Information Unlimited
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Always head to wind

Success Story District Heating for Lienz by zenOn

Development IEC 61850 Driver

Tips & Tricks Automated Engineering (1.)

Always head to wind

Dear readers,
I hope every one of you had a healthy start full of fresh energy into the New Year. Sailing with good winds and always on target. This year, COPA-DATA is celebrating a jubilee. It has been 20 years since I started, and for over 15 years now, zenOn has existed as a product.
A long time and a long tradition of product innovations and developments. But this development was not limited to the product, because COPA-DATA as a company also experienced massive advances.
Tradition is of great importance to us when it comes to compatibility and conservation of values. In all other concerns, our development is a very dynamic one; after all, tradition is not about conserving the embers but about passing on the fire.
That means: for our customers, we always sail head to the wind, and we use energy and synergies. How? You can find out more in the stories about zenOn, in-house driver development and market trends.
It is simply beautiful to see the enthusiasm that employees put forth in their work, discussing, developing and designing with passion. Always focusing on the customer's benefit. Because at COPA-DATA, from the very start, we put **Customer-Value**, not Shareholder-Value, at the center of our attention.
I will make every effort that this remains the same in the years to come. True to our tradition of change and development, we are once again going to show a firework display of innovations this year.

I hope you enjoy reading this issue of IU – and I wish you good winds in your sails.
Regards,

Thomas Punzenberger, CEO

Content

CONTRIBUTORS

Reinhard Mayr
As a product manager, Reinhard Mayr experiences day to day what moves companies. Like Perikles, he is against "waiting and seeing" and in favor of thinking ahead.

Markus Stangl
Viva la Revolución? Not when brand manager Markus Stangl writes about zenOn and compatibility. The only thing that is left for the "R" then is the red pencil to cross it out. And for good reason.

Jürgen Resch
Profinet makes for speed and flexibility in plants. Product manager Jürgen Resch knows about the advantages for the customer and what COPA-DATA does with this.

Robert Ficker
Product marketing specialist Robert Ficker shows us in his four part workshop just how easy engineering can be with zenOn. Today, you'll learn to set your own standards.

Günther Haslauer
Günther Haslauer, head of development, prefers reading 3.000 pages about the IEC 61850 protocol rather than merely offering a ready-made driver to his customers.

Mark Clemens
Mark Clemens, head of support, knows how his customers get the best support as quickly as possible. With brand new software he keeps his team on the move.

Markus Helbok
Above all, Markus Helbok wants one thing: the best zenOn. That's why he tortures it with punishing usability tests. And here he admits just how intensely he does that.

IMPRINT

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Securing tomorrow's business success, today.

SCADA-Systems in the present and challenges for the future.

In the future, SCADA-Systems will play an important role for the success of a business. In this field, if you bet on the wrong horse you will have lost from the start.

CURRENT CHALLENGES

If you look a the current trends in business, for example the fusion of companies into more and more complex clusters, you notice that the tendency towards cost-oriented business strategies is still strong. With the globalization of markets and the resulting pressure of competition the need for cost-optimized processes is on the rise.

These developments are particularly obvious in the domain of production businesses. In the wake of process automation and standardization the main project targets are still full cost control and cost optimization.

Production in the 21st century has developed into one of the most data and information intensive processes in everyday business. Nowadays, optimizing requires considerably more information than in all previous cycles of industrial development; and the tendency is rising.

Core processes must be monitored, costs must remain calculable and at the same time they must be reduced to a minimum, to ensure the continuing presence on the global market. Additionally there's a growing pressure on businesses to comply with a variety of industry specific standards like ISO, VDA, etc. Successful businesses can no longer ignore these topics and requirements and so they face the challenge of having to implement appropriate control measures in their core processes.

Today, SCADA-Systems already play a decisive role and assist businesses in the successful realization of their strategies. Helpful systems allow the linking of different levels within a process. The challenge here no longer lies in the simple exchange of process data, but rather in a system's potential of linking different IT levels and hardware platforms.

Current quality solutions are characterized by the use of state-of-the-art technologies and the resulting benefits of integration. Such integrated solutions enable companies to collect and analyze data across different areas and processes. On top of that, this can be performed at any level of granularity and - thanks to the open design of modern systems - based on already existing structures.

Only with such a consistent database can a company obtain a well-grounded overview of its core processes. Only with data in the appropriate granularity and integrity can the constant optimization of processes, as postulated by norms, become true.

PREPARED FOR TOMORROW, TODAY

"It's not about predicting the future, but about being prepared for the future!", a recommendation which dates back to the Greek statesman Perikles.

According to current studies of the Fraunhofer Institute and the IEEE, the challenges of the near future lie in the interoperability between technical and management systems. What is necessary is a holistic and optimized view on businesses.

Modern markets create a demand for growing flexibility in all divisions of a company, from production planning to production to packaging and shipping. The keyword is no longer mass production but mass individualization.

Additionally, there are more and more complex regulations and country specific standards that must be met by products and businesses. All of this leads to an ever-growing demand for data,

"It's not about predicting the future, but about being prepared for the future!"

Perikles, Greek statesman

from its collection to its evaluation to the actual product level. At the moment we still talk about lot-related data, but in the near future it will be all about seamless product-related tracking and reporting: the precise identification of a single product and the seamless and comprehensible documentation of its entire life cycle.

The topics will be: integration between any different existing IT infrastructures, data collection and storage at product level, interoperability of substantially different systems, protection/development of business and process know-how. Coping with these future challenges, some of which are already present, will have a great influence on the success or failure of complete businesses. But who can take these challenges, who can act as the connecting part in these dynamic processes? Management and business systems reach their limits fast when they are confronted with these requirements. Modern SCADA-Systems already offer solutions and will do so in the future, providing a basis for the success of many businesses.

SCADA-Systems are independent systems, which are tightly coupled to production processes. They are designed to collect data directly and store it in real time and in any desired form. SCADA-Systems are also built to process large amounts of data and so they can provide real-time information in the appropriate quality, in the right place and at the right time.

SCADA-Systems acknowledge these trends; their structures are already prepared for these future challenges. That's why they will play an important role in the business life of tomorrow and become a critical success factor for modern and prosperous businesses.

Reinhard Mayr, Product Marketing

We help you! Automated and Unlimited

The COPA-DATA Support Team proves their versatility and competence day after day. Inquiries range from "Where can I find out about status processing in the manual?" and "Does the web client run under Unix?" to "How many variables communicate with a S7 PLC over a driver" up to troubles with starting up CE terminals as clients.

For the steadily growing amount of inquiries, the support team will get assistance from a helpdesk software package in 2007. It will help in keeping a handle on things, even with 20 inquiries a day, distributed over three teams. Which team has available capacity? Which inquiry requires immediate action? What is the status of the analysis in the development department? Have we received all necessary information from the customer yet?

SELECTING AND CHOOSING THE RIGHT SYSTEM

In order to find the right helpdesk software, several different products were evaluated. The most important criteria were: seamless connection to the existing CRM (Customer Relationship Management) system, facilitating cross-national technical support, flexibility and possibility of upgrades. An integrated knowledge base was also a requirement.

Furthermore, it was necessary to manage software maintenance agreements to satisfy customer needs. The final decision was made in favor of a direct implementation of a helpdesk module into the existing CRM software of Sunrise Software. Now, the new helpdesk keeps the overview and supports the responsible employees in organizing, prioritizing and processing. Franz Nussbaumer, CEO of Sunrise Software, is pleased that "... COPA-DATA has chosen our ticket-based system. It will improve the speed and efficiency of the support team by reducing call durations, by allowing the upload of customer data for faster analysis and by providing quicker problem definition and solutions. And of course it works perfectly with our CRM software."

THE HELPDESK MODULE IN THE CRM SYSTEM

The helpdesk module consists of several essential components. The issue tracking system or ticket module assigns a unique ticket number to every inquiry, storing all details of the inquiry. Properties like licensed modules, network constellation, driver etc. can be assigned to each ticket. Based on this data, it is possible to retrieve older tickets with identical or similar concerns, which may already contain the solution or at least be helpful for resolving the issue at hand. Incoming email messages containing the ticket number in the subject field are automatically assigned to the existing ticket. New tickets can be assigned to different queues, where they are processed according to priority and date of receipt. With this system, the specialists of the support team receive a simple list of tickets. Different colors indicate at a glance if somebody is waiting for information, whether an answer was sent, whether new information has been received and which new tickets have to be attended to.

SLA (Service Level Agreement) data from customers or the company makes it possible to check the existence and date of any training session or if there are any software maintenance contracts. The integration into the CRM system gives Sales a direct insight into current and past tickets of a contact or a company.

EVERY SPECIALIST IS AN AUTHOR

Certainly, many inquiries have already been answered in the past. It would be helpful to have the possibility to access those questions and answers with a few mouse clicks. The integrated

knowledge database will replace the existing one. After entering keywords, it will offer possible approaches. Closed tickets containing all relevant information for a solution can be transformed into knowledge base articles with a few clicks and they can also be translated into German or English. Thus, every specialist is an author and supports both users and co-workers.

STEPWISE INTRODUCTION

The introduction of the helpdesk module will consist of several steps. The first step will be to introduce the ticketing module, which you may already be familiar with. For you, the introduction of the ticketing module implies that every single inquiry will now be recorded with a unique number in the system. This may take a few seconds longer when inquiries are answered by phone but from that moment on, your question can be retrieved easily and quickly, with all details and changes.

Of course, multiple open tickets at the same time are possible. For each ticket, you will receive email notices about status changes containing the inquiry description and ticket number, guaranteeing an easy overview. If you have any questions regarding a ticket or if you want to send additional information, you can simply answer the notice message and the responsible person will be notified automatically.

THE FUTURE

In the course of the introduction, you will get access to our knowledge base and the tickets via our website. The access to the knowledge base articles via our website will offer a rich source of information and experiences of many other users. The online status request on our website will allow you to track the status and development of the ticket and to send us new information or files for a ticket—without using your mailbox. Do you have any ideas or wishes for our helpdesk? We are looking forward to every suggestion. ***Mark Clemens, Manager Support***

"I am pleased that COPA-DATA has chosen our ticket based system. It will improve the speed and efficiency of the support team by reducing call durations, by allowing the upload of customer data for faster analysis and by speeding up problem definition and solution. And of course it works perfectly with our CRM software."

Franz Nussbaumer, CEO Sunrise Software

Kohlbach and zenOn are warming up Lienz

Austrian city Lienz provides its citizens and businesses with cost-efficient environmentally friendly heating and electricity from wood and solar energy. At the heart of the 57 kilometers of piping, biomass boiler systems from CHP experts Kohlbach are controlled by zenOn SCADA software to ensure that nearly a thousand properties receive dependable heating delivered free all year round.

Lienz is an area of natural beauty in the ski haven of the Tyrol, which is uncompromising in its commitment to ecologically sound technology. Kohlbach was commissioned to provide a system that produces the optimum conversion of energy into heat. The solution provided burns wood chippings to heat almost 1000 homes, while supplying power to the grid with a highly efficient power-heat coupling.

Austria based Kohlbach Holding GmbH has been synonymous with clean energy from wood for 50 years. The innovative company has continued to set new standards for biomass heating plants in Europe. In fact, this know-how has made it a regular cooperation partner for International Research Institutes and Universities. Not restricted to district heating projects, Kohlbach boiler systems can be found in many companies across many industries from drying ovens and chip driers, to heating for production plants.

Many communities place their trust in the advanced technology of Kohlbach for their district heating systems. Its bio-heating systems supply educational centers and swimming pools as well as public facilities. Having evaluated a number of solutions, Kohlbach chose zenOn SCADA/HMI software from COPA-DATA for the control of all boiler systems 6-7 years ago and have never looked back.

Complex technical processes need failsafe control and monitoring. Kohlbach's standard zenOn installation provides extensive control of the heat process using a panel PC. This includes

- The boiler temperature controller
- The initiation of the heater PID controller
- The actuation of the hydraulic feeder grate

In the Lienz district heating station the SCADA/HMI software controls the boiler system, collects optimisation and warranty data and facilitates a highly automated plant operation.

CLEAN POWER IN LIENZ

Kohlbach supply thermal oil and steam systems for the simultaneous production of heating and electricity from wood, so-called 'cogeneration'. The difference from simple power generation is in the exploitation of the unused waste heat. This energy – which would otherwise be lost – is used in the combined heat and power (CHP) process for district or process heat.

The new Lienz plant employs cogeneration or combined heat and power (CHP). This is an efficient, energy saving technology that has proven itself in practice and that protects resources and the environment. Combined heat and power (CHP) plants utilize up to 95 % of the fuel employed. Depending on requirements, Kohlbach equips these CHP plants with conventional steam technology or innovative ORC technology (Organic Rankine Cycle). Kohlbach make it very easy for even small operators to install heating systems. Their modular container-type construction enables completion of assembly and commissioning in just a few days because the modules are delivered pre-assembled. The boilers are of a modular construction, so that any subsequent changes of location are possible at any time and are quick and easy to carry out.

"Standard zenOn modules such as Extended Trend and Archive quickly convinced us that we had found the right partner in COPA-DATA. They simply make our job easier and our products safer."

Dipl.-Ing. Zvonimir Preveden, CEO of Kohlbach Group

The Lienz district heating system uses a combination of these technologies and was delivered in two stages. The Lienz 1 heating power station, established in 2001uses:

- 2 biomass boiler systems: A hot water boiler with a rated power of 7 MW and a thermal oil boiler with a rated power of 6 MW
- 1 ORC process: supplies 1 MW of rated electrical power
- 1 solar plant with 630 m² surface area of collectors
- 1 exhaust gas purification plant, carried out in a first stage by a multi-cyclone downstream of each biomass furnace and in the second stage by a shared exhaust gas purification plant including exhaust gas condensation
- 2 oil boilers: 11 MW oil boiler fired with extra light heating oil

"It's a pleasure to know that our software ensures monitoring and safety in such innovative and powerful products."

Ing. Thomas Punzenberger, CEO of COPA-DATA

The Lienz II heating power station, established in 2005, uses:

- 1 biomass boiler system with attached thermal oil boiler for a rated power of 8.7 MW
- 1 ORC process with a rated electrical power of 1.5 MW
- 1 exhaust gas purification plant with integrated exhaust gas condensation
- Round timber shredding with automatic fuel feed
- Buffer storage with a capacity of 400 m³

MODULAR PLANT BENEFITS FROM MODULAR SCADA

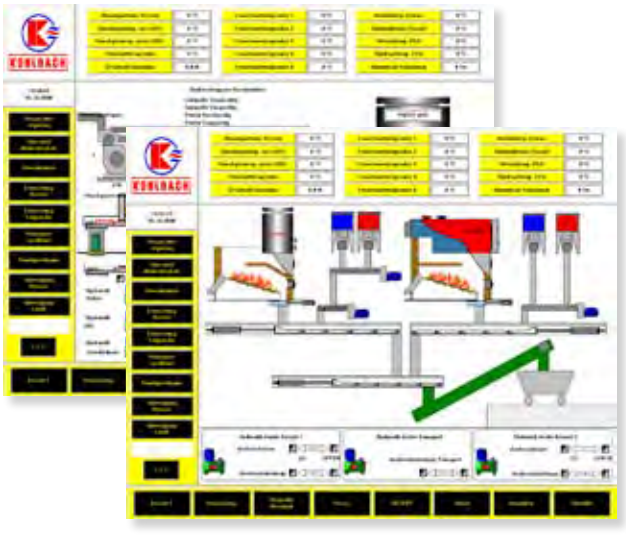
One of the reasons why Kohlbach use zenOn is the modular nature of the software. The highly reliable core software provides standard SCADA functionality, but also many built in features such as a powerful editor and seamless redundancy as standard. Where additional functionality is required, additional modules can be installed. Managing Director Thomas Punzenberger elaborated, "With zenOn, you just buy the modules you need. These interface directly into zenOn, so there is no need to over-specify." Zvonimir Preveden, Graduate Engineer and Managing Director of the Kohlbach Group commented, "Standard zenOn modules such as Extended Trend and Archive quickly convinced us that we had found the right partner in COPA-DATA. They simply make our job easier and our products safer." "Indeed, the potential of the software is still not exhausted," added project technician Hartwig Streit. The network control and complete exhaust gas purification in projects such as the Lienz thermal power station are also visualized with zenOn."

TREND MODULE PROTECTS ASSETS

The zenOn archive server continuously records and archives all process data. Each archive can contain any number of, and any type of variable (binary, analogue, string) and these can be stored spontaneously, cyclically or event driven.
Kohlbach used the archive module primarily to record boiler temperatures. The extended trend functionality is then used to analyse the trends in temperature to ensure that the operator uses the boiler within the specified parameters. This is very important to Kohlbach because their boilers are installed with a conditional lifetime guarantee. A boiler will normally operate for many years, but if permitted to overheat the damage would void this cover. The extended trend module is used to analyze trends in temperatures, for example if a boiler is tending to overheat, or is running at maximum efficiency.
The data can also be used by Kohlbach consultants to optimise the plant in future years.

AUTOMATED PLANT RELIES ON MESSAGE CONTROL

Kohlbach plants such as Lienz are fully automated using zenOn and hardware control. A single supervisor may be responsible for a number of plants in a district, with no operators on site.



Modular HMI/SCADA makes futuristic CHP safer

Carbon neutral CHP project benefits from modular SCADA

This makes effective message control very important. The zenOn message control ensures that alarm messages and system information in the Lienz district heating plant arrive quickly to the operating personnel – regardless of whether the station is currently manned or not. The message control built in to zenOn forwards condition and alarm information immediately to the right recipients.

When operators are not logged in on site, this could use SMS, pager, fax, e-mail or as a voice message on the telephone. The sending of messages can be triggered manually or automatically when a threshold is violated or according to a time control.

For example in the event of a boiler overheating, the supervisor could receive a text message or a voice message. Regular reports, such as alarm logs or temperature trends could be sent by email. All messages are, of course, also documented and archived.

INNOVATIVE TECHNOLOGY DEMANDS INNOVATIVE PARTNERS

Kohlbach installed an ecologically and economically well thought-out district heating system for Lienz. Such systems are only achieved using future-oriented technology. One new technology that the company is watching carefully is the trend towards the 'soft' PLC. As such, Kohlbach is experimenting with the proven soft logic solution named STRATON from COPA-DATA. This technology integrates completely with zenOn to produce an elegant, cost effective and above all, safe solution.

The powerful and flexible STRATON programming system is embedded within the zenOn development environment. STRATON is a fully IEC 61131-3 compliant "soft" PLC that supports all five languages defined in the IEC standard (AWL, ST, KOP, FUP and AS). It consists of the workbench (the programming interface), a runtime (the runtime environment) and a communication system. A series of performance enhancing and useful programming features facilitate rapid, pain-free project development. Engineering time is reduced using an integrated zenOn and STRATON system because the SCADA/HMI system and soft PLC share a central database of variables. Any variable declared in zenOn is available in STRATON and vice versa. This makes project commissioning more efficient because the variables are only declared once, rather than separately in both the SCADA and PLC programs like in a typical process control system. Although not immediately obvious, safety is an advantage of an integrated system that is of particular importance to Kohlbach. In a traditional control system, a SCADA system reads PLC variables for visualization and control from a fixed memory address. If some changes are made to the PLC program, for example during an upgrade the data accessed by the SCADA system could become incorrect. This disparity could lead to inaccurate control of the plant or an inaccurate representation of the plant in visualization, either of which is clearly unsafe.

Using an integrated zenOn / STRATON system any new variable declared in a 61131-3 program is instantly available in zenOn. Furthermore, if a variable is renamed or moved to a different address within the STRATON (PLC) program, this will also be updated in zenOn so that the system is always safe. With these and many other features, zenOn makes the control and monitoring of plants simple and safe, whether for energy plants, in automobile construction or factory automation. Kohlbach is currently upgrading the Lienz district heating plant from zenOn 5.50 to zenOn 6.20 to make use of the powerful improved multi user editor and automatic project creation wizards, both of which promise to improve project commissioning times for the company.

Kohlbach values the engineering support provided by COPA-DATA, maintaining a close relationship to deliver innovative solutions efficiently and safely. Thomas Punzenberger, Managing Director of COPA-DATA, is delighted about the cooperation with Kohlbach, "It's a pleasure to know that our software ensures monitoring and safety in such innovative and powerful products". *ru*

Usability. An editor can work as easy as that.

In the process of developing and extending zenOn, we pay special attention to usability from the very start. But how do we know if zenOn really is as easy to use as we think? Can we, the professionals, really judge that? No, but...

PROS FOR FASTER CLICKS

We do not just want to claim that zenOn is easy to use – we want to know it. And of course, we also want to know if beginners use it as easily as technicians who have been working with HMI/SCADA for a long time.

The best approach: off to the laboratory. Because analyzing your own software is very hard and the results are always subjective. For that, we like to employ professionals who deal with usability on a scientific level. For example, the Austrian usability specialists at USECON whose work is based on the scientific help of the research establishment CURE and the University of Salzburg. In 2006, we started the project GUI Usability PLUS for the zenOn Editor, in cooperation with CURE. Of course, it is not always nice to expose your beloved creation to such tough tests, but there are evident rewards: first, development engineers in your own house thinking way outside the box. Second, as a result,you get the HMI/SCADA software that is the easiest to use HMI/SCADA software.

WHAT IS USABILITY?

Looking up DIN EN ISO 9241 part 11 and DIN 55350-11, 1995-08, Nr. 4, we find a quite exact definition: Ease of use or usability refers to the appropriateness of a product being employed by certain users and in a certain context of employment in order to reach defined goals effectively, efficiently and satisfactorily. The context of employment consists of users, tasks, equipment (hardware, software and materials) and the physical and social environment in which the product is employed.

The fitness for use is based, amongst others, on the usage properties and the needs of the user; consequently, apart from an objective rating, there is also a subjective rating that can differ from individual to individual. In a few words, we can put it like this: you should be able to parameterize your project without having to think about our software. One hundred percent of your attention should be available for your work. And when you hand over a project or train new employees, you should talk about your system, not about zenOn.

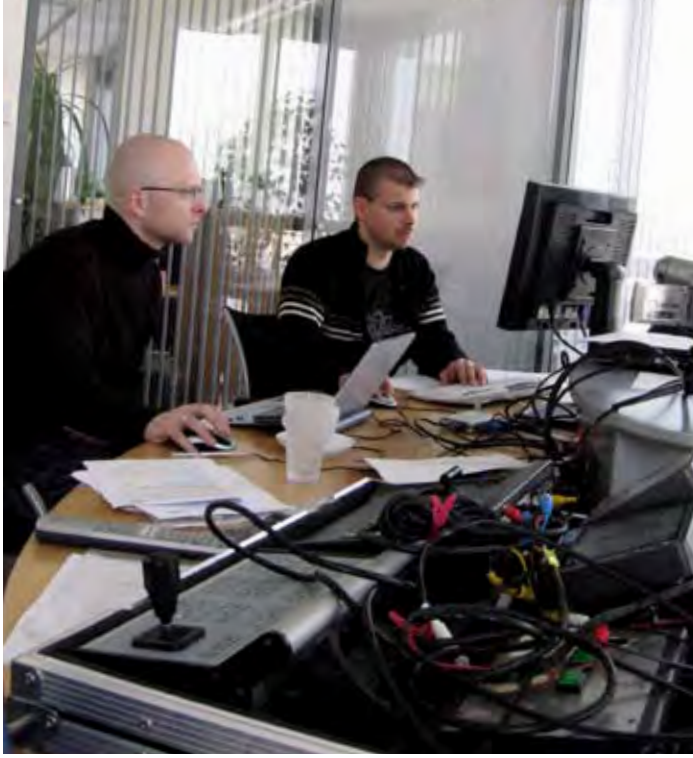
THE PROJECT

The goal of GUI Usability PLUS was to give the zenOn Editor a level of usability and user friendliness that would set a new standard in the sector. For this, we had to find out about strengths and weaknesses of the zenOn Editor, but also about new ways of making your project handling with zenOn even easier and more efficient.

Generation 6 of zenOn introduced a completely redesigned Editor. The goal was to reduce engineering times significantly. Functions like multiple selection, object oriented parametriz-

Usability means to us: You can give your full attention to your project and you don't even notice which software you are working with.

Markus Helbok, Product Manager



ing, the integrated solution with STRATON and much more have facilitated project building a lot. Generation 6 has been on the market for nearly three years now. Time to strike a balance and check the original aims and their realization.
But how do you find out which parts of zenOn Editor behave as planned – and which elements have to be revised? That is where the specialists at USECON helped with their experience.

First, we needed test persons. And we had specific requirements for those persons. They

- had to actually use the Editor
- should not be afraid of showing what is good and what is bad
- should be capable of working in the test situation without being stressed
- should in no case come from any COPA-DATA related background

USECON chose 15 people from the employees of Atec, Audi, BMW, Brodersen, Elin, Festo, Gottschild, Harro Höfliger, KSI, KWB, Lamilux, Metior, Plasser & Theurer, SIG and Swarovski. An even mix of zenOn experts and beginners, professionals familiar with third party products and pure zenOn users. Besides the professional qualifications, our test persons had to be willing to spend up to two workdays for the test. At this point, we would like to say a big "Thank you!" to everybody who took part in the test! You have been a great help to us and all zenOn users.

ON YOUR MARKS, GET SET, TEST!

For two whole days, zenOn was tested in the COPA-DATA Headquarters in Salzburg. Every participant got a fresh system and had to do a list of tasks within two hours. Of course, the tasks for the expert users were a few more and a bit more complex than the tasks for the beginners. USECON recorded all inputs and mouse movements and videotaped the test persons during their work.
Then the usability experts of USECON did a painstaking evaluation of their recordings in order to tell us how beginners get along and what experts think of the zenOn user interface. At the end of each day, the testers additionally summed up their experiences in so-called focus groups. We at COPA-DATA were very curious about that, but we had to stay outside. The group talks strengthened some judgments or qualified first impressions. What is important for us: the focus groups also collected ideas about the direction in which zenOn should be developed over the next 10 years.

WHAT´S NEXT?

Now it is up to our developers. And they have already been very industrious. In the second quarter of 2007, version 6.21 will enter the market. It has already put into practice some of the insights gained from GUI Usability PLUS. Even more: version 6.21 will be a pure usability release. A release in which it will be all about you, the user. You will not get to know any new runtime functions, but you can lean back to see and feel instantly how serious we take our colleagues at the usability lab and our customers.

And if you don't swap to version 6.21 yet, you can read all about the changes and modifications in the next issue of Information Unlimited. *Markus Helbok, Product Marketing*

Homemade: Drivers for the IEC 61850 protocol

Would you prefer reading 3000 pages and developing drivers on your own to simply buying a ready-made driver? We do.

In the past, the preferred choice for substation automation was the IEC 60870 communication protocol. As this protocol, from a technological point of view, dates back to the late 1980s, it soon failed to meet the rapidly rising requirements. For this reason, the IEC published its successor, the IEC 61850 protocol, in the year 2004, after 10 years of development.

For this protocol, a very comprehensive and object-oriented approach was chosen which considers both station level and process level on the communication side, but which also standardizes the engineering side. This leads to a rather voluminous standard, which is divided in 14 parts and covers over 1200 pages. These 1200 pages, however, lack the definition of physical transmission. For this matter, the reader is referred to the IEC 9506 protocol for server/client communication, which itself covers 600 pages. The IEC 9506 protocol is based on the ISO norms for session, presentation and application layer, the Abstract Syntax Notation ASN.1 and the RFC 1006, to finally arrive at the exchange of telegrams via TCP/IP. Altogether, this results in a set of standards covering about 3000 pages.

TAILORMADE DRIVERS

Nevertheless, COPA-DATA decided to develop the protocol stack in-house instead of purchasing a ready-made stack. Why is that? The implementation must

- be available in source code
- run in Windows CE
- be "lean", it must not contain loads of features that we don't need
- fit seamlessly into our logging and diagnostic system
- meet our design and implementation criteria
- allow for easy maintenance

In addition, we want to create and gather protocol specific know how for the best possible customer support. For the same reasons, we decided to keep the development of the IEC 60870 protocol, the ProfiNet protocol and many other protocols in-house. What's more, the currently available implementations of IEC 61850, which is similar to ProfiNet in this concern, are built for the server side, thus for controller manufacturers.

For SCADA, we use only server/client communication via TCP/IP. For this, we implemented the communication profile A1/T1, in which the IEC 850 driver serves as client on TCP side and as master on the application side. The driver supports Browsing, because the complete variable model of the 61850 protocol, as opposed to the 60870 protocol, can be read out. TWhat facilitates this is the fact that the variables model is entirely object-oriented and consists of relatively few strictly defined Common Data Classes (CDCs). The semantics of the CDCs' attributes are predefined.

For example:
The logical node *XCBR1* (circuit breaker 1) has, amongst others, a data object Pos, which is a CDC *Controllable Double Point.* This data object Pos in turn has attributes stVal, q and t, and the CDC defines the names and semantics of these attributes.

XCBR1.Pos = switchposition (LN-Definition XCBR in 61850-7-4)
XCBR1.Pos.stVal = positionvalue (CDC-Definition DPC in 61850-7-3)
XCBR1.Pos.q = quality (CDC-Definition DPC in 61850-7-3)
XCBR1.Pos.t = timestamp (CDC-Definition DPC in 61850-7-3)

All objects in the variable model are structured like this. This means, for example, the driver knows that the attributes *q* and *t* contain Quality and Time Stamp for the value contained in *stVal.* Because of that, you can access any desired attribute of any object in the variable model and, if necessary, the driver automatically adds the existent Quality and Time Stamp values of the actual variables.
We can see a similar situation regarding commands (Operate Command). Because of the predefined variable syntax, when writing to a variable (e.g. with the name **.Oper.ctlVal*), the driver automatically recognizes that a command rather than the normal setting of a value is required and sends the necessary telegrams to the PLC.

IN THE KNOW!

In this regard, using the IEC 850 driver is much easier than might be concluded from the complexity of the protocol. More than that it's a lot more comfortable than you might be used to from the already easy-to-use IEC 870 driver.

1. Create driver
2. Insert connection into driver configuration and enter IP address
3. Choose variable online import and select connection
4. Check required variable in the filterable and sortable list
5. Use variables as usual

There is no need for further address inputs or manual creation of variables. Quality and Time Stamp are considered automatically, even when no variables were created for them.
From our point of view, using the IEC 61850 protocol is another important step towards easier engineering and maintenance. We hope that it will be employed quickly and in a wide domain.

Günther Haslauer, Development Manager

Myth about the origin of the railroad track's gage

The Canada and US standard railroad gage (distance between the rails) is 4 feet, 8.5 inches. [In Austria, this is the same distance with 1435 mm].

That's an exceedingly odd number. Why was that gage used? Because that's the way they built them in England, and the US railroads were built by English expatriates.

Why did the English build them like that?

Because the first rail lines were built by the same people who built the pre-railroad tramways, and that's the gage they used. Why did "they" use that gage then? Because the people who built the tramways used the same jigs and tools that they used for building wagons, which used that wheel spacing. But why did the wagons have that particular odd wheel spacing?

Well, if they tried to use any other spacing, the wagon wheels would break on some of the old, long distance roads in England, because that's the spacing of the wheel ruts. So who built those old rutted roads? The first long distance roads in Europe (and England) were built by Imperial Rome for their legions. The roads have been used ever since. And the ruts in the roads? The initial ruts, which everyone else had to match for fear of destroying their wagon wheels, were first formed by Roman war chariots. Since the chariots were made for (or by) Imperial Rome, they were all alike in the matter of wheel spacing. The United States standard railroad gage of 4 feet, 8.5 inches derives from the original specification for an Imperial Roman war chariot. Specifications and bureaucracies live forever. So the next time you are handed a specification and wonder what horse's ass came up with it, you may be exactly right, because the Imperial Roman war chariots were made just wide enough to accommodate the back ends of two war horses. Thus, we have the answer to the original question.

There's an interesting extension to the story about railroad gages and horses' behinds:

When we see a Space Shuttle sitting on its launch pad, there are two big booster rockets attached to the sides of the main fuel tank. These are solid rocket boosters, or SRBs.

The SRBs are made by Thiokol at their factory at Utah. The engineers who designed the SRBs might have preferred to make them a bit fatter.

But the SRBs had to be shipped by train from the factory to the launch site. The railroad line from the factory had to run through a tunnel in the mountains. The SRBs had to fit through that tunnel. The tunnel is slightly wider than the railroad track, and the railroad track is about as wide as two horses' behinds.

So, the major design feature of what is arguably the world's most advanced transportation system was determined over two thousand years ago by the width of a horse's ass!

Source: *http://groups.google.com/group/comp.software.year-2000/browse_thread/thread/1bce2d08d8f6f78c/a7875833dc2a61b2?&hl=en*

~~R~~evolution: zenOn®

Revolutions involve casualties. If it's about software, this means that applications that have evolved over years are left behind. We object to that.

The year 2007. Even if it is just a few weeks old, I dare say: it will once again be a year of innovations. Just like the previous years. And once again, there will be many revolution not only in the advertisements, but also in everyday life. Microsoft, for example, not only delivers Windows Vista as the successor of Windows XP, which will herald "a milestone year for high tech industry" – according to Microsoft. What's more, in the middle of the year, Microsoft stops its support for the last DOS-based operating system, Windows Millennium. This ends the DOS-era. Does it really end?

I am curious and doubtful. Contrary to the innovation-loving sectors like the computer industry, there are longer product cycles in the real world. Here, it can happen that a working system is used for decades before it is replaced. Revolution here leads to a dead-end.

Do you know the story about the origin of the gage of our railroad tracks? It is typical for the endurance of certain systems. I found the story on the Internet. Have a look at it and find out what modern technology really depends on.

NEW TREES HAVE ROOTS, TOO

To be honest, things often happen like in the track gage story: plants grow historically, different systems from different generations are operated in parallel, more or less efficiently. Preferrably more, of course. And the standards of the oldest and weakest part determine how well the other parts can unfold. In automation, we encounter evolved, grown structures; existing things have their roots in past things. All too rarely, you get the chance to build a completely new plant, and even in that case: the parts of this system are usually already known and established and they draw on older norms and standards.

Thus, new things are an adaptation of known things. According to Dr. Jan Göpfert (ID consult, innovation and technology consulting, Munich), this applies to 99% of all innovations.

Many of us actually know or at least suppose that if you do not move forward, you move backward. Or as Jan Göpfert expressed it in an interview with the business magazine *brand eins*: "If you do not innovate, you saw off the branch you are sitting on."

Nevertheless, few companies try something new. They prefer to stick to the old proverb 'Never touch a running system'. Either for fear of doing something wrong or even based on some painful experience.

Sales promotions often present simple solutions for complex problems. Some say 'Simplify your Life'. Others offer 'Solution Providing'. The ones who pay for this in the end are the trustful users – most of the time it is too late when they discover the important flaws in those 'simple' solutions. As a consequence, many businessmen have become cautious and no longer trust those offers that sound almost too tempting. Good. It is important to keep moving, but change has to happen at the right time and in the right direction. The alternative does not lie in keeping still, but in careful preparation and well-planned selection of partners. Evolution instead of Revolution. Know where you are going – and why.

COMPLEX ≠ COMPLICATED

Of course: complex problems require complex solutions. But beware! 'Complex' does not equal 'complicated'. And all too often, these terms are mixed up. As a consequence, solution providers often confuse customers rather than informing them. No wonder high technology users lose focus and react cautiously. In case of doubt, they just suppose that there are not really any big differences. After all, the information they are confronted with every day seem all too similar. So they rely on what they are familiar with and believe in suppliers with a big name. Because you can trust a market leader, right? Or can´t you? The fact that a company has a lot of customers proves the company´s ability to provide efficient solutions, right? Solutions for each and everyone? Is that for sure? The effect, nearly every automation supplier calls himself a leader of some kind; you can read about

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>
> *Markus Stangl, Strategic Marketing*

> *"We offer a unique technology guaranty to our customers. Whether a new platform, a new operating system, new hardware or growing structures – with zenOn, you stay compatible."*
>
> *Markus Stangl, Strategic Marketing*

market leaders, technology leaders, innovation leaders, sales leaders and so on – a typical stalemate situation. Whom should one believe now? Most of the times, those that one knows. But that provider is not necessarily the best. According to a study by Charles Roxburgh, McKinsey London, there is a so-called *Status Quo bias* when making strategic decisions. In plain words, this means something like: We'd rather stick to things as they are. Or: new things scare us.

Already in ancient China, there was a proverb: "When the winds of change are blowing, some build walls and some build windmills." Well, China was not really known for its windmills in the past, but a change of mind seems to have started. And what about the west? Here, we have a lot of industrious Don Quichotes fighting against the windmills. And so it happens that exactly those systems that are highly popular all over the world are actually the ones that have long been outdated.

So we decided it is time to change that and went ahead to not just make our products simpler to use but simply overhauled them – and with a great deal of success. Professor Dr. Ing. Dieter Klaus Adler, head of the Steinbeis transfer center in Karlsruhe, Germany, confirms: "I arrive at the conclusion that zenOn is at the cutting edge of technology and definitely the most powerful system on the market today."

However, as Wolf Lotter writes in *brand eins*: "merely new is nonsense" and "Without meaning and orientation, new things are lost." Without compatibility, they are lost, too; that is what we think.

STAYING RELIABLE

What do we act upon, when it is about the future? Which compass do we use? How do you know that you are on the right track when you draw the map while you are on the way? Let us start with a clear vision. It helps us in understanding where the journey goes. The more we picture and describe it, the better. And on the way between today and the visionary day-after-tomorrow, there lies the strategic tomorrow. A clear direction that you can stick to. On this road you can move ahead, step by step. Just do not give in to the numerous temptations along the way. There are lots. Usually, they include people who explain to you how you have to walk on your way, how you have to build your road – and that actually, you want to go somewhere completely different. Consultancies, industry specialists and trend analysts. Everyone of them has their own vision and constructs a bit of his personal road with that. And let's not forget the tollbooths, also known as shareholders, and their advisors, the analysts. And for enough profit, they will sacrifice reserves and build the roads with poor asphalt. Good if a private business stays independent and stays loyal to its values. After all, when building a road, you also trust in a solid foundation.

What about the competition – lately so-called "marketing partners"? Every one of them is traveling on their own road. Heading towards the future? Maybe. The main thing is that they are on the way, it appears. Some build motorways, some build real superhighways. At the same time they serve climbers, circumnavigators, spacemen and all the others who want to go somewhere and trust that they will get there somehow, someway. Many also buy up other road users and try to merge roads together or block the roads they just bought in order to lead people onto their own roads. That is what is called market consolidation. And what about us at COPA-DATA?

We have been blazing our own paths for 20 years now. Ones that we were the first to travel and that others, over time, have taken and then adopted. These paths are open to everyone. They have connecting bridges and streets that can be flexibly adapted to your surroundings. Compatibility is the key word that makes it possible for travelers on our paths to be ready for the future at all times. But our past is the solid footing on which we continue to grow and expand. Right from the beginning, we have made convenience the focus of our products. Automation specialists are consistently impressed with zenOn's comfortable and useful features. Innovative functions quickly turn requests into competence, giving our customers important competitive advantages. zenOn users have the freedom to take any path they choose in the vast automation market. In other words, go where you want to and zenOn will join you.

SUSTAINABILITY WITH A TECHNOLOGY GUARANTY

Specializing in software for the areas of HMI, SCADA and

DCS, we offer a unique technology guaranty to our customers. Whether a new platform, a new operating system, new hardware or growing structures: You not only get access to the most modern technology on the market, you can also be sure that with zenOn, you will be ahead of the field in the future. Care for some examples?

Smooth change of platforms? With zenOn, as always.
HMI/SCADA on PDA? With zenOn, you were the first.
Automated Engineering? With zenOn, naturally.
And Windows Vista? With zenOn, already today.
FDA? With zenOn, at the click of a mouse.
Decentralized intelligence? With zenOn, unbeatable.

In the last 20 years we proved that we can keep our promises. You can put us to test for the next 20 years. As the saying goes in publicity: comparison gives you certainty.
Change and movement are natural and do not imply the simple exclusion of older technology to us. We follow the idea of step by step. For the development of zenOn, we invested a lot of time and attention into a solid base. This way, we can now develop new versions with completely new features and elements – and still, we retain compatibility with the previous versions. Our customers benefit from that: They do not take part in every one of our steps, but use zenOn in the version which is appropriate for their needs. And as soon as it makes sense, they change the version, buy new modules. Whether with small steps or with great leaps – for the compatibility of the equipment, this is not a problem. Krones, for example, began with zenOn 2.20 and took part in all the updates until version 6.20. Treibacher Schleifmittel, in contrast, started with zenOn 3.04 and changed straight to zenOn 6.20.

RENEWING BY COMBINING

Networked information is the name of a current trend in automation. And here we are, back to the topic of cooperation, openness and compatibility.
Frequently, we encounter several systems spanning different sectors and tasks, running in parallel in one facility. The tasks range from direct control of the production process to control of an integrated wastewater treatment facility and the control technology for an integrated power plant with connected supply of cooling, ventilation, exhaust-gasses and energy all the way to building control technology.
zenOn can score here with a lot of competence. Sustainable renewability, above all, refers to the combination of established technologies to a bigger and better whole. zenOn not only works as an HMI and SCADA system in this matter, but rather as a central platform. If you have had the chance to witness the compatibility and interoperability of zenOn in action, you know what Automation Unlimited really means. The nice thing about zenOn is that it is ready for communication in all directions and it collects and provides data just as you need it. You expand a station in a larger network, zenOn does not care which hardware and which additional software you employ. Or maybe you need a connection to your ERP system. zenOn acts as an SQL database. The variety of interfaces makes it easy for zenOn to communicate with many different systems. For example, it likes to be addressed by SAP quite directly over its own interface. How can we keep such a complex solution so simple?

UNITY THROUGH DIVERSITY

Our society works well by the principle of task sharing. The baker, for example, not only provides us with fresh breakfast rolls every morning. Above all, he gives us the freedom to spend our time with other things. We live in a world of specialists and experts. Complex problems require complex solutions, partnerships, networks and cooperation. As with all networks, this brings about compatibility problems. Specialists of different disciplines speak different languages and have different views. The challenge lies in bringing these people together, moving them towards each other.
We at COPA-DATA pay attention to internal and external compatibility. Working together openly and in flat structures. Communicating in partnership within wide networks of specialists from a variety of disciplines. Uncomplicated language and many contacts worldwide. We do not want to push anybody from the market. We do not exclude anybody – we see ourselves as mediators and enablers. We look for solutions and always try to get a bit closer to our vision of the future. Step by step. Some have left us and went their own ways but many others stayed and a lot more have joined us.
What is our wish for the future? Smoother and more effortless evolutions – and your company on this path. With your feedback, your praise, your opinion. The future can only be enjoyed together. *Markus Stangl, Strategic Marketing*

Profinet I/O RT Controller for STRATON

Profinet is a field bus standard based on industrial Ethernet. As the user organization is the PNO (Profibus User Organization), there are some similarities to Profibus, but also some differences. For instance, when referring to Profinet, you do not talk about Slaves but about Devices and instead of a Master we talk about a Controller.

WHY USE PROFINET AT COPA-DATA?

Profinet is promoted heavily by Siemens. Just like Beckhoff did with EtherCAT or B&R with Powerlink. This alone raises the question why exactly COPA-DATA settled on Profinet as the first Industrial Ethernet Standard. The reason for this, above all, lies in the market orientation. COPA-DATA is well represented in the German automobile industry. The AIDA (Automation Initiative of German Automobile Producers – Audi, BMW, DaimlerChrysler, VW) agreed on the use of Profinet in November 2004. What did they expect from that:

- Reduction of development costs and
- Product variety on the manufacturer's side causing
- Cost reduction on the user's side
- Reduction of Engineering costs during Equipment construction
- Reduction of running expenses (Training, Maintenance...)
- Reduction of hardware costs through increased competition (wider range of products)

Another good reason for integrating Profinet in zenOn was the fact that COPA-DATA established its product as best-practice at BMW. The past also showed that the decisions of the automobile industry influence all other industrial sectors. This is obvious regarding Interbus and Profibus: Profibus pushed Interbus out of the market due to the pressure exerted by Siemens.

WHAT IS PROFINET I/O RT?

Profinet is divided into three types. Profinet CBA, Profinet I/O RT and Profinet I/O IRT. CBA stands for Component Based Automation, I/O for Input/Output, RT for Real Time and IRT for Isochronous Real Time. Profinet CBA is used for horizontal integration along the production line and primarily serves for the cross-communication between PLCs and between PLCs and SCADA-Systems. Profinet I/O RT is the classical field bus. It replaces Profibus while offering similar performance characteristics. RT does not require any additional hardware like a dedicated field bus card. This is why this type can score with very low hardware costs. Its typical field of application is Factory Automation. Profinet I/O IRT is the typical protocol for Motion Control. The cycle of this field bus ranges in the area below one millisecond. IRT requires specific hardware (ASICS) that reserves time slots in the Ethernet layer for the transmission of IRT information. For COPA-DATA, as a manufacturer of independent software for the area of Factory Automation, it was reasonable to develop the type Profinet I/O RT first.

HOW IS PROFINET INTEGRATED INTO OUR SYSTEM?

The Profinet driver is a driver for STRATON. In combination with Profinet, STRATON forms a so-called Profinet I/O Controller (Master). The driver consists of three different parts. First, there is the protocol driver, which must be installed directly onto the system (XP or CE). This driver works with the lower protocol lay-

ers of Profinet on Ethernet. Second, the I/O driver of the STRATON runtime establishes a connection between the STRATON project and the protocol driver.
Last but not least, there is the Profinet configuration. With this file, all parts of a Profinet Network can be browsed. After that, you can import the corresponding GSDML files (device description files) and configure the individual devices. For this, there is a clear and definite workflow. To allow for a good overview, the configuration dialogs are always adjusted to maximum width, according to the screen resolution.

HAS STRATON ALREADY BEEN USED WITH PROFINET IN PRACTICE?

The Profinet driver will be available in version 6.21 of zenOn. It was first presented at the SPS/IPC/DRIVES 2006 in Nürnberg. For this, we laid an Ethernet line connecting the exhibition booths of COPA-DATA and Wago. At the COPA-DATA booth, we were running our STRATON Runtime with the Profinet Controller (Master) and at the Wago booth, we installed a Profinet Device (Slave) with digital outputs. Our STRATON Runtime controlled the Wago I/Os over a distance of about 200 meters.

WHAT´S IN IT FOR zenOn AND THE INTEGRATED SOLUTION WITH STRATON?

With the development of the STRATON Profinet driver, we expand the PLCs of zenOn with another useful I/O driver. The particular advantage of this: we can work without expensive field bus cards and read and write directly from the network adapter to the I/Os. With the same cycle time as with Profibus! Additionally, simple CAT5 cables are sufficient for connecting and we do not need any special Profibus cables with expensive connectors and switchable terminators.
In future projects, if necessary, Profinet Devices can be accessed easily over zenOn by using STRATON as a gateway. During the development of the Profinet driver, we created further important expertise at COPA-DATA. Expertise that will also be useful for the integration of Profinet CBA.

If we want to access Profinet Devices from zenOn in a project, STRATON acts as a gateway. Fast, simple, clean.

Jürgen Resch, product manager STRATON

WHEN WILL PROFINET FOR STRATON BE AVAILABLE?

Profinet for STRATON will be available in the integrated solution with version 6.21. It will be released, as usual, for PC as well as CE. *Jürgen Resch, Produktmarketing*

Who is who?

NICOLE KAINDL

Role at COPA-DATA: Front Office
Born: May 19, 1986 in Salzburg. Living in Koppl**.**
Zodiac sign: Taurus
What happened before / at COPA-DATA: Before starting at COPA-DATA I went to school (HLW in Ried/Wolfgangsee). At that time I did several gastronomic internships, which I was not always happy with. For one year I also stayed in a dorm by the school, but I soon returned home, which I like most.
Hobbies: My favorite hobby is painting. But I also like my family a lot and because of that, I would also count looking after my nephews and my niece as one of my hobbies. (The good thing is that you can give them back in case…) I also like spending time with my Retriever dog Sheila who I often take out for a walk or a hike. Additionally, I like cooking, especially Italian food, because I am a big fan of everything Italian. In summer, I like to go bicycling, swimming or hiking. A perfect summer day to me means spending the whole day with friends at the lake, having a barbecue and sleeping in a tent overnight. I don't really like the winter – it just lasts too long!
Books: I prefer books that have a strong message, because I tend to read books in one go. My preferred place for reading is the bathtub or somewhere on holidays. Music: Music is very important for me, because it helps me to cheer up and be in a good mood. This is why I listen to a wide variety of music, from Biene Maja music to Rolling Stones or The Doors to Mozart and other classical music. As a proud Austrian, of course, one of my favorite music genres is Austro Pop (Ambros, STS, EAV). But I also enjoy Cuban music like Buena Vista Social Club or Italo Pop like Gianna Nannini or Eros Ramazzotti (summer holiday atmosphere) .
Furthermore, I like going to music festivals, where I listen mainly to Rock or Alternative music.
My motto: I do not really have a motto, but if I could choose, I would go for the motto of the little prince, who says: "It is only with the heart that one can see rightly; what is essential is invisible to the eye." Or also maybe: "What doesn't kill you, makes you stronger…"
E-Mail: NicoleK@copadata.at

BERNHARD SCHUIKI

Role at COPA-DATA: Since July 17, 2006, I work as a Support Engineer in the driver team for COPA-DATA in Salzburg.
Born: July 19, 1984 in Oberndorf near Salzburg, living in St.Pantaleon / Upper Austria.
What happened before / at COPA-DATA: I went to the HTBLA (higher technical school) for electrical engineering in Salzburg. Before starting at COPA-DATA, I worked at Sigmatek as a PLC programmer in the application area.
Hobbies: Sailing, chess, billiard
Books: Literature on historic topics
Music: mainly Rock, sometimes good old Blues or Boogie.
My motto: always look on the bright side of life…
E-Mail: BernhardS@copadata.at

MARTIN WINKLER

Role at COPA-DATA: Spare man in the support team of COPA-DATA since July 17, 2006.
Born: November 15, 1984 in Abtenau, where I lived for four years. After that, my family moved to Russbach. For the last 6 years, I have been living back in Abtenau.
What happened before / at COPA-DATA: I went to the HTBLA (higher technical school) in Salzburg, specializing on electronics and computer science. During the summer, I worked at SONY DADC in Anif in the area of engineering (construction and development of machines). After finishing my school, I did my civilian service at the Red Cross in Abtenau and after that, I started at COPA-DATA on July 17, 2006.
Hobbies: Since finishing my civilian service, I work voluntarily for the Red Cross in Abtenau, where I have a weekend shift once a month. Another hobby – since 1½ years – is playing the drums in a band (we call the style "Austrian Reggae"). You can often find me in the garage working on my car or my friends' cars because I like tinkering with cars and I prefer repairing them on my own.
Books: I have never been much of a reader and you rarely see me with a book. I prefer technical magazines.
Music: Although I am playing Reggae music with my band, I mainly listen to Hard Rock and Heavy Metal.
My motto: Never give up!
E-Mail: MartinW@copadata.at

HEIKE SOMMERFELD

Role at COPA-DATA: Product manager and technical reference person for Southern Germany. I am in charge of two product groups: Industrial Performance Analyzer (IPA) and Production and Facility Scheduler (PFS)
Born: February 20, 1966. Grew up in the area around Köln and moved to Munich in the year 2000.
What happened before / at COPA-DATA: After a university degree in mechanical engineering, I worked as a development and project engineer for the company Metso Lindemann until 2003. Here, I chose zenOn as a SCADA system and introduced it as the in-house standard for shredding systems. Besides planning, I was also responsible for engineering and startup of the pilot system.
At COPA-DATA I create demo applications, among other things, which implement the technical requirements of the customers. A very comprehensive and interesting field. You never stop learning.
Hobbies: My daughter Anna; reading, if Anna lets me do so; driving my car, making phone calls.
Books: The river that flows uphill (travel documentation about the Grand Canyon, also discussing evolution theory)
Music: Sound of my 2-liter turbo diesel corporate car at 210 km/h
My motto: Always be in a good mood.
E-Mail: Heike.Sommerfeld@copadata.de

BERND WIMMER

Role at COPA-DATA: I am very busy as the head of sales and application support (jack-of-all-trades) at COPA-DATA since October 1, 2002. My job includes general support activities as well as planning and engineering assistance and managing key accounts.
Born: Yes, on August 19, 1966, in Straubing, Bavaria. I grew up in the Bavarian town of Dingolfing and I have been living in the area around Munich for many years.
What happened before / at COPA-DATA: before starting at COPA-DATA, I was busy at TaurusMediaTechnik (TMT) for nearly 10 years (yes, I am already that old). TMT, as a subsidiary of the KirchMedia Group, is in charge of all technical services of the group in the area of Free-TV. Here I was able to work in an independant position as a project engineer in supply engineering.
Hobbies: "No sports", except dancing. At the moment, my daughter Pia (nearly) takes up all of my time.
Books: Mainstream, fantasy welcome.
Music: Nearly everything, except maybe Hard Rock or Punk.
My motto: Good-bye and thanks for the fish.
E-Mail: Bernd.Wimmer@copadata.de

December 2, 2006.
We are getting curious. No, not because of Christmas time. Much better. And then it happens. Not just one reason for celebrating, but two. New members to the family of COPA-DATA. Double pack. We are sharing the happiness of Franz Nussbaumer about his daughter Jenny and of the Schrödel Family about their little Valentina. Congratulations and welcome to the team! ☺

Jenny

Valentina

Guest commentary
from Italy

SCADA systems: There is a difference– and it can be seen.

Choosing a SCADA system is not an easy endeavor.
Many of the products seem just too similar. But there are specific characteristics that have become essential today and that should not be ignored. This is what some Italian users of a well-known SCADA product realized–and so they changed to zenOn.

A popular Italian slogan goes: "There is a difference but it cannot be seen". Which means that all products are the same at first glance and that their qualities are often hidden inside.
This certainly does not apply to zenOn. You can see the differences, not only in daily operation. Let us take a closer look:
Which questions does a technical director ask himself when he has to choose a supervision system for his plant? What exactly makes him prefer zenOn to other products like InTouch®, iFix® or others? The experiences of COPA-DATA Italia, which are based mainly on contact with manufacturers of automation equipment, show that the main topics are:

- Choosing between SCADA and Visual Basic
- Development time for projects
- Openness for many machine types
- Simple engineering for automation engineers
- Simplicity
- Reliability

SCADA OR VISUAL BASIC?

The first question, especially of machine manufacturers (OEM), sounds something like this: Should we develop our own application in-house? Or should we rather use a product designed for a specific purpose, like a SCADA system? The answer can be found after analyzing cost efficiency (hours/person or runtime costs) and estimating time to market and long-term maintenance.
In this article, we will not describe any further details. We simply assume: a SCADA system has been chosen.

DEVELOPMENT TIME OF PROJECTS

Normally, this is one of the most important aspects. The product must be able to provide applications with complex functions in a short time. Only a function-rich SCADA system with predefined pictures for fast deployment can guarantee real time saving. In contrast, when the designer has to use scripts for implementing a function, this prolongs the time necessary for designing.
Equally important: Which tools are there to help the designer during the development phase? He should be able to concentrate on the function created by him without being distracted by secondary activities like the distribution of project changes. In zenOn, for example, he can transfer the project from the development to the runtime station with a simple mouse click. Changes are applied without restarting the runtime system. The connected clients are updated automatically.

COOPERATION WITH EVERY TYPE OF MACHINE?

Nowadays, operators often handle a very heterogeneous machinery in operation. Some machines are fitted with an operating and monitoring system (HMI) on a touch panel. Others have a PC based control system or even a combination of both.
So, an engineer of operating and monitoring systems must put

into practice simple HMIs, for example on a 5.7" touch panel, as well as sophisticated network projects including several computers. That means he must have a standardized development environment. At the same time, it is important that he can reuse completed projects and automatically adjust them to display sizes and to different operating systems like Windows CE, Windows Mobile, Windows XP / XP embedded as well as for use on the Web – just like zenOn does it naturally.

SUITABLE FOR EVERY AUTOMATION TECHNICIAN?

If you deal with constructions in the field of automation, you are a specialist for PLC, drives and Motion Control, but probably not a software developer in the Microsoft environment. zenOn takes this into consideration. The construction engineer configures and parameterizes functionalities that are already present in zenOn. The result of this is a reliable project that is understandable for a wide group of people, because it does not depend on scripts. But of course, every construction engineer can include his own scripts via Microsoft VBA or by using a familiar environment like the IEC 61131-3 SoftLogic STRATON, in order to put the finishing touches on his application.

COMPLEX TECHNOLOGY MUST BE IMPLEMENTED IN A SIMPLE WAY

Albert Einstein said: "Everything should be as simple as it is, but not simpler". This is where the difference between zenOn and other products lies. It is easy to claim that a product possesses advanced functions. The interesting questions however are the following: How long does it take until they work? Which hardware platform must be used? What are the total costs of the solution?

For example:

How long does it take a user of FactoryLink® to activate the archiving of a large amount of data and visualize this information in a trend format? And which skills does he need for that? He must have SQL skills, he must find his way through different modules and windows and he must use scripting. The zenOn user only needs to configure two or three pictures.

How much time and runtime costs are associated with a request of iFix® to activate a client/server functionality? Many users shake their heads in disbelief when they hear the term client/server because they regard this functionality as cost-intensive, complicated and not reliable enough. The zenOn users merely adjust a check box in the project properties. Only now, Wonderware® begins to offer to its customers an automatic distribution of project changes, using the architecture ArchestrA®. Which kind of hardware architecture is required? What are the runtime costs? We are talking about a feature that requires a complex and cost-intensive network system solution. Barilla, an impor-

tant Italian end-user, recently implemented a new production facility with six Wonderware® monitoring stations. After considering the use of ArchestrA® and seeing that it would be too complex and cost-intensive, they settled on Intouch as a sufficient solution. zenOn users take these functions for granted, even on a simple Windows® CE terminal.
iFix® is the most common SCADA system in the Italian pharmaceutical industry because it complies with the norm FDA21CFR part 11. A manufacturer of machines for the pharmaceutical industry employed this product on a machine with two HMI stations in client/server mode. They used high-end PCs for this and one of them (the server) was equipped with a hard disk in RAID configuration to protect the audit trail archives. Every failure of the server blocks the machine.
With zenOn, using two PCs with Windows XP embedded and zenOn redundancy, both data protection and availability of the HMI system are ensured in case of a failure of one of the PCs. If worse comes to worst, it is enough to have one PC with zenOn installed. On that PC, two parameters are configured and the new PC automatically takes over the project and the archives. Considering that zenOn CE also conforms to the requirements of FDA 21CFR Part 11 with electronic signature, we can see that it offers a lot of freedom and possibilities to a construction engineer. A manufacturer of machines for the food industry, for example, who used operator panels and a well-known american SCADA system, recently changed to zenOn after careful consideration.
Today he is more independent: With zenOn, he has achieved a higher utilization of his less specialized employees and he has reduced his dependency on suppliers. In the same way, he was able to reduce his dependency on hardware suppliers by using Windows® CE and Windows® XP, which are more powerful and cost-efficient. With the help of zenOn, the facility now makes use of innovative technologies that represent added value in comparison with competitors.

For example:
The client/server function - if two or more HMI stations are present in a facility. Or the Teleservice function via TCP/IP for remote monitoring of a facility and for applying changes to a project.
System integrators, who have used various SCADA systems for some time, have chosen zenOn as their favorite product. That way, they were able to clearly reduce the development time of projects, to increase the total reliability of applications and to lower the use of scripts and additional programs like ActiveX®.

RELIABLE PARTNERS

How can zenOn perform so well? I think this arises from dedication. You can only get superior results if you concentrate on the product and go to work with great commitment every day.
The COPA-DATA Group has been on the market for 20 years, it employs over 100 people, including 20 software developers and it is still independent of financial syndicates and hardware manufacturers - a good setting to pay particular attention to our customers. *Giuseppe Menin, Sales Manager COPA-DATA Italy*

The new zenOn 6.20 and the keyword "mechatronics engineering" caused a lively discussion at the COPA-DATA stand during the SPS/IPC/DRIVES exhibition.

Events

"Simply more productive: zenOn" at the Vienna-tech exhibition 2006

From October 10 to 13, 2006, for the first time, six separately managed trade exhibitions on industrial topics took place under one roof. Right in the middle of it, in hall C (automation-austria): COPA-DATA. With the slogan: "Simply more productive: zenOn", we demonstrated how automation can really be made productive. On an area of 80m², which constituted the largest stand of COPA-DATA in Austria so far, we presented the advantages of the independent and open HMI/SCADA technology of zenOn to interested visitors. The focus was the 100% safe but nevertheless easy handling, the new freedom thanks to open standards, independence from hardware, protection of investments and the encouraging of individual and coherent solutions. Whether the first Vienna-tech exhibition was a success, remains to be seen, because the number of visitors was not exceedingly high, especially on the first and last day of the exhibition, with about 30.000 visitors. Nevertheless, the quality of the contacts that we established was mostly positive. We will see in the near future what this brings for COPA-DATA.

Stefan Reuther, Sales Manager

zenOn in Nürnberg: Success at the exhibition SPS/IPC/DRIVES 2006

Many of our customers and partners, potential customers and HMI/SCADA professionals gathered at the COPA-DATA stand on the SPS/IPC/DRIVES 2006 exhibition last fall. Our visitors came up with questions and proposals about many topics, from safe and coherent process control by single users to process control systems or process data flow in the factory network ranging from Windows® CE to Windows® 2000/XP/2003. And topics like the simple presentation of the process from plant views to alarm management were also on their minds. No surprise, with zenOn at the stand. Transparency at all levels? That's our daily business. Tailor-made solutions for efficient process and facility visualization? Naturally no problem with zenOn, as we were able to demonstrate live at our stand.

Talking about demonstration: in the interaction between zenOn and the EPLAN platform, our visitors got to know new perspectives and possibilities in mechatronics engineering.

Of course, every exhibition means a lot of work for us. But looking back at the lively interest of our visitors and the intense conversations at the SPS/IPC/DRIVES, one thing is clear for us: In 2007, we will take part again. See you there.

Hans-Peter Ziegler, Sales Manager

Remarkable women's power at BMW Munich

The times when the software industry in general and COPA-DATA in particular were dominated by men are long gone. Especially at COPA-DATA, women work in all areas of the company. From development and support to sales, documentation and administration to marketing and design. BMW was able to experience this live, when we appeared there with our remarkable women's power.

For us women, it has not yet become natural to see zenOn live in action at the customer's. Therefore, the workshop Competence creates Confidence including a tour of the BMW plant in Munich was organized.

In the most entertaining instruction of all times, we got to know zenOn in a completely different way: The focus didn't lie on the product (after all, we all know it) but on the surroundings. The connection to processes, the PLC, the production and the zenOn modules were explained in practice. And we experienced the wide range of applications of zenOn from examples that were all familiar to us (even if we do not have any bottling plants or power plants at home)

In 2006, BMW decided to use zenOn as the standard with all technologies and in all plants worldwide – a great reason to visit BMW and see zenOn in action.

This is why we were lead into the holy site of the BMW plant in Munich, with zenOn omnipresent. While for us, the zenOn applications and the automation of formerly manual labor were the center of attention, our group of twelve women was itself probably a real attraction for the workers in the BMW production. We will remember the astonishing impression of such a plant for a long time, as well as the competence of the BMW employees as they gladly answered our questions.

We started to talk about all the impressions and to make a lot of plans for the future during a dinner that evening. As we went back to work the next day, we were all motivated and full of different ideas on how to apply our experiences to our fields of work. *Elke Holzer, Manager Documentation*

Other important dates

AB&E Vakdagen
March 20 to 22, 2007
Hardenberg, Netherlands

Industrial Automation Solutions
March 28 to 29, 2007
Mikrocentrum Nieuwegin, Netherlands

Mocon (Easyfairs)
April 11 to 12, 2007
Brussels, Belgium. Expocenter

zenOn at the Hannover Messe Industrie
April 16 to 20, 2007
Hannover, Germany. hall 9, stand G 32

zenOn on tour in Italy
April 17 to 20, 2007
Turin/Milan/Bologna/Padova, Italy

Industrial Oil Show
April 18 to 22, 2007
Teheran, Iran

Theme workshop at Prozesstechnik Kropf
Mai 23, 2007
Hof / Oberkotzau, Germany

20 years COPA-DATA
June 15, 2007
Salzburg, Austria

COPA-DATA's turning 20!

What do we wish for our birthday?
What we'd like best is that you help us celebrate.
Mark your calendars now!

20 YEARS COPA-DATA

20 years COPA-DATA
June 15, 2007 Schloss Leopoldskron Salzburg, Austria

Highest quality bottling for Pepsi-Cola® using zenOn

Quadrant Amroq Beverages (QAB) is one of the largest American investors in Romania, a licensed bottling company and distributor for Pepsi, Prigat, Lipton Ice Tea and Roua Muntilor in Romania and in the Republic of Moldova.

QAB entered the Romanian soft drink market in 1991, bottling and distributing the products of PepsiCo. In 1992, the company opened the first polyethylene terephthalate (PET) bottling line in the country, beginning with Pepsi 1.5l bottles and launching Prigat in 1993, the first still drink manufactured in Romania.

The Company experienced a 48% increase in turnover in the year 2004-2005. This huge success was the result of the company's decisive action and the QAB team investing over 14.5 million USD in the Romanian soft drink market in 2005 to launch new carbonated and still products and introducing a packing system that ensures the integrity of their products. Moreover, QAB was nominated among the best bottling companies in the world, in the PepsiCo system.

THE LATEST TECHNOLOGY FOR PEPSI-COLA PRODUCTION: KRONES WITH zenOn HMI SOFTWARE

QAB's drive for high quality was also mirrored by the investments made at the production level, which utilise the latest trends and technologies. One example is the state of the art bottling line installation at QAB, manufactured by a world leader, Krones. The productivity, reliability and optimal operation of the equipment are determining factors in the success of the Pepsi-Cola bottler.

All equipment was designed in such a way that both the operators and specialist teams have the tools required to operate and control the complex equipment effectively. The software interface had to be direct, immediate and satisfy their needs perfectly. COPA-DATA's zenOn software suite was found to excede these requirements and was chosen by Krones for their HMI (human machine interface). Furthermore, all new machines manufactured by Krones are now supplied with zenOn 6.20 XP embedded powered HMI's.

SCADA IS SIMPLIFIED WITH THE LATEST TECHNOLOGY

QAB usees the most modern equipment and their team wanted to push the limits of their machines. The specialists have the capability to analyze every machine in detail, and furthermore the power to monitor the overall characteristics of the plant which has to provide optimal quality and productivity. Mr. Mihai Ciorbaru, Technical Manager of QAB and his engineering team, decided to create their own SCADA application using zenOn, as

the professional tool for visualization and analyzing the plant data.
At the beginning of 2006, during the design phase, QAB had decided that zenOn was the best choice for the SCADA software. Together with Kreatron Automation, the Romanian zenOn distributor, the complete software & hardware solution was identified.
Ciorbaru explained, "In complex systems, SCADA has to satisfy three main criteria: interface simply with most automatic control systems, facilitate in the handling and visualization of the analysed data and to remain flexible for future modernization of the production process. We discovered all these advantages using the zenOn software".

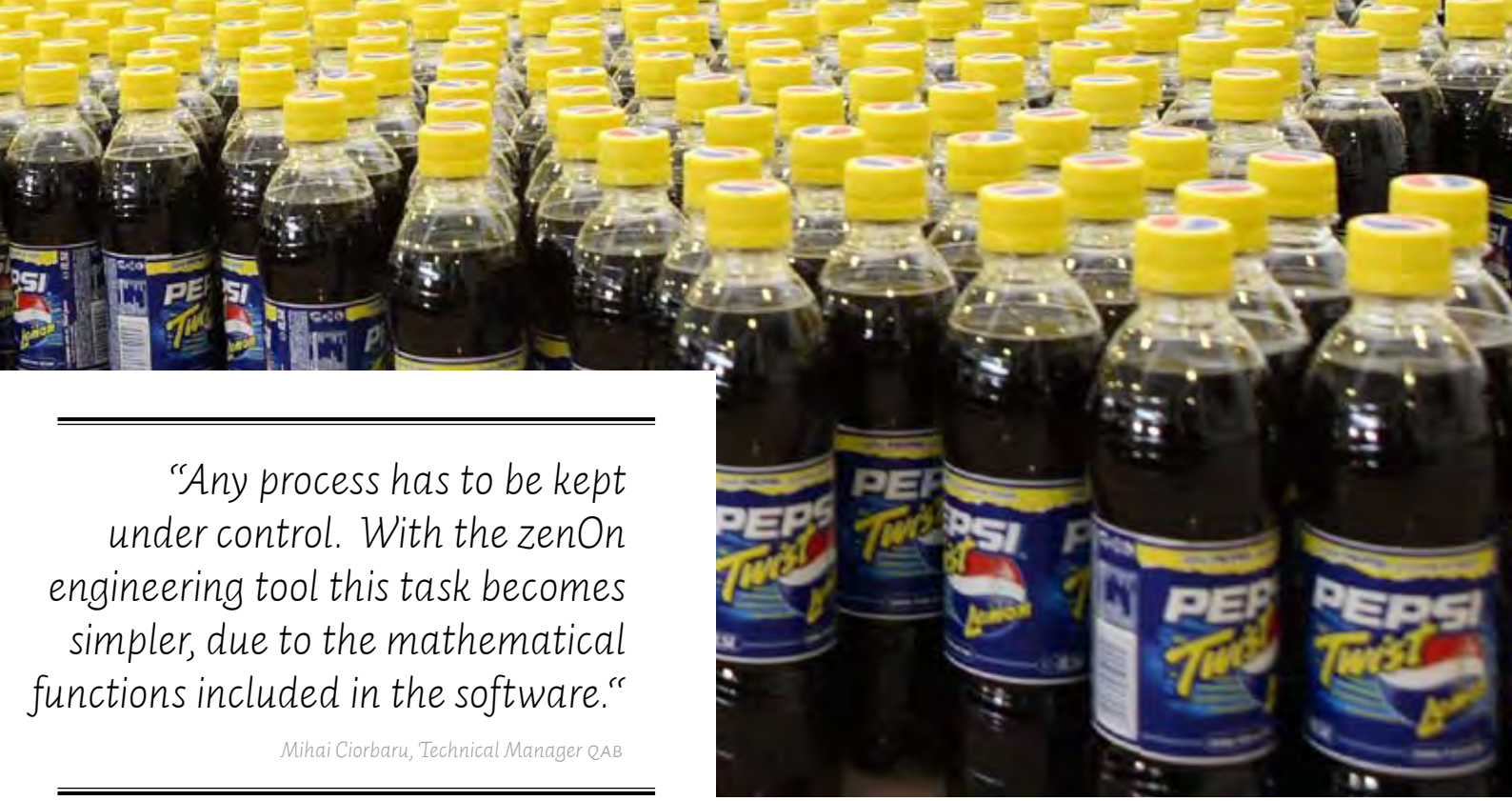
"In complex systems, SCADA has to satisfy three main criteria: interface simply with most automatic control systems, facilitate in the handling and visualization of the analysed data and to remain flexible for future modernization of the production process. We discovered all these advantages using the zenOn software".

Mihai Ciorbaru, Technischer Manager QAB

As in every SCADA application, effective communication with the hardware was essential. QAB used a highly reliable industrial PC, interfacing with equipment using zenOn's built-in drivers. An advantage of zenOn is that over 250 drivers, developed in-house ensure its integration into complex, heterogeneous projects where interfacing hardware components from diverse suppliers is the key to successful implementation.
As Ciorbaru highlighted, the zenOn software suite gives users the power to work at a high technological level, in a very accessible way. A practical approach, the programmer receives highly evolved software instruments, in order to develop their own project by freely parameterising components. In fact, developing the application is closer to engineering than to classical programming, the focus being on the process and desired functionality rather than coding.
As a result, the SCADA tool designed "in house" by QAB could be further developed by the bottling specialists according to their technological or organizational needs. Using zenOn, they are completely capable of maintaining and developing their own system.

HIGH QUALITY PERFOMANCE FROM zenOn

No matter whether Pepsi, Prigat or Lipton Ice Tea is produced, at QAB consistent quality control is essential. When the market demands flexibility, the change from one bottled product to another has to be achieved with minimum production downtime and maintaining maximum quality. "Any process has to be kept



"Any process has to be kept under control. With the zenOn engineering tool this task becomes simpler, due to the mathematical functions included in the software."

Mihai Ciorbaru, Technical Manager QAB

under control, and sometimes this involves a large number of parameters that have to be managed within a given space of time. With the zenOn programming system, this task becomes simpler, due to the mathematical functions included in the software." said Ciorbaru.

The modular structure of zenOn allowed the QAB engineers to select the software mechanisms that could best implement the application requirements. The plant effectively "appeared" on their desktop PC with an overwhelmingly amount of data, they then transformed it into extremely useful information using built in tools so that they could control the quality and productivity of the bottling line as described below:

- The entire process is presented optimally on screen, but operators can also "zoom in" on equipment in detail, resulting in an effective and user friendly top-down application.
- The operator receives exact and complete information using alarm and event management. By filtering the information according to their requirements, the user's concentration is focussed entirely on the analyzed aspects of the process.
- Data archiving is accessible and flexible using the zenOn archiving module. The data is archived not only as it is collected directly from the process, but also in the processed form using so-called "derived archives".
- The pieces of information gathered become valuable because they are processed and presented in an advanced graphical system and analysed with the help of the built-in report generator.
- Accessible, flexible, well founded mathematical functions assist with the development and expansion of SCADA projects.
- Software mechanisms ensure that users from the operators to the maintenance team of the plant, quality assurance department, production planning and surveillance team, receive the most relevant information to perform their individual roles effectively.

"zenOn offered us an excellent means for accomplishing our SCADA system, no matter if we are talking about visualizing online processes, alarm management, or gathering and reporting production data.", Ciorbaru concluded.

GREAT FUTURE FOR PEPSI-COLA AND zenOn

Now, the zenOn-based SCADA system is already offering better than the expected results, being a source of ideas for further technological developments and helping more and more departments of the QAB team solve their information and control needs. Because zenOn is an open system based on standards such as OPC, SQL, SNMP, the SCADA system is going to be easily integrated into the ERP system of the plant.

Such happy meetings between innovation and quality suppliers do not happen by mere chance. Pepsi-Cola and QAB is a continuing success story, driven by the promise of quality and creativity servicing the consumer that relies on the QAB team's innovation and everything the latest technology can offer. In the same way, COPA-DATA has continued its tradition of innovation and applying its experience in automation to push the limits of HMI/SCADA technology, providing customers such as QAB with the technological edge they need to succeed in such a competitive market.

iu

TIPS & TRICKS
Automatic Engineering

Automated engineering

Setting standards for engineering

In this issue, we start a four-part series called Automated engineering. You will get to know how you can handle projects faster and easier with automated engineering. In the first part today, you will learn how to set standards.

WHY AUTOMATE?

The topic of Automated Engineering is no longer only relevant for standard machines but it can also save time when used with projects that are different from each other. This ranges from the setting of standards (colors, fonts, button sizes, etc.) to completely automated engineering. For example, think of creating a variable: If all the variable information, like addressing, limits, identification, etc., is saved in a file or database, it can be easily created in a project using VBA. This not only saves time but also avoids errors like typos that can easily arise when doing this manually. Then, you can also export picture information, for example from CAD programs, and transform the contained information into the corresponding pictures and elements with VBA.

SETTING STANDARDS FOR ENGINEERING

If you define pictures or elements in zenOn, they are created in the desired size and at the desired position on the screen. The default properties of the elements are defined by zenOn. For example, when you change the background color of a TextButton, this information is saved and the next TextButton gets the same background color. Now how can you react to this behavior?

There are already several VBA macros that you only have to adapt to the standards that you have set earlier. These macros are triggered by the "OnElementCreated" event, which itself is triggered when a new element is created in a picture. As you can see here in the VBA code, some lines were commented out; one of them contains the call for setting your own standards. Activate the line ("'obMpElem.SetDefault obElement") by removing the quotation mark in front of it. (obMpElem.SetDefault obElement)

To change the VBA event, you have to open the VBA editor. The required event can be found in the VBA project "ZWorkspace", in the class module "MyWorkspace". With this change, the zenOn standards will now be overwritten by VBA;

```
Private Sub ZenWorkspace_OnElementCreated(ByVal obElement As Element)
    Dim obMpElem As CD_ManipulationElement

    Set obMpElem = New CD_ManipulationElement
    Set obMpElem.Parent = Me
    Debug.Print "Element of Type " & obElement.Type & " created."

    '>> The codeline below will set defaults to elements when they
    '>> are created.
    'obMpElem.SetDefault obElement
    '>> The Defaultsettings are located in the classmodule
    '>> "CD_ManipulationElement"

End Sub
```

the predefined macros, however, have the same defaults, so you will not notice any difference after the first step. To set your own standards, open up the class module "CD_ManipulationElement" and scroll to the procedure for the corresponding element. In the following example, we define a standard background color, font and size for TextButtons. These directions apply to the creation of an element and afterwards you can still change the values manually in the picture.

PROCEDURES ARE PERFORMED FOR EVERY CREATED ELEMENT

1. "DynElementDefault" is used for all elements to set the common properties and
2. For the TextButton, the second procedure "DynButtonDefault" is performed, in order to set the special properties for the TextButton.

```
Private Sub DynButtonDefault(obElem As Element)
    obElem.DynProperties("Font") = 3
    obElem.DynProperties("Text1") = obElem.DynProperties("Text1")
    obElem.DynProperties("Text2") = obElem.DynProperties("Text2")
    obElem.DynProperties("BackColor") = RGB(0, 255, 255)
    obElem.DynProperties("TextColor") = RGB(0, 0, 255)
    obElem.Width = 100
    obElem.Height = 50

    Debug.Print vbTab & "<DynButtonDefault>"
End Sub
```

NOW, THE EXPLANATION OF THE SEPERATE PROPERTIES

`obElem.DynProperties("Font") = 3`
Sets font number 3
`obElem.DynProperties("Text1") = obElem.DynProperties("Text1")`
The existing text (if present) is used
`obElem.DynProperties("BackColor") = RGB(0, 255, 255)`
Background color is set to CYAN
`obElem.DynProperties("BackColor") = RGB(0, 0, 255)`
Text color is set to BLUE
`obElem.Width = 100`
The button width is always 100 pixels
`obElem.Width = 50`
The button height is always 50 pixels

It works the same way for all elements; there are only some differences in the specific properties of different elements. Finally, a little hint:

- First, create an element manually, with the desired standards,
- Export the picture with this element to XML and
- Open it with a browser.

The "DynProperties", as seen above, are identical to the names in the XML file! In the next issue of IU, our topic will be: *Reusing existing project parts.* *Robert Ficker, Product Marketing*

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In the next issue…

…you will read more about the first ***20 years*** of COPA-DATA

…we will discuss what the use of ***Windows Vista®*** implies for software design, implementation and databases

…we will regard the impacts of the ***Usability*** Test on zenOn

…we will take a look at ***Training*** and ***Documentation***