

INFORMATION UNLIMITED

Spotlight:
GLOBAL MINDSET



**OPENNESS
TO LEARNING**



**ADAPT TO NEW
CULTURES**



**MANAGE DIFFERENT
CULTURES**



**NO ONE
CORRECT WAY**



**INTEREST AND
CURIOSITY**



**PROACTIVE USE OF
DIVERSITY**



**NOT BOUND BY
LOCAL**



GLOBAL MINDSET

EMPLOYEES ROUND TABLE:
What does a global company's DNA look like? *Page 10*

PREDICTION INTERFACE:
Take a closer look at the future! Now also available in zenon Runtime. *Page 22*

SUCCESS STORY:
Transparent filling operations made possible for PepsiCo in Lebanon. *Page 37*

HOME STORY:
zenon. Created for the industry but enhancing homes too. *Page 60*

IU

INFORMATION UNLIMITED

THE COPA-DATA MAGAZINE

ISSUE #34 | JUNE 2019

PRESIDENT AND PUBLISHER:

Thomas Punzenberger
 Ing. Punzenberger COPA-DATA GmbH
 Karolingerstrasse 7b, 5020 Salzburg, Austria
 Commercial Register Number: FN56922i
 t +43 (0)662 43 10 02-0
 f +43 (0)662 43 10 02-33
 www.copadata.com

EDITOR-IN-CHIEF: Phillip Werr

PROJECT MANAGEMENT: Christina Andexer

EDITORIAL TEAM: Nicola Richter, Esther Rutter

ART DIRECTOR: Manuela Rettenbacher

COPY-EDITING:

Supertext Deutschland GmbH, Berlin

AUTHORS/CONTRIBUTORS: Johnny Andersson, Julia Angerer, Anna Angermayr, Emilian Axinia, Sebastian Bäsken, Esther Borao (guest author), Anton Brandauer, Milana Čelarević, HeeJun Choi, Robert Korec, Christoph Dorigatti, Alexander Fröhlich, Andreas Gasteiger, Michael Gerlin, Sandra Handke, Markus Helbok, Markus Hillinger, Peter Kemptner (guest author), Thomas Lehrer, Reinhard Mayr, Robert Merz (guest author), Johannes Petrowisch, Thomas Punzenberger, Jürgen Resch, Stefan Robl, Dieter Strauß (guest author), Alexander Treiber, Abigail Walters-Davies, Phillip Werr, Lea Willenborg, Bernd Wimmer

PRINT OFFICE:

Offset 5020 Druckerei & Verlag Ges.m.b.H., Bayernstrasse 27, 5072 Siezenheim, Austria

LETTERSHOP:

BK Service GmbH – Dialog Marketing Agentur, Neualmerstrasse 37, 5400 Hallein, Austria
 PRINT RUN: 11,850 copies

COPYRIGHT:

© Ing. Punzenberger COPA-DATA GmbH. All rights reserved. The magazine and all the articles and images it contains are protected by copyright. Any use or duplication is not permitted without prior permission from the editorial team. The technical data contained herein has been provided solely for informational purposes and is not legally binding. zenon®, zenon Analyzer®, zenon Supervisor®, zenon Operator®, zenon Logic® and straton® are trademarks registered by Ing. Punzenberger COPA-DATA GmbH. All other brands or product names may be the trademarks of their representative owners and have not been specifically earmarked. We thank all contributors for their friendly support and the pictures they provided. Subject to change – technical, print or otherwise.

SOURCE COVER DESIGN:

<https://www.garyranker.com/global-mindset/global-mindset-leadership-what-it-really-means/>



[linkedin.com/company/copa-data-headquarters](https://www.linkedin.com/company/copa-data-headquarters)

[facebook.com/COPADATAHeadquarters](https://www.facebook.com/COPADATAHeadquarters)

twitter.com/copadata

[xing.com/companies/copa-data](https://www.xing.com/companies/copa-data)

[youtube.com/copadatavideos](https://www.youtube.com/copadatavideos)



CONTENTS

5 Editorial

6 SPOTLIGHT GLOBAL MINDSET

7 Knowledge is great, but attitude is everything

10 Interview: Working abroad fosters a global mindset

17 Infographic: Living and working abroad

18 PRODUCTS & SERVICES

20 zenon Release 2019

22 Prediction Interface: The future of your Runtime environment

25 FAQs: Secure and flexible batch production with zenon

28 Engineer's Kitchen Season 2: Always hungry for something new

32 INDUSTRIES & SOLUTIONS

34 zenon's smart characteristics for your line management system

37 zenon Success Story at PepsiCo Partner SMLC

41 Substation HMI:
 Why local control systems need to stay

44 New technologies set to improve future mobility

47 zenon Success Story at ADAC:
 Building automation with zenon

50 zenon Success Story:
 Sterile and safe production with SKAN and zenon

54 Industry 4.0:
 Plant comparison made easy thanks to zenon

56 AROUND THE WORLD

58 Who is Who

60 Interview: Smart homes with zenon

65 The Ifs - Learning about programming through play

68 Partner Community World Café

CONTACT/
 FREE SUBSCRIPTION:

IU@COPADATA.COM

WWW.COPADATA.COM/IU

PREFACE



Dear readers,

Curiosity, acceptance of new things, and the courage to open up to the unknown. These qualities are important not only in the realm of technology and innovation, but also on an interpersonal level. In this issue, we direct our spotlight to the “global mindset”. We ask how we can best shape our contacts with people from differing cultural backgrounds. Why are we so interested in this topic? Currently at COPA-DATA Group, we have associates of 25 nationalities working towards a common goal. We see this diversity not only as a necessary circumstance in a global company, but also as a source of energy and inspiration in our daily work.

In addition, we bring you some interesting product news. For example, you can now use predictive analytics directly in zenon Runtime (*page 22*). A number of exciting use cases result from this; it should help you operate your equipment even more reliably and efficiently.

PepsiCo partner SMLC in Lebanon has taken an important step in the digitalization of its production with zenon. It has rid itself of manual data entry altogether on its packaging systems. The optimized information flow from production to the boardroom has enabled better and faster decision-making since then (*page 37*).

Plus, do we manage to enthuse the youngest generation with technology and software? We are happy to present to you: “The Ifs”. This startup from Spain is bringing a first glimpse of programming knowledge to preschool-age children with its charming idea (*page 65*).

Be inspired!

A handwritten signature in blue ink, which appears to be 'TP', written over a faint, light blue circular background.

THOMAS PUNZENBERGER, CEO



**SPOTLIGHT**

A GLOBAL MINDSET FORMS
THE BASIS FOR SUCCESSFUL
INTERNATIONAL OPERATIONS

KNOWLEDGE IS GREAT, BUT ATTITUDE IS EVERYTHING

The world in the 21st century is more interconnected than ever before. Global trade and interwoven cross-border supply chains have increased our contact with people from different cultures which, initially, seem unfamiliar. In this context, the term “global mindset” often crops up. But what exactly is a global mindset? Is it little more than a buzzword created by and for executives? Or can we all learn something from it? And, if so, how do you acquire a global mindset?

“When in Rome, do as the Romans do” is a saying with which we are all familiar. In foreign language classes, we learn something about the various customs we might encounter in the countries that speak those languages. Often, we find out that we cannot be too direct in expressing our wishes and expectations to our fellow human beings – instead, we have to be extremely polite and careful with our choice of words. It’s likely our knowledge relates primarily to countries with a similar cultural milieu to our own. But the world is not restricted to our own continent and, thanks to increased mobility and virtual communication, we often come into contact with people from vastly different cultures. Misunderstandings become inevitable.

While it is helpful to master a country’s language, culture encompasses more than just language. Being open and friendly is the first step toward getting to know other people because, despite the different languages that we speak and our different skin colors, religions, genders, social statuses, and cultures, at the root of everything we are all human. It is this realization that establishes a foundation for a global mindset.

WHAT DO WE MEAN BY A GLOBAL MINDSET?

In Forbes’ Corporate Responsibility blog, Gregory Unruh defines a global mindset as: “an ability to connect with people from other cultures on an intellectual as well as emotional level. Culture dictates the way we dress, the food we eat, the language we speak, and the stories we tell. Global mindset is thus the capacity to appreciate the differences among cultures and bridge the gap between them.”¹

Another definition claims that a global mindset encompasses openness to other cultures, an awareness of cultural differences, and the ability to handle these differences. As soon as one of these characteristics is missing, you no longer possess a global mindset.²

THE DIFFERENCE BETWEEN INTERCULTURAL SKILLS AND A GLOBAL MINDSET

The terms “global mindset” and “intercultural skills” are often used interchangeably – but they are not actually synonymous with one another. As a general rule, intercultural skills are understood to be the ability to interact successfully with people and groups from different cultural backgrounds.

In books and on the Internet, there are countless tips about what to watch out for in various countries and when

interacting with different cultures, including the faux pas that must be avoided at all costs. Possessing intercultural skills really means gaining this specialist knowledge – but is it enough on its own?

As humans, we associate knowledge mainly with the rational side of our being, not our emotional or spiritual elements. At the same time, we have to reconcile this with the fact that being human is far more than a one-dimensional state of rationality – and that goes for the ways in which we interact in our own cultural sphere as well as when interacting with other cultures.

Adopting a global mindset is really all about being human. Even if someone has excellent intercultural knowledge, for example, they may still be uninterested in people from other cultures or may even be afraid of or hostile to them.

Every person – or group of people – craves respect and dignity. Failing to recognize this need will result in communication simply breaking down due to a lack of trust. For effective communication, it is also vital to have empathy: in other words, the ability to put yourself in others’ shoes and sympathize with their emotions. This makes empathy an essential component of a global mindset. But remember: showing empathy and openness towards others is an attitude, and one that must be lived in order to be credible.

HOW TO ADOPT A GLOBAL MINDSET

Anyone who considers it important to have a global mindset should approach other individuals on an equal footing – instead of looking down on them – and should be aware of the distinctive features that mark out particular cultures. Adopting this kind of attitude is all about being open-minded.

DON’T JUDGE CULTURES

Avoid categorizing cultures as “good” or “bad”, whether they are different from or similar to yours. There is no room for ethnocentric opinions that attribute more value to your own culture than to others.

ACCEPT CULTURAL DIFFERENCES

Having a global mindset means much more than simply being tolerant of others. It means becoming more familiar with other cultures and using the knowledge gained from this in a positive way when interacting with people from those cultures.

¹ Source: <https://www.forbes.com/sites/csr/2012/04/19/being-global-ii-global-leaders-have-a-global-mind/#5b6b21415811>

² Source: <https://studlib.de/10836/psychologie/einleitung> (source only available in German)

BE OPEN TO NEW EXPERIENCES

Every day should be a school day. Adopt the same attitude to other countries, languages, customs, and cultures as you would to a new and unfamiliar piece of technology. If you come across as open and willing to learn, you will always be viewed in a positive light. Remember that those with whom you interact will quickly get the measure of whether your outlook is open, reticent, or even hostile. Information about the dos and don'ts of any given environment will prove particularly useful in your interactions. Nobody will expect you to copy exactly what they do, but they will expect you to adapt to their customs and be tolerant and respectful of them.

BE ATTENTIVE

Attentiveness and awareness are two highly positive traits. Global mindset coach Gary Ranker³ believes that there are three pillars of awareness: self-awareness, social awareness, and perception awareness.

Self-awareness means understanding yourself on a deeper level. The more you know about yourself, the easier you will find it to adapt to a different environment.

Social awareness equips us with the ability to understand the needs and wishes of other people, and respond accordingly. By accommodating the needs and wishes of others, you are more likely to gain their trust.

Perception awareness finetunes our senses when we are interacting with others. It gives us the ability to understand others more deeply through the gestures, facial expressions, and intonation that they use. It is also important to be aware that certain gestures will have a completely different meaning in other cultures and that making them could even be perceived as insulting.

DEMONSTRATE INTEREST AND CURIOSITY

Be open to new experiences and you will quickly find your feet in a new cultural environment. It helps to adopt a childlike sense of curiosity (on a toned-down scale), showing your interest in other traditions, cultural environments, historical backgrounds, and ways of life. Sharing food and drink with others is a good place to start.

The people you meet from other countries or cultures will know that you will not be familiar with every single aspect of their locale. If you show a sincere interest in their country or culture, however, they will gently point you in the right direction if you make a mistake – and you should take this advice to heart.

In the next article, you can read all about the experiences that some COPA-DATA employees have had during their encounters with other countries and cultures.

HOW TO ADOPT A GLOBAL MINDSET

- There is no single correct way to adopt a global mindset.
- Accept cultural differences instead of judging them.
- Remember that a global mindset and intercultural skills are not the same thing.
- Intercultural skills refer to knowledge housed in our rational being.
- A global mindset, on the other hand, is an attitude that embraces humans in their entirety – at a rational and emotional level.
- People who have a global mindset accept other cultures and try to understand how they work.
- A person with a global mindset accepts other cultures and tries to understand how they tick.
- Preparing for contact with people from other cultures is useful. However, imitating what they do in an exaggerated way will look artificial.
- Stay open, friendly, and willing to learn, and people with good intentions will accept you wherever you go.
- A global mindset means engaging with areas of difference.

³ Source: <https://www.garyranker.com/2017/12/08/what-is-global-mindset/>

INTERVIEW:
WORKING ABROAD FOSTERS A GLOBAL MINDSET

In reality, it's just different

For companies with a desire to be active players in the global market, having a competitive product is not enough – they also need employees who embody this international outlook.

So just how much is a global mindset already embedded in COPA-DATA's DNA? At the beginning of 2019, COPA-DATA staff met in Salzburg to take stock and reflect on their own experiences of working abroad.

PHOTOGRAPHY:
CHRISTIAN LEOPOLD | NEUMAYR FOTOGRAFIE

Having a positive attitude toward other cultures is essential for developing a global mindset. Is this openness something you are born with or do you only develop it by going abroad yourself?

MARKUS HILLINGER: It was definitely something innate in me. During my studies, I wanted to complete a semester abroad, but it would have been really difficult to manage the time involved in this as I was studying two subjects simultaneously. Joining COPA-DATA's International Sales department gave me the perfect opportunity, and I seized it on my very first day by saying that I wanted to work abroad – and didn't mind where. I find all cultures and their idiosyncrasies fascinating. Every country has so much to offer. All you need is the courage to venture out and soak up the culture, and make the most of whatever comes your

fact that COPA-DATA offers and promotes this opportunity is remarkable. You have to have an open mind to develop a global mindset, otherwise you won't be able to engage much with another country and you'll have less chance of enjoying your work trip abroad.

ANTON BRANDAUER: If you work for an international company, having an open mind is an absolute must – you need to accept other cultures and understand how they work. So here at COPA-DATA, the real challenge is making sure that the interfaces between headquarters and the subsidiaries are set up in a way that suits everybody. This means we have to help our subsidiaries understand our way of thinking and vice versa. It's not about changing a culture; it's about finding common ground so that everyone feels the benefits of working as an international team.

"In reality, it's just different. You should accept cultural differences rather than judge them."

SANDRA HANDKE

way. I already had a global mindset and was open to new things before I joined COPA-DATA UK so, in that sense, not much has changed. I am still open to going abroad again.

SANDRA HANDKE: I was also very open to learning about other cultures and keen to do a semester abroad during my studies, but I didn't manage it in the end. The

MILANA ČELAREVIĆ: When I was asked whether I wanted to help support the team at COPA-DATA USA, I knew instantly that I wanted to do it. My experience of working abroad has also changed me personally – it was a great experience and I would do it again in a heartbeat.



Anton Brandauer

Service Alliance Business Developer,
COPA-DATA

Anton Brandauer has been at the company since 2010 and was initially employed as a technical consultant.

In 2013, he moved together with his wife and their two children (four and a half years old and six months old) to Chester in the north west of England, where he supported the COPA-DATA UK team.



Milana Čelarević

International Sales Assistant,
COPA-DATA

In 2012, Milana Čelarević started an “apprenticeship with high school graduation” in the COPA-DATA administration team while simultaneously completing a qualification in event management. Her role involved supporting the training team and organizing internal events. In 2017, she spent three months at COPA-DATA’s US subsidiary.



Sandra Handke

Marketing Manager International,
COPA-DATA

As part of the marketing team, Sandra Handke looks after COPA-DATA subsidiaries in South Korea, France, and the USA. She started in 2014 and, three weeks into her job, was sent to South Korea for a year to set up marketing operations there. Following her return, Sandra’s role extended to incorporate responsibility for marketing in the Central Eastern Europe and Middle East regions.



Markus Hillinger

International Sales Manager for North America and the UK,
COPA-DATA

Markus Hillinger started his career at COPA-DATA in 2016 with an internship in product management. He then moved to the International Sales team. In 2018, he went to Cardiff, Wales, for nine months to work for the COPA-DATA UK sales team there.

How do you prepare yourself mentally and organize everything before immersing yourself in an unfamiliar culture?

MILANA: It was quite an emotional experience for me. I wasn't prepared for it at all. I still live with my parents and am a family-oriented person, so it wasn't easy to break the news to my parents that I was going to work abroad in the USA. They were very skeptical. My mom said, "Why can't my Milana work as a cashier at the supermarket – who cares about having a career?" She then didn't come into my room for a whole month.

I wasn't sure what awaited me. It was only once I had arrived that we started to figure out the day-to-day stuff. Our HR team was very supportive when it came to organizing everything – whether it was applying for a visa or finding a place to live.

MARKUS: I didn't really prepare for it; I just took things in my stride. I always knew that I wanted to do it, so I told myself that I just had to get on with it. I did feel a little

beginning: from my residence permit to helping me search for an apartment. There were two of us going (the other was Christoph Dorigatti, Head of International Sales), which made it easier because we could share our joys and sorrows. We moved out of our apartment and sold our cars and furniture, so we moved in briefly with parents. We didn't have a return ticket as we were unsure how long we were going to stay there. It was a pretty bold move. Also, my family weren't very happy about it, partly because they were worried about the media coverage of the situation with North Korea. But we had made our decision several months before. After that, my mother found it difficult to sleep well. In the end, though, it was an entirely positive experience. My parents came to visit and changed their minds about it – they found that South Koreans were very polite, there was hardly any crime, and everything was extremely clean. It is necessary to prepare, but it shouldn't make you crazy. It will be nothing like what you expect anyway, so you just have to go for it.

"Our HR team supports all employees who would like to go abroad. We should continue to promote this so that more colleagues can make use of this opportunity."

MARKUS HILLINGER

uneasy, but you have to push any fears you might have to one side. And then as soon as you take the plunge, everything falls into place because you're immersed in so many new experiences that there's no time left to worry. I've always been keen on self-improvement too – and I mean that in my life in general, so that goes beyond the time I spent abroad. Luckily, there wasn't too much to organize in anticipation of my trip to the UK, as it is much more similar to Austria than, say, Asian countries.

ANTON: The UK is a little different, of course, but it is still a European country, so it wasn't too big an adjustment. My departure was very last-minute, so I wasn't able to prepare for it very thoroughly. I did, however, have to check that everything was arranged for my family – like health insurance for the children. My eldest son was four and a half years old at the time, and my daughter was six months old. My colleagues at COPA-DATA UK helped me with all the day-to-day issues – where the nearest dentist was, where you could get certain everyday items or food, and much more. You only really get to know how the locals think and act when you live there for yourself, and my new work colleagues were instrumental in helping me learn about this.

SANDRA: When I was preparing for my stay abroad in South Korea, our HR team took care of a lot right from the

Does that mean you can't just learn everything from a guide to doing business abroad?

SANDRA: You can read books on Korean etiquette, of course, and learn things from the funny everyday stories they include. But you only find out what it's really like when you live there yourself – then you learn very quickly.

What do you think is the best strategy for integrating into another society? Is it better to show diplomatic restraint and be cautious, or should you take risks so you can learn quickly from mistakes and faux pas?

MILANA: I was pretty careful to ensure I didn't do anything wrong and I told myself that I needed to fit in. My US colleagues were even more open than I was. I can't think of any particularly major faux pas I made.

MARKUS: I didn't make any huge blunders either, although it was impossible to be overly reserved because of the British sense of humor – it is everywhere. It meant I had a lot to learn at the beginning. Hardly ten minutes would go by without someone making an amusing quip. We actually didn't have any real blunders but always found the necessity to keep adapting a little.

SANDRA: We arrived late on our first day, which is a complete no-no in Korea – they would normally deduct a full vacation day. However, as it was always obvious from



Markus Hillinger, Robert Korec, Sandra Handke, and Anton Brandauer (left to right) discussed the intercultural challenges faced by a company on the global stage.

our appearance that we were not Korean, they were more lenient with us in many situations, like if we had not bowed correctly. The Koreans were always very obliging with us Europeans – everyone was very friendly and open, so we didn't worry too much if we made mistakes or not.

ANTON: I gave my colleagues something to laugh about when I tried to get in the car on the wrong side after I'd filled it up with gas. By their definition, the Brits are the only ones who drive on the correct side of the road! (laughs)

SANDRA: There is no single right way to do something. When we come into contact with people from other cultures, we often say "that's funny" or "that's strange." But in reality, it's just different. You should accept cultural differences rather than judge them – once you understand that, everything works very well.

Apart from the jetlag, during your time abroad did you need to adapt your daily routines to suit local situations?

SANDRA: Life in Korea is very different to back home. Time is different: things are going on 24 hours a day, seven days a week. You can quickly grab a good bite to eat at any time, even at 3 am. No matter what you want to do, and whatever time it is, you can be sure somewhere will be open that offers it – there's no such thing as opening hours. We don't have that at home.

MILANA: It's similar in the USA. The city never sleeps.

SANDRA: COPA-DATA is an international company with people who have a lot of experience in handling customers and partners from different countries. Still, we must always realize that regional circumstances are understood best by the locals themselves. Of course, we gather experiences, but



Markus Hillinger (left) thinks that Austria has a lot of catching up to do in adopting a global mindset.

when we implement new processes or create new marketing material for example, we need to get local feedback if what we're doing is even appropriate in the respective country.

ANTON: Our subsidiaries are perfectly placed to understand our customers. They are the professionals from whom we can learn. Smaller subsidiaries are more reliant on our headquarters, but larger ones such as Italy, Germany, and CEE/ME serve their markets independently.



Robert Korec (right):
 "What do you think is the best strategy for integrating into another society?"
 Markus Hillinger (left):
 "It was impossible to be overly reserved in the UK because of the British sense of humor."



Anton Brandauer: "Everything is becoming more global – both in our company and elsewhere."



Milana Čelarević: "My experience of working abroad has changed me personally."



Sandra Handke: "You only find out what it's really like when you live there yourself."

Has this experience helped you improve your understanding of what people from other countries find unusual about our way of conducting business?

SANDRA: Americans think it's strange that they can't reach us after 5 pm.

MILANA: Where I was, they thought it was funny that I was already in the office at 6:30 am.

SANDRA: They are also amazed at the number of public holidays we have – they ask me: “Do you get a day off just because the grass on your lawn has grown another inch?”

ANTON: Yeah, many people are blown away by the number of vacation days we have.

MARKUS: When I arrived in the UK, I thought about every little thing but then I learned that all these thoughts were actually a hindrance during a meeting. If you go into a meeting feeling more relaxed, the output is almost always better.

SANDRA: If a customer in Asia calls you at 11 pm, you pick up – they will expect no less.

ANTON: One thing we can learn from people in Asia is their absolute discipline when it comes to waiting in line. It's always said that the British are the best at that but, in reality, it's people in Asia. It would be fantastic if we could get people to do that back home – it would be much less stressful.

MILANA: I also remember how friendly the Americans are.

MARKUS: ... and how helpful the British are.

SANDRA: People are very friendly in South Korea and there is hardly any crime, which is why Korean tourists feel a bit uneasy abroad, even in places like Vienna. Seoul is very clean despite the lack of trash cans in the city – people take their trash home with them and dispose of it there.

to work in the way the customers expect it to there. I also learned a lot in conversations with customers from Asia.

SANDRA: Not all of our colleagues have the opportunity to spend an extended period abroad themselves, but lots of people at COPA-DATA have developed a global mindset as a result of their experiences – so they can then share their knowledge and act as mentors and intermediaries.

What can COPA-DATA do to continue cultivating a global mindset in its staff?

SANDRA: We should offer colleagues in subsidiaries more opportunities to come and work with us at the company's headquarters for a certain period of time.

ANTON: I've advocated that idea to colleagues across the globe. So far, we have only sent technicians from Salzburg to our subsidiaries and not the other way around.

MARKUS: Working abroad was a fantastic experience and we had so much fun. Our HR team supports all employees who would like to go abroad. We should continue to promote this so that more colleagues can make use of this opportunity.

MILANA: That's right, we should be taking a more active approach. The first step is the hardest. If someone comes up to you and asks whether you'd like to go to Spain, it's a smaller leap than if you have to make the effort yourself.

ANTON: We have already started doing that in our apprentice training program – it now includes a one-month work trip to a foreign subsidiary at the end of the training period.

SANDRA: When we draw up new processes, we should always consider the international perspective and ensure we provide opportunities for people to give feedback.

“It's not about changing a culture; it's about finding common ground so that everyone feels the benefits of working as an international team.”

ANTON BRANDAUER

What advantages does your experience abroad give you when you are in contact with international customers?

ANTON: It has helped me a lot. In Salzburg, I'm mainly in contact with my colleagues, not as much with customers, so I learned a lot in the UK because I was out with customers. I realized that it is not just our subsidiaries that act differently, but customers do, too. The subsidiary has

MARKUS: As a global company, we have already successfully implemented several steps. Although there are a lot more we could take, we are definitely heading in the right direction.

COPA-DATA'S JOURNEY TO BECOMING A GLOBAL COMPANY



Number of employees worldwide 12 95 274



Number of subsidiaries 0 5 11



Number of employees in subsidiaries 0 37 122

Percentage of employees in subsidiaries 0 38.9 44.4



Nationalities (COPA-DATA Group employees): 25



Languages spoken as a mother tongue (COPA-DATA Group employees): 23

* Status as of March 2019

"People of my generation have significantly more international career opportunities than people did 20 years ago."

MILANA ČELAREVIĆ

Let's think outside the COPA-DATA box for a moment. Is the number of people with global mindsets increasing or is there a greater trend toward focusing on national interests?

MARKUS: Austria has some catching up to do in this respect – we could learn something from what other countries are doing. Generally, though, things are heading in the right direction. Nowadays, there are more opportunities for people to work all over the world. Some international companies are setting an example and driving the growth in location-independent working.

SANDRA: There is also certainly a generational divide. The younger generation are growing up in a globalized world, so they are perfectly accustomed to working with people of different nationalities and traveling a lot.

MARKUS: People's language skills have also improved. English has become a lingua franca so that has got rid of a major barrier. Nowadays, you know that wherever you go, it is highly likely that people will also speak English.

MILANA: People of my generation have significantly more international career opportunities than people did 20 years ago. Even training programs and professional development incorporate international aspects.

ANTON: Everything is becoming more global – both in our company and elsewhere. The amount of contact we have with people from other countries is increasing. Openness and intercultural understanding are therefore becoming more and more important. Anyone who is given the opportunity to spend some time abroad should seize it and broaden their horizons.

THE INTERVIEW WAS CONDUCTED BY
ROBERT KOREC,
PR & COMMUNICATIONS CONSULTANT,
COPA-DATA HEADQUARTERS.

LIVING AND WORKING ABROAD

FACTS AND FIGURES FOR YOUR CONSIDERATION

THE BEST PLACES FOR EXPATS



WHERE IT IS EASIEST TO ...

- ... get high-speed internet at home: **South Korea**
- ... go through the local registration process: **Singapore**
- ... pay without cash: **Finland**
- ... apply for a job: **Vietnam**

WHERE EXPATS ENJOY LIFE ABROAD MOST

- Quality of Life: **Taiwan**
- Health & Well-Being: **Austria**
- Leisure Options: **Spain**
- Safety & Security: **Luxembourg**
- Travel & Transport: **Singapore**
- Digital Life: **Estonia**
- Personal Happiness: **Mexico**

EXPAT STATISTICS

51% FEMALE  **49%** MALE

Age Groups

44.2 years on average
5% 25 and below
13% 26–30
29% 31–40
22% 41–50
31% 51 and above



Planned length of stay

1% less than 6 months
4% 6–12 months
13% 1–3 years
14% 3–5 years
19% longer than 5 years
32% possibly forever
17% undecided



Motivation for moving abroad

16% moved for a better quality of life
12% sought an adventure
10% sent to work abroad by their existing employer
21% found a job or was recruited locally
8% moved for their partner's job or education
12% joined their partner in their home country
21% unknown



DOS AND DON'TS TO NOTE ABROAD



Bin your litter in Singapore:

Dropping rubbish is a criminal offence. Chewing gum has even been banned from being imported.



Kiss as a form of greeting in France:

Kissing both cheeks is very important and holds a long-standing place in French culture.



Don't underestimate the pizza size in the US:

Large pizzas in the US are generally not to be made to be eaten by one person. Two slices might be enough.



Be careful with your chopsticks in Japan:

It's considered ill-mannered to point, play with, or stab food with chopsticks.



Don't show up on time in Venezuela:

It's considered to be rude. Those who do so may be considered too eager and even greedy.





PRODUCTS

&

SERVICES

AHEAD OF THE CURVE:

zenon is now even better, faster, and more secure

Enhanced features and improved functions

There is no such thing as a piece of software that has attained total perfection. Excellent though it is, even the zenon platform always has room for some improvement. For example, we can add enhancements in areas such as the range of functions it offers. We naturally want zenon to be a contemporary operating system – but we want it to be ahead of the curve too. That's something we've achieved with the new version, zenon 8.10. We have accelerated the platform's performance significantly, made it even more user-friendly, and enhanced its security features. Read on to find out more about the improvements we have made.

GETTING UP TO SPEED

The sheer number of variables housed in projects is rapidly on the rise. This affects increasing numbers of projects and adds to the lists of demands that hardware and software have to meet. We appreciate just how important performance is to our customers, so our new release is facing this challenge head-on through code adaptations such as optimized algorithms. The zenon Editor now starts up much more quickly, and parameters are grouped and sorted more efficiently – affording you the benefit of a noticeably improved Runtime system. The engineering features are better too: the time required for recurring property changes, for instance, has dropped by as much as 97 percent.

FASTER ARCHIVING

For some time now, cyclical archives have been capable of multitasking. In the new version, spontaneous and triggered archives can do this too. To enable this, we have made fundamental technology updates and optimized the storage system. As a result, archiving now runs even more quickly in the background. While past versions were able to process up to 400 value changes per second, that number has now risen to as much as 150,000. What's more, archiving no longer affects Runtime performance. So, the user interface is able to keep running smoothly (allowing a new screen to be opened, for example) even when archiving is working at maximum capacity.

OPERATION MADE EVEN SIMPLER

We have listened to our customers and used their feedback to make it easier to create and display trend curves. New features include the ability to add variables to the display via drag & drop, and even the option of changing the curve display in Runtime. Until now, it was not possible to switch to a different style when creating trend curves, making groups of several value lines appear identical in some cases and, therefore, difficult to distinguish from one another. Now there is the option of adopting the value axis color from the curve color, thereby uniquely associating each axis with a specific curve. Additionally, it is now possible to control the visibility of axes using a variable. Custom-designed buttons, for instance, can be used for this purpose – and for controlling curve visibility as well.

MAINTENANCE

We have now integrated maintenance commands into other functional modules. The maintenance status, for example, can be identified in the equipment model, while the Chronological Event List (CEL) contains optional information about maintenance.

AN IMPORTANT DEVELOPMENT FOR BUILDING AUTOMATION

Around ten years ago, we developed the BACnetNG driver with a view to enabling reliable, flexible communication in building automation. Now, zenon has been awarded BACnet certification in line with criteria set by the ANSI/ASHRAE

(American Society of Heating, Refrigerating and Air-Conditioning Engineers). This proves zenon's compliance with 135-2012, the principal standard governing connectivity in building automation. It ensures maximum security for users working in this field.

SECURE COMMUNICATION FOR SMART EQUIPMENT

Not only have we integrated new drivers, we have also revised several existing ones. The RemoteRT driver, for instance, now also supports encrypted communication with the connector container, an application that can be started in parallel with zenon Runtime to enable remote access to partial components of Runtime. Additionally, authentication and encryption have been optimized in other drivers without compromising their functions. All these enhancements have made for a more secure software platform.

TREND PREDICTION WITH MORE PRECISION

The feeling when your system goes down without warning is infuriating – particularly if you know it could have been prevented. That's where zenon's Predictive Analytics function comes in. It identifies trends on the basis of existing data and tells you when it's time to replace a component, for example. The new release has made trend prediction even more precise, with zenon Analyzer delivering data with accuracy down to the second rather than simply the minute. Time-based prediction models also enable automatic detection of a production facility's main periodicity, providing information more quickly and allowing faster decision making. In zenon 8.10, predictions can even be used in Runtime. For more on this, see our article on [page 22](#).

MORE FLEXIBILITY IN BATCH-BASED PRODUCTION

In the new version, zenon Batch Control provides unit classes for configuring the process. You now create generic recipes and do not decide which equipment will be used to execute the process until the process actually starts. In previous versions, this was set for you. This removes any reliance on specific items of equipment, giving you more flexibility during batch-based production. This feature is explained in more detail in the article on [page 25](#).

HEADING TOWARD A PLATFORM-INDEPENDENT FUTURE

The HTML5 Web Engine, part of the web server, has been modified and updated to reflect the latest standards in technology. This is laying the foundation for a platform-independent future with even better connectivity.



With unit classes, the equipment that is to be used for executing the process is now not defined until the process starts.

The Combined element – often referred to as zenon's multi-purpose tool – has now been released for the Web Engine. With full support also provided for released symbol properties, the amount of time that engineers are required to spend on creating projects has been slashed. Existing screens no longer have to be adapted for the Web Engine, and text is entered directly in the input field, consigning pop-up windows firmly to the past. In a first, zenon 8.10 also makes it possible to evaluate limit value violations and execute functions supported by the Web Engine, such as applying set values or screen switching.

THE HIGHLIGHTS AT A GLANCE

- Improved performance and faster response times
- Multitasking for spontaneous and triggered archives
- Extended Trend module now more user-friendly
- Proven building automation security thanks to BACnet certification
- More accurate predictions with Predictive Analytics, improving analyses and reports
- Unit classes in Batch Control for additional flexibility in batch-based production
- Additional options for using the Web Engine: Combined element and released properties now supported

ANDREAS GASTEIGER,
PRODUCT MARKETER

Prediction Interface: How your Runtime can look into the future

NEW MODULE NOW ENABLES
PREDICTIVE ANALYTICS IN RUNTIME

Until now, zenon has only been able to conjure up predictions about the production process in zenon Analyzer. Now, Runtime has its own way of gazing into the future too – making process automation significantly more reliable and more efficient than it ever has been.

EVEN BETTER PREDICTIONS WITH ZENON

Predictive analytics functions are highly popular features of HMI/SCADA applications – and it's easy to see why. The predictions they deliver are much more than simply a gaze into a crystal ball. Instead they use concrete historical data as their foundation. This makes it possible to predict future developments and actively respond to them, bringing greater reliability during planning, less downtime, and financial advantages.

With all these benefits in mind, a year ago we incorporated the Predictive Analytics feature into zenon Analyzer as a means of generating predictions based on time or values. Now, the new release of zenon has also added these prediction capabilities to zenon Runtime.

A WHOLE HOST OF POSSIBILITIES

The ability to identify likely future events early on makes working environments more transparent and the decision-making process more reliable. It helps you to assess how energy consumption or other variables are likely to behave as you head toward the end of a month, or how planned quantities might impact on the quality of the end product. Of course, there is also the option of comparing current and past production data in order to ensure that production is being maintained within the required parameters.

The results of such predictions are stored in variables that can be used flexibly in zenon, allowing all kinds of analyses to be performed.

DIFFERENT PREDICTION TYPES

There are two types of predictions available to suit different applications. A time-based prediction forecasts how a value is set to behave in the future. And a value-based prediction describes how a value will act if another value is modified. As well as this, there are two ways of executing predictions: a triggered method that is purely demand-based, and a recurring method that executes predictions at certain intervals according to a schedule.

CONNECTING THE INTERNET OF THINGS

The Supervisor, Analyzer, and Service Grid features all work together to deliver predictions in Runtime. While users will already be familiar with Supervisor and Analyzer, Service Grid is a newer addition. This software platform extension connects zenon to the Industrial Internet of Things (IIoT) and is made up of several distributed services. Each service performs a specific task and can be installed and operated independently of other services on different target systems. zenon Editor, zenon Runtime, and zenon Analyzer can all be connected to Service Grid and exchange data with one another or make it available to third-party

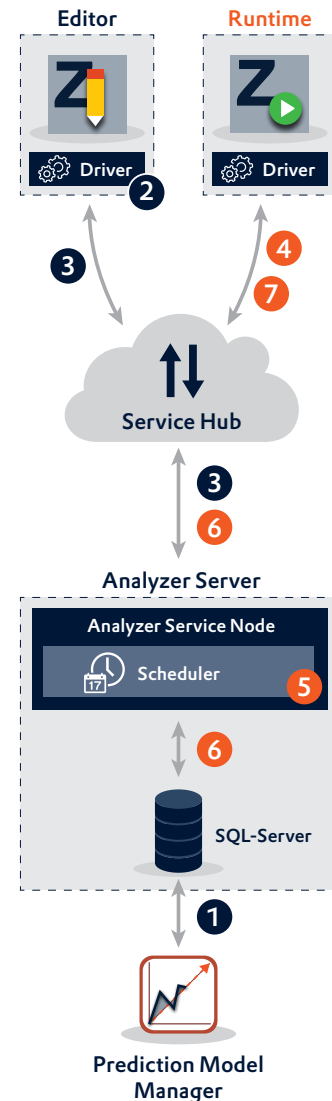
SPONTANEOUS PREDICTIONS BASED ON SCHEDULES

DATA FLOW IN THE EDITOR

1. Prediction models are generated in the Prediction Model Manager and stored in the zenon Analyzer metadata database.
2. The available Service Hubs are read during driver configuration. When you select a Service Hub, it is stored in the driver settings.
3. During the variable import process, the driver communicates with the Service Hub several times.
 - a. Select an available Analyzer Server for querying.
 - b. The Service Hub reads the available metadata databases from the Analyzer Server and passes this information onto the driver. Select the metadata database that contains the prediction models you would like to use.
 - c. From the metadata database, the Service Hub reads the available projects (including variables, prediction models, and schedules) that can be used for predictions and passes this information on to the driver.

AUTOMATIC DATA FLOW IN RUNTIME

4. When Runtime starts, the driver subscribes to the required schedules on the Service Hub.
5. When the Analyzer Server starts, the Analyzer Service Node with integrated Scheduler starts along with it. Predictions are calculated according to the schedules.
6. Once predictions are available, the Analyzer Service Node passes them on to the Service Hub.
7. As soon as these predictions reach the Service Hub, they are sent to every driver that has subscribed to them.



systems such as ERP systems or cloud applications. Data is transmitted in an encrypted format with service access data and digital certificates, ensuring secure, effective, and dynamic functions that perform on a superordinate system level and use the very latest Internet technology.

All the Prediction Interface module requires is the Service Hub. Part of the Service Grid, this is a central point for transmitting data and thus acts as the interface between the individual applications.

THE FUTURE IS NOW

Predictions from the Prediction Interface are laying the foundation for a brand-new, targeted approach to problem solving. As an example, you can use automatically or manually triggered predictions for planning production more effectively and preventing waste. One possible

application is as an early-warning system. Here, predictions that are generated on a schedule are the ideal solution as they tell you one hour in advance when limit values are likely to be reached, for instance. This enables you to respond in good time. The range of applications in which predictions can be used is as diverse as the field of predictive analytics itself. Incorporating these predictions into Runtime not only supplements the existing predictions used in reports, it also opens up a whole host of new possibilities.

HOW TO START PREDICTING

Setting the parameters for the Prediction Interface and operating it couldn't be simpler. Here's how to integrate the prediction function into your Runtime in just five easy steps.

EXAMPLES OF IIOT APPLICATIONS

Here are just some examples of the applications that these new features open up:

- Cross-location networking of production facilities
- Analysis of historical data to predict value behavior
- Connection of third-party systems and mobile apps for data querying and control
- Connection with IoT devices, such as smart energy meters
- Display of the current equipment status using web-based user interfaces

STEP 1 – THE PREDICTION MODEL

Every prediction is based on a prediction model that in turn relies on a comprehensive stock of data. In zenon Analyzer's Prediction Model Manager, this data is analyzed and then converted into a mathematical function, with a separate prediction model required for each aspect that is to be taken into account.

STEP 2 – CONNECT YOUR ZENON APPLICATIONS TO THE SERVICE HUB

A Service Hub is installed and automatically configured in all cases that involve the Analyzer Server. We recommend using the Service Hub because it renders any further steps on the Analyzer Server unnecessary. You need the Service Node configuration tool, included in the scope of delivery, to ensure that the zenon Editor is able to communicate with the Service Hub. This tool is used for logging onto the Service Hub and takes care of the digital certificates as well.

STEP 3 – SCHEDULE-BASED PREDICTIONS

This step is only required if you intend to generate predictions according to a schedule. If you would rather use triggered predictions, you can skip this step.

Schedules are created using zenon Analyzer. To do this, start zenon Analyzer Management Studio and open the Service Node interface. There, you will find defined prediction models and can set up customized schedules for them. Predictions will then be generated immediately based on your schedules and transmitted to the Service Hub.

STEP 4 – THE PREDICTIVE ANALYTICS ENGINE DRIVER

Predictions are uploaded to Runtime by means of a driver. To enable this, you need to add the Predictive Analytics Engine driver to your project and set the parameters in the normal way that you would for any driver. All you then need to do is select the Service Hub that you want to use for communication, and start variable import in the driver. The number of variables that are generated will differ according to which prediction is selected. Triggered predictions will be generated by a certain variable, for example, which is not the case for spontaneous predictions.

STEP 5 – YOUR AUTOMATION SOLUTION

As a result of all this, predictions will be present in variables that can be used just like any other variables in zenon – for simply displaying values, in a combined element or a trend curve, or as an event trigger. Any of the options that zenon provides are there for you to take advantage of, and you can even archive future values.

THOMAS LEHRER,
PRODUCT MANAGER

FAQs

Secure and flexible batch production with zenon

How to master your processes with the Batch Control module

zenon Batch Control is an integrated solution for automatic process control in batch-based production that conforms to the ISA-88 standard. With simple engineering and operation, plus flexibility and vertical integration, this is a module that stands out from the crowd. Read on to find out how you can use Batch Control to boost efficiency in your batch production processes.

We have several product lines that are similar to one another. Do I need to create and maintain a separate unit configuration for each line?

No, because Batch Control works with unit classes that provide a template for units. Configuring a unit – including all of its phases, parameters, and reactions – can be a highly time-consuming task and requires unwavering concentration, as even one slip can have disastrous consequences for production. Batch Control does away with unnecessary engineering work, especially for items of equipment that are similar. This not only makes life easier for the project creator but also cuts down on the error rate.

Every instance (called a unit instance) in a unit class inherits the settings of that class. You can then allocate individual variables to associate the unit instance with the actual equipment in question. If a configuration error is

identified during testing, it only has to be corrected in one place: the unit class. The correction is then automatically fed through to every unit instance. Of course, there is also the option of configuring areas where you would like a unit instance to be different from the rest. If one item of equipment features an additional function, for instance, a phase can simply be added to the unit instance (see *Figure 1*).

Let's say that a plant is using three identical mixing tanks. In the zenon Editor, it is possible to create a "Mixing Tank" unit class in which all the phases are configured. The next step is to generate three instances that correspond to the three actual tanks. Once the variables have been assigned correctly, these instances can communicate with the PLC and, therefore, the equipment.

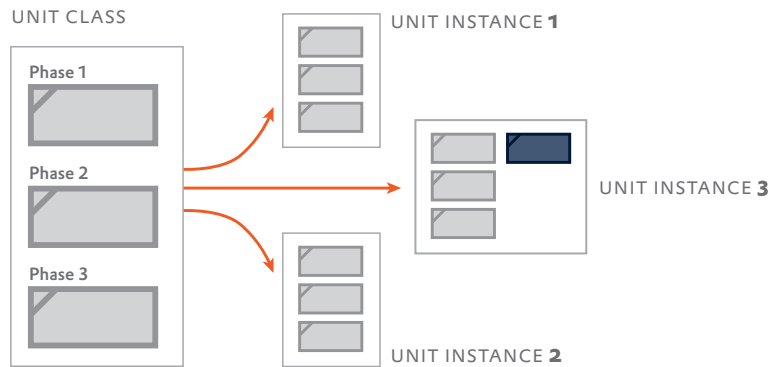


Figure 1: A unit class provides a template for any number of unit instances. You can also adapt the unit instances to suit your requirements.

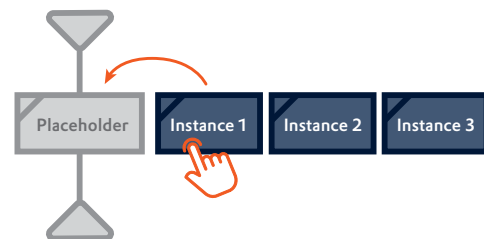


Figure 2: You can use placeholders when creating recipes. These are then replaced with a suitable unit when the recipe is executed.

In our batch production, we use different items of equipment each time depending on what is available. This means that a product could be made in a variety of different ways. Do I need to create a separate recipe for each possibility?

No, because Batch Control can be used to configure recipes or parts of recipes independent of machinery. In this case, you use placeholders during the process of creating recipes in the same way as you would use units. The placeholders do not represent an actual piece of equipment. The only information that is needed at this stage is the unit class; in other words, which type of equipment you will be using. So in a recipe you could use the “Mixing” phase from a “Tank” class placeholder, for example. You do not specify which tank will actually be used for production until the recipe is executed. This provides you with maximum flexibility and compact, transparent recipes (see Figure 2).

We enter our orders in a separate manufacturing execution system (MES). For some orders, we need to adapt specific parameter values. Can we do this with Batch Control?

Yes – and, in fact, you can adapt the values manually or even obtain them automatically from an external source.

To do this, in each command tag you have the option of linking a variable from which the value will be read when a control recipe is created. The plausibility of the value that is read is, of course, checked in this process. Once all the values that are required have been read, the recipe can be started and you can then also correct values as and when you need to. This means that you not only have the ability to create recipes using the zenon function, but you also benefit from the given tools to establish a fully automatic recipe life cycle. This provides the option of making recipe generation (including custom adaptations to parameter values), recipe start, and, of course, recipe execution completely autonomous.

Sometimes we need to correct parameter values during the process because of factors like varying raw material quality. How does Batch Control handle corrections like this?

Once the right configuration settings have been made, parameter values can be changed at any time – even in active phases. If a value is changed while a process is under way, the PLC needs to be notified of this so that it can respond accordingly by, for example, adding more material or adapting the mixing speed. Batch Control does not

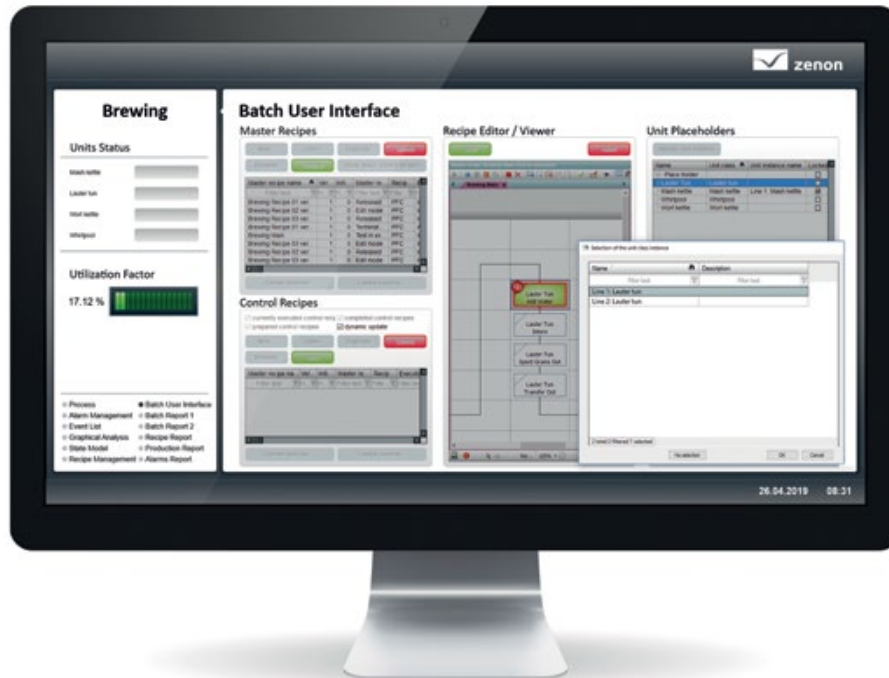


Figure 3: Batch control image with activated dummy functionality and instance selection dialog.

require communication with the PLC to operate in a specific way. Instead, you are afforded a flexible and reliable way of configuring the process of exchanging information in a way that suits your needs.

In some phases, there are multiple parameter values that need to be aligned with one another. How does Batch Control prevent production from starting up with inconsistent values?

For each phase, it is possible to configure a requirement for the user to confirm value changes. This means that no values will be written if they are associated with unconfirmed changes. So you can easily configure all your values and then confirm them in a group – and the phase will not continue until you have done so.

How do I optimize the Batch Control screen for working on a small touch screen?

On small monitors in particular, it is vital to ensure that no space is wasted – but that doesn't have to mean making the control elements smaller and squashing them closer together. In this case, less is more. Start by identifying the users and their roles, and don't try to set up a single screen for everyone to use. Instead, create a specific Batch Control

screen for each role so that you can simply discard the control elements that a certain user will not need.

As with most screens in zenon, the Batch Control screen provides a whole host of control elements that can be optimized for touch screens. Large buttons and wider rows in lists are designed to make it easier to operate screens using touch.

While PFC recipes are better suited to mouse-based operation due to their complexity and many configuration options, the simpler matrix recipes are easy to create and execute using touch inputs. Customizable buttons are available for any action that needs to take place.

ALEXANDER FRÖHLICH,
TECHNICAL PRODUCT MANAGER

ENGINEER'S KITCHEN SEASON 2:

ALWAYS HUNGRY FOR SOMETHING NEW

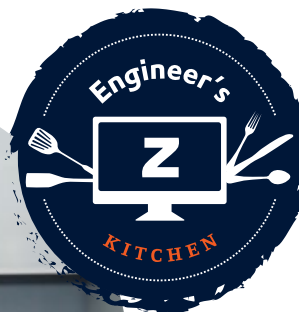
TEXT:

SEBASTIAN BÄSKEN,
PR & COMMUNICATIONS CONSULTANT

As living beings, we all need food to survive. As humans, we need to feed our thirst for knowledge too. For good engineers in the automation industry, staying up to date and keeping abreast of the latest innovations is our bread and butter.

It's the sustenance we need to solve tricky tasks, meet ever-growing customer requirements, and keep the competition at bay.

Enter the "Engineer's Kitchen", the YouTube series from COPA-DATA. In the kitchen, zenon experts share their personal experiences with the software platform, exploring current functions and exciting applications. Discover what's cooking and get a taste for what's on our menu ...



Reinhard Mayr invites his guests into the development team kitchen at our head office in Salzburg, Austria. Here, they share their personal zenon highlights over a cup of coffee. Read on to find out who Reinhard met with in our second season.

**"HEAD CHEF" AND INTERVIEWER:
REINHARD MAYR**

STYLING YOUR EXTENDED TREND SCREENS

EPISODE

13

Expert: Zenaida

Trends in the food sector come and go – but some classics persist. The Extended Trend module in zenon is an evergreen solution for automation processes. Our expert Zenaida shows how efficiently Extended Trend can be used and how it can automate your engineering.



TIPS AND TRICKS FOR USING ZENON ADD-INS

14

EPISODE

Expert: Matthias

When it comes to hardware independence, the flexibility of zenon is legendary. But zenon also has open interfaces with development tools like Visual Studio. Learn more about zenon's comprehensive Add-In framework in this episode with Matthias.



TWO OPTIONS FOR PREDICTIVE ANALYTICS WITH ZENON

EPISODE

15

Expert: Harald

What exactly will you have for lunch in four weeks' time? You could probably make a guess – but how can you be more certain? With zenon, existing data can be analyzed and transformed into a realistic predictive model. This is where guessing gets calculated! Get a taste in this episode with Harald.



AN ITALIAN TASTE IN SCREEN DESIGN

16

EPISODE

Expert: Giuseppe

Italy is famous for great food and la dolce vita. So it was an obvious choice to invite our Italian colleague Giuseppe into the Engineer's Kitchen. He brought along some delicious HMI screen designs from his customer Danieli Automation. Buon appetito!



PRODUCTION ANALYSIS BY SHIFT DATA

EPISODE

17

Expert: Eva

This episode focuses on Shift Management with zenon. Eva shows you how production data can be analyzed, filtered, and read out shift by shift.



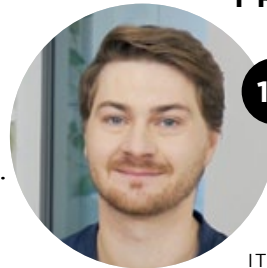
DATA CONNECTION FROM FIELD TO THE CLOUD AND BACK

18

EPISODE

Expert: Christian

Great chefs often combine unexpected ingredients. In this episode, we combine the IT and the OT worlds: Microsoft Azure and zenon are a great combination.



EASY-TO-MAKE SPC REPORTS FOR GREAT PRODUCT QUALITY

EPISODE

19

Expert: Alexander

Using Statistical Process Control (SPC) can reduce waste in your production process and improve the quality of outcomes. Alexander shows how you can start producing with the precision of a chef de cuisine using zenon.



VISUALIZE PROJECT EVOLUTIONS WITH ZENON PROCESS RECORDER

20

EPISODE

Expert: Franziska

Looking into the past can be very helpful for improving your production processes in the future. Franziska explains how you can track and trace your operations with the zenon Process Recorder, even if the projects have been changed multiple times in the past.



KEEP YOUR SMART FACTORY RUNNING

EPISODE

21

Expert: Bernhard

Smart Factories have to be online 24/7. This is why modern redundancy architectures are important. Bernhard reveals the three zenon redundancy modes: dominant, non-dominant, and rated redundancy. Configure to your own taste!



CONTEXTUALIZE YOUR DATA WITH A SMARTER HISTORIAN

EPISODE

23

Expert: Emilian

Our world is full of data. But data only becomes valuable information when it is put into context. Emilian demonstrates in four steps how zenon helps you to convert data into information and use it profitably.



RED ALERT FOR UNSTRUCTURED ALARM LISTS

22

EPISODE

Expert: Anita

Day by day, a bunch of alarms can occur in a production process. Anita's wise advice: No matter what's cooking, stay calm and relaxed by cleverly structuring your alarm lists in zenon. The better the overview and context, the more relaxed your alarm administration can be.



Are you hungry for more? Scan the QR code to view all 23 episodes of Engineer's Kitchen to date or go to **www.copadata.com/engineerskitchen**

Tip: Change your YouTube settings so that the English subtitles automatically switch to your own preferred language.

If you have any ideas or requests for other topics you'd like to see covered in the Engineer's Kitchen or in other videos from COPA-DATA, please send your suggestions to **info@copadata.com**!





INDUSTRIES

&

SOLUTIONS

FOOD & BEVERAGE
ENERGY & INFRASTRUCTURE
AUTOMOTIVE
PHARMACEUTICAL

ZENON'S SMART CHARACTERISTICS FOR YOUR LINE MANAGEMENT SYSTEM.

How to make a line manager smile gratefully



It is always inspiring to meet people deeply involved in food and beverage production. For me, talking to filling or packaging line managers is especially exciting. In this role, you know exactly the challenge of always being in control. You directly impact the output of your production site – and, therefore, the commercial success of your brewery or bottling plant. Equipment simply must run smoothly and as planned. Product quality and diversity are fundamental. What can you do to make your life easier?

WHY DO YOU DESERVE A SMARTER LINE MANAGEMENT SYSTEM?

Although focused on software technologies, this article is dedicated to you, the filling or packaging line manager. Do you already use a line management system to help your daily work? Typically based on an industrial software platform installed on a PC, a line management system communicates directly with the different machines on the line. On your PC screen, you have an overview of the filling process in

real time, key performance indicators, plus supervision and analysis functions.

What is your experience in terms of system flexibility? Perhaps the first implementation was completed well, but now you need continuous support for your enhancements? How easy is it to connect with further equipment or software applications? Or to enlarge the group of users?

New experiences of using smart devices in your private life inspire more ideas for improvement. On mobile

devices you can connect to household equipment, then comfortably interact with it and profit from acquired data. You can continuously benefit from the newest software technologies. At home, we live with such smartness daily. So why not on the production line?

ZENON'S SMART CHARACTERISTICS

It is time to change our expectations of line management systems. Following the evolution of software technologies, the packaging specialist and their automation and IT colleagues are reformulating their ideas. How close are you to digitalization, Industrial IoT and Industry 4.0 initiatives? To bring them even closer, let's look to zenon's smart characteristics. Here, you'll discover a structured approach for transforming your filling line into a smarter operation.

There are five main smart characteristics to focus on:

- **FUNCTIONALITIES:** from the expected to new, extended features
- **CONNECTIVITY:** interfacing with equipment and sensors for measurement and data collection
- **DIGITAL INTELLIGENCE:** embedded data processing, analysis, and artificial intelligence
- **INTEGRATION:** within the wider plant automation and IT architecture, including the cloud
- **USER EXPERIENCE:** the ergonomics and the availability of the user interface.

These five characteristics translate into the digitalization success factors leveraged by the COPA-DATA Partner Community. They enable valuable and creative implementations of line management systems with zenon. Let's take a closer look.

FUNCTIONALITIES

For the line manager, a line management system provides real-time supervision and historical analysis of the filling process. You are empowered to make quick and focused corrective reactions and continuously improve line performance. Process views, dashboards, lists of events and alarms are made available in a top-down approach; from packaging area level to every single machine. Aggregated indicators of performance, quality, resource consumption and maintenance are backed up by detailed values of parameters, set points, measurements and status data.

zenon has out-of-the-box components to further extend a line management system. For instance, recipe management at machine level and integration with ERP help to reduce changeover time and secure quality. The zenon Process Recorder enables you to travel back in time to review complex situations in deep detail. This is a prerequisite for better control and less downtime. Moreover, zenon is a

great enabler for a wide range of preventive and predictive concepts for equipment maintenance.

CONNECTIVITY

A smart system within the industrial environment is fundamentally capable of connecting with any relevant data source. A line management system with zenon draws data from the entire line: every machine, different types of PLCs, and sensors. Such high connectivity and data centralization opens up considerable opportunities to combine and correlate information, e.g. Overall Equipment Effectiveness (OEE) indicators and energy consumption data.

The acquisition and archiving (historian) of increasing volumes of data are key components of an automated information flow. Behind the scenes, zenon ensures the necessary design flexibility for the system integrator. What does this mean for you, as a user? You are simply able to implement your ideas more fully. Your growing taste for profiting from data is even sweeter, because the change is quick and cost-effective.

DIGITAL INTELLIGENCE

The Industrial Internet of Things (IIoT) shows us exciting examples of hybrid architectures. Digital intelligence is placed exactly where it is needed: on premise and in virtualized or cloud systems.

What does this mean for you, when using a line management system with zenon? You are empowered with advanced mechanisms for transforming data. Your line management is simultaneously an Extract Transform Load (ETL) tool. Your system integrator is free to treat the data with the technology which fits your needs – using automation or software development languages. The result? Reliable and efficient information flows, maximum profit from production data, and trusted analyses of production performance.

INTEGRATION

Your line management system is part of a larger architecture. zenon prevents you from building software islands. Older or newer systems can be securely integrated – be it SCADA, MES, ERP, IIoT, or hybrid and cloud-based solutions. A classic ERP-to-HMI communication concept, for example, can assure continuity in machine operation and material supply, helping operators to improve performance. But you can further enjoy the power of software technology. zenon combines a wide range of technologies. For example, leverage cloud-based data lakes for analytics across your global organization. Or adopt cloud-based machine learning for intelligence-led preventive maintenance actions at machine level.



Figure 1: Line Management with zenon for smart bottling and packaging.

USER EXPERIENCE

Typically, a production environment spans different equipment and IT systems. How easy is it for you, as a user, to interact with the complexity behind this infrastructure? How can you visually engage with the data when analyzing line efficiency, energy consumption or supervising quality?

zenon provides every system integrator with advanced graphical tools to enhance the user experience. Moreover, usability with zenon means advanced mechanisms to focus on information of particular interest, such as equipment, time frame or production context. This way, data becomes relevant, clear and actionable. Plus, thanks to advanced networking and communication technologies, zenon brings you this valuable information wherever you need it: at your desk, on larger displays installed in the production area, or on your mobile devices.

Here, we've just touched the tip of the iceberg when it comes to zenon's smart characteristics. Our zenon software platform is ideally suited to being deployed as a

line management system that will make your life easier in a sustainable way.

We invite you and your automation and IT colleagues to explore new ideas which will help you maintain your high performance through zenon. Technology shouldn't be difficult; but it should be smart. zenon's smartness makes it easy to enjoy exploring new ideas. It's technology designed to put a smile on your face.

EMILIAN AXINIA,
INDUSTRY MANAGER FOOD AND BEVERAGE

ZENON SUCCESS STORY

TRANSPARENT FILLING OPERATIONS THANKS TO DATA COLLECTION WITH ZENON

Filling in the information for smart decisions



Producing a variety of beverages in glass and PET bottles, cans and cartons, PepsiCo partner SMLC is Lebanon's biggest beverage bottling company. The implementation of a line management system based on zenon software from COPA-DATA put an end to manual data entry, providing comprehensive information for efficient filling operations.

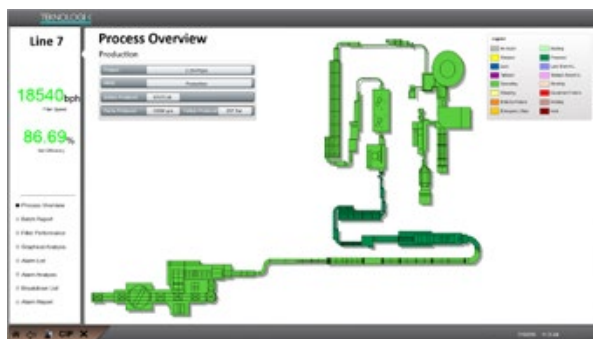


Figure 1: A zenon-based line management system provides SMLC with comprehensive information for efficient filling operations.

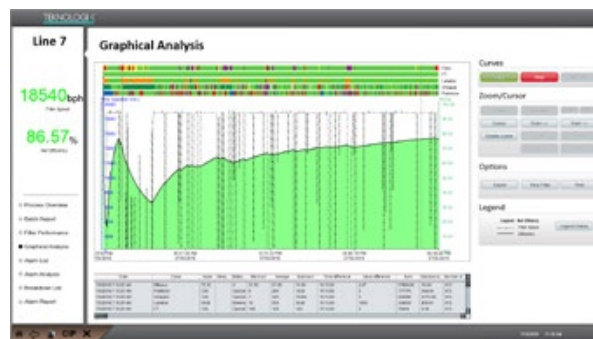


Figure 2: The zenon implementation by Teknologix eliminates manual entries and shows the line's actual efficiency at a glance.

The advent of household refrigerators, department stores and supermarkets in the 1950s changed market rules for drinks manufacturers such as PepsiCo. The makers of Pepsi Cola seized the tremendous worldwide growth opportunities presented by the consumer society. In 1952, they entered a co-operation with the Société Moderne Libanaise pour le Commerce (SMLC) in Beirut, Lebanon, who serves as bottler and distributor of the popular PepsiCo brands of soft drinks, iced tea, sports drinks, juices, energy drinks and water.

recording using paper forms and spreadsheet software. As both production and maintenance staff have other work priorities and regard record-keeping a cumbersome side activity, reports were often inaccurate and sometimes contradictory. In some instances, they even reflected a desired status rather than actual reporting values.

Thus, the company started a modernizing initiative aimed at improving both quality and efficiency. This involved organizational changes, investment in state-of-the-art production lines as well as the construction of new

"The zenon-based line management system gives us full transparency of our production and provides us with the information needed to make smart decisions on a solid foundation."

SHADY KHOURY,
DIRECTOR OF OPERATIONS AT SMLC

With ten filling lines for glass and stretch blow molded PET bottles, aluminum cans and composite cartons, SMLC is the country's biggest beverage bottler. The company has won several awards, most recently the Performance with Purpose award from PepsiCo International that recognizes the outstanding efforts made to reduce water and energy consumption.

A LACK OF TRANSPARENCY

Although SMLC's packaging operations had generally always been quite efficient, production data acquisition and management information involved manual data

buildings. As part of this transformation, management decided to invest in software spanning all packaging lines. Its main purpose was to improve the information flow from the shop floor to the top floor to facilitate faster and better-informed management decisions. It was also meant to provide the information required for the company's clean in place (CIP) process.

EARLY ATTEMPTS WITH HUMBLE RESULTS

SMLC awarded the contract for a pilot installation covering one bottling line to Teknologix. This team of industrial



Figure 3: Reports can be created in a very short time, practically all details can be shown on batch level.

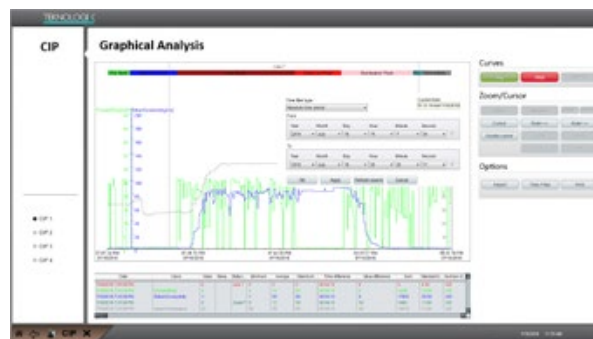


Figure 4: Utilizing the dynamic reporting capabilities zenon provides, SMLC implemented monitoring and visualization for the clean in place (CIP) process.

automation specialists based in Beirut enjoyed a favorable reputation from various automation and retrofitting projects they had successfully implemented for SMLC in previous years. Unlike European suppliers, they also did not need to include massive travel expenses for commissioning and after-sales support in their proposal.

To reduce the amount of data to transport and process, Technologix designed a system configuration using a PLC for each line to collect, concentrate and preprocess the information from the line's individual stations. "Although we knew the concept was right and we spent many days and nights in a herculean attempt to fulfill SMLC's requirements, we were not able to satisfy the customer," admits Lucien Kazzi, founder and CEO of Technologix. "The reason was that we were not using the right software."

Although well-established process visualization systems from major global automation solution suppliers and enriched with numerous add-ons and upgrades, the software products originally chosen failed to support many of the customer's reporting requirements. "We needed to spend several months programming scripts to display Gantt diagrams based on the information within the system," says Lucien Kazzi. "Reports were also slow, with a Gantt diagram taking two minutes to build up, they often failed to refresh and frequently crashed."

USING THE RIGHT SOFTWARE FOR BETTER INFORMATION

Several attempts were made using different platforms but none was able to satisfy all of the required criteria. In search of a better solution platform, Lucien Kazzi found that a leading supplier of filling technology and packaging machines was relying on zenon software from COPA-DATA as an overall control system solution. "If this is right for them chances are it is what I am looking for," he thought and decided to make contact with COPA-DATA.

This proved the right thing to do to rescue the project. zenon can be used out of the box, projects can be created with user-friendly graphical interfaces entirely by configuration without any programming. Lucien Kazzi confirms that using zenon was not only much easier than implementing the other system, but generally much easier than expected. Consequently, Technologix successfully completed the first line management system for SMLC only weeks after he took his first zenon training. "This was greatly helped by zenon's highly flexible, dynamic reporting tools making it easy to create for instance quality reports, performance analyses or root cause analyses using pie charts or Pareto diagrams," Lucien Kazzi says. "Another key to success was the excellent quality and fast response of COPA-DATA's after-sales support."

A COMPREHENSIVE SOLUTION

Using zenon, Technologix implemented a comprehensive data acquisition and line management solution in a very short time. The automation experts used the experience gathered there to create templates, so four more lines followed at a fast rate. The zenon-based system now spans five beverage production lines: one for returnable bottles, two with PET bottles and two with cans.

A long list of communication drivers enables zenon to communicate with machines from various manufacturers using different PLCs. Creating standard PLC blocks even allows integration of older equipment. The software's optimized database structure reduces memory requirements for data storage as well as report loading times. While in the old system, data for one bottling line amounted to 500 GB per month, the zenon-based solution only requires 10 GB for a full year. Similarly, a Gantt view diagram is created in two seconds as opposed to two minutes and it never crashes at all.

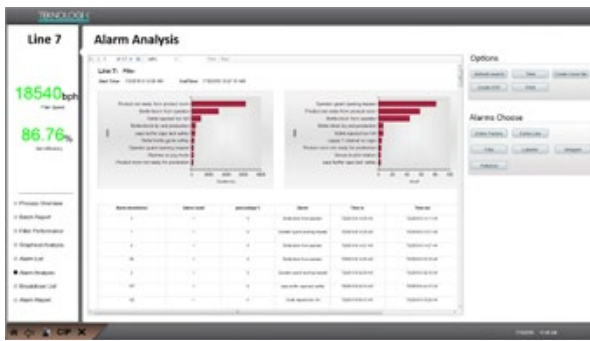


Figure 5: Analyzing the frequency of alarms helps SMLC target problem scenarios and improve overall plant efficiency.

The implementation comes with dynamic reporting capabilities. While the previous system architecture had allowed only static time frames to be displayed, in zenon's Extended Trend module these can easily be merged for comparisons and live trends can be displayed for real-time monitoring. The Gantt diagrams that had taken Teknologix more than two months to program in the software previously used, for instance, took only one hour to configure using zenon's Extended Trend module.

A SOLID FOUNDATION FOR SMART DECISIONS

The zenon-based solution implemented by Teknologix has overcome the drawbacks of its predecessor and fulfills the requirements of the customer, who is considering future extensions such as predictive analytics. "The new zenon-based line management system has eliminated the need for manual entries and provides us with dynamic management reporting, including quality reports, performance analyses, root cause analyses and time losses categories," says Shady Khoury, Director of Operations at SMLC. "This gives us full transparency of our production and provides us with the information needed to make smart decisions based on solid foundations such as line accumulation design validations."

HIGHLIGHTS:

- Use of zenon as filler/packaging line management system for SMLC
- Central system monitoring
- Elimination of manual data collection
- Comprehensive management information
- Fast line accumulation design validation
- High system stability, low memory requirement
- Fast creation of new and dynamic information charts without programming

CONTACT:

Lucien Kazzi
 Managing Director
 Teknologix
lkazzi@teknologix-automation.com

SUBSTATION HMI

Why local control systems
need to stay



Elger stands in front of the giant 400 kV substation, spanning several hectares, and considers the problem he has on his hands. The employees in the load distribution plant have told him that they have almost no idea of how the substation is performing. A circulating telegram is overloading the automation and control components and virtually knocking out the communication network. They can see graphics and measurement values, but the system is updating so slowly that they are unable to trust what is in front of them. Elger has been sent out to the substation for a closer look, and intends to report back by phone.

It's the year 2030, and a practice that was once commonplace in less significant substations is now the norm in the 400 kV variants too. Local control systems have been made a thing of the past. Considered surplus to requirements and an unnecessary cost, they were phased out some years ago.

Elger is an employee of the transmission system operator with authorization to perform switching actions using the substation's enormous 400 kV switch equipment. For the moment, however, there is no need for him to do that – all he is charged with is gaining an overview of the situation and reporting back on things in a call with the control center.

There are two options for him to access the situation. He could put on his safety gear, make his way over to the outdoor facility, and note down the switching state of each disconnecter and circuit breaker there. Or he could choose the more convenient option of staying in his office attire and paying a visit to the room where the field control devices are installed. There, he will be able to see the switch settings and measurement values on the LC displays, giving him a picture of how things are running. The LEDs on the panels can also tell him – even from a few meters away – if there are any faults affecting the field. As the LEDs generally remain dark or lit green, anything red or flashing is an instant indication that something has gone wrong and needs attention. Elger heads over to this room, takes a seat, and casts his eye over the equipment. It's a process that could take hours – or even days if the problem involving the circulating message cannot be resolved.

Elger misses the days when an HMI was installed in every substation. With an HMI on hand, all he would have had to do was sit back in his chair and never once worry about looking at the monitor. In the event of an alarm, the computer would have sent out an audible alert to Elger, who could then have turned his attention instantly to the flashing red object and identified exactly what was happening with just a few clicks of the mouse. All he would then have had to do was reach for the phone and let his colleagues in the control center know what was going on. But now, there are no more HMIs. The only option that Elger has is to try and fend off sleep during his 12-hour shift, keep monitoring the displays, and wait for the next person to come and replace him at the end of it all.

Elger is an employee who thinks carefully about everything he does and tries to predict things before they happen. Because of this, he makes regular notes about the measurement values he reads from the panels, attempting to identify trends so that he can give dispatchers early notice of anything to which they need to attend. He keeps a close eye on frequency, voltage, and currents, meticulously writing down every value and the time at which it occurs.

But all this work recording values together with their time-stamps and producing trend graphics would be a breeze for any HMI. It could pull together key measurement values to create a trend that could then be used for predictive analysis. Instead, Elger has to rely on his own records and values to create a picture of events in his own mind.

It is at exactly this inconvenient moment that Elger's phone chooses to ring. The dispatchers, he is told, need to amend something in the network so that the loads can be distributed in a slightly different way. He is given precise instructions on what he needs to do and notes them all down in his switching manual before reading them back to the colleague to whom he is speaking. They're all correct, so all that is left to do now is make sure that they're carried out properly too. Elger has to make sure that he is at the right device and then actuate the switches in the correct order. Every one of these actions fills him with unease, as he does not have an adequate overview of the situation or the experience to operate the switches with enough self-assuredness. He wishes fervently that he had a neat single-line diagram with valid switch position displays and color-coding to indicate whether an area is being supplied with high voltage. However, there is nothing for it but to stand in front of the small LC displays, check that he is in the right place, and turn the key switches. This sets the device to a local state preventing anyone except Elger from performing switching actions. All remote commands are blocked, including those from the central load distribution plant. He selects the correct switch on the LC display and sets the command for closing one of the high-voltage switches. A dull popping sound can be heard when the circuit breaker, driven by strong coil springs, changes its state from off to on. Elger then repeats these steps on all the other switches in his manual, logging the exact time of each switching action. Once everything is complete, he calls the dispatcher and reports back on the work he has done, including the times he has noted down.

If an HMI had been there for Elger to use, he would have been able to work more quickly and with a lot more certainty. He would have been able to perform the switching actions he had noted down directly on the screen with everything in view. Each switching action would also have been logged with precision down to the second in an automatically generated digital operations log book – so Elger would simply have needed to read off the times when reporting them back to the load distribution plant. There would even have been a luxury feature that is the stuff of Elger's dreams: the ability to record the individual switching actions in a simulation mode, just like a macro recorder. He could then have played the recording back – still working in this simulation mode – to check that everything was correct, switch back to real-time mode,



Figure 1: All information is collected in a substation HMI for a perfect overview.

and start the sequence of commands he had tested. And the whole thing would run exactly as it had in the test. Just imagine that ...

Elger spends the remaining hours of his shift with his measurement value recordings, keeping watch over the LEDs. At the end of his shift, he heads over to the meters and notes down the values representing the energy that has been directed through the transformer station over the last 12 hours – a few megawatt hours. Normally, an automatic measurement value archive linked to a reporting tool would have recorded this information. But without an HMI, all this has gone too.

There are so many benefits that using a powerful HMI can bring: reliability, a good overview, early detection abilities, and convenience. By contrast, dispensing with an HMI creates inconvenience, uncertainty during switching actions, and Sisyphean tasks – and it can ultimately put the power supply in jeopardy.

Thank goodness for people like Elger. Only someone with his capacity for imagination could retain an abstract model of the substation in his mind, allowing him to maintain an overview of the equipment state and identify trends.

Fortunately, we live in the year 2019 – still a time in which 400 kV substations are equipped with HMIs that do all this work so we don't have to. While a situation like the one that Elger faced would still require a person to go on site in order to check the state of affairs, an HMI would allow that person to approach the situation in a calm frame of mind, confident in the knowledge that every action will be the right one.

JÜRGEN RESCH,
INDUSTRY MANAGER
ENERGY & INFRASTRUCTURE



187.88.25.112

2464884123132165

NEW TECHNOLOGIES SET TO IMPROVE FUTURE MOBILITY

Never-ending traffic jams, fine-dust pollution, and insufficient parking spaces – private transport in our cities has just about reached its limits. City and traffic planners and the automotive industry need to find new strategies in order to improve urban mobility. The vehicle manufacturing sector itself is also experiencing radical change, with innovative technologies leading to increased process efficiency. Today, carmakers are facing a battle on multiple fronts in order to keep up with the competition.

Over half of the global population currently lives in cities. By 2050, this figure is set to rise to 70%. And in almost every city, the number of cars is growing at a faster rate than the number of inhabitants. While, on the one hand, this may well signal a positive development for motorists, fine-dust pollution and never-ending traffic jams are leading to a serious rethink for many. By 2050, experts warn, the amount of urban traffic in circulation could have trebled. New mobility concepts are therefore urgently required in order to meet these challenges.

SMART TECHNOLOGIES AND CAR SHARING

Smart technologies could offer a promising solution. These technologies offer the possibility of networking mobility functions such as traffic planning and public transportation and optimizing them based on usage data gathered by sensors. Intelligent traffic control systems capable of operating in real time could facilitate safe, proactive travel, reduce the risk of congestion along certain stretches, and ensure that traffic routes and parking spaces are used as efficiently as possible. Even smarter would be systems which feed all traffic data into a personal program, which then uses algorithms to learn the user's travel habits and recommends the best routes and modes of transport, or points out free parking spaces. However, there are a few obstacles to overcome before ideas like this can start to take real shape. In particular, concerns over data protection and the lack of unified standards are currently putting the brakes on further developments in this area.

What's more, solutions like this won't actually be enough if traffic continues to expand at the rate that it's going. Functioning alternatives to private cars must be developed to bring city dwellers quickly and flexibly from A to B. This presents completely new challenges – not only for the cities themselves, but also for car manufacturers. Young people are becoming less and less enthused by the concept of the car. In cities, in particular, owning a car is increasingly seen as unnecessary, while car sharing and ride hailing – that is, the opportunity to share rides in the city – are enjoying rising popularity. BMW and Daimler brought their own sharing-economy offerings to the market several years ago in the form of DriveNow and Car2Go respectively. Now, these companies have announced that they will be merging their car-sharing fleets and closely interlinking their mobility services in the areas of ride hailing, parking, charging, and multi-modality services.

AUTONOMOUS DRIVING AND ALTERNATIVE FUELS

Some of the greatest hopes for the mobility of tomorrow are pinned on the concept of autonomous driving. In Singapore, self-driving test cars have been on the roads since 2016. Driverless buses, lorries, and robot taxis are set to take to the streets in regular operation by 2022. In this part of the world, car manufacturers are turning their attention to self-driving robot taxis which use existing transport networks and therefore don't require new infrastructure. For this breakthrough to succeed, however, a few roadblocks still need to be navigated. A car without a driver throws up a

THE USE OF AUGMENTED REALITY IN VEHICLE MANUFACTURING HAS A NUMBER OF TANGIBLE ADVANTAGES:

- **FEWER MISTAKES:**
The step-by-step display of data and instructions reduces production errors. Employees know exactly which production step comes next.
- **SMOOTH PROCESSES:**
Not only does the AR system provide information on the precise order of process steps, it can also display the exact position of parts
- **TIME SAVING:**
Relevant information is displayed automatically, meaning employees no longer have to search for the right documentation.
- **QUALITY:**
Regular scans and checks reduce the error rate and minimize rejects.
- **SHORT DEVELOPMENT TIMES:**
Manufacturers no longer have to spend significant amounts of time painstakingly making prototypes by hand. Instead, they can simply project prototypes onto an available surface in a matter of seconds, saving both time and material costs. The projected prototype also offers a detailed view which can be broken down into individual parts.

whole host of legal and moral questions; not least who is liable in the event of an accident and in connection with the life-and-death decisions that must be made in situations where such decisions are unavoidable. Finally, algorithms for self-driving cars only work when they have been properly trained using video recordings from actual traffic situations – something which, however, goes against current data protection regulations.

Alternative fuels are also set to play a significant role in the mobility transformation. While electric cars cannot solve the ever-growing traffic problem, they can help to improve air quality and reduce noise pollution in cities. Admittedly, we might have a while to wait yet before any real breakthroughs are made. However, as far as the EU's climate change goals are concerned, in the long term, the classic combustion engine is set to become obsolete. This is something no car manufacturer can afford to ignore if they wish to remain competitive in the international market.

NEW TECHNOLOGIES FOR EFFICIENT VEHICLE MANUFACTURING

At the same time, the car manufacturing industry must also be prepared to overcome challenges in another area: production. Against the backdrop of Industry 4.0, more and more processes are being automated and restructured. These developments open up entirely new possibilities for the automotive sector. One example of this is augmented reality (AR) – that is, the overlaying of real-life scenarios with virtual information as part of the construction and planning of new models. Manufacturers like Volkswagen are already producing 3D models which are being used to plan the entire car body. Changes and corrections can be made on the projections instantaneously, and special models or customer requests can be implemented more quickly during assembly. This is where automation software like zenon comes into play. Not only does this software take care of both energy data management and automated engineering, it also enables users to create “digital twins” in order to define significant performance features before going into production.

With the shifts in mobility in our cities and the rise of new automation technologies in the vehicle manufacturing process, the automotive industry is facing a battle on two fronts. New competition, in Asia in particular, is giving established manufacturers a run for their money. In part, progress is being driven by legal requirements. In China, for example, electric cars must make up a minimum of 10% of cars sold by any given company from 2019. In France and the UK, combustion engines are set to be completely banned from 2040. Other governments will doubtless follow suit. And Tesla boss Elon Musk wants to completely revolutionize the way we travel. Against this backdrop, car manufacturers have no time to lose.

BERND WIMMER,
INDUSTRY MANAGER AUTOMOTIVE

ZENON SUCCESS STORY

THE ADAC CHOOSES COPA-DATA FOR ITS BUILDING
MANAGEMENT VISUALIZATION

Flexible and absolutely fail-safe – building automation with zenon



The ADAC (General German Automobile Club) wanted to introduce end-to-end centralized building services management at its new headquarters in Munich. The old and rigid system was to be replaced with a flexible modern solution that would be able to meet the varying needs of the approximately 2,500 employees working in the new building. The ADAC was able to achieve this with zenon software from COPA-DATA, which is used to monitor and visualize every single element of the building's technology.

With 20 million members, the ADAC is Europe's largest automobile association. It is renowned for its breakdown recovery and accident rescue services. Its yellow angels are called upon for help about 10,000 times every day. Approximately 2,500 employees work at its headquarters in Munich. With its colorful and modern facade, the new building has been a striking feature on Munich's skyline since its completion in 2011. One of the goals in the construction of the new building was to introduce a centralized control system that controls ventilation, heating, lighting, and power supply. "The existing technology gave us very little scope to adapt to new requirements and make changes. We wanted to move away from this," explains Markus Lamers from the building services team.

GREATER FLEXIBILITY THANKS TO MODERN BUILDING CONTROL SYSTEM

The ADAC's headquarters houses various departments under a single roof. "We're home to 100 professions," says Markus Lamers. There's a print shop, training rooms, goods-receiving department, TV studio, canteen, and conventional office spaces – all of which have very different room temperature, lighting, and ventilation requirements. Frequent location changes for employees or entire departments also have to be accommodated. It has to be possible to adapt the interior spaces specifically to meet the needs of their inhabitants.

the sun, and temperatures, forwarding its findings to the solar protection system controllers. Around the building, more than 1,000 distributed PLCs control these data points.

VISUALIZATION, CONTROL, AND OPTIMIZATION OF COMPLEX EQUIPMENT

Given the high number of data points, planning interfaces and connectivity was a very important consideration when selecting suitable software. The decision-makers at ADAC wanted to introduce an open system that would support a flexible choice of hardware and control systems. Good visualization of fault management so problems can be located and dealt with quickly was another important factor, in order to make work easier for engineers.

STRONG PARTNERS WORKING TO ACHIEVE A COMMON GOAL

Collaboration with COPA-DATA got underway even when the building was still at the planning stage. A demo version of zenon was tested. The SCADA software impressed with its platform independence, wide and varied interfaces, and customizable display options for visualization. All of the components in the building control system are managed in an equipment identifier system (EIS). A main overview and an alarm message list provide information about possible faults and their status. If limit values of variables

"zenon software provides us with a window into the technology. It makes our work so much easier."

MARKUS LAMERS,
ADAC BUILDING SERVICES MANAGEMENT TEAM

So that it would be best placed to respond and adapt to the wide and varied requirements inside the building, the ADAC prioritized maximum flexibility when constructing the new building. The entire building technology, with more than 55,000 hardware variables, can be controlled remotely, enabling it to be adapted at any time. Each individual light, for example, is represented by a variable. The individual hardware variables generate a total of more than 400,000 virtual variables, which are used for monitoring and control of the entire building services. For example, all of the shutters are controlled from within the system. A central weather station analyzes luminance levels, the position of

are breached, an alarm or a fault message is triggered. Individual application screens visualize every aspect of the building technology. Should a fault occur, it is easy to track where it is located. Lamers says, "This provides us with a window into the technology. The engineers can see immediately exactly where the problem is. This represents a huge time-saving for us."

FLEXIBLE ACCESS FOR OPERATORS

zenon can be accessed via the zenon Web Client from more than 25 operator stations at centralized locations inside the building. Equipment plans and the alarm message list are



Figure 1: Status of all areas at a glance. Faults and messages are color-coded.

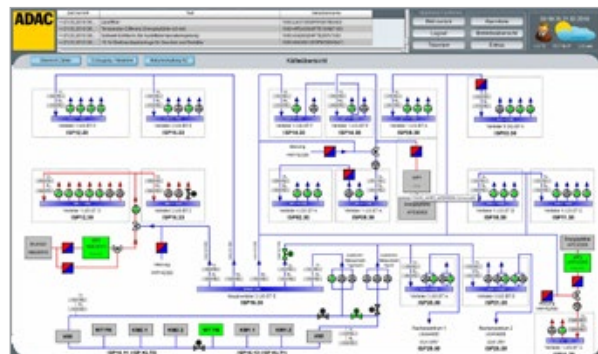


Figure 2: Visualization of the cooling distribution network. Any part of the building can be selected directly in the visualization.

thus easily available in all significant locations. Members of the building services management team can even access the system from home. This safeguards the availability of the highly sensitive areas that are relied upon 24/7 (accident rescue or casualty evacuation, for example), including outside normal working hours.

REDUNDANCY FOR GREATER RELIABILITY

At the ADAC, zenon runs on two independent servers. This redundancy maximizes the reliability of the system. One server is always in regular operation, while the second runs in standby, serving as a backup. Should the first server fail, the second will automatically take over all functions without any loss of data.

EXPANSION TO INCLUDE MORE BUILDINGS

The ADAC is currently planning to integrate more buildings into the central control application. Until now, these buildings have been controlled by a separate system. "zenon's open design gives us the flexibility to expand the central control system and achieve a uniform standard for our building automation," explains Lamers. The advantage: The building services management team has to master only one system to be able to operate equipment across all sites.

HIGHLIGHTS:

- Flexible, extensive BMS that adapts to changing requirements
- 55,000 variables provide comprehensive building services management
- Platform-agnostic solution that easily integrates with heterogeneous systems and hardware
- Customizable alarm messaging
- Opportunity to integrate multiple sites into a single system

CONTACT:

Andreas Zerlett
Sales Excellence
Energy & Infrastructure / Smart City
COPA-DATA Germany
andreas.zerlett@copadata.de

ZENON SUCCESS STORY

PERFECT CLEANROOM TECHNOLOGY FOR THE
PHARMACEUTICAL INDUSTRY

Sterile and safe production with SKAN and zenon

If the tiniest dust particle can falsify results, if toxic substances endanger health, if active ingredients need to be precisely handled, then isolators can ensure perfect safety and sterile working conditions. For many companies, one of the pioneers in cleanroom technology comes into play here: Swiss SKAN AG.



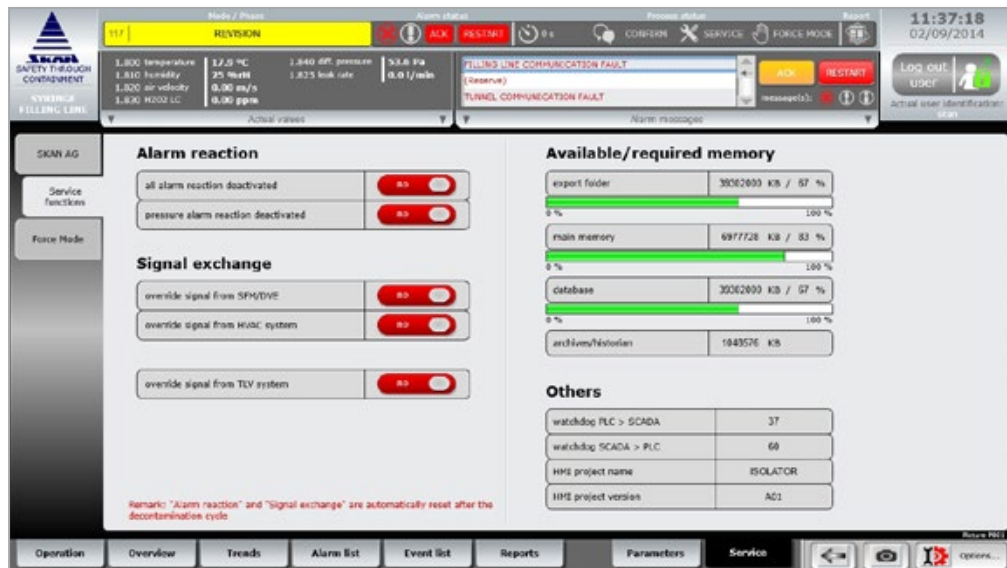


Figure 1: Everything under control: The internal zenon variables clearly display important information, such as watchdog or available memory space.

Whether for the pharmaceutical industry, biotechnologies or colleges, special equipment is required in all laboratories and production sites where work is carried out with sensitive or dangerous substances. The basic requirements include cleanrooms and isolators.

Isolators protect with strict physical separation of products and people in both sterile or toxic applications in production, quality control and sterile working, as well as for active ingredient processing. SKAN AG has been a partner of many well-known corporations since 1968. As an expert in cleanrooms and isolators, it provides many laboratories with special technology. The required control technology and visualization is made to order by an on-site engineering team. For its isolators for filling process equipment, SKAN AG builds on the expertise of Swiss SATOMECH AG and the HMI/SCADA software zenon from COPA-DATA.

As the supplier of many customers, SKAN utilizes the advantages of zenon in order to create a uniform and modern interface as standard, which can then be rapidly and simply adapted to customer-specific requirements.

TWO PROS IN THE PHARMACEUTICAL INDUSTRY

With zenon, SKAN AG has specifically chosen a software that is on the one hand highly deployable and on the other hand, with its specialized functions, is innately able to fulfill many of the mandatory requirements in the pharmaceutical industry. Heinz Leutwyler, Head of Automation at

SKAN AG: "For us, a high level of availability in production and ergonomic and rapid diagnosis is particularly important for the user. Compliance with FDA/GMP guidelines is mandatory. Furthermore, we lay great importance on contemporary usability, for example, through Multi-Touch operation, and visualization that can be handled without much extra coding in complicated language or software from other manufacturers." This is why a high level of importance has been given to user guidance. The clear equipment screens ease orientation and help with fault locating. Important information is prominently displayed. And for necessary entries the rest of the monitor is dimmed and the operator's attention is directed to the element which requires action.

zenon can satisfy these demands very well. The FDA and GMP guidelines are fulfilled out of the box. And when it comes to Multi-Touch, its manufacturer, COPA-DATA, is a pioneer. The user administration could also convince immediately, confirms Elger Gledhill, zenon Sales Manager at SATOMECH AG.

zenon is deployed on isolators for filling process equipment and is responsible for the sensor to the MES connection, such as to Osisoft PI, or to the ERP level, with SAP for example. The audit trail for compliance with FDA and GMP guidelines is simply parameterized with a few mouse clicks. Many predefined functions and modules keep programming efforts for special requirements to a minimum, such as the native integration of Multi-Touch.



Figure 2: Perfect overview: The wide array of equipment components are visible at a glance for fast, simple fault locating.

The shift between languages and measuring units for international use is also achieved in a mouse click. SKAN AG engineers simply define the wording and the measuring units for all required languages. These are tailored in the Runtime with the click of a button, or automatically during log in.

The capability of zenon to connect to the customers' Active Directory offers notable simplicity for the engineering team. It makes the user administration very simple and clear. And especially: the regular license renewal of passwords required by the FDA can be carried out in a sub-network in the zenon Runtime. Perfect for use in the pharmaceutical industry: All operations are logged and listed in the Audit Trail. Should an action require special rights or a signature, this can be easily configured.

PERFECTLY INTEGRATED

SKAN AG is often involved in very heterogeneous environments. Its customers utilize various control systems. Furthermore, the plants differ greatly in size. The systems can range from small equipment with a zenon Runtime to large redundant systems with zenon Supervisor and numerous clients. Easily scalable systems such as zenon are obviously at an advantage. Secure and simple integration is especially important.

SKAN engineers particularly need to be able to equally reliably control Siemens or Allen-Bradley PLCs or a Box PC with Windows 8.1, or a broadband monitor with Multi-Touch from B&R. As zenon can directly control all these systems and many more, the connection, selection and configuration of the corresponding driver is rapidly achieved.

The network configuration of zenon is particularly valued: "Activate the network project properties, enter server. Done." Heinz Leutwyler happily states. He adds: "The competent support by SATOMEK and the quick realization of any additional requirements we had of zenon were implemented in conjunction with COPA-DATA in a professional collaboration."

ABOUT SKAN AG

With over 200 employees, the SKAN organization provides the pharmaceutical industry and colleges with high-quality cleanroom equipment and isolators. SKAN was founded in 1968 in Allschwil, Switzerland, and has built on many years of partnerships with longstanding customers. An in-house engineering department sees to modern and tailored visualization and control. Further information:

www.skana.ch

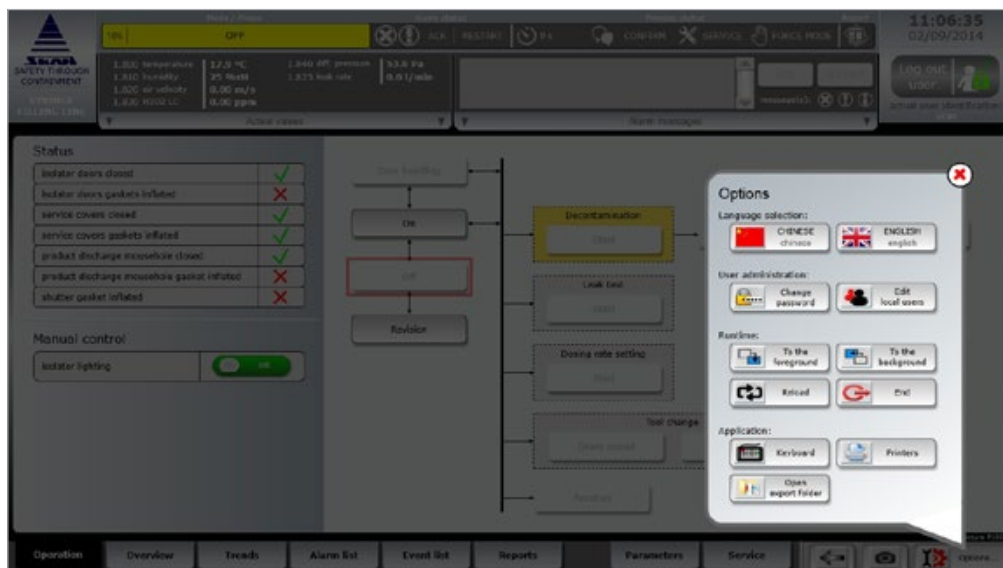


Figure 3: Sophisticated usability: The dimmed screen allows the attention and focus to be transferred to the important information and dialogs.

ABOUT SATOMECH AG

SATOMECH AG is a commercial company with dealers for automation systems. The partner, based in Cham, supports its customers in Switzerland and Liechtenstein with highly-qualified support, consulting, instruction, training and a comprehensive warehouse in Switzerland. Control systems, visualization, HMI or IPC and network technology are some of the areas of expertise of the Swiss company with 15 employees. SATOMECH AG was founded in 1976 and has been privately owned by the Studhalter family since 2005. Further information: www.satomech.ch.

SKAN AND ZENON - TEAM WORK INCLUDING:

- Direct drivers for customer-specific control, e.g. Siemens and Allen Bradley
- Connection to OsiSoft PI (MES) or SAP (ERP)
- User administration via Microsoft Active Directory with access from sub-networks
- Extended Trend module for historical data display
- Reporting
- Native Multi-Touch for Windows 8.1

CONTACT:

Elger Gledhill
Sales Manager Control Systems
SATOMECH AG
elger.gledhill@satomech.ch

PLANT COMPARISON MADE EASY THANKS TO ZENON

In the era of Industry 4.0 and digitalization, data is becoming an increasingly significant asset for businesses. The ability to integrate machines, equipment, and production sites with existing IT systems and compile meaningful reports from the data gathered is becoming ever more important. zenon collects live data for a customer from their plants all around the world, pools it in a centralized data lake, and prepares it for further analysis. This smart solution enables equipment operators, production managers and senior executives to keep their finger firmly on the pulse.

By founding and purchasing factories in virtually all corners of the globe, a hidden champion from Germany was able to transform itself into a worldwide corporation. Through the acquisition of its former competitors, the company inherited factories equipped with a wide variety of legacy plant technology. Under these conditions, globally comparing the capacity and performance of the plants proved to be particularly time consuming. The corporate management team therefore initiated a project to collect production data from all the various locations and transfer it to a centralized data lake for further analysis. The zenon software platform played a crucial role in the project's success.

One of the biggest challenges to be overcome was the highly diverse automation environment, with a different installed base of PLCs at each plant. A further difficulty was posed by the limited bandwidth of the data connections. The only constant was the fact that all of the plants were connected to the central company network via a VPN. A lean data communication system was needed, so the customer opted for the modern MQTT (Message Queue Telemetry Transport) communication protocol.

MQTT has a number of advantages:

- The sender does not communicate directly with the receiver, so neither party has to "see" the other. The sender and the receiver always interact with an intermediary, known as the "broker".
- The connection can be encrypted using certificates.

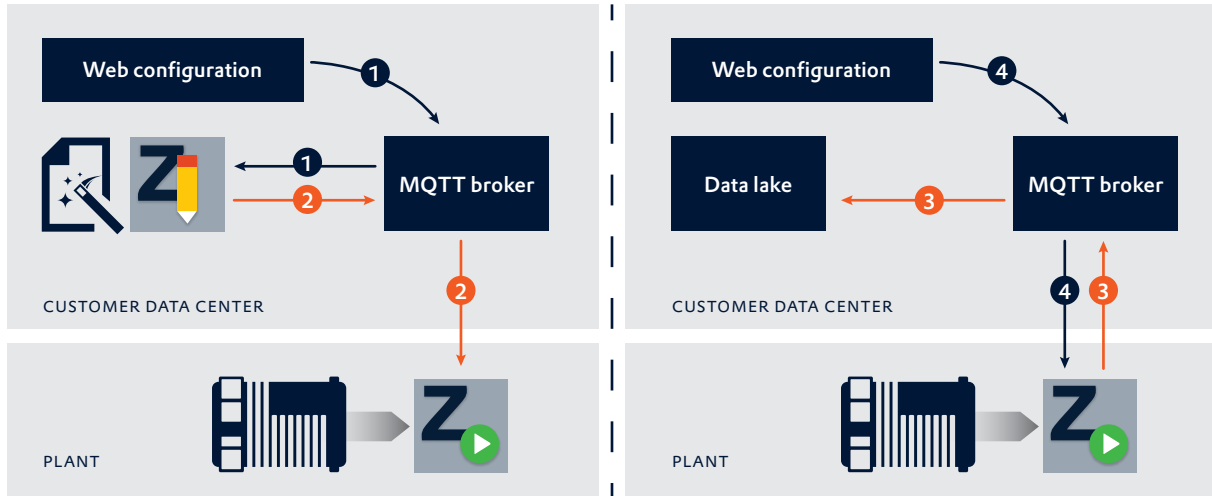
- There are three different types of transfer, ranging from "fire and forget" through to 100% assured delivery, including data buffering in the event of a communication failure.

Only one feature of MQTT can really be viewed as a disadvantage:

- The protocol is completely open in terms of the data that can be transferred. There is no standard to determine the "payload". The sender and receiver therefore have to implement the same payload for communication to work. This requires careful coordination, particularly if the sender and receiver are developed by different companies.

The first stage involved the development of a common concept. The customer wanted a centralized, web-based interface so each plant could be individually configured. This web interface was developed and implemented by a third-party company. A central engineer can determine a number of factors using this application, such as specifying the production plant, the driver, the variables to be transferred in a particular cycle time, the calculations to be carried out, and much more besides.

A request telegram is sent from the web interface to the zenon Editor. The Editor then generates the zenon project fully automatically using a template project. This can be achieved thanks to the strict separation of zenon Editor and



1. Configuring the solution: Web configuration sends configuration file to zenon Editor.

2. zenon Editor creates the project and transfers RT files to zenon Runtime.

3. Data flow: zenon Runtime cyclically transfers data to the data lake.

4. Cycle-time reconfiguration: Modified cycle times are directly transferred to zenon Runtime.

Runtime. Using MQTT, the Editor Runtime files are then sent to the relevant plant via the broker. Each plant has a unique plant ID, which is used as the key in the MQTT header, ensuring that the right project arrives at the right plant.

At the plant itself, a standard Windows PC in the switch cabinet communicates with the MQTT broker and the PLCs in the production network through a firewall. An MQTT client running on the PC receives the data package sent by the Editor via the broker and launches zenon Runtime as a service. Here too, the system can work fully automatically as a gateway without the need for any user interaction. zenon Runtime takes over the work and cyclically requests the values from the connected PLCs. To facilitate this, project engineers allowed for three different data types to be sent to the receiver, i.e. the data lake.

1. **REAL-TIME DATA:** Data is sent as soon as it is generated. The driver is set to a sample time of one second, resulting in a maximum transfer rate of one value per second. Since zenon only generates a notification if a value is changed, data is only transferred when a value changes. This is particularly important if the bandwidth is limited.
2. **TRIGGERED DATA:** Using the web interface, the data analyst can set the cycle time for the data transfer. Depending on the application, users can choose whether measured values should be transferred every minute, every five minutes, or even just once an hour. The cycle time can be changed by the data analyst at any point using the web interface.

3. **CALCULATED VALUES:** A number of calculations were required, such as min./max. calculations, average-value calculations, etc. Logical operations were also implemented – for instance, to detect whether a conveyor belt is empty or carrying items. zenon Logic carries out all the calculations and transfers the results via MQTT as per the set cycle time. Of course, the zenon Logic project is also created fully automatically by the zenon Editor.

For all three data types, a common MQTT protocol was developed for transferring measured values, timestamps, and quality. It was also decided that the values in a cycle would always be sent in blocks. For example, certain measured values are sent in a single telegram every five minutes. This measure also helps to ensure particularly streamlined communication.

CONCLUSION

The openness of the zenon software platform combined with its ability to produce projects entirely automatically led to significant cost savings when implementing and rolling out the solution. Meaningful reports generate added value at all levels and now facilitate transparent benchmarking across geographical borders.

MARKUS HELBOK,
HEAD OF TECHNOLOGY SERVICES

CHRISTOPH DORIGATTI,
HEAD OF INTERNATIONAL SALES



AROUND **THE** **WORLD**

WHO IS WHO



Johnny Andersson

AREA SALES MANAGER
COPA-DATA SCANDINAVIA

AT COPA-DATA SINCE: 2018

RESPONSIBILITIES: As a part of the Scandinavian sales team, my main objective is to sell our zenon Software Platform. My daily work consists of customer meetings and visits, customer calls and workshops on customer sites. Plus, a great deal of quotes and follow-ups. All this activity adds up to the most rewarding thing: namely, a confirmed order.

I GET MY INSPIRATION FROM ... mainly my family, but also from running and playing the guitar as it sets my mind at ease.

IT IS MY DREAM TO ... live life to the fullest with no regrets.

You can reach me at:
johnny.andersson@copadata.com



Alexander Treiber

HEAD OF TECHNICAL CONSULTING
COPA-DATA USA

AT COPA-DATA SINCE: 2011

RESPONSIBILITIES: I'm in charge of coordinating the technical team at COPA-DATA USA, particularly in the areas of training and zenon customer support. I also take care of the makeup and expansion of our team at COPA-DATA USA.

I GET MY INSPIRATION FROM ... places in nature where you can go and just completely switch off from your everyday life – no smartphones, no Internet, no social media. I'm also inspired by my travels around the USA and getting to know new places.

IT IS MY DREAM TO ... be able to say that I always stayed true to myself and that every decision I took in my life was in line with my personal values.

You can reach me at:
alexander.treiber@copadata.com



Abigail Walters-Davies

MARKETING MANAGER
COPA-DATA UK

AT COPA-DATA SINCE: 2017

RESPONSIBILITIES: I am responsible for developing, implementing and executing strategic marketing plans for the UK office. My tasks also include market research, tracking and analyzing the performance of live campaigns, event production, generating exposure through public relations, and ensuring that all marketing material is in line with our brand identity.

I GET MY INSPIRATION FROM ... the positivity and support of my family and friends.

IT IS MY DREAM TO ... keep exploring, laughing and learning.

You can reach me at:
abigail.walters-davies@copadata.co.uk

WHO IS WHO



HeeJun Choi (a.k.a Susan)

TECHNICAL SALES MANAGER

COPA-DATA KOREA

AT COPA-DATA SINCE: 2015

RESPONSIBILITIES: I started as a member of the technical consulting team, but have now moved to the sales department. Currently, I am responsible for supporting existing customers, helping new customers and managing the COPA-DATA Partner Community here in Korea. I also act as local product manager. By understanding the Korean market, we can implement new features and improvements that are needed by our customers.

I GET MY INSPIRATION FROM ...

Charlie, the team leader in our sales team. Like every boss in Korea, he often pushes me: every day he tells me “everything is up to you.” He shows me how to be a good salesperson and I have learned a lot from him.

IT IS MY DREAM TO ... travel all around the world. Life is short and the world is wide.

You can reach me at:
HeeJun.Choi@copadata.com



Anton Brandauer

SERVICE ALLIANCE BUSINESS DEVELOPER

COPA-DATA HEADQUARTERS

AT COPA-DATA SINCE: 2010

RESPONSIBILITIES: As a Service Alliance Business Developer, I act as the link between the consulting teams in our subsidiaries and the headquarters in Salzburg. It's my job to continuously improve collaboration to make sure that we're ready to take on large-scale global projects. For the past few years, I've also been responsible for training newcomers in consulting.

I GET MY INSPIRATION FROM ...

my family, without a doubt. I love being able to see my children grow and develop every day right before my eyes. Good conversations with my friends are also very important to me.

IT IS MY DREAM TO ... travel to every country in the world with my family, to see all the different landscapes and cultures, and sample the best of each of them before returning to our wonderful home to recharge our batteries.

You can reach me at:
anton.brandauer@copadata.com



Michael Gerlin

TECHNICAL CONSULTANT

COPA-DATA FRANCE

AT COPA-DATA SINCE: 2015

RESPONSIBILITIES: I am in charge of technical support for zenon and straton at COPA-DATA France. I work together with my sales colleagues to address customers' technical needs in the pre-sales phase. I also train customers in zenon and straton.

I GET MY INSPIRATION FROM ...

having fun enjoying outdoor activities like climbing, mountain running, ski touring, and surfing. Meeting sporting challenges inspires me to succeed in my daily work.

IT IS MY DREAM TO ... continue to live my life happily. My life is simple and cool – I would like to be as happy every day as I am now.

You can reach me at:
michael.gerlin@copadata.com



SMART HOMES WITH ZENON

In this interview, Robert Merz explains how he uses zenon in his home.

PHOTOGRAPHY:
FLORIAN MITTERER PHOTOGRAPHY

Like zenon, Robert Merz originally hails from Salzburg, Austria, and since mid-2017, he has been constructing a digital factory at the University of Applied Sciences in Vorarlberg (FH Vorarlberg). At the same time, Robert is building a detached house – a smart home, of course. During our visit, he explained to us how and why he is using zenon in his home.

Robert, what gave you the idea to turn your house into a smart home and to use zenon to achieve it?

I doubt I would have been appointed by the FH Vorarlberg to construct a digital factory without my pioneering zeal for technology. For example, I started working on 3D printing way back in the 1990s when I had completed my studies in Electrical Engineering. As Head of the Mechatronics and Robotics department at the FH Salzburg, I have used zenon in numerous projects. COPA-DATA is on board as a software partner and zenon is being used at the new “Digital Factory Vorarlberg” research center.

The software is so open and communicative that it can work together with almost any device or application, regardless of manufacturer. It can be programmed to create solutions for controlling, monitoring, and operating almost any system configuration. So I thought: why not use it in my house, too?

Why have you chosen not to use a special building automation system?

I looked at a few housing technology control systems and I even use one of them – however, below the overall control level. These systems have limitations: some cannot integrate certain features, whereas others can only connect to hardware made by the same manufacturer. zenon has none of these limitations. As I set about planning my new house, the only control system that was capable of managing all the technology in my house was zenon.

As I am already very familiar with zenon, I am able to do a lot with it without any outside help or training. I can create new functions easily in a single evening. Sadly, given my work projects and the fact that the house construction is ongoing, it is difficult to carve out time to do this, so progress on implementing my ideas has not been as fast as I would have liked.

How have you made the house ready for a building control system?

The house is a new build. From the beginning, I made provisions for a CAT7 cable. In addition to WiFi, which I do not want to rely on all the time, there are about 15 Ethernet sockets built in.

The house is autonomous from a data point of view – it has no Internet connection. I quite like the fact that there is not complete Internet coverage at home. If I need to do something quickly, I can always set up a mobile hotspot or pop over to my nearby office. However, there is provision for an Internet connection and it only needs to be switched on.

Can you outline the general setup of your control solution for us?

Certainly. zenon is at the top level, which is installed on a compact master computer. The computer is linked to the power meters directly via an RS-232 interface and to the ventilation with a Modbus connection. The photovoltaic system, the geothermal heat pump, the controls for the swimming pool, the wood-burning stove in the living room, and the security cameras are all connected to the Ethernet via a central router.

The same goes for all the smaller things you typically find in a house, such as lights, switches, door contacts, heating valves, motion detectors, and sensors. They are connected to zenon centrally via a gateway as part of the housing technology system I mentioned before.

Could you describe this key subsystem in more detail?

It's a shared system with no central controls. All its elements (switches, actuators, etc.) have integrated intelligence and can communicate with each other via the KNX bus. KNX is not proprietary so there are lots of manufacturers that produce compatible terminals. (Note: KNX is a worldwide, open standard for house and building technology.)

I programmed the KNX system myself and I carry out small modifications every couple of weeks or so. I deliberately avoid using KNX's automatic functions, except for light control via motion detectors and heating control via the thermostats. I normally program automatic actions one level above that, as zenon can retrieve and send KNX telegrams directly within the KNX system. This means I can always use the zenon user interface to intervene and change threshold or set values, or to take direct control.

What is the advantage of using a subsystem like this?

It is easy to add things to the KNX system. All I need is a bit of green cable to add an extra switch or sensor, and I have fitted green bus cables everywhere in the house. Each KNX switch includes a temperature sensor and a programmable display, and is capable of 24 actions, depending on the

chosen menu and whether the six switches are pressed quickly or slowly. You can also assign shortcuts to different functions – this stops you operating the system incorrectly when you press switches quickly or inadvertently.

The KNX system also works independently, so that vital basic functions continue to operate even if zenon stops working. This means that untrained people are also able to use all the functions in the house. And the system continues to operate without interruption even during maintenance work on the zenon installation.

Where are the system boundaries between KNX and zenon?

The boundaries between the systems are not always clear cut, as many actions can be carried out by both systems. Take the windows and doors as an example: they are equipped with sensors, so when they are opened, this is displayed on both the KNX panels and in more detail in zenon. In KNX, the sensors are connected based on what floor they are on. In zenon, each sensor is connected separately. At the moment, this is only used for the display, but in future, I am planning for the ventilation to respond whenever doors or windows are opened.

In addition, an alarm is triggered and the siren goes off if a window or door is opened when nobody is at home. Incidentally, the alarm system is programmed entirely in zenon Logic, which monitors the windows, doors, and motion detectors.

You can program combined actions on the KNX switches, such as closing all the shutters in the house at the same time, or all shutters on one floor. However, I prefer using zenon to program large-scale actions, such as switching all the lights in the house on or off, as it offers more options. For example, you can program different scenarios for different times of day or for a specific activity.

What is energy management like with zenon?

The energy cockpit shows me how much electricity the photovoltaic system is generating and the individual electrical loads. A power meter from the electric utility, an extra overall consumption meter, and a meter in the photovoltaic system inverter are connected to the system to determine the total power consumption.

My house is heated by a geothermal heat pump, which must be operated at specific intervals in order to produce optimum power and to ensure it has a long service life. Here, zenon is only used as a monitoring system. Later on, I will adapt the scheme seasonally based on the empirical values I obtain.

zenon monitors the heating system. The heating valves can be switched on or off individually. At the moment, I am not planning to make this automatic because there needs to be a constant minimum flow rate.



A modern KNX Push Button can operate up to 24 actions. Robert Merz carries out primary tasks in zenon, which the KNX telegrams then process.



Do you also intend to automate your wood-burning stove using zenon?

It's already automated. The stove regulates the air supply itself, depending on the fire temperature. The ventilation control is connected to zenon so that it can be monitored and the ventilation flap can be controlled. It is good to know that even the treat of a log fire can be achieved with the utmost energy efficiency.

And what about the swimming pool?

The swimming pool can be heated using geothermal energy, but due to the large volume of water it is still very expensive to do so. Ideally, the swimming pool is heated using direct sunlight. The heat of the pool can be managed simply by deliberately opening or closing the cover. On sunny days, the water temperature can rise by 3°C per day if the cover is open.

Sometimes it is useful to close the cover because direct sunlight increases the amount of chemicals needed compared to cloudy days. I am already programming automatic controls for the pool cover in zenon Logic, which should be ready in time for the summer.

What have you implemented so far in your private zenon system and what plans do you have in store?

Apart from a few creature comforts, my electricity costs are extremely low, despite the pool. That is not solely down to zenon, but the automation system does play a big part – for instance, it tells me cost-effective ways to ventilate the basement.

I am intending to connect the cables that are hanging on the front door at the moment to an entry control. Later on, I will link up the security cameras, program even more scenarios and integrate appointments from my calendar, such as garbage collection days. I am even planning to sync the system up to the weather forecast so that I can work out the perfect time to jump into the pool!

What's so great about this system is that when I think of something, I can just sit down and program it myself. I can use simple configurations from zenon's engineering tools to do it, so it is not necessary to write a real program. If I had a conventional house control system, I would have to hire a specialized company to change anything.

ZENON HOME STORIES WANTED

Share your personal zenon story with us!

Are you also using zenon successfully at home? We want to bring your projects into the limelight and give our community an exclusive glimpse into your quirky solutions – surprise results included! Please tell us about your experiences and share the creative ways in which you use zenon.

Write to us at iu@copadata.com.

Learning about programming through play



*Pictured: Diana Blas, "The Ifs" with Reinhard Mayr, COPA-DATA
Photo: Matthias Rauch*

Finding the right talent for a particular job is one of the greatest challenges facing recruiters today – especially in the IT and software industry, which has been struggling with a skills shortage for years. COPA-DATA has been working with local educational institutions for over 15 years and is actively involved in training the next generation of IT experts. Now, we are also dedicating resources to mentoring through the innovative European Youth Awards (EYA) community.



THE IFS

"The Ifs" is a project created by a team of four Spanish developers and tech company founders. "The Ifs" family is made up of four members – small robots that can communicate with each other. Each member features its own behavior and action options. As the name suggests, each of the Ifs can be programmed with an "If – Then" instruction in order to interact with the other three Ifs. For example, the robots can vibrate, play music, or send flashing signals. Children can choose from a wide range of options and find out for themselves how the robots communicate with each other. At the same time, the children can playfully become familiar with the logical thought patterns required for programming.

CONTACT

Esther Borao
Cofounder at "The Ifs"

info@theifs.cc
www.theifs.cc

SPARKING ENTHUSIASM FOR TECHNICAL CAREERS

As potential employers, COPA-DATA and our partner companies are actively engaged in encouraging young people to embark on technical careers. Alongside schools, we help extracurricular institutions to design and run events, project weeks, and taster days. Our Lego Mindstorms events, which are run in conjunction with school classes and Salzburg University of Applied Sciences, are a particular highlight. With our support, participants are able to build robots for all kinds of tasks and even program them via zenon Logic.

A NETWORK OF INNOVATION

Through our work in training, research, and support for start-ups, COPA-DATA has built up an extensive network of partners.

In 2018, this led to the company establishing contact with the EYA Festival (<https://eu-youthaward.org>). The EYA community, which receives funding from the EU Commission, brings together young innovators from all over Europe. The community shares a goal to improve the world we live in through the creative use of existing IT technologies. The competition takes place every year, and projects and teams from all over Europe can enter. At the big closing event, companies can volunteer to mentor one of the winning teams. This allows companies like us to meet lots of talented young people and is an opportunity that we relish.

The highlight of the EYA year is the closing festival, where the winners are named in front of a large audience. The 2018 event took place in Graz, Austria. For over 360 participants from 40 nations and the numerous representatives from local and international companies, the festival served as a perfect networking opportunity.

We quickly identified our favorite among the winning teams: "The Ifs" (<http://www.theifs.cc/>).

"We want children to stop being simple technology users and to become creators of the future that is to come."

ESTHER BORAO,
COFOUNDER AT "THE IFS"

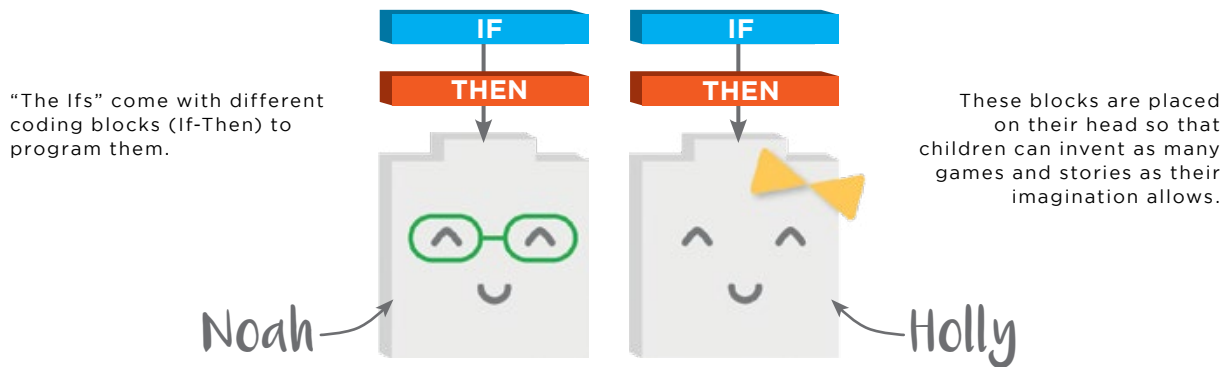
PROGRAMMING FOR LITTLE ONES

"The Ifs" won us over straightaway – with both their approach to getting young people interested in technology and programming, and the technical execution of their idea. Up to now, our collaborations have focused primarily on pupils who were about to leave primary education or who had already expressed an interest in courses of study.

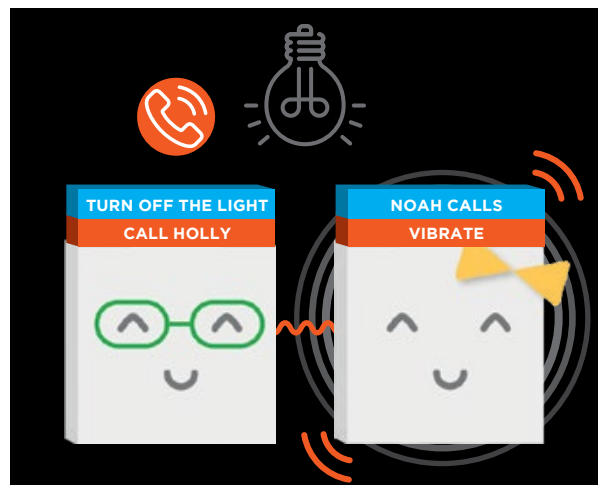
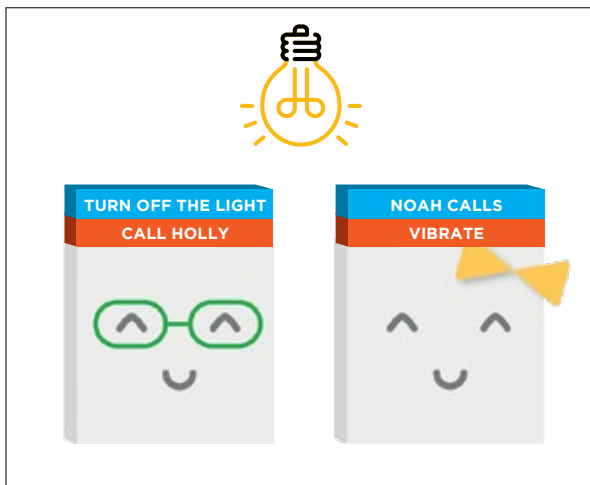
"The Ifs", on the other hand, have developed an educational toy for children aged three and over. The children are introduced to the principles of programming through play (simple "If – Then" conditions), without a screen or PC, using a method known as "tangible programming".

"THE IFS": CREATIVE AND INVENTIVE

When they play with the four members of the If family (further information provided in the info box), children are not only using technology but inventing new worlds as well. "The Ifs" show how even preschool children can be given a basic understanding of programming by playing with mini robots. They don't even need to be able to read.



ONE EXAMPLE:



"The Ifs" allow children to express their creativity – they can invent and play out their own stories and discover the world of technology in their own way at the same time. Months after the award ceremony, the first practical trials continue to deliver impressive results. The feedback from parents has been very positive too. Even those who were skeptical about software and programming at the start of the project are now keen to encourage their children to engage with these topics.

CONSIDERING ERGONOMICS FROM THE OUTSET

Projects such as "The Ifs" clearly demonstrate how important it is to think about ergonomics when designing (software) products. By taking into account the needs of a particular target group, very complex content can be conveyed in a simple manner – an approach that has long been one of our top priorities when it comes to our software platform as well.

We are therefore delighted to be part of the EYA community. Lively exchanges with other members of the community help to reaffirm a COPA-DATA principle: If used responsibly and effectively, software and technology can make our lives easier and more exciting – whether that is at work, in our free time, or even when our children are playing. This project has come up with a fun way of teaching young children the basics of programming and we are very excited about it – bravo!

REINHARD MAYR,
HEAD OF INFORMATION SECURITY AND
RESEARCH OPERATIONS

PARTNER COMMUNITY WORLD CAFÉ

CERTIFIED PARTNERS LETTING YOUR PROJECTS SHINE WITH ZENON

JS Automation



FRANCE



ABOUT US:

JS Automation has been selling zenon for 17 years and our team has extensive zenon expertise. Our company structure serves the sale and service of zenon. Our technical team is certified to deliver zenon training and provide expert support for our customers.

OUR SOLUTIONS WITH ZENON:

We deliver a range of solutions on the zenon platform – from machine panel solutions to MES.

Our expertise includes embedding straton as a DCS and control systems based on zenon Logic. Our zenon-based solutions include wizards for the quarrying and mining industries, substation automation, electricity distribution, power grids, and tracking solutions for the automotive sector.

OUR CUSTOMER PROMISE:

Our service promise underwrites our solutions with trusted reliability, simplicity, and longevity. zenon excels in connectivity, rapid commissioning, and secure archiving and networking. With more than 17 years of experience with zenon, JS Automation offers a wide range of innovative solutions.

www.jsautomation.fr

KROPF Solutions



GERMANY



ABOUT US:

KROPF Solutions is a medium-sized, independent service provider which is headquartered in Oberkotzau, Upper Franconia in the district of Hof in Germany. The company operates in the field of industrial automation and our Managing Director is Mr. Werner Kropf.

OUR SOLUTIONS WITH ZENON:

KROPF Solutions has been working with zenon for over 25 years and offers a wide variety of solutions based on the software platform from COPA-DATA. With around 60 employees across a number of European sites including Germany, Hungary, and the Czech Republic, we look after companies in the automotive, consumer goods, and food and beverage industries as well as the fields of equipment and machine construction. With a particular focus on process control systems, data technology and substations, KROPF Solutions offers a complete range of services from consultation and design to implementation, training, and support.

OUR CUSTOMER PROMISE:

We process and visualize data for our customers in industrial environments. We adapt all software solutions to meet the requirements of the application in question, and also take care of procuring and installing the hardware. As a certified COPA-DATA Expert Partner, KROPF Solutions provides its customers with reliable expertise and a comprehensive range of services.

www.kropf-solutions.de

NEOPIS



REPUBLIC OF KOREA (SOUTH KOREA)



ABOUT US:

NEOPIS has contributed to the digitization of the electric power sector in Korea by producing various IEDs, such as digital protection relays and digital meters. System integration projects with our IEDs promote smart systemization in a variety of factories, power plants, and substations.

OUR SOLUTIONS WITH ZENON:

Our Power Management System (PMS), Electricity Management System (EMS) and Electricity Storage System (ESS) are based on the zenon software platform. Customers include Korean giants such as KOMIPO and Hanwha Energy. Our substation ECMS (Electrical Control and Management System) is used in grids across Korea, Vietnam and Haiti. We also offer special solutions, such as combined power metering systems.

OUR CUSTOMER PROMISE:

As a renewable energy solution, our zenon-based PMS, ESS and ECMS can be implemented as a mutual backup system, thereby providing complete system redundancy via zenon. In addition, it is possible to operate an unmanned substation and electrical control room with our web-based server-client solution.

www.neopis.com

PARTNER COMMUNITY WORLD CAFÉ

CERTIFIED PARTNERS LETTING YOUR PROJECTS SHINE WITH ZENON

Schweitzer Engineering Laboratories (SEL)



USA



ABOUT US:

SEL invents, designs, integrates and builds digital products and systems that protect electrical power systems. SEL is a 100% employee-owned company headquartered in Pullman, Washington. We have manufactured innovative quality products in the United States since 1984, serving customers in 164 countries.

OUR SOLUTIONS WITH ZENON:

zenon is SEL's preferred HMI/ SCADA front end for its state-of-the-art PowerMAX system, an Electrical Power Management system widely used in oil & gas, paper, chemicals, water/waste water, universities, substation and microgrid control system projects. Powerful graphics, robust circular redundancy, in-built device drivers like IEC 61850, DNP, Modbus and SOE reporting makes zenon an obvious choice for SEL.

OUR CUSTOMER PROMISE:

SEL is motivated to help our customers succeed. SEL's mission is simple: to make electric power safer, more reliable and more economical. To that end, SEL provides unparalleled quality and value in our products, technical support, customer service and 10-year warranty.

selinc.com

SEP – System House Factory For Electric Panels



SAUDI ARABIA



ABOUT US:

At SEP, we pride ourselves on our excellent customer service and our ability to quickly deliver effective solutions for power distribution and safety. Founded in 2006 by Er. Sami Angari and Dr. Bruno Stocchi, we design, manufacture, test, and supply control, protection, automation and metering systems.

OUR SOLUTIONS WITH ZENON:

SEP deploys zenon Energy Edition in a Substation Automation System (SAS) solution for the National Grid/Saudi Electricity Company (NG/SEC) and key contractors in the Kingdom of Saudi Arabia. The SEP team comprises well-qualified engineers with zenon Advanced Certifications. Our key focus is on SAS solutions for NG/SEC/ARAMCO. SEP has been awarded four projects from SEC and a project from ARAMCO with zenon.

OUR CUSTOMER PROMISE:

With certified zenon engineers, SEP focuses on providing excellent, competitive service to our customers and suppliers. We have developed an in-house training facility with a simulator set-up. Leveraging zenon's ergonomics and parameterization, we provide cost-effective and timely solutions to our customers.

www.sep.com.sa



COPADATA
Partner Community

FAST FACTS



240 Partners Worldwide

3 Expert Partners
27 Qualified Partners
210 Registered Partners



44 Countries

COPA-DATA partners cover more than 40 countries worldwide



Partner Categories

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

Figures as of March 2019



Entry Year



Partner Level

Industry Focus:



Cross-Industry



Pharmaceutical



Automotive



Food & Beverage



Energy & Infrastructure



Video:
**zenon – automate your manufacturing and
infrastructure equipment with incredible ease!**
Scan & Play!



[www.copadata.com/
zenon-Software-Platform](http://www.copadata.com/zenon-Software-Platform)

