

Heterogeneous Systems, Need of the Hour in Process Industry

One-system integrated engineering does not match up with reality

Today, the term ‘integrated engineering’ has become commonplace when it comes to plant engineering in the process industry. At first, the statement that ‘integrated engineering does not match up with reality’ may seem intriguing! Nevertheless, a closer look at the realities of planning shows that the ‘best of everything’ approach offers many advantages, provided it is realized in the right way.

The idea of gathering all project data in one common database and using one tool for complete lifecycle of the plant, from concept and basic planning through detailed planning and construction to commissioning and operation, does sound attractive. However, what sounds good in theory unfortunately does not work in practice. Only in rare cases, it is possible for a whole enterprise to switch to one integrated software solution – not to mention any project partners who may be involved. Reality in the process industry and hence its software solutions are definitely heterogeneous. Heterogeneous solutions offer several advantages and they can be reliably implemented.

Many believe that there is no alternative to integrated engineering. But, users do have a choice. In simple terms, they have to make the decision between having ‘everything from one source’ and having ‘the best of everything’.

How integrated is integrated engineering?

At first glance, both decisions have their advantages. However, with ‘everything from one source’ it is advisable to take a look behind the scenes. Since one is not necessarily looking at a unified database with no redundant information, how homogeneous is the ‘monolithic’ solution really? Rather, different software components have often been purchased to construct the ‘integrated’ solution and, wherever too much work was involved in adapting the data structures to make a unified solution, unification did not take place. It is well known that a chain is only as strong as its weakest link. If, for instance, the tool for creating Piping and Instrumentation Diagrams (P&IDs) in the integrated solution does not correspond to the user’s concept, the user of a ‘monolithic’ system does not have the possibility of substituting alternative solutions.

Source: Rösberg Engineering GmbH

Moreover, a decision on the unified use of software is not often made centrally in companies today. If there is a decision in favor of an integrated solution with a 'monolithic' system, the changeover is complex and time-consuming. And it is not really possible to influence the solutions used by external project partners. Thus in reality, the software landscape necessarily remains heterogeneous, despite all efforts to the contrary. At the latest, interfaces will become necessary when linking up to the control system.

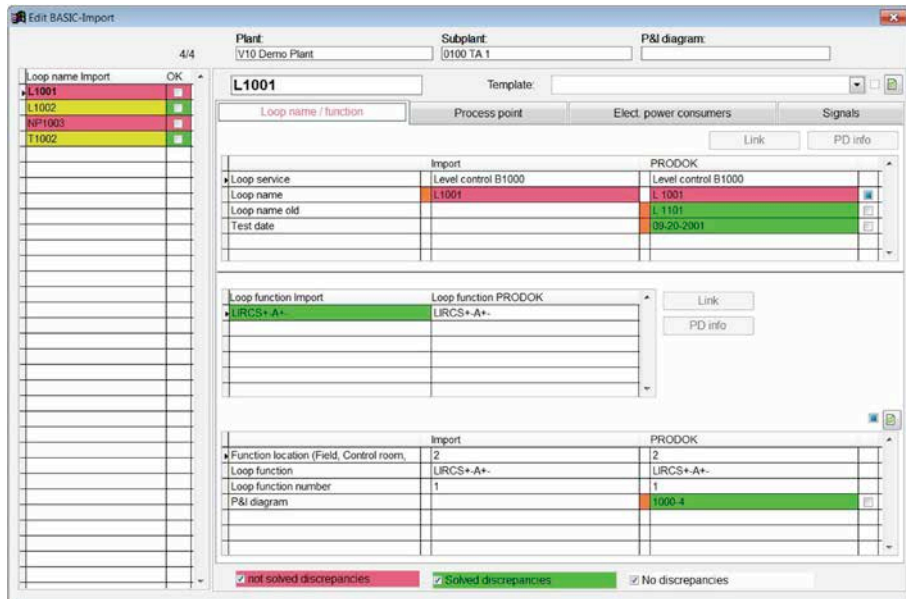
Need for revision-proof interfaces

So is it better to take the 'best of everything' approach? Here, too, one has to proceed circumspectly. Where various different software solutions need to be combined, challenges inevitably arise regarding the interfaces.

A case in point: The I&C-CAE system - ProDOK

The automation experts from Rösberg Engineering GmbH know this from their own experience. Their instrumentation and control (I&C) engineering system ProDOK supports the user in plant planning and construction, and also beyond. Together with the documentation tool LiveDOK, ProDOK supports the whole lifecycle of the plant, including operation and maintenance. With I&C-CAE system, automation experts have to deal repeatedly with interfaces between process planning and its realization in I&C.

Head - Plant Solutions Product Management, Rösberg Engineering GmbH, Dipl.-Ing. (BA) Martin Dubovy sees the advantages of heterogeneous systems. But from practical experience, he is also aware of the challenges they bring along. "We



Various filter functions enable parallel planning procedures, which shorten the planning phase as a whole

have always been convinced by the 'best of everything' approach. Of course, we see the associated problems, and we understand why some people hesitate: where different systems are working together, great attention has to be given to data exchange. Only when it is clearly traceable what data and structures have been changed, when, and by whom, can errors be avoided. For this reason, revision proof data import plays an important role in ProDOK."

Modern process engineering plants can only be operated effectively if the data from the planning stage are available for operation, maintenance and modernization. Factory reality (as-built) and documentation have to correspond reliably. Only when all data are consistent can costly new entries and unnecessary use of engineering resources be avoided. This is exactly where

I&C-CAE system ProDOK comes in. It enables an integrated planning process with uniform rules. Because all data are collected and exchanged within one system, there is no more trouble with tiresome data transfer errors. Functions include basic, functional, realization and installation planning for new construction projects, plant alterations and extensions, as well as operational support. The complete lifecycle of the plant is supported. By its continuous, consistent documentation, ProDOK ensures that the documentation really does reflect plant reality at all times. The result is a noticeable improvement in quality and efficiency, along with substantial savings in terms of time and costs. Security of investment is ensured by wide acceptance of the system and use of state-of-the-art software technology.

Source: Rösberg Engineering GmbH



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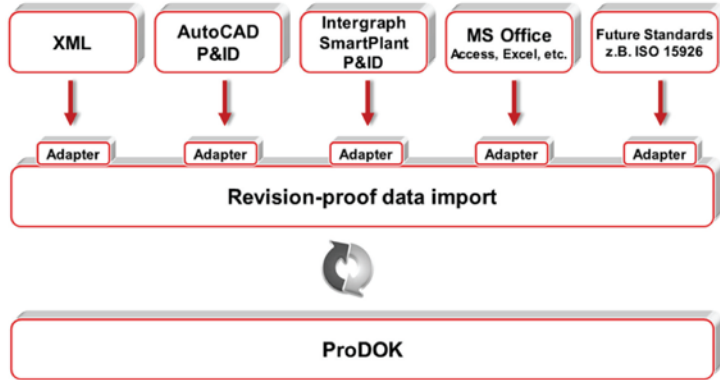


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Source: Rösberg Engineering GmbH



By its continuous, consistent documentation, ProDOK ensures that documentation really does reflect plant reality at all times

Adapters enable fast integration

Very many different software tools are generally used in the planning, construction and commissioning of a plant. In the course of the whole planning procedure, all of them supply documentation relevant data that needs to be passed on to I&C-CAE system. Reliable concepts are needed to ensure that the data fits seamlessly into the overall landscape. Dubovy described Rösberg’s approach to a solution in these words, “For this purpose, we develop the so-called ‘adapters’. Here, the data delivered by other software tools to plant engineering can be converted and passed on to ProDOK. Here too, information is received about when they were changed, and by whom, and status is given, for instance, whether provisional or final.”

Over the years, automation experts have developed several adapters of this kind, which can be used for subsequent projects. Thus, for new projects Rösberg can make use of existing adapters, e.g. for SmartPlant P&ID, AutoCAD P&ID or similar systems.

Of course, adapters can map the standards such as ISO15926 or CAEX, which are usual in the sector for the exchange of data between the various departments involved in process planning and I&C engineering, and between individual software systems.

When software tools are based on these standards, it cuts down the number of adapters necessary for a project. With Rösberg’s broad, tried and tested repertoire of such adapters, the integration of I&C-CAE

system ProDOK into virtually any planning task can be performed simply and speedily. Dubovy commented, “We have just been dealing with a large project for a user in the chemical industry. For this, we actually had to develop four new adapters. However, that is very unusual – usually it is one or two at most.”

Revision-proof data import brings other benefits

In the last analysis, what sounds at first like additional effort and expense in fact brings various advantages. One advantage has already been mentioned – the I&C-CAE system can be upgraded very simply, whereas switching to an integrated solution with a ‘monolithic’ system is usually a complex and costly matter. In addition, revision-proof data import also meets the wish for shorter planning phases.

In theory, plant planning takes place in series, meaning that after the concept phase has been completed the basic phase follows, then the realization phase, and so on. In practice, however, these processes take place side by side – parallelly. To speed up the procedure, it may make sense to exchange provisional data between different departments. Thanks to revision-proof interfaces, the next documentation status always gives a clear overview of where data has changed relative to the previous version.

Various filter functions are also helpful here. In this way, parallel planning procedures that shorten the planning phase as a whole can be managed more reliably

in practice. In addition, the adapter solution makes it simpler to ‘try out’ different variants. Dubovy explained, “With integrated solutions, if a change is made it is applied at once throughout the whole system. Often, it is not possible to trace who made what change, and when, or to establish that the change was only made for testing purposes. For this reason, many software providers are now building artificial ‘interfaces’, with which they can record this kind of information. Our solution already contains this function as part of its purpose. For instance, it allows users to specify when data is only provisional. This makes try-outs much easier.”

Faster access to translations and device documentation

Projects in which software tools deliver data for documentation in different languages also benefit from revision-proof data import. In some cases, translation can take place automatically in the adapter. Where this is not possible, lists can be automatically compiled. These can be passed onto the translator and then reimported.

Finally, device engineering also offers benefits. For component documentation, ProDOK adopts the NE-100 Standard. Data recorded in this way no longer has to be manually entered in I&C-CAE system, but can be transmitted automatically. Dubovy asserted, “We are working at present on a project in which an estimated 20,000 devices will have been built by the time the project is completed. The time saved by not having to enter the data for the devices manually in I&C-CAE system is clearly enormous. This is why we have developed a module for NE-100 mass import.” ●

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