it at all the levels of the automation pyramid. Sounds complex, right?

Indeed, it is complex. One of the major challenges in industry's digitalization is the data's diversity and heterogeneity. How can I compare two machines from different manufacturers if they provide entirely different data? The problem is not new and different industries have been seeking solutions with different degrees of success for years. Uniformly defined metrics such as OEE or standards such as PackML or CIM are the result of such efforts and these models have certainly achieved a lot.

STANDARDIZATION CAN GO MUCH FURTHER...

When a machine complies with PackML standards, automation specialists can expect a well-defined set of information, regardless of its manufacturer or internal functionality. This is a good start, which makes vertical integration of machines much easier. However, we can go further.

One example of these developments is Module Type Package (MTP) in the process industry. Essentially, MTP is a description format for a process engineering unit that not only contains information about the data provided by the machine but also about the services offered, i.e. the basic functionality. Using this description format, a machine and its functions can be integrated into the process automation system with just a few clicks. (https://www.copadata.com/en/industries/mtp-modular-production/)

DATA MODELS SUPPORT MORE THAN VERTICAL INTEGRATION

The aforementioned approaches using PackML, CIM, and MTP have one thing in common: they promote standardization by converting heterogeneous and manufacturer-specific source data into a homogeneous and describable data model. As a result, this gives equipment, lines, and entire processes a defined interface that allows operators to monitor, manage, and analyze the processes and data produced. Of course, this greatly simplifies the vertical integration of OT equipment. But what other benefits do these models offer?

REMOVING DOMAIN BOUNDARIES AND OPENING UP THE MARKET

The software and data landscape in a manufacturing company can be divided into a vertical hierarchy of abstraction levels. At the very bottom and not very abstract, i.e. very close to the physical processes, is the PLC. At the top is the ERP system, with its aggregated figures, cost centers, and balance sheets. And somewhere in between are components such as HMI, SCADA, PLT, and DCS.

It has always been in the interest of suppliers to provide their customers with as much of this vertical hierarchy as possible – the magic words being "vendor lock-in". Historically, almost every major manufacturer of automation components in the OT industry has relied on proprietary solutions for vertical integration. If the green PLC can only communicate with the green HMI and the green PLT, then, for better or worse, the customer has to buy everything as a package – and in green.

However, because the expertise of even the best component suppliers is finite, no manufacturer will be able to provide the best-in-class solution at all levels of vertical integration. For you, as a customer, it makes sense to help yourself from the shelves of a variety of manufacturers.

In the lower part of vertical integration, standards such as OPC UA have made this possible for a number of years. They ensure more competition in the industry and allow users more freedom of choice.

Exactly the same function can now be fulfilled by standardized data models in the upper layers of vertical integration. Process engineering equipment that uses the MTP standard can be integrated into any software that also uses this standard – goodbye vendor lock-in. This not only makes the market more competitive for established manufacturers, but it also opens up the market to new players.

This can only be good for you as ▶

an end user.

DEMOCRATIZATION OF INFORMATION

In the OT environment, we deal with complex processes and machines. For decades, engineers have dedicated countless hours to solving manufacturing challenges in the most elegant way possible. So it is not surprising that the data from these processes can be quite complex. To really interpret it, some domain knowledge is, therefore, required.

This circumstance is made even more difficult by the fact that the structure and naming of the data often follows functional requirements rather than being designed for ease of comprehension. The variable name "A1_MC_P0_DB3_Conv_Rot_Act" might make sense from a PLC programmer's perspective. Unfortunately, for the business analyst it is entirely useless. However, if this information is found in a data model under the item "Filling Machine -> Conveyor Speed", it can also be interpreted by people with less control system knowledge.

Data models have great added value: they transport domain knowledge implicitly and pass on data in a simplified and structured way. This significantly lowers the entry hurdle for interpreting the data and makes the information more easily accessible for many parties. As a result, the boundaries between knowledge domains and applications are broken down.

This is a significant advantage, particularly in the process of digitalization and in aiding IT/OT convergence.

A SECOND-ORDER PROBLEM: HETEROGENEOUS DATA MODELS

From the perspective of a software manufacturer, such as COPA-DATA, that offers cross-sector digitalization solutions, a second-order problem is developing. Standardized data models are being created in different sectors, but these models are often not compatible with one another.

There is a risk that boundaries and incompatibilities will arise again, which may make vertical or horizontal integration more difficult. We are already taking on this challenge today and are developing highly flexible tools for modeling data – across all sectors – for upcoming versions of the zenon software platform.

You will be able to read more about this topic soon in IU.

PHILIPP SCHMIDT
Industrial Digitalization Freelancer

Philipp Schmidt has worked in the area of industrial digitalization for more than ten years and has helped to shape these innovative changes from the very beginning. As part of our Product Management team, he supported companies with implementing new technologies and developed the zenon software platform for the future. Today, he accompanies organizations as a freelancer in the creation and implementation of their digitalization strategy.

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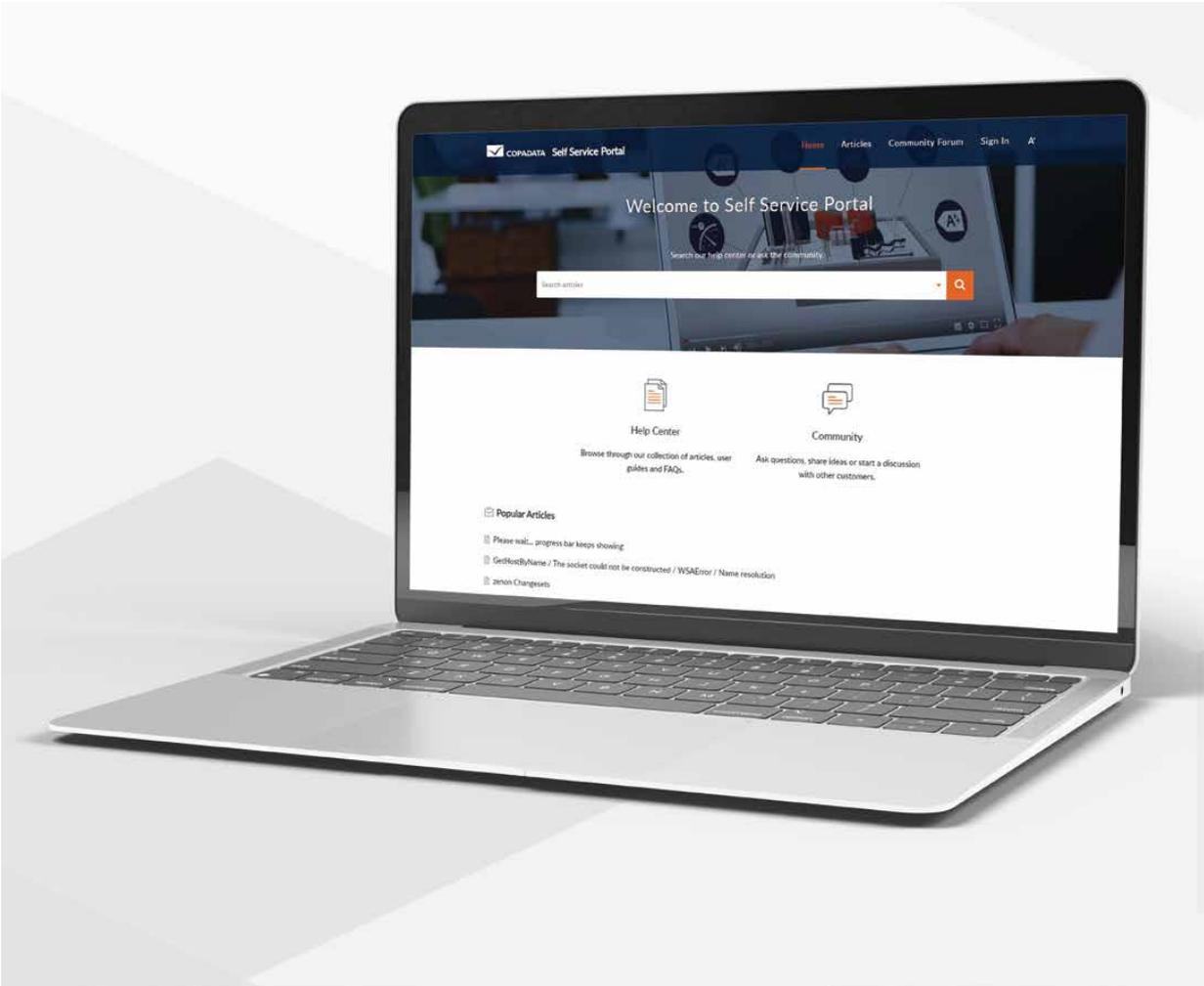
WHY WE LOVE FEEDBACK SO MUCH

Our Support Services team is taking significant strides with new tools, a new customer portal, and added content – thanks to your feedback! As a result, our support services are even faster, more efficient, and feature new self-help options for users.

In 2019, for the first time in our company history, COPA-DATA surveyed our customers worldwide about our support services. We were pleasantly surprised not only by the number of responses (almost 300) but also by the results and comments. A customer satisfaction score (CSAT) of 4.04 (on a scale from 1/very dissatisfied to 5/very satisfied) put a smile on the face of every team member. A benchmark assessment of our services, conduc-

ted by the Technology & Services Industry Association (TSIA.com), highlights this above-average CSAT in an industry and peer group comparison. This excellent rating was confirmed by another survey in 2021, with even more feedback and an equally high CSAT value.

THE SURVEY ABOUT SUPPORT SERVICES

Far more meaningful than KPIs are your individual responses. Short re-

sponse times, expertise, and personal, friendly, and committed service were mentioned most frequently. We are heartened to note that these answers closely reflect our internal values. Above all, this dedicated, personal service is something that, in our opinion, clearly sets us apart from the competition.

At this point, I would like to thank you for your answers and the recognition shown. However, the survey also sought to identify ▶

Customer Satisfaction Score

- very satisfied
- satisfied
- moderately satisfied
- slightly dissatisfied
- dissatisfied
- very dissatisfied

Customer Effort Score

- very low
- low
- neutral
- high
- very high

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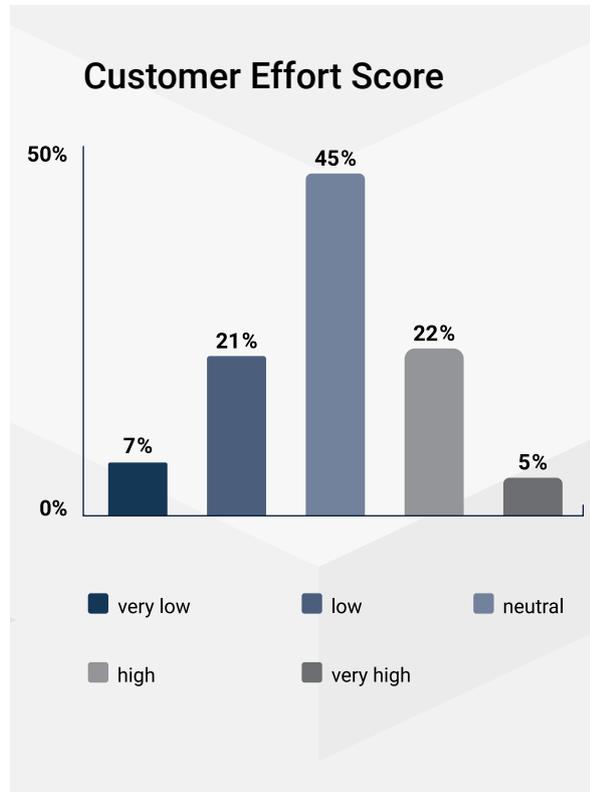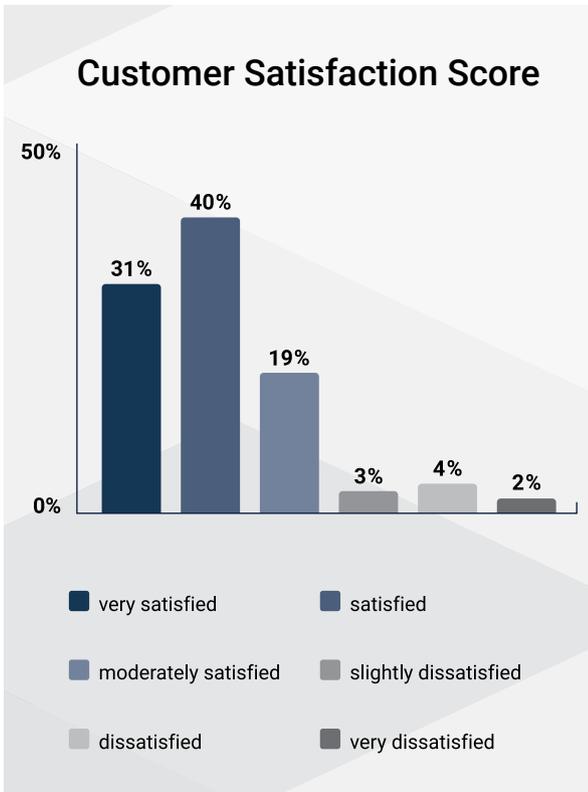
potential for improvement. Therefore, in addition to customer satisfaction, the Customer Effort Score (CES) was also measured. This indicates how highly zenon users estimate their own effort when they have a question about zenon. With 3.1 (on a scale of 1/very high to 5/very low), there is clearly room for improvement.

Analysis of the survey revealed that the biggest hurdle for users is obtaining the data and logs required for support. A lot of time is spent in preparation before the customer and support staff can work on the actual query. Helping people to help themselves was not as easy as users expected.

This is a clear mandate for COPA-DATA to reduce the effort on the part of customers, in line with our motto: "There is always an easier way!". In the past three years, we have worked on many projects, all with the goal of making day-to-day work even easier for zenon users. These include new systems, improved support service tools, and expanded, more efficient self-help options. We aim to help expe-rienced users find answers to their questions themselves but also to help customers who are looking for simple solutions.

Read on to recap the changes made over the past three years.

THE NEW SELF-SERVICE PLATFORM

Customers asked for a simple, central search function for everything to do with the zenon software platform; a central search function that works for beginners as well as power users. The information then found should help users to work out answers to questions themselves. The benefits are clear: customers can find solutions faster, more efficiently, and independently – regardless of people, response times, office hours, or time zones. This saves a lot of time and money, particularly for smaller queries.

The search function on the new self-service platform is filled with hundreds of checklists and FAQs created by zenon experts. The particularly active zenon Community Forum has also been included in the new portal and is included in the search functionality, including user know-how from the last 15 years in thousands of zenon Community Posts.

Do you always want to be up to date on the latest bug fixes and product enhancements? In the self-service portal you will find a change set area, where you can download a list of all product changes for each zenon version. You can filter this list as necessary and keep it for audits.

MyArea in the self-service portal provides a complete overview of your tickets and those of your colleagues in your company. You no longer need to archive emails or maintain your own tracking lists of tickets. The complete history is stored clearly and in searchable format – for open and closed support tickets.

SYSTEM INFORMATION COLLECTOR

Providing the logs and data required is often a challenge for users, with different log files in different locations, various configuration files, and system information. Even then, the critical source of information can

be missing. From our experience, a large part of the time it takes to answer a question is spent on information retrieval. This situation is not satisfactory for zenon users or for our support team.

The System Information Collector (SIC) is a tool that collects all data relevant to support services and bundles it into one package. It is intended to help us understand your request even faster so we can offer solutions promptly. It is version-independent, activated in just a few clicks, and can be used with all platform products. Even better for users: the latest version of SIC can be downloaded and run as an independent tool at any time from the self-service portal – even without prior zenon platform installation. It is continuously being expanded and a more user-friendly interface is already planned. This enables you to carry out an initial analysis of the system and identify problems yourself.

Tip: Save time and effort by sending the System Information Collector log with your initial request!
Get the latest version directly from
www.copadata.com/sic

NEW TICKETING SYSTEM

In Support Services, we are working with a new, state-of-the-art ticketing system. For example, we plan to use artificial intelligence to automatically search all available resources and pass on relevant information directly to customers – including on public holidays and without delays or limited availability. The new system also allows guided automated communication. In the future, the ticketing system can point you to helpful checklists with specific questions or verify which steps you can take first and which data you should collect for the ticket.

New content for the self-service portal can also be generated directly from tickets in the new system. As a result, the information available to all customers will continue to increase in quality and quantity.

FILE INSPECTOR

This tool enables you to analyze zenon log files with alarm and event data from zenon Service Engine in chronological order. Extensive filters and search functions ensure that log messages can be narrowed down in a selective manner. Important messages can be marked. Graphical processing of the frequency of occurrence allows you to draw specific conclusions and quickly identify time-related dependencies.

The new tool offers extensive options for problem analysis, especially for experienced zenon users and support personnel. You can identify anomalies in the system more quickly and compare their occurrence and frequency with CEL, AML, and archives from Service Engine. This saves time by offering more efficient analysis.

Tip: For zenon version 11 and higher, you will find File Inspector in the tools area of the zenon Startup Tool.

WHAT'S NEXT?

In the years ahead there will be further innovation in support services and systems maintenance. For example, users will be able to configure and manage log files centrally from all zenon systems in the network. Of course, there will also be iterations to the product itself to further improve the experience for colleagues and customers.

Do you have any ideas about how we can support you even more efficiently and personally? Have you always wanted to say something about our support services – whether something positive or about something that could be improved?
I WOULD BE VERY HAPPY TO HEAR YOUR IDEAS AND SPEAK WITH YOU.

JOHANNES FOIDL
Support Services Manager

Johannes Foidl has been part of the COPA-DATA team in Salzburg since May 2011. In his current role, he leads the Support Services team at COPA-DATA headquarters. Johannes is jointly responsible for systems, procedures, and processes related to support worldwide for the COPA-DATA Group.

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LET ME HANDLE THAT FOR YOU!

Digital networks offer many companies the potential to provide new services, such as remote diagnosis and remote maintenance. Find out how you can get fit for the future using the zenon software platform and our new Device Management service.

Digital transformation is in full swing. Production data is increasingly being used by businesses to make informed decisions. Data-driven decision-making promises more efficient production processes, less downtime, and reduced energy consumption.

For this reason, connected machines and equipment that send data to central instances, whether continuously or in blocks, are critical. On the one hand, connectivity requires higher security requirements for the technical systems involved. On the other hand, it allows machines to be used at remote locations and, under certain circumstances, these machines can run even without operating personnel. Examples of this are the monitoring of energy converters in distributed photovoltaic systems or equipment used worldwide in the food and beverage industry.

In any case, it will be necessary to monitor equipment operation and status via data interfaces in order to take action when needed. This can range, for example, from simple configuration and troubleshooting to importing configuration changes and security updates.
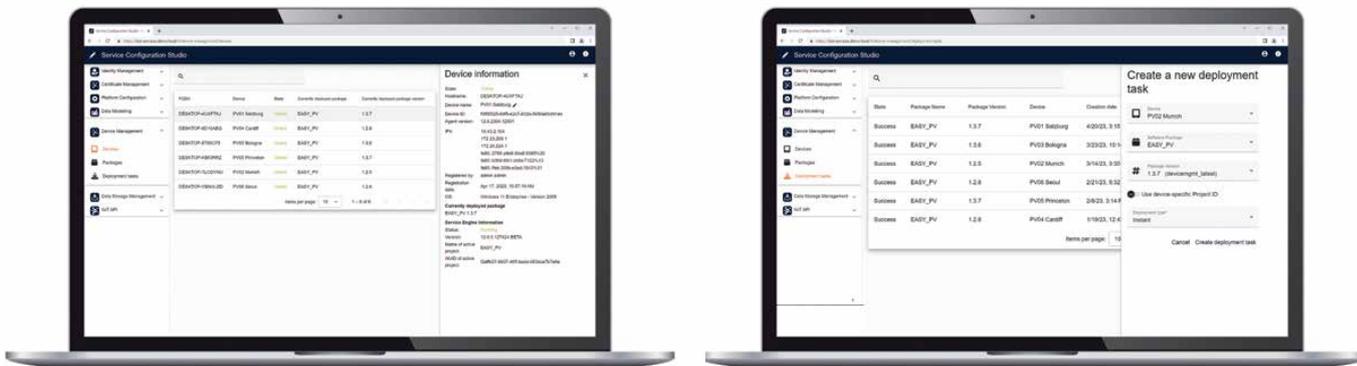
The basic information of the connected devices and the currently installed zenon projects can be checked in the devices overview.

Things are also easier for service personnel if they can check on the state of equipment and keep track of logs remotely.

Remote maintenance improves sustainability and energy efficiency since it eliminates unnecessary travel. This saves time and money and reduces emissions. Predictive maintenance functions also make it easier to optimize equipment and processes, enabling service personnel to intervene and prevent equipment or machine downtime.

For this reason, we are working on new features in zenon intended to support these activities and optimization strategies. Our new zenon Device Management service is at the heart of these developments. It can be used flexibly, as with other zenon IIoT Services. We will continue to develop this service over the next few years, guided by a targeted but flexible vision.

THE VISION BEHIND ZENON DEVICE MANAGEMENT

Device Management focuses primarily on managing services for the zenon software platform. For example, our plans include manual and automatic updates of zenon projects on connected machines or the initial installation of zenon components.

A tagging system, combined with a configurable set of rules, is intended to provide further flexibility for rolling out fully or semi-automated updates. For example, the solution will support workflows that allow project changes to be uploaded and then enable the equipment operator to install the upload at a later time. This could be performed after manual confirmation during a maintenance window or a period of downtime. These types of processes will be particularly useful for batch updates, where the same update can be uploaded to multiple identical machines. The system takes into account equipment-specific settings and parameters when installing these updates, in order to retain the individual properties for each instance.

When it comes to error handling and support activities, functions such as retrieving log messages and viewing system parameters such as CPU, memory, or network utilization are designed to make life easier for service personnel.

WHERE WE STAND TODAY

Following our vision for zenon Device Management, we have divided the implementation of the functionality into successive phases. The priority is on the greatest possible benefit for applications.

Currently, device agents can be installed and registered on Windows and selected Linux operating systems. A device agent is installed on every connected machine and receives the tasks to be carried out from the central Device Management service.

To distribute projects, the fully compiled zenon project can be uploaded directly from zenon Engineering Studio to the Device Management service using a wizard. The upload is completed after the relevant user authentication and authorization checks are performed.

Once the package with the project content is available in zenon Device Management, it can be transferred to a connected machine and installed by creating a deployment task. In this step, you can choose to run the installation immediately or at a future time. The feedback and any log information from the installation process is then shared with zenon Device Management so that the administrator is notified regarding the success of the installation. As an option, users can also activate the automatic connection to the IIoT Services and, consequently, data storage or the IIoT API. The device agent takes care of the necessary settings and thus reduces the related configuration steps.

A corresponding view with filter options is available to keep track of the project versions uploaded already. The different projects can also be viewed and managed here.

In addition to distributing zenon projects, remote-controlled ▶

29

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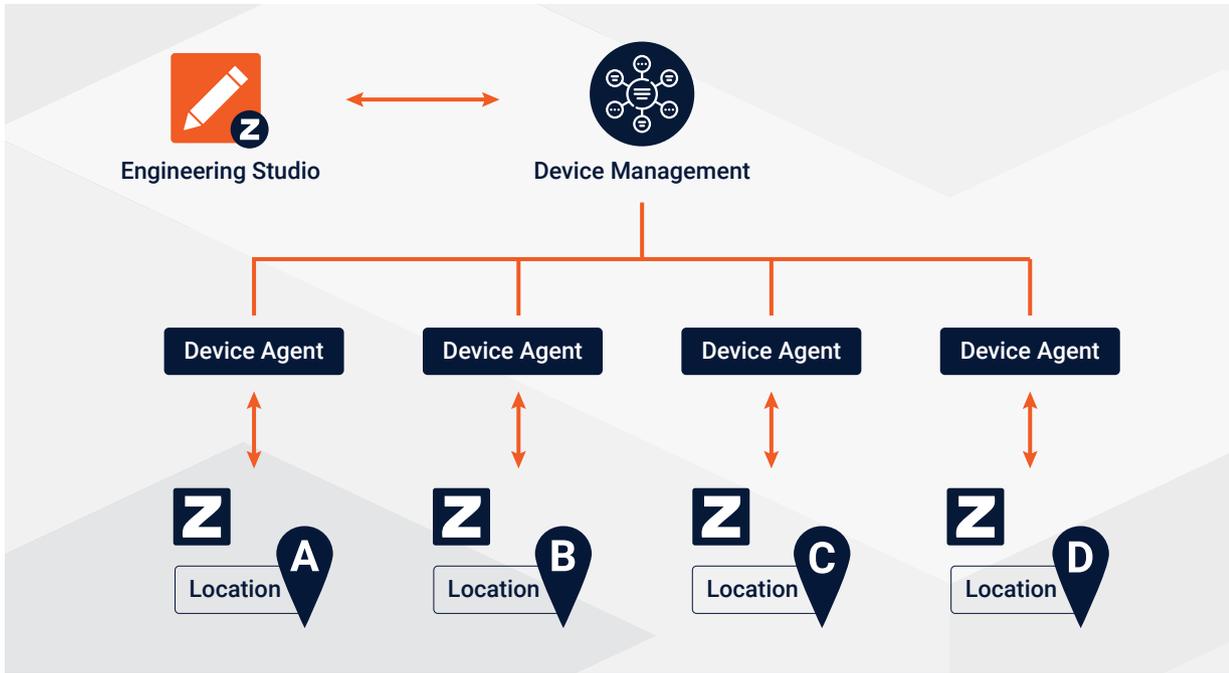
The Device Agent is installed on each device and takes care of the information exchange with the central Device Management Service.

updates of the Device Agent component are also supported. This ensures that the Device Agent contains the latest functions and security measures at all times.

For the equipment overview, basic information – such as the computer name, assigned IP addresses, operating system version, and the version of the installed zenon Service Engine – is identified and displayed centrally in zenon Device Management.

THE NEXT STEPS

Future versions of zenon Device Management will include new and expanded functionalities that, for example, collect log messages from the installed zenon services. Running batch-based updates simultaneously on multiple machines is also an important aspect of this functionality. In particular, it will enable users to more efficiently manage all of the connected zenon Service Engine instances and zenon projects.

As you can see, we have big plans for Device Management on the zenon software platform as we steadily expand its range of functions.

You can look forward to more forthcoming features and the exciting possibilities they will enable!

MATTHIAS SCHNÖLL
Product Manager

Matthias Schnöll joined COPA-DATA in 2015. He has been part of the Product Management team since 2018. As a product owner, he works on developing the zenon software platform. His main focus is on zenon IIoT Services and all cloud-related issues. He considers bridging the gap between OT and IT as one of today's most important challenges.

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INSIDE ZENON HISTORIAN 360

Without a doubt, the collecting, processing, and analyzing of production data is more important than ever. As a result, companies are increasingly relying on process historians that are able to meet these requirements and much more. zenon Historian 360 has a lot to offer in this regard.

When we consider the data produced in the industrial environment, only 20 percent of this data is structured. The remaining 80 percent is available in various formats and is unstructured. As a result, fast and efficient further processing is out of the question.

zenon Historian 360 can help here, because it offers specialized solutions for these and many other requirements in the industrial environment.

YOUR BENEFITS WITH ZENON HISTORIAN 360

The software not only collects the data, but also harmonizes it at the same time. No matter where data comes from, it is stored uniformly when merged into zenon Historian 360. A high level of data consistency and data integrity ensures that the data is complete and correct.

The data collected by zenon Historian 360 can easily be made available to different areas of the business for advanced analysis, the creation of reports, visualizations, predictive analytics, etc. The same, ▶

comprehensible data is available for each area without having to be specially prepared.

THE DATA PATH

The main task of a historian is the automated collection and storage of time series data in an industrial automation environment. The data acquisition requirements can vary depending on the sensor, controller, or system. With zenon Historian 360, the data sources can be configured individually.

DRIVER LANDSCAPE

It's common to find machines and systems from different manufacturers and series in production facilities. In order to be able to connect heterogeneous infrastructures, the greatest possible flexibility is required. Thanks to zenon's more than 300 drivers and communication protocols, you can rise to this challenge with zenon Historian 360.

DATA ACQUISITION

Flexibility is a top priority with zenon Historian 360 when it comes to data acquisition. There isn't just one way to collect data. Depending on the requirement, different scenarios are possible.

THE STANDARD METHOD – RECORDING OF CHANGES

Any change in value, no matter how small, e.g. a temperature sensor, is recorded seamlessly. However, with this type of recording, a lot of data can accumulate, especially if the value changes frequently in the high decimal place range. A hysteresis or the swinging door algorithm can help here – or you can choose a different type of recording.

CYCLICAL RECORDING

If you want to monitor values in a regular cycle, cyclical recording is the right choice. Values are recorded here at a specified interval, e.g. energy meters that record energy consumption at 15-minute intervals. This means that significantly less data is generated, which can be pro-

cessed more quickly and efficiently.

EVENT-TRIGGERED RECORDING

Your data is specifically recorded by setting a trigger. This is particularly useful if you want to record the data precisely at a certain project step in production, e.g. at the start of a batch production run.
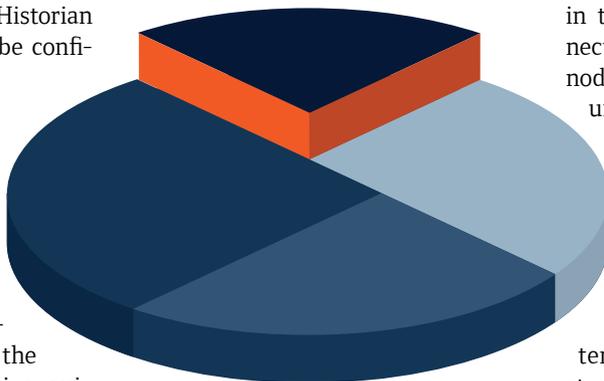
DATA VALIDATION

zenon Historian 360 not only records the data, it also validates and labels it accordingly. This is possible because the data being recorded is linked to metadata that contains relevant details such as value ranges and so forth. Furthermore, each recorded value is linked to a status that contains statements about the value recorded. This shows whether there was a communication problem at the time of recording and whether the value is valid. You can also see whether the machine has been serviced and the value can therefore be disregarded or whether the value has been changed manually afterwards. This ensures you have full transparency in your data.

DATA ACQUISITION NODE

A single- or multi-server architecture can be used depending on the size of the project, development stage, or local conditions. Each server or, as we call it, data acquisition node, is only used for collecting the data. Long-term storage of the data is possible and makes sense for smaller projects, but we recommend forwarding the data to zenon Data Storage, the centralized data storage system. Only in

the event of a connection failure is data stored locally. This is actioned indefinitely until the connection is restored. This prevents data loss.

DATA BUFFERING

As a rule, the data acquisition node immediately forwards the data collected to the central database. Even if the connection to the data storage is interrupted, not the slightest gap in the data is allowed. If the connection is lost, the data acquisition node buffers the data indefinitely until the connection to the database is restored and it can be saved reliably and completely in the centralized data storage system.

DATA STORAGE

The zenon Data Storage system is responsible for central data storage, long-term data storage, and carrying out data operations. This is based on a high-performance NoSQL database management system optimized for zenon Historian 360. It is optimized for recording large amounts of data. The zenon Data Storage system can be adapted flexibly to meet requirements. Use the data storage on-premises application in a Microsoft Windows environment or in a container (e.g. Docker) in a Linux or cloud environment. If necessary, container virtualization enables load distribution and data replication, which is particularly recommended for implementation with very high data volumes. zenon Data Storage grows with you and is fully scalable whenever necessary.

VERTICAL INTEGRATION AND DATA ACCESS

A historian has to be able to share the collected production data with other higher-level parts of the organization. Even if the data is stored homogeneously by zenon Historian 360, the systems to be connected are anything but standardized. zenon Historian 360 is versatile in this regard. Data sharing can be carried out in many different ways. It is possible to transfer data using

The data path.

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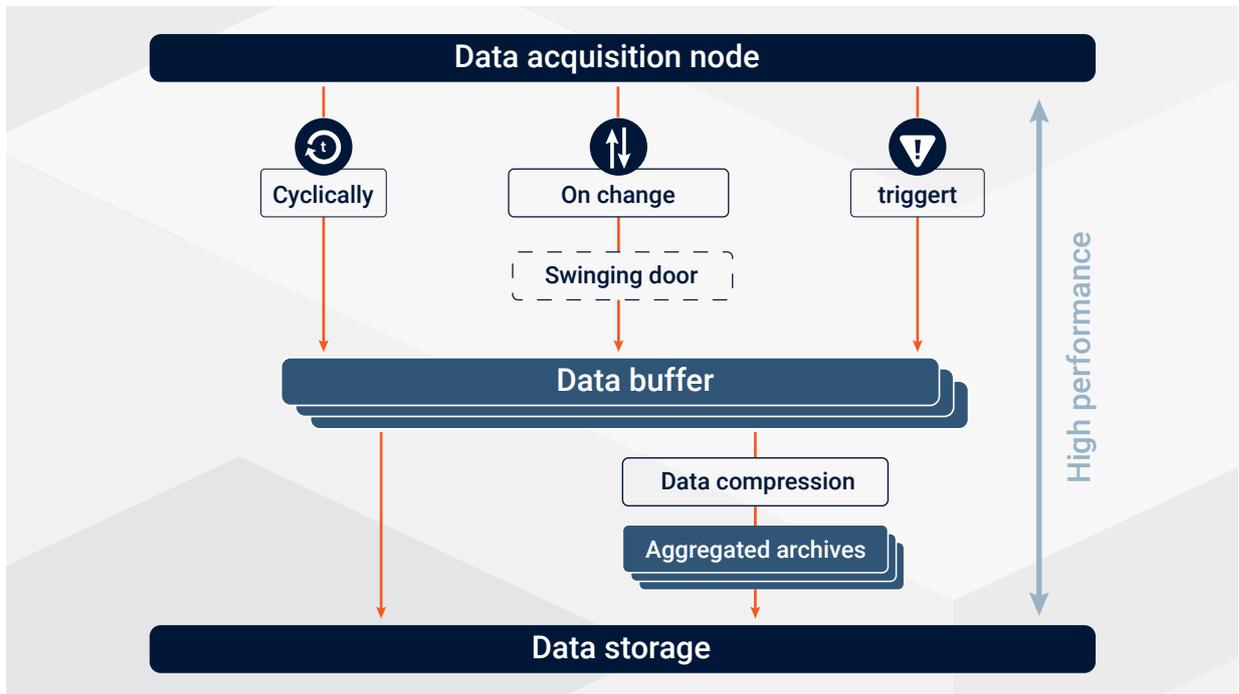
data exports, dedicated protocols (SAP interface, Werum PAS-X interface, etc.) or flexibly using APIs, e.g. via a GraphQL interface. GraphQL is a standardized query language that provides fast, easy, and efficient access to process data, alarms, and metadata.

DATA ANALYTICS AND DATA VISUALIZATION

Data is an extremely valuable commodity. By analyzing and visualizing data, you can gain important insights into the manufacturing processes. This can help you to further optimize processes and reduce costs. Here, too, zenon Historian 360 offers a wide array of possibilities. Choose what suits you best. Use the powerful zenon Report Engine to, for example, evaluate zenon alarm messages or analyze and visualize data using the set status bits. You can also evaluate Report Engine data directly in Excel using the Office data integration. Alternatively, use the zenon PyZAN library to develop a Python application that uses the data recorded for predictive analytics or predictive maintenance. This way, you benefit directly from the versatility of zenon Historian 360.

THOMAS LEHRER
Product Manager

Thomas Lehrer joined COPA-DATA in 2011. He first worked in Consulting and then in Product Management, where he was responsible for the development of zenon Reporting. He is currently the product owner of several new development projects. He gladly faces these challenges in the spirit of statesman David Lloyd George's motto: „Don't be afraid to take a big step. You cannot cross a chasm in two small steps."

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PROFESSIONAL SERVICES – ALWAYS AND FOREVER AT YOUR SERVICE

Rising production costs, shortened planning horizons, the implementation of data-driven production systems – and software updates to top it off? The Professional Services team helps you to meet today's challenges and ensures that software upgrades and new product developments are implemented to meet your needs.

Designing and implementing customer-centric solutions is the bread and butter of COPA-DATA's Professional Services team. This article looks at the team's mission and strategy. It was founded in 2011 in response to customer requests for experts to develop specialized solutions on the zenon software platform. COPA-DATA developers began to focus on development activities outside the scope of regular support services. Over the years, the range of services offered by the team has expanded steadily. Then, as now, the team's focus is on providing the best possible customer support for the zenon software platform – supporting its introduction and ensuring efficient operation. The software enhancements developed by the team are tailored precisely to customer needs and enable the product range to be generated in the most sustainable and resource-efficient way possible. This applies to resources such as electricity or water, as well as personnel, since employees benefit directly from the intuitive user interfaces and ease of operation. Another milestone is the rollout of the concept to COPA-DATA subsidiaries, which was carried out successfully in 2019. This leverages existing synergies and strengthens the support provided by your local zenon partner.

HIGH-TECH MECHANICAL ENGINEERING MEETS USER INTERFACE

Romaco, a Bologna-based manufacturer of machines and integrated system solutions, specializes in the development, manufacture, and packaging of a wide variety of products. Its range spans food, pharmaceuticals, nutraceuticals, cosmetic, and chemical products. The requirements for automation software are understandably diverse. In addition to the daily challenges in manufacturing operations, it is continually confronted with new requirements and regulations, for example, through certifications or changes in workflows or in machinery.

At an international trade fair, Romaco wanted to present a filling machine in which the technical innovations were visible in the interface design. The time horizon was tight and there was a lack of in-house developer resources to be able to implement such a project in the time available. Cooperation between Romaco and the Professional Services team from COPA-DATA proved to be the solution to this challenge. How did the collaboration work?

At the outset, our team visited Romaco in Bologna to discuss the objectives and the scope of the cooperation. This was followed by a proposal for carrying out desired development work and a kick-off meeting with everyone involved from technology, design, project management, and sales. The Professional Services team first studied the machinery to gain a deeper understanding of the various functionalities and processes. Romaco experts from the Commissioning/Support and Development departments then gathered further information on the details and possible stumbling blocks that could be identified in advance. Concepts for the operating design and the graphical user interface for the operator terminals were then designed and the redesign of the technical project architecture was started.

After additional usability tests, a review of the previous new developments, including the color concept and new icons and symbols, was carried out together with the client in order to be able to deliver the pilot version on time.

As part of the coordination activities, daily and weekly meetings were held regarding the development status and feedback loops were monitored closely. As a result, the zenon pilot project was improved continuously. This initial concept phase, including the first tests, later saved a lot of maintenance and troubleshooting effort.

Thanks to the close cooperation ▶

35

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between the specialists from Romaco and the Professional Services team at COPA-DATA, a completely new operating concept for system users was generated in just three weeks. The zenon pilot project can now be used as a basic project for other machine types which can be easily adapted to meet the relevant needs. The intuitive and clear structure of the graphical user interface not only facilitates simplified human-machine interaction, but also ideally reduces training times for new employees. Not only that, due to this positive experience, further follow-up projects have been implemented across teams and in cooperation with other COPA-DATA subsidiaries

"Our business area is very competitive, driven by highly skilled and demanding customers. We have to get out of the comfort zone and face the market with innovative and captivating solutions. The partnership with COPA-DATA allows us to obtain the most appropriate knowledge and technical solutions to satisfy our customers."

Franco Ficarra,
Automation Engineering Manager at Romaco

PROFESSIONAL SERVICES

Are you looking for software solutions tailored closely to your needs? The Professional Services team welcomes new challenges that will support you in your daily work and help you use your equipment and resources more efficiently. The range of services offered includes:

PROJECT CONFIGURATION SERVICES
- Project concept development
- Support, review, and optimization of projects
- Creating project templates and Smart Objects
- UI/UX Design

APPLICATION DEVELOPMENT
- Wizard development for zenon Engineering Studio
- Add-in programming for zenon Service Engine
- Developments in zenon Logic

PROJECT SUPPORT
- API support / code review
- Project / code optimization workshops
- Designing and creating reports

To reach our team of experts, contact your local zenon representative or visit:

WWW.COPADATA.COM/EN/SUPPORT-SERVICES/PROFESSIONAL-SERVICES/

JOSEF RIES
Technical Editor

Technical editor Josef Ries is responsible for creating and updating the online help for the zenon software platform. In addition to managing various engineering teams, he also is responsible for zenon Logic documentation.

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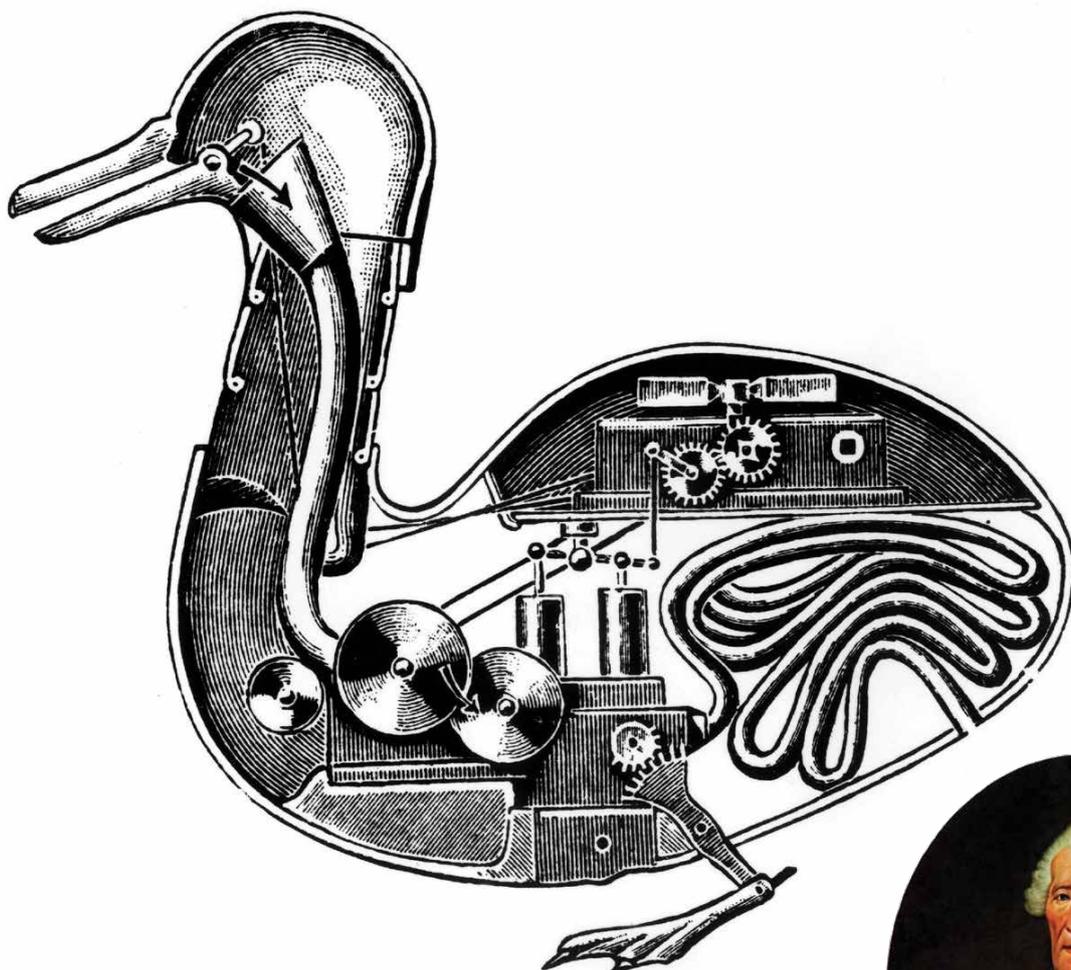
AUTOMATION: A STRATON STORY

Jacques de Vaucanson was born in 1709 in Grenoble in the French Alps. Some three hundred years ago, de Vaucanson already understood that automation could ease our lives. In 1737, he created the world's first robots, including a life-size figure of a shepherd that played the tabor and the flute and had a repertoire of twelve songs. Subsequently, de Vaucanson created the world's first automated silk-weaving loom and the first all-metal lathe. Through his work, modernization accelerated.

HURTLING FORWARD INTO MODERNITY

The world is in constant motion. Meeting today's challenges is crucial – perhaps more than ever. We must adapt, so industry must too. Even in our own lifetimes, the pace of change is rapid.

In 1812, around 67 years after Jacques de Vaucanson's invention, the world became smaller when Richard Trevithick put on rails the first train in history. It enabled humanity to reduce the transportation time between towns, regions, and countries and made it easier to transport people and goods. Through the 1900s, we saw the invention of the transistor, the electric washing machine, the first modern computer, and even the first civil plane.

Inventors had in their heart the goal of making human life easier.

While modern machines were populating our environment, it became important for factories to increase their efficiency – in terms of production, of course, but also in terms of resource consumption. Tools to optimize production were required. And other tools to monitor energy consumption, enable ▶

automatic analysis, automate processes, and optimize graphics became must-haves too. The need for these tools is even greater today, as we face a future of climate change and seek to create a more sustainable world.

STRATON EVOLVES TO MEET THESE NEEDS

When zenon's story began in 1987, it was one of the tools able to answer industry's new expectations. It provided an easy way to synchronize a large amount of data from different devices made by different manufacturers and using different communication protocols. Over time, it became a software platform that could answer industrial requirements in the main sectors of activity: energy, pharmaceutical, food & beverage, automotive, and the process industry.

The development of straton followed in 2002. This strengthened the zenon software platform's solution for IEC61131-3 logic and fulfilled the needs of customers wishing to have a complete solution from field to SCADA.

286 years after the creation in Grenoble of the first automaton, straton is born in the same city. Christian Jargot states: „The straton adventure started with a round trip to Salzburg to meet the COPA-DATA team. The machine was launched. As soon as we came back, we started to develop the software. Since then, we have never stopped developing it."

A traditional programmable controller (PLC) would have been limited to specific features, certain programming languages, function blocks, communication protocols, Input/Output (I/O) boards, hardware capabilities, etc. This kind of solution would have needed a whole PLC family to be manufactured to meet different use cases. It would then become expensive – including for the end user – in terms of mo-

ney, engineering time, materials, and electronics – particularly if the hardware needed to be changed if new features were required.

The industry needed something more flexible: a soft PLC. This brought automation to the core of the system. And we mean automation in the broadest sense: for a wide range of uses – from a small, embedded controller in a truck to an intelligent circuit breaker in a power plant.

PLC OR SOFT PLC: WHAT'S THE DIFFERENCE?

In the early days of the PLC, they were developed to meet a specific purpose, with specific features and hardware. The only modularization was the option to add additional I/O boards, directly fixed into the hardware.

By contrast, a soft PLC is fully flexible. The I/O boards are external modules communicating with it. As the software can be integrated with any platform and be customizable, it is cost-effective and more convenient for manufacturers, integrators, and end users. It enables a small microcontroller or classic PC to be turned into a PLC.

Today, the distinction between PLC and soft PLC has almost disappeared. Almost all PLCs will use a similar software concept to the soft PLC. The software seems hidden, but it is already everywhere around us.

ONE MAJOR NEED: TO EVOLVE

From the beginning, a key ambition for straton was for it to be customizable – so that it can adapt to all customer needs and market sectors. It has to be capable of being integrated with any platform, so that it is the basis for solutions that last over time, are not discarded or changed when new requirements emerge, and for which the application remains the same no matter the hosting device.

Since straton's original iteration, developments have been made to create a source code that is portable on any OS, particularly the one which is today used the most: Linux. straton has also been adapted over years to be implemented on systems with all kinds of CPUs, including ARM and Intel processors, in 32bit or 64bit architecture. It supports increasing data processing

The Fieldbus Configuration in straton allows you to configure the communication to external devices through different wizards.

capacity. In this way, straton lives and evolves through time, as good technologies do.

WHICH FEATURES?

Sustainability requires a highly adaptive solution. But it does not end there; sustainability is seen in features to improve the overall system robustness. In this way, we avoid, or at least reduce, the impact of unpredictable failure or data corruption which could cause discontinuity to energy supply, machine stoppages, production losses, or even environmental damage. This is seen in the implementation of redundancy capabilities for certain communication protocols; another key topic in straton's development.

Communication protocols have been secured using authentication and TLS encryption of data exchange since early on. Limiting the options to access or modify critical data ensures a proper way of working for all devices in the loop – from the sensor, through the logic, to the SCADA.

The creation of different tutorials, help, and use case examples also helps to improve reliability for the end customer, supporting them to adapt the system with as little effort as possible. In this way, we can share the experience of people involved over straton's long history.

PROFINET S2

The most recent and notable change in this area has been the implementation of S2 redundancy for Profinet communications. The term S2 roughly means a Single Device with two (2) controllers. Both controllers are at play in the redundant system – one being active, the other being backup. This ensures that, in case of failure of the first controller, the second can take over communication while the other is replaced.

The outcome is improved reliability in the overall architecture; strengthening the processes in which such a solution is implemented. Thus, straton and zenon users can be confident in their solutions: they know their system is designed to run smoothly for a long time.

> "I was in charge of implementing Profinet S2 redundancy inside our Profinet Controller driver. This was a very interesting challenge, as there is very little information outside of the standard about this feature – mainly because only a few people know about it. Providing this feature to our controller driver makes it more powerful. It is one of the very few which can handle this kind of redundancy."
>
> **Anthony Ralay, Developer, in charge of Profinet drivers.**

STRATON TODAY

Today, straton continues to evolve this way. Around 75 percent of features in each release are implemented in response to customer need. The remaining 25 percent are inspired by technological advances and to deliver strategic enhancements. Together, the full 100 percent adds up to a complete solution that meets market and industry expectations, enabling customers to reach their financial and sustainability goals.

Just as this tradition for innovation based on the notion of creating an easier life began in Grenoble 286 years ago, so it continues to this day!

39

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ANTHONY BURILLE
Managing Director at STRATON AUTOMATION (France)

Anthony Burille joined the COPA-DATA family in 2014. He was team leader of the Customer Services Team at STRATON AUTOMATION from 2018 and became Managing Director in 2022. With extensive experience working with customers on technical projects, Anthony Burille now supervises and contributes to all activities of the company.

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WHO'S IN CHARGE? TALKING ABOUT EV CONNECTIVITY

Have you ever thought about what happens when you make the physical connection between your electrical vehicle (EV) and a charging station to start charging your vehicle? Ohm's law dictates that the current that flows when closing an electrical circuit equals the voltage divided by the total resistance.

When you plug in several electrical heaters into sockets on the same circuit in your home, because they are connected in parallel, the overall resistance of the circuit is less than it would be for a single heater. The total current that flows would likely exceed the safe capacity of the circuit. At this point, a fuse or circuit breaker should interrupt the flow of electrical current.

Consider that an AC charger can charge an electrical vehicle with up to 22 kW and a rapid DC charger can charge with 175kW or more. The fact that you can still charge most EVs using a domestic socket suggests that Ohm's law does not directly apply and some kind of regulation must take place.

COMMUNICATION IS NEEDED

Every EV has an onboard charger which is used when charging an EV using an AC charger. It converts the AC power into DC for the EV's battery management system so it can charge the batteries at the maximum current it supports.

This suggests that for an EV and an EV charger to agree on how much current can flow, some form of communication is needed.

You would expect that today, when making the connection to an AC charger, information like vehicle ID, vehicle type, battery type, and current battery charge level would be the minimum information shared by the EV. And that the charging station would share its ID, its operational status and the charging currents the vehicle can choose. Yet the reality is quite different.

In fact, an AC charger and an EV don't communicate much more information than an AA battery does with its charger.

LIMITED INFORMATION SHARING

A typical European AC charger uses "Basic Signaling" communication with the CP, PP and PE pins in the type 2 connector. A resistance between the PP and PE pins indicates the maximum capacity of the cable that is used. When a cable is connected between an AC charger and an EV, a resistance value of 2740 Ω between the pins CP and PE exists. A drop in the resistance to 882 Ω signals that the EV is ready for charging. Hello Ohm's law!

On the connection of an EV, the charging station provides a 1kHz square wave signal on the CP pin. The duty

cycle of the signal (Pulse Width Modulation, or PWM) tells the EV the maximum current the EV can draw per phase. A duty cycle of 10% for example, means that the EV can draw 6 amperes at most, depending on the maximum cable capacity.

The CP signal remains active throughout the charging cycle. The duty cycle of the PWM signal enables smart charging. The EV changes its charging current as soon as the duty cycle changes. A 22kW smart charging station may charge one vehicle with the full 22kW but reduce the charging rate to 11kW when a second vehicle is connected. A home charger (wall box) may consider the current energy consumption in the home. The smart metering controls should maximize the charging current while avoiding overloading the home grid connection when other large consumers like a heat pump, induction oven, or air conditioning are also active. It should also allow for dynamic charging when PV panels generate surplus electricity during the day.

A DOWNSIDE TO SMART CHARGING?

During an AC charging cycle, the onboard charger con-

The Ohm's Law

$$U = R \times I$$

$$R = \frac{U}{I}$$

$$I = \frac{U}{R}$$
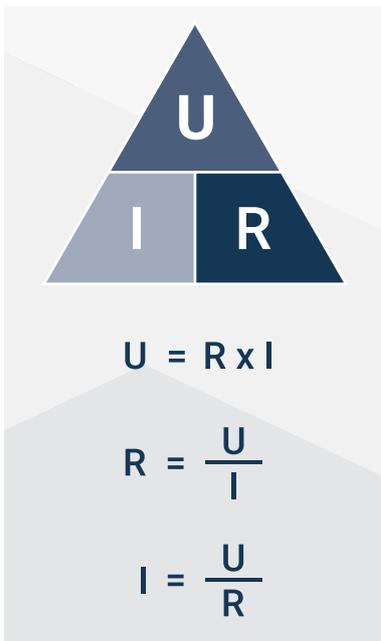
verts the power to DC, generating heat and resulting in a loss of energy. Research by the German automotive associationADAC has shown that energy losses range from ~6% to up to ~10 % when charging with 11kW. Depending on the brand and model of a vehicle, these losses can be double or even more when an EV is charged with reduced power. Onboard electronics are also active during a charging cycle. Charging with reduced power takes more time and results in a total higher consumption by these onboard electronics. The energy provided to the vehicle by the charger might show up as 22kWh on your bill, but the actual energy added to the car's battery may only be 19kWh – and there's no transparent display of the value of losses.

When operating a private AC charging infrastructure for multiple vehicles, it may therefore make sense to charge each vehicle with the optimal amount of power, while keeping within the power supply limit of the facility or site.

OCPP CAN HELP SOLVE THIS
OCPP, or Online Charge Point Protocol, is a communication protocol that many wall boxes support. It is maintained by the Open Charge Alliance. Currently, Version 1.6J is the most widely used version. However, the latest version 2.01 adds significant features to support new use cases.

Provided a wall box supports the smart charging profile, an OCPP central system can manage charging profiles in charging stations. Charging profiles can define the maximum power for a new transaction. The charging profile for a running transaction can also be changed, dynamically increasing or decreasing the power that can be consumed by the EV.

OCPP also allows for remotely stopping or starting transactions for connected EVs. This allows you to charge EVs with optimized power, one vehicle after the other. It also enables you to prioritize the EVs of different people, e.g. those who need to leave earlier. A RFID card could be used at the wall box to communicate by OCPP to the central system to link a charge-point connector to a specific user and/or vehicle provided this information is available in a central system.

USING THE ZENON OCPP DRIVER
The zenon OCPP driver is a proven enabler for a smart charging infrastructure for small to medium sites.

With DC charging, the onboard charger is bypassed. This does, however, require high-level communication between the charger and the EV. For most vehicles using CCS connectors, this is based on Power Line Communication. For CHAdeMO or Tesla connectors, this is based on CAN.

New AC charging stations supporting OCPP 2.01 and ISO 15118 make it possible to enable high-level communication with compatible EVs, to identify the vehicle, determine the battery state of charge, and offer support for new use cases like Vehicle to Grid (V2G). In V2G, the EV battery can be used to provide power to a facility, for example, when energy prices are high. It also supports Plug&Charge, where high-level communication enables the identification and authorization of charging transactions.

There is no doubt that the future of EVs and EV charging will be exciting. zenon OCPP driver will help you to drive it forward.

MARK CLEMENS
Connectivity Architect & Security Strategist

Mark Clemens has been part of the COPA-DATA HQ customer services team since 2002. In his role as Connectivity Architect & Security Strategist, he is also a product owner for connectivity topics. As an expert for cybersecurity, he contributes to the security of the zenon software platform. Mark Clemens is actively involved with the ongoing development of sustainability standards support in zenon, including OCPP.

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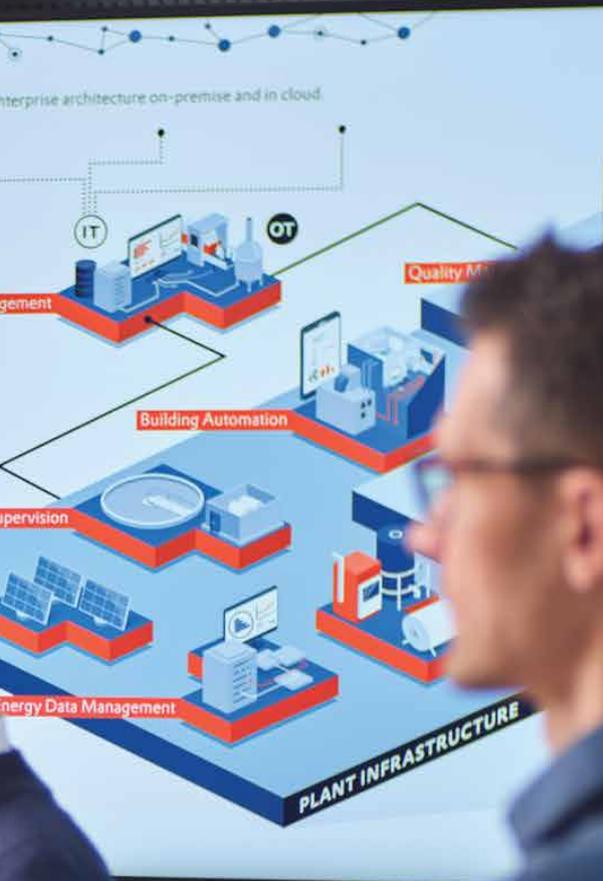
INDUSTRIES & SOLUTIONS

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TOGETHER TOWARDS NET ZERO

Do you know what the warming stripes are? They display the temperature anomalies of a geographical place. The colorful stripes on the cover of Greta Thunberg's „The Climate Book" show how critical global warming is. The activist demonstrates that it is still possible to remain optimistic and calls for impactful action. In this article, we'll explore why it's possible to be optimistic about the transformation to net zero in the food & beverage sector.

Building on numerous scientific studies, at the beginning of 2023 the World Meteorological Organization (WMO) announced that "the past 8 years were the warmest on record globally, fueled by ever-rising greenhouse gas concentration and accumulated heat."

"THE PLANET HAS A FEVER"

The effects of climate change are now visible – and already dramatic for many people around the world. The environmentalist Al Gore explained: "The planet has a fever". If someone in your family has a fever, what do you do? You go to the doctor to check the cause and take action. We know the cause of our "planetary fever" and we know the medicine we need to resolve it: net zero greenhouse gas (GHGs) emissions by 2050. This goal was stipulated in the Paris Agreement in 2015, signed by 195 countries. The former UN Secretary-General Ban Ki-moon offered no room for alternatives: "There is no Plan B because there is no planet B".

In Greta Thunberg's book, a team of renowned specialists offer a science-based, straight-forward, and mobilizing call to action. Everyone can have an impact or learn to have a bigger impact. With this personal and collective purpose in mind, let's look at an industry which has a very direct connection to our daily lives: the food & beverage industry.

AN INDUSTRY TAKING OWNERSHIP

According to the UN Food and Agriculture Organization, food systems are responsible for over a third of global GHGs. This includes all the emissions along the supply chain, from growing raw materials and ingredients through to the final products reaching our tables. A standard used worldwide to account for greenhouse gas emissions, the GHG Protocol classifies emissions into three scopes (see graphic on page 10 and ghgprotocol.org). Food & beverage manufacturing plants are directly responsible for only around five to ten percent of these emissions which fall into Scope 1 and 2. The indirect impact – Scope 3 – is no less a responsibility for industrial producers. Many required raw materials, such as beef, have a high carbon footprint. Others negatively impact the environment, such as palm oil production – which drives deforestation. And how do we stop plastic packaging materials from spreading uncontrollably in our oceans and other natural environments? What's more, according to OurWorldInData.org, food losses and waste generate 6% of total GHGs.

For years, humanity has more or less consciously created an environmentally harmful system. However, there is good news. The world can still head in the right direction. Political and legislative decisions can mobilize entire societies as well as industry players. The European Union is leading here; setting a good example with its strategy towards climate neutrality: the European Grean Deal. The food & beverage industry itself, including many manufacturing companies, is investing heavily to become more sustainable.

I've observed an intensive phase of accelerating positive impact, in alignment with the United Nation Sustainability Development Goals (SDGs). We see changing organizations, the creation of new roles, and developing new sustainability competences. This works hand in hand with the public commitment to Science Based Targets (SBTi) in respect of Scopes 1, 2 and 3. True industry transformation is evident when people take ownership of their own transformation journey.

When I meet our customers, I see the passion in the eyes of their manufacturing teams when they explain why the innovation and digitalization enabled by our zenon software platform are so powerful in helping them achieve their net zero ambitions. We feel privileged to partner with these sustainability makers in their transformation journey. And, in this journey to achieving net zero, there are three important areas – performance, resource optimization and change enablement – in which zenon simply rocks.

CO2
ZERO
EMISSION
BY 2050

45

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zenon empowers the food & beverage manufacturing
to accelerate the journey towards net zero.

MAXIMIZING PERFORMANCE

Striving for improved performance is not a new goal in food production. It has always been important to ensure that investment has a high return financially. Concepts such as Total Productive Maintenance (TPM) have been pursued for years with the goal of streamlined processes producing tasty products at the highest quality.

In the context of sustainability, "performance" gains a greater meaning. In a manufacturing environment dedicated to decarbonization, lost production time or spoiled products are equivalent to losses of energy or resources. Low efficiency means a higher carbon footprint for every produced unit.

zenon transforms traditional HMI and SCADA systems into state-of-the-art digital architectures. Solutions for process control and the management of production lines are transforming beyond their original functions. Our zenon software enables the latest, user-centric interface design. Interacting with complex equipment is refreshed to offer better and easier control. Machine operators and production specialists are empowered with enhanced process flexibility and situational awareness. They gain exact trends detailing measurements and complex key performance indicators. In this way, operators can respond in real time and learn by analyzing the process history. Any team member is easily involved, whether onsite or remote. The equipment is easily integrated within the entire digitalization infrastructure, thanks to robust and secure information flows. Production specialists can increasingly leverage the plant floor data at larger scale.

Just as zenon satisfies the appetite for innovation, the drive for sustainability focuses a new light on an older need: to prolong the lifecycle of existing equipment. The future-oriented design principles on which zenon is built can help greatly to get more from what you already have. Because zenon copes so easily with retrofit actions and technology updates, you can intelligently replace damaged hardware and sustainably upgrade obsolete technology and operating systems.

MANAGING EVERY ENERGY FLOW

Almost every food & beverage plant is aiming to reduce its Scope 1 and 2 emissions. As well as the gases directly emitted by process reactions, the energy used in the plant is a priority focus. ISO 50001 compliance has already been on the agenda of many manufacturing plants for some time. A regular plan-do-check-act framework shapes the capabilities of businesses to continuously improve their energy efficiency.

Our global net zero goal has pushed the acceleration pedal: instead of a few incremental improvements every year, we must now decarbonize at pace. Different countries are targeting different goals, but we must do this, at the latest, by 2050. Production teams are suddenly dealing with immense challenges. This demands different approaches, huge creativity, increased collaboration between stakeholders, and innovative technologies.

Understanding how different forms of energy are used by different processes and equipment is a key instrument in achieving the net zero agenda. Individual machines can no longer be seen as islands consuming, creating, and losing forms of energy. They are nodes in a network which interplay with each other. All energy generation and consumption require a decarbonized "cure". For example, a plant might not buy all its energy anymore – with emissions reflected in Scope 2. Instead, it might invest in onsite renewables. It's a dynamic system that needs tools to make it easy to manage.

Right from the start, our zenon software platform has been designed for interdisciplinary solutions. Integrating an energy data management system based on zenon makes it possible to collect any information about consumption and corelate it with production data. With

a utilities supervision system, the delivery of compressed air, heating, cooling, and other services and resources stays in focus.

When building automation based on zenon is added to a plant's digital architecture, the picture of contextualized consumers is further extended. By drawing on zenon's extensive experience in the energy and infrastructure sector, the solutions for renewables supervision – such as for solar or wind energy – are contributing to a holistic view of the manufacturing sites.

Integrating these different solutions as part of your digitalization journey brings spectacular benefits. With process supervision and analytics, zenon flexibly supports connecting energy flows. This helps to optimize usage, especially when energy is reused or converted to other forms. With powerful data processing capabilities, zenon helps you to better use renewable energy in correlation with consuming processes. In the middle of a sunny day, for example, available solar energy should contribute significantly to reduce resource consumption and costs.

By managing every energy flow, zenon offers transparent information that can be used to boost innovation towards a minimized carbon footprint.

GET READY FOR DISRUPTIONS AND INNOVATIONS

The food & beverage industry is sensitive to disruptions to the supply chain, such as those caused by climate change, ingredient scarcity or changing consumer demand. Downstream disturbances challenge manufacturing teams. One solution might be to diversify material sourcing. This has ramifications for the production processes, with a need to cope with variations of ingredients.

According to "The Carbon Almanac", "The biggest agricultural source of greenhouse gas emissions is beef […]. A single cheeseburger has the same climate impact as driving a typical car more than 10 miles/20 km." In such situations, the carbon-responsible option for the manufacturing team is to replace the product with alternatives with a much lower carbon footprint (Scope 3 emissions).

In the battle towards net zero, the automation and IT infrastructure is not a goal in itself. However, it is an powerful tool that can enhance the manufacturer's product and process innovation. As a software platform, zenon enables creativity by leveraging standardization. Recipe management – from customizable groups of process parameters to entire production procedures – is essential for manufacturing flexibility. The mature implementation of the Modular Type Package (MTP) framework in zenon brings such flexibility to a state-of-the-art level.

Along the sustainability journey, supply chains are rewired. While performance maximization and energy management remain consistently in focus, zenon has always offered opportunities for creative and surprising solutions for transformation owners. The zenon software platform itself, with the toolset of mature automation and digitalization services, evolves continuously. With versatile software technology, let's act with confidence to achieve net zero well before 2050. Together we can be truly impactful.

EMILIAN AXINIA
Industry Manager
Food & Beverage

Emilian Axinia, M.Sc. Computer Engineering and Executive MBA, has accumulated over 25 years of experience in engineering and automation projects in the food and beverage industry. He led industrial projects for the global company Ecolab before managing his own company as a distributor of innovative automation technology in Romania. Since May 2007, Emilian Axinia has been part of COPA-DATA's team in Salzburg, Austria. His focus as Industry Manager is to develop the business in the food & beverage industry by addressing the challenges faced by today's manufacturing companies, for instance supporting their agile transformation journeys.

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PROMOTING SUSTAINABILITY VIA STANDARDIZATION

To be more sustainable, we need to reduce our reliance on fossil fuels and invest more in electricity from renewable sources. More electricity means more power plants, power lines, and substations as nodes for power lines. In Sweden, Svenska Kraftnät (SvK), the national transmission system operator for electricity and gas, is building or upgrading twenty extra-high voltage substations in 2023. Every substation needs a human machine interface (HMI). Rapid, automation-enabled configuration of the HMI application plays a small part in building substations and replacing old ones more quickly.

AN ENERGY TRANSITION FOR OUR WORLD

Less CO_2 and less fossil fuels is the goal. This means more electromobility, the electrification of industry, and heating with heat pumps. We must hurry up because time is running out. The climate emergency is already here, but we are not yet able to meet the increasing demand for electricity. Industry and its suppliers are switching to electricity, but we know that there are neither enough generators available nor enough lines and cables laid.

As an example, for a distribution network operator in the Netherlands, the 55 MW power capacity of a substation was sufficient for 20 years. However, this situation changed within three months when the nearby industry switched from oil and gas to electricity. The substation capacity needed to more than double. This required installing an additional 60 MW transformer. With foresight, the planners built for the future and prepared a place for a third transformer. We hear something similar from Sweden: to route wind power from the north to the industrial south, new lines will have to be laid and twenty substations must be commissioned or upgraded in 2023 alone. This change is of unprecedented magnitude. It is a real challenge, especially since no changes can be made to existing systems during the frosty winter months. In Sweden, heating is mainly provided by electricity, primarily through heat pumps. But heat pumps also need electricity. As a result, there is only a six-month window in which the twenty substations can be commissioned. This, in turn, means that approximately ten days are available per substation, if processed sequentially. Therefore, any support that can speed up the commissioning process is helpful.

ZENON IS DOING ITS PART

So how can zenon, as an HMI system for substations, do its part to help meet this challenging workload? Well, not all the secondary technology can be created, configured, and commissioned with zenon. zenon covers a small part of the functions required. But on its own, as an HMI, gateway, and automation component, it provides plenty of possibilities to speed up engineering and testing – and so do its part in upgrading and bringing new substations online more quickly and efficiently.

How does this actually work? The best way to improve the efficiency of software projects is to standardize. It will always be quicker to orchestrate off-the-shelf components. Don't let anyone tell you otherwise! A good deal of work has already gone into a standard component so that preliminary engineering activities no longer have to be carried out and thus can be avoided. In zenon, such components are available as base projects, symbols, and Smart Objects. COPA-DATA provides a lot of such preconfigured content, especially for substations.

AUTOMATION-ENABLED ENGINEERING

In addition to standardized components, zenon offers other engineering accelerators. You can wave our magic wand! That is, that of the zenon magician: the zenon wizard. A zenon wizard will not produce white rabbits from a black stovepipe, but it can create entire zenon projects automatically. The wizard can save users a lot of time through automation. Weeks of effort become hours. And hours are reduced to
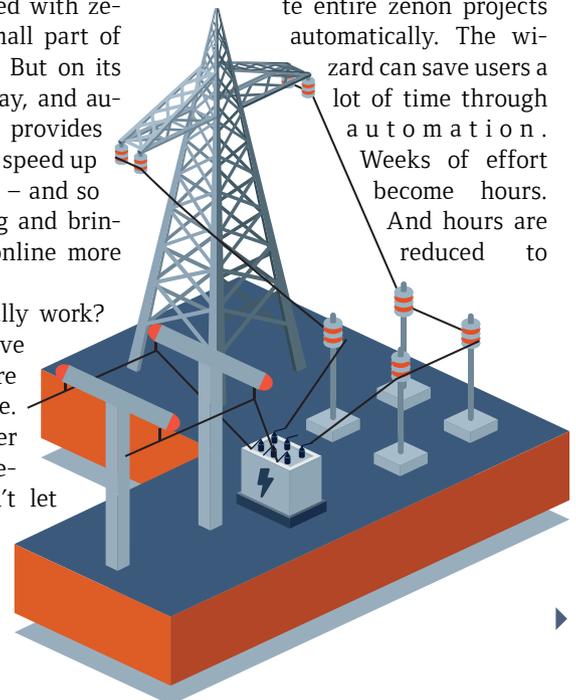
minutes. Where does the wizard get the information to create a zenon HMI gateway automation program? The signals and their relationships are documented by the system operators. This means that they are recorded in digital form. The formats range from CSV to Excel to IEC 61850 SCL. All these formats have the potential to provide the wizard with the relevant information. CSV and Excel formatted tables offer the opportunity for greater individuality. This provides for compatibility when working with the wizard. Compatibility should not be a problem; it has been solved brilliantly several times by the wizard developers at COPA-DATA – to the delight of end users, who have saved eons of configuration time as a result.

However, IEC 61850 SCL can do more; it can contribute much more concretely to project creation due to its standardization. It describes the basic structure of the substation and, thus, the single-line circuit diagram. Using the wizard, this can be created automatical-

ly. The rest of the HMI application can be prepared as a ready-made base project. So how do we ensure our visualization in zenon complies with IEC 61850? Because IEC 61850 makes sense of voltage levels, bays, switching devices, and their electrical connection and one can deduce which graphical representation is involved. This enables the wizard to draw them in zenon and link existing variables with graphical elements. The existing IP addresses and report information can also be used for driver configuration.

The output covers four requirements:

1. An end-to-end zenon HMI – built using the base project
2. The finished driver configuration
3. A complete variable list
4. The single-line diagram with the linked variables.

The standardization draws on zenon templates, symbols, and IEC 61850 to bring you engineering peace of mind with minimal engineering effort.

AUTOMATION-ENABLED VALIDATION

It's not all plain sailing, though. Wherever people are involved, mistakes can occur. Even if the wizard has been thoroughly tested and errors can be ruled out, a residual risk remains: namely with the quality of the input data. There may be errors in the lists and files. Therefore, the output of a wizard must be tested and validated as if a human had carried out the engineering. This testing work offers great, if not the greatest, potential for savings. Ideas and approaches already exist about how to test an HMI application automatically. We differentiate between data point tests and functional tests. The former can be very tedious and must be carried out in full. Each piece of data must be stimulated at its source and find its visible expression in the HMI application. Bottom (device): ping, top (HMI): pong. Otherwise, something could be rotten in the state of Denmark. The concepts for this provide a separa-
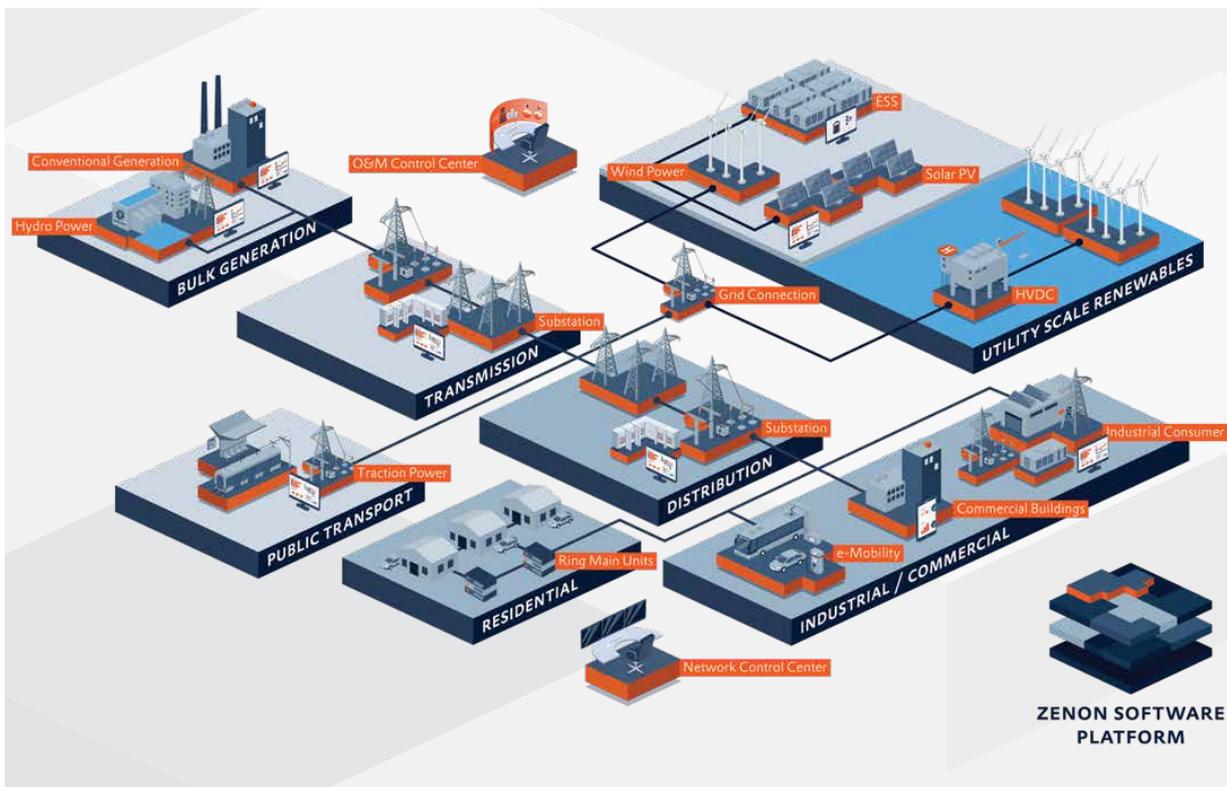
In addition to the application field of substations, zenon is also used in almost all other areas of energy automation

te mechanism that can inject test signals and recognize the effect in the HMI via API query or image-pixel color change. To test only the HMI, omitting the underlying sensor-device-network-HMI-computer stack, IEC 61850 simulation software can be used. This can produce the corresponding stimuli at network level or zenon driver level. The individual data points are triggered one after the other and the result is checked using image recognition. The opposite direction, i.e. the setpoints and commands in the direction of the process, can be set via simulation software using API or manual input. The IEC 61850 software recognizes the incoming commands and sets the corresponding test steps to "passed" or "failed".

Functional tests such as interlocks, local/remote behavior, alarm/event grouping, protection device test configuration, etc. can also be included in an automated validation concept. We'll discuss how to get the most from this capability in the subsequent articles we have planned to follow in later IU magazines.

To summarize, standardization is a good thing. Not only in terms of engineering standards, but also for automated HMI creation – and for data point tests. Standardization saves a lot of work steps which, at a minimum, speeds up the creation of the HMI of a substation. Quickly built substations bring us one step closer to fully electrified industry and transportation: closer to a fossel-fuel-free life and further away from climate collapse. In this way, we are doing our part toward greater sustainability and CO_2 neutrality.

51

IU

JÜRGEN RESCH
Industry Manager Energy

Jürgen Resch has been passionate about power plants and captivated by cables since he was a child. If you want to test out his expertise and find out just how switched on he is, simply email:

juergenr@copadata.com

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STATE-OF-THE-ART USER INTERFACE FOR CENTRAL SYSTEMS ENGINEERING

When it comes to designing user interfaces, there are a lot of different opinions. However, there are also rules and guidelines that are designed to promote user-friendly operating screens. The trained and experienced team of specialists at COPA-DATA supports zenon users in the design and implementation of optimal user screens.

SEBASTIAN KALBE, ENERGIEBETRIEB DINGOLFING/MSR, BMW GROUP
BERND WIMMER UND DAMIAN BONHOLZER, COPA-DATA

At the BMW site in Dingolfing, Germany, the energy and process control technology was migrated to zenon version 5.50 in 2003. During the years of operation, those responsible have always updated the system to the latest zenon versions and continually developed it. Beginning with the energy supply, it is now used across the board as an end-to-end standard system in all technical facility management groups from heating, air conditioning, ventilation to medium voltage systems.

After almost 20 years and many enhancements by different project managers, it was time to modernize the layout. The users were closely involved in this task and the UI/ UX team from COPA-DATA was also involved. Together, they systematically developed a new user interface and implemented it successfully.

WORKSHOP TO COORDINATE WITH ALL USER GROUPS

The first step in meeting BMW's requirements was an onsite workshop

at the BMW plant led by a designer from COPA-DATA. Representatives were present from all the user groups that work on the system or deal with maintenance or further development of the system.

Such workshops consist of several sections. At the start, participants are briefed on the theory of ergonomics and usability. Ergonomics is the science of human work. It sets forth rules to optimize working conditions for people. The basic standard DIN EN ISO 26800 governs the relevant principles and concepts.

Usability is often referred to as ease of use. Factors such as learnability, efficiency, memorability, and error avoidance play an important role. ISO/DIS 9241-11 defines usability as follows: "The extent to which a product can be used by specific users in a specific application context to achieve specific goals effectively, efficiently,

and satisfactorily."

While usability describes the period during use, user experience also considers the periods before and after use. Before using the system for the first time, users have certain expectations. Experiences about usability are collected during use. After completion of the work, the experiences gathered in this way are processed. An emotional experience of the product develops.

In the next section of the workshop, participants identify typical tasks, or the use cases, which they divide into sub-steps. In these sub-steps, the requirements of the different users involved are considered in the context of process improvement. When discussing the use cases, the workshop participants take on different perspectives. Initially, they look at the requirements based on the individual's position. These positions are then jointly examined

and discussed by all user groups involved. The first possibilities for optimization can already be identified here. It should be noted that the focus should be on the user fulfilling their tasks. Since the experience of the respective employees plays a role in the processing, it is helpful to take this into account when selecting the participants.

The method used is known as "user journey mapping". As the name suggests, it describes the user's journey from initial contact to the completion of the task. From the process triggers to the achievement of the goal, all necessary activities are defined, together with potential stumbling blocks and improvements. These activities are considered from the point of view of all represented user groups in order to find a solution that enables all users to run the system efficiently.

The results of the use-case analysis are documented in the form of ▶

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Before: Initial navigation situation
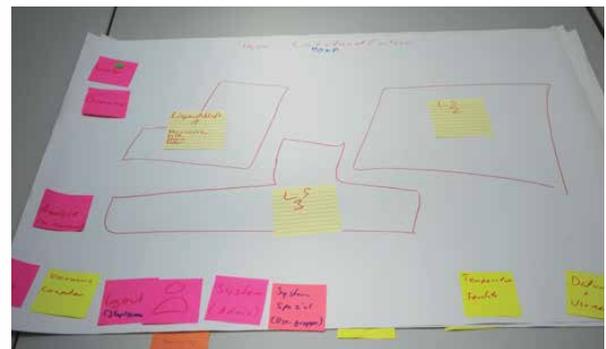
Planning of navigation by location

After: Result for navigation by location
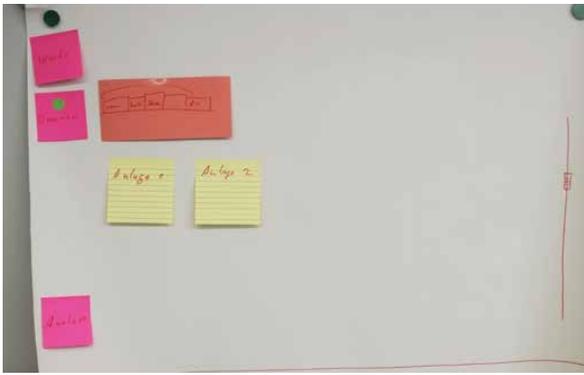
Planning of navigation by discipline

Result for navigation by discipline

a list of actions. After these actions have been placed in the best possible sequence, the creation of the initial mockup begins.

DESIGNS BASED ON PRACTICAL REQUIREMENTS

These mockups, which are created directly in the workshop as paper prototypes, also serve as the visual basis for further discussions with the participants in order to rule out any misunderstandings in communication. The functionality of a user interface can be visualized very quickly using post-it notes and then confirmed by all stakeholders. With the help of these prototypes, a navigation structure is defined that contains two main navigation paths: navigation by location and navigation by type of group.

From this basis, the first graphical mockups are created after the workshop using the customer's corporate identity (CI); another step towards UX design. Colors and fonts are defined, icons are developed, and the precise screen layout is decided. The functional skeleton that was created in the workshop is now filled out and brought to life to provide a visually attractive user experience and technical usability. These mockups are created in graphics applications such as Adobe Creative Cloud.

Both the static and interactive mockups provide a foundation for user testing and further feedback to refine the user guidance. To check the hypotheses from the workshop and get a clearer picture of the

workflows, as well as to get to know the end users better, the designer visited the control room at BMW.

CUSTOMIZED ZENON TEMPLATES FOR SUBSEQUENT OPERATION

All of these preparatory steps are then brought together in a zenon project. This includes the following elements:
- Project structure with global project and integration project
- Icon library for screen elements
- Navigation
- Transitional state with integration of the existing screens in the new project

This template project was handed over in close cooperation with BMW.

In addition, a style guide is provided for future design projects. The style guide summarizes the design principles in order to make further development of the project as easy as possible.

FIT FOR THE NEXT 20 YEARS

Based on the zenon templates developed in this way, existing projects are reconfigured to the new design. New systems are already being integrated based on the new design. The user acceptance of the system increased thanks to the redesigned operating screens. As a result, a system that has reliably met all requirements for 20 years is now fitter than ever for a sustainable future.
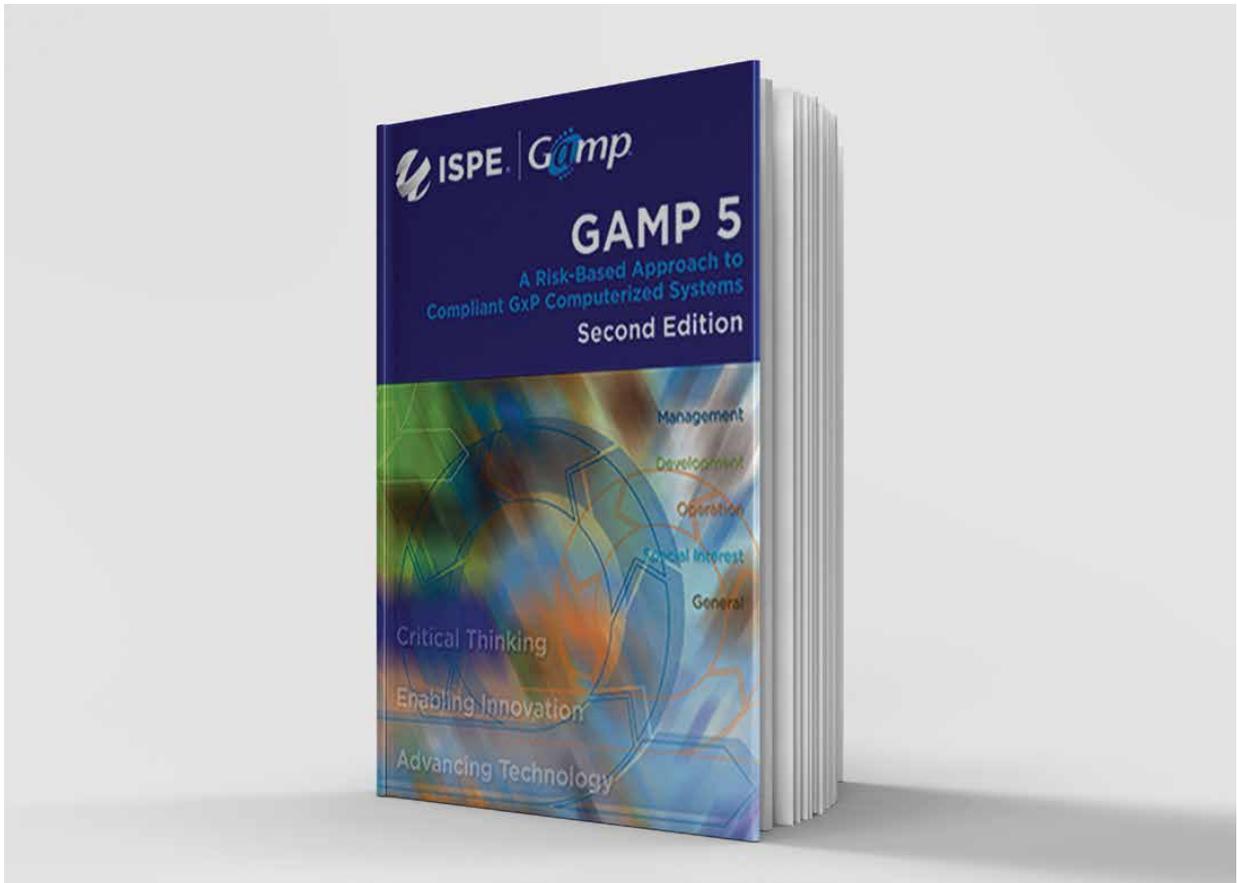
ISPE GAMP 5 GUIDANCE SECOND EDITION: WHAT'S NEW?

The ISPE GAMP 5 guidelines, the reference for those working in the life sciences sector, was updated in July 2022. While retaining the principles and framework of the first edition, it has been updated to reflect the important technological innovations that have taken place over the intervening 14 years. Let us take a look at some of the most important innovations.

As we know, the GAMP 5 guidelines aim to achieve computerized systems that are fit for purpose and comply with current regulatory requirements. It builds on existing good practice in the industry in an efficient and effective manner, thereby safeguarding patient safety, product quality and data integrity.

Traditionally, the costs associated with documentation and system validation activities are an obstacle to digitalization in the pharmaceutical industry. Formal criteria of documentation and test protocols – including a lot of testing paperwork – are prioritized over the effectiveness of testing actions, e.g. preventing system failures.

GAMP guidelines have always supported companies in the industry to increase flexibility and efficiency while enhancing patient safety, product quality and data integrity. This is a priority need for drug manufacturers, whether CDMOs or R&D-intensive companies, such as biotech and cell&gene therapy firms.

ISPE GAMP 5 A Risk-Based Approach to Compliant GxP Computerized Systems is intended for regulated firms, suppliers, and regulators. This includes suppliers of software, hardware, equipment, systems integration services, IT service providers, and internal and external IT support services.

ISPE GAMP 5 was first publis- ▶

hed in 2008. This second edition, published 14 years later, maintains the original approach, framework and key concepts. However, some aspects have been updated to reflect today's IT environment. The changes reflect the increased importance of IT service providers, including cloud service providers; the evolution of software development approaches, including incremental and iterative methods such as Agile, and the increased use of software tools and automation to achieve greater control, higher quality, and lower risk throughout the lifecycle. It also covers Artificial Intelligence and Machine Learning (AI/ML), blockchain, cloud computing and open-source software (OSS).

NEW TOPICS INCLUDE:
– The increasing importance of service providers
– New software development approaches, e.g. Agile
– Extensive use of software tools
– Importance of critical thinking
– Adoption of data integrity guidelines

New and evolving topics in the life science sector have been included in the Guide's Appendices, which have been updated as detailed below:
– Appendix M11 –
  IT Infrastructure **NEW**
– Appendix M12 –
  Critical Thinking **NEW**
– Appendix D1 –
  Specifying Requirements
  UPDATED
– Appendix D2 – **RETIRED**
– Appendix D8 – Agile Software
  Development **NEW**
– Appendix D9 –
  Software Tools **NEW**
– Appendix D10 – **Distributed**
– Ledger Systems (Blockchain)
  NEW
– Appendix D11 – Artificial
  Intelligence and Machine
  Learning (AI/ML) **NEW**
– Appendix O7 – **RETIRED**
– Appendix S2 – Electronic
  Production Records **UPDATED**
– Appendix S5 – **RETIRED**

CRITICAL THINKING
The new ISPE guidelines promote critical thinking, an informed decision-making process to define the most appropriate approach for specific circumstances.

Critical thinking helps us to understand and assess where business processes and data flows can potentially affect patient safety, product quality, and data integrity, either by introducing new risk factors or by mitigating existing risks.

Critical thinking thus supports quality and compliance decisions for IT systems. For instance, the application of critical thinking makes it possible to assess the extent and depth of testing and supporting documentation as well as the definition of maintenance phase activities, such as the frequency of periodic review. In this way, special attention is paid where it is really needed – leaving out onerous procedures and documentation for phases or activities that are not considered relevant.

For example, it makes little sense to apply the same Periodic Review frequency to two devices that, although they are of the same type, have a different maturity, i.e. one has recently been introduced to the market or in the factory, while the other has been in use for years.

AGILE
Another new focus of GAMP 5 is agile software development methodology, characterized by an iterative and incremental approach. It is for this reason that the software lifecycle, particularly the project phase, can be represented either by the traditional V-shaped (linear) model or with the circular progression typical of an Agile approach.

Another change is the use of tools to support each stage of the software lifecycle; tools in which information and evidence is maintained in the form of electronic records rather than paper documents.

These tools, moreover, do not require validation. Rather, they need an assessment for appropriateness, as well as use by trained and qualified personnel on GxP issues, and monitoring and supervision by Quality Assurance.

COPA-DATA is very familiar with the advantages of this development methodology. It adopted the Agile model in 2010. Quality management across the entire zenon product lifecycle is based on Azure DevOps. COPA-DATA adopted this platform in 2012, when it was still called Microsoft TeamFoundationServer.
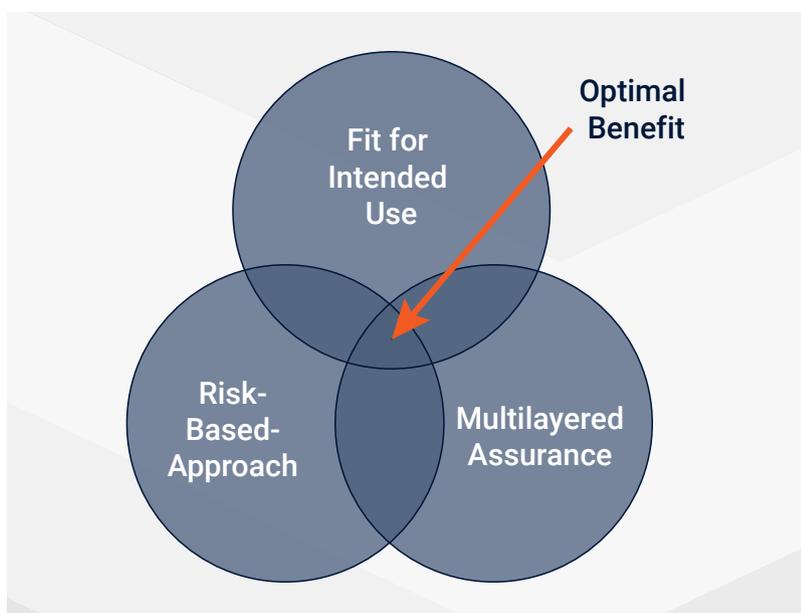
Critical Thinking for Computerized Systems –
Source: GAMP 5 Guide, 2nd Edition
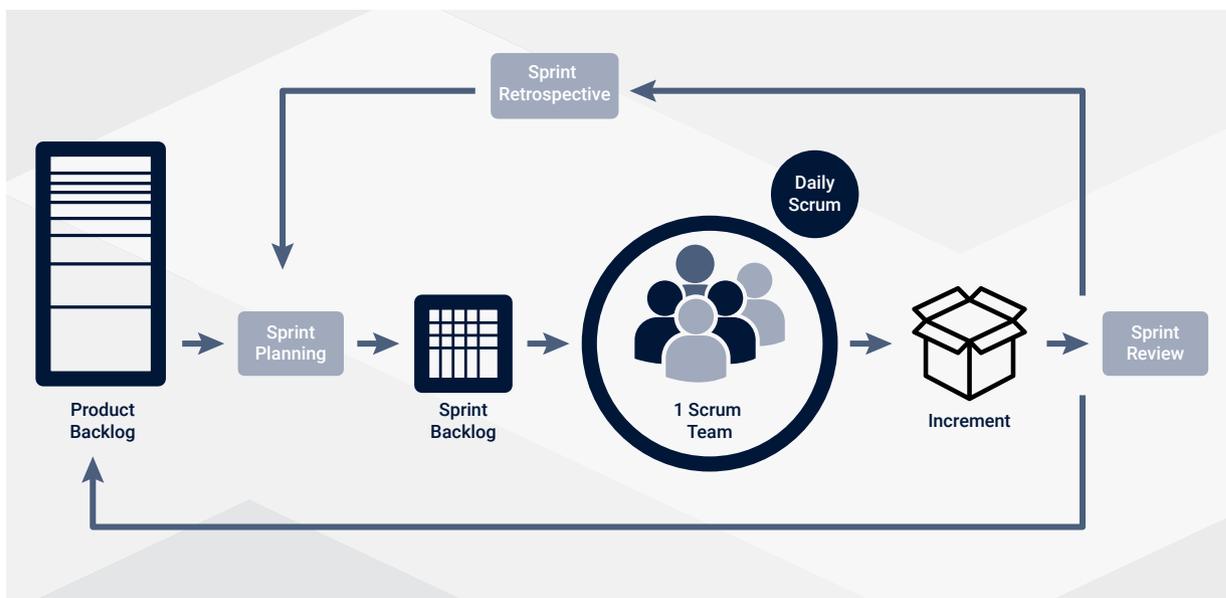
Scrum Framework Model – Source: scrum.org

SERVICE PROVIDERS

The GAMP 5 update places greater emphasis on the role of service providers, particularly of cloud systems. This is seen in the new importance given to audits and contracts between suppliers and the regulated company. They are seen as tools for selecting and controlling suppliers and reducing risk, both during the initial validation and, later, in the definition of maintenance phase processes. However, it is necessary to remember that the ultimate responsibility for compliance remains with the regulated company, even when one or more of the lifecycle activities are delegated to an external provider.

The update also highlights that providers are not directly subject to GxP so it may be necessary to make use of other standards, such as Information Technology Infrastructure Library (ITIL), to complement the GAMP 5 guidelines.

SOFTWARE CATEGORIES

Software categories are no longer to be regarded as clear-cut divisions, but as a continuum. In fact, software can be composed of elements of different categories. This is why, in the new edition of GAMP 5, we speak of components rather than products.

The category to which the soft-ware belongs is then not the only factor in defining the testing effort or its documentation. Risk analysis, vendor evaluation, the novelty and complexity of the system, and critical thinking must be considered. Category is also a criterion for supplier evaluation.

Another important change is the extension of category 1, now better detailed into Operating Systems, non-GxP critical software tools (e.g. IT tools), and GxP critical software tools (i.e. directly impacting a GxP process or critical GxP data).

VALIDATION OF COMPUTERIZED SYSTEMS

When it comes to the initial validation of systems, the main novelties lie in the definition of requirements and testing activities.

SPECIFYING REQUIREMENTS (APPENDIX D1)

One of the biggest changes in the new ISPE GAMP 5 guidelines is the merging of User Requirements (URS) and Functional Specification (FS) into Specifying Requirements.

Specifying Requirements:
- are the responsibility of the regulated company, but can be collected by a third party (e.g. a machine builder or the Product Owner of an Agile project)
- define the intended use and expected functions of the software in its operational context
- may be in the form of a document or a record in a tool

Appendix D1 relates to Specifying Requirements for category 4 or 5 systems. For category 3 systems with low risk and/or complexity, critical thinking may be applied to determine the most appropriate approach for defining requirements.

TESTING (APPENDIX D5)

The main purpose of testing is to identify defects, reduce the risk of failure, demonstrate that the system meets its intended use and regulatory requirements, and ensure that risk reduction measures are effective. The focus of testing activities is, thus, returned to their original purpose rather than the excessive production of documentary evidence.

GAMP 5 also introduces the concept of unscripted tests, which differ from scripted tests in that they do not require step-by-step testing actions. Instead, they rely on the intuition and experience of the testers to identify system flaws and explore its functionality beyond the specifications and manuals. For this reason, they are dynamic and scarcely reproducible. Unscripted testing does not,

57

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SW Category	Description	Examples
1. Infrastructure Software and Tools	Layered software (i.e., upon which applications are built); Software used to manage the operating environment and infrastructure	Operating systems; Database engines; Middleware; Programming languages; Network and performance monitoring tools
2.	Not used	
3. Standard System Components	Run-time parameters may be entered and stored, but the software cannot be configured to suit the business process	Firmware-based applications; COTS software; Some instruments, …
4. Configured Components	Software, often very complex, that can be configured by the user to meet the specific needs of the user's business process. Software code is not altered	HMI/SCADA, DCS, LIMS, ERP, BMS, EDMS, Spreadsheets, …
5. Custom Applications and Components	Software custom designed and coded to suit the business process	Interfaces between systems; Internally and externally developed IT applications; Internally and externally developed process control applications; Custom PLC logic

Software Categories: Summary from GAMP 5
2nd Edition Guide Appendix M4

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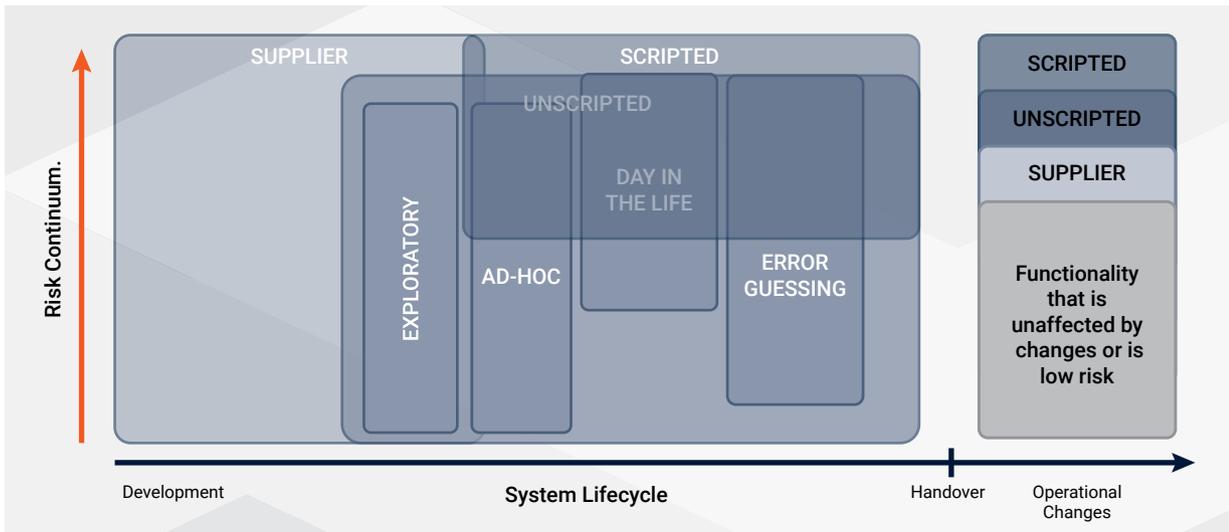
An example of the Test Coverage approach –
Source GAMP 5 2nd Edition Guide Appendix D5

however, mean undocumented. In fact, it remains necessary to indicate what was tested, by whom, when, and with what objectives, as well as the results produced.

UNSCRIPTED TESTS INCLUDE:
– Ad-hoc testing
– Error guessing
– Exploratory testing
– Day in the life

The use of automatic tools is encouraged if the information provided is complete, accurate, available, and adequate.

MAINTAINING THE VALIDATION STATUS OF COMPUTERIZED SYSTEMS
As far as the maintenance phase is concerned, the main innovations concern the aforementioned tools and the use of critical thinking as well as a better description of processes, the creation of links between them, references to new technologies, for example for backup and archiving solutions, and considerations for services provided by external providers.

Today, backup activities can be performed by combining redundancy measures with the use of automated tools and/or outsourced services. They should, therefore, be adequately described with process mapping. A simpler procedure would be inadequate even for processes such as disaster recovery, cybersecurity, or IT infrastructure configuration management.

BACKUP AND RESTORE (APPENDIX 09), BUSINESS CONTINUITY MANAGEMENT (APPX. O10)

In the new version of GAMP 5, backup and restore are treated in parallel, although they are still described in different appendices. It starts with risk analysis and the definition of RTO (Recovery Time Objectives) and RPO (Recovery Point Objectives).

The introduction of integrity tests for backup copies now extends to Business Continuity Planning and Disaster Recovery, the loss of IT infrastructure, service providers, access to premises, connectivity, cybersecurity attacks, and pandemics, in addition to the loss of the software application.

SUMMARY

We expect the implementation of these new guidelines to help life sciences companies to increase flexibility and efficiency without losing sight of patient safety, product quality or data integrity.

Choosing a well-documented software platform with a documented quality system, supported by appropriate development, testing and documentation tools can significantly reduce the time and cost of validation in line with the new guidelines.

Doing so also offers a means of responding to the sustainability challenge. As always, it is first and foremost a cultural challenge: are we ready to step out of our comfort zone?

PIERLUIGI AGAZZI
Computer System Validation
Consultant, Adeodata SA

Pierluigi Agazzi graduated in electronic engineering and gained an MBA at Politecnico di Milano. He has also attended AI courses at MIT in Boston.
After 15 years as an automation engineer for chemical and pharmaceutical plants, since 2000 he has worked as a Computerized System Validation Engineer and partner at Adeodata. He has undertaken several CSV projects and 21 CFR Part 11 and data integrity compliance assessments, with an active role in remediation plans for production and quality control. He is an expert trainer and auditor specialized in CSV and DI compliance and a member of the steering committee of GAMP and ISPE Italy.

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GIUSEPPE MENIN
Life Sciences & Process
Industry Manager

Giuseppe Menin began his career in mechatronic engineering at the end of the 1980s, as an automation engineer and software developer. As a project manager, he coordinated R&D projects for the automation, monitoring, and data integration of manufacturing lines. In 2004, Giuseppe joined COPA-DATA and now works in the role of Life Sciences & Process Industry Manager at COPA-DATA HQ. He collaborates on digitalization projects in life sciences together with pharmaceutical companies and equipment vendors. Since 2014, he has been a member of the International Society for Pharmaceutical Engineering (ISPE). He is member of ISPE Pharma 4.0 "Plug & Produce" Special Interest Group and is on the steering committee of GAMP Italy CoP.

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AROUND THE WORLD

THE PIONEER OF THE FAR EAST

COPA-DATA Korea celebrates its tenth birthday this year. Ten years of continuous growth is a fantastic milestone for the whole team. We take the opportunity to look back at our Korean subsidiary's 2013 founding with YoungSu Kim (aka Charlie), managing director of COPA-DATA Korea.

IU MAGAZINE: CHARLIE, DO YOU REMEMBER HOW IT ALL STARTED AND HOW "COPA-DATA" MADE ITS FIRST STEPS IN SOUTH KOREA?

Charlie: It all began in the middle of June 2010. I'd been working on a project in Vietnam for Intel and I came across zenon. It really impressed me because you didn't need any programming skills. I saw an opportunity for the product in my home market, so I called COPA-DATA Headquarters.

Three days later, I found myself on an airplane to Austria for a face-to-face meeting with the international sales team in Salzburg. We started with setting up an Authorized Distributor (CDKR Co. Ltd) in 2010. We had the right to operate under COPA-DATA's name but were not a full subsidiary. That happened in April 2013 when COPA-DATA made the decision to set up a full-blown subsidiary.

WHAT WAS YOUR MARKETING STRATEGY INTO THE KOREAN MARKET AND HOW DID IT WORK FOR YOU?

Charlie: When COPA-DATA Korea was established in 2013, zenon had very little brand recognition in the local market. We had some limited success in the automotive industry and Samsung was one of our first customers. We deployed zenon in three of its factories.

However, our biggest early successes came in another key industry. With great support from Head-

quarters, we established the beginnings of a bright future in the Korean energy sector. KEPCO, the government-owned electricity generator, distributor, and provider of electricity in Korea, became an early customer of ours. The IEC 61850 standard was very well known and a mandatory protocol. zenon's native support for IEC 61850 gave us an edge and opened doors in the Korean Energy market. KEPCO has now standardized on zenon for substation automation, ECMS, and generation.

The fact zenon is a European product might have caused some concern in the local market because foreign products can mean difficulties in getting technical support. We were very aware of this and took specific steps with the HQ to ensure this wasn't an issue for COPA-DATA Korea. We invested well in training for our employees to elevate their zenon skills and knowledge.

HOW IMPORTANT A ROLE HAS THIS COOPERATION PLAYED IN THE GROWTH OF COPA-DATA KOREA?

Charlie: International cooperation has been key to our success. COPA-DATA has a strong network of international subsidiaries, distributors, systems integrators, partners, and customers who are all well supported by the Headquarters' team in Salzburg.

I have been spurred on by the success of my COPA-DATA colleagues in Italy and Germany; both

very successful subsidiaries. I am working to make COPA-DATA Korea just as successful in our home market, inspired by the idea "stop wishing and start doing".

Global work is great fun if you exchange ideas regularly and are interested in the culture of your colleagues. Even though teleconferencing is the first choice for global collaboration these days, the value of face-to-face meetings should not be underestimated. The team at COPA-DATA is aware of this and actively encourages it through internal events, personal support for onsite customer appointments or even longer stays.

In 2014, for example, two employees from Salzburg joined the Seoul branch for 12 months. From our point of view, it is valuable to work directly with employees trained at Headquarters. They know the company's philosophy, corporate culture, work processes, rules and regulations; ideas which can be more difficult to communicate via email or video conferences. Personal exchange builds trust and strengthens cooperation. Cultural differences are recognized and understood.

Christoph Dorigatti, Steve Ryu, YoungSu Kim (Charlie) and Thomas Punzenberger at the 1st Asian Partner Academy (2015)

The Korean team: Ryan, Charlie, Sunni, and David at their last visit in Salzburg (February 2023)

DO YOU HAVE ANY OTHER TIPS FOR SUCCESS?

Charlie: We've found that zenon is a very sticky product. Customers who use the zenon software platform come to love it and tend to stick with it forever.

Together with the great teamwork between sales, technical consulting, and marketing, zenon's unique strengths have helped to grow our business every year since 2013. zenon is no longer unknown in the Korean market and it is especially well known in our energy sector.

We'd like to establish zenon as the default industrial software platform in other major industries in Korea, including in life sciences and food & beverage. These are important industries in which COPA-DATA has a lot of expertise and a strong customer base around the world. Our ability to demonstrate zenon's particular strengths in these sectors to the Korean market will be key to our future success.

Three years ago, COPA-DATA Korea started to expand into the life sciences and food & beverage industries. We've expanded our sales team and built up support and marketing. Within the next 10 years, COPA-DATA and zenon should be as well known in these sectors in Korea as it is in our energy sector.

WHAT ARE YOUR GOALS FOR THE FUTURE? HOW DO YOU ENVISION THE NEXT TEN YEARS GOING?

Charlie: Our goal is to make our customers happy. We'd like to be the market leader in industrial automation in Korea and plan to establishing ourselves as a hub office for COPA-DATA in this region. This is an exciting and growing market with plenty of opportunities. The expertise that we've developed over the last ten years will help us to deliver on these goals for COPA-DATA and for our customers.

"When I picked up the phone in 2010 and spoke with Charlie for the first time, an incredible journey began for me, too. It makes me personally proud to see, after almost 13 years, the achievements of COPA-DATA Korea and zenon in the Korean market. It's a status that we had to work hard for, with tireless effort from both the Korean team and the Headquarters team in Salzburg."

Christoph Dorigatti, Head of International Sales

TIMELINE

2013: Founding of COPA-DATA Korea in Seoul

2015: The biggest customer event of COPA-DATA Korea to date: the Asian Partner Academy

2018: EUR 1 million turnover reached

2020: More than 20 partners in the COPA-DATA Partner Community

2022: Move to new office; achieved EUR 1.85 million turnover.

63

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ABOUT US

In every issue, Information Unlimited places the spotlight on selected employees to help our readers get to know our company better. Our employees featured here talk about their professional workday and personal interests.

ALEXANDRA SCHRÖDEL

Head of Marketing & Communication,
COPA-DATA, Ottobrunn, Germany
At COPA-DATA since: 2017 (full-time)
and 2004-2017 (freelance)

When working with colleagues, I find it particularly important to interact respectfully with one another. To build a strong team, it is important to consider each team member's strengths and develop ideas together, always keeping an open mind for new things. I especially like the mix and variety my job provides, for example, in our online versus offline marketing activities. I also like collaborating with other teams. It offers new perspectives and often results in exciting new projects.

Personally, I would use the following three words to describe myself: open-minded, humorous, and authentic.

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BERNHARD KRATZER

Agile Team Manager
At COPA-DATA Headquarters
Since 2000

I am the go-to for anything related to agile workflows, teamwork, professional development opportunities, personal matters, and any suggestions for simplifying internal processes. I value openness, honesty, and, in particular, respect when working with colleagues from across the business. I'd like to promote a constructive troubleshooting culture in terms of building a learning organization, as well as creating the framework for professional growth and "growing together" as a team. In short, I want everyone to feel that they are able to contribute actively to COPA-DATA's development.

bernhard.kratzer@copadata.com

TAREK MASSAOUD

Service Alliance Manager.
At COPA-DATA Headquarters
Since 2017

My work consists of organizational, technical, and communication activities. My day-to-day work is to support our Customer Services teams in the COPA-DATA Group, but also to learn from everyone. The aim is to achieve the best possible teamwork, to expand our shared knowledge, and to ensure that our technical teams feel at home in the COPA-DATA Group.

I'm in contact daily with all of COPA-DATA's Customer Services teams worldwide. This cultural exchange makes me very happy. All this great communication motivates me to achieve the best service quality for our customers. Since I travel a lot for work, I try to be at home more when I'm in Salzburg. I like spending time with my brother and friends and going out for good food. I also play the keyboard and flute.

tarek.massaoud@copadata.com
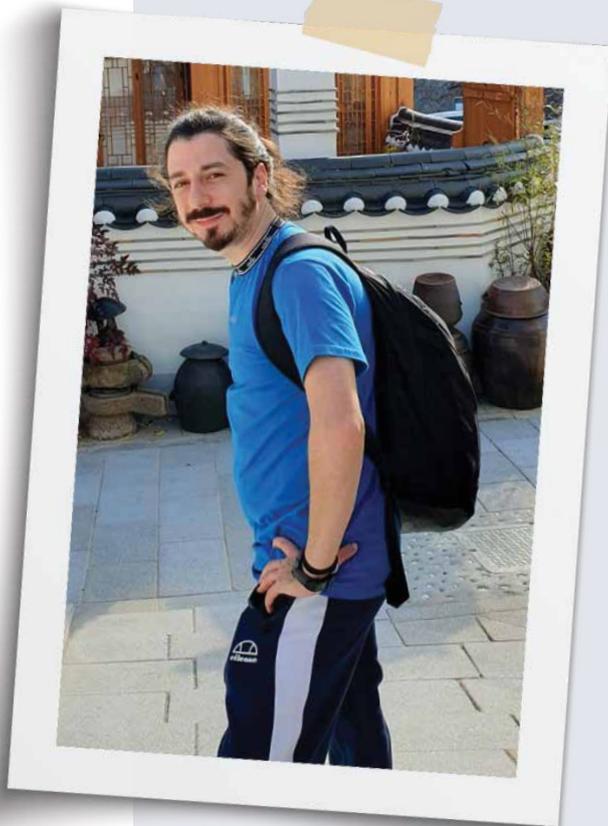
MICHAEL LEGAT

Developer of Trainees
At COPA-DATA Headquarters
Since 2014

What I especially like about my job is working with young people and seeing them develop. The apprenticeship to become an application developer takes a total of four years. It's really nice to see how the young specialists literally "grow up". In this position, I can pass on my knowledge – whether about the zenon software platform, industry knowledge, or general programming expertise. After the training program, many colleagues are no longer aware of who did an apprenticeship and who came from university.

Today, more than ever, knowledge sharing, training, and continuing education are critical elements of our professional lives – particularly in IT environments, where you are constantly dealing with complex requirements. I'm thrilled that COPA-DATA takes training seriously.

In my free time I enjoy playing music. I play the guitar and bass. I also like climbing and cycling. Three words that best describe me are: empathetic, curious, and creative.

michael.legat@copadata.com

65

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CELEBRATING 20 YEARS OF SUCCESSFUL PARTNERSHIP

There was special cause for celebration this past December as Salzburg University of Applied Sciences and COPA-DATA looked back on a 20-year partnership of joint research projects, countless internships, and many successfully completed diploma, bachelor's and master's theses. COPA-DATA and Salzburg University of Applied Sciences look forward to many more years of cooperation.

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In addition to teaching and research, universities also play a role in transferring knowledge. However, this is not a one-way relationship, where knowledge is transferred only from universities to society and business. Instead, the relationship is like a communication channel filled by the lively interchange between universities, society, and companies – and this has a positive impact on teaching and research.

Inspired by this collaborative model, the Information Technology and System Management program at Salzburg University of Applied Sciences and COPA-DATA laid the foundation for a long-term partnership in 2002. From the outset, the goals of the partnership were two-fold. First, joint R&D projects focused on software interfaces, architectures, industrial data processing, and IT security, as well as readying the latest technology for use in business environments. Second, to ensure that contemporary business issues are part of the university curriculum.

The cooperation laboratory (Coop-Lab) is the home base for this partnership. This dedicated room in the university building serves as a meeting point for university and business representatives. It forms the foundation of the partnership. Under this cooperation concept, you'll find a wide range of joint projects.

CLOSE PARTNERSHIPS ARE NOT FORMED IN A DAY

In the first few years, the collaboration focused on jointly developing interfaces for connecting systems. In particular, the partnership was based on integrating data from different sources with different semantic models in a common relational database-based platform. The data was transferred to a model based on time series and measured values and processed at the SCADA

level for data visualization and control of equipment and machines. In 2010, the Center for Industrial Information Technology was formed in collaboration with the companies B&R, Bosch, and the Urstein Foundation, as well as the Salzburg Chamber of Commerce. The focus of the joint R&D project was to design and implement a parameterizable, XML-based parser for transformation between different semantic models and meta-models.

MULTIPLE JOINT PROJECTS IN 2013

The Center for Industrial Information Technology continued its activities and several new projects were launched, including SCADA::GIS and Simuprod, a bridge project and a project in the then newly launched ICT of the Future. Working with other partners from research and industry, time- and location-based data records were merged into a common meta-model. Simuprod dealt with data integration, virtual commissioning, and simulation-supported maintenance of production plants. At that time, the "digital twin" was not yet a concept but, in retrospect, it precisely describes the project and what it accomplished. A few years later, this topic received further attention as part of the LernZwilling project, as well as through the collaboration with COPA-DATA on the aWHEREness:Lab project.

Following these projects, an intelligent maintenance planning tool was developed in partnership with Profaktor. The project and a collaboration with AVL List strengthened the cooperation in an area where the reporting and visualization of the data captured is playing an increasingly important role.

Looking ahead to the future, two major projects are already underway. In the "Modeling and Analy-

COOPERATION EST. 2002

tics Services" project, the metadata required for modern data analysis is being organized in a distributed database. In the Josef Ressel Center for Secure and Intelligent Industrial Automation, the topics of architecture, AI, and OT security are being worked on with the companies Bernecker & Rainer and Sigmatek.

ENCOUNTERS AT ALL LEVELS PROMOTE ENTHUSIASM AND UNDERSTANDING

Students at Salzburg University of Applied Sciences play an active role in the partnership through internships, theses, and by working on R&D projects. In return, COPA-DATA employees participate in qualification activities, supervise students, and serve as visiting lecturers who help to ensure that practical training at the university stays relevant. More than 50 employees at COPA-DATA are or have been students at the university.

At the same time, we partner in another very important area for both the university and the company. Through workshops, boot camps, and at events with schoolchildren, we are working together to create a positive perception of STEM subjects. Generating enthusiasm for this area can help to win over young talent. When young people have the opportunity to create their own technology, it helps them to better understand the possibilities.

For two decades, the university and its corporate partners have been working together successfully under the umbrella of the Coop Lab in the areas of teaching, knowledge transfer, and research. The scope and intensity of the partnership have steadily expanded over time, and new projects point to a bright future for the partnership over the next 20 years.

SIMON KRANZER
Senior Lecturer

Simon Kranzer has been teaching and researching in the Information Technology and Systems Management program for almost two decades. He is the interface with COPA-DATA and a big zenon fan. Together with many colleagues from both institutions, Simon lives the partnership between business and university.

www.fh-salzburg.ac.at

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COPA-DATA PARTNERS

The COPA-DATA Partner Community (CDPC) is a global network of specialists in the fields of industry and energy automation. It is based on long-term and sustainable business partnerships, two of them here:

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SAR ELEKTRONIC

Germany
Industry focus: Automotive +
Energy & Infrastructure

ABOUT US

SAR has been a partner for professional industrial and process automation since 1985. Headquartered in Germany and with offices in the US, South Africa, England, Austria, Switzerland, the Netherlands, and Slovenia, we employ more than 700 people.

OUR SOLUTIONS WITH ZENON

We have been deploying zenon in power plants and in the automotive industry for more than 20 years. In particular, we use the Server-Standby functionality, Smart Server, and Smart Client. We often use the electronic key system from EUCHNER to control operating authorization. For the most part, we use communication drivers with Siemens 300-, 400-, and 1500-series controllers.

OUR CUSTOMER PROMISE

We consult with and support our customers as partners in implementing their projects. Our experienced and knowledgeable team of experts provides our customers with end-to-end, process-driven solutions designed to meet their unique needs. We always focus, first and foremost, on the needs of our customers.

WWW.SAR.BIZ

COPA-DATA Partner Community
400+ members worldwide in 70+ countries

DARA PHARMA

Spain
Industry focus:
Life Sciences and Pharmaceutical

ABOUT US

Dara Pharma provides the pharmaceutical, biotech, and cosmetic industries with the most advanced technological aseptic packaging equipment. In this way, we contribute to the improvement of people's wellbeing and quality of life. We design, develop, and manufacture washing, sterilizing, filling, freeze-drying, and closing machines as well as complete lines for vials, bottles, syringes, cartridges, and IV bags to process liquid, semi-solid products, and powders in sterile conditions.

OUR SOLUTIONS WITH ZENON

Dara Pharma currently uses zenon in our aseptic packaging production equipment for the pharmaceutical, biotech, and cosmetics industries. Our goal is to make zenon our standard software. zenon provides Dara Pharma with many advantages, including secure compliance with FDA / CFR21 certification, which is very important in the pharmaceutical industry.

OUR CUSTOMER PROMISE

From the very beginning of the consulting phase, Dara Pharma guides our customers through the best options for their specific needs, solution selection, and project management. Our project management team acts as an interface to all the strategic areas of our company. During the installation phase, our team of multilingual technicians will be onsite to ensure the correct implementation and go-live of the machinery. And customers can count on the full support of Dara Pharma's after-sales department, offering 24/7 global coverage.

WWW.DARA-PHARMA.COM

COPA-DATA DISTRIBUTORS

zenon is a globetrotter. The COPA-DATA sales network spans all continents, from North America to Australia and consists of subsidiaries and distributors. We introduce two distributors here:

SATOMEC AG
Switzerland

ABOUT US
SATOMEC AG is a commercial company with 16 employees that specializes as a factory distributor of automation systems. Headquartered in Cham, Switzerland, the company is a distributor for zenon. It supplies customers in Switzerland and Liechtenstein with highly qualified support, consultancy services, and training, as well as operating a large warehouse. SATOMEC AG was founded in 1976. It has been owned by the Studhalter family since 2005.

OUR SOLUTIONS WITH ZENON
In addition to equipment manufacturers such as SKAN and SYNTEGON and energy utility companies such as AET in Ticino, we support a network of 23 integrators focused on providing solutions for customers in the Pharmaceutical and Energy & Infrastructure industries.

OUR CUSTOMER PROMISE
Our customers benefit from our team's many years of experience in automation, our premium support services, and extensive training and technical advice.

WWW.SATOMEC.CH

**International sales network
14 COPA-DATA locations & 18 zenon distributors**

LINX
Japan

ABOUT US
LINX is an expert zenon distributor in Japan. We are industry leaders in the distribution of the world's most advanced automation products into the Japanese market. Over many years, we have developed world-class expertise in many software development tools for factory automation, based on our highly skilled engineering and experience.

OUR SOLUTIONS WITH ZENON
Although we are a distributor, we do more than sell licenses. We also provide technical support together with COPA-DATA. As well as providing simple technical support, we always take responsibility as a member of a customer's project. We will propose the optimal implementation of zenon to realize a customer's requirements and accompany the customer throughout the entire implementation.

OUR CUSTOMER PROMISE
Our vision is to pursue automation technologies that free up human workers and boost productivity. What customers want differs from situation to situation. However, the direction we are all headed is the same: to increase production efficiency. In order to achieve it, we discover the best products from all over the world, combine them correctly, implement them accurately, and deliver them to the manufacturing site.

LINX

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69

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