Time for Engineering 4.0

Automation for the Industrial Internet of Things

The consumer Internet of Things has been pointing the way for some time: members of the public buy a device with a certain range of functions. But this is just the beginning. Continuous software development throughout the device's lifecycle improves its capabilities and keeps it contemporary. Networking and working seamlessly with devices not even invented at the time of purchase becomes possible while data exchange and sharing becomes easier and faster. The device is continuously optimized, which gives its user the feeling of being always "up-to-date". The mechanical and plant engineering industry is however still far away from such scenarios and business models. logi.cals therefore wants to fundamentally change this status with its new automation and engineering approach.

Challenges facing automation projects are constantly increasing with the tasks at hand often resembling the challenge of squaring a circle. Despite increasing complexity, the time span for the development of new solutions is becoming shorter. In addition, requirements for the customization of products are becoming more diverse, the costs of production however should remain the same. Customized products at the price of mass products can however be only achieved by a more flexible production approach. After all, new business models such as predictive maintenance require additional development effort because they demand high data quality and availability.

Designing modern automation solutions

Engineering is still dominated today by single-user systems running on a PC – usually under a Windows OS. "With engineering tools that have been used in the automation world for 30-years, programmers and integrators are increasingly no longer able to meet today's business demands. It is essential to design automation solutions that are proactive, flexible, efficient and future-proof for tomorrow's business models," says

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Michael Plankensteiner, CEO of the automation software company logi.cals, a pioneer of software-based control technology.

Never touch a running system...

… is an unwritten law in machine and plant engineering. At best, applications are optimally programmed and put into operation. Once the application (production line or individual machine) is running, changes in terms of functions and programming are kept to a minimum. This approach however is no longer sustainable, explains Plankensteiner. Customers today want to benefit from new and better technological developments without constantly having to renew their production park. Automation technology therefore needs to develop in line with customer requirements – just as we are accustomed to with smart devices nowadays, which are constantly being upgraded through software updates.

A Good Feeling

Customers today expect their products to allow software updates, explains Plankensteiner: "Nobody would buy a television set for which no regular updates are available. This is clear to every user of mobile phones but also applies to sports watches, robotic vacuum cleaners and smart LED lighting. Users benefit from better software in terms of quality and functionality, which provides a "good feeling" of owning a product that is always state-of-the-art."

Quality and Security

"It is obvious that a permanently maintained system meets significantly higher quality standards than conventional systems, which are created once and basically only receive bug fixes. This approach and thinking are increasingly outdated," explains Plankensteiner. "Due to permanently changing security requirements, today's systems must allow for updating with little effort." Automation solutions are increasingly becoming an integral part of the Industrial Internet of Things, as they offer many advantages for operators and in applications. Ignoring the resultant security requirements may however give rise to expensive lessons in the event of a cyber-attack. The ability to import security updates is therefore a process that must already be part of the operation of any automation solution today. "It should be as simple for machines or building automation as it is for my cell phone or television," says Plankensteiner. "But it is not as today's processes with PC-based engineering systems are not optimally suited for this."

Retrofitting functions against payment

"There are also good financial reasons to consider an automation software that develops flexibly and dynamically", says Plankensteiner. "Automation software can also offer customers new functionalities. This can be done free-of-charge as part of an update

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under a maintenance contract or as an upgrade with extended options for which the software manufacturer can request payment". Automation software therefore becomes a driver for new business models, for example in the fields of safety and predictive maintenance as well as in the area of data analytics.

New Thinking – New Acting

"A web-based automation solution is ideal for the challenges facing the mechanical and plant engineering industry", explains Plankensteiner. "Applications need to be flexible and able to change dynamically. Tool chains need to be available, updatable, and extendable throughout their entire lifecycle regardless of the device on which they are installed. Furthermore, web-services enable engineers from various domains to work both together and independently on the development of an application, irrespective of workplace and computer installation", says Plankensteiner.

"Open Web Automation" is logi.cals' answer

Open Web Automation (OWA) is logi.cals' answer to the new dynamic. OWA is an open, modular, and browser-based cloud architecture. The concept, interfaces, and (browser-based) core components are open to OEMs and their developers. OWA describes a vision for the automation process that will soon become reality. Plankensteiner comments: "The world of automation is still dominated by hardware manufacturers, although major functional leaps are achieved through software. With OWA, we open possibilities for current development processes and make the design process more agile and efficient. For example, we eliminate the lock-in effect because today it is virtually impossible to change hardware or software without a great re-engineering effort. We enable easy re-use through software product lines based on objects that can be used in a defined process. Overall, OWA opens an entire range of tools, such as model-based consistency checks, tests, virtual launches or even orchestration and micro services – across hardware boundaries. While others are working on platforms, we are building an entire ecosystem."

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"With Open Web Automation we are taking automation and engineering processes to an entirely new level", says Plankensteiner. "It is a fact that previous approaches and methodologies do not meet today's requirements for flexibility, faster times-to-market and quality. Looking to the future, it is important that any new approaches can not only add functions in a simple and efficient way but also functions that have yet to be even conceived. The importance of this is clear given that business models are constantly evolving. Flexible and creative automation solutions must be supported by a modern engineering ecosystem throughout their entire lifecycle. logi.cals provide OEMs and their developers with a tool that is made for a constantly changing automation world".

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30 years of competence in high-end automation

Back in 1986 logi.cals launched a graphical development tool for the automation industry. At this time, PC operating systems such as MS DOS and Windows had not yet been invented. From its foundation, logi.cals stands for the idea of making cutting-edge technologies from the IT world available for automation engineering. With logi.CAD 3 as part of OWA, logi.cals offers a "state-of-the-art" desktop engineering tool with comprehensive reuse and team engineering functions. logi.CAD 3 is an open, scalable and powerful system that can be easily adapted to individual requirements given its open platform structure. It provides users with the choice of using IEC 61131 languages or high-level languages such as C, C++, or Python. A safety tool chain supplements the system for the aspect of functional safety. logi.CAD 3 allows the efficient creation of manufacturer-independent automation solutions and increases engineering performance in every project phase.

Further information can be found at www.logicals.com/en/news

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