Infopaper

AUCOTEC

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Ready for family planning

Apps for special applications expand range of Engineering Base

The cooperation platform Engineering Base (EB) has grown up. Apart from its age (almost 20 years of development), this is also reflected in the fact that it is now starting a family. Based on an application server and database, EB's classic, fully comprehensive desktop client will only be a part of the family, albeit an important one, which is gradually growing through browser-based front-end products for individual special tasks.

Lightweight instead of heavyweight
Engineers who use EB to edit a large part of their demanding day-to-day work need a desktop client. They have a broad range of system expertise and solve their wide-ranging tasks with numerous features. This is how EB has made a name for itself and has matured. Its universal data model unites everyone involved in the development process of a plant in an interdisciplinary manner and also provides operators with a comprehensive digital twin of their plants as a backbone for

all revampings and expansions, classic maintenance cases and predictive maintenance.

However, such an extensive, client-bound system can also seem like a sluggish heavyweight if you want to use certain data specifically for individual special tasks. If, for example, a project manager regularly wants to monitor the progress of an engineering process or a revamping design, it is considerably more efficient if he or she can directly obtain the desired information virtually with a "lightweight system" without having to wade through a complex system that is also linked to a client and the corresponding full license.

Different usage needs
This gave rise to the idea of starting an EB family with more accessible offshoots for special tasks. Pouria Bigvand, Director of Product Management, explained: 'Through close cooperation with our customers, we have learned that EB's Industry-4.0-compliant data availability has led to completely

new and diverse users registering the need for data access.' According to Bigvand, this is an impressive confirmation, on the one hand, that the value of data has finally been realized in practice. 'On the other hand, this need confirms that we were on the right track when we took the path to the data-driven platform long before Industry 4.0,' said the product manager.

'Everything already there'
The new EB Mobile View is an example of such an individual application "offshoot". In the event of a malfunction, the service can thus quickly provide the data of the affected plant area on its mobile device, even without a great deal of system knowledge. It can enter change information on site and send it to the engineering team so that "as-built" remains as-built (more in the article on page 2). The company is already working on a monitoring and maintenance app that will also provide a slightly different target group with, for example, still organized mainte-

nance tasks that can be continuously marked as processed. Furthermore, the aforementioned monitoring for project managers is also conceivable via front-end access. 'Everything is already available in EB, both the data and the technology,' explained Bigvand. 'The apps provide specific cut-outs or summaries from the central data model, even for users without system knowledge or for those who do not need or do not want to know all the details of the plant twin.' Thanks to EB's multi-layer architecture and web service orientation, the desired data can always be easily retrieved from anywhere via a browser.

Ideas are welcome
Only a few years ago, such a dedicated selection of online information would have been impossible, simply because of the network capacities. 'Previously, we would have solved such tasks with a wizard, although it would have had system knowledge and a full EB

Irreplaceable: new work and old normality

Dear readers,

Have you too not met many of your colleagues in person for ages? The pandemic is banishing us to our home office, and discussions are taking place almost solely digitally. Whether one likes it or not, the cooperation of locally distributed teams will remain and requires suitable systems – also in engineering. This is precisely one of the great strengths of our Engineering Base (EB) platform. AUCOTEC responded quickly at the start of the pandemic and very unbureaucratically enabled many customers to work remotely, even if their licensing model did not fully cover this option. We are all proud to have been able to help reduce the economic impact of the pandemic.

With the consistent expansion of EB through the new front-end products, for example, we are advancing agile engineering processes on the one hand, while, on the other hand, we are also increasingly covering operator requirements with EB's cross-disciplinary database, the complete digital twin. This means that our customers are ideally equipped for their diverse challenges. For this purpose, we are also continuing to invest in the AUCOTEC team by including additional experts.

We now share your hope that tests, vaccinations and the upcoming summer in our part of the world will permit more of the "old" normality – both personally and professionally. The entire AUCOTEC Group is looking

forward to meeting you again in person at trade fairs and Technology Days as well as during joint projects. Even if our lockdown experience has shown how effectively we can cooperate remotely: personal contacts are the "icing on the cake" and are irreplaceable in the long run.

Stay healthy!

**Yours faithfully,
Uwe Vogt
Executive Officer**

Bild: AUCOTEC

Further topics:

license. Today, we can offer users the specific desired extract from their plant data for virtually every special task imaginable; with customized licensing and no client environment,' enthused the product manager. This doesn't necessarily have to be an app on a mobile device, but it can be.

'Feel free to approach us with your ideas,' Bigvand encouraged EB users. Whether designers, operators, EPC or a community formed from these groups, everyone can initiate such a front-end development. The developers are currently working on an application for a pilot community composed of operators and suppliers. It will significantly accelerate the exchange of data among each other, despite different EB versions and customizations. 'As a community, they were able to more easily overcome the threshold for tackling such a project and were the first to benefit from the outcome. Their financial contribution will be credited to their licensing model afterwards; subsequent users will pay "normally" for such a front-end special,' said Pouria Bigvand.

Big brother can do anything
It is important for him to emphasize that all functionalities of the apps remain a part of EB, i.e. they can also be used via the desktop client. EB is virtually the big brother who can do everything from FEED via process and detailed engineering to automation and oper- ation. It is joined by the "smaller siblings" such as EB Mobile View, conceivable future monitoring, asset management or other offshoots, all with access via web service to EB's universal data model, the mother of all plant information. It constitutes the perfect family – at least for the international engineering community.

(For information on how family life has given EB a boost, see the following interview.)

"Potential still far from being exhausted"
Eike Michel, Director R&D and Operations, on fast apps, flexible use of data and EB as an "oil extraction" platform

> Eike Michel,
> Director R&D and Operations
> AUCOTEC

Mr. Michel, you've been with AUCOTEC for 14 years. How has the development work for Engineering Base (EB) changed over time?
Where should I start? No seriously, first of all: The philosophy of the multi-layered platform to concentrate data on the server side, but to locate access and computing power, i.e. the business logic, on a dedicated application server, dates back to the early 2000s and is ground-breaking. It is unlike any other system in our market. This allows users to access their data in an incomparably efficient manner and assures them that their access rights will be respected. Nevertheless, in my early days, the development here focused on optimizing convenience, stability and new features for the client.

Then AUCOTEC succeeded in attracting an increasing number of major customers and correspondingly large projects. For this purpose, we increased our personnel and set up our teams in an agile manner, which was a fundamental organizational change. As far as EB is concerned, the development of "Data as a Service" (DaaS) based on web service technologies has enabled us to take a huge leap forward.

What can DaaS do?
The service can be freely scaled as a "gateway to www" and is upstream to the application server. As a result, we didn't have to design it as a typical, error-prone "standalone server." DaaS and EB's client have the same access to the data, and there is only one source code, thus no inconsistencies.

A desktop application "remembers" a status for each data processing. If there are many requests, they are met with the usual response: join the queue! Online accesses to EB, on the other hand, run completely independently of each other. If hundreds of requests come at the same time, you can simply run more instances of DaaS. Thus, the service has also enabled us to develop front-end products for EB that cover special tasks for certain target groups. We also don't have to change the engineering client at all in this case.

What does this mean in concrete terms?
This simply means that the development cycles for innovations such as EB Mobile View are much shorter. We've been working on it for just over a year, only about a third of the time that a similarly complex feature for EB's desktop client can take. In addition, the release of front-end products is not tied to EB's annual major releases – which is a huge advantage, especially for the initiators of such apps.

Do client users also have advantages?
Definitely! They no longer have to wait, as they can simply outsource orders to DaaS while they continue to edit the client task. In addition, corporate networks are always subject to the risk of timeouts. This is a risk in particular for cross-country activities, such as outsourcing a project from SAP. As of a timeout in the two-digit seconds range, the work order will be considered faulty and will be cancelled, regardless of how much of it has already been executed. This doesn't happen with DaaS. Each request has only one "receipt number" which can be used by users to check the status at any time until the task is finished. Even in the event of interruptions, it will be unnecessary to start over again. The service also lets entire systems talk to each other without the need for manual intervention.

Can you give me an example?
Yes, of course. There are a number of major customers who have set up numerous integrations with EB not only with simulation tools, 3-D and process control systems, but also with various in-house developments. There, EB is the central engineering data backbone. All connected systems can always automatically obtain, for example, change information, regardless of client, location or operating system. The potential of this approach is far from being exhausted! This is exactly what we have been working towards, as the added value of a software is no longer to accelerate individual users or disciplines, but rather its ability to coordinate the cooperation of many different teams as seamlessly as possible, as data transfers are time-consuming and error-prone. EB's focus on the big picture more than pays off with its enormous synergy effects.

So does EB's development as the data backbone affect your work?
Absolutely - like that of users. The range of users of EB data continues to grow, thus specifying licenses for certain workplaces makes less sense and restricts engineering and business processes unnecessarily. With DaaS, the "endpoints" which use EB can be freely organized. It is billed according to objectively measurable data accesses, whereby there are demand-based scales from "unlimited" to several tens of thousands per year. The dusting of unused licenses is therefore a thing of the past. This will make customers much more flexible, although they will need a competent IT team with sufficient resources. Otherwise, nothing is required that is not already necessary for using EB anyway. If data is the oil of the 21st century, EB is not only an engineering platform but virtually a production platform also.

Thank you very much for this interview, Mr Michel!

Immediately mobile if something goes wrong
EB Mobile View: Quickly eliminating malfunctions and sending back maintenance data

If there is a hiccup in production somewhere in the plant, the maintenance personnel must quickly have the relevant documentation to hand; and not only the diagram, but all associated attributes and links to ensure that connections and functions are appropriate even after the repair. However, documentation structures and complex engineering systems that contain all this data are usually not the job of technicians. Thus, they have to be relieved of the search, as usually "time is money", and a lot of it, in the event of a malfunction.

Simple search engine EB Mobile View
Designed as an app, the EB Mobile View tool ensures the easiest handling and rapid retrieval in such cases. The Infopaper reported on it in connection with AUCOTEC's classics ELCAD, AUCOPLAN and RUPLAN. The tool can now also be integrated into the cooperation platform Engineering Base (EB) – with increased functionality.

Repairing and informing
Those who work with EB can also start updating the documentation in the plant after the repairs or device replacement, so that the documented as-built stand really corresponds to the plant reality and not only in the case of an emergency. EB Mobile View enables redlining directly in the loaded EB documentation. Once the fault has been eliminated, the technician

Existing projects can be easily exported to the tool irrespective of the operating system, coupled with the last approved documentation status in each case. In the event of a malfunction, the service technicians extract the data, which is also available online, to their mobile devices. It finds the defective object via a simple search entry. The fitters can then navigate in a touch-based manner through the logic of the digital twin on their laptop or tablet and obtain any necessary information directly on the screen, even without system expertise or that of an engineer.

marks and names the digital twin of the edited object. By clicking, the app bundles a package with all service information and sends it to the engineering department, where the data is imported into EB.

All about up-to-dateness
From the service information, EB generates an engineering task including the malfunction designation, comments and all redlining sheets that are linked to their respective original sheet in EB. Thus, the engineering professionals don't have to search in order to finally be able to insert the new data into the appropriate place. Subsequently, there is a new revision status that can be transferred to EB Mobile View. Thus, the current as-built status is ensured in the tool in each (malfunction) case, and the service is ready to start immediately.
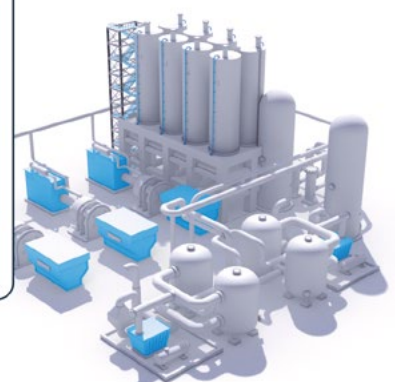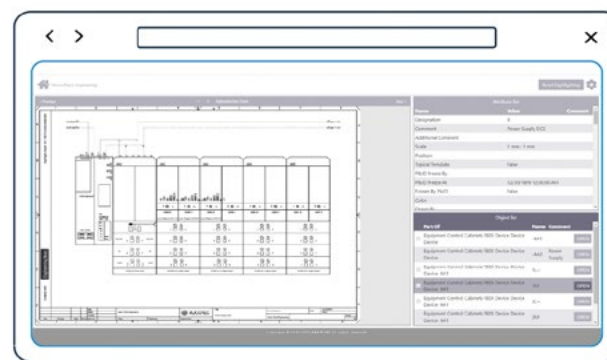
Electronically signing and certifying? Certainly!

FDA-compliant e-signatures and e-records in Engineering Base

Whoever signs something conveys reliability, responsibility and integrity. Signatures below plant documents for approval processes are electronic in the digital world. However, this requires security mechanisms to ensure that the digital signature also really belongs to the right person responsible.

The signature is preceded by the confirmation of up-to-date and correct plant documentation, also essential for operating licenses. While the generation of such e-records is virtually part of the DNA of AUCOTEC's cooperation platform Engineering Base (EB), secure digital signing is now also possible.

Both solutions meet the strict standards globally set by the U.S. Food and Drug Administration (FDA) with Title 21 Food and Drugs Part 11 (21 eCFR Part 11).

EB's e-records: inherently rule-compliant
Qualified e-records are in EB's nature. Due to its cross-disciplinary, centralized data model, the complete change history of each asset and documentation can be tracked, with all links and background data, including who has changed what and when. All revisions and versions as well as their history are fully logged in EB's database for the entire project. The information can be viewed via web services with encrypted data tunnels and 2-factor authentication.

E-signing by the professional
EB's e-signing solution ensures other services in addition to the uniqueness of signatures. In cooperation with the PDF experts of the Schweizer PDF Tool AG, the "PDF to PDF/A Converter" and "PDF Advanced Electronic Signature" are integrated into EB per API if necessary. This enables documents to be transferred to the long-term archive format PDF/A and to be digitally signed at the same time. All requirements that authorities such as the FDA have with respect to legally secure documents are covered in this case. Such requirements include time stamps, unique identification codes for a signature or password-protected access configurations; in short, everything that makes a digitally signed document reliably approvable.

Major effort for uniformity

Documentation expert on the value of standardized designations, holistic standard implementation and the appropriate engineering system

> Sabine Richter, 50Hertz

Sabine Richter (55), engineering economist for energy applications, has been working for 50Hertz and its legal predecessors for almost 30 years. As Head of Documentation, she is responsible for all of the fundamental topics in this area and is an expert in plant designation as well as various documentation topics and systems. One focus of her work is the holistic consideration and linking of topics. This includes transparent processes as well as the development of new paths with partners. One of these paths is currently the implementation of the plant structuring and designation standard IEC 81346 including the newly revised Part 2.

You are currently making a major effort to introduce DIN EN IEC 81346, even though it has been in existence since 2010. Why now?
We must finally put an end to the historically developed inhomogeneity of our designation requirements. They are based on a standard that has been withdrawn for the last 20 years and are not consistent for primary and secondary technology. This requires many special regulations, which have long since exceeded their limits in terms of control. Consistency and clarity are increasingly difficult to achieve. This not only affects the integration of new technologies into our designation concept, but it also offers potential for conflict when cooperating with external partners.

The broad approach of the current standard makes it possible to classify one's own philosophy within the given framework. However, it desperately needs detailed interpretations, as the range of the standard extends from nuclear power plants to beer dispensers.

What benefits do you see for the future of 50Hertz as a result of the transition?
Very clearly the holistic approach! This enables us to structure all 50Hertz assets "from the top" down to the last terminal.

With the recently revised Part 2 on the classification of objects and the extension of codes, the IEC standard has been further developed in a consistent manner. We no longer need to compromise on designations. The aspects and principles described by the standard help the adherence to clear work methods throughout the project. Thanks to the structural "modular system", we can seamlessly classify each new asset area. In general, the implementation of the standard primarily means "structuring!" – once you have accepted this, you can also approach the topic holistically.

My personal highlight of the standard is the "part of" relationship, one of the most frequently used terms in our team. Such principles are easy to comprehend and convey, and a good understanding increases their effectiveness. The application of the standard is a clear basis for creating the structure of tools which use asset data, such as our asset management system. It also facilitates structuring in engineering, including in connection with AUCOTEC's platform Engineering Base (EB), which we are also introducing. We expect the depth with which EB can map the standard to come closest to our holistic approach. Both innovations, the standard and EB, are almost a bit mutually dependent. We expect this combination to be established in a future-proof manner for the growing complexity of plants.

Such a transition between standards cannot be achieved overnight. What does this project signify for 50Hertz?
It definitely signifies a major effort. Three years of groundwork are behind us, with plenty of in-house and external manpower. Following the introduction, there will now be a transitional period in which we will engage in dual designations for a few years. Also in terms of the directives, we must allow old and new requirements to apply in parallel for a while. However, the goal will be worth the major effort: uniform designation of the entire 50Hertz asset park including the documentation. The asset-related IT tools will also adhere to the regulations.

What will the implementation look like?
As the relabeling of plants and their documentation is very complex, we will tackle this gradually in the context of projects. However, we are already "translating" all 50Hertz sample projects for equipment provision as well as the first of RUPLAN's existing projects into the new standard. It is very important for us to involve all of our in-house and external partners in this undertaking. We're offering open training for this purpose. From May '21, interested parties can register directly with our external service provider Gridlab (+49 30 600 86662).

The transition from the AUCOTEC classic RUPLAN to EB will also be a huge step. AUCOTEC is currently preparing the structure of a 50Hertz key project in EB according to our new directives for the energy supply working group ("EVU-Arbeitskreis"). I'm very excited about it!

So you want to share your hard-earned designation directives with AUCOTEC's energy supply working group. Why?
In the EVU working group, we meet as industry colleagues in order to benefit from an intensive exchange of expertise on a broad basis. Network operators are not in direct competition. We have very similar goals and challenges, one doesn't have to reinvent the wheel over and over again. By sharing our results, we are strengthening the designation topic within the industry. The more partners who join us, the more uniformity we achieve. This will significantly facilitate our work and that of our suppliers. Furthermore, we also provide new ideas for EB in the working group and thus support the practical orientation of the solution. Whether EB then ensures an even wider acceptance of the standard or vice versa, we will see if the need to implement the standard leads to broader demand for EB. The decisive factor is that uniformity, and thus simplification and transparency, are achieved - that's our goal.

Thank you very much for this interview, Ms Richter!

In the interview

'Hundreds of man-hours saved'

US EPC achieves more productivity with Engineering Base

With future-oriented engineering and IT services, RCM Technologies Inc. (RCMT) offers optimization solutions for power generation, transmission and distribution, aerospace and the life sciences industry. Founded in 1975, the EPC employs around 2,800 people worldwide, more than 500 of them in the engineering division, which operates in the US, Canada and Europe. Their services range from engineering analyses via design and documentation to technical services.

Considerable added value

The long-time ELCAD user took the opportunity to test AUCOTEC's data-driven platform Engineering Base (EB) some time ago. 'We tried the system and immediately realized that its possibilities could provide us with significant added value,' said Ostap Dzikh, Electrical Designer at RCMT.

In a challenging major project, the engineering professionals used EB for the first time: around 300 protective and distributed control devices in seven high-voltage plants for direct and alternating current had to be designed, from the overall concept via schematics and bills of material to the wiring diagram. 'We have learned to appreciate EB's very convenient ability to also document the multiple connection logics between different drawings," said Dzikh. EB also provides wizards that easily identify connection errors, for example. 'This ensures that all equipment is wired and complies with all design rules,' he added.

'Greatly increased productivity'

Everyone involved benefits from the time saved and the increase in quality. In addition, EB's standardization significantly accelerates RCMT's engineering processes through the easy reusability of existing documents in new projects.

The electrical engineer emphasized two advantages: on the one hand, EB's data-driven nature, which has greatly increased RCMT's productivity. Changes are entered at only one point; they are "inherited" automatically by all documents which contain the changed object.

'EB's tools have already saved us hundreds of man-hours, which we used to have to put into tedious, unproductive manual work!' he stressed. On the other hand, RCMT appreciates that the easy handling enables every user to quickly become familiar with EB and work efficiently.

Letting customers benefit

As a consulting company, RCMT is generally required to use the software that is specified by its client. 'However, we will try to introduce EB into our projects, as we are sure that our customers will benefit from EB's impressive advantages as much as we do,' stressed Ostap Dzikh.

Engineering in a flash

LOM PRAHA s. e. modernizes its electrical documentation with AUCOTEC

LOM PRAHA s. e. is one of the world's leading companies for complex services related to Mi helicopters and L-39 aircraft. The traditional Czech company, which dates back more than 100 years, now supplies NATO and EU countries. It attaches major importance to state-of-the-art technologies for maximum quality and safety over the entire lifecycle of aircraft. This includes maintenance and modernization of all dynamic components. Furthermore, LOM PRAHA also manufactures and repairs piston engines and operates a flight training centre.

Better and faster due to digitization

LOM considers high-quality data to be the key to improving processes and saving time. This was the reason why the company opted for AUCOTEC's data-driven platform Engineering Base (EB). Thus, the aviation expert, together with AUCOTEC's Czech partner TECHNODAT, digitized their electrical documentation. Previously, two tools were necessary. This was complicated and did not provide links between the logical wiring diagrams and the manufacturing documentation for wiring harnesses. EB's central data model simplifies complex workflows. Circuit diagrams, wiring lists and equipment folders are developed from only one system. Changes at one point are inherited "in a flash" by the entire project, error-prone manual work and control runs are eliminated, graphics and alphanumerics are always in sync.

Processes and methods optimized

'When searching for a suitable CAE system, we were particularly fascinated by EB's database architecture, which perfectly supports multi-user operation,' said Jan Kalita, Head of the Modernization and Retrofitting Department. A pilot project with EB quickly revealed optimizations when creating device lists and connections. The development of electrical circuit diagrams and supporting macros for work automation has also become significantly more efficient.

Accelerated standardization

Thanks to EB's flexibility, TECHNODAT was able to develop special macro adjustments for LOM PRAHA. For example, they enable the automatic selection of connections for wiring harnesses, including contacts, seals and blind plugs. The plug or connection rule wizards included in EB as standard, as well as the device or disconnection point manager, accelerate the work even more.

LOM engineers also appreciate the fact that they can select the device accessories within the project. This saves complicated tracking and "pairing" with the bill of material (BOM). The conclusion of Department Head Jan Kalita: 'The use of EB has greatly increased the efficiency of our documentation process. Each additional project improves the standardization and quality of our documentation in the long term.'

In addition, we would like to welcome the following new customers to the AUCOTEC family: